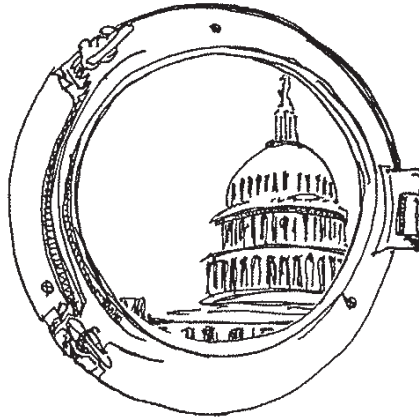


WINDOW ON WASHINGTON



GASSING UP

By Bryant E. Gardner

Due to a confluence of regulatory, technological, and economic factors, liquefied natural gas (“LNG”) is quickly gaining traction as a viable alternative marine fuel, particularly in the U.S. domestic sector. At a time when stringent new regulations regarding vessel air emission standards for the U.S. Emission Control Area (“ECA”) are coming into effect, U.S. domestic gas production has exploded and LNG prices have dropped relative to traditional marine fuels, making clean-burning LNG marine fuel a realistic alternative to traditional marine fuels. Operators are required to outfit their vessels to burn low sulfur fuels in order to comply with the most stringent emissions requirements by 2016. LNG fuel presents one path to emissions well below U.S. and international emissions requirements. When compared to Heavy Fuel Oil (“HFO”), LNG emits 85% less nitrogen oxide (“NOx”) and sulfur dioxides, 90% less particulate matter (“PM”), and 30% less carbon dioxide.¹ Thanks to the advent of shale gas and new drilling technologies, U.S. operators now have access to bountiful, and relatively cheap, LNG supplies: According to U.S. Energy Information Administration data, natural gas delivered for production is 75% less expensive on an energy equivalent basis than marine

residual fuel, and 85% less expensive than marine distillate fuel, with the price advantage predicted to increase through 2035.²

Faced with these dynamics, mainstream U.S. operators have begun to take the dive into LNG fueled vessels—particularly those in the Jones Act coastwise trades, operating primarily within the ECA. In December 2012, Saltchuk’s TOTE announced the construction of two dual-fuel containerships in the Puerto Rico trade, with options for three more vessels in the Jones Act trades, to be constructed at NASSCO in San Diego.³ Harvey Gulf International Marine announced plans in February 2014 to build and operate a LNG-fueling facility at its Port Fourchon, Louisiana facility to support a fleet of six offshore supply vessels.⁴ Interlake

¹ Det Norske Veritas & U.S. Maritime Administration, *Liquefied Natural Gas (LNG) Bunkering Study*, Report No. PP0087423-4, Rev. 3, at 1 (Sept. 3, 2014) (hereinafter, “MARAD Study”).

² American Clean Skies Foundation, *Natural Gas for Marine Vessels: U.S. Market Opportunities* (April 2012); MARAD Study; Frederick Adamchak & Amokeye Adede, Poter & Partners, *LNG as Marine Fuel* (May 2013).

³ See, e.g., Tote Press Release, *World’s First and Largest LNG-Powered Containerships to Serve Puerto Rico for TOTE, Inc.* (Dec. 4, 2012); Gregory Morris, *LNG Emerging as Fuel of Choice for Vessels, Ferries*, *The American Oil and Gas Reporter* (July 2013).

⁴ Harvey Gulf International Marine Press Release, *Harvey Gulf Breaks Ground with LNG Facility: Louisiana to Lead the Nation in Clean Energy* (Feb. 14, 2014).

Steamship announced plans to convert vessels, in concert with onshore LNG fueling facilities to be supplied by Shell.⁵ Matson has contracted with a Philadelphia yard to build two 3500 TEU containerships with dual-fuel engines, convertible to LNG later depending upon LNG availability on the West Coast.⁶ The Washington State and Staten Island Ferry Systems are also looking at conversion to LNG, and Seabulk Tankers, Inc. has also announced a contract to LNG-conversion ready product tankers.⁷ And in July 2014, ABS and Daewoo Shipbuilding & Marine Engineering ("DSME") announced partnership to build the first LNG-powered drillship.⁸ During recent congressional hearings, EPA representatives touted these developments as evidence that environmental regulations, and particularly the North American and Caribbean Sea ECAs, are working by spurring advancement to cleaner technologies at lower cost.⁹ Many of these "first movers" have cited concerns about supply shortages for ultra-low sulfur diesel in 2015 and related price spikes, high air emissions scrubber installation costs, the relative low cost and abundant supply of LNG, and LNG's ability to meet Tier 4 ECA and EPA requirements.¹⁰

Washington has reacted by moving to support the transition to LNG through regulatory infrastructure and policy encouragement. Recent congressional hearings have featured favorable remarks on LNG marine fuel use, spurred by shipyard constituent interests, and the U.S. Maritime Administration has been very active in trying to get out in front of and promote the LNG marine fuel trend focusing particularly on how to encourage

and develop LNG bunkering infrastructure in the United States.¹¹ Although the Coast Guard has begun to develop a regulatory regime for LNG bunkering, it remains in a formative stage, and a report prepared by Det Norske Veritas ("DNV") for the U.S. Maritime Administration ("MARAD") in September 2014 found significant gaps remain with respect to U.S. regulations applicable to LNG bunkering.¹²

Existing U.S. Federal regulations for LNG facilities, regardless of size, are generally covered in 33 C.F.R. Part 127 "Waterfront Facilities Handling Liquefied Natural Gas and Liquefied Hazardous Gas," 33 C.F.R. Part 105 "Maritime Security: Facilities," 33 C.F.R. Part 154 "Facilities Transferring Oil or Hazardous Materials in Bulk," 33 C.F.R. Part 155 "Oil or Hazardous Material Pollution Prevention Regulations for Vessels," 33 C.F.R. Part 156 "Oil and Hazardous Material Transfer Operations," 49 C.F.R. Part 193 "Liquefied Natural Gas Facilities: Federal Safety Standards," and 18 C.F.R. Part 153 "Applications for Authorization to Construct, Operate, or Modify Facilities Used for the Export or Import of Natural Gas," among others. However, these regulations primarily contemplate the movement of LNG as cargo and in bulk, and gaps exist with respect to, *inter alia*, LNG bunkering barges and LNG fuel systems. The various Federal agencies and departments with responsibility for LNG facility regulation include the Department of Energy, Federal Energy Regulatory Commission, Department of Transportation (various agencies including MARAD, Pipeline and Hazardous Materials Safety Administration, Federal Railroad Administration, and Federal Motor Carrier Safety Administration), Environmental Protection Agency, Bureau of Safety and Environmental Enforcement, Bureau of Ocean Energy Management, Fish and Wildlife Service, Department of Labor Occupational Safety & Health Administration, Army Corps of Engineers, and Department of Homeland Security including the U.S. Coast Guard, among others.

State and local agencies may also assert overlapping jurisdiction with respect to LNG bunkering and LNG

⁵ Interlake Steamship Press Release, *Interlake Steamship Moves Toward Upgrading Fleet to Energy Efficient LNG: Move Would Allow for Significant Environmental Benefits* (May 6, 2013). Press reports have recently suggested Shell may be pulling back somewhat from the initial proposal.

⁶ Comments of Matson Navigation Company, Inc., Docket No. USCG-2013-1084 (Mar. 10, 2014); MARAD Study at 22.

⁷ Commissioner William P. Doyle, U.S. Federal Maritime Commission, *Remarks Before American Society of Transportation and Logistics* (Oct. 29, 2013).

⁸ ABS Press Release, *DSME & ABS Collaborate on First LNG Fueled Drillship* (July 3, 2014).

⁹ Testimony of Christopher Grundler, Director, Office of Transportation and Air Quality Office of Air and Radiation, U.S. Environmental Protection Agency, before the House Transportation and Infrastructure Committee, Subcommittee on Coast Guard and Maritime Transportation, Hearing on Maritime Transportation Regulations (Mar. 4, 2014).

¹⁰ MARAD Study at 21.

¹¹ See, e.g., Hearing on Merchant Marine Issues before the House Transportation and Infrastructure Subcommittee on Coast Guard and Maritime Transportation, September 10, 2014 (discussing U.S. yard orders associated with Jones Act LNG fueled vessel construction); MARAD Study.

¹² See generally MARAD Study; ABS, *Bunkering of Liquefied Natural Gas-fueled Marine Vessels in North America* (Mar. 2014) (hereinafter, "ABS Study").

facilities generally, particularly with respect to the review of location, design, and construction of any facility. Currently, LNG facilities face significant inconsistencies with respect to local adoption of National Fire Protection Association safety standards regarding plant siting requirements, regulatory inspections and enforcement, and shore to ship fuel transfer procedure.¹³ The Coast Guard is the primary agency responsible for U.S.-flag and port state regulations governing the design, construction, and operation of LNG-fueled vessels, and its adoption of policy is also expected to bring greater consistency and certainty to LNG bunkering operations and facilities onshore as well as those afloat.

On April 19, 2012, the Coast Guard issued Policy Letter CG-521 No. 01-12 "Equivalency Determination—Design Criteria for Natural Gas Fuel Systems," which provides a basis for designing gas-fueled vessels and is premised upon the 2009 International Maritime Organization's ("IMO") Interim Guidelines on Safety for Natural Gas-Fuelled Engine Installations in Ships.¹⁴ The main points of departure from the IMO guidance are with respect to U.S. standards for type approved products, fire protection, and electrical systems. For U.S. flag vessels, there are currently two paths to obtain Coast Guard approval of an equivalency determination to use LNG as a fuel. In the first instance, operators would ensure that the vessel design meets CG-521; alternatively, a vessel-specific concept review may be requested of the Coast Guard, Marine Safety Center.¹⁵ Generally, LNG build and conversion vessel designs and concepts have been treated by the Coast Guard on a case-by-case basis to determine whether the proposed design is equivalent to standards otherwise existing under the C.F.R., with the CG-521 standards serving as the baseline.¹⁶

¹³ MARAD Study at 89-90 & 96.

¹⁴ IMO, Mar. Safety Comm., Res. MSC.285(86) (June 1, 2009). Note that in September 2014, the IMO Sub-Committee on Carriage of Goods and Containers agreed to a draft of the permanent Code of Safety for Ships using Gases or other Low Flashpoint Fuels (IGF Code), expected to replace the interim guidance. See IMO Press Briefing No. 28 (September 16, 2014), available at <http://www.imo.org/MediaCentre/PressBriefings/Pages/28-CCC1IGF.aspx>.

¹⁵ ABS Study at 21.

¹⁶ See Comments of Tim Meyers, Office of Design and Engineering Standards, U.S. Coast Guard, Before the Towing Safety Advisory Committee (Mar. 21, 2013). This is also the case for uninspected vessels. *Id.*; 46 C.F.R. 24.15-1.

Additionally, on February 7, 2014, the Coast Guard released for comment two draft policy letters, No. 02-14 "Guidance Related to Vessels and Waterfront Facilities Conducting Liquefied Natural Gas (LNG) Marine Fuel Transfer (Bunkering) Operations" and No. 01-14 "Guidance for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels Using Natural Gas as a Fuel."¹⁷ Once finalized, these will serve as guidance applied by Captains of the Port ("COTP") for fuel transfer operations and training of personnel working on U.S. and foreign vessels that use LNG as a fuel or conduct LNG fuel transfer operation in U.S. waters. Specifically, the new guidance sets out fuel transfer procedures, notification of transfer requirements, mariner training and drills, vessel equipment, pre and post transfer conduct, operations and emergency manuals, and simultaneous operations standards.

The Coast Guard policy letters were publically noticed in February 2014, and received numerous comments, many of them technical in nature. In its comments, Matson noted that policy letter No. 01-14 provides that "it is the responsibility of the operator of the facility and/or the transferring vessel to ensure that the receiving vessel has the necessary personnel and equipment to safely and securely participate in the conduct of LNG transfer operations," and suggested that the requirement be modified to impose mutual obligations on the transferring and receiving vessels and bunker suppliers.¹⁸ Matson also suggested that a vapor recovery system requirement be added in order to prevent the release of methane greenhouse gas emissions, and both Matson and TOTE strongly encouraged the availability of simultaneous operations or "SIMOPS," i.e., LNG refueling during loading and discharging in port, requesting a clear Coast Guard statement permitting such operations to ensure vessel turnaround times and schedules can be met.¹⁹ On the other hand, the Society of International Gas Tanker & Marine Terminal Operators ("SIGTTO") encouraged caution with respect to distractions which may arise during SIMOPS, and recommended that the guidance address emergency

¹⁷ U.S. Coast Guard, Notice of Availability and Request for Comments, "Draft Policy Letters: Guidance for Use of Liquefied Natural Gas as a Marine Fuel," 79 Fed. Reg. 7470 (Feb. 7, 2014) (Docket No. USCG-2013-1084).

¹⁸ Comments of Matson Navigation Company, Inc., Docket No. USCG-2013-1084 (Mar. 10, 2014).

¹⁹ *Id.*; Comments of TOTE, Inc., Docket No. USCG-2013-1084 (Mar. 7, 2014).

procedures to apply in the event of an incident during bunkering.²⁰ Matson also expressed concern that the policy letters are vague in many areas, leaving many decisions in the hands of the COTP and thereby creating the risk of disparate and conflicting practices port-to-port.²¹ In that vein, SIGTTO's comments suggested that there be some kind of "clearing house" to advise on issues and encourage consistent practices.²² TOTE, in its comments, also suggested that the wording of 33 C.F.R. 156.118 remain as written where the COTP *may* require notification of bunkering, upon his discretion, with weekly or scheduled liner service to require notifications on an as needed or required basis, rather than imposing mandatory notification.²³ Interlake Steamship similarly proposed that the reporting and notification process be simplified through VTS reporting or simple email, and both Interlake Steamship and Magnolia LNG proposed that the notification process not turn into a request for permission to bunker such that operations cannot commence prior to COTP approval.²⁴ Neither foreign flag nor U.S. international trade operators chose to submit comments.

The development of bunkering infrastructure to support LNG fueling presents another significant hurdle to widespread adoption of LNG. For the foreseeable future in the U.S., targeted, port specific development will likely be driven by ad-hoc development through regular, localized contracts between suppliers and vessel operators, such as the Harvey development of a bunkering station in Port Fourchon to support its offshore fleet, or the potential cooperative platform between Interlake Steamship and Shell on the Great Lakes. High-volume onshore bunkering stations can be augmented by mobile

vessel-to-vessel and truck-to-vessel bunkering options where needed.²⁵ However, the MARAD DNV study found that currently there exists a regulatory gap for LNG bunkering and associated infrastructure operation to ensure consistent safety standards and guidelines across jurisdictions, and proper training for crew, operators, and first responders involved with LNG bunkering operations and contingencies.²⁶

Meaningful development of LNG bunkering infrastructure will also likely encounter significant local political interest in decisions regarding large-scale trucking versus rail or pipeline transport and local liquefaction, and Federal involvement will be required both to ensure uniformity and the achievement of nationally important onshore infrastructure in support of maritime commerce.²⁷ However, LNG industry participants have shown they are capable of handling the regulatory approval process for LNG import, and subsequently export, terminals which are of significantly larger scale than bunkering facilities. Although bunkering facilities will be free of the sometimes cumbersome Federal Energy Regulatory Commission ("FERC") process under the natural gas Act which can take 1-2 years for import and export terminals, the Act did have the benefit of Federal pre-emption of states' ability to disapprove of LNG facilities—which bunkering facilities will not enjoy and therefore may experience more challenging regulatory hurdles at the local level, absent Federal intervention.

Current market conditions for LNG and the new air emissions requirements have catalyzed the movement toward LNG in some markets. Operators are moving quickly to embrace the technology, while the Coast Guard is quickly establishing a regulatory regime in collaboration with industry. So far, the real traction for LNG appears to be in the Jones Act and offshore markets which are covered by the ECA. Successful transition to LNG will require swift regulatory action by the Coast Guard and other Federal agencies to ensure safe practices and consistent standards across locations and among operators and suppliers. Although LNG bunkering

²⁰ Comments of the Society of International Gas Tanker & Marine Terminal Operators, Docket No. USCG-2013-1084 (Mar. 10, 2014).

²¹ Comments of Matson Navigation Company, Inc., Docket No. USCG-2013-1084 (Mar. 10, 2014).

²² Comments of the Society of International Gas Tanker & Marine Terminal Operators, Docket No. USCG-2013-1084 (Mar. 10, 2014). *See also* Comments of Mark Bell, Society for Gas as a Marine Fuel, Docket No. USCG-2013-1094 (Mar. 10, 2014).

²³ Comments of TOTE, Inc., Docket No. USCG-2013-1084 (Mar. 7, 2014).

²⁴ Comments of Interlake Steamship Company, Docket No. USCG-2013-1084 (Mar. 10, 2014); Comments of Magnolia LNG, Docket No. USCG-2013-1084 (Mar. 6, 2014).

²⁵ *See generally* MARAD Study.

²⁶ *Id.* at iv.

²⁷ For example, proposals for transportation of LNG by truck through portions of the City of Savannah encountered significant local opposition in the context of the Elba Island LNG Terminal proposal in 2010, until the terminal ultimately abandoned the proposal in 2012.

promises major environmental benefits and potential fuel costs savings under current and forecast market conditions, LNG is not without its risks. The public perception of LNG risk factors related to fire and explosion is already sensitive, and a major LNG bunkering incident could threaten confidence in the entire LNG supply chain. LNG marine fuel stakeholders will need to engage in the regulatory process to ensure that needed rules and consistent standards are put in place to

support further investment, without imposing uneconomical and unnecessary regulatory burdens stifling investment in this promising new clean fuel alternative.

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