



Marine Field Service Newsletter

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Coast Guard Proposes Confined Space Safety Training in Proposed Towing Vessel Rule

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Public meetings on proposed towing vessel rule are announced by the U. S. Coast Guard.

On August 11, 2011 the United States Coast Guard published a Notice of Proposed Rulemaking (NPRM), *Towing Vessel Inspection Proposed Rule*, (Docket No. USCG-2006-24412) in the Federal Register/Vol. 76, No. 155. (*See related article below*)

The Coast Guard proposes to establish safety regulations governing the inspection, standards, and safety management systems of towing vessels. The intent of the proposed rule is to promote safer work practices and reduce casualties on towing vessels by requiring that towing vessels adhere to prescribed safety standards and safety management systems.

Please see Proposed *Confined Space Training Rule* on page 3

Public Meetings for Towing Vessel Proposed Rule Scheduled

On 09 September 2011 the Coast Guard announced a series of public meetings to receive comments on a notice of proposed rulemaking (NPRM) entitled "Inspection of Towing Vessels" that was published in the Federal Register on August 11, 2011.

The regulations proposed in the NPRM would establish safety regulations governing the inspection, standards, and safety management systems of towing vessels. The proposal includes provisions covering: Specific electrical and machinery requirements for new and existing towing vessels, the use and approval of third-party auditors and surveyors, and procedures for obtaining Certificates of Inspection. The proposed rule may be found at:

<http://www.regulations.gov/#!documentDetail;D=USCG-2006-24412-0035>

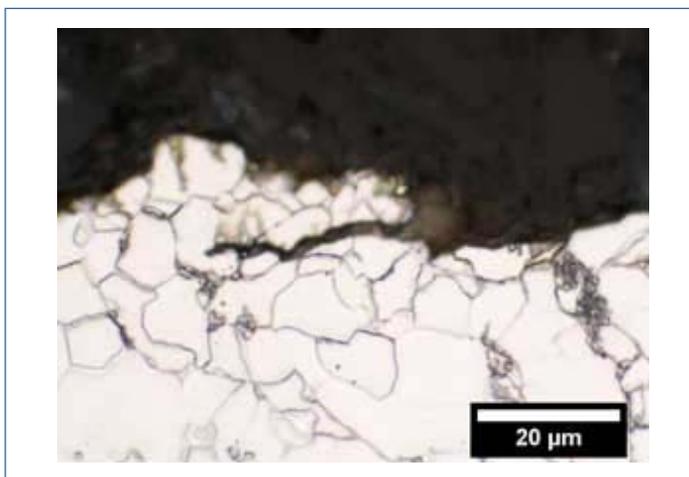
Please see *Public Meetings on Proposed Towing Vessel Rule* on page 3

NIST Finds Ethanol-Loving Bacteria Accelerate Cracking of Pipeline Steels

*Editor's Note: Two years ago at a Marine Chemist Association technical seminar, Marine Chemist Gregory Grondin, CMC 676, presented findings of microbiologically influenced corrosion (MIC). This summer (August 2, 2011) the National Institute of Standards and Technology (NIST) published in **NIST Tech Beat** new experimental evidence that ethanol, and especially the bacteria sometimes found in it, can dramatically degrade pipelines. Certainly this is a concern for many groups within the maritime industry. The entire article is reprinted here with permission of the NIST. For more information about this article please contact Ms. Laura Ost at NIST (Tel: 303-497-4880).*

U.S. production of ethanol for fuel has been rising quickly, topping 13 billion gallons in 2010. With the usual rail, truck and barge transport methods under potential strain, existing gas pipelines might be an efficient alternative for moving this renewable fuel around the country. But researchers at the National Institute of Standards and Technology (NIST) caution that ethanol, and especially the bacteria sometimes found in it, can dramatically degrade pipelines.

At a conference [on August 1, 2011],* NIST researchers presented new experimental evidence that bacteria that feed on ethanol and produce acid boosted fatigue crack growth rates by at least 25 times the levels occurring in air alone.



Micrograph of crack in X52 steel after the sample was subjected to mechanical forces for several days in an ethanol solution containing acid-producing bacteria, *Acetobacter acetii*. Researchers at NIST's biofuels testing facility found that the bacteria increased fatigue crack growth rates at least 25-fold compared to what would occur in air.

Credit: Sowards/NIST

[View hi-resolution image.](#)

The NIST team used a new biofuels test facility to evaluate fatigue-related cracking in two common pipeline steels immersed in ethanol mixtures, including simulated fuel-grade ethanol and an ethanol-water solution containing common bacteria, *Acetobacter acetii*. Ethanol and bacteria are known to cause corrosion, but this is the first study of their effects on fatigue cracking of pipeline steels.

"We have shown that ethanol fuel can increase the rate of fatigue crack growth in pipelines," NIST postdoctoral researcher Jeffrey Sowards says. "Substantial increases in crack growth rates were caused by the microbes. These are important data for pipeline engineers who want to safely and reliably transport ethanol fuel in repurposed oil and gas pipelines."

* J.W. Sowards, T.D. Weeks, J.D. McColskey, C. Williamson, L. Jain and J.R. Fekete. Effect of ethanol fuel and microbiologically influenced corrosion on the fatigue crack growth behavior of pipeline steels. Presented at DOD Corrosion Conference 2011, La Quinta, Calif., August 1, 2011

Please see *Pipe Eating Bugs* on page 4

Proposed Confined Space Safety Rule for Towing Vessels from page 1

The proposed rule contains a provision for the health and safety of towing vessel crew members. Specifically, no later than 3 years after the effective date of the final rule the owner or managing operator must implement a health and safety plan and institute a crew training program. Within the health and safety plan are requirements for crew training and procedures to identify and mitigate health and safety hazards, including but not limited to confined space entry.

Safety training is required as soon as practicable but no later than 5 days after employment and annual refresher training is also proposed. Training is required to be documented and those records must be maintained by the owner or managing operator.

The Coast Guard is accepting comments on this proposed rule on or before December 9, 2011. See related article concerning public meetings about this proposed rule.

Injury and death caused by hazardous atmospheres within confined spaces on marine vessels has been a chronic safety problem.

According to an October 2009 report from the *Marine Accident Investigator's International Forum* (MAIIF) to the *International Maritime Organization* (IMO) there were 101 reported confined space accidents resulting in 93 deaths and 96 injuries on a variety of vessels in a 12 year period (1998 - 2009). MAIIF believes the root cause of these casualties is inadequate training. The NFPA Marine Field Service agrees with this conclusion based on the incidents reviewed by the NFPA's Marine Chemist Qualification Board during the last 25 years.

Confined space safety hazards have gotten the attention of International Maritime Organization (IMO) and recently several IMO working groups have been developing revisions to the *Recommendations for Entering Enclosed Spaces Aboard Ships* [Resolution A.864 (20)], adopted in 1997.

The NFPA Marine Field Service applauds the efforts of the U. S. Coast Guard and International Maritime Organization to address confined space safety on commercial vessels.

Public Meetings on Proposed Towing Vessel Rule from page 1

The four (4) public meetings are scheduled for interested parties to present oral comments to the Coast Guard. Detailed information about these meetings may be found at this link: <http://www.federalregister.gov/articles/2011/09/09/2011-23053/inspection-of-towing-vessels#p-3>. The dates and locations of the meetings are:

October 18, 2011, in Newport News, VA
October 26, 2011, in New Orleans, LA

October 24, 2011, in St. Louis, MO
November 16, 2011, in Seattle, WA

Written comments and related material may also be submitted to Coast Guard. The deadline for submitting comments is December 9, 2011. Written comments must be identified by docket number USCG-2006-24412. Go to the Federal eRulemaking Portal: <http://www.regulations.gov> and follow the instructions for submitting comments (this is the preferred method to avoid delays in processing).

Pipe Eating Bugs from page 2

Ethanol, an alcohol that can be made from corn, is widely used as a gasoline additive due to its oxygen content and octane rating. Ethanol also can be used as fuel by itself in modified engines. The NIST tests focused on fuel-grade ethanol.

The tests were performed on X52 and X70 pipeline steels, which are alloys of more than a dozen metals. Simulated fuel-grade ethanol significantly increased crack growth at stress intensity levels found in typical pipeline operating conditions, but not at low stress levels. The cracking is related to corrosion. The X70 steel, which is finer-grained than X52, had lower rates of crack growth at all stress levels. This was expected because larger grain size generally reduces resistance to fatigue. In the bacteria-laden solutions, acid promoted crack growth at stress intensity levels found in typical pipeline operating conditions.

According to NIST Researchers "...bacteria that feed on ethanol and produce acid boosted fatigue crack growth rates by at least 25 times the levels occurring in air alone."

Preliminary tests also suggested that glutaraldehyde, a biocide used in oil and gas operations, may help control bacterial growth during ethanol transport.

The findings are the first from NIST's biofuels test facility, where material samples are installed in hydraulic test frames and subjected to load cycles while immersed in fuel inside a transparent polymer tank. Fatigue crack growth and other properties are observed over a period of up to 10 days. NIST staff expect to continue and possibly expand the research to other potential biofuels such as butanol or biodiesel. Collaborators at the Colorado School of Mines provided the bacteria, which were isolated from industrial ethanol storage tanks. The research was supported by the U.S. Department of Transportation.

Proposal Closing Date for NFPA 306 is November 25, 2011

The Standard for the control of Gas Hazards, NFPA 306, is in the Annual 2013 Revision Cycle. The NFPA is accepting public proposals for the document. If you think something in NFPA 306 needs to be revised, changed, added or removed now is your chance. But the closing date for proposals is November 25, 2011 at 5:00 PM EST. Instructions and forms for submitting a proposal to any NFPA Code or Standard may be found on our web site at this link:

<http://www.nfpa.org/categoryList.asp?categoryID=124&URL=Codes%20&%20Standards&cookie%5Ftest=1>

Call for NFPA Technical Committee Members

These NFPA Technical Committees related to Codes and Standards for the maritime industry are seeking members as noted.

The **Committee on Gas Hazards**, responsible for NFPA 306, *Standard for the Control of Gas Hazards on Vessels*; the **Committee on Merchant Vessels**, responsible for NFPA 301, *Code for Safety to Life from Fire on Merchant Vessels*; and the **Committee on Marinas and Boatyards**, responsible for NFPA 303, *Fire Protection Standard for Marinas and Boatyards* are seeking members from all categories.

The **Committee on Marine Terminals** is seeking members in all interest categories except Special Experts and Insurance. This Committee is responsible for NFPA 307, *Standard for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves*.

The **Committee on Shipbuilding, Repair, and Lay-Up** responsible for NFPA 312, *Standard for Fire Protection of Vessels During Construction, Conversion, Repair, and Lay-Up*. is seeking members in all interest categories except Insurance.

The **Committee on Motor Craft** is seeking members in all interest categories except for Special Experts. With the recent notice of proposed rulemaking (NPRM) entitled "Inspection of Towing Vessels" published in the Federal Register on August 11, 2011 (see related article) the Committee is looking for representatives from the towing vessel industry. This Committee is responsible for NFPA 302, *Fire Protection Standard for Pleasure and Commercial Motor Craft*.

An application for committee membership may be found at this link:

<http://www.nfpa.org/assets/files/PDF/TCApp.pdf>

Marine Chemist Qualification Board News



NFPA Marine Chemist Qualification Board at San Diego, CA July 13-14, 2011.
Rear Row (left to right): Joseph Daddura, Dennis Berry, Robert Walker, III, Evans Rustad, Michael Arnold, and John Doran. Front Row: (left to right): Philip Dovich, Alan Rainsberger, Gary Morris, Lawrence Russell, and Laura Weems.

The Marine Chemist Qualification Board met on 13-14 July 2011 in San Diego, CA and will be meeting in Annapolis, MD on 26-27 October 2011.

In September Jill McGovern joined the Marine Field Service team as Project Administrator. Jill is responsible for administrative including a professional certification program for Marine Chemists and seminar program for maritime confined space safety.

Jill may be reached at telephone: 617-984-7418 and email:

jmcgovern@nfpa.org

NFPA Maritime Confined Space Safe Practices Training

NFPA Confined Space Safe Practices Seminars are based on OSHA's maritime confined space standard in 29 CFR 1915, Subpart B and *NFPA Standard for the Control of Gas Hazards on Vessels*, NFPA 306. Students work with NFPA staff and NFPA Certificated Marine Chemists as they learn a 3-step systematic approach to confined space safety:

- Hazard Recognition
- Hazard Evaluation
- Hazard Control

Seminar instruction uses an interactive format combined with group exercises that focus on case histories and hands-on activities with atmosphere testing devices.

Participants learn current information on changes in workplace exposure standards and other regulations. At the completion of the seminar participants will be able to develop and implement practices and procedures essential to safely entering and working in confined spaces on all types of marine vessels and offshore platforms.

A certificate of completion and Continuing Education Units (CEU) are awarded to participants who complete the seminar. To arrange for training at your location contact the NFPA Marine Field Service at telephone: 617-984-7418 or email: marine@nfpa.org



NFPA Instructor, Marty Finkel, demonstrates confined space testing methods to participants at an NFPA confined space class in Singapore in September 2011.



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In Memoriam, Chuck Lilly

With sadness the NFPA Marine Field Service reports the passing of NFPA Certificated Marine Chemist, Charles D. Lilly of Marrero, LA on Saturday, October 1, 2011 after a long battle with cancer.

Chuck was originally certificated in July 1969 as a Marine Chemist Number 569. His concern for the safety of shipyard workers was demonstrated for 42 years by his practice of diagramming safe hot work areas on his Marine Chemist Certificates. A graveside memorial service will be held on Monday, October 10, 2011.