



The Newsletter of the
Society of International Gas Tanker
and Terminal Operators Ltd

SIGTTO News

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MESSAGE FROM GENERAL MANAGER

Highlighting the case for LNG carriers

In IMO discussions on the control of greenhouse gas emissions from ships SIGTTO has highlighted the fact that gas tankers, particularly LNG carriers, will require special consideration

Since I last wrote, in the Spring 2011 edition of *SIGTTO News*, there has been a major step forward in the development of regulations governing technical means to reduce greenhouse gas (GHG) emissions from ships. At the 62nd Session of IMO's Marine Environment Protection Committee (MEPC 62) in July

tactics to prevent any decision at MEPC until after 17th Conference of Parties of the United Nations Framework Convention on Climate Change (COP 17) in Durban in November 2011. A brief explanation of their position with "common but differentiated responsibilities" was set out in the Spring



The SIGTTO Board of Directors met in Douglas, Isle of Man in June 2011

the Committee passed by vote a resolution to adopt an amendment to MARPOL Annex VI, Chapter 4. Entry into force will be 1 January 2013. However, individual flag state administrations may defer entry into force for up to 6.5 years for delivery of new ships and 4 years for major conversions. The full wording of the resolution and the related documentation can be found in Annex 19 of IMO's MEPC 62/24 document.

The Chapter 4 regulations, as amended, mandate the introduction of an Energy Efficiency Design Index (EEDI) for new ships and the application of Ship Energy Efficiency Management Plans (SEEMP) to ships in service.

The debate in the MEPC 62 plenary session was rather fractious. The Kyoto Protocol non-Annex 1 countries (broadly speaking, the less developed nations) appeared to be employing delaying

2011 edition of *SIGTTO News*.

Minutes before the MEPC plenary session closed on the last day a vote on the resolution was forced. This resulted in an overwhelming vote to carry the motion for the adoption of technical measures, including EEDI and SEEMP. Of the 59 eligible voting delegations registered in attendance, 49 voted for, five against, three abstentions and two not present in the room.

Also agreed was a workplan to resolve outstanding EEDI issues, inclusive of the aim of finalising all issues by 2013. Included in these are issues directly related to LNG and LPG ships.

SIGTTO submitted a paper to the latest MEPC session (MEPC 62/6/20) elaborating on the issues relating to the application of EEDI as currently proposed to 'gas tankers'. I was able to introduce formally the paper to plenary. However, because of the time spent on debating

the high-level principles, as described above, the discussions on the SIGTTO paper were severely curtailed.

It is expected that the issue will be further discussed at an 'inter-sessional' meeting tentatively planned for January 2012. Although this is rather frustrating from our gas shipping industry's point of view, at least one objective has been achieved, i.e. we have placed on record the fact that there are unresolved issues pertaining to the application of the EEDI to LNG and LPG vessels.

For LNG ships the main issue is that our industry is in the middle of a major change of propulsion technology - from steam-powered ships, which numerically still dominate the fleet, to vessels with dual-fuel diesel electric and slow-speed diesel propulsion systems.

The slow-speed diesel LNG carriers operate in tandem with reliquefaction plants.

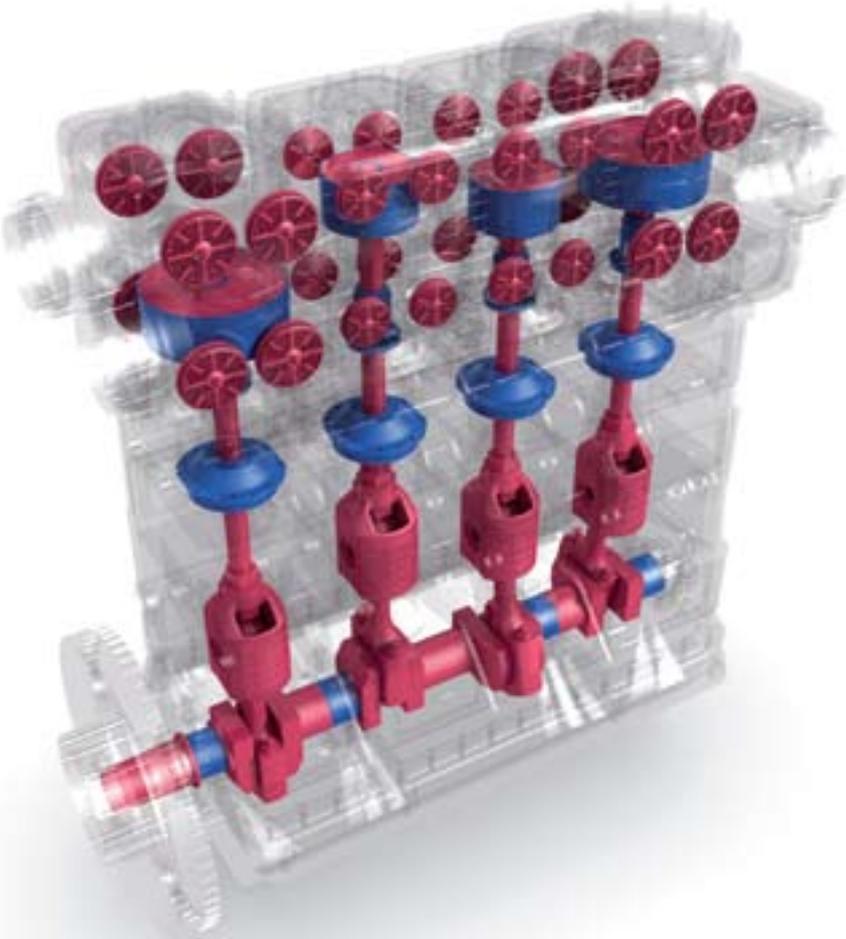
The concept of EEDI is based on a statistical analysis of existing ships to develop a 'reference curve' against

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**Burckhardt
Compression**

continued from page 1

which future ship designs can be evaluated. This reference curve is the start line against which future developments will be measured. Due to the eclipse of steam LNG ships and the introduction of new propulsion technologies the gas shipping industry is in a position where there is no statistically significant population of the new designs to develop a reliable and robust reference curve.



Outgoing GPC Chairman Marc Hopkins (left) receiving a gift from the new Chairman Chris Clucas

This leaves a problem in that, whilst understanding IMO's desire to complete work by a deadline, the Organization cannot mandate the industry to build a number of ships sufficient to create a statistically significant population.

The foregoing paragraphs describe the regulatory progress on one strand of IMO's response to the climate change challenge, i.e. the so-called 'technical and operational' measures. The other strand, the 'market based measures' (MBMs), was not discussed at MEPC 62. However, a full week inter-session meeting on MBMs was held at the end of March 2011. Development work on MBMs was very limited for much the same reasons that resulted in the protracted discussions at MEPC 62.

Turning to other subjects, the SIGTTO General Purposes Committee (GPC) met in March in Amsterdam at the end of the Gastech meeting. Because of the Gastech conference, no SIGTTO Panel Meeting was held. Marc Hopkins of BG LNG Services has acted as GPC Chairman for the past six years. As per the constitution of the GPC, Marc had to step down after a tenure of this duration and an election was held to nominate his successor. The new GPC Chairman is Chris Clucas of Bernhard Schulte Shipmanagement, a long-standing GPC member. We would like to note our thanks to Marc for his commitment and leadership of the GPC and to welcome Chris to his new role.

The spring SIGTTO Board meeting was held in Isle of Man on 9 June, kindly hosted by Bernhard Schulte Shipmanagement. The page 1 photograph shows the assembled Board.

The Board meeting was the last meeting presided over by Mr Allyn Risley as President of SIGTTO. He has stepped down as he is retiring as planned from BG LNG Services. His final duty will be to attend the forthcoming SIGTTO Panel Dinner in Houston as guest of honour. I would like to record my personal thanks to him for the guidance and support he has given to me as your General Manager. We all wish him well in his retirement.

Vice President Steffen Jacobsen of AP Møller has stepped up into the role of President and Luc Gillet of Total SA has taken over Steffen's role as Vice President.

The week beginning 6 June was that of the 'Tourist Trophy' in the Isle of Man. This is a series of motorcycle races around a track of some 38 miles (62 km) on ordinary public roads. After the Board meeting BSM arranged a bus to take the

visitors around the course. They also organised one of the riders to give a commentary. The top racers do the circuit in about 17 minutes, averaging just over 130 mph (210 km/h). In the bus we took 90 minutes! My abiding impression afterwards was that the riders must be insane to do what they do. There is certainly a different appreciation of risk to that in our industry.

NEW MEMBERS

New pair welcomed

Two companies involved in the LNG sector have joined SIGTTO as full members since the last Newsletter was published. The listing of the companies below shows their date of joining the Society. The SIGTTO membership now stands at 124 full members, 59 associate members and 20 non-contributory members.

Elengy	1 April	2011
Stena Bulk AB	1 September	2011

A subsidiary of GDF SUEZ, **Elengy** operates three LNG terminals in France - the Montoir-de-Bretagne, Fos Tonkin and Fos Cavaou facilities - and is Europe's second largest LNG terminal operator. The company serves all LNG importers wishing to supply French and European markets connected to the French natural gas transmission system.

The terminal operator owns more than 70 per cent of Société du Terminal Méthanier de Fos Cavaou (STMFC) and 100 per cent of the two other terminals. Elengy operates in a regulated market under the supervision of the French Energy Regulation Commission and has more than 45 years of experience in designing, developing, operating and maintaining LNG terminals. Internationally, Elengy leverages its expertise by participating in new LNG projects.

The operator has successfully unloaded more than 8,000 LNG cargoes, including 232 vessels in 2010. The French terminals have an aggregate annual regasification capacity of 23.75 billion m³ of natural gas and an LNG storage capacity of 840,000m³. The customer portfolio for the three facilities comprises 17 for Elengy and three for STMFC.

Stena Bulk AB of Gothenburg made a dramatic entry into the LNG shipping arena in May 2011 when it utilised cash reserves of US\$700 million to acquire three vessels from the Taiwanese owner TMT. The fleet comprises the 2006-built, 145,000m³ *Stena Blue Sky* and the newly delivered *Stena Clear Sky* and *Stena Crystal Sky*, each of 174,000m³. All three ships are ice class and *Stena Clear Sky* and *Stena Crystal Sky* have dual-fuel diesel electric propulsion systems.

The Stena group, which is active in a number of different shipping sectors, has stated that it does not want to be one of the major players in the LNG carrier field. Nevertheless, it is determined to become an established niche player in the sector and Stena Bulk AB intends to build up a fleet of between five and ten LNG ships over the next five years.



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SIGTTO PRESIDENT (1)

Valedictory message

Allyn Risley, on completing his tenure as SIGTTO President, writes ...

I deeply appreciate the opportunity to serve on the SIGTTO Board and as the President of the Society. Growth of the fleet, application of new technologies to gas ships and the escalating challenges of piracy are significant developments in our business during my tenure.

Over a year ago expansion of the gas fleet, with the final ship deliveries for the Qatar projects, was effectively realised. Trained crews were in place, albeit with substantial dilution of experience. Each day, month and year that goes by builds the collective experience present onboard. Training programmes focused on identified needs and lessons learned complement the maturing experience of the men at sea. My personal appreciation for the professionalism of gas shipping seafarers has grown over this period.

The strength of SIGTTO is the willingness of members to share lessons learned and establish guidelines and best practices that sustain and enhance the excellent safety record established in gas shipping and terminal activities. A consensus approach to establishing new guidelines and practices may seem



Allyn Risley - "My personal appreciation for the professionalism of gas shipping seafarers has grown over my tenure"

burdensome at times, but this is absolutely the right approach for new technologies and novel applications.

Demonstration and acceptance by multiple parties provide a broader knowledge base from which to decide and act. It may have seemed lengthy, but the time and study invested in creating guidelines for LNG ship-to-ship (STS) transfers are a good example of this process at work.

Capacity growth of LNG vessels and the application of new propulsion and liquefaction technologies have provided new challenges for our members and customers. I'm reminded of the shared wisdom of a fellow board member, "We will first need to learn to operate these vessels and then we can learn to trade them". Many of us understand this first hand and know it is still a work in progress for larger diesel-propelled vessels.

SIGTTO is active in the key fora which develop best management practice for avoiding the risk of piracy. We simply must do all that we can to protect our crews and assets from this scourge.

Globalisation of the gas industry is occurring in our time. It has been and will continue to be an exciting time in the gas business. Many thanks to Bill Wayne, past and present fellow officers Mark Ross, Aizawa-san, Yamawaki-san and Steffen Jacobsen for your guidance and assistance during my tenure. To my many unnamed friends and colleagues active in SIGTTO work, thank you for your diligence and commitment. I wish you each fair seas and following winds.

SIGTTO PRESIDENT (2)

Looking to the challenges ahead

Steffen Jacobsen, on commencing his tenure as the new SIGTTO President, writes ...

It is with great pleasure that I write to you as incoming President of SIGTTO. I have had the pleasure of working with most of you over the last two years as Vice President and before that as a Board member for four years and I am honoured to be appointed by my peers to my new position.

On taking the reins I would first like to thank Bill Wayne, SIGTTO's General Manager, for his leadership and efforts on behalf of the Society over the past five years. Bill embarked on an ambitious programme of improvement and change within the organisation, much of which I would like to see continued.

With our good safety record, the enviable profile of gas as a fuel of the future and the current period of high demand for natural gas amid rising prices, it is easy to assume that expanding the market for LNG/LPG should be a relatively easy challenge. However, despite evidence to the contrary and the favourable risk versus reward ratios, the fuel, its tankers and shore infrastructure are still singled out and perceived by media and public officials as being exceedingly dangerous.

We, along with other shipping bodies, must continue to proactively promote best practice sharing on issues such as piracy, safety, innovation and sustainability. We must also communicate our efforts focusing on our assets and people. It must be acknowledged and communicated that through innovation and experience we as a group are continually improving our environmental, quality and safety records.

The issue of crewing standards will play a particularly pivotal role in gaining general acceptance of the benefits offered by our industry. In the coming years we must tackle this problem head-on and sooner rather than later. The availability of sufficient trained and qualified gas carrier crews is already a problem and the challenge will grow as the fleet continues to expand. We as an organisation have an important and perhaps unique role in bringing the charterers, shipowners and terminals together to deal with this issue.

I am confident that we are fully prepared to address these concerns and are fortunate to have the resources and the right people in place to do so.

We must be prepared to address the issues and challenges of our members in a timely and diligent manner and be open to the thinking taking place outside our industry for best practice and innovative ideas. Much work has recently been carried out by the members on the rewriting of the International Gas Carrier (IGC) Code and we must now work diligently at IMO to bring this work to fruition. This is not an easy task and will require considerable time and effort.

I look forward to working with you all on these challenges.



Steffen Jacobsen - "We must also be open to the thinking taking place outside our industry for best practice and innovative ideas"

Enhanced LPG carrier reliquefaction

Weir LGE Process has developed an LPGC reliquefaction system based on the addition of a vent gas cooler to traditional plant to achieve improved efficiency and enhanced operational flexibility

The reliquefaction systems used on gas carriers used to transport LPG, ammonia and petrochemical gases have remained unchanged for a number of years. Such systems are based on compression refrigeration, using either seawater as the condensing medium in a direct cycle or an intermediate refrigerant in a cascade cycle.

The gas shipping industry strives for continual improvements in the efficacy of shipboard cargo-handling equipment and today, more than ever, the need to minimise and control costs, both capital (Capex) and operating (Opex), is a key driver. When it comes to reliquefaction plants, until industry finds a viable alternative to compression refrigeration, improvement efforts need to be targeted at getting the most out of the existing technology.

Weir LGE Process (WLGE) has recently developed an enhanced plant design which is based on the application of known technology in a novel way. The company is currently in the process of patenting its new concept, a key component of which is its vent gas cooler (VGC) arrangement.

WLGE explains that the VGC, when installed as part of a reliquefaction plant on both fully refrigerated and semi-pressurised/fully refrigerated (semi-ref) LPG carriers, provides the following benefits:

- (a) more output for the same input, and hence improved efficiency;
- (b) the ability to carry additional cargoes, and hence increased operational flexibility; and
- (c) reduced cargo vapour emissions (and losses) and hence an environment-friendly solution.

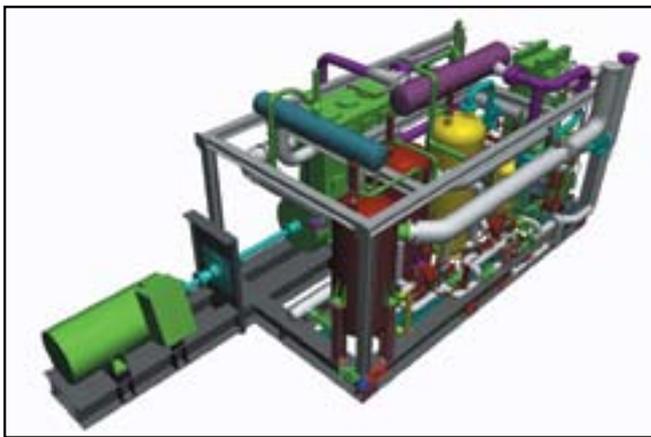


Figure 1 - New WLGE reliquefaction plant design; the vent gas cooler is the yellow cylinder in the middle of the skid-mounted unit

“The greatest efficiency increase is achieved when the VGC is incorporated in a reliquefaction system with a three-stage compression system,” points out Andrew Scott, general manager sales & design at WLGE. “By installing the VGC between the second and third stages, increases of 10-15 per cent in the coefficient of performance (COP) of the plant can be achieved. COP is a measure of the refrigeration capacity yield from the electric power input. In practical terms the increased COP takes the form of increased refrigeration capacity for the same electric power and seawater consumption.”

For plants based on a two-stage compression system the VGC provides a COP improvement of around 3 per cent as the cooler would be installed between the stages and would

share the load with any existing economiser.

The increased capacity made available through use of the VGC concept has resulted in a solution particularly applicable to fully refrigerated very large gas carriers (VLGCs). For such ships the ‘standard’ reliquefaction plant, comprising four compressor systems, can be replaced by three slightly larger compressors, resulting in a lower overall build cost and increased capacity/performance.

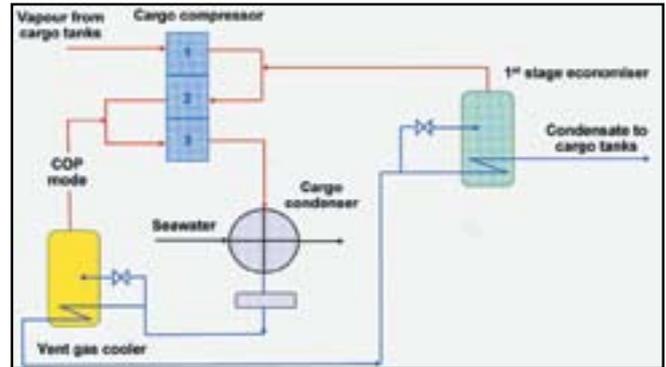


Figure 2 - Increased capacity - COP mode

When used with a two-stage compression system, the most significant benefit offered by the VGC is the ability to carry additional cargoes. A good example is commercial propane. Due to the mechanical limits of the compressors typically used in reliquefaction plants, a two-stage compressor would normally be certified to carry commercial propane with up to 3.00/3.25 mole% ethane, but generally limited to 2.50 mole% ethane. Above this concentration, there is a significant loss in capacity as the ethane which cannot be condensed is vented back into the cargo tanks. Venting to atmosphere effectively increases the refrigeration capacity but represents a costly approach to dealing with that part of the cargo vapour which is not condensed.

The addition of a VGC allows a two-stage compressor to handle commercial propane cargoes with 5.00 mole% or greater with only a slight loss in capacity. The three-stage compressors which are normally installed to handle the higher ethane content commercial propane cargoes are in reality only required to operate to their full potential in a relatively small ‘window’ with high seawater temperatures. There is therefore the consideration of a higher Capex spend for a three-stage compressor that is not utilised to its full capability for the majority of the time.

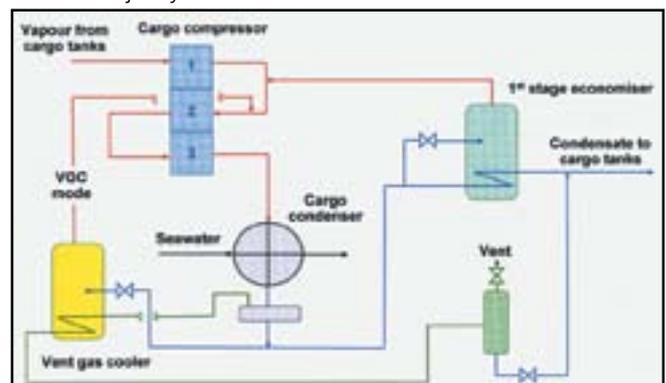


Figure 3 - Non-condensed and incondensibles - VGC mode

Whether a two or three-stage compression system is employed, the incorporation of a VGC facilitates the operation of the reliquefaction plant with a higher concentration of non-condensed components and incondensibles than would normally be tolerable without problems due to high compressor discharge pressure arising. Additionally, the use of the VGC reduces significantly the amount of cargo lost when venting to atmosphere, giving a financial benefit as well as an environment-friendly solution.

VGCs can be fitted to gas carrier newbuildings and as retrofits to existing ships. The benefit of a VGC in a retrofit project is that there would be no requirement for additional power or seawater and therefore no need for modifications to ancillary systems.

"For newbuilding projects where three-stage compressors are necessary for reasons other than simply higher ethane content commercial propane, e.g. for their refrigeration capacity, the addition of a VGC to such a plant will increase the COP and give more capacity for a given compressor size," continues Andrew Scott. "The additional Capex to add in a VGC to realise this extra capacity would typically be paid back through Opex savings in around two years, depending on the trading pattern of the ship. The direct result of this increased capacity is reduced loading time, and therefore time in port, and the opportunity to increase the average number of voyages per annum.

"The Opex savings are achieved through reductions in the amount of fuel consumed in providing electric power to drive the reliquefaction compressors. As fuel costs increase and the requirement for low-sulphur fuels becomes a significant factor, reduced fuel consumption will become increasingly attractive as a means of reducing ongoing operating costs. The increased refrigeration capacity for the same heat loads will also result in shorter operating periods and as a consequence of the reduced running hours the maintenance requirements for rotating machinery will be reduced due to greater intervals between overhauls."

Andrew Scott concludes, "As the vent gas cooler is an application of known technology in a novel way, there is no need for special training or education for the crew. All that is required is some basic instruction as to what benefits the VGC can bring and when it should be applied. With the correct piping set-up a single VGC can provide both the potential for additional capacity and the ability to handle higher levels of non-condensed components, e.g. ethane in commercial propane, and incondensibles, e.g. nitrogen."

Andrew Scott will present a paper on the new Weir LGE Process reliquefaction system at SIGTTO's 56th Panel Meeting in Houston on 21 September.

PUBLICATIONS

Manifold guidelines

Now available in both electronic and hard copy format, the new "Manifolds Recommendations" publication provides updated guidance on the construction of manifolds and strainers for LPG and LNG vessels. The guidance reflects the demand for optimum spacing and heights brought about by the use of rigid cargo arms or other types of transfer lines incorporating emergency shutdown systems to give spill and transfer system protection.

This publication replaces "Standardisation of Manifolds for Refrigerated Liquefied Gas Carriers for Cargoes from 0°C to Minus 104°C", "Recommendations for Manifolds for Refrigerated Liquefied Gas Carriers (LNG)" and "Recommendations for the Installation of Cargo Strainers on LNG Carriers".

SAFETY

Ensuring safe diving

The International Association of Oil & Gas Producers (OGP) is to hold an Inshore/Nearshore Diving Safety Workshop in Houston on 8 March 2012. Occupational diving is an inherently risky business, as evidenced by the 124 diver fatalities which have occurred worldwide over the 2000-2010 period in inshore and nearshore waters alone. Many more incidents have led to injuries to divers. The main aim of the workshop is to raise awareness of the OGP Diving Recommended Practice (Report Number 411) and to show how compliance with the guidance can help minimise attendant risks.

OGP points out that the nature of diving is such that tasks interface with the activities of other agencies and operators and that such activities can give rise to the accidents. As an example a major European port reported five diver incidents over the past 18 months. In one a diver was carrying out a propeller polish on a tanker when the propeller was started. The diver was pushed away and suffered ripped shoulder and leg muscles. In another incident the diver's umbilical became enmeshed in a tender's propeller and he was forced to jettison his equipment and swim to shore.

For this reason OGP explains that the upcoming Inshore/Nearshore Diving Safety Workshop will be relevant for a wide range of interested parties with some involvement in diving activities. In addition to diving companies the target audience for the event includes fleet operators and managers, class societies, flag states, regulatory bodies, trade associations, insurance underwriters and ship agents.



The OGP workshop is seeking a global step change in improvements to diver safety

UPCOMING MEETINGS

2011	Date	Location
64th General Purposes Committee	20 Sep	Houston
56th Panel Meeting	21-22 Sep	Houston
Board and AGM	9 Nov	Vancouver
2012	Date	Location
Western Europe Regional Forum (TBC)	1 Feb	Paris
65th General Purposes Committee	26 Mar	Doha
57th Panel Meeting	27-28 Mar	Doha
Board (TBC)	31 May	Kuala Lumpur

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FIREFIGHTING SAFETY (1)

Fire training film updated

SIGTTO and Videotel Marine International have launched the second edition of the *Liquefied Gas Fire Hazard Management* training video. Using graphic image animations and live footage of firefighting operations, the new film explains the science behind the combustion of liquefied gases; identifies roles for each of the fire-suppressing technologies available; and shows how they work.

The second edition of the SIGTTO/Videotel *Liquefied Gas Fire Hazard Management* training package provides a broad introduction to the fire hazards faced by seafarers and terminal staff when handling LNG and LPG and explains how each can be managed. The video emphasises the importance of understanding and following closely fire safety procedures and stresses the role regular monitoring, inspection and recordkeeping can play in reducing the risks associated with liquefied gas handling.

“Every individual working onboard or ashore needs to fully understand the risks involved, carry out best practice procedures and be aware of all necessary precautions,” states Nigel Cleave, Videotel Marine’s ceo. “SIGTTO’s expertise in this field and its commitment to safe, responsible and reliable terminal operations have proved invaluable in helping to create this realistic, relevant and practical training package.”

The project to remake the original liquefied gas firefighting film, which was compiled in the mid-1980s, was initiated by SIGTTO’s General Purposes Committee (GPC). Videotel, a company specialising in training films and computer-based training (CBT) programs, was assisted in the creation of the new video through the expert advice provided by Niall Ramsden of Resource Protection International. The *Liquefied Gas Fire Hazard Management (Second Edition)* training package is available on VHS/DVD with supporting booklet and interactive CD-ROM.



The new film identifies roles for each of the liquefied gas fire-suppressing technologies available.

FIREFIGHTING SAFETY (2)

Understanding the LNG fire hazard

Resource Protection International (RPI), part of the Falck Group, is running two LNG Hazard Awareness and Fire Hazard Management workshops in Europe in the latter part of the year. The first will be held at the Falck Risc centre in Rotterdam on 28-29 September while the second will take place at the Centro Jovellanos training establishment near Gijon in northern Spain on 13-14 December. The Rotterdam event will be classroom-based while the Spanish workshop will also feature practical LNG firefighting demonstrations.

RPI has configured the workshops, the hours of which will count on the Institution of Fire Engineers’ continuous development programme, to make those responsible for risk analysis, hazard identification, design or the implementation of incident mitigation systems or incident response at LNG facilities fully aware of the special hazards posed by this fuel.

Those delegates attending the Centro Jovellanos workshop will have the opportunity to experience first hand the special characteristics and behaviour of LNG in the practical demonstrations. Working in conjunction with RPI, the Spanish training centre has developed a purpose-built demonstration facility for use with LNG.

Niall Ramsden of RPI will be the lead course instructor at both events. Niall has over three decades of experience in all aspects of fire hazard management for the oil and petrochemical industries and has had a close working relationship with SIGTTO for many years. He was a key contributor in the writing of the Society’s *Liquefied Gas Fire Hazard Management* book and more recently has assisted SIGTTO and Videotel in the compilation of the updated *Liquefied Gas Fire Hazard Management* training video.

Niall Ramsden will be assisted by colleagues Paul Watkins in Rotterdam and Carl Lamb in Spain.

WEBSITE

Passwords and security

The SIGTTO Secretariat occasionally receives requests to reset passwords for access to the www.sigtto.org website. In the majority of cases this is due to the password having expired. The system requires that the password is renewed at least once a year and, if that is not done, the visitor seeking access to the site will be automatically locked out. Should that happen, you can request a new password from the site. If for any reason that fails, please contact the Secretariat directly. Requests for renewal should be directed via the SIGTTO member company’s chief representative.

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Anti-piracy initiatives

As the annual monsoon season in the Indian Ocean draws to a close in late August/early September, it is expected that the number of pirate attacks on shipping will increase significantly.

On 20 August the 25,390 dwt product/chemical tanker *Fairchem Bogey* was captured by pirates whilst at anchor waiting to enter the Omani port of Salalah. The incident brought the number of seafarers from large, internationally trading ships in captivity to 399. The number held prisoner from dhows and smaller vessels is unknown.

The piracy problem is now a global one. There were 276 acts of piracy or armed robbery against ships in 2010. With failed attempts added the total increases to 489, a 20 per cent increase on 2009.

The recent attack on *Fairchem Bogey* is believed to be the first time that a vessel has been pirated whilst in territorial waters. It is not clear if this is a change in tactics or an isolated event. What is known is that the pirate tactics evolve over time and it is not unreasonable to expect that during the monsoon season pirates have been developing new tactics.

Being held captive, often for many months in squalid conditions, is very stressful for seafarers and their families. An organisation called the Maritime Piracy Humanitarian Response Programme (MRHRP) has been formed to assist seafarers and their families with the humanitarian aspects of a traumatic incident caused by a piracy attack, armed robbery or being taken hostage. The members meet regularly to develop best practice guidelines and will make these available to the industry as soon as possible. The Seafarers Helpline "00800 7323 2737" is currently able to provide support to seafarers

and their families on piracy issues. Further information is available on www.seafarerhelp.org.

Going into this period of heightened risk of piracy attacks, SIGTTO members need to revisit the risk assessments drawn up for each of your vessels. A number of new initiatives and publications are now available, or should be available, by the time this issue of *SIGTTO News* is published. These include the following:

1. Best Management Practices for Protection Against Somalia Based Piracy (BMP4) BMP 4 was released in August 2011 and contains updated information for masters and ship managers. This publication is a joint industry/military initiative sponsored by, among others, SIGTTO. A low-resolution version has been sent as an e-mail attachment to all SIGTTO members. A high-resolution version of the document can be downloaded from the SIGTTO website www.sigtto.org.

2. Piracy - The Menace At Sea is a DVD produced by Steamship Mutual and can be obtained through their website www.simsl.com. It supports BMP 4 and provides valuable support to the seafarer on preparing for pirate waters.

3. Guidance relating to the Construction and Use of Citadels describes how a shipboard citadel, as defined in BMP 4, should be constructed and used. Citadels should be used as a last resort and not as a substitute for implementing the rest of BMP 4, in particular the maintenance of a good lookout. The guidance is available from www.mschoa.org.

4. IMO circular IMO has produced interim guidance on "The use of privately contracted armed security personnel on board ships in the high risk area" in the form of MSC.1/Circular 1405. Similar guidance is available for flag states. This circular is recommended reading for anyone considering the employment of such security personnel.

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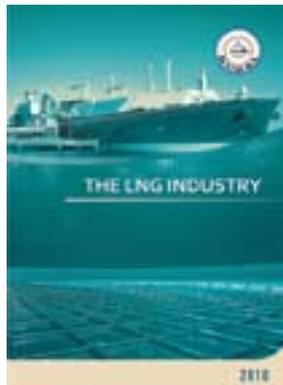
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GIIGNL logs record LNG trade growth

By far the most comprehensive statistical record of LNG shipping, terminal and global trade activity is that compiled by the International Group of Liquefied Natural Gas Importers (GIIGNL). The Group has just released its report on the LNG industry for 2010 and the results make for interesting reading.

Worldwide shipments of LNG rose by 21.2 per cent in 2010 to reach 220.21 million tonnes (mt). In tonnage terms this was the greatest ever annual increase in LNG shipments. The global LNG trade expanded four times faster than the growth in primary energy consumption last year. Spot and short-term imports (defined as contracts with a duration of four years or less) increased by over 40 per cent compared to 2009, reaching 41.6 mt or 18.9 per cent of the total LNG trade.

The GIIGNL statistics show that the strong performance in 2010 was made possible by rising production levels at existing export plants in Qatar, Nigeria, Indonesia and Russia as well as through the addition of new liquefaction capacity in Qatar, Yemen and Peru. At the receiving end there was a ready market for this additional LNG output due to the global economic recovery and the continuing rise in the demand for gas in key developing nations.



The GIIGNL report covers LNG carriers, terminals, contracts and sea routes

The GIIGNL LNG carrier review reveals that 25 new ships were delivered during the course of the year, bringing the fleet total to 360 vessels by the end of 2010. The additions last year were down on the unprecedented ship delivery levels of 2008 and 2009 and reflect the drawing down of an orderbook that had gained only a handful of new contracts over the previous two years.

GIIGNL also maintains data on LNG export and import terminals. The 2010 LNG Industry report states that there were 25 LNG liquefaction facilities in operation in 18 countries at the end of 2010 and that four new trains were commissioned during the year. The 9.2 million m³ of capacity in the 91 storage tanks at these 25 export terminals represents the equivalent of about seven days of LNG production. The utilisation rate at the world's liquefaction plants averaged 81 per cent in 2010, up from with 74 per cent the previous year.

Regarding LNG import facilities, four new terminals were commissioned in 2010 and three existing terminals were expanded. At year-end there were 83 LNG regasification plants, including 10 floating structures, in operation. Between them, these facilities sported 363 storage tanks and provided a total sendout capacity of 600 million tonnes of LNG per annum, well in excess of actual throughput.

The surge of LNG industry activity recorded by GIIGNL in 2010 reflects the decisions to invest in new ships, liquefaction plants and regasification facilities made prior to the September 2008 credit crisis. A significant percentage of this investment was spurred by an anticipated surge in US LNG imports but that market collapsed as a result of the recent discovery and exploitation of large deposits of shale gas throughout the country. Nevertheless, all the increased LNG shipping and production capacity that came onstream in 2010 was welcomed enthusiastically, thanks to the buoyant demand for LNG in Europe, Asia and, most recently, Latin America.

Infrared gas detectors

The gas shipping and terminal sectors are increasingly turning to infrared-based equipment for use as portable gas detection meters. Such devices are more resistant to contamination than existing alternatives; rarely require adjustment during calibration/verification; and can operate in inert atmospheres.

Whilst these infrared instruments are very good, it is important that users are aware of any limitations of the equipment. Whilst every instrument is different, the following considerations should be taken into account.

In order to show the correct readings the instrument should be calibrated with the correct gas for the cargo being carried. Typically equipment used on oil tankers will be calibrated with iso-butane whereas devices used on LNG carriers will be spanned with methane. Using a meter calibrated with the incorrect gas will not give accurate readings, e.g. when the same meter is used for more than one purpose such as on deck and for bunker tank entry.

When a low per cent volume is detected, some meters will automatically display the lower explosive limit (LEL). While this is correct in the presence of oxygen, in many instances the atmosphere being measured has little or no oxygen. In order to work out the % volume some maths is required to convert % LEL to % volume.

Infrared meters only work with hydrocarbon gases; they do not work with other flammable gases such as hydrogen. Therefore such units cannot be used for all operations on board. For instance they cannot be used for detecting flammable gases prior to entering a boiler following cleaning because the flammable gas in question is likely to be hydrogen.

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REGIONAL PROFILE

Back to the birthplace

SIGTTO is returning to where liquefied gas shipping began - the US Gulf - for its upcoming 56th Panel Meeting. It is an appropriate time and place for the event, which is being held in Houston on 21-22 September, as the recent discovery of vast reserves of shale gas throughout the US, not least in Texas and Louisiana, is bringing great changes to the profile of liquefied gas shipping activities in the Gulf.

At the end of World War II US Gulf LPG production began to grow rapidly, giving rise to shipments up the Mississippi River by tank barge and by vessel to Florida, the US East Coast, Europe and Latin America.

That same LPG was also used as a feedstock at the new petrochemical complexes being built on the Gulf coast, the world's first such facilities. During the late 1950s the first ships purpose-built for the carriage of US Gulf liquid and liquefied gas chemicals to global markets went into service.

At about the same time LNG made its entry onto the world stage. In February 1959 the 5,123m³ *Methane Pioneer*, a converted dry cargo ship, loaded the first of eight trial shipments of LNG from a small barge-mounted liquefaction plant near Lake Charles, Louisiana. The consignments, to Canvey Island in the UK, heralded the birth of the global LNG trade, an activity that is

Houston. Texas, with its vast underground gas storage capacity, has traditionally been the global market of last resort for LPG sellers. The availability of shale gas could ensure the transition of Houston's role as LPG importer to exporter.

LNG in the US Gulf is a special case. In June 2011 the Gulf LNG terminal in Pascagoula, Mississippi received its



US Gulf LNG, LPG and petrochemical gas shipping activities are set for a turnaround as a result of shale gas discoveries in the region

inaugural commissioning cargo, becoming the fifth of five large LNG import terminals to be completed in the US Gulf in recent years. The newcomers joined the region's established LNG receiving terminal at Lake Charles.

The construction of the five new terminals - Cameron, Sabine Pass, Freeport, Golden Pass and Gulf LNG - was sanctioned five or six years ago, a time when US domestic gas

production was going into steep decline and the country was expected to become a leading LNG import nation.

Since then, however, the discovery of shale gas and the development of drilling technologies to exploit these finds mean that the US is now awash in domestic gas and that the terminals are largely idle. US gas prices are one-half those in Europe and one-third the prices being paid in Asia. At the same time the demand for LNG in Asia is booming.

Looking to realise the potential of their facilities in some way, the operators of the Sabine Pass, Freeport and Lake Charles terminals have applied for permission to add liquefaction plants and become bi-directional facilities. A similar step is being considered for Cameron.

The addition of liquefaction plants would transform their facilities into LNG export terminals fed by gas from the nearby shale deposits. The availability of an enlarged Panama Canal, due onstream in 2014, would facilitate movements of US Gulf LNG to Asia in conventional size LNG carriers of 155,000m³.

Commencement of LNG exports from these terminals is envisioned for 2015/16, enabling US Gulf LNG liquefaction plants to be once again be in operation some 55 years after the industry's pioneering operations in the Lake Charles delta.

now four times the size of the LPG shipping market in terms of cargo tonnage.

Today, five decades later, the US Gulf gas shipping and terminal businesses are poised for rejuvenation as a result of the discovery of shale gas. In recent years US LPG and petrochemical exporters have been losing market share to lower-cost output from a number of world-scale plants built in the Middle East. Also, dwindling domestic resources raised the spectre of a slow transformation of the Gulf region from an export to an import zone.

However, shale gas is now set to extend the status of the US Gulf as a major player on the world stage. Several petrochemical producers are seeking to capitalise on the region's new low-cost ethane and other light natural gas-based feedstocks. Companies like Dow, Chevron Phillips Chemical, Westlake, Shell and Formosa Chemical are planning to build new ethylene and propylene crackers and expand existing facilities. All the producers reckon that their new output would be competitive on the world market with the ethylene, propylene and downstream chemicals produced by naphtha-based crackers in Europe and Asia.

In the LPG sector Enterprise Products Partners is upgrading infrastructure to enable the export of additional LPG volumes from its large gas terminal in

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