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Biodiesel Testing Report Reinforces Compatibility of Steel with Various Fuel Blends

Electrochemical reactions between carbon steel and all commercially available types of biodiesel (soy- or animal-based) generate corrosion rates so low that they cannot be measured.

This is the conclusion of a final report on unprecedented testing by a nationally recognized independent research laboratory on how carbon steel could be affected by biodiesel, a growing presence among America's fuel inventories. Tank Talk in February reported on the initial phase of testing, which focused strictly on soy-based biodiesel.

The overall testing – collaboratively funded by STI/SPFA, the American Iron and Steel Institute, the National Biodiesel Board and the National Oilheat Research Alliance (NORA) – reinforced the compatibility of steel within the full spectrum of blended concentrations. Steel samples used in the testing were made of standard low-carbon steel most commonly used in atmospheric storage tanks.

Both soy- and animal-based biodiesel fuels were used “to obtain test results representative of all biodiesel blends,” the report said. “Half of the samples contained water in order to represent the worst-case conditions. The testing was carried out to simulate typical storage tank conditions for a 12-month period.” Heating oil used in the testing contained 4,000 ppm sulfur, which is representative of typical fuel in that application.

Key findings showed:

- “The conductivity of the fuel blends was so low that no corrosion rate could be measured,” the report said.
- Despite an expectation that aging fuel samples would exhibit higher acidity, the findings showed that an increase in acid number did not correlate with a boost in corrosion rate.

- Biodiesel exhibited significant levels of degradation during course of test.

The study included steel coupons – test samples – immersed in blends of biodiesel and ultra-low sulfur diesel (ULSD) fuel that were maintained at a controlled temperature of 109.4 degrees Fahrenheit (43 degrees Celsius) for the duration of testing.

Test cells were disassembled, visually inspected, photographed and weighed after one month, two months and at the conclusion of the testing.

While STI/SPFA strongly encourages owners to remove water from storage tanks as part of routine maintenance procedures, the worst conditions occur when some water exists in the tank. The presence of water will also cause fuels to degrade at a faster rate.

News Analysis: Oklahoma Balancing Act Boosts Pressure on Fire Marshals

By Jim Wisuri

Just do what's right.

It's the catch-all solution in modern America. When in doubt, trust your gut. Live by the golden rule. Follow all of those simple sandbox-etiquette rules you learned in kindergarten – and everything will work out in the end.

For a few dozen fire marshals in Oklahoma, their ethical instincts will be severely tested for the next few years – balancing out their obligations to protect public safety by enforcing local fire codes, and their willingness to recognize that new underground storage tanks (UST) rules might be a financial back-breaker for local businesses.

In various parts of Oklahoma, fuel is being dispensed from USTs that have been moved into service as aboveground storage tanks (ASTs). Owners of the converted USTs are trying to avoid costly new regulatory rules by adapting the tanks to aboveground service.

The problem: USTs are neither designed nor built nor certified for aboveground service. This is widely recognized within the petroleum industry.

For example, consider a recent question-and-answer article from The Code Authority, a periodical published by Underwriters Laboratories. "Underground tanks are not required to have an emergency vent, which is required for all aboveground tanks to prevent pressure buildup if the tank is exposed to fire," the newsletter said. "Without properly sized and constructed emergency vents, during a fire exposure the tank could overheat, over-pressurize and rupture with catastrophic consequences."

So, Oklahoma this spring had a wobbly five-legged stool:

- A bill approved by the Oklahoma Legislature and the governor in 2007 allowed USTs to be used as ASTs
- The state has adopted the National Fire Protection Association's NFPA 30 code, which does not allow USTs to be used as ASTs
- The Oklahoma Corporation Commission, as a state agency, is supposed to create regulations that put meat on the bones of legislative intent without creating conflicts that could impair public safety
- Fire marshals are supposed to ensure that laws and codes are respected through compliance
- Tank owners are trying to keep their fuel operations running

Trying to balance that stool, Oklahoma lawmakers approved HB 3303, which – despite opposition from fire marshals – was signed into law by Gov. Brad Henry on April 18. The key language in the law says

that “any rules promulgated by the Corporation Commission governing the design and labeling of aboveground storage tanks shall be amended to allow storage tanks designed and built for underground use to be used as aboveground storage tanks if used with secondary containment and if the storage tanks were installed for that use prior to July 1, 2007.”

The only problem with this solution is what UL was alluding to – a “catastrophic” situation. Is catastrophe far-fetched? Reporter Kit Wagar of the Kansas City Star newspaper in 1999 wrote about a firefighter’s recollection of one of the most famous aboveground tank fires in United States history:

“Seared into the memory of Kansas City firefighter Tony Valenti is the deafening screech of a gasoline storage tank as it is about to explode. Valenti knows the sound from a sultry August day in 1959 when he and dozens of others fought a massive fire at a fuel depot on Southwest Boulevard.

“When it started screaming, the captain said get away and we started running,’ Valenti recalled Saturday. ‘Everybody else ran south. But I ran straight away. If a tank is going to explode, the fire will shoot right out at you. But I wasn’t thinking.’

“It saved his life.

“The fireball from the burning tank blew apart a brick building and washed over firefighters in a sea of flames. Six persons died – five firefighters and a depot worker who was helping to battle the blaze.”

The Kansas City tragedy showed that mere secondary containment for a UST converted to aboveground use will not save anyone’s life if thousands of gallons of flammable and combustible liquids are exposed to a blaze. Tank installers and manufacturers know that.

Fire marshals know it, too. And a few dozen fire marshals in Oklahoma now face potentially agonizing do-what’s-right decisions about how to balance the fueling needs of small towns with their own abilities to protect those communities from fire and explosion hazards.

And, on a more personal level, those marshals will have to consider how to protect their best friends – knowing that some day the local fire protection district could get a call that a less-than-perfectly configured “aboveground” UST is flaming, screaming and about to begin combusting.

North Carolina Rule Raises Questions on Technical Justification

A provocative debate has been underway in North Carolina during recent months about the state’s efforts to regulate a change to secondary containment for underground storage systems. Tank Talk posed a few questions to Charles A. Frey, Jr., vice president of Highland Tank Co., who has closely followed the proceedings, and contributed to the debate.

Q. What prompted the recent actions in North Carolina?

A. After the Federal Energy Policy Act of 2005 was passed, states faced the choice of implementing secondary containment for underground storage tank (UST) systems or expanding financial responsibility requirements. North Carolina leaders, in moving regulations toward secondary containment, took the virtually unprecedented step of eliminating the most popular means of monitoring a double-wall steel tank – a sensor that detects liquid in the annular space.

Q. How did North Carolina’s regulatory action affect the UST marketplace?

A. Despite the nearly perfect track record of double-wall steel USTs in protecting against a release of petroleum into soil, the North Carolina regulatory action required a double-wall UST to be monitored by pressure, vacuum or a hydrostatic method. Unfortunately, in the marketplace these were not realistic

monitoring methods for a steel tank. There is no known pressure monitoring system being marketed in the United States. Hydrostatic monitoring employs a proprietary system used exclusively by the two fiberglass-reinforced plastic (FRP) tank manufacturers. It uses a brine liquid that, among other problems, is not compatible with a steel tank. As for vacuum, there are two storage tank vacuum systems that can be purchased in the United States. They have been exclusively used to meet a California regulation, and unsuccessfully marketed anywhere they were not mandated by law. The lack of a viable monitoring system has left the steel tank manufacturers unable to market their tanks in North Carolina. For example, Highland Tank's largest distributors were unwilling to experiment with the vacuum method that they had never sold before. It was easier to use the FRP industry's proprietary hydrostatic system.

Q. What technical or scientific data backed up the regulators' shift on the issue?

A. A key precedent was a decision in North Carolina to end recognition of a liquid sensor at the bottom of an interstice as a continuous monitoring device. This was not a concept that can withstand much logical or technical scrutiny. One multi-part theory expressed is that a primary tank could "somehow" develop a leak above the product level. The second part of the theory claimed a secondary tank could develop a leak in a dry non-corrosive environment. Exactly how this situation would occur is unknown. The follow-up claim extrapolated that a primary tank could leak when the tank is filled higher and the product would avoid migrating (and defy the law of gravity) to the probe. Somehow, the theory claims, the fuel would flow directly to the simultaneously created outer hole – and no one would know. This, of course, is hardly believable. If two leaks were ever to occur in a dry hole, the product would still sound the alarm.

Q. Wouldn't a hole in the secondary containment layer allow moisture into the annular space?

A. Exactly. As installers are aware – and PEI and STI installation codes clearly point out – most storage tank holes are like a bathtub. A hole is dug out of native soil, tanks are installed and then backfilled with sand, crushed stone or pea gravel. These are all materials that rainwater will easily pass through. It is hard to believe water would not find its way to a tank defect and sound an alarm.

Q. How do North Carolina regulators view the use of an interstitial sensor in a piping system?

A. State officials have said that an electronic sensor for an interstitial space can qualify as a continuous monitor, if used in a piping application.

Q. So, how does this apparent technical conflict get resolved?

A. Highland Tank – and more than 20 other firms – petitioned the North Carolina Department of Environment and Natural Resources this spring to recognize that the continuously operating sensor technology they accept for piping will continue to work, just as it has for many years, in underground storage tank applications. After a committee hearing and a separate hearing before the state's Environmental Management Commission in March, the petition received approval from both bodies.

Q. What happens next?

A. Though North Carolina leaders in early May decided to move toward more public comment on the rule-making, a revised, proposed rule – clearly influenced by the fiberglass-reinforced plastic tank industry – was circulated by regulatory staff prior to the start of the comment period. It contained new language that would provide challenges for proven, widely accepted sensor technology. The next step is providing elected and appointed leaders in the state the solid technical information that demonstrates how long-proven sensor technology continues to provide excellent environmental protection in double-wall steel USTs.

New Table Summarizes AST Code Requirements Side by Side

A newly compiled table compares aboveground storage tank (AST) requirements in the 2008 edition of NFPA 30A, and the 2006 International Fire Code (IFC).

The table is available [here](#).

In reviewing the table, it's helpful to know that the 2006 edition of the National Fire Protection Association's NFPA 1 standard references the 2003 edition of NFPA 30A for all requirements pertaining to ASTs at motor-fuel dispensing stations.

The 2009 edition of NFPA 1, which will be released by the NFPA Standards Council on July 24, will reference the 2008 edition of NFPA 30A.

The table is a partial list of differences and similarities between the codes, and is not intended to be a replacement for actual code documentation.

STI/SPFA Introduces New Alternate Listing Program for ASTs

Steel Tank Institute (STI), a division of STI/SPFA, is introducing a new listing program for aboveground storage tanks (ASTs) through Southwest Research Institute (SwRI).

"The new SwRI program will allow STI members and future members to fabricate STI-labeled aboveground tank technologies, including Fireguard[®] and F921[®], and also single-wall tanks through SwRI, as an alternative to listing through Underwriters Laboratories," said Lorri Grainawi, director of technical services at STI/SPFA. Members also continue to have the option of strictly listing ASTs through the UL 142 program.

SwRI's listing program requires fabricators to apply the SwRI mark along with a description of the tank. For example, a single-wall AST will bear a label that says, "This tank complies with UL 142 Standard for Aboveground Tanks," along with the SwRI mark and all other marking requirements of the UL 142 standard.

SwRI also requires all listed tanks to be manufactured and inspected to STI standards and SwRI requirements. All inspections will be conducted by independent inspectors who have received thorough training on tank fabrication by STI, according to SwRI requirements.

"STI believes that offering access to both UL and SwRI programs provides added value for Steel Tank Institute members," Grainawi said. "Augmenting the value of STI's association with UL makes sense because SwRI is known for fast response time, a professional approach on technical issues and personalized service. We are always in search of ways to serve our member community effectively."

SwRI has received notice from all 50 states indicating that authorities having jurisdiction (AHJs) will accept the SwRI mark, and it is reaffirming some prior approvals provided by AHJs.

For more information on SwRI's listing program, visit <http://www.swri.org/4org/d01/fire/listlab/home.htm>. Individuals interested in learning more about the SwRI program STI specifications or information on becoming a STI member manufacturer are invited to contact STI/SPFA at 847-438-8265, or contact Grainawi at lgrainawi@steeltank.com.

STI/SPFA Recognizes 2007 Fabricated Products of the Year Winners

STI/SPFA has honored within specific industry categories several companies with Steel Fabricated Product of the Year Awards for projects completed in 2007.

In the special fabrication category, the award recognized the work of MMI Tank of Mesa, Ariz. for a complex steel-roofing design constructed and installed on a 1929 tank in Signal Hill, Calif.

The atmospheric tank category of the Fabricated Product of the Year recognized seven 88,000-gallon (333,018-liter) tanks manufactured by Brown-Minneapolis Tank Co. of Albuquerque, N.M. as part of a processing system for gold spills at Nova Gold in Nome, Alaska. This unique design called for the tanks to be built in two sections in Olympia, Wash. The two pieces were nested together and transported by truck for field assembly and installation at the mine site. ([Fabricated Product of the Year photo links](#))

MMI Tank was also honored in the reservoir category for a tank installation that provides potable water for campers in Picacho Peak State Park in southern Arizona.

In the standpipe category, CB&I Constructors, Inc. of Plainfield, Ill. received honors for installation of a 350,000-pound (158.76 metric ton) water tank in Darien, Ill. designed to look like a lighthouse with a coned roof, five pilasters, two balconies and 10 three-dimensional, simulated windows. CB&I also was cited in the elevated steel tank category – spotlighting a 2.5 million-gallon (9.46 million-liter) water tank installation whose multi-function design makes it the centerpiece of a sports complex in Ripon, Calif. The roof of the tank is painted to resemble a soccer ball.

T. Bailey, Inc. of Anacortes, Wash. received the award in the special storage systems category for its installation of 17 biodiesel storage tanks in Aberdeen, Wash. – the largest biodiesel storage facility in the United States. ([Tank of the Year photo links](#))

The Affiliate Member Award winner for 2007 was The Sherwin-Williams Co. for its Dura-Plate UHS paint coating used first by the U.S. Navy and later in potable water tanks. In various evaluations, it was discovered that corrosion begins on the edges of submerged structures. Dura-Plate UHS maintains its film thickness along edges, thereby extending service life on painted, submerged structures.

May 30 is Deadline for Comment on AST Repair Standard

The Steel Tank Institute (STI) has just completed the committee review process for standard SP031, "Standard for Repair of Shop-Fabricated Aboveground Tanks for Storage of Combustible and Flammable Liquids."

The standard, which was last revised in January 2006, covers repair procedures for vertical and horizontal shop-built aboveground storage tanks after they have been installed in the field.

The draft document is open for public comment until 5 p.m. (CDT) on May 30. A comment form with instructions is provided [here](#). Late comments will not be considered.

Interested parties can submit comments to STI via email, dschmidt@steeltank.com, or fax, (847) 438-8766.

A copy of the revised standard, as approved by the SP031 Committee for external review, is available [here](#).

Committee members who have worked on the standard to date include:

Jim O'Day, chair, O'Day Management, Inc.; Chuck Travelstead, co-chair, Brown-Minneapolis Tank Innovative Tank Solutions; John Albert, Missouri Department of Agriculture Weights and Measures Division; Steve Allwein, Morrison Bros. Co.; Bill Baker, Pennsylvania Department of Environmental Protection; Greg Bareta, PE, Wisconsin Department of Commerce, Bureau of Storage Tank Regulation; D.J. "Jerry" Boldra, PE, Consulting Engineer; Roger Claff, PE, American Petroleum Institute; Dean Flessas, Pond & Co., Inc.; Bill Herdman, Kennedy Tank & Manufacturing Co.

John Lieb, PE, Tank Industry Consultants; Sam Lillard, Virginia Department of Environmental Quality; Don Lister, Superior Services; Troy Swackhammer, U.S. Environmental Protection Agency Oil Center; Hap Travis, Eaton Sales & Service; Sonny Underwood, Mid-South Steel Products, Inc.; Aaron Westfall, PE, SPEC Consulting, LLC; Wiley Wilhelm, PE, LCMF, LLC; Richard Williams, Suburban Energy Services; Tim Woolfer, Stanwade Metal Products, Inc.; and Dana Schmidt, PE, Steel Tank Institute.

PEI Releases New Recommended Practice for Bulk-Plant Installations

The Petroleum Equipment Institute (PEI) has published a new document that covers the best approaches for installing bulk-storage systems that will contain and handle fuels.

Recommended Practices for Installation of Bulk Storage Plants (PEI/RP800-08) provides a basic reference that incorporates published and unpublished information from equipment manufacturers, contractors, installers, bulk-plant facility owners and regulators.

The document applies to underground, aboveground, atmospheric, and shop-fabricated tanks, associated piping, diking, spill containment, and equipment used for bulk storage and transfer of petroleum, biofuels, and related products. The recommended practices focus on systems that include single- and double-walled horizontal and vertical tanks – and insulated or fire-protected (resistant) tanks.

PEI developed the document to help tank owners, managers and installers to pinpoint ways to maximize system efficiency; prevent surface and groundwater contamination; minimize environmental hazards; reduce safety hazards; and avoid activities that needlessly increase installation costs.

More information about RP800-08 is available [here](#).

Boat Owner Raises Ethanol Compatibility Issues in Lawsuit

A Los Angeles area boater has sued several major oil companies and distributors contending that they provided inadequate warning to boat owners about the effect of ethanol-blended fuels on fiberglass-reinforced plastic (FRP) tanks used in marine applications.

While chemical formulations and fabrication techniques for FRP tanks used on boats may not necessarily be the same as specifications guiding the manufacture of fiberglass underground storage tanks (USTs), a Los Angeles Times newspaper article raises interesting questions about the performance impact of containers incompatible with certain fuel blends. Click on the following link for the entire article (registration may be required for access.) <http://www.chicagotribune.com/travel/la-fi-boat15apr15,0,373496.story>

Seaworthy, an online publication of the Boat Owners Association of The United States, also explores ethanol-compatibility concerns, including laboratory test results, at this link: <http://www.boatus.com/seaworthy/ethanol.asp>

Quality Inspection Program Knows No Borders

The reach of the Steel Tank Institute (STI) Quality Assurance program is transcontinental. You can find STI inspectors at tank fabrication sites in Africa, Asia, Australia, Europe, North America and South America.

Aboveground storage tanks (ASTs) and underground storage tanks (USTs) built to various STI standards can be surveyed during random, unannounced site visits from inspectors – who also quiz tank-plant personnel on procedures that they follow in fabrication and welding processes. As fabrication plants adhere to standardized processes, it enables production of storage tanks with a remarkable record of consistent performance.

An inspector's attention to detail can make a bona fide difference, said Larry O'Shea, director of quality assurance, STI/SPFA.

"I was at a plant earlier this year on the other side of the Atlantic where there had been a restructuring of management duties," O'Shea said. "A leader with the company who had vast experience with underground storage tank sales had also been relied upon for fabrication know-how. However, when I did the inspection, it was clear that employees in the shop were not aware of some key processes, which had not been documented properly. I was able to show them the proper way to do a couple of things, and ensure that they had documents to support them if future questions emerge.

"By using the correct processes, they were able to save time and costs in fabrication because they weren't encountering the same problems repeatedly."

Observation visits to other continents can lead to some long plane rides for the inspectors. But their work provides the industry with long-term confidence in the overall quality of tanks that carry the STI label. Risk management also is a key factor supporting the inspection program. For tanks that will be used in the United States, STI's third-party insurance provider requires a system of quality-assurance measures.

Inspectors, used by STI solely for the purposes of tank inspections at fabrication facilities, are trained on a regular basis – as are licensees of STI technologies.

About 100 plants participate in the STI Quality Assurance program.

Offices of STI/SPFA and Veri-Tank to Move

After 18 years at one location, the offices of STI/SPFA and Veri-Tank will move a short distance down the street.

On June 6, the address for STI/SPFA and Veri-Tank will change to 944 Donata Ct., Lake Zurich, IL 60047. The new location is a few blocks south of the 570 Oakwood Rd. facility.

The office's [phone and fax](#) numbers will remain unchanged.

Facts of Steel



The Queen. Many larger suspension bridges have been built during the last seven decades, but the royalty of the genre remains the Golden Gate Bridge. According to The Morning Call newspaper, the bridge debuted in 1937 with a 4,200-foot (1,280 meters) span between two enormous towers and another 1,100 feet (335 meters) on each side. At the time, the Golden Gate was both the longest suspension bridge in the world, and the highest structure west of New York in the United States. About 68,000 tons (61,689 metric tons) of steel beams were rolled in Pennsylvania, then transported by rail and ship (passing through the Panama Canal) en route to San Francisco for creation of the art deco masterpiece. <http://www.mcall.com/news/specials/bethsteel/all-bethsteel-printingchapter-4,0,1259434.htmlstory?coll=all-bethsteel-nav>

Really fast track. Europe is setting the pace in expanding high-speed train travel. To surpass 150 mph (241 kmh), dedicated high-speed tracks (with fewer curves, little change in gradient and no crossings) and fast trains are required. Two of dedicated high-speed steel track's advantages over the more experimental Maglev (magnetic levitation) technology are lower cost and flexibility in serving destinations. High-speed trains can operate on both conventional steel track and dedicated track. Traveling at speeds of 150 mph or higher, high-speed trains operate on 3,034 miles (4,883 kilometers) of track in 10 European nations. By 2010, another 1,711 miles (2,754 kilometers) are scheduled to be in place, and plans call for adding on average 346 miles (557 kilometers) annually through 2020. <http://www.travelindustrywire.com/article27223.html>

Big tanks in China. According to research by Industrial Info Resources, China is on a mega-tank building spree related in part to the expansion of a national strategic petroleum reserve. Reports from last year showed that China Petrochemical Corporation (PetroChina) was building more than 100 large-scale steel oil tanks. An official from the National Development and Reform Commission said in September that China's current strategic oil reserves may quadruple before 2010. Some of the larger tanks are 24 meters (79 feet) in height and 93 meters (305 feet) in length.

Online Sources of UST, AST and Pipeline News and Information

Online Publications

2006 Biodiesel Handling and Use Guidelines <http://www.nrel.gov/docs/fy06osti/40555.pdf>

Buncefield Fire <http://www.buncefieldinvestigation.gov.uk/>

NEW Code Requirements for ASTs at Motor Vehicle-Dispensing Stations
<http://www.steeltank.com/Portals/0/tanktalk/Code%20Requirements%202008%20AST%20Motor%20Vehicle%20Dispensing%20Stations.pdf>

Energy Tomorrow, American Petroleum Institute www.energytomorrow.org

California Air Resources Board, Enhanced Vapor Recovery Phase II Advisory:
<http://www.arb.ca.gov/vapor/advisories/adv359.pdf>

California State Water Resources Control Board, Results of Secondary Containment Survey
http://www.waterboards.ca.gov/ust/leak_prevention/secondary_containment/docs/results_survey.pdf

Fuel Oil News <http://www.fueloilnews.com/>

International Code Council <http://www.ecodes.biz/>

National Biodiesel Board Fuel Quality Policy
http://www.biodiesel.org/pdf_files/fuelfactsheets/20060621_TAB_11_Fuel_Quality_Policy.pdf

National Ethanol Vehicle Coalition E85 Compatible Products and Manufacturers List
http://www.e85fuel.com/pdf/E85_Equipment_and_manufacturers.xls

National Petroleum News <http://www.npnweb.com/>

The PEI Journal Online <http://www.thepeijournal.org/content/1q07/index.php>

Recommended Practices for Overfill Prevention for Shop-Fabricated Aboveground Tanks (PEI RP600)
<http://www.pei.org/RP600>

NEW Recommended Practices for Installation of Bulk Storage Plants (PEI RP800)
<http://www.pei.org/Index.aspx?p=rp800>

Renewable Fuels Association Industry Statistics <http://www.ethanolrfa.org/industry/statistics/>

STI/SPFA Suggested Specification for Steel Water Transmission Pipe
<http://www.steeltank.com/Portals/0/pubs/WSPSpecificationV1-1.pdf>

Steel Tank Institute Water in Fuel Tanks Research
<https://www.steeltank.com/LinkClick.aspx?fileticket=SmQZA0POL4E%3d&tabid=108&mid=502>

TulsaLetter <http://www.pei.org/Index.aspx?p=tulsaletter>

NEW U.S. Environmental Protection Agency FY 2007 Annual Report on the Underground Storage Tank Program
<http://www.epa.gov/oust/pubs/2007annrpt.htm>

Wisconsin Department of Commerce Ethanol Storage and Dispensing Conversion Policy
http://commerce.wi.gov/ERpdf/bst/ProgramLetters_PL/ER-BST-PL-EthanolConversionPolicyMemo.pdf

Associations

American Iron & Steel Institute <http://www.steel.org>

American Petroleum Institute <http://api-ep.api.org/>

American Water Works Association <http://www.awwa.org>

Clean Diesel Fuel Alliance <http://www.clean-diesel.org/index.htm>

National Association of Convenience Stores <http://www.nacsonline.com/NACS/News/>

National Biodiesel Board <http://www.biodiesel.org>

National Ethanol Vehicle Coalition <http://www.e85fuel.com>

National Leak Prevention Association <http://www.nlpa-online.org/index.html>

National Oilheat Research Alliance <http://www.nora-oilheat.org>

Petroleum Equipment Institute Learning Center <http://www.pei.org/Index.aspx?p=96>

Petroleum Marketers Association of America <http://www.pmaa.org/>

Safe Tank Alliance http://www.osha.gov/dcsp/alliances/api_nfpa/api_nfpa.html#api

Society of Independent Gasoline Marketers of America <http://www.sigma.org/>

Steel Plate Fabricators Association <http://www.spfa.org/>

Steel Tank Institute <http://www.steeltank.com>

Federal Regulatory Agencies (United States)

U.S. Chemical Safety and Hazard Investigation Board, Methanol Fire Report
http://www.csb.gov/completed_investigations/docs/CSBBethuneFinalReport.pdf

U.S. Department of Labor, Occupational Safety & Health Administration
<http://www.osha.gov>

U.S. Department of Labor, Occupational Safety & Health Administration, Storage Tanks
<http://www.osha.gov/dcsp/products/topics/storagetank/index.html>

U.S. Environmental Protection Agency, Fiscal Year 2009 Budget Summary
http://www.epa.gov/ocfo/budget/2009/final_09_bib%20.pdf

U.S. Environmental Protection Agency, Laws and Regulations
<http://www.epa.gov/lawsregs/laws/index.html>

U.S. Environmental Protection Agency, National Pollutant Discharge Elimination System, Stormwater Pollution Prevention Plans for Construction Activities
<http://cfpub.epa.gov/npdes/stormwater/swppp.cfm>

U.S. Environmental Protection Agency, Office of Underground Storage Tanks
<http://www.epa.gov/swerust1/>

U. S. Environmental Protection Agency, Office of Underground Storage Tanks, Energy Act Guidelines for Secondary Containment and Financial Responsibility
http://www.epa.gov/oust/fedlaws/epact_05.htm#Final

U.S. Environmental Protection Agency, Office of Underground Storage Tanks, Final Operator Training Grant Guidelines
http://www.epa.gov/oust/fedlaws/epact_05.htm#Final

U.S. Environmental Protection Agency, Office of Underground Storage Tanks, State Delivery Prohibitions
<http://www.epa.gov/oust/dp/index.htm>

U.S. Environmental Protection Agency, Oil Program, Spill Prevention Control and Countermeasure
<http://www.epa.gov/oilspill/spcc.htm>

State Regulatory Agencies (United States)

California Air Resources Board, Vapor Recovery Information <http://www.arb.ca.gov/vapor/vapor.htm>

Florida Department of Environmental Protection, Leak Autopsy and Program Data Presentation
<http://www.dep.state.fl.us/waste/categories/tanks/default.htm>

U.S. Environmental Protection Agency, Office of Underground Storage Tanks, State And Territory UST/LUST Program Status And Contacts <http://www.epa.gov/OUST/states/statcon1.htm>

Model Codes and Testing Organizations

American National Standards Institute <http://www.ansi.org>

ASTM International <http://www.astm.org/>

International Code Council <http://www.iccsafe.org/>

International Code Council jurisdictions <http://www.iccsafe.org/government/jurisdictionadoptions.xls>

National Fire Protection Association <http://www.nfpa.org/>

Southwest Research Institute <http://www.swri.edu/>

Underwriters Laboratories <http://www.ul.com/>

Underwriters Laboratories Canada <http://www.ulc.ca>

Underwriters Laboratories Collaborative Standards Development System
<http://csds.ul.com/Home/Default.aspx>

Industry Meetings and Conferences

May 31 to June 5, 2008
AIHce'08, American Industrial Hygiene Convention and Expo, Minneapolis, Minn.
<http://www.aiha.org/aihce08/expo2008/list-exhibitor.htm>

June 1 to 4, 2008

WindPower 2008, American Wind Energy Association, Houston, Texas

<http://www.windpowerexpo.org/>

June 2 to 5, 2008

NFPA World Safety Conference & Exposition, Las Vegas, Nev.

<http://www.nfpa.org/categoryListWSCE.asp?categoryID=1059&cookie%5Ftest=1>

June 7 to 10, 2008

NLGI Annual Meeting, Williamsburg, Va.

<http://www.nlgi.org>

June 8 to 12, 2008

ACE 08, American Water Works Association, Atlanta, Ga.

<http://www.awwa.org/ace08/index.cfm?ItemNumber=5994&navItemNumber=1514>

June 9 to 11, 2008

28th Annual Conference & Trade Show, Independent Liquid Terminals Association, Houston, Texas

<http://www.ilta.org/CalendarofEvents/AOCTS/2008/2008info.htm>

June 9 to 12, 2008

Safety 2008, American Society of Safety Engineers, Las Vegas, Nev.

<http://www.asse.org/education/pdc08/registration-fees-and-schedule.php>

June 16 to 19, 2008

24th Annual International Fuel Ethanol Workshop and Expo, Nashville, Tenn.

<https://www.fuelethanolworkshop.com/ema/DisplayPage.aspx?pageId=Home>

July 22 to 27, 2008

American Society of Civil Engineers Pipeline Conference, Atlanta, Ga.

<http://content.asce.org/conferences/pipelines2008/index.html>

July 27 to 31, 2008

2008 ASME Pressure Vessels and Piping Conference, Chicago, Ill.

<http://www.asmeconferences.org/PVP08/>

Aug. 3 to 7, 2008

StormCon, Orlando, Fla.

<http://www.stormcon.com/sc.html>

Aug. 17 to 20, 2008

2008 APWA Congress and Exposition, American Public Works Association, New Orleans, La.

<http://www.apwa.net/Meetings/Congress/2008/>

Sept. 9 to 10, 2008

Stainless Steel World America 2008 Conference & Exhibition, Houston, Texas

<http://www.stainless-steel-world.net/ssw2008/ShowPage.aspx?pageID=1291>

Sept. 9 to 10, 2008

2008 Visions Conference, New England Fuel Institute, Boston, Mass.

<http://www.nefi.com/visions/>

Sept. 10 to 12, 2008

NISTM AST, Orlando, Fla.

<http://www.nistm.com/>

Sept. 15 to 18, 2008
Pacific Oil Conference, Reno, Nev.
<http://www.petroshow.com/schedule.html>

Sept. 21 to 24, 2008
Distribution Systems Symposium and Exhibition, American Water Works Association, Austin, Texas
<http://www.awwa.org/conferences/dss/>

Oct. 5 to 7, 2008
2008 PEI Convention at the NACS Show, Chicago, Ill.
<http://www.pei.org/Index.aspx?p=convention>

Oct. 18 to 22, 2008
WEFTEC.08, Chicago, Ill.
<http://www.weftec.org/home.htm>

Nov. 13 to 16, 2008
SIGMA 50th Annual Meeting, San Francisco, Calif.
<http://www.sigma.org/meetings/2008-annual/index.html>

Dec. 2 to 4, 2008
2008 Power-Gen International Conference, Orlando, Fla.
<http://pgi08.events.pennnet.com/fl//index.cfm>

STI/SPFA ©2008
570 Oakwood Road
Lake Zurich, IL 60047
847/438-8265
info@steeltank.com
<http://www.steeltank.com>

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Jim Wisuri, Editor

Contributing Editors: Wayne Geyer, Lorri Grainawi, Dana Schmidt, Larry O'Shea, Vivian Bartt, Marie Scimeca