NEWSLETTER OF THE USCG LIQUEFIED GAS CARRIER NATIONAL CENTER OF EXPERTISE

The Gas Gauge

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P: 409.723.6507
F: 409.718.3838
E: lgcncoe@uscg.mil
W: dco.uscg.mil/lgcncoe

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

Contents:

Events:

September 23-26, 2019
Liquefied Gas as Fuel Workshop
Jacksonville, FL.

December 3-5, 2019
Senior Executive Forum
Houston, TX.

Coast Guard and Classification Society Workshop. Location and Time TBD.

Gas Carrier Inspector Course
Convening's TBD and forthcoming.

LGCAP
Convening's TBD following GCI Course publication.

Liquefied Gas Carrier NCOE Semi-Annual Update

Since our last edition, the LGC NCOE's training manager, Mr. David McCusker departed and took on a new role at Coast Guard Headquarters at CG-CVC-4 doing third party oversight. We hated to see him go, but happy he got this excellent opportunity. Consequently, we recently shopped David's position and are eager to announce that we have hired Mr. Joseph Brown. He comes to the LGC NCOE with over 10 years of Coast Guard inspector and training experience and is the perfect addition to our team.

Meanwhile, the liquefied gas industry has continued its growth and impact on ports throughout the country. We now have 8 LNG export terminals either under construction or in operation. We also have 9 U.S. Flagged LNG fueled vessels operating in the U.S.

LGC NCOE Crew 2019

Additionally, this past fall the CLEAN JACKSONVILLE was successfully delivered. It is the world's first LNG bunker barge to use membrane tank technology. The world's LNG community witnessed a critical milestone when the vessel successfully loaded its first LNG cargo.

Recognizing this increased workload, we continue to urge local units to prioritize the Foreign Gas Carrier Examiner (FGCE) qualification. If your inspectors are not able to attain this qualification locally but there is a need for a liquefied gas qualified individual in your port, we have developed a robust OJT program called the Liquefied Gas Carrier Accelerated Program (LGCAP). allowing most inspectors the ability to obtain the qualification within 3-4 weeks on temporary duty at the LGC NCOE. In addition, the LGC NCOE began utilizing the CG's YouTube channel to broadcast training videos. More information regarding these two innovative tools can be found on page 4 in our services section.

We continue to augment field units that need qualified gas inspectors, provide technical support to both USCG and industry, train the future gas carrier inspectors with our Gas Carrier Inspector and LNG as a Marine Fuel courses. Moreover, the LGC NCOE remains engaged with industry to stay current on new projects and future challenges. If anyone would like to schedule a meeting anytime here in Port Arthur or in Houston during our monthly industry day visits, please send us a request through the general LGC NCOE email address .

Lastly, this past December marked the 4th annual Liquefied Gas Senior Executive Forum where the LGC NCOE partnered with SIGTTO, the Society of Gas as a Marine Fuel (SGMF), and Riviera Maritime Media to hold the event in Houston. As with the previous three forums, the 2019 Liquefied Gas Senior Executive Forum was a huge success. This forum covered an array of topics that included LNG exports, LPG and chemical gases, the use of LNG as fuel and LNG bunkering operations. We remain committed in helping to serve the Coast Guard and industry all that we can.

Call to Focus:

The LGC NCOE continues to receive input from their own inspectors and from major ports during the course of regulatory oversight . We continue to champion a call to focus on critical items that continue to be problematic findings in the field. This time around we want to bring attention to newer findings revealed to us in the application of the 2016 IGC Code during recent examinations of Gas Carriers. Our hope is that this call to focus, directed at all the entities who have a responsibility to ensure the safe and reliable transportation of ships carrying liquefied gas, will rally everyone to ensure these newer issues don't become systemic as we work to reduce the deficiencies that already have.

The International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (2016 edition) applies to ships whose keels are laid on or after July 1, 2016. The U.S. has received approximately 1,400 gas carrier vessel arrivals throughout her ports in 2019 to date. Of those arrivals, less than 1% (11) fall under this new code, however this will trend upwards over the coming years as newer ships call on the US. The new Code recognizes the importance of not only having Cargo Operations Manuals but speaks to the level of importance of the accuracy of these by solidifying that they be approved by the vessel's Administration. The LGC NCOE has received input that these Cargo Operations Manuals have had gaps in both content and accuracy.

Recently, we have examined Gas Carriers whose primary cargo is classified as toxic and have seen an uptick in findings where gas detection equipment being utilized is not suitable for the cargo being carried. This has been determined to either be a lack in understanding of the equipment and its usage, the lack of proper detection equipment, or failure in procedures to adequately address proper vapor detection protocol. Our Tech Talk on page 4 discusses further inattention to the importance of understanding the relationship of toxicity and the detection of it. Our fear is that ships' crews, have been acting on a false sense of security that the Fixed Gas Detection Systems are alerting them of dangers in spaces throughout the ship.

Lastly, we will echo that the Top 5 common deficiencies are consistent with years past. Sector Houston-Galveston who receives 45% of the nation's total gas carrier arrivals released a MSA to this end.

Training Tips: Cargo Operations Manual/ Loading and Stability Booklet

Todays training tip focuses on the requirements surrounding a vessel's Cargo Operations Manual and Stability Booklet. As per the IGC Code and 46 CFR 154, vessels are required to have onboard the necessary information for the safe carriage of cargo. Chapter 18 of the IGC Code stipulates the data that is required which includes the following:

1) Full description of the physical and chemical properties necessary for the safe containment of cargo.
2) Actions to be taken in case of spills or leaks.
3) Counter-measures against accidental contact.
4) Fire-fighting procedures.
5) Procedures for cargo transfer, gas-freeing, ballasting, tank cleaning, and charging cargoes.
6) Special equipment needed for the handling of a particular cargo.
7) Minimum allowance of inner hull temperatures; and
8) Emergency Procedures.

Approval of the Operations Manual under the 1993 IGC Code is not required and a single manual is not mandatory. However, under the 2016 edition regulation 18.2, an approved manual is required. It is critical for Gas Carrier Examiners to become familiar with the information contained in the Operations Manual before conducting the Cargo Examination portion of the Certificate of Compliance.

Regulations 2.2.5 and 2.4 of the 1993 IGC Code and 46 CFR 154 address the requirement of having onboard a Loading and Stability Information Booklet to contain details of typical service conditions, to include but not limited to loading, unloading, and ballasting. This booklet must include sufficient information for the Master to identify vessel's survival capabilities and ensure overall safe operations. Gas Carrier Examiners are to ensure that the Loading and Stability Information Booklet is onboard and available for vessel use, and for examination, when conducting the Administration portion of the Certificate of Compliance examination.

Refer to the LGC NCOE Foreign Gas Carrier Examiner Tactics, Techniques, and Procedures (TTP), the IGC Code and GC Code for more information.

NCOE Community Spotlight: Mr. Robert "Kirk" Richardson Texas A&M's Engineering Extension Service (TEEX)

Each edition, the LGC NCOE spotlights 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 are excited to shine the light on Mr. Robert "Kirk" Richardson of Texas A&M's Engineering Extension Service (TEEX) …

Throughout the "Energy Renaissance", the LGC NCOE has worked feverishly to ensure the Coast Guard and the liquefied gas community were prepared for the drastic increase of US LNG exports and the use of LNG as a marine fuel with the looming 2020 air emission regulations. During this period of time, the LGC NCOE has partnered with countless liquefied gas industry leaders, technical bodies, and regulatory entities to ensure the use and transportation of liquefied gas is conducted safely. Part of this initiative is to ensure that the characteristics and flammable properties of liquefied gas is thoroughly understood, and by LGC NCOE perspective, there is one man that knows liquefied gas characteristics better than anyone else; Mr. Kirk Richardson.

Mr. Richardson is currently the training director for the marine firefighting, LNG emergency response, and oil spill response programs within the Emergency Services Training Institute (ESTI) at TEEX in College Station, Texas. Mr. Richardson joined ESTI in 1986 and has been providing hands on firefighter training and emergency services at the renowned Brayton Fire Training Field as a marine firefighting and LNG emergency response instructor for the past 30 years to frontline emergency fire supervisors and responders.

In 2015, the LGC NCOE held the first annual four days LNG as Fuel Workshop as an answer to the question if Coast Guard inspectors were properly trained over these complex LNG as fuel systems being installed on a number of US flagged offshore supply, container and CON/RO vessels. It was during this workshop that the Coast Guard first partnered with Mr. Richardson to train Coast Guard vessel and facility inspectors over the behavior of confined and unconfined LNG spills on land and water, vapor cloud behavior, and the use of

common firefighting mediums.

Following the 2015 LNG as Fuel Workshop, has Mr. Richardson continued working with the LGC NCOE by providing training during the first annual Liquefied Gas Senior Executive Forum, the recurring annual LNG as Fuel Workshop, and advanced LNG training for Sector Corpus Christi

before Cheniere LNG began exporting LNG from their new Corpus Christi, TX. terminal.

"Our partnership with Mr. Richardson has expanded the Coast Guard's knowledge of LNG characteristics beyond what we could have imagined. He is hands down one of the LGC NCOE's biggest contributors to ensuring that the true hazards of LNG are known throughout the Coast Guard's liquefied gas community and has been critical in our efforts to ensure safe transferring and bunkering of LNG is being carried out".

- LCDR Dallas Smith

Detachment Chief

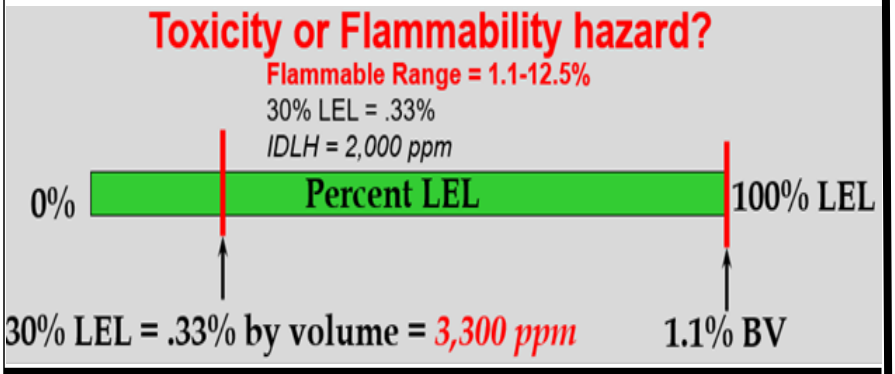
LGC NCOE

To date, Mr. Kirk Richardson has graciously provided training to over 400 Coast Guard Marine Inspectors, government officials and liquefied gas industry representatives, and remains a consistent strong supporter of the LGC NCOE's training mission.

Tech Talk: By Volume vs. LEL: Toxic Cargoes

In this newsletter's Tech Talk, we are going to continue our discussion about gas detection as we originated from our previous newsletter. However, today we are going to talk about cargoes that are also considered toxic.

Let's use Butadiene as an example. The flammable range of Butadiene is 1.1% - 12.5% by volume, making 1.1% by volume the LEL. Therefore 30% of the LEL would be .33% by volume. Since it's also a toxic cargo, we need to determine the parts per million (ppm) range. Remember that when calculating ppm in relation to percent by volume, every 1% by volume is equal to 10,000 ppm. That being said, the Immediate Danger to Life and Health (IDLH) level of Butadiene is 2,000 ppm. If a vessel's gas detection systems was set to alarm at 30% of the LEL, the gas concentration would be at 3,300 ppm (.33 X 10,000) and well above the IDLH of Butadiene. Understanding this is imperative and often overlooked. It's always important to ask for the safety data sheets to help you determine if the gas detection system is suitable for detecting the appropriate vapor concentration.



How Full is YOUR Tank?

This is our chance to test your knowledge of the Liquefied Gas Industry. First person to correctly answer the following questions will receive a LGC NCOE recognition certificate! 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. On nitrogen gas generators and inert gas systems, where is the oxygen content alarm required to be set?

2. When a liquefied gas carrier does not have the capacity to generate nitrogen onboard, how much nitrogen storage capacity is required in lieu of a generator?

Service Center: LGCAP & Video -Based Training

The LGC NCOE held its first Liquefied Gas Carrier Accelerated Program (LGCAP) of 2019. The LGCAP is designed to bring 4-6 members at a time to the LGC NCOE for 3-4 weeks to receive specialized, targeted classroom training, but more importantly OJT. Members work with National Verifying Officers to gain knowledge and experience on both LPG and LNG vessels. They also have the opportunity to complete the industry indoctrination portion of the PQS at a liquefied gas facility. The expectation for members coming in with experience 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 or reserved for more vessels if needed. The fourth week has to be prearranged with the unit and LGCAP manager. Of the 34 participants that have gone through the program to date, 32 are currently FGCE certified. The members that complete the course appreciate the time they are able to spend focusing on perfecting their craft and the units receive an immediate return on their investment by having a member board ready upon completion of the program.

The LGC NCOE has recently began making educational training videos. Utilizing the CG YouTube channel as medium, these videos are published for USCG Marine Inspectors as well as any individual that wishes to increase their knowledge in USCG inspection techniques. Currently, 14 short lectures are available and more will be developed in the near future.


LGCAP Class 1901