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SIGTTO NEWS

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MESSAGE FROM GENERAL MANAGER



Strong and steady progress

Andrew Clifton, the SIGTTO General Manager, reviews the industry-wide scope of the Society's current activities, with particular focus on two notable landmarks

The Society has made good progress in 2016, not least with the completion and closing out of two substantial milestones that have been central parts of our workload for several years.

The first was the implementation of the revised *International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)* on 1 July 2016. The work in updating the old Code began in 2008 when SIGTTO facilitated, on behalf of IMO, the formation of nine working groups under the auspices of a steering group. By coordinating the efforts of nearly 140 experts representing over 40 entities and 20 countries over a two-year period, SIGTTO ensured that this revision was delivered to IMO.

The revised Code was approved at the 92nd Session of IMO's Maritime Safety Committee (MSC 92) in June 2013 and adopted at MSC 93 in May 2014. The updated global regime entered into force on 1 January 2016 and was fully implemented this past 1 July.

The second major milestone was the publication, also in July 2016, of the fourth edition of *Liquefied Gas Handling Principles*. This document is SIGTTO's premier publication and was last revised in 2000. The new edition is a completely updated publication which accommodates and aligns with the many changes that have



The Spring 2016 Board Meeting was held in Boston in May and SIGTTO's directors had the opportunity to visit the USS Constitution in drydock

"Implementation of the updated IGC Code and the revision of Liquefied Gas Handling Principles are major landmarks for SIGTTO."

taken place in the gas shipping and terminal sectors over the past 16 years. See page 6 for more information on the new edition.

I would like to take this opportunity to thank all those who were involved in the revision of both these major industry publications. Some members were involved in both updates, while a number who were involved in the IGC Code revision have since retired!

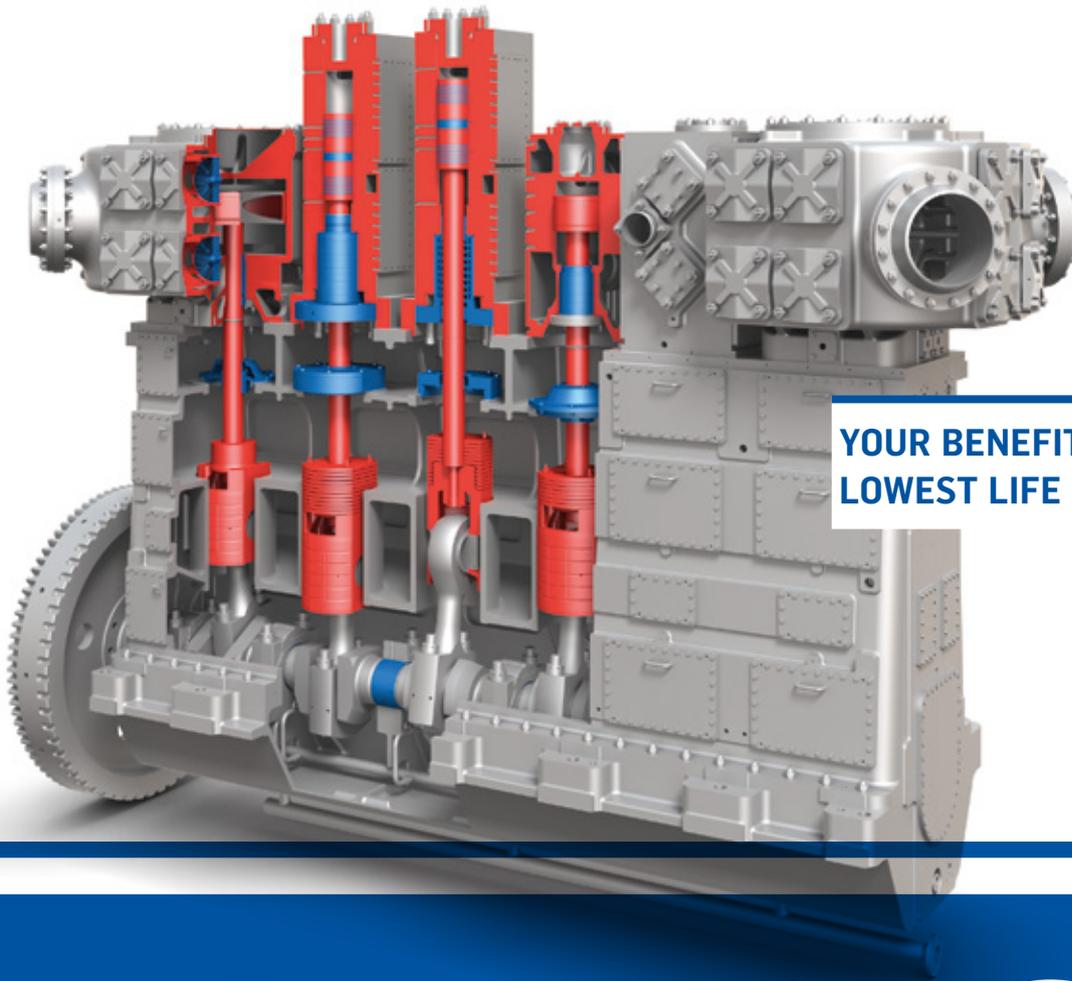
I am also pleased to announce that our *Principles of Emergency Response and Protection - Offshore* document is being published as we go to print. This is the fourth paid publication the Society has delivered in the last two years and we have three more scheduled to appear in the next

12 months. The first of these is expected to be *Guidance for the Operation and Maintenance of Loading Arm Emergency Release Systems*, a document scheduled for publication by the end of this year.

The current worklist of the Society's General Purposes Committee (GPC) is gradually being reduced and the Secretariat, with the support of the members, has worked hard at delivering the projects, >

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MESSAGE FROM GENERAL MANAGER

> and the associated publications, that have been sanctioned. SIGTTO has established an improved structure for its document-producing process in recent years, resulting in greater productivity and efficiency.

The future vision of the Society, as laid out in its 2016 Strategic Plan, 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.

Although the current office space is somewhat restricted, the Secretariat's staff has recently been augmented and I would like to extend a warm welcome to Nikolaos Panagiotakopoulos, who joined us in August in the new position of technical support officer. Nikolaos is profiled on page 5.

Rick Boudiette, one of our technical advisers, returns to Chevron at the end of this year following completion of his secondment. Rick has been with the Secretariat for four years and has been involved with several major projects, including the revisions of the *IGC Code* and *Liquefied Gas Handling Principles*. We would like to thank Rick for his services to the Society and wish him all the best for the future. News regarding Rick's successor will be covered in the next newsletter.

SIGTTO is also set for a scheduled change in the Society's President during 2016, with the three-year term of Total's Luc Gillet coming to an end and David Furnival of Bernard Schulte Shipmanagement moving up from Vice President to President. These changes are to be confirmed at the SIGTTO Board and Annual General Meeting (AGM) in November.

The chairmanships of both SIGTTO's GPC and Panel Meeting are also changing. Chris Clucas is stepping down as GPC chairman after four years in this role. Chris has seen through many projects from start to finish during his tenure and has kept our long and detailed meetings on time and as interesting as possible with sharp technical insights and much-needed humour!

Marc Hopkins' four-year tenure as Panel chairman has come to a close and we would like to thank him for coordinating these busy and stimulating two-day conferences for us and, at the same time, wish him well for the future.

We welcome Mark Hodgson of Shell, who is succeeding Chris Clucas as GPC chairman, and Richard Gilmore of Maran Gas, who will take the Panel Meeting reins from Marc Hopkins. The careers of Mark and Richard are covered on page 5.

Richard's first Panel Meeting as chairman will be in Limassol in October. As mentioned in the last issue of SIGTTO News, SCF Management Services has kindly offered to

host our Autumn 2016 Panel in Cyprus and it promises to be a memorable occasion.

We are pleased to announce that the Panel Meeting's agenda will feature three presentations on important lessons learnt recently by the industry. All credit to the members concerned for sharing their experiences so that the industry as a whole can benefit. Such sharing of experience is the very essence of the Society's purpose and remit. The three Cyprus presentations follow in a long-line of such discussions at SIGTTO and are set to reinforce the success we have achieved in disseminating key lessons to our members and the industry at large over many years.

It was an honour and a privilege for SIGTTO and myself to be present at the inauguration of the Panama Canal's new, enlarged locks in June. LNG shipping and our publication *Guidance for LNG Carriers Transiting the Panama Canal*, which was published in 2014, were mentioned several times throughout the weekend. The Panamanian people are deservedly proud of their new locks and the inauguration ceremony, which is described on page 6, was a great patriotic occasion for them.

There is a perception amongst some that SIGTTO deals predominantly with LNG shipping, even to the exclusion of all else. I'm pleased to say that our current activities and those of the recent past are very much evidence to the contrary! Our workload also

encompasses terminal operations, while key SIGTTO focal points of late include the handling of LPG, ethane and hydrogen.

An example of this broad liquefied gas scope is *LPG Ship/Shore Interface - Best Practice for LPG/Chemical Gas Vessels and Terminals*, one of the SIGTTO publications due for delivery over the next year.

A large number of our members, including from amongst SIGTTO's Board of Directors and GPC, are participants in the LPG, chemical gas and terminal sectors. Although LNG shipping is capital-intensive and the "box office ticket" in terms of profile and exposure, the Society continues to also represent the equally important LPG and terminal industries.

Chubu Electric is kindly hosting SIGTTO's 2016 Board and AGM in the Japanese port of Nagoya on 18 November, while we will also have an Asian Regional Forum meeting in Tokyo on 15 November. This will be the first time for some years that SIGTTO has held meetings in Japan and we look forward to these events. The Society will also be returning to Tokyo for the 75th meeting of our GPC and the Gastech conference in April 2017.

At press time the first ever meeting of the Society's new Human Element Committee was about to take place. The new 2016 Strategic Plan identified the need for such a body and the initiative will be discussed in detail in the next newsletter.

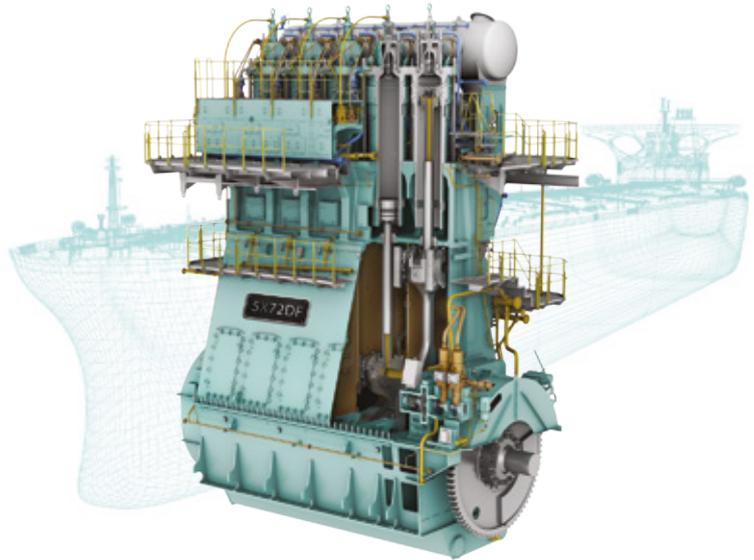
UPCOMING MEETINGS 2016

MEETING	DATE	LOCATION
European Regional Forum	14 Sep	London
South American Regional Forum	27 Sep	Buenos Aires
74th General Purposes Committee	4 Oct	Cyprus
62nd Panel Meeting	5-6 Oct	Cyprus
Singapore Regional Forum	21 Oct	Singapore
Asia Regional Forum	15 Nov	Tokyo
Autumn Board Meeting & AGM	18 Nov	Nagoya
Australia Regional Forum	1 Dec	Perth
Middle East Regional Forum	5 Dec	Doha
Pan American Regional Forum	6 Dec	Houston
Joint SIGTTO/US Coast Guard Forum	7 Dec	Houston
India Regional Forum	7/8 Dec (TBC)	Mumbai

UPCOMING MEETINGS 2017

75th General Purposes Committee	3 Apr	Tokyo
Spring Board Meeting	17 May (TBC)	Glasgow
76th General Purposes Committee	3 Oct	Houston
63rd Panel Meeting	4-5 Oct	Houston

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Mark Hodgson at GPC helm



Mark Hodgson has taken over as chairman of the SIGTTO General Purposes Committee (GPC) in succession to Chris Clucas who has stepped down from the role after a four-year tenure.

Mark has been a member of the SIGTTO GPC for seven years as the Shell representative and has contributed to several SIGTTO activities during that time. These include chairmanship of the Fire Effects Working Group and membership of the Steering Group that led the revision of the IGC Code.

As manager, gas projects within Shell's Shipping & Maritime Technology division in London, Mark Hodgson is responsible for global maritime gas-related projects, including LNG and LPG design and technology; floating gas projects (FLNG, FSRU and FSU vessels); and novel technology deployment. The latter function encompasses the development of global gas marine design and engineering standards under the aegis of relevant technical authorities.

Following sea time as chief engineer in the Shell oil and gas fleet, Mark served as recruitment and training manager for Shell and as shipping industry training manager for the UK Chamber of Shipping. In these roles he was involved in developing and implementing new competence and training regimes across the British shipping industry.

During a subsequent period in fleet management, Mark led numerous LNG and LPG carrier refit and refurbishment projects as a superintendent engineer. The work included life extension programmes and major vessel conversions in Dubai, Singapore, Japan and Europe, and led to an appointment as London-based fleet manager for the Shell oil and gas fleet.

On moving to Shell's Technology Division, and before taking on his present global role, Mark Hodgson led gas projects in Russia, Europe, Australia, Dubai and the US.

"Being asked to become SIGTTO GPC chairman is a signal honour," says Mark, "considering the great gas industry leaders that have occupied the seat over the years. In light of the growing and increasingly diverse nature of the gas industry, the Society is as relevant and important today as at any point in the past. I very much look forward to contributing to the Society's continuing success going forward."

Richard Gilmore in the Panel chair



Richard Gilmore will take on the role of SIGTTO Panel chairman starting with the next Panel Meeting to be held at the Four Seasons Hotel in Limassol, Cyprus on 5-6 October 2016.

Richard takes over from Marc Hopkins who has relinquished the position after a four-year tenure to take up other duties at his company.

When approached by Andrew Clifton for the job as SIGTTO Panel chairman, Richard replied, *"I am honoured to be asked and would very much like to take on this task. I have attended several SIGTTO Panel and Regional Meetings over the years and have always been very impressed by the high quality of the papers presented and the audience attending."*

Richard is long-term member of SIGTTO's General Purposes Committee (GPC), having joined this body in 2006.

Richard Gilmore is director gas fleet for Maran Gas Maritime Inc, the LNG shipping unit of the Angelicoussis Shipping Group Ltd. Maran has 20 LNG carriers in operation, with another 12 such vessels under construction.

Richard has been involved with LNG shipping for over 30 years, this part of his career encompassing LNG ship design and construction, operations and finance. In his current role he oversees the management of Maran's gas fleet, as well

as new business development activities.

Richard Gilmore received a BSc in Marine Engineering and Naval Architecture from Webb Institute and an MBA from Harvard Business School.

Technical Support Officer - Nikolaos Panagiotakopoulos



In August 2016 Nikolaos Panagiotakopoulos joined the SIGTTO Secretariat in London in the new position of technical support officer. He will report to technical

adviser Cherian Oommen and will assist all the Secretariat's technical advisers with research, report writing and analysis.

Nikolaos has recently completed an MSc course in shipping, trade and finance at London's Cass Business School. Prior to that, he graduated from the National Technical University of Athens in Greece with a degree in naval architecture and marine engineering. The five-year programme at the University provides a qualification that is equivalent to an MEng degree.

Nikolaos has had the opportunity to bring the knowledge gained in the classroom to bear in industry by means of two summer internships in Athens. The first was with Sigma Marine Design while the most recent was at the offices of Thenamaris (Ships Management).

MEETINGS

Notable Forums

Of the many 2016 Regional Forums listed in the upcoming SIGTTO meeting table on page 3, several merit special mention.

The South American Regional Forum in Buenos Aires on 27 September is the second such meeting in the region and the first in the Argentine capital. The inaugural South America meeting was in Montevideo in 2014. On this occasion the Forum will be complemented by a technical visit to the Escobar LNG import terminal on the River Plate where cargoes are received by a floating storage and regasification unit (FSRU).

The Pan American Regional Forum in

Houston on 6 December will be followed a day later by a joint SIGTTO/US Coast Guard/Society of Gas as Marine Fuel (SGMF) Forum, also in the Texas energy capital. SIGTTO participated in a similar collaborative event with the Coast Guard in Houston in December 2015.

The first-ever SIGTTO Regional Forum in India is scheduled to take place in Mumbai on 8 December. The last time the Society was in India was for a Panel Meeting, also in Mumbai, in April 2006. Players from many of South Asia's new projects in the LNG, LPG and chemical gas sectors, both planned and in progress, are being invited to attend.

EYEWITNESS TO PANAMA CANAL HISTORY

The first gas carrier transited the expanded Panama Canal locks the day after the official opening; pieces of the ceremonial staging are visible in the foreground



Gas shipping was present at the opening ceremony for the expanded Panama Canal on 26 June 2016 in the form of SIGTTO general manager Andrew Clifton. Official events began the day before, on the Saturday, with a technical visit to the Canal's Pacific locks. Andrew writes:

"It was great to see the finished locks, having last visited more than two years ago when the area was a construction site. On this occasion workers were cutting the grass and applying coats of paint in preparation for Sunday's inaugural ceremony.

"On the Saturday evening a thousand of us gathered for an official presentation in Panama City's conference and convention centre. Intertanko managing director Kathi Stanzel and I found ourselves sitting just two rows behind Panama's president, Juan Carlos Varela.

"To kick things off Panama Canal Authority (ACP) chief executive Jorge Quijano appeared out of a thick cloud of dry ice in front of three large video walls

to give a presentation that placed heavy emphasis on LNG shipping and the new opportunities the expanded locks provide.

"For the main event the following afternoon we took our seats in a large, covered stand next to the middle lock on the Canal's Pacific side, joining 20,000 people, including several heads of state. We had a rather long wait in hot and humid conditions before we saw, streamed live on large video screens, the chosen first vessel, the 9,443 TEU container ship *Cosco Shipping Panama*, begin its journey through the Atlantic locks.

"When President Varela gave the signal for the lock gate near us to open, we heard a blast on the ship's whistle as the large container ship came fully into view. That triggered a long and colourful firework display and portrayals of the nation's history by dancers and actors positioned on the side of the lock.

"The Canal's opening ceremony was followed by a final reception for the guests in a huge, air-conditioned

marquee and, finally, a bus back to our hotels. It was a great honour and privilege to represent the gas shipping sector at what was a groundbreaking event for not only the maritime industry but also the people of Panama."

The enlarged Panama Canal did not have to wait long for the flow of large gas carriers to commence. The first gas ship to transit the locks was NYK's very large gas carrier (VLGC) *Lycaste Peace*, the 78,945m³ LPG vessel making the passage on 27 June, the day after the opening ceremony. The first LNG carrier to pass through was the 163,700m³ *Maran Gas Apollonia*, on 25 July.

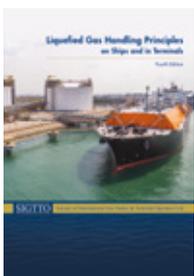
The US shale gas revolution is making possible large-scale exports of LNG and LPG from US Gulf terminals, and the enlarged Panama Canal is enabling much shorter delivery voyages to destinations in Asia and on the west coast of Latin America. Prior to the commissioning of the new locks, the only options for VLGCs and LNGCs were the long sea routes around the Capes.

In June 2014 SIGTTO released its *Guidance for LNG Carriers Transiting the Panama Canal* publication. A working group comprising representatives from SIGTTO member companies and ACP compiled the document over the course of 2013-14 in anticipation of the new locks entering into service. It is available to purchase on the website of Witherby (<http://www.witherbyseamanship.com/guidance-for-lng-carriers-transiting-the-panama-canal.html>).

The SIGTTO guide provides practical guidance on the ACP requirements for LNGC transits, including pre-arrival procedures, security, navigation, pilotage, mooring, tugs, LNG cargo carriage, vapour management, propulsion systems, bridge visibility and contingency planning. It is believed that, as yet, this remains the only publication produced by any organisation regarding the new Panama locks.

PUBLICATIONS

Updated Principles



SIGTTO is pleased to announce the publication of the fourth edition of its premier document, *Liquefied Gas Handling Principles: On Ships and in Terminals*. LGHP4 incorporates

extensive updates and a wide range of new material to reflect the many

changes and technological advances that have taken place in the gas shipping and terminal industry since the third edition was published in 2000.

Topics impacted by the changes include, but are not limited to, vessel design, propulsion systems, size of fleet, floating regasification and reliquefaction, Arctic LNG, containment systems, improved vessel energy and environmental efficiencies, vessel capacities, equipment technology, industry best practices and legislation.

The wide range of revision work is reflected in LGHP4's impressive

credentials. The fourth edition comes in at 2.5kg on the weighing scales and its 530 pages are almost double the third edition's 275 pages. The new edition also features over 300 figures, diagrams and photos to complement the text and help explain issues, concepts and principles.

Although the new publication has an undoubted appeal as a valuable reference work amongst all those involved in the design, construction and operation of gas carriers and terminals, it has been compiled primarily for serving ships' officers and terminal staff who are

responsible for cargo handling operations.

Like the previous editions, LGHP4 stresses the importance of understanding the physical properties of liquefied gas cargoes in relation to the operation of gas-handling equipment and systems on the ship and at loading and discharge jetties. Unless they are aware of how and why each gas cargo behaves the way it does, and the associated risks across a range of operating scenarios, operators will not be able to fully appreciate the role of the shipboard and terminal equipment they are controlling.

"This publication is SIGTTO's flagship document and it is a great achievement

to have this fully revised edition available for the industry," comments SIGTTO general manager Andrew Clifton. "I would like to thank all those involved with the revision. It is recommended that a copy of LGHP4 be kept - and used - onboard every gas tanker and in every terminal to provide advice on operational procedures and the shared responsibility for safe and efficient operations."

SIGTTO member companies played a key role in providing the foundation material for the new edition while Rick Boudiette, one of the Secretariat's technical advisers, served as the central

coordinator to bring the project to fruition.

"Compiling LGHP4 was a cooperative effort, with input received from across the membership and industry subject matter experts (SMEs)," points out Rick Boudiette. "My role in editing and structuring the revision was facilitated by assistance from my SIGTTO Secretariat colleagues, project staff at the book's publisher Witherby and the aforementioned SMEs.

The fourth edition of Liquefied Gas Handling Principles: On Ships and in Terminals is priced at £275 and is available from Witherby Publishing Group Ltd: www.witherbys.com.

FROM THE ARCHIVES ... Avondale remembered

Avondale, the Louisiana shipyard near New Orleans involved in the ill-fated construction of three LNG carriers for El Paso back in the 1970s, is up for sale. Except it is no longer a shipyard.

Avondale has passed through the hands of several major US defence contractors over the years. In 2010 Northrop Grumman decided to halt vessel construction at the yard and consolidate all its shipbuilding business at Ingalls Shipbuilding in nearby Pascagoula, Mississippi. The following year Northrop Grumman spun off Huntington Ingalls Industries (HII) and in 2013 HII transitioned Avondale Shipbuilding to Avondale Industries to pursue business in the energy market. The latest chapter in the saga was opened in 2015 when HII decided to put the site on the market for sale.

Avondale's only brush with LNG came in 1973 when El Paso Natural Gas Company ordered three 125,000m³ LNG carriers at the yard. The vessels were to form part of a nine-ship El Paso fleet employed in the carriage of Algerian LNG to the US. Two other trios were ordered, at the France-Dunkerque yard in France and Newport News in the US. Prior to the Avondale and Newport News breakthroughs, no LNG carrier had previously been built at a US yard.

The Conch containment system was chosen for the Avondale newbuildings, and each of the US\$103 million vessels was provided with five aluminium alloy, self-supporting, prismatic cargo tanks. These were by far the largest LNGCs ever specified with Conch tanks.

Each cargo tank was built with a liquid-tight centreline bulkhead and a transverse swash bulkhead. The tanks were insulated by means of layers of sprayed polyurethane foam (PUF) applied to the ship's inner hull. Bottom load-bearing balsawood/plywood composite panels supported the weight



of the tanks and cargo. Centreline anti-rolling support keyways and transverse top keys held the tanks in place.

Having been subcontracted to construct the cargo tanks and supply and apply the insulation, Kaiser Aluminum and Chemical Corp set up an assembly plant near Mobile, Alabama to carry out the tank construction work.

Once Avondale completed the vessel hulls, including spraying PUF insulation on the inner hulls, these were towed to the Kaiser assembly plant for the installation of the tanks. Although each cargo tank weighed, on average, 950 tonnes, the installation of the units proceeded without any undue problems.

The three Conch ships - *El Paso Columbia*, *El Paso Cove Point* and *El Paso Savannah* - were all completed in 1979. Unfortunately, extensive cracking of the PUF foam was discovered throughout the insulation during the vessels' gas trials. As result El Paso refused to accept the ships from Avondale. After many years of claim and counter claim, extensive layup

periods and much debate, it was decided that the ships could not be economically repaired for LNG trading. El Paso received a US\$300m insurance settlement.

As described in *LNG Shipping at 50*, the 2014 SIGTTO/GIIGNL commemorative publication, *El Paso Cove Point* and *El Paso Savannah* were later sold to Coastal Corp and taken to the Hyundai Mipo repair yard in Korea to be converted to bulk carriers. The aluminium cargo tanks were removed and reused ashore and the boiler and steam turbine propulsion systems were altered to enable them to burn coal. In 1983 the ships began to trade commercially as *Jade Phoenix* and *Golden Phoenix*, respectively. In March 1987 *El Paso Columbia*, the first of the Avondale trio, arrived at Kaohsiung in Taiwan to be broken up for recycling.

Back to the present, HII tells us that they have yet to find a buyer for the property. Established in 1938, Avondale at one time had 26,000 workers on its books and was the largest employer in the state of Louisiana.

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REGULATIONS



The revised IGC Code applies to gas carriers whose keels were laid on or after 1 July 2016

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) enters into force on 1 January 2017. As a reminder, 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 design and arrangements for the fuel storage and distribution systems comply with the requirements of the IGC Code for gas as a cargo.

Work on Phase 2 of the IGF Code, covering the use of low-flashpoint diesel, fuel cells and methanol as means of propulsion, continues via Correspondence Group under the purview of IMO's Carriage of Cargoes and Containers (CCC) Sub-committee.

IGC Code: The International Gas Carrier (IGC) Code entered into force on 1 January 2016, and applies to vessels whose keels are laid on/after 1 July 2016. Several requests to amend the new version of the Code were submitted for consideration at the 96th Session of IMO's Maritime Safety Committee (MSC 96) in May 2016 but,

with the exception of one item, rejected.

The one proposed amendment not rejected at MSC 96 was the possible use of high manganese steels in cryogenic service. This will be further debated at the CCC Sub-committee's 3rd Session (CCC 3) in September 2016. Several IGC Code Unified Interpretation proposals have also been submitted for consideration at this meeting.

IMO also intends to progress the development of *Interim guidelines for the carriage of liquefied hydrogen* at CCC 3, and finalise them at MSC 97 in November 2016.

EU: While IMO prepares amendments to the Ship Energy Efficiency Management Plan (SEEMP) guidelines for fuel consumption data collection, the European Sustainable Shipping Forum (ESSF) continues its work on guidelines for implementation of the European Commission's Monitoring, Reporting and Verification (MRV) regulation for quantifying and reducing ship CO₂ emissions.

The MRV regulation requires shipowners and operators to annually monitor, report and verify CO₂ emissions for vessels of 5,000 gross tons or larger calling at any EU port. MRV data collection, which will take place on a per voyage basis, is set to start on 1 January 2018.

The EU is, however, still working on the details of the monitoring and verification final rules. Under the current proposals LNG carriers will use volume, as per the custody transfer measurement system (CTMS) readings, to determine the amounts of cargo carried and boil-off gas (BOG) burned as propulsion fuel. Other gas carriers will use mass, as per bills of lading, to determine cargo carried.

There are ongoing attempts to align the two sets of requirements but for now the EU and IMO schemes differ. A comparison of EU and IMO regulatory regimes for CO₂ emissions is given in the accompanying table.

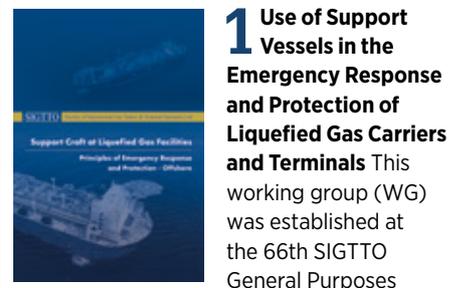
EU and IMO regulatory regimes for CO₂ emissions

	EU MRV	IMO Data Collection
Entry into force	July 2015	Expected March 2018
First monitoring period	2018	2019
Monitoring plan	Standardised template	Included in SEEMP
Basic parameters	Fuel and CO ₂	Fuel and CO ₂
	Cargo carried	Design deadweight
	Distance	Distance
	Time at sea and in port	
Reporting to	EC	Flag State
Verification	Accredited 3rd Party verifier	Flag State

WORKING GROUPS

Project updates

The following paragraphs review the progress made by SIGTTO's latest four working groups. All aim to complete their projects during the course of 2016/2017 to enable the publication of the relevant guidance.



1 Use of Support Vessels in the Emergency Response and Protection of Liquefied Gas Carriers and Terminals This working group (WG) was established at the 66th SIGTTO General Purposes

Committee (GPC) meeting in October 2012. As described on page 9 of the Autumn 2015 edition of *SIGTTO News*, the WG produced a document on emergency response principles for onshore terminals which was published in mid-2015. The second and final publication in this series - on emergency response at offshore facilities - has been approved and is being prepared for publishing. This should be available to purchase soon.

2 Emergency Release System (ERS) Failures This WG was established at the 70th GPC meeting in October 2014 and first met in January 2015. The WG is tasked with examining all safety aspects relating to the operation of emergency release systems (ERS). 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 obtain approvals and commence the publishing process in 2016.

3 LPG Ship/Shore Interface Formed at the 70th GPC meeting in October 2014, this WG held its inaugural meeting in February 2015. The WG is tasked with identifying the possible root causes of LPG ship/shore interface-related incidents and updating or rewriting 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 and terminal sectors and to minimise the risk of LPG ship/shore interface-related incidents in the future. The group aims to complete its work in 2017.

4 Gas Carrier Manifolds At the 72nd GPC meeting, which took place in September 2015, it was decided to form a WG to revise the 2011 SIGTTO publication *Manifold Recommendations for Liquefied Gas Carriers*. The group has had two meetings in 2016 and aims to complete its work in 2017.

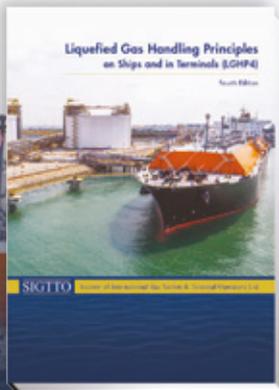
SIGTTO

Liquefied Gas Handling Principles on Ships and in Terminals (LGHP4)

Fourth Edition

This fully illustrated 500-page reference book covers every aspect of the safe handling of bulk liquid gases (LNG, LPG and chemical gases) on board ships and at the ship/shore interface at terminals. It is indispensable for personnel training for operational qualifications as well as those already engaged in liquefied gas operations.

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NEW MEMBERS

Seven sign on

Seven companies have joined the Society's membership in the six months since the Spring 2016 edition of SIGTTO News. The new members and their date of joining the Society are shown below. The SIGTTO membership now stands at 139 full members, 48 associate members and 27 non-contributory members.

Saga LNG Shipping	1 May 2016
Etki Liman Isletmeleri	1 July 2016
Fratelli Neri	1 July 2016
Bumi Armada	1 August 2016
Maritime Safety	
Queensland	1 September 2016
Anthony Veder	1 September 2016
Enagás	1 September 2016

Saga LNG Shipping is the recently established shipping arm of Landmark Capital. Landmark has a 45,000m³ LNG carrier under construction at China Merchants Heavy Industry's Haimen shipyard in the eastern Chinese province of Jiangsu and has specified an innovative cargo containment system for the vessel. The mid-size gas carrier will feature the first application of the patented LNT A-Box tank design. Developed by LNG New Technologies, another Landmark Capital unit, the LNT A-Box system features self-supporting IMO Type A tanks mounted within an insulated hold space. The ship is due for delivery in early 2018.

A subsidiary of Kolin Construction, **Etki Liman Isletmeleri AS** is developing Turkey's third LNG import terminal. To be located at Cakmakli, close to the port of Aliaga, the facility will make use of a floating storage and regasification unit (FSRU) in its first phase of operations.

Fratelli Neri SpA provides support vessel services for *FSRU Toscana*, a floating LNG import terminal positioned 20km off Italy's west coast near Livorno. Fratelli Neri owns and operates *LNG Guardian*, a 2012-built tug used to assist LNG carriers arriving and departing *FSRU Toscana* and to maintain standby services at the facility. The tug is employed by terminal operator ECOS, a joint venture of Exmar Offshore Services and Fratelli Cosulich.

Bumi Armada Berhad made its entry into the floating LNG sector in April 2015 when it was awarded an 18-year lease and operate contract covering the provision of a floating storage unit (FSU) for use at the Delimara LNG import terminal in Malta's Marsaxlokk Bay. Bumi Armada has had the

1985-built, 125,000m³ Moss spherical tank LNG carrier *Wakaba Maru* converted by the Keppel yard in Singapore into the FSU *Armada LNG Mediterrana* for the project. To be permanently moored at a jetty near the Delimara power station, the vessel will supply LNG to an onshore regasification plant feeding natural gas to the 400MW baseload plant. *Armada LNG Mediterrana* is scheduled for a September 2016 arrival in Malta.

Maritime Safety Queensland is responsible for ensuring that maritime activities in this Australian state's waters are in compliance with international conventions, federal and state legislation and local port procedures. Gladstone, one of the largest ports under Maritime Safety Queensland's jurisdiction, has recently commissioned three new LNG export terminals - Queensland Curtis LNG, Gladstone LNG and Asia Pacific LNG - adjacent to



LNG carrier traffic at Gladstone in Queensland is gradually building towards plateau levels of one vessel per day

each other on Curtis Island. When output from the six trains at the three terminals reaches capacity in 2017, Gladstone port authorities will be responsible for managing the safety of approximately 30 LNG carriers arriving to load cargoes each month.

Anthony Veder has been a leading operator of LPG and chemical gas tankers for many years and, most recently, has introduced a number of small-scale LNG shipping innovations. Delivered in April 2009, the 7,500m³ *Coral Methane* is the industry's first multigas carrier, able to transport LNG, ethylene, LPG and a wide range of other liquefied gas cargoes. Veder's 16,500m³, 2013-built *Coral Energy* is the world's first direct-drive, dual-fuel, ice class 1A LNG carrier while the 7,500m³ *Coralius*, due for completion in early 2017, is a combined LNG bunker and feeder vessel. Veder is sharing ownership of *Coralius* with Sirius Rederi. SIGTTO is especially pleased to welcome Anthony Veder to the membership, as the Society has liaised with the shipowner for several years with this goal in mind.

Enagás, the Spanish energy company, owns and operates the nation's gas grid and also operates or has a share in eight LNG import terminals worldwide. The regasification plant complement comprises six facilities in Spain - Barcelona, Sagunto, Cartagena, Huelva, Gijon and Bilbao - as well as Altamira LNG in Mexico and GNL Quintero in Chile.

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

SCF Management Services - ice specialist

SCF Management Services is responsible for the technical management of Sovcomflot's worldwide fleet of 154 vessels totalling over 13 million dwt. SCF also offers its ship management services to other clients, and these business partners include Glencore, Nordic Bulk, NYK and EuroAfrica.

Among the ship manager's specialities is the operation of oil and gas tankers in locations with challenging ice conditions. One-half of the vessels in the fleet have been built to a high ice class. The ice class expertise extends to the support of oil and gas facilities in Arctic waters.

The chief SCF Management Services offices engaged in fleet technical and commercial management activities are those at Limassol in Cyprus and at the Russian ports of Novorossiysk, St Petersburg and Yuzhno-Sakhalinsk. Other offices are maintained at Vladivostok in Russia and the Philippines capital of Manila.

SCF Management Services (Cyprus) Ltd in Limassol is looking forward to welcoming a large cross-section of the gas shipping and terminal industry as it hosts the Autumn 2016 SIGTTO Panel Meeting on 5-6 October.

"We are proud to be hosting the upcoming SIGTTO Panel in Cyprus," states Sergey Popravko, managing director of SCF Management Services. "The Society's Panel Meetings always provide great opportunities to discuss topical industry issues; network with peers; and exchange ideas and thoughts relevant to the global gas industry."

SCF Management Services is part of the SCF Group, or Sovcomflot, Russia's largest shipping company. Sovcomflot is a global leader in the seaborne transport of hydrocarbons and servicing the offshore oil and gas exploration and production industry.

SCF Management Services was formed in 1991 and from the outset was involved in the management of dry cargo ships, tankers and offshore support vessels for Sovcomflot and a wide range of other owners.

In 2005 SCF Management Services embarked on a new journey, establishing a presence in the LNG/LPG ship management sector and joining SIGTTO as a committed member. At around the same time the company became an approved ice class operator, and today SCF Management Services manages many vessels active in the Baltic Sea and Arctic Ocean, including along the Northern Sea Route and to Canada's Baffin Island.

Sergey Popravko continues, "The training of our crews to deal with extreme weather conditions is a key part of our ice class



Having supervised the construction, SCF Management Services now manages the 170,000m³ Velikiy Novgorod and her three sisterships

expertise. Opened in St Petersburg in 2012, our SCF Group Training Centre quickly became a hub of expertise and excellence for operations in ice-covered waters.

"We are an established player with an acknowledged know-how that extends to executing newbuilding projects of various complexities for our clients."

To date SCF Management Services has completed 147 shipbuilding projects, including the recently delivered LNG carriers *SCF Melampus*, *Pskov*, *SCF Mitre* and *Velikiy Novgorod*. All four of these 170,000m³, ice class 1C ships are powered by tri-fuel, diesel-electric propulsion systems while their construction incorporates the latest environmental protection and energy efficiency technologies to meet the needs of the most discerning charterers.

The SCF Management Services newbuilding project team is currently supervising the construction of the pilot icebreaking LNG carrier in the 15-vessel fleet being built for the Yamal LNG project in the Russian Arctic. Named *Christophe de Margerie*, the 172,000m³ SCF Group lead vessel has been built to the Arc7 ice class standard.

The ship's propulsion system comprises six tri-fuel, medium-speed engines driving three Azipod units, an arrangement which enables the ship to navigate through level ice up to 2.1m thick at a steady speed. *Christophe de Margerie* is scheduled to be undergoing gas trials at the time of SIGTTO Autumn Panel.

SCF Management Services is also overseeing the construction of six 42,000 dwt, Arc7 shuttle tankers that will serve the Novy oil port close to the Yamal LNG terminal in the Gulf of Ob.

"Safety Comes First!", as emblazoned on the bridge fronts of our ships, is a tenet to which we have adhered throughout the quarter century we have served the

industry," concludes Sergey Popravko.

"While we apply this guiding principle with rigour across every ship we manage, ensuring compliance for gas carriers and ice-class vessels provides extra challenges. We are proud to be amongst the industry leaders active in establishing, refining and maintaining the high standards required.

"Being a SIGTTO member has been a key part of our success. We share the Society's goals and vision and have been pleased to participate in, and benefit from, SIGTTO's work in developing codes of industry best practice and operational excellence. As a member, we can confirm that SIGTTO has made an invaluable contribution to the exemplary safety record established by the gas shipping and terminal industry."

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