NEWSLETTER OF THE USCG LIQUEFIED GAS CARRIER NATIONAL CENTER OF EXPERTISE

The Gas Gauge

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USCG LIQUEFIED GAS CARRIER NATIONAL CENTER OF EXPERTISE 2901 TURTLE CREEK DRIVE PORT ARTHUR, TEXAS 77642-8056

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December 5-7, 2017
Senior Executive Forum
Houston, TX

January 29– February 23
Liquefied Gas Carrier Accelerated Program (LGCAP)
Port Arthur, TX

March 21-22
Liquefied Gas Carrier Exam Training for Class Surveyors
Houston, TX

March 26-30
Gas Carrier Inspector Course
Easton, MD

April 9– May 4
Liquefied Gas Carrier Accelerated Program (LGCAP)
Port Arthur, TX

May 21-25
Gas Carrier Inspector Course
Easton, MD

June 4-29
Liquefied Gas Carrier Accelerated Program (LGCAP)
Port Arthur, TX

Liquefied Gas Carrier NCOE Semi-Annual Update

The LGC NCOE has undergone a leadership change since our last newsletter. CAPT Jason Smith, after a great tour at the NCOE, has transferred to Sector Corpus Christi where he is serving as the Deputy Sector Commander. LCDR Dallas Smith has fleeted-up from the LGC NCOE's National Technical Advisor position to the Detachment Chief position and LCDR Eric Hanson replaced LCDR Smith as the LGC NCOE's National Technical Advisor. He is reporting to the LGC NCOE with over 11 years of Coast Guard marine inspection experience. He recently completed a tour as the Supervisor of Marine Safety Detachment Lewes, DE, where he oversaw and managed all marine safety, homeland security, and emergency management missions on the Delaware and New Jersey Coasts.

Meanwhile, the liquefied gas industry has continued its growth and impact on ports throughout the country. Although the export of LNG often demands the most attention due to the potential export quantity and transparency in the facility approval process required under the Natural Gas Act, other natural gases (LPG, Ethane, and NGL) as well as chemical gases are experiencing similar growth.

In addition to these new exports, there is still a need to import various liquefied gases due to transportation limitations and in some parts of the country (i.e. Puerto Rico, Hawaii, and even the North East) it is expected that we may see increased imports. Another growing aspect of this industry is the use of gas as a marine fuel. The driver for this growth, is the new US and global environmental emission standards, but cost does play a role. The US expects to have 12 vessels operating on LNG in 5 ports by the end of 2018. Other proposed projects such as ferries, cruise ships, car carriers, and break bulkers will move this market to all major ports in the near future.

To help prepare for this growth, the LGC NCOE hosted the 3rd annual Liquefied Gas as Marine Fuel Training for CG inspectors in September. In addition, the LGC NCOE is scheduled to host the 3rd Liquefied Gas Senior Executive Forum in December, and their 4th session of the Liquefied Gas Carrier Accelerated Program (LGCAP) in January. The LGC NCOE continues to assist CG field units that need qualified gas inspectors, provide technical support to both USCG and industry, train the future gas carrier inspectors and engage with industry to remain current on new projects and future challenges.

Training Tips: Instrumentation and Automation Systems

As part of the instrumentation piece of the Coast Guard Certificate of Compliance examination, Gas Carriers Examiners are required to verify compliance of instrumentation and automation systems for the safe transportation and handling of liquid and vapor cargo. As per IGC Code 13.1, cargo tanks shall be provided with means of indicating and/or monitoring pressure and temperature. These devises are to be located in the liquid and vapor piping and inside the tank as prescribed.

A. Pressure Monitoring

The vapor space of every tank must be provided with a direct reading gauge. Each cargo-pump discharge line, liquid and vapor manifolds, and holds and interbarrier spaces shall be equipped with pressure indicators. Cargo tanks fitted with a relief valve that can be set for more than one set pressure are required to have an alarm for each specific pressure setting. A high-pressure alarm and, if needed, a low-pressure alarm shall be provided in the navigation bridge and control station. Also, maximum and minimum pressure shall be clearly marked.

B. Temperature Monitoring

Cargo tanks shall be provided with at least two devices capable of indicating cargo temperature. One device must be located at the bottom, and the second near the top below the highest allowable liquid level. The lowest temperature allowed by design, and as specified on the Certificate of Fitness, shall be clearly indicated on or near the temperature indicating devises.

Guidance Gouge

The purpose of the Gas Gouge continues to be to inform the reader of regulatory resources available to them and updates concerning liquefied natural gas in the maritime industry. We are continuing to see growth in LNG as fuel, new construction, and bunkering. As a result, several U.S and international publications have been published since the last edition of the Gas Gouge. For convenience, the LGC NCOE has consolidated the following non-inclusive list of references that you may or may not be aware of.

The *International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF)* was adopted by the Maritime Safety Committee (MSC) in order to provide an international standard for ships using low -flashpoint fuel. The IGF entered into force on January 01, 2017 and was made mandatory under amendments to chapters II-1, II-2 and the appendix to the annex of the International Convention for the Safety of Life at Sea (SOLAS) that was adopted by resolution MSC392(95).

The Maritime Safety Committee also adopted amendments to the Standards of Training, Certification and Watchkeeping for Seafarers (STCW) under resolutions MSC.396 (95) and MSC.397 (95) regarding special training requirements for personnel on ships subject to the IGF Code. These basic and advance training requirements for seafarers entered into force on January 01, 2017.

The Liquefied Gas Carrier National Center of Expertise has released Field Notice 01-17 in June of 2017. This notice provides guidance to Coast Guard Captains of the Port considering safety issues with Simultaneous Operations (SIMOPS) while conducting LNG fuel transfer operations in conjunction with other important shipboard operations. As a reminder, CG-OES released CG-OES Policy Letters 01-15 & 02 -15 in February 2015 that focus on LNG fuel transfer operations and training of personnel on LNG fueled vessels as well as waterfront facilities conducting LNG transfers. Both policy letters provide industry and COTPs/OCMIs a well laid out avenue for regulatory compliance and where deemed necessary, provides acceptable alternative suggestions.

The Office of Design & Engineering Standards released CG-ENG Policy Letter No. 02-15 in April 2015. This policy letter provides guidance for the design aspects of barges built to carry LNG. The policy letter also provides an avenue for OCMI's to address the gap in existing regulations. Current regulations for barges are covered in Subchapter D. However, these regulations are silent on details for cryogenic suitability. 46 CFR 154 does address cryogenic suitability but is applicable to only to self-propelled vessels. This policy letter identifies certain sections of Part 154 that could be used when determining design suitability for non self-propelled barges.

NCOE Community Spotlight: DNV GL, Risk Advisory Team

Each edition we spotlight one member of the Coast Guard's Liquefied Gas community that has gone above & beyond to help keep the liquefied gas industry safe, secure, & clean. In this edition we decided instead to shine the light on an entire group, DNV GL's Risk Advisory Team…

DNV GL & the USCG have a well-established partnership centered around protecting crews & ensuring that vessels are operating safely within U.S. waterways.

With the growing popularity of LNG as a marine fuel in the U.S., the USCG & DNV GL recently expanded the existing partnership to include training programs that are agile & easy to implement.

Focusing on thought leadership & improving operational efficiency, DNV GL continuously seeks out new ways to build competence for employees, regulators, & industry partners. Recently, DNV GL's Risk Advisory Services team, which is headed by Pedram Fanailoo, invited LT Ethan Lewallen, of the LGC NCOE to join their operations for a period of eight weeks. LT Lewallen accepted the invitation & was granted open access (by both DNV GL & the client) to participate & oversee the development of a Qualitative Risk Assessment (QRA).

During this time, DNV GL's risk experts worked with LT Lewallen to develop new tools which are now being used by the LGC NCOE to review the quality & completeness of risk studies on proposed LNG bunkering operations. Pedram commented, "This experience was mutually beneficial for all. The time that LT Lewallen spent with the Risk team provided a greater insight to the challenges the USCG faces when reviewing risk assessments. At the same time, LT Lewallen took away an appreciation for the critical components of a risk study."

Peter Bjerager, Executive VP for Oil & Gas in Region Americas noted that, "We will continue to seek out ways to include leaders of the USCG in our day-to-day operations. This unique program opened new doors & delivered a comprehensive understanding of what is expected & needed to build safe & sustainable operations."

Risk assessments are recognized for providing clarity around critical & robust decision making processes—especially when an organization is considering how to implement a new tool or approach.

"It was an incredible opportunity to work with DNV GL's Risk Advisory Group. As the use of LNG as a marine fuel grows, so does the complexity of some LNG fueling operations. As this occurs, risk assessments will be needed and it was great to learn from the leading industry risk experts."- LT Ethan Lewallen, USCG

"Since the collapse of oil prices, DNV GL has intently focused on developing new digitalization tools that improve operational efficiency. These cloud-based tools (many of which are free) simplify the decision-making process & provide added value to our existing services," added Peter Bjerager.

"These new tools, & partnerships, unlock new possibilities that drive operations & regulations forward. Looking ahead, we will continue to seek out new ways to develop lean processes & cloud based tools that improve efficiency & safety across all industries," added Pedram Fanailoo.

DNV GL recently released a free, cloud-based solution known as My-QRA. This harnesses information and transforms QRA studies in ways that are not possible in a typical, fixed report format.

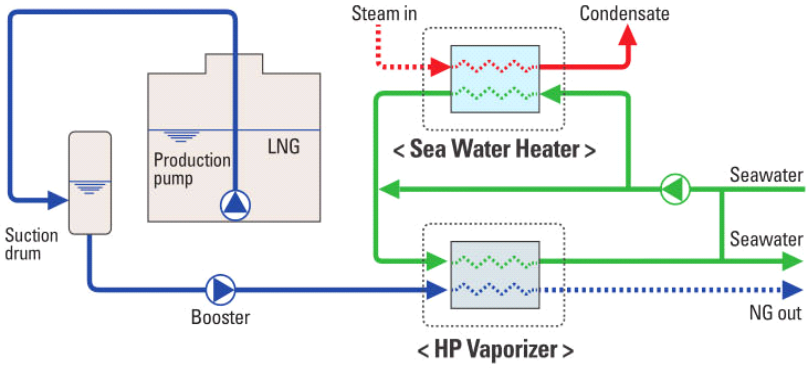
DNV GL is the technical advisor to the oil & gas industry. They bring a broader view to complex business & technology risks in global & local markets by providing a neutral ground for industry cooperation, creating & sharing knowledge with their customers & setting standards for technology development & implementation. From project initiation to decommissioning, their independent experts enable companies to make the right choices for a safer, smarter & greener future.

Tech Talk: Cargo Heaters vs. Cargo Vaporizers

While examining cargo handling systems onboard gas carrier vessels, it is important to understand the uses of the cargo heating systems onboard and the difference between them.

Cargo Heater: The cargo heater is usually operated during cargo discharge when a heated cargo is required by the receiving terminal when the shore storage will be in a pressurized cargo tank. The heater uses sea water as the heat source where cargo flows in the shell side of the exchanger and sea water flows in the tubes.

Vaporizers: There are actually two types of vaporizers onboard LNG ships, a *forcing vaporizer* and *cargo vaporizer*. Supplied by a stripping/ spray pump, a *forcing vaporizer* is used to vaporize LNG liquid to a gas for burning in the vessel's gas consumer(s) to supplement the natural boil-off. A *cargo vaporizer* (or commonly referred to as *LNG vaporizer*) is typically used during cargo discharge to prevent a vacuum from occurring when there is no vapor return line available from the shore. It is also used when gassing-up the cargo tanks if there is no vapor supply available from shore.



Service Center: Liquefied Gas Accelerated Program (LGCAP)

In the coming year, the LGC NCOE intends to hold 3 more LGCAP sessions. The first will be held in January 2018. Earlier this year, the LGC NCOE held 3 successful sessions. Of the 18 participants that have gone through the program to date, 17 are currently FGCE certified. The LGCAP is designed to bring 6 members at a time to the LGC NCOE for 3-4 weeks to receive specialized, targeted classroom training and OJT. Members work with National Verifying Officers to gain knowledge and experience on both LPG and LNG vessels. They also have an opportunity to complete the industry indoctrination portion of the PQS at a liquefied gas facility. The expectation is that most members should be able to complete 100% of their FGCE PQS by the end of the 3rd week. The 4th week is reserved for those members that have successfully completed their PQS and would like to complete a check ride and certification board before returning to their unit. This has to be prearranged with the unit and LGC NCOE. Please visit our website for more details.

How Full is YOUR Tank?

This is our chance to test your knowledge of the Liquefied Gas Industry. First person to correctly submit all the questions below will receive a LGC NCOE Challenge Coin! Send your answers to the general LGC NCOE email address with the subject line "Gas Gauge; How Full is YOUR Tank". After the first person has correctly answered all the question, **including references**, we will post the winner and the answers on the LGC NCOE website.
Are YOU ready for the challenge?

1. **Discuss testing requirements for valves intended to be used at a working temperature below –55C.**
2. **Discuss testing requirements for expansion bellows.**