What the NIST study on ethanol corrosion really says

Despite erroneous interpretations in the media, the National Institute of Standards and Technology (NIST) has NOT stated that ethanol causes corrosion in steel tanks.

NIST published a study in August, called *Corrosion of copper and steel alloys in a simulated underground storage tank sump environment containing acid-producing bacteria*. On August 8, *The Kiplinger Letter* published a statement that misinterpreted the study results to imply that "...the biofuel can speed up corrosion of underground steel tanks..."

This is completely incorrect. According to the NIST researchers, "This study was not aimed at investigating underground storage tank corrosion, but...at looking at the *sump corrosion* reported by inspectors." (Emphasis added—Ed.)

Further, numerous studies have shown that steel is compatible with all ethanol blends.

Clarifying NIST's research on corrosion in sump headspaces

STI/SPFA contacted the researchers to ensure we had understood their study's scope and conclusions. They responded with an hour-long interview.

Read more: NIST research on ethanol "corrosion:" What it really says.

New STI Standard for Inspection, Repair and Modification of Shop-Fabricated Underground Tanks for Storage of Flammable and Combustible Liquids

The Steel Tank Institute recently published a new standard, *SP131 Standard for Inspection, Repair and Modification of Shop-Fabricated Underground Tanks for Storage of Flammable and Combustible Liquids.*

"SP131 was developed in response to requests from several state environmental agencies," said Lorri Grainawi, Director of Technical Services for STI/SPFA. "These agencies are responsible for ensuring the safety of the public and the environment from spills of hazardous flammable and combustible liquids." STI standards are the most widely recognized in the steel tank fabrication industry. Many state and federal regulations reference them directly in their rules.

Most existing steel underground storage tanks are constructed to STI standards, so it was logical for states to come to STI for development of SP131. "We invited a group of regulators, tank manufacturers, contractors, and other stakeholders to form a committee to develop SP131," Grainawi said. "They spent over a year meeting, drafting, and re-drafting the document, ensuring it fairly addresses the needs and concerns of agencies, regulators, and the industry."

Scope of SP131

In the Scope description, SP131 states that:

"This standard covers the inspection, repair, and modification of an atmospheric-type, shop-fabricated, carbon and/or stainless steel underground storage tank. It applies to tanks storing stable liquids at atmospheric pressure. This standard covers tanks built to a nationally recognized standard for underground storage tanks....This standard applies to tanks that are installed and also to tanks that have been temporarily removed to achieve a repair..."

Copies of STI's *SP131 Standard for Inspection, Repair and Modification of Shop Fabricated Underground Tanks for Storage of Flammable and Combustible Liquids* are available for purchase from the STI/SPFA Store. Technical questions may be addressed to Lorri Grainawi, 847-550-3831.

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The importance of tank maintenance

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CSB releases new safety video, "Behind the Curve" about 2010's Tesoro Anacortes Accident

Behind the Curve--Anacortes fatal accident


The accident occurred during startup of the refinery's "naphtha
In the May 2014 issue of Tank Talk, we published an article by Lorri Grainawi, STI's Director of Technical Services, about the importance of keeping water out of fuel storage tanks. (By the way, you can always go back and read past issues of Tank Talk on our website.)

The topic of tank maintenance remains important to the fuels industry, as evidenced by the publication of new and revised guides. Here are two more resources to use and share:

- **Keeping Water Out of Your Storage Tank System**, STI/SPFA.

### Fire risk: Lightning and fiberglass saltwater tanks

An article in the Christian Science Monitor, July 19, 2014, highlighted the dangers of explosion and fire in fiberglass tanks storing saltwater.

According to the report, "Three massive fires since the beginning of June have highlighted the threat lightning poses in the North Dakota oil patch...in each case, it was tanks that store the toxic saltwater associated with drilling—not the oil wells or drilling rigs—that were to blame."

The American Petroleum Institute's standard API 12P provides requirements for fiberglass-reinforced plastic tanks at well-sites, but not specifically for those storing saltwater. API is currently reviewing standards for all tanks at well-sites.

Read more...

### Ask the Expert: What's the difference between STI's Permatank and ACT-100 tanks?

**Permatank**

My customer asked for a FRP coated, double wall tank. *From your ACT-100 brochure, it seems to me that the ACT-100 is very similar to Permatank in shape and function. What's the difference?*

Dana Schmidt, STI's Standards Engineer, responds: **Permatank** is a steel tank with a separate FRP jacket. A Mylar layer in between produces a space between the steel tank and the jacket, making Permatank a double wall tank. (See picture at left.)

**ACT-100**

ACT-100 is a coated tank. The steel tank's exterior is blasted and the FRP coating adheres directly to the steel, so there is no space between the steel and the coating.

ACT-100 may, however, be fabricated as a double wall tank. A second steel tank is wrapped around the primary tank, leaving a small interstice. The FRP coating is then applied to the exterior of the outer tank. (See picture at right. Note that the exterior FRP coating is not shown.)
Changes coming in UST rules

UST regulations haven't been revised since 1988, but big changes are coming. In late September, EPA sent a draft final rule to the White House Office of Management and Budget for review and final approval.

The new rule would mandate comprehensive UST system walk through inspections, new interstitial monitoring of tanks, pipes and sumps equipped with secondary containment, installation of under dispenser containment, and spill and periodic overfill and spill equipment testing, among other requirements.

Of particular note are requirements that UST owners and operators keep records of O&M walk through inspections for one year. Each of these records should include:

- A listing of each area that was checked;
- The status of each area checked (i.e., whether the area was acceptable or required some action be taken);
- A description of any actions taken to correct issues or problems found during the O&M walk through inspection.

Environmental Daily Advisor has a good overview of the walk through provisions.

California: USTs prohibited for use as ASTs

The California State Fire Marshal issued Information Bulletin 14-005 in late July, prohibiting the "repurposing" of underground fuel storage tanks as aboveground fuel storage tanks.

Tank Talk readers will recall our article in the January 2014 issue, "Repurposing underground tanks as aboveground tanks: A dangerous game," where industry experts weighed in on this dangerous practice becoming more common in agricultural areas. In December 2013, one person died and two were injured in Merced County, California, when a farm tank exploded during welding operations.

Ask the Expert: Why is the ASME Code stamp important?

Why should I buy an ASME Code stamped pressure vessel, when I can buy a non-Code stamped vessel for substantially less cost?

Industry consultant John Curry responds:

The ASME Code Stamp is a universal symbol of insurability worldwide. The insurance company will deny a claim for any failure of the vessel that is not code-stamped. For a non-coded vessel, you have only the manufacturer's assurance that the design and fabrication are up to ASME standards.

When you purchase a code-stamped vessel, the authorized inspector assumes the responsibility to affirm that the vessel is designed to minimum ASME requirements, including non-destructive testing (NDT) and required MTR's.

Bottom line? A non-ASME Code stamped vessel may be uninsurable.

STI/SPFA consultant Bill Herdman responds:

First, quite a few states have regulations in place requiring that pressure vessels 15 psi or higher must be built and stamped to the ASME Boiler & Pressure Vessel Code, Section VIII. (Note that the code applies only to vessels designed to operate at 15 psi or higher.)

Second, I've found there's a decrease in the degree of effort and documentation in manufacturing when a vessel doesn't require a code stamp, ranging from less detailed drawings to quality flaws in the final product. For example:

- A Code-stamped pressure vessel will require QA testing of the welds that may include UT, magnetic particle, or even radiography. A non-Code stamped vessel may entail only a simple, visual examination of the welds.
- A non-Code stamped vessel may be air-tested at low pressure to verify tightness, similar to a UL atmospheric tank. A Code stamped vessel will be tested using NDE or a significant hydrostatic pressure test that exceeds expected operating or surge pressures.
Third, the fabricator of an ASME Code stamped vessel is subject to inspection by a qualified third-party agency, while the non-Code stamped fabricator is subject only to its own internal quality assurance personnel. There are certainly fabricators of non-Code stamped vessels that produce high-quality products. But there's something about a third-party inspection that keeps everyone on his toes. It ensures quality standards are met, standards that have been subject to continual review and thus constantly improved.

To me, installing a non-Code stamped tank for a critical application is like putting a bomb in a refinery. The risks and the stakes are higher if the vessel fails.

Surprising insights about fuels from consumers

GreenPrint LLC has published preliminary results of a consumer survey about purchase decisions, brand loyalty, petroleum retailers, and the environment. We found the story in PetrolPlaza, an international online industry newsletter.

The survey was sent to more than 100,000 consumers nationwide. Interesting highlights:

- When asked which factors were most important in their gasoline purchases, 83% of respondents named "price" as being an important consideration, while only 29% considered "brand" to be important
- When asked what type of fuel could differentiate a petroleum retailer from their competition, nearly 50% said "gas that was less harmful to the environment" - more than any other response
- Nearly 76% of respondents agreed with the statement that "Mankind needs to take immediate action to protect the environment"

Tank and Petroleum Mishaps

PETROTRIN IGNORED OIL TANK WARNINGS: $70 MILLION IN OIL SPILL COSTS
TRINIDAD & TOBAGO, SEPTEMBER 15 2014
"Contrary to claims made by the company’s top brass about a 2010 inspection checklist slipping through the cracks, state oil giant Petrotrin had knowledge that its slop oil storage tank MP6 had corrosion and integrity issues and did nothing about it, Sunday Express investigations have found..."

LIGHTNING STRIKES OIL TANK, CAUSING BIG EXPLOSION
BAYTOWN TX, SEPTEMBER 18 2014
"Wednesday’s storms are being blamed for a fire and explosion in Baytown. It happened around 1pm. According to the Baytown Fire Department, one oil tank was struck, caught fire and exploded. A second tank then caught fire, as well. Both are operated by Linc Energy. No injuries were reported and at this point, there’s no evidence of pollution in the bay..." See video here...

OIL-COVERED OWLS PROMPT INVESTIGATION OF ‘NEGLECTED’ OIL FIELD SITE
FAIRVIEW OK, JULY 26 2014
"The discovery of two barn owls coated in oil has prompted an investigation of a "neglected" oil field site in northwest Oklahoma. One of the owls died, the Enid News & Eagle reported on July 25. The surviving bird is eating, walking and climbing and is being monitored by Jean Neal, a Fairview caretaker "licensed to handle small non-migratory animals..."

PLUMBER BLAMES DIESEL FUEL TANK LEAK FOR KIDNEY FAILURE
LEHIGH COUNTY PA, AUGUST 12 2014.
"A 32-year-old Lehigh County man says a heavy exposure to diesel fuel has caused him to suffer acute renal failure and needs a kidney transplant to survive, according to a federal suit filed in the U.S. District Court for the Eastern District of Pennsylvania. Jason Marino, of Slattington, Pa., seeks more than $150,000 in damages for several counts of negligence and violations of the Storage Tank and Spill Prevention Act (SPCC) against Pilot Travel Centers, LLC, and Sovereign Consulting..."
Construction of Michigan's $274 million Karegnondi Pipeline, a raw water conduit, continues despite weather and endangered species challenges, reports ENR Midwest in a recent article.

The pipeline will run 67 miles between Lake Huron and treatment facilities in Genesee, Lapeer and Sanilac counties, providing potable water to residents in more than 2400 square miles along Michigan's I-69 corridor. Read more.

Why think about future fuels?

Between 2007-2030, demand for gasoline is expected to decline by 25%, and between 2012 and 2030, miles traveled by gasoline fueled vehicles are projected to increase by 17%.

Those predictions were noted by John Eichberger, VP of Government Affairs for the National Association of Convenience Stores (NACS) and Executive Director of the Fuels Institute. He delivered his presentation, "Why think about future fuels?," at the PEI/NACS show in Las Vegas in October.

According to Eichberger, the Fuels Institute projects a substantial shift in fuel market share for light-duty vehicles. Gasoline-exclusive vehicles could lose 10% market share by 2023, largely to flex fuel (E85). In just two years, 2012-2014, consumer opposition to non-gas vehicles has dropped by 33%.

Why Think About Future Fuels?

Contenders for future fuels market share are E85, E15, diesel, CNG, hydrogen fuel cell and electric battery:

- **Diesel** is gaining market share. It delivers fuel efficiency, helping automakers meet CAFÉ standards. Diesel demand is expected to grow by 22% 2012-2030 says the US Energy Information Administration (EIA). While diesel is perceived as "too expensive," it's actually about $0.20 lower than gasoline on an energy-equivalent basis.
- **Ethanol** has a price advantage. Ethanol prices have averaged $0.25 lower than gasoline (USDA) since 2009. (With current falling gasoline prices, that spread is reduced.) Flex-fuel vehicles are forecast to capture 9.3% of the light duty market by 2023 (US EIA, Fuels Institute). By 2023, monthly sales of E85 per retail outlet may be 3,000-37,000 gallons, averaging 9,000 per store.
- **Use of natural gas (CNG)** is already increasing in the heavy-duty vehicle market and could capture 30% of CNG demand by 2023, according to PIRA Energy Group.
- **The first mass-produced hydrogen fuel cell vehicles** appeared in California dealerships this year. By 2023, the Fuels Institute estimates there will be nearly 70,000 of them on the road.

"Environmental protection and sustainability is driving most vehicle development strategies," said Eichberger, "but those strategies must also benefit the economic well-being of consumers to be successful."

Eichberger concluded that "Technology that survives must satisfy environmental objectives, such as carbon and green house gas capping, and at the same time provide cost-savings to consumers over competing alternatives; deliver return on investment to implementing industries; and be
economically sustainable without government support."

**Government workgroup reports on chemical facility safety progress**

A working group of federal agencies was established in 2013, in response to President Obama’s Executive Order 13650, Improving Chemical Facility Safety and Security.

The group issued a Report to the President in 2014, focusing on actions the agencies have taken to date, findings and lessons learned, challenges and priority next steps.

**Young welders repair historic Navy warship**

*Welding Journal’s* October issue has an interesting article by Melissa Gomez: “Students from Ivy Tech Community College in Evansville, Indiana, recently used their welding skills outside of the classroom when they volunteered to work on the LST-325, a decommissioned U.S. Navy tank landing ship."

**Danger: Hotwork and biological/organic material**

The Chemical Safety Board is warning of the dangers of hotwork on tanks containing biological or organic material.

In July 2014, a worker was killed and another severely injured in a tank explosion. The lid was blown off a 30-foot-high tank that contained a small amount of “stickwater,” a slurry of water and fish matter. The tank had not been tested for combustible gases prior to the hotwork.

**DOL, FCC form working group to prevent fatalities in telecom industry**

Here’s a cautionary story for all workers on field erected tanks and towers. The article appears on the IHSN website.

"Kathy Pierce expected her son, Chad Weller, to come home on March 19, 2014, at the end of his shift as a cell tower climber. But Weller, always ready with a smile for his mother, never came back. He was sent up alone to fix a communication signal on top of a water tower in the rain while wearing a harness two sizes too big - and he lost his life in a fatal fall. Chad Weller is one of 11 workers who have lost their lives in 2014 while constructing or repairing cell towers. Thirteen died in the previous year, including Bridgette Hester’s husband, who was killed as he worked on a tower that was struck by a vehicle and collapsed..."

**US earthquake risk more widespread**

The US Geological Survey has released maps showing a greater potential for seismic activity throughout the nation than was previously thought. The last update was six years ago.

The updated maps indicate that the potential earthquake risk for the East Coast and Midwest shows greater strength and damage. And the West Coast’s seismic hazard spreads over a larger area than prior maps indicated.

However, USGS says that while there are incremental changes to the maps, there are no drastic changes.
How a field erected tank is born

Ever wondered how they DO that when you see your local water tower? Here's an explanation from Fisher Tank, Inc.'s blog:

"If you're not already in the tank industry, you may have thought the field erected tanks you see (municipal water storage tanks, for example, or storage tanks at bulk liquid terminals in port cities) were just born right where they're sitting. They look and act like monolithic structures, but they all started the same way - as drawings and huge flat pieces of steel plate."

Read Fisher Tank's blog post...