



MARINE Field Service News

Spring/Summer 2009 Edition

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471



Announcing Newly Certificated NFPA Marine Chemists

The Marine Chemist Qualification Board approved the initial certification of these NFPA Marine Chemists:

- John L. Bell, Certificated Marine Chemist 710, Houston, TX –John is the son of NFPA Certificated Marine Chemist John T. Bell. John is employed by Marine Inspection Services of Channelview, TX.
- Michael Schmitt, Certificated Marine Chemist 711, Beaumont, TX – Michael is works for Marine Chemists, Inc. of Texas in Beaumont, TX.
- Robert Tew, Certificated Marine Chemist 712 is a NFPA Certificated Marine Chemist at Newport News Shipyard in Newport News, VA.

To find out more about NFPA Certificated Marine Chemists

For general information, or to request an application for registration as a Marine Chemist Trainee please contact the NFPA Marine Field Service. Contact information is on the last page of this newsletter. Additional information is also available on our website:

<http://www.nfpa.org/categoryList.asp?categoryID=867&URL=Training/Marine%20chemists>

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Checking Ballast Water Proves Deadly

The United Kingdom Marine Accident Investigation Branch, Southampton, UK released a report (MAIB Report No. 01/2009) earlier this year that provides information concerning a fatal accident on a passenger vessel which occurred in June 2008.

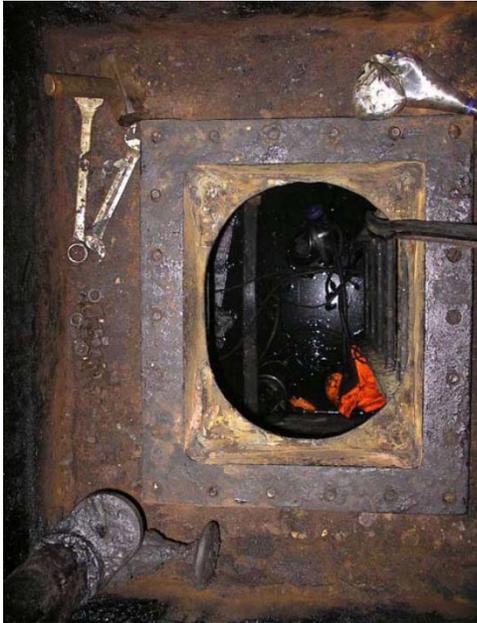


Photo Credit: UK Marine Accident Investigation Branch, Southampton, UK

The ship's Second Bosun entered a "nearly empty" ballast tank to determine the salinity of the ballast water in the tank. The photo to the left shows the open manhole for the tank where the fatality occurred. Corrosion of the bulkheads in the ballast tank depleted the oxygen concentration within the tank to a level that could not support life. A second crewman upon sounding the emergency alarm attempted to rescue his shipmate only to fall semi-conscious over the body of his friend. The second man into the tank was rescued by the ship's emergency. He was resuscitated. The Second Bosun wasn't as fortunate; he died in the ballast tank. Oxygen concentration in the tank at the time of the accident was estimated near 6% by volume. Not enough to support life.

This is yet another example of a needless confined space fatality. The deceased crewman was trained in confined space safety procedures. The vessel had a permit to work system for confined space entry but was not used in this case. The report speculates that perhaps the Bosun's decision to enter the ballast tank without testing the tank atmosphere with the ship's atmospheric testing instruments was due to complacency or because he was only going to be in the tank for a few seconds so testing and other recognized safety procedures were not necessary. It was a fatal decision.

For more information on this accident and other MAIB reports go to: <http://www.maib.gov.uk>

NFPA 302-2010 Edition Now Available

For more than 80 years the *Fire Protection Standard for Pleasure and Commercial Motor Craft*, NFPA 302 has focused on fire protection and life safety of boats (less than 300 gross tons) that are used for pleasure and commercial purposes. The 2010 edition will be available in July 2009.

Boat owners, manufacturers and marine surveyors will find NFPA 302 useful for properly protecting their boats from fires and other life safety hazards. The document specifies requirements for installing electrical systems (ac & dc), fuel systems and fire protection equipment on boats.

New in the 2010 edition are provisions for the mitigation of carbon monoxide hazards on boats; requirements addressing the fire hazard of portable heaters and dehumidifiers; updates to electrical systems requirements and guidance information for the installation of fire detection equipment in the engine rooms of commercial vessels that are 12 meters or more in length.

Go to the NFPA website, www.nfpa.org, for ordering information for NFPA 302 and other NFPA products.

Public Comment Sought for NFPA Marine Fire Protection Standards

The following NFPA Fire Protection and Life-Safety Standards are in the Annual 2010 Revision Cycle. The respective technical committees for each document are requesting public comment on the revisions presented in the Report on Proposals (ROP).

NFPA 303, *Fire Protection Standard for Marinas and Boatyards*. The committee addressed several proposals that addressed electric shock hazards to persons in water in close proximity to boats connected to shore power; and changed the requirement for sprinkler protection of boat rack storage arrangements due to a pending change to NFPA 13, Standard for the Installation of Sprinkler Systems Sprinkler Code that specifically identifies boats stored on racks as a commodity class that is not covered by NFPA 13 among other proposed changes. The ROP is available on the NFPA website link:

<http://www.nfpa.org/Assets/Files/PDF/ROP/303-A2010-ROP.pdf>

NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers and Wharves*. In addition to other proposals the committee added a recommendation permitting the authority having jurisdiction (AHJ) to consider alternative hydrant spacing in conjunction with large diameter fire hose and portable nozzles in the container stacking areas where the standard spacing is not compatible with the container handling equipment. The ROP is available on the NFPA website link:

<http://www.nfpa.org/Assets/Files/PDF/ROP/307-A2010-ROP.pdf>

NFPA 312, *Standard for Fire Protection of Vessels During Construction, Repair, and Lay-up*. The requirements for fire protection in shipyards (OSHA 29 CFR 1915 Subpart P) became effective in December 2004. The first element of this regulation is for a written fire safety plan for the shipyard and contractors. As of January 2009 US Coast Guard rules for vessel response plan salvage and marine firefighting requirements for tank vessels carrying oil (33 CFR Part 155, Salvage and Marine Firefighting Requirements; Vessel Response Plans for Oil) mandate the development of firefighting pre-fire plans.

Experience has shown that a fire safety plan (or fire control plan) is a useful tool for land-based fire fighters and vessel crews that may have to respond to vessel fires. The committee was in general agreement that some type of fire plan should be available on all types of vessels covered by the standard but could not come to a consensus on whether this should be a general requirement or incorporated in section for Planning and Station Bills of vessels in lay-up

status. The committee encourages all potentially affected stakeholders to submit comments on this issue for its consideration. Access the ROP from this link:

<http://www.nfpa.org/Assets/Files/PDF/ROP/312-A2010-ROP.pdf>

Instructions for submitting comments are found in the above links. The closing date for public comments is 04 September 2009.

Bio-degradable Solvents & Hydrogen Sulfide Hazards

Information for this article was provided by NFPA Certificated Marine Chemists, Scott Godfrey, CMC 692 and John Edgar, CMC 686

Incident: Recently, Certificated NFPA Marine Chemist Scott Godfrey was called to test two slop oil tanks on tug boat. The slop oil was being removed by a disposal contractor by vacuum truck. Upon arriving at the vessel's berth the Chemist noticed a strong odor of hydrogen sulfide. Two disposal contractors were standing up-wind of one of the open slop tanks. When

Hydrogen Sulfide (H₂S) is a colorless flammable gas with strong odor of rotten eggs however in high concentration; the sense of smell becomes fatigued rapidly.

Exposure Limits:

OSHA PEL: 10 ppm
ACGIH TLV®: 10 ppm*
ACGIH STEL: 15 ppm*
NIOSH IDLH: 100 ppm

Flammable Range: 4% by vol. (LEL) to 44% by vol. (UEL)

*The ACGIH lists H₂S in its 2009 TLV® Guide, Table of 2009 Notice of Intended Changes with the proposed change in the adopted values:

TLV®: 1 ppm
STEL: 5 ppm

tested by the Marine Chemist both slop tanks contained more than 999 ppm of hydrogen sulfide (above the range of measurement for the instrument) and the combustible gas indicator read 100% of the lower explosive limit (LEL). The workers were immediately removed from the area near the open slop tanks and the area was secured to prohibit unauthorized entry until the tanks were safely ventilated overnight.

Further investigation by Marine Chemist Scott Godfrey revealed that the tug boat's owner had changed to a soy-based bio-degradable solvent degreaser for cleaning the engine room bilge approximately 1 ½ months earlier.

Marine Chemists Edgar and Godfrey examined slop tanks of two other tug boats operated by the same company. One of the tug boats was using the same bio-degradable cleaner; the other boat was using a petroleum-based solvent. The slop tanks on the tug that used the soy-based degreaser had similar high concentration of hydrogen sulfide. The boat using the petroleum-base solvent had no detectable hydrogen sulfide in its slop tanks.

Problem: After cleaning the engine room with the soy-based degreaser - bilge water, oil residue and the solvent are pumped into the vessel's slop tank until there is a sufficient quantity for economical removal by a waste oil disposal contractor.

The bio-degradable solvent alone is not apparently the problem. It contains surfactants and soy methyl esters. The vessel uses a high sulfur content fuel oil. The rinse water is sea water approximately 83°F (or 28°C). These three elements when combined in the slop tank create an apparent increased rate of decomposition of petroleum hydrocarbons. Very high concentration of hydrogen sulfide gas is the by-product of this organic reaction. On the boats that used this bio-degradable solvent degreaser the atmosphere of the slop tanks was immediately dangerous to life and health (IDLH) before ventilation.

Conclusion: Certain bio-degradable solvents that yield increased rates of decomposition of petroleum hydrocarbons may present an unexpected health and safety risk to personnel. Organic decay of the soy-based solvent and high-sulfur fuel residue (common in the marine industry) by salt water organisms may produce a lethal concentration of hydrogen sulfide in a relatively short period of time.

Before opening any tank (in this case a slop tank) the atmosphere needs to be checked by a competent person or Marine Chemist for oxygen, flammable gas and toxic gases with a properly calibrated and maintained test instrument. Only when the atmosphere inside the tank is *Safe for Workers* may personnel be permitted to enter. As in this case, any confined space found to contain a high level of hydrogen sulfide should be ventilated and then retested to verify the atmosphere is safe before entry is authorized.

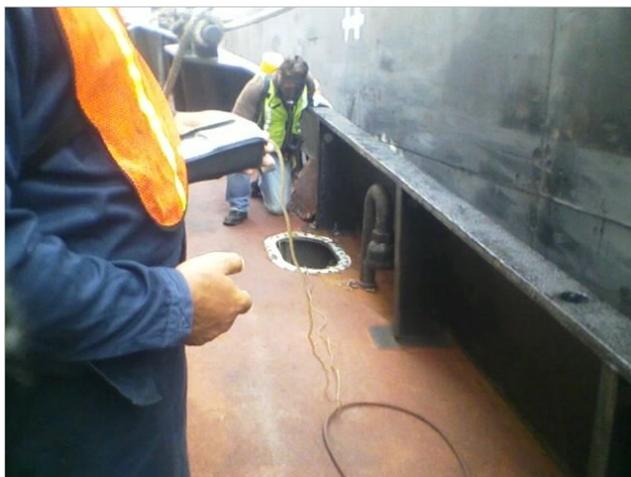


Photo Credit: NFPA Marine Chemist Scott Godfrey

In the photograph to the left NFPA Marine Chemists Scott Godfrey (wearing SCBA) and John Edgar (foreground) of Southern Marine Chemists, Inc., test a tug boat slop tank.

Immediately upon removing the man-hole cover they found the tank atmosphere to contain 150 ppm hydrogen sulfide and 50% of the lower explosive limit.

For more information:

Minimum requirements for determining that tanks and spaces on marine vessels or in a shipyard or vessel repair facility are safe for entry and work may be found in NFPA® 306, *Standard for the Control of Gas Hazards on Vessels*, 2009 edition. Regulations concerning precautions and order of testing before entering confined and enclosed spaces and other dangerous atmospheres in shipbuilding, ship repairing, shipbreaking and related employments are found in OSHA's Shipyard Industry Standards, 29 CFR 1915.12 (a) through (c).

2009 ACGIH TLV® Guide is Available

The 2009 TLV® Guide is now available from the American Conference of Governmental and Industrial Hygienists (ACGIH). The Guide is used worldwide as a guide for evaluation and control of workplace exposures to chemical substances and physical agents. Threshold Limit Value (TLV®) occupational exposure guidelines are recommended for more than 700 chemical substances and physical agents.

The proposed TLV® change for ethanol that appeared in the 2008 Notice of Intended Change (NIC) was adopted. In the 2009 edition of the TLV® Guide ethanol has a short-term exposure limit (STEL) of 1,000 ppm. The TLV® for VM & P Naphtha is withdrawn in the 2009 edition. The 2009 NIC includes but is not limited to the following chemical substances:

- Ethyl Benzene
- Hydrogen Sulfide
- Methyl Isobutyl Ketone
- α -Methyl Styrene

2010 NFPA Confined Space Safety Training

The NFPA is pleased to announce open registration Maritime Confined Space Safe Practices training seminar dates for 2010.

- 16 – 18 March 2010 (3-Day Program)
- 14 – 16 September 2010 (3-Day Program)

For over 25 years NFPA has provided confined space safety training to the marine industry focusing on a three-step approach of hazard recognition, evaluation, and control.

This course is intended for anyone responsible for testing or entering confined spaces during construction, repair, or inspection in shipyards or in the offshore industry. This may include competent persons, repair foremen, welders, tank cleaners, ship fitters, marine surveyors, grain inspectors, vessel personnel and marine inspectors.



*NFPA Confined Space Safe Practices Seminar presented in London, UK, May 2009
Photo Credit: L. Russell, NFPA*

A certificate of completion with 2.0 Continuing Education Units (CEU) is awarded to participants who complete the three days of instruction.

For information on these seminars, a course description, registration form or to schedule similar training at your location - please contact Larry Russell or Joanne Goyette at NFPA, telephone: 617-984-7950; email: marine@nfpa.org

New IMO Material Safety Data Sheet (MSDS) Requirement in the International Convention for the Safety of Life at Sea (SOLAS)

The International Maritime Organization (IMO) recently amended the International Convention for the Safety of Life at Sea (SOLAS), 1974, to require Material Safety Data Sheets (MSDSs) for ships carrying oil or oil fuel as defined in Regulation 1 of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), Annex I.

The new requirement will go into effect on 01 January 2011. Each ship subject to SOLAS and carrying oil or oil fuel as defined in MARPOL 73/78 must be provided with an MSDS prior to loading such oil as cargo in bulk or oil fuel.

Additionally, IMO developed a recommendation for MSDS format and content that went into effect this month (on 01 July 2009). The United States Coast Guard is encouraging the use of this recommended format. The recommended format and content may be found in the *IMO Recommendation for Material Safety Data Sheets (MSDS) for MARPOL Annex I cargoes and marine fuel oils*, MSC.150 (77). The US Coast Guard has published these recommendations in the *Federal Register*, June 26, 2009 (Volume 74, Number 122), Pages 30612-30615, Docket No. USCG-2009-0553. (<http://edocket.access.gpo.gov/2009/E9-15337.htm>)

After 01 January 2011, all U.S. flagged SOLAS vessels traveling overseas should expect foreign Administrations to ask for MSDSs for each MARPOL 73/78 Annex I cargo and marine oil fuel on board.

All U.S. and foreign flagged SOLAS vessels in U.S. ports (tank vessels – including barges – above 150 gross tons, and all other vessels above 400 gross tons) should anticipate that the Coast Guard will ask for MSDSs, as part of its domestic and foreign vessel compliance activities and in fulfillment of the United States' duties as a party to the SOLAS convention.

Although SOLAS requirements for material safety data sheets do not apply to vessels that are not subject to SOLAS, such as unmanned inland barges, other regulations, such as 46 CFR 197.565, may require MSDSs to be on board.

Notifying Personnel of Benzene Hazards

*From US Coast Guard Marine Occupational Safety and Health Standards
Title 46 - Shipping, Part 197, General Provisions, 46 CFR 197.565(a)
Material Safety Data Sheet.*

A material safety data sheet (MSDS) addressing benzene must be made available to all persons involved in the benzene operation. The MSDS must describe the physical and chemical characteristics, physical and health hazards, permissible exposure limits, precautions for safe handling and use, control measures such as personal protection equipment, and first aid procedures for benzene. A copy of appendices A and B of this subpart or a MSDS on benzene meeting the requirements of 29 CFR 1910.1200(g) is sufficient.

For now, the Coast Guard recommends that an MSDS provided to a ship follow the recommended IMO content and format referenced above. The Coast Guard anticipates that MSDSs will be provided by the oil terminal or bunker supplier, unless otherwise arranged by the cargo/bunker supplier and the ship interests. It is further expected that ship-board personnel will have access to these MSDSs in a working language or languages understood by them. Additionally, occupational exposure limits referenced in an MSDS should be based on internationally recognized standards.

Stay Fire Smart! Don't Get Burned

Testing the water before putting a child in the bath, or wearing short or close-fitting sleeves when cooking on the stovetop may sound like common sense. Simple actions like these may be all it takes to prevent devastating burns.

Fire Prevention Week (October 4-10, 2009) will focus on burn awareness and prevention, as well as keeping homes safe from the leading causes of home fires.



Eight Bells

The Marine Field Service sadly reports NFPA Marine Chemist Robert Landry, CMC 701, died on March 29, 2009. Robert was certificated as a Marine Chemist in 2005. He worked with other Marine Chemists including Ken Mercer, who sponsored Robert through his training, John T. Bell and Chris Scott.

Questions, Comments or Contributions If you have any questions, comments or if you would like to contribute to this newsletter we'd like to hear from you! All correspondence should be directed to Marine Field Service Newsletter Editorial Staff care of:

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