

# THE GAS GAUGE

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Welcome to the 2<sup>nd</sup> edition of the Gas Gauge, the biannual newsletter used to distribute information to the Coast Guard Liquefied Gas inspection community, particularly the Foreign Gas Carrier Examiners (FGCE).

The new **FGCE Performance and Qualification Standard Workbook** was released and is available on the Learning Management System website. Message 271755Z MAR 14 provides guidance on implementing the new standard including the process for phasing out the previous edition. The PQS industry indoctrination requirement provides three different alternatives. Please call us with any questions.

The new **Gas Carrier Inspector Course (GCIC)** took place this past March at MEBA Calhoun in Easton, MD.

This course gives students both an industry and regulatory perspective to gas ship inspections and is led by instructors from MEBA and the LGCNCOE. The overall reviews for the course were positive. Those students that attended were sent a course scorecard that summarizes student feedback from the course and corresponding response/action from the NCOE & program. In September, supervisors of the March course attendees will be receiving an electronic survey from the NCOE's Training Support Staff at TRACEN Yorktown on behalf of CG-CVC-2 and the LGCNCOE. This feedback gauges the benefit of the training to the sponsoring unit and, along with

the individual student feedback, will be used to make course improvements.

The next course convenes September 8, 2014. The roster for this course has been finalized and orders should be going out within the next month. Dates for two FY15 courses have been tentatively approved and, once final, will be advertised. Expect another March & September timeframe.

**LNG SME Exchanges** – The LGCNCOE participated in two separate SME exchanges that highlight the capabilities the unit can provide to USCG field units. In the first case, the LGCNCOE hosted a two week exchange from a visiting

## USCG Liquefied Gas Dashboard (as of 1 June 2014)

District	Unit	FGCE's	4 yr avg Exams	past trend	forecast
1	MSD Portsmouth	1	4	↓	—
	SEC Boston	7	48	↓	↑
	SEC New York	1	0	—	—
	SEC SE New England	3	4	↓	—
5	MSD Lewes DE	1	0	—	—
	SEC Baltimore	2	1	—	—
	SEC Delaware Bay	2	4	—	—
	SEC Hampton Roads	3	4	—	—
7	MSD St Croix	0	4	—	↑
	MSU Savannah	1	10	—	↑
	SEC San Juan	2	8	—	↑
	SEC St Pete	0	11	—	↑
8	DDE Victoria TX	1	6	↓	↑
	MSU Lake Charles	3	8	↓	↑
	MSU Port Arthur	3	14	↓	↑
	MSU Texas City	3	6	—	↑
	SEC Corpus Christi	2	6	↑	↑
	SEC Houston	11	73	↑	↑
	SEC Mobile	1	3	—	↑
	SEC New Orleans	1	10	↓	↑
11	SEC LA/LB	1	1	—	—
	SEC San Francisco	1	3	—	—
13	MSU Portland	2	1	—	—
	SEC Puget Sound	1	2	—	↑
14	MSD American Samoa	0	2	—	—
	SEC Guam	0	1	—	—
	SEC Honolulu	0	3	—	—
17	MSD Homer	0	1	—	—
	ACTEUR	3	1	↓	—

Japanese Port State Control Officer. Japan experiences a robust LNG import market and the exchange focused on liquefied gas carrier examination techniques and the current domestic and international regulations pertaining to the operation and construction of liquefied gas carriers. The information shared was beneficial to all parties. Of special note was the limitation that Japan's strict air emission controls have on operational testing of equipment (particularly machinery).

The second exchange involved both the LGCNCOE and the OCSNCOE. The two units paired up for a week-long visit to Israel to discuss LNG and offshore regulatory compliance issues, notably: marine traffic, ports & moorings, commercial vessel inspections, port state control examinations, and marine licensing. The first two days of the exchange consisted of discussing inspection techniques onboard an LNG Re-gasification Vessel (LNGRV) and a gas field production platform. The next three days consisted of presentations and round-table discussions on LNG gas carriers and offshore oil & gas regulatory compliance. Of particular note is the fact that all of Israel's flag state and PSC marine inspectors have previous commercial shipping experience.

We expect this international information sharing to continue in the future, particularly as the LNG/LPG shipping and LNG fuel markets grow.

### **Field Unit Structured OJT**

Intensive one-on-one training for prospective or current Gas Carrier Examiners is available, that includes training on the new PQS, gas carrier examinations and use of the NCOE's cargo handling simulator. We recently hosted apprentice FGCE's from Sector St Petersburg and MSU Lake Charles for about 1 week duration each. During these visits the NCOE provided training onboard LNG/LPG vessels and customized content reviews, covering over 90% of the new PQS. Also, over six hours of cargo handling simulator time was arranged on various cargo containment systems, including LNG Spherical, LNG MKIII, LNG No96 and LPG Type A with cascade reliquefaction. We will be hosting an inspector from Anchorage this summer. If you are interested, please email Mr. Rob Hanley for more information.

### **The Society for Gas as a Marine Fuel (SGMF)/USCG Mutual Training Agreement (MTA)**

The SGMF/USCG Mutual Training Agreement was signed by Mr. Mark Bell and RDML Servidio on March 7, 2014. The agreement is inclusive of all of the association members. The NCOE's own Mr. Scott LaBurn has been designated as the Coast Guard's official liaison with the SGMF. This agreement mirrors the one already established with the Society of International Gas Tanker and Terminal Operators (SIGTTO) and its members, for whom Mr. Rob Hanley is the Coast Guard liaison

### **LGNCOE Personnel Turnover**

All of the NCOE's Active Duty members are changing this summer. LT Dallas Smith (from one year gas carrier Merchant Marine Industry Training at Excelerate Energy and Cheniere LNG) has relieved LT Dan Mochen (to MSU Savannah CID). LCDR Anthony Hillenbrand (from MSU Portland) will relieve LCDR Steve Stowers (to Sector SE New England CID). Finally, CDR Jason Smith (from Sector Boston) will relieve CDR Buddy Reams (to D7p).

## **On the Horizon**

### **International Gas Carrier Code Update**

The revised International Gas Carrier (IGC) Code was adopted at MSC 93 in May 2014. The corresponding entry-into-force date is January 1, 2016 with an implementation/application date of July 1, 2016. The revised IGC Code will not be retroactive, and will apply only to vessels built after the entry-into-force date.

### **International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels [IGF Code]**

The new IGF Code is at least 12 months behind the revised IGC Code. The IMO subcommittee is not scheduled to meet until September 2014 to finalize the draft IGF Code and the earliest anticipated implementation for any final standard is sometime in 2017.

### LNG Bunkering Job Aid

A LNG bunkering job aid has been submitted to CG-FAC-2 for review and implementation. The current draft closely resembles the existing Pollution Prevention Compliance Report (CG-5562B).

### Draft Policy

- Two CG-OES draft policy letters recently completed public comment in the Federal Register and are receiving further review at CGHQ. These policy letters will address vessels using LNG as fuel and vessels and facilities providing LNG as fuel.
- CG-ENG-5 is preparing a draft policy letter to address construction of LNG barges.
- A draft revision to the LNG Shiprider program has been submitted for review to CG-CVC. The intent of this revision is to expand accessibility to LPG vessels and introduce more advanced-level training aspects of a shipride. Similarly, a Liquefied Gas Carrier addendum to the Merchant Marine Indoctrination Shipride program instruction has been proposed to better align with the new FGCE PQS industry indoctrination requirement.

### PQS Tasks for Vessels Using LNG as Fuel

A teleconference with Program and Forcecom stakeholders was held on Apr 17. The group collectively developed a recommended bridging strategy for the next 2 years until we are able to get LNG fuel standards and PQS in place. We realistically anticipate up to 4 dual fuelled (LNG) ships between now and the end of 2015, operating within the D7/D8 region. There are a handful of other legitimate proposals but so far no concrete progress. These estimates do not account for potential new construction/conversion on towing vessels, also under discussion. We have supported Sector Mobile and are supporting Sector San Diego with LNG fuel new construction projects in their AOR's and are available to support the operating units of these vessels. Because of the small number of ships and affected OCMI's through 2015, and the fact that the LGCNCOE has been asked by TRACEN to develop the LNG Fuel PQS task list in similar fashion to what was done with the FGCE PQS, we feel this would ensure consistent enforcement until standards are established and give us the best LNG Fuel PQS product. Currently, a PQS task list is being developed based on applicable sections of the IGC Code and draft IGF Code. As other policies come into force, such as the draft CG-OES policy letters pertaining to LNG fuelled vessels, those criteria will be referenced in the draft PQS.

### FGCE "How-to" Guide

The Tactics, Techniques and Procedures (TTP) for Foreign Gas Carrier Examiners is under construction with possible release late Summer to Fall of 2014. TTP is the detailed information needed to effectively and efficiently operate specific platforms and systems, and carry out procedure-based tasks. The role of TTP is to instruct and guide the reader on the correct performance of tasks prescribed by standards and policy. TTP will be provided for each task outlined in the new PQS. Once we have validated the steps in the field, we will work with Forcecom for transfer it to the Forcecom TTP library.

## Liquefied Gas Shipping

We've experienced fewer technical or unique enforcement issues between edition #1 and this one so we don't have much to share with respect to FGC examinations. We see this as a sign of mature and experienced FGCE's and verifying officers. If there are any questions or topics you'd like to see covered in future editions, please let us know.

### Liquefied Gas Shipping Export Forecasts

There are a number of approved LNG export facilities and an even greater number of pending requests. There are also a growing number of LPG export locations being proposed as the availability of LPG increases from domestic natural gas conditioning processes. This, obviously, has relevance to your unit workload expectations. From the COTP perspective, increased numbers of regulated facilities means more facility inspections, reviews of facility security and response plans, and potentially an increase in waterway suitability assessments. From the OCMI perspective, we expect a much larger foreign gas carrier examination workload.

As of today, there are 7 facilities with approval to export LNG to non-free trade agreement countries, for a total of 9.3 BCF/day. An additional 26 currently pending applications could add another 26 BCF/day of LNG if all are approved. See the [DOE Summary of LNG export applications](#). This could result in as many as approximately 1200 LNG ship arrivals per year (or approximately 4500 if all are approved). OCMI workload will be most affected by the number of different ships that call, not necessarily by the number of arrivals and while it is difficult to obtain a precise forecast (due to the likelihood of more "frequent callers"), we can put the future rough estimates into perspective relative to the 2013 and 2007 LNG workloads. In 2013 the Coast Guard had 84 LNG ship arrivals and 23 COC exams. In 2007 (the busiest LNG import year for the U.S.), there were 375 LNG ship arrivals and a total of 55 COC exams. LNG ship COC exam workload could increase up to 10 times the current COC workload if current approved non-FTA facilities reach full operating capacity. The only clearly definable limit we have is the maximum number of possible LNG ships which is about 470 including existing and on order.

For LPG exports, the forecasting is less precise. In 2013, the Coast Guard experienced a 26% increase in LPG vessel COC exams (15% greater than the past busiest year) and are on track for a commensurate increase in 2014. Our evaluation of some industry forecasts indicate we could experience a doubling or tripling of 2013 LPG COC exam workload in 2015 and out.

### LGCNCOE SUPPORT

The LGCNCOE staff is available to support your field unit with qualified FGCE's, often with very little notice. This support can take many forms; participating in or leading a gas carrier COC exam, conducting training, serving as PQS verifying officer, participating in a FGCE qualification board, etc. If we can't support directly, we're often capable of identifying a nearby source to fill the need. In 2013, the LGCNCOE provided support on a little over 25% of the Coast Guard's foreign gas carrier examination workload.

### 2013 Ship to Ship Transfer Guide

A new Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gas has recently been published. This guide provides recommended operational procedures for the safe ship to ship (STS) transfer of petroleum, chemicals and liquefied gases.

## LNG as a Marine Fuel

The Coast Guard's Chemical Transportation Advisory Committee (CTAC) is working on a number of different areas relative to LNG fuel: carriage of LNG and CNG as a marine fuel, LNG floating processing units, design requirements for barges not subject to the IGC Code, and procedures and LNG/CNG bunkering design and operations. Likewise, the Towing Safety Advisory Committee (TSAC) is working on recommendations for requirements associated with LNG as a marine fuel.

### LNG SUPPLY INFRASTRUCTURE

We expect an eventual rise in the use of coastwise LNG vessels for distribution (LNG barges, ATB's, or small coastal tankers). In the meantime, bunkering will likely be from LNG trucks (for smaller applications) or shore side LNG storage tanks (which could incorporate small scale liquefaction). CG-OES has draft policy being considered for implementation that addresses the facilities and vessels that will provide the LNG as marine fuel. Until this is published, if you are aware of any planned LNG bunkering operations in your region, please ensure your unit is in contact with Mr. Ken Smith (CG-OES-2) (through normal chains of communication) as soon as possible to review the applicable requirements. We can assist if necessary but this communication will be critical.

Below are known supply infrastructure projects:

- Harvey Gulf started work on the first of its two \$25 million LNG bunkering facilities in Port Fourchon, LA in February 2014. Each facility will have three horizontal Type C storage tanks with a capacity of 90,000 gallons each with an external pump designed to supply a maximum of 500 gallons per minute of LNG to the bunkering vessel. Anticipated completion date for this first facility is December 2014.

- Shell has postponed indefinitely their plans to build two small scale LNG liquefaction units, one in Geismar, LA, and the other in Sarnia, Ontario.

### COMMERCIAL MARITIME USE OF LNG FUEL

There are a number of well-publicized projects underway or projected. Below we've tried to summarize these and, where possible, what Officer in Charge, Marine Inspection (OCMI) zone we expect to be impacted, in order of the expected delivery and operation.

- Harvey Gulf International Marine [HGIM] has six dual-fuel, LNG burning OSV's ordered from TY Offshore shipyard in Gulfport, MS, with the first vessel scheduled to be delivered by the end of October 2014. The first three vessels will initially operate out of Port Fourchon, LA. The 295 m<sup>3</sup> LNG storage tanks for the first three hulls were fabricated by Chart Industries, Inc. in New Prague, MN. Lockheed Martin will build the remaining three storage tanks at NASA's Michoud Assembly Facility near New Orleans. Sector Mobile is managing new vessel construction oversight and inspection, while MSU Morgan City will be the operating OCMI.
- TOTE contracted for two 3100 TEU dual fuel containerships to be built at NASSCO in San Diego, CA for operation by Sea Star Line in the Jacksonville to Puerto Rico liner trade, with options for three sister ships. These new boxships will be the first in the world that can use LNG as a fuel and will be powered by MAN ME-GI two-stroke slow speed diesel engines utilizing high pressure [300 bar = 4400 psi] gas injection. Construction on the first of these Marlin Class dual fuel containerships commenced at NASSCO in February 2014. These vessels are scheduled to be delivered and enter service in November, 2015 and 2016.
- The Interlake Steamship Company has plans to convert some of its fleet of ten vessels to use LNG as the main propulsion fuel. These ships are expected to be the first LNG powered ships on the Great Lakes. The original forecast is to convert the first ship by the Spring of 2015.
- TOTE has also announced a plan to convert their two existing Orca Class Con-Ro diesel powered vessels, the 2003-built MIDNIGHT SUN and NORTH STAR, to dual fuel. These vessels currently trade from Tacoma to Anchorage. The engineering, design, installation of the engine kits, and construction of the LNG plants is expected to take five years and the work will be performed while the ships are in service.
- Crowley announced plans for a new class of LNG powered ConRo vessels (Commitment Class) for operation from the U.S. to Puerto Rico. The ships will be built at VT Halter Marine in Pascagoula, MS and are expected for delivery in 2017.
- Horizon Lines has expressed an interest in converting 2 existing steam powered ships to use LNG for fuel utilizing dual-fuel, medium speed diesel engines. Completion on both is expected in early 2016.
- Matson has plans for a new class of dual fuelled 3,600 TEU Aloha class containerships with LNG capability. They are designed for operation in Hawaii and will be built at Aker Philadelphia Shipyard. Expected delivery is in 2018.
- Staten Island Ferry, operated by New York City Department of Transportation [NYCDOT], is considering conversion of one of its ferries to use LNG as fuel. Sector New York is the operating OCMI.
- Washington State Ferries [WSF] is exploring the possibility of converting six of their vessels to use LNG as fuel. Sector Puget Sound is the operating OCMI.
- Waller Marine of Houston has developed plans for coastwise ATB's with capacities from 15,000 m<sup>3</sup> to 34,750 m<sup>3</sup> and smaller LNG vessels ranging from 2,000 m<sup>3</sup> to 10,000 m<sup>3</sup> for river transport and bunker barges.
- GTT North America received approval in principle from ABS for the design of a 2,200 cubic meter LNG bunker barge that incorporates GTT's Mark III Flex membrane cargo containment system.
- The first containerized LNG shipment to Hawaii was provided by Clean Energy Fuels

There are countless other proposals and concepts being considered. As those become more firm and public, we will summarize them here.

## How full is YOUR tank?



1. What type of system/space is represented in this photograph?
2. What hazards are associated with this space?
3. Is a marine chemist required before entering?
4. What are precautions that should be taken prior to examining equipment in this space?
5. Is the space required to have fixed gas detection sampling?
6. What types of lighting/electrical installations are required?

You can check your answers on the LGCNCOE website: <http://www.uscg.mil/hq/cg5/lgcncoe/>