



# The Gas Gauge

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## Events:

**September 18-21, 2018**  
Liquefied Gas as Fuel Workshop  
Jacksonville, FL

**December 4-6, 2017**  
Senior Executive Forum  
Houston, TX

**Coast Guard and Classification Society Workshop.** (Location and Time TBD; looking for host).

**Gas Carrier Inspector Course**  
Contract out for bid. Convening's TBD and forthcoming.

**LGCAP**  
Convening's to be determined following GCI Course publication

## Liquefied Gas Carrier NCOE Semi-Annual Update

The LGC NCOE has continued to help train the USCG liquefied gas community and assist the industry with any regulatory challenges. Of note, we have now held three Liquefied Gas Senior Executive Forums, an event where 300 attendees from the government and industry come together to discuss the state of the industry in its many forms from large and small scale liquefied gas projects as well as using liquefied gas as a marine fuel. These events were held in cooperation with the Society of International Gas Tanker and Terminal Operators (SIGTTO) and the Society of Gas for Marine Fuel (SGMF). In addition, we hosted our annual Liquefied Gas as a Marine Fuel Workshop with great support from industry partners. We also held 2 Gas Carrier Inspector Courses to continue to prepare our USCG inspector workforce. We completed four Liquefied Gas Carrier Accelerated Programs (LGCAP) this past year where we hosted upwards of 6 apprentice marine inspectors for 4 weeks and exposed them to an intense classroom and on-the-job-training schedule to ensure a thorough qualification process, particularly for ports that need inspectors but don't have the throughput of

vessel arrivals to get sufficient application practice. We continue to augment field units that need qualified gas inspectors, provide technical support to both USCG and industry, and train the USCG workforce. One of the ways we are looking to expand the knowledge base of our workforce faster and more efficiently is through web-based training videos. The LGC NCOE has been working to develop this capability over the last year and is on the cusp of publication of a series of videos to further educate our workforce in new but reliable ways. We undoubtedly will continue to lean forward to build partnerships in this endeavor in order to showcase inspections of critical



Coast Guard and Classification Society Workshop on Liquefied Gas Carriers March 2018

equipment on vessels carrying liquefied gas. In addition, 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](mailto:lgcncoe@uscg.mil) address. We look forward to hearing from you.



## Training Tips: Cargo Environmental Control Examination

Cargo tanks onboard liquefied gas carriers always contain flammable or toxic vapors when in operation. Inert gas systems (IGS) are installed on liquefied gas carriers to meet operational demands like gas freeing, before gassing up, and in certain cases, between the switch of cargoes.

When conducting the examination of the IGS, examiners are required to verify the following three items:

- 1) System has an operational O<sub>2</sub> content meter.
- 2) System has an operational alarm for when oxygen levels exceed 5%.

- 3) Means to prevent backflow of gas is provided.

The crew must be able to demonstrate the operation of these three components and the inspector should analyze functionality without energizing the system.

Nitrogen gas generating systems are used onboard liquefied gas carriers for numerous applications to include: inerting interbarrier spaces, insulation spaces, and hold spaces; purging pipelines and cargo related machinery, and as gas tight bulkhead seals.

There are two main types of nitrogen generators: membrane separation, and pressure swing adsorption. It is vital

for the examiner to be familiar with the basic functionality and properties of these systems.

When conducting the examination of a nitrogen plant, the same three items as with the IGS are required to be verified.

Majority of liquefied gas carriers can generate nitrogen onboard. However, in the event that a generator is not provided, storage tanks must be enough for normal consumption for at least 30 days.

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

## Call to Focus:

The LGC NCOE has received input from major ports during the normal course of regulatory oversight and on their behalf would like to champion a call to focus on some critical items that continue to be problematic and discovered by Coast Guard Examiners who are requested to attend and complete oversight activity particularly on Liquefied Gas Carriers.

While this information is a reminder for our CG inspectors, it is primarily a call to focus to all of the entities that have a responsibility to ensure the safe and reliable transportation of ships carrying liquefied gas. Over the last five years we have seen a steady increase in Coast Guard examination activities given the growth and transition of the nation into an export country. After reviewing historical data, the Coast Guard has issued more deficiencies in this last fiscal year related to Liquefied Gas Carriers than ever before in the last 10+ years. While it is reasonable to

factor in the rise in the amount of deficiencies as a correlation to the increase in vessel activities or construe other factors, ultimately it is mutually beneficial for all entities to focus on reducing these findings as part of a comprehensive safety system and the earlier it is caught, the better. We bring these issues that we continue to see, not as an indictment, but as regulators and part of our service passion in ensuring the safety of both this industry and the mariners serving in it. We can only hope that this call renews a focus for all levels that have a role in any part of the vessel's safety to include construction, operation, and oversight. This past year our deficiencies have revealed culpabilities in all levels of each sector and should trigger a warning across the bow.

Recently we have had incidents where vessels have been underway at sea with their cargo tank "In Harbor" safety relief pilot valves in continuous use and not switched to the "At Sea" setting. This does not comply with the IGC Code. All parties are encouraged to ensure your vessels are operating in accordance with the International Certifi-

cate of Fitness. Also recently, [USCG Marine Safety Alert 07-18](#) was issued due in fact that Coast Guard examiners onboard two separate vessels identified significant cargo leaks representing a breakdown in the safety systems.

The Coast Guard continues to get smarter regarding oversight of electrical installations in hazardous areas. We have seen deficiencies and gaps in this area both during examinations of Liquefied Gas Carriers but also during new construction oversight. While it is critical that these installations are completed per the standard (ie. International Electro Technical Commission), it is also imperative that repairs are made with the same focus of compliance.

Vessel crews not being able to demonstrate proper operation and testing of the fixed gas detection system continues to be a top deficiency raised. Proper operation and comprehension of this system and the manufacturers manual is critical to the safe operation of any gas carrier and will continue to be a critical focus of our examination teams.



## NCOE Community Spotlight: Mr. Chad Verret, Harvey Gulf International

*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. Chad Verret of Harvey Gulf International Marine...*

Mr. Verret is Harvey Gulf's Executive Vice President & has played a vital role in assisting the LGC NCOE with training CG marine inspectors regarding LNG fueling operations & LNG as fuel engineering systems. Overseeing the 1st US waterfront LNG facility completely dedicated to LNG bunkering operations, Mr. Verret maintained an open training platform with his maritime personnel, LNG fueled offshore supply vessels & CG inspectors. The offshore supply vessels operated by Harvey Gulf are the first U.S. flagged vessels operated exclusively on natural gas as fuel. With their unique design, Harvey Gulf actively enlists every opportunity to involve the LGC NCOE & other CG units during their normal operations to ensure adequate natural gas fuel system training is provided to CG marine inspectors. This open cooperation allowed for critical LGC NCOE milestones to be completed, like the new [LNG bunkering job aid](#), [LNG Facility inspection checklist](#), [& the LGC NCOE Field Notice 01-17 \(SIMOPS While Bunkering](#)

[LNG](#)). Chad also is heavily involved with the Coast Guard's Marine Inspector Industry Training, where he offers to have a Coast Guard prevention officer work with him & his company for up to six months, to help train & educate Coast Guard future leaders about the industry side of the maritime domain.

Mr. Verret joined Harvey Gulf in October 2008 where his duties include project management, project planning/review & customer interface for both domestic & international markets. Mr. Verret, a native of Louisiana, is the fourth generation of his family to be involved in the marine business. Chad has worked extensively in

**“One of the key contributors for the success of the LNG projects was the decision to include relevant stakeholders including the NCOE/USCG in the planning and implementing phases. This allowed meaningful feedback from all stakeholders which contributed to the ultimate goal of promoting a cleaner alternative fuel source for the marine industry.”**

- Chad Verret

the marine industry for the past 30 years, sharing his talents with a number of vessel operating com-



panies both as a vessel master & shore side operational support lead. He is the active lead on all LNG related projects & heads the Alaskan business unit for Harvey Gulf. Mr. Verret's combination of shipboard & shore side experience offers unique perspective in the dynamic & evolving offshore vessel market.

Chad is Chairman of the board of directors for the Society of Gas as a Marine Fuel (SGMF). Formed as a membership based organization in 2013, SGMF is an international group whose concentration is the development of standards for the safe use of LNG as a marine fuel & all marine activities relating to the supply of gas used for fuel. SGMF publishes studies & produces information papers & works of reference to promote best practice for safe & responsible operations for both LNG-fueled vessels & LNG bunker supply logistics. The LGC NCOE acts as the CG liaison with SGMF & participates with their work groups who are charged with creating these new international guidelines & best practices.



# The Gas Gauge

## Tech Talk: By Volume vs. Lower Flammable Limit

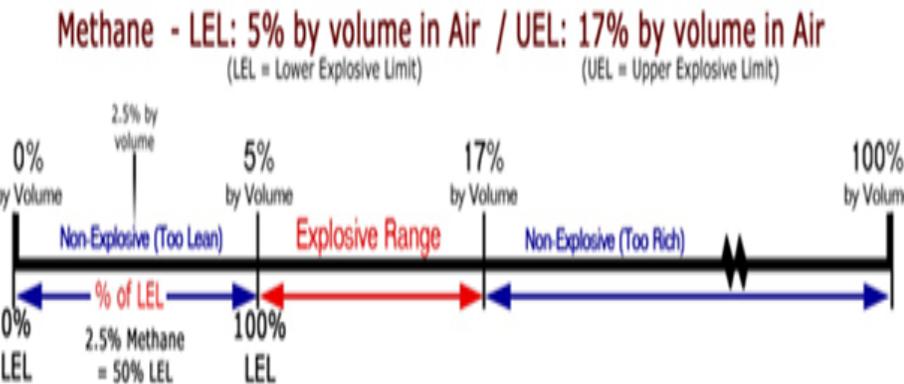
While inspecting a liquefied gas carrier's fixed gas detection system & testing associated alarms during a COC examination, it is important to know the difference between gas concentration by volume (BV) & the lower flammable limit (LFL) of the gas vapor being analyzed.

If we use methane as an example, the LFL is 5% BV. That means the mixture is too lean to burn if there is less than 5% BV methane present, but at 5% BV, it can burn or explode if there is an ignition source. So we call

5% BV methane same as 100% LFL.

To compute the LFL of any gas, you would divide the BV concentration by the LFL. For example, if you take 2.5% methane BV in air & divide it by 100% LFL of methane (5%), the result is 50% LFL. Conversely, you can multiply the 50% LFL by 100% LFL (5%) to obtain the % BV (2.5%).

The picture below illustrates methane's gas concentration by volume & the lower & upper flammability levels. For the illustration, LFL & LEL are synonymous.



## 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 or plaque! 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.



## Service Center: LGCAP

In the coming year, the LGC NCOE intends to hold at least 1 LGCAP session. The first session will be held following the first Gas Carrier Inspector Course of 2019 (dates TBD). Of the 28 participants that have gone through the program to date, 26 are currently FGCE certified. 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 an 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. This has to be prearranged with the unit and LGC NCOE. Please visit the LGC NCOE website for more details and the upcoming dates.



1. On ships built under MSC.285(86) or IGF Code, are they required to be capable of off-loading the liquefied gas from their storage tanks? Yes or no? Cite your source(s).
2. On ships built under MSC. 285(86) or IGF Code, are members conducting inspection and/or maintenance on electrical installations in hazardous locations required to have specific training for the installation in hazardous locations? Yes or no? Cite your source(s).