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SIGTTO NEWS

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MESSAGE FROM GENERAL MANAGER



SIGTTO prepares for new home

Andrew Clifton, the SIGTTO General Manager, reflects on an upcoming change of address after a notable 25-year sojourn

SIGTTO is set for a historic year in 2018, not least because the Secretariat will be moving from its current City of London offices in St Helen's Place after 25 years. Quite aside from the fact that there was no option available to extend the lease, it had become clear that we needed larger premises and facilities to accommodate our expanding Secretariat team. We would have needed to find new premises in any case.

When SIGTTO moved into St Helen's Place in April 1993, a drinks reception was held on the Friday evening to celebrate the office move. The following day, Saturday the 24th of April, the Bishopsgate bomb exploded near the entrance to St Helen's Place, causing widespread damage.

Although no one from the Secretariat was in the office at the time, all the buildings in the immediate area suffered substantial damage and we were not permitted access to our premises for several weeks afterwards. Those were the days before computers had become essential to everyday office life and paperwork still reigned supreme. As a result of the bomb, several of the projects with which SIGTTO was engaged at the time were delayed because key documents remained out of reach.

Over our 25-year tenancy at St Helen's Place the Society has had six general managers and 16 technical advisers. These SIGTTO officers are shown in the table on page 3.

The hunt for new premises is currently



The Liquefied Gas Senior Executive Forum in Houston in December 2017, the third in the series, attracted another large crowd

"SIGTTO has delivered six paid publications in the last three and a half years and has three more scheduled for publication in the next 12 months."

well underway, and the search has been concentrated within the immediate vicinity of the current office, in the City of London. We are seeking a new office that is considerably larger than the existing one, to provide space for more staff, as specified in the Society's Strategic Plan 2020, as well as a much larger meeting room than is currently available.

An appropriately sized conference room will enable us to host meetings of our working groups and other SIGTTO bodies, such as the Human Element Committee, within our own premises, something that is not currently possible.

We expect to be in the new office by this coming summer. Full details of the new premises, including

photographs, will be featured in the Autumn 2018 edition of SIGTTO News.

Quite apart from the office move, SIGTTO has a busy schedule of meetings arranged for 2018. The 12-month programme features 10-11 Regional Forums, a Panel Meeting and two meetings each of the General Purposes Committee (GPC), the Board of Directors and the Human Element Committee (HEC). >

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MESSAGE FROM GENERAL MANAGER

> SIGTTO's major event of the year will be the 64th Panel Meeting which will take place in London on 11-12 April. The Panel will be very kindly hosted by Smit Lamnalco and there will be a technical visit to HR Wallingford on 13 April.

The Society is also looking forward to the Gastech 2018 conference and exhibition in Barcelona in September. As usual, we will be sharing an exhibition stand with Witherbys, our publishers, but this year our two organisations have agreed to book a much larger space than has traditionally been the case.

In December 2017 we hosted the third Liquefied Gas Senior Executive Forum in Houston, together with the US Coast Guard (USCG) and the Society for Gas as a Marine Fuel (SGMF). Riviera Maritime Media provided assistance with the organisation of the event, which proved to be a great success, with over 180 delegates participating. See page 6 for further information about the Senior Executive Forum.

In addition to this meeting, 2017 finished with a flurry of December Regional Forums, in Houston, Shanghai and Perth.

On the subject of an expanding Secretariat, I would like to extend a warm welcome to Rob Farmer, who joined us in January 2018 as a directly employed technical adviser. Having worked in senior positions for Shell, BG, Chevron and, most recently, Petroineos, Rob brings with him a wealth of experience in marine operations and technical management.

Rob Farmer also handled project management work at a US shipyard earlier in his career, served in the US Navy and Merchant Marine reserve and is well known to many of our members. I do hope that you will have the opportunity to meet Rob over the course of the year, either at one of our various meetings or during an office visit. Rob Farmer is profiled on page 5.

The Autumn 2017 Board and Annual General Meetings were held in Copenhagen in November. Graciously hosted by Evergas, the gatherings were the focus of much constructive discussion and one of the outcomes was a decision to commence the revision of SIGTTO's Strategic Plan in 2018.

At the time of going to press, the Society is publishing its latest publication, *Recommendations for Liquefied Gas Carrier Manifolds* (see page 9 for further details). The manifold document is the sixth paid publication that SIGTTO has delivered in the last three and a half years and we have three more scheduled for publication in the next 12 months.

This is a notable level of productivity for a small secretariat and it could

“In 2017 the in-service LNG carrier fleet passed the 500-ship mark and logged its 90,000th safely delivered cargo.”

not have been accomplished without the contribution of the Society's members through their participation in the various working groups that developed these publications.

SIGTTO's HEC and GPC are continuing their good work under the respective chairmanships of Teekay's John Adams and Mark Hodgson of Shell. The robust structures and strategies that have been established and put in place for both committees have resulted in greater levels of productivity and efficiency.

I look forward to continuing to serve SIGTTO's members in 2018 during this very exciting time for our industry. In 2017 the in-service LNG carrier fleet passed the 500-ship mark and logged its 90,000th safely delivered cargo, while the seaborne trade in LPG grew strongly and approached the 100 million tonnes per annum level. Who knows what further milestones can be achieved in 2018!

SIGTTO general managers and technical advisers during the 25-year St Helen's Place tenure

General managers

From moving in to July 1995	Bruce E Keer
July 1995 to July 1998	Alain P Vaudolon
July 1998 to February 2003	John L Gyles
February 2003 to May 2007	James MacHardy
May 2007 to November 2012	William S Wayne
November 2012 to moving out	Andrew M Clifton

Technical advisers

July 1993	Ken Spowles (Shell)
June 1994	John Cummings (Shell)
January 1997	Roger Roue (BG)
December 1997	Marc Hopkins (BP)
December 2000	Gary Dockerty (Shell)
April 2002	Chris Snape (Shell)
April 2004	Andrew Clifton (Golar)
December 2005	Paul Steele (BP)
December 2007	Andy Murray (Chevron)
September 2008	Teo Popa (Golar)
December 2010	Craig Jackson (Teekay)
January 2011	Cherian Oommen (Maersk)
November 2012	Rick Boudiette (Chevron)
July 2014	Thierry Descamps (Conoco)
October 2015	Bobby Steele (Exxon)
January 2018	Rob Farmer

UPCOMING MEETINGS 2018

MEETINGS	DATE	LOCATION
77th General Purposes Committee	10 Apr	London
64th Panel Meeting	11-12 Apr	London
Spring Board Meeting	10 May	Isle of Man
Singapore Regional Forum	5 Jun	Singapore
Pan American Regional Forum	21 Jun	Houston
5th Human Element Committee	17 Jul	London
78th General Purposes Committee	21 Sep	Barcelona
Gastech 2018	17-20 Sep	Barcelona
Autumn Board & AGM	28 Nov	Doha
Pan American Regional Forum	3 Dec	Houston
4th SIGTTO/USCG/SGMF Senior Executive Forum	4 Dec	Houston

UPCOMING MEETINGS 2019

MEETINGS	DATE	LOCATION
79th General Purposes Committee	1 Apr	Shanghai
LNG 2019	1-5 Apr	Shanghai
Spring Board Meeting	TBC May	San Francisco



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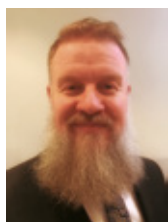
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PEOPLE

Rob Farmer – new Technical Adviser



Rob Farmer joined SIGTTO in January 2018 as the Secretariat's third Technical Adviser. He brings with him a wealth of experience in marine operations and technical management.

Rob's qualifications include a Bachelor of Science degree in Marine Engineering from the California Maritime Academy and a US Coast Guard Assistant Engineer's license for steam and motor vessels. Following the classroom studies, he spent several years at sea sailing on crude and clean product tankers operating between Alaska and US West Coast/Gulf Coast refineries.

A transition into project management roles in a US West Coast shipyard specialising in conversion, repair and some new construction was the next step in his career path. Rob Farmer then joined Chevron Shipping at its California headquarters, taking on roles of increasing responsibility within the fields of engineering, fleet management, and marine assurance.

One notable assignment was his secondment by Chevron to the Angola LNG joint venture project, where he acted as the marine technical manager for Angola LNG Supply Services whilst in Houston, and for Angola LNG Marketing in London. During this four-year tenure he had oversight of all the charterers' operational and technical interests during the design, construction and in-service operation of Angola LNG's dedicated seven-ship fleet.

Seeking a return to the UK after over 10 years with Chevron, Rob then took a position as fleet operations manager for BG Group based in the company's

Reading office. Responsibilities of this role included a transition assignment integrating BG Group fleet and cargo assets into the Shell LNG portfolio, following Shell's 2016 acquisition of BG.

Most recently, Rob was the marine assurance manager for Petroineos Trading. Along the way, Rob Farmer also received a commission as a US naval officer, spending 14 years in the US Navy Reserve/Merchant Marine Reserve where he achieved the rank of lieutenant commander.

"I'm very excited to have joined SIGTTO as the latest step in an LNG journey that started during my cadet shipping days when I happened to tour a very distinctive vessel at the only other berth in Nikiski, Alaska," says Rob. "This was the 89,800m³ *Polar Eagle*, one of a pair of pioneering LNGCs with IHI-SPB tanks, then loading a cargo at the Kenai plant for her maiden voyage to Japan in June 1993. I look forward to confronting the challenges and opportunities which lie ahead for both the Society and the LNG industry."

FLOATING LNG INSTALLATIONS SUB-COMMITTEE



SIGTTO members will be able to bring a wealth of experience to bear on the development of guidance by the new Floating LNG Installations Sub-Committee

Focus on floaters

SIGTTO has established a Floating LNG Installations Sub-Committee to provide guidance on operations with the growing fleet of floating process vessels now being utilised by the LNG industry. The installations that come under the new group's purview are floating LNG production (FLNG) vessels, floating storage and regasification units (FSRUs), floating regasification units (FRUs) and floating storage units (FSUs).

The Floating LNG Installations Sub-Committee will be a standing sub-committee of SIGTTO's General Purposes Committee (GPC), and will coordinate the activities of individual working groups established to consider issues of topical concern in the floating LNG vessel sector.

The new Sub-Committee will have up to 16 members, including a chairperson

and vice-chairperson but exclusive of the appointed SIGTTO Technical Adviser. Ed Scott, chief operating officer of Exceleerate Energy, has been appointed to chair the new group.

As the LNG floater sector grows and diversifies, new participants with no experience of such operations are joining the community. SIGTTO believes there is a need to make the experience and expertise of the pioneering companies in this field amongst its membership generally available through published guidance and recommendations.

Going forward, the Floating LNG Installations Sub-Committee will be preparing guidelines on a range of topics, including site selection, cargo transfer options, vessel design, mooring and fendering, offloading systems, operational safety and contingency planning.

GENERAL PURPOSES COMMITTEE

Choosing new SIGTTO priorities

The 76th meeting of SIGTTO's General Purposes Committee (GPC 76) took place in Houston on 3 October 2017. Committee members devoted a significant proportion of the meeting to discussing the results of the GPC survey conducted in summer 2017 on topics worthy of further consideration by the Society.

The two areas recognised as top priorities for further development are floating concepts, including floating LNG production (FLNG) vessels, floating storage and regasification units (FSRUs), floating regasification units (FRUs) and floating storage units (FSUs), and propulsion systems in tandem with cargo reliquefaction.

Following identification of these priorities, the GPC 76 attendees established a new SIGTTO sub-committee on floating systems (see adjacent panel) and a new propulsion systems/cargo reliquefaction working group to develop relevant guidelines. An additional discussion in Houston on gangway landing areas prompted the creation of a separate working group to consider this topic.

The next GPC meeting, GPC 77, is scheduled for 10 April 2018. Two new publications, i.e. *Ship/Shore Interface for LPG/Chemical Gas Carriers and Terminals* and *Guidelines for the Alleviation of Excessive Surge Pressures on ESD for Liquefied Gas Transfer Systems*, will be submitted to the Committee for approval at that meeting. The publications are described on page 9.

Recent gas-related developments at IMO

Mooring operations At its 5th Session in January 2018 IMO's Sub-committee on Ship Design and Construction (SDC 5) considered regulations and guidelines on mooring operations. Delegates agreed amendments to SOLAS Regulation II-1/3-8 that require the design of the mooring arrangement and the selection of appropriate mooring equipment, including lines, to be based on guidelines being developed. An amendment requiring such equipment to be maintained in a suitable condition has also been included, along with supporting guidelines. The extant guidelines on mooring (MSC.1/Circ.1175) are also being revised.

The important role of industry guidelines has been recognised, particularly the recently revised OCIMF Mooring Equipment Guidelines, and these will be referenced within the IMO guidelines. This work will continue through a correspondence group with a view to finalising both the SOLAS amendments and guidelines, as a complete package, at the SDC 6 meeting next year.

Firefighting equipment At its 5th Session in March 2018 the Sub-committee on Ship Systems and Equipment (SSE 5) will consider a number of gas-related issues. Under a new agenda item a review of IMO's "Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk" (MSC.1/Circ.1315) will begin. The lack of detailed "fire-extinguishing capability test" requirements and the fact that the current guidelines specify only the use of powder based on the salts of potassium when other media are available will be considered. Submissions to date suggest a proposal to allow the use of sodium bicarbonate-based powders may prove controversial.

There are also two unified interpretations on the International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) on the table. One concerns whether the weather deck areas above fuel oil tanks are regarded as part of the cargo area, while the other deals with the installation testing of the onboard discharge test of a dry chemical powder fire-extinguishing system.



The mooring arrangement is just one of a myriad of factors to be weighed up when considering FSRU siting options

Floating regas vessels in the spotlight

SIGTTO hosted the third Liquefied Gas Senior Executive Forum in Houston in December 2017, together with the US Coast Guard (USCG) and the Society for Gas as a Marine Fuel (SGMF). The event proved to be a great success, with over 180 delegates participating.

Reflecting the popularity of floating storage and regasification units (FSRUs) as a means of fast-tracking LNG imports at relatively low cost, the presentations on regas vessels at the Senior Executive Forum attracted a particularly attentive audience. Capt Doug Brown, LNG/marine manager for Poten & Partners, got the ball rolling by looking at the issue of site selection for FSRU-based receiving terminals.

Given the greater focus today on offshore terminal facilities in more exposed locations, his comments on open sea operations and the impact of sea states on the ability to carry out cargo transfers were especially topical.

Cargo transfers are usually halted if the wave period is above 8 seconds and wave heights exceed 2 metres. Options such as protective breakwaters and weathervaning by means of internal or external turret mooring arrangements can be considered as part of efforts to mitigate the effect of sea states. If the project makes use of an offshore fixed jetty, or 'sea

island', this is oriented to suit prevailing wind and wave conditions in the area.

Compared to a conventional shore terminal jetty, where the water depths are typically around 14-18 metres, dredged enough to provide an adequate underkeel clearance, internal submerged turret loading (STL) systems and external turret mooring arrangements are utilised in deeper waters, usually of more than 50 metres.

Having said that, the use of turrets is possible in shallower waters; Excelerate Energy, for example, will employ the STL method to offload regasified LNG from one of its FSRUs in 35 metres of water in an upcoming project off Moheshkhali Island in Bangladesh.

When siting an FSRU in a harbour zone protected by a breakwater, a different set of concerns must be considered, not least the availability of adequate space, including for emergency departures. In weighing up the impact of other vessels transiting port waters, LNG project developers need to consider that the length of attendant escort tugs and their towlines can effectively add a further 80-100 metres to each end of the LNG carrier being manoeuvred.

In regasification operations heat is extracted from the surrounding seawater to assist in warming the cargo. FSRU operators need to be aware that port and coastal authorities will set limits on the maximum permitted change to the seawater temperature as a result of cargo processing, usually in the order of 7°C.

SPB tanks make a comeback

On the eve of the appearance of the first LNG carrier to be built with an IHI-SPB containment system in 25 years, it is illuminating to consider this notable Japanese gas ship cargo tank technology.

Ishikawajima-Harima Heavy Industries (IHI) developed its self-supporting, prismatic-shape, IMO Type B (IHI-SPB) design as a liquefied gas cargo containment system, including for LPG and LNG, 30 years ago. It first saw the light of day in the 1,500m³ prototype LNG/ethylene carrier *Kayoh Maru*, constructed in 1988, and was then chosen for a pair of 89,900m³ LNGCs, *Arctic Sun* and *Polar Eagle*, completed by the IHI yard at Aichi in 1993.

Arctic Sun and *Polar Eagle* replaced *Arctic Tokyo* and *Polar Alaska*, a pair of pioneering 71,500m³ membrane tank LNGCs that had served on the Alaska to Japan route since 1969. The robustness of the IHI-SPB containment system stood the two new ships in good stead, not least when sailing through the inhospitable waters of the northern Pacific during the winter storm season.

IHI-SPB tanks are subdivided into four spaces by a centreline, liquid-tight bulkhead and a transverse swash bulkhead. This subdivision, in tandem with the stiffened plate structure of both the shell and the internal supporting elements, provides the IHI-SPB system with a high degree of strength, to the extent that the risk of cargo sloshing damage is obviated at all fill levels.

In addition, like all liquefied gas tanks designed to the IMO Type B standard, IHI-SPB units require only a partial secondary barrier. Robust Type B tanks comply with the “leak before failure” principle which means that if a fatigue crack occurs, it will propagate only very slowly, allowing time for remedial measures to be taken.

Another advantage is the prismatic



Installation of one of the two IHI-SPB tanks manufactured in Japan for the floating storage and regasification barge that Wison Offshore Marine built for Exmar

shape; IHI-SPB tanks are the most space-efficient of the containment systems currently in use. The units can be constructed to accommodate specific hull lines so that the final shape optimises use of the space available. The main deck is flat across the width of the ship and there is no need for a trunk deck.

IHI-SPB tanks can be constructed of either aluminium, stainless steel or 9 per cent nickel steel. Aluminium tanks are the lightest of the three options and have been chosen for all the liquefied gas vessel applications to date.

The cargo tank insulation consists of polyurethane foam (PUF) panels, fixed by central studs to the tank. Cushion joints are inserted between panels to absorb relative movements between the tank and the insulation and eliminate thermal stresses in the insulation.

The IHI-SPB LNGC newbuildings poised to enter service are a series of four 165,000m³ vessels that the Japan Marine United Corp (JMU) shipyard in Japan is constructing for use by Tokyo Gas. The charterer will employ the ships, which are due for delivery in 2018 and 2019, in lifting cargoes from the new Cove Point LNG

export project on the US East Coast.

The IHI-SPB containment system has also been chosen for a 25,000 m³ floating storage and regasification unit (FSRU) barge built for Exmar by the Wison Offshore Marine shipyard at Nantong in China. Delivered in December 2017, the vessel has two 12,500 m³ cargo tanks which were built at the Aichi yard in Japan and barged to China.

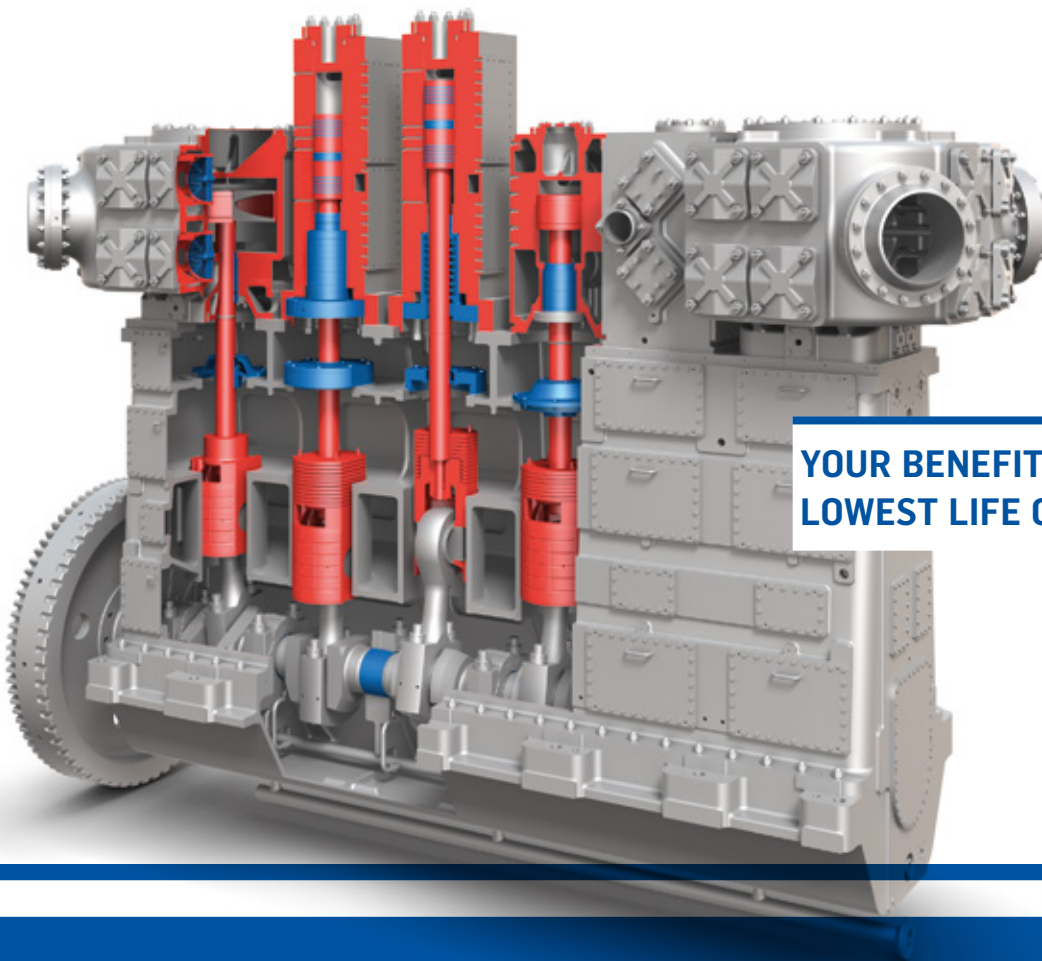
The IHI-SPB system is already in use onboard two offshore LPG vessels. They are the 1997-built, 54,000m³ *Escravos* floating storage and offloading (FSO) unit and the 135,000m³ *Sanha* floating production storage and offloading (FPSO) vessel commissioned in 2005.

IHI is also promoting the weight and space-saving advantages of its SPB system compared to IMO Type C tanks when used as bunker tanks on LNG-powered ships. United Arab Shipping Company (UASC) has chosen the IHI-SPB concept for the bunker tanks that will eventually be installed on the large LNG-ready container ships recently completed by Hyundai Heavy Industries (HHI). The newbuilding complement comprises eleven 14,000 TEU and six 18,000 TEU vessels.

ROYAL CELEBRATION

IMO welcomed Queen Elizabeth II to its London headquarters on 6 March to celebrate the UN maritime safety organisation’s 70th anniversary. The visit marked a return for Her Majesty as she officially opened the headquarters building in 1983. In his welcome speech IMO secretary-general Kitack Lim spoke of the UK royal family’s long-term links with IMO and of The Queen’s ‘deep personal interest in ships and the sea’. SIGTTO general manager Andrew Clifton, representing the Society, attended the IMO reception to mark the occasion.





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Update on gas carrier manifolds

The Second Edition of *Recommendations for Liquefied Gas Carrier Manifolds*, a joint SIGTTO/Oil Companies International Marine Forum (OCIMF) publication, was published in March 2018. The document, which updates the previous, 2011 edition, provides recommendations on the layout, strength and fittings for gas carrier manifolds.

The aim of the new publication is to bring together, in one document, the manifold arrangements and cargo strainer guidelines for LPG and LNG carriers in order to promote improved standards of safety and efficiency in ship operations. The guidance will also assist in planning the position of loading and discharging facilities on new jetties. The recommendations do not apply to existing ships.

Amongst the key changes in the latest version of the manifold publication are the following:

- New categories created for small-scale LNG
- Bunkering manifold provisions extended to include LNG bunkering as an option
- A new approach to laying down the recommendations on manifold design was achieved by specifying the following requirements:
 - Pipe schedule, denoting wall thickness of the pipework
 - Allowable loads on manifold support
 - Minimum mechanical properties of material used
 - Pressure rating of flange reducers and spool pieces
- Clarified *Presentation flange* dimensions and *face finish* to conform to the ASME B 16.5 standard



SIGTTO decided to revise the manifold guidelines at the 72nd meeting of its General Purposes Committee (GPC 72) in September 2015. The working group responsible for

the revision work had four meetings, and the resultant guidance document received approval from the respective SIGTTO and OCIMF committees in October 2017.

LPG/chemical gas ship/shore interface guidance



The first edition of the *Ship/Shore Interface for LPG/Chemical Gas Carriers and Terminals* guidance document has also been completed. It will be submitted to the

77th meeting of SIGTTO's General Purposes Committee (GPC 77) in April for approval.

The new publication recognises the technological advances that have been made over the past two decades and supersedes a 1997 SIGTTO publication entitled *Ship/Shore Safe Working Practice for LPG and Chemical Gas Cargoes*, which is now withdrawn.

SIGTTO has prepared this document to identify the potential hazards that can arise at the LPG/chemical gas ship/shore interface; to provide safe working practice guidelines through reference to industry publications; to minimise the risk of incidents occurring; and to help raise overall safety awareness at the interface. As part of highlighting the principal risks present in the interface zone, the publication describes risk assessment and hazard identification techniques that gas carrier staff and terminal operators are able to make use of.

Understanding excessive surge pressures

The new *Guidelines for the Alleviation of Excessive Surge Pressures on ESD for Liquefied Gas Transfer Systems* publication has been prepared by SIGTTO to enable project teams and operators of terminals and liquefied gas carriers to review the design, engineering and operation of their cargo transfer systems. Such reviews may assist in avoiding the generation of excessive surge pressures and momentum change in transfer systems on activation of emergency shutdown (ESD) devices or other events.

The purpose of this document is to provide familiarisation with the concepts of surge pressure and to provide practical guidance and recommendations to the designers, engineers and operators

of liquefied gas carrier and terminal loading and unloading systems. This knowledge and familiarity is intended to assist such personnel to:

- (a) recognise the potential hazards of surge pressure;
- (b) understand the factors that affect or create surge pressures;
- (c) review the engineering and operating procedures of the cargo transfer system;
- (d) understand aspects of surge pressure control on the other side of the ship/shore interface to enable mutual understanding of safe transfer procedures; and
- (e) understand the potential benefits of a linked ship/shore ESD system in mitigating surge pressures.

The document's description of the generation of surge pressures features both a high-level overview and a more detailed technical explanation so that it is applicable to surge experts and novices alike. One recommendation that is particularly highlighted is the practice of utilising linked ship/shore ESD arrangements as an effective means of reducing surge pressure.

This document will also be submitted to the 77th meeting of SIGTTO's General Purposes Committee (GPC 77) in April for approval.

HUMAN ELEMENT COMMITTEE

Focus on prioritising cargo alarms

The fourth meeting of SIGTTO's Human Element Committee (HEC 04) was held in London on 15 February 2018. The discussions covered a range of topics, including gas carrier crew training, human element guidance, cargo control room (CCR) ergonomics, shore staff training and the role of the human element in incidents.

The HEC working group on CCR ergonomics is now well underway, its 4th meeting having taken place in London on 10 January 2018. Good progress was made on the development of guidance on the prioritisation of cargo alarms.

The Society believes that the availability of such recommendations will help minimise the risk of incidents and mishaps as a result of actions taken in gas carrier cargo control rooms. The work involves prioritising cargo alarms as per the *IMO Code on Alerts and Indicators, 2009*.

HEC 05 is scheduled to be held in London July 2018.

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A time for thanksgiving

Ed Carr writes of a memorable reunion between one of the Vietnamese boat people and the seafarers who rescued her 37 years earlier:*

Members who attended SIGTTO's 35th Anniversary Panel Meeting in October 2014 might recall a presentation on the history of BGT, one of the founding members of the Society. One of the slides shown in that talk commemorated the rescue of 2,000-plus Vietnamese refugees by the Energy Transportation Company (ETC)-operated fleet of BGT LNG carriers.

A postscript to that 2014 presentation took place in November 2017 when 'alumni' of that historic LNG shipping project gathered in New York City to hold a reunion and celebrate the opening of an LNG exhibit at the Maritime Industry Museum. Attending the event was a 45-year-old San Francisco attorney, Lauren Vuong, and her family.

Lauren was at the event because in 1980, when she was eight years old, she was rescued from the middle of the South China Sea by the 125,000m³ *LNG Virgo*, commanded at the time by Capt Hartman Schonn. She had heard the stories from her mother and father about their escape and rescue and, as she became an adult, realised that she needed to find and thank the people who had saved her and her family.

That search ultimately led her to a loosely



Lauren Vuong, 3rd from left, with her mother, brother and sister, shortly after being rescued by LNG Virgo



Lauren Vuong meets Dan Hansen and Ken Nelson for the first time since 1980

organised group called the 'ETC Alumni' and, in turn, to a number of the seafarers who were aboard *LNG Virgo* during the rescue. Capt Schonn, who himself was a refugee from the ruins of Nazi Germany, had

passed away, but Lauren was successful in locating his widow, Karin, in Germany.

Lauren arranged for Karin to come back to the US and the stage was set for Lauren and her family to meet her rescuers. It was a dramatic moment when the two ship's engineers, Ken Nelson and Dan Hanson, who had boarded that refugee boat to determine its seaworthiness, were reunited with Lauren and her family.

Lauren and her mother addressed those attending the reunion, recounting their harrowing escape, their rescue and the rebuilding of their life in the United States.

Most of the ETC Alumni are retired now and no doubt they have many memories of their days in that pioneering LNG shipping project. However, on this particular November day in New York City they were reminded that their legacy will not be just the successful carriage of LNG from Indonesia to Japan but also of the many lives they changed forever by following the seafarer tradition of coming to the aid of those in peril on the sea.

Lauren's journey to find and thank her rescuers is being made into a documentary film and those with an interest in learning more or supporting this effort can find more information at [Refugees' Gratitude to Rescuers](#).

** Ed Carr, senior vice president LNG and Offshore - North & South America at Mitsui OSK Bulk Shipping (USA) LLC in Houston, is a former ETC master and was navigator on the maiden voyage of LNG Taurus in 1979.*

TECHNICAL VISIT

HR Wallingford welcomes London Panel delegates

Members attending SIGTTO's 64th Panel Meeting, which takes place in London on 11-12 April 2018, have the opportunity to participate in a technical visit to HR Wallingford's Oxfordshire headquarters on 13 April. Standing proudly behind its 'Working with water' slogan, HR Wallingford is an independent engineering and environmental hydraulics organisation which has had a deep involvement with the LNG ship and terminal sector over the years.

HR Wallingford's consultants deal with all major aspects of LNG terminal planning, design, optimisation and performance validation. The expert services, covering analysis, advice and support, are utilised by relevant parties during the concept development, front-

end engineering and design (FEED) and engineering, procurement and construction (EPC) phases of a terminal project.

More specifically, HR Wallingford's LNG terminal offering encompasses site investigation, selection and protection; environmental impact analysis and forecasting; terminal design; seawater system hydraulic design; terminal operations; mooring; and navigation. As regards the navigation function, the company is recognised as a world leader in the evaluation of ship navigation and manoeuvring, especially using simulation in design feasibility and assessment and training/familiarisation work. HR Wallingford's UK and Australian Ship Simulation Centres are able to call on 10 full bridge, ship and tug simulators.

These navigation services have been much in demand in recent years as the global network of LNG terminals has spread rapidly. Floating facilities and shore terminals



Tug master Capt Mike Johnson in the HR Wallingford simulator for Prelude FLNG vessel training

in exposed locations represent a growing segment of this network. HR Wallingford has been able to help meet the challenges posed by such facilities in many ways, including by providing the necessary expertise to those parties responsible for planning and implementing the support services required for the safe berthing of LNG carriers.

Smit Lamnalco extends marine services envelope

The 64th SIGTTO Panel Meeting, to be held in London on 11-12 April 2018, is kindly being hosted by Smit Lamnalco. A SIGTTO Associate Member, the company is known to the Society's membership as a provider of support vessel fleets at LNG terminals worldwide.

Smit Lamnalco is a 50/50 joint venture between the Rezayat Group and Royal Boskalis Westminster. The Smit Lamnalco brand was launched in 2012, following the acquisition of Smit by Lamnalco a year earlier.

While the Rotterdam-based company's specialised terminal tugs and dedicated crews might be the most public face presented by the company, Smit Lamnalco's full portfolio of LNG-related terminal services encompasses emergency response, pilotage and mooring, logistics and shore base management, environmental response, vessel traffic management, marine consultancy, terminal management and inspection, repair and maintenance.

Notable recent LNG terminal contracts secured by Smit Lamnalco include PNG LNG in Papua New Guinea, Port Qasim in Pakistan, Cameroon, Gladstone in Australia and Bahrain LNG.

For its Gladstone commitment, Smit Lamnalco provides a number of tugs for the Queensland port. Of this fleet, five are specialised vessels dedicated to the support of all the LNG carriers serving the three LNG terminals clustered on Curtis Island – Queensland Curtis LNG (QCLNG), Australia Pacific LNG (APLNG) and Gladstone LNG (GLNG). Up to four of the five dedicated vessels are in service at any one time; the LNGCs are escorted by all four tugs while transiting the inner harbour and by two tugs when in the outer harbour approaches.

Cameroon LNG is a particularly notable project with which to be involved. The scheme is making use of *Hilli Episeyo*, the world's first conversion of an LNG carrier into an FLNG vessel. Cameroon is only the second FLNG project to be commissioned.

Hilli Episeyo is moored 14 km offshore by means of an external frame turret arrangement which allows it to weathervane. Cargo transfers to loading LNGCs are being carried out with the two vessels positioned side-by-side (SBS). Central to the range of project services provided by Smit Lamnalco are three 32-metre, 75-tonne bollard pull tugs that support the SBS operations.



Smit Lamnalco is providing a fleet of tugs as part of its marine service package for the Cameroon FLNG project

Andrew Brown, Smit Lamnalco's group business and project development director, states "We are well represented and active throughout the shipping industry, always striving to improve our own safety performance and processes through engagement with industry associations such as SIGTTO as well as a number of regional maritime organisations."

Having successfully lobbied to have providers of tug services accepted into the SIGTTO membership as associates, Smit Lamnalco then played a key role in the working groups that produced the two recent Society documents on the emergency role of tugs and similar vessels at gas terminals.

Support Craft at Liquefied Gas Facilities: Principles of Emergency Response and Protection – Onshore was published by SIGTTO in 2015 while the offshore version appeared the following year. The former covers the use of support vessels at shore-based terminals and nearshore facilities utilising floating LNG production vessels (FLNG) vessels and floating storage and regasification units (FSRUs) while the offshore version deals with FLNG and FSRU operations at exposed offshore locations.

"LNG is a dynamic sector at the moment and a growing percentage of new terminal projects involve the use of FLNG vessels and FSRUs," continues Andrew Brown. "It is good to see SIGTTO evolving in

tandem with the industry, not least through the formation of its new Floating LNG Installations Sub-Committee to provide guidance on operations with the growing fleet of floating LNG process vessels."

As a further progression of the initiatives taken and the work done to date in advancing the safety of offshore LNG operations, Smit Lamnalco is promoting the benefits that can stem from adopting an integrated approach to the provision of a floating terminal package, especially for facilities in exposed locations. With this model the marine service provider is an integral part of the team, providing advice, along with the LNG carrier operator, direct to the process vessel operator. The process vessel operator can then offer the complete, integrated terminal package to the client.

As part of the onward drive for continuous improvements in LNG supply chain safety, Smit Lamnalco supports the development of new industry guidelines covering ship-to-ship (STS) cargo transfer operations, with the two vessels moored together in the SBS configuration, in exposed waters.

"With the growing demand for LNG, there are now upwards of 50 projects under development worldwide that would be impacted by such guidance," concludes Andrew Brown. "The availability of these industry best practices, developed by acknowledged industry experts, would be of particular benefit to those players new to offshore LNG operations."

SIGTTO

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