

Marine

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LNG: Now Powering Vessels – and New Safety Regulations



New Hazards, New Regulatory Concerns and New Solutions.

By Joseph Keefe

According to global classification society DNV, as much as 50 percent of the world's maritime fleet could be dual fuel-powered, as early as 2020. The lure of LNG is understandable – cleaner burning fuels, potentially lower maintenance costs, better efficiencies and lower fuel cost all can be counted amongst the growing reasons to take the leap. But, owner/operators considering LNG to power vessels must understand the fire hazards present, the various fire protection solutions and the codes that regulate them.

In the rapidly emerging LNG market, it's important for ship owners and builders to understand just how different fire safety standards are for LNG ships versus diesel. With diesel, the primary focus area for protection is the engine room and machinery spaces. With LNG, in addition to those areas, protection also needs to extend to the bunkering stations and deck areas. From foam and dry chemicals to clean agents, each area requires a unique fire suppression agent. Fire

protection systems on LNG ships require detailed planning in order to maximize deck space and provide premium fire protection.

Applications of maritime fire protection include high performance systems for LNG bunkering stations and ships that meet performance specifications of IMO, ABS and USCG. Safety, regulations and training all come into play as more players tentatively dip their toes into the LNG waters.

This month, Coast guard veteran Steve Pelletier, business development manager of Tyco Marine brought us up to speed on what's new, what's needed on the new LNG frontier and more importantly, why and how.

CHANGING REGULATORY LANDSCAPE

According to Tyco's Steve Pelletier, there are several regulatory factors for the marine industry in flux at this time. As industry continues to adapt to evolving

regulations and standards, it is imperative for ship owners to ensure their fire suppression systems provide the best possible protection for the safety of people, cargo and equipment. One regulation that has been proposed by the U.S. Coast Guard (USCG) is referred to as CFR-46 Subchapter M. The intent of Subchapter M is to promote a safer work environment on board towing vessels. One of the newly proposed measures within CFR-46 Subchapter M may require fire protection for all vessels that need a certificate of inspection (COI).

The International Maritime Organization (IMO) has also introduced an amendment known as FSS Code 5.2.2.2, which specifies the activation sequence of the controls that operate carbon dioxide (CO₂) fire suppression systems, as well as discharge alarm activation on SOLAS-classed vessels. According to Tyco's Pelletier, This code was developed in response to the inconsistent operation of ball type zone valves in some fire protection systems. The code is intended to prevent the possible malfunction of CO₂ system zone or selector valves by specifying the sequence of system operation. The appropriate sequence of operation prevents CO₂ pressure from building up at the inlet of the zone valve by requiring the valve be opened before the CO₂ cylinders are opened.

Pelletier told *MarineNews* in August, "Retrofitting a boat for fire protection can present several challenges, such as space and cost, but a vessel owner can address these issues by working with a professional familiar with marine industry applications and requirements. Tyco Marine Services, a division of Tyco Fire Protection Services, has a fire protection solution for every hazard and can be a partner to those who need to retrofit to meet current marine fire protection regulations."

Upon notification of FSS Code 5.2.2.2, Tyco Marine Services took the initiative to develop both cable and pneumatically operated release and control units that meet the requirements of this code. Although FSS Code 5.2.2.2 was approved in October 2011, the USCG, as well as other regulatory agencies, was conscientious of the impact these upgrades would have on owner operators and manufacturers and created a two-year timeline for compliance. Therefore,

vessels contracted on or after July 1, 2010, will need to upgrade standard controls to hardware that meets FSS Code 5.2.2.2 no later than November 21, 2013.

FIRE SUPPRESSION – ONE SIZE DOES NOT FIT ALL

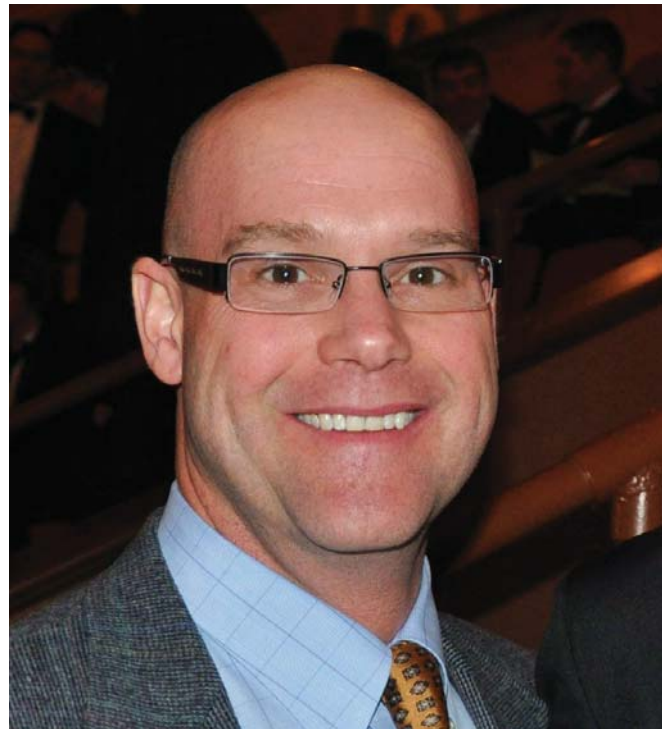
Marine applications for total fire suppression is not limited to a single product, hence a manufacturer should have the ability to offer total fire suppression solutions for any hazard. With the introduction of liquefied natural gas (LNG) as a new, viable source of power for marine vessels, fire protection for the unique hazards presented by this fuel source, including protecting bunkering stations, gas valve areas, LNG tank spaces and machinery spaces must be addressed.

There is a certain level of danger when transferring fuel, regardless of its form. A spill event is a concern when transferring fuel whether it is taking place on board a ship or dockside. Containment of materials at all times is important from both an environmental and fire protection standpoint. The difference between LNG and legacy fuels is that natural gas is a liquid when cooled and stored at atmospheric pressure, but a gas when warmer than -160 degrees Fahrenheit.

Due to its changing properties, it is important to prevent LNG from igniting as it changes state from liquid to gas, which can occur as it is exposed to the relatively warm temperatures of a ship's operating environment. Another potential danger of LNG is that it burns very clean (flames can be invisible), making detection, especially in an open area, a challenge. Leak detection prior to ignition is critical. Traditional fuels, such as diesel, can pose an issue if not properly contained and are subject to possible ignition if a static arc or an errant ignition source is present.

LNG FIRE PROTECTION SOLUTIONS

Tyco Marine Services offers a variety of products with dry chemical powder, the only agent approved for the protection of LNG bunkering stations. A full product line that includes ABC agent, a multipurpose dry chemical agent used on Class A, B and C fires, as well as Purple-K agent, or PKP, which offers some enhanced performance characteristics, provides an approach that addresses the needs of LNG bunkering stations.



Steve Pelletier, business development manager, Tyco - Marine 

According to Tyco's Pelletier, dry chemical agents also offer a variety of delivery solutions to help provide protection to all bunkering areas. He added, "Traditionally portable wheeled fire suppression units help meet minimum fire protection requirements, however location of the units can be a challenge at times. To help solve this, Tyco Marine Services also offers a skid type hose reel unit that can be conveniently installed on a bulkhead, which minimizes the equipment's footprint and provides additional fire protection."

PRIOR PLANNING IS THE KEY

As the domestic OSV market evolves, it also appears to be leading the charge to LNG. But in a market where every ton and every square foot expended to install new equipment impinges upon the working missions of the vessel, prior planning is critical when addressing fire suppression on board LNG or dual fuel powered vessels. To this end, Tyco's Pelletier says that being able to provide portable as well as permanent

solutions is important. He explained further, "Not only does equipment flexibility make planning easier; it provides architects, engineers and shipyards options during the design phase." Pelletier added that Tyco was active in the LNG fire suppression market today, but due to confidentiality agreements, was not able to share the names of current customers. But, he said, "We are working with several shipyards on LNG projects, but are not at liberty to elaborate at this time."

It's a brave new world out there. And while Pelletier conceded that LNG fuel has thus far enjoyed a relatively safe track record at sea, he also cautioned that this may lead some people to feel a sense of security that could prove hazardous if steps are not taken to provide proper fire protection for all areas of an LNG-fueled ship. He added, "Understanding the potential hazards and working with an expert to develop a total fire suppression solution will help maintain the safety of people, product and equipment." That sounds like good advice.