

L.U.S.T.LINE

A Report On Federal & State Programs To Control Leaking Underground Storage Tanks

Adjusting to a New Normal COVID-19 Impact to State UST Programs

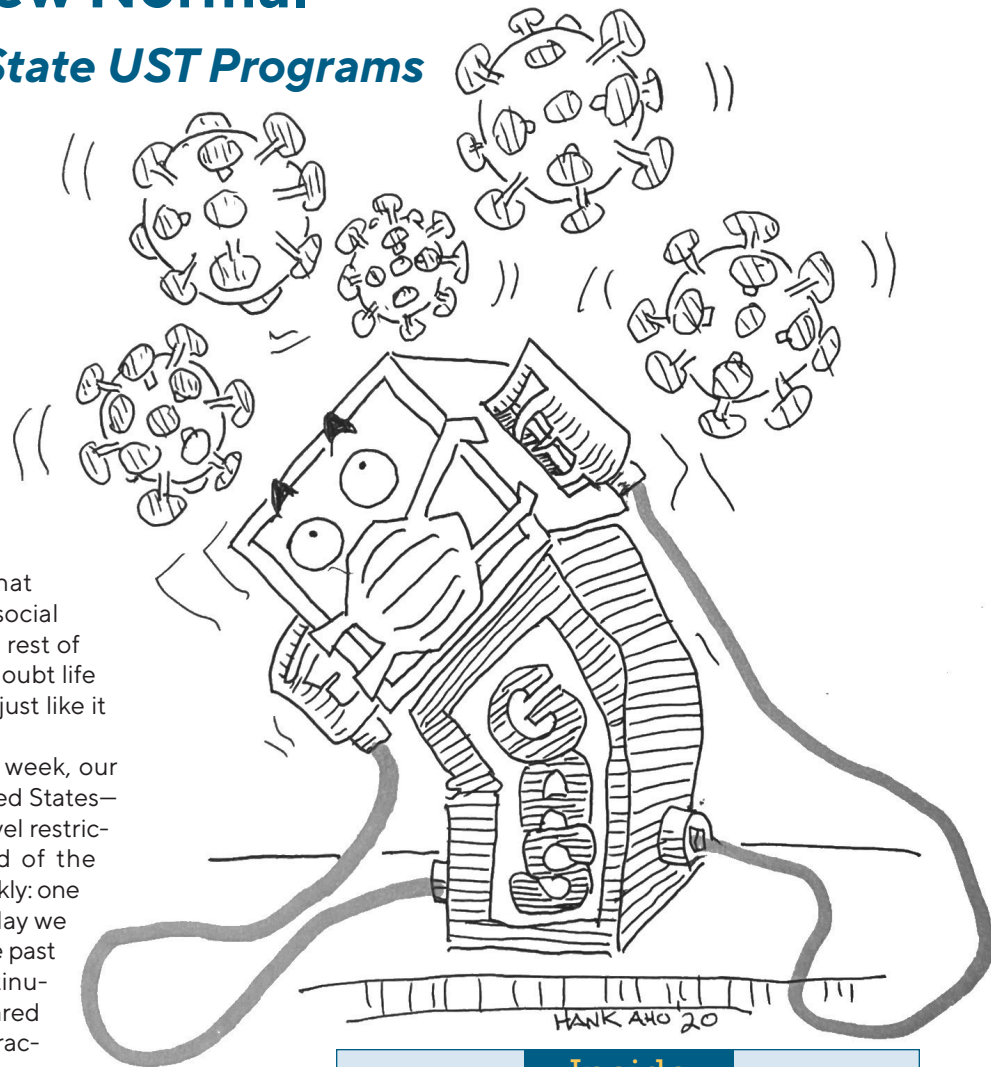
by Mahesh Albuquerque

I was getting ready to leave a meeting in Florida in early March when I experienced COVID impacts firsthand. My airline notified me that they were reducing flights and offered earlier flight options with no change fees. I stuck with my flight, but when I arrived at the airport, I noticed some people were wearing masks. The conversation on the flight home was all about the virus and the crashing stock market. Little did I know then of the speed and magnitude of the COVID impact across the world, or that we would all be walking around in masks, social distancing, and working from home for the rest of the year. This is now our new normal and I doubt life will ever get back to what it was pre-2020, just like it changed after 9/11.

Back home in Colorado and later that week, our governor—like many others across the United States—issued “stay-at-home” orders and other travel restrictions in efforts to slow down the spread of the COVID-19 pandemic. It all happened so quickly: one day we were all in the office and the next day we were all to begin working from home. For the past few years, we had been working on a Continuity of Operations Plan (COOP) that was shared with all our staff, and we even staged and practiced mock pandemic scenarios, with no knowledge that we would be facing the real thing soon.

There was, nevertheless, a tremendous amount of uncertainty in early March, but thankfully we humans are an adaptive species and I think we have for the most part adapted very well to this new normal. Sometimes, I believe we become our best selves when we encounter and overcome adversity. Here are some of the challenges we all have faced, and have overcome these last six months:

- **Working from Home:** No matter where you were in the county or across the world, stay at home orders have required us to work from home. Thankfully, in Colorado, many of our staff were already teleworking one day a week, and were set



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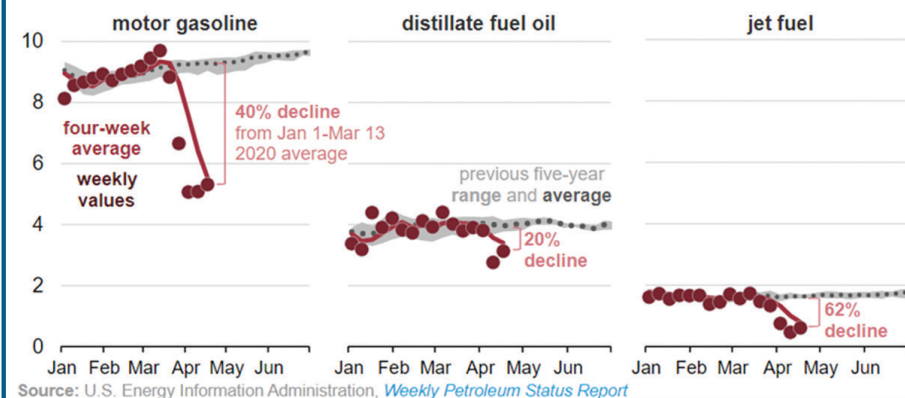
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up with virtual private network (VPN) access, so transitioning to working from home went a lot smoother than we could have imagined. Some of us had to physically move computers and some furniture to our homes. While we previously had apprehension around allowing employees to work from home, we were starting to learn that many were in fact equally if not more productive working from home, and over the last six months this pandemic has confirmed the same.

- **Personal Protective Equipment:** Prior to 2020 we donned personal protective equipment (PPE), mainly level C or B, when we were at a LUST removal or site cleanup. COVID changed this paradigm: we now all wear face masks in public places, sometimes even gloves, and using hand sanitizers and disinfectants has become the norm. We were fortunate to

U.S. PRODUCT SUPPLIED OF SELECTED PETROLEUM PRODUCTS (Jan 2020–Apr 2020)

million barrels per day



have access to face masks and other protective equipment, which we were able to distribute to our inspectors and other staff as needed. Having this PPE available early helped not only protect our staff but also give them the assurance that we really cared about their health and safety, as well as that of those around them.

- **Online Video Meetings:** COVID has forced us to embrace video technology almost overnight. While we all participated in online meetings occasionally, these meetings have now become the norm. It also seems like we have learned to communicate more frequently, yet also more efficiently and effectively with video conferencing. It has also made our communications more personal, and we have learned more about our coworkers' families, pets, and lives in general.

- **Social Distancing:** Before March we used to be packed like sardines in a tin can on the light rail to work. Nowadays, it's not so unusual to have the entire compartment on the light rail commute to yourself, even during rush hour. Maintaining a 6 or 10 foot distance certainly poses some challenges for conducting business and returning to work, but once again we have all learned how to communicate

and work effectively in spite of this social distancing.

- **Financial Impacts:** Perhaps the biggest impact to UST programs across the country will be to budgets, maybe not so much this year but certainly more next year. Within a few days of the stay-at-home orders, demand for transportation fuels declined significantly and continued to drop in March and April. Many states saw 50% to 70% reductions in gasoline fuel consumption during this time.

According to the US Energy Information Administration reports released on April 23, 2020, the COVID-19 mitigation efforts resulted in the lowest U.S. petroleum consumption in decades. The most significant declines from March 13 through April 17, for example, were in motor gasoline and jet fuel.

The financial impact to state and federal revenues collected on fuel taxes would have been even more devastating, had it not been softened by the uptick in diesel sales spurred by online shopping and packaged goods deliveries.

The Covid-19 UST Cleanup Fund Survey

In late March and early April, with assistance from ASTSWMO and USEPA-OUST, all State UST Fund managers received the COVID-19 Impact to State UST Cleanup Fund Survey. Of the thirty-three states that responded to this survey, almost 80% rely significantly on fuel tax revenue to fund their State Fund programs. The seven states that

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did not rely on fuel tax revenues, rely on other revenue sources such as registration and permit fees, or do not have a fund and/or rely on financial assurance by UST owners.

While every state program has unique subtleties in operating their state funds, from funding mechanisms, reserve balances, and approaches to paying for cleanup, every fund will be impacted in some manner by the COVID-19 pandemic crisis. For some states, recovery will take longer than others. Funds with large cash balances may be in a better position to weather the COVID-19 economic impacts, but they are however at a much higher risk of being the target of cash fund transfers (raided) by their legislature. Agility related to financial impacts will ensure

a state UST program's ability to successfully weather this COVID-19 crisis.

How Will COVID Impact Our UST Program Future?

I believe the adversity posed by COVID has forced us to think differently and will cause us to innovate and implement our programs differently. For instance, we have learned that most of us can be as productive at home compared to being in the office, which will cause us to question the necessity of office space. This is especially true for those like us, working in leased downtown office buildings, where rental rates are not cheap. I also believe that the impacts to states and federal program budgets, especially to general fund deficits, will

force us to learn to do more with less. In addition, I believe we and our elected officials will begin to prioritize things differently. For example, if the risk of dying from an infectious disease exceeds the one in a million-cancer risk that most of our cleanup standards are based on today, where should public monies go to protect human health and the environment? The following three articles provide insights on experiences and lessons learned from a few states implementing UST programs during the pandemic. ■

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Prepare, Don't Panic

How Colorado's Division of Oil and Public Safety Adapted to the COVID Pandemic and Increased Productivity

by Zach Hope

In early 2020, storage tank programs across the country were successfully adapting to new regulations, reporting requirements, and budget uncertainty, and that was all before the COVID pandemic. Since March 2020, we've seen attempts at worldwide adaptation on unprecedented levels that have left us impressed, amused, or just plain confused at times.

The State of Colorado's Division of Oil and Public Safety (OPS) has, through our COVID adaptations, been able to increase our presence in the storage tank industry, strengthen relationships with tank owners and contractors, increase compliance, and more efficiently conduct our business. Several of these changes had been in place or in the works for some time before the pandemic, and were expedited in order to continue business, while others were made necessary and immediately enacted.

State of Colorado leadership has taken a pragmatic approach throughout 2020, addressing the facts of the unprecedented situation, while attempting to keep Colorado open for

business. This attitude helped guide OPS leadership, and highlighted the value of preparation, not panic.

Getting with the Program

At the onset of the pandemic, personal protective equipment, such as disinfectant, disposable gloves, and face masks were scarce, to say the least.

Our inspection team is a crafty bunch, though, and we were able to sew face masks for each inspector, procure alcohol-based disinfectant from creative sources such as local distilleries, and quickly distribute the supplies to our state-wide inspection team.

In March and April 2020, as we were grappling with the dynamic situation, we received immediate feedback from tank owners/operators and contractors that our presence and availabil-



Personal protective equipment has always been an important part of the inspector's job.

ity was welcomed and needed, which encouraged our team to stay focused and productive. Work didn't stop for our tank installers and contractors either. Those sectors capitalized on reduced traffic at fuel stations and temporarily lowered prices for equipment and services. As a result, tank installations and dispenser swaps have been more numerous in 2020 to date than in 2019.

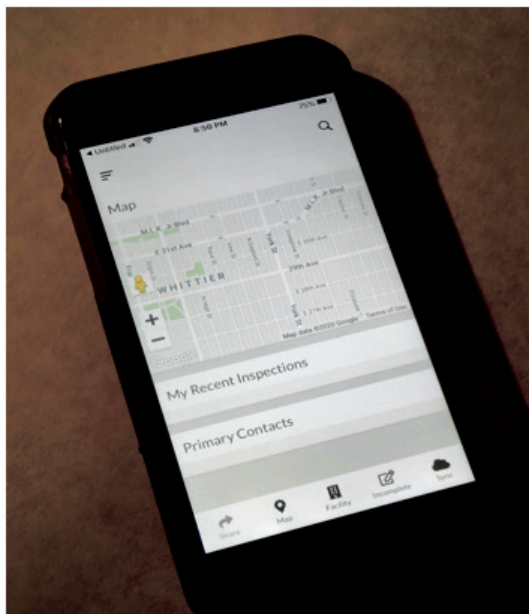
OPS has been conducting its UST and AST inspections via a mobile app

developed in-house for more than two years, and this electronic approach proved to be most effective in 2020. OPS maintains a comprehensive database of tank owner/operator email addresses, and we had already transitioned to paperless correspondence with our inspection certificates, notices of violation, enforcement, installation permitting, registration, and tank-closure documents. This allowed our in-office compliance team to seamlessly transition to working remotely while maintaining our level of service, and our existing home-based inspection team was already accustomed to productively completing their work without frequent visits to the downtown Denver office. As most readers have experienced, web-based meeting software such as Google Meet has allowed our team to stay connected remotely, and we utilized this technology to increase our meeting frequency early in the pandemic in order to share news of the dynamic situation.

The mobile inspection app is also used to notify tank owners/operators of our upcoming inspections, providing us with an opportunity to encourage attendance by the tank owner/operator and to request that the necessary compliance documentation be submitted ahead of time electronically. OPS had already dramatically increased the number of announced inspections we perform in 2019, so this shift to further owner/operator engagement was a smooth transition.

OPS took a number of additional on-site steps to help reduce our COVID exposure risk during inspections. It became more important than ever to prepare and plan for the inspection more thoroughly, to ensure tools and equipment are available, and to confirm tank components are accessible. We also attempted to meet with tank owners and contractors outside whenever possible. Further, we temporarily reduced our retail motor fuel device inspections in April and May 2020 in order to avoid too much dispenser-nozzle contact, given their heavy public usage.

Our team has a variety of work duties and several staff members work across what are traditionally separate programs, allowing us to diversify and stay productive as well. OPS has weights and measures authority over retail fuel sales in Colorado, and all of our UST/



Mobile apps can enable swift adaptation.

AST inspectors conduct retail motor-fuel device inspections. These inspections include dispenser meter-calibration checks and consumer-complaint response services that have kept our work very relevant to the public, even with the temporary decrease in vehicle miles traveled in the state.

Further, our weights and measures authority brings with it an obligation to ensure retail fuel-vapor-pressure requirements are met across the state. Decreased gasoline sales in March and April led to a surplus of high-vapor-pressure fuel that had been formulated for use during the winter months. OPS provided moderate leniency to suppliers given the surplus, but we took steps to ensure Colorado didn't become the destination for excess high-vapor-pressure fuel, and we ramped up our fuel analyses to ensure retailers were meeting the slightly relaxed requirements.

We also have a number of inspection staff that review and approve release characterization and corrective action plans in addition to their inspection duties, which allows us to stay connected to our remediation team and address releases more holistically. This

connection between the inspection and remediation teams allows for a number of efficiencies, including the ability to have the local inspector visit a facility to investigate potential ongoing releases or respond quickly to dynamic new releases.

Our remediation team also seamlessly transitioned to remote workspaces in March 2020. OPS release assessment requests, Site Characterization Reports, and Corrective Action Plans have been paperless for many years, and the team has capitalized on the efficiencies of working from home to continue closing release events at a steady pace.



A diversity of regulatory functions allows us to adapt to the public's needs.

Protecting the Budget

The State of Colorado, like all others in these times, has been struggling with the pandemic's impacts to our state budget. OPS is thankful for the healthy partnerships that helped us address the immediate budget concerns in 2020. First, ongoing support from USEPA via grant renewal and funding has ensured that we can maintain our services and ensure high-risk releases lacking responsible parties are addressed. Second, the Colorado Wyoming Petroleum Marketers Association helped craft legislation to ensure our Petroleum

■ *continued on page 6*

Conducting Virtual Inspections During COVID-19

Arizona's Lessons Learned

by Pamela Nicola, Arti Jain

The COVID-19 pandemic has forced us all to take a new look at how we live our daily lives and how we conduct business. State environmental regulators have faced a multitude of challenges, from employee safety to greater IT demands due to increased telework. Finding ways to innovate and take control in order to accomplish our mission work is more important now than ever before.

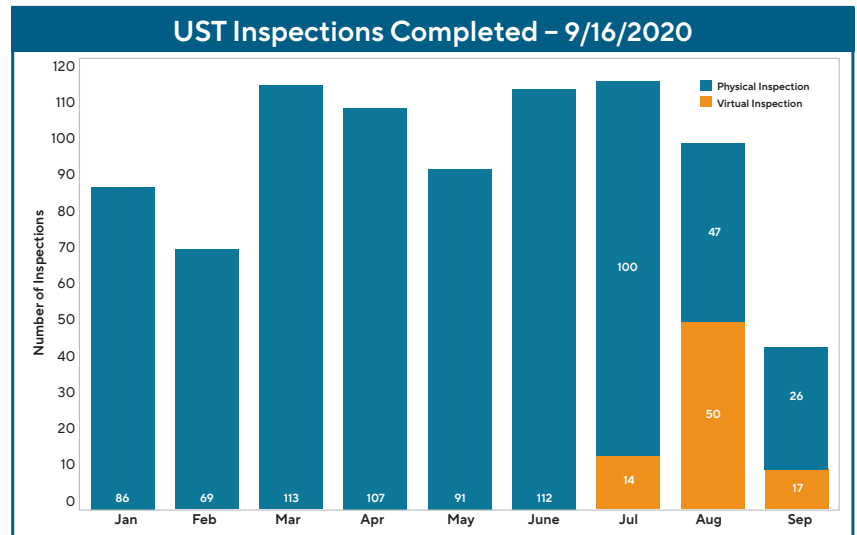
Arizona Department of Environmental Quality inspectors have continued to conduct physical inspections throughout the COVID-19 pandemic with proper personal-protective equipment and social distancing measures. In March and April 2020, guidance was issued and staff were given training on inspection prioritization and best practices. This helped the agency to prioritize higher risk facilities and focus resources on where they were needed most.

In July 2020, interim guidance and best practices for virtual inspections were rolled out to our staff in response to the increased number of positive COVID cases reported within the state. The Underground Storage Tank (UST) Program was one of the first teams to implement virtual inspections, and as with any new process, there were initial challenges. However, the more virtual inspections we conducted, the more we learned and were able to refine the process.

Virtual Inspection Challenges

■ Technological Issues:

Information technology issues are a part of everyday life and UST inspections are no exception. Video quality can be impacted by internet connectivity, the number of people on call, and the screen size of the device being used; live-streaming may not be possible in remote areas; identifying an app that works for all parties can be challenging; and capturing inspection areas like dispenser



pans, drop tubes, and spill bucket bellows can be difficult.

- **Social Challenges:** Not every facility representative is technologically savvy, and some onsite individuals are either not familiar with the UST system or do not have the equipment to open sump lids. Many facilities have minimal onsite staff, and it could be a burden for them to dedicate an individual to leave the cash register to walk the site for the virtual inspection.

Lessons Learned

- Communication with facility representatives is crucial; the pre-inspection phone call to discuss what will happen during the virtual inspection and confirm software and hardware capabilities will determine the success of the inspection.
- If possible, set up a brief dry run with the onsite individual to ensure all technology is compatible.
- Virtual inspection pre-work is key; ask for all records to be sent in advance of the virtual inspection for review, and exchange inspection rights documentation for signature in advance via email.
- The quality and size of the capturing device being used is important; phones tend to be the best device for onsite individuals

to use, and inspectors can capture screen shots from their computer to use in photo logs.

Program Successes

- Both facility and agency employees appreciate the additional measures to limit exposure and increase safety.
- More inspections can be conducted as agency field staff save time by not needing to drive to every inspection.
- It provides an additional opportunity to build relationships between customers and inspectors as they work together in a new way to complete the inspection process.
- Facility owners and corporate environmental staff that live out-of-state can now participate in inspections, which increases their involvement and the agency's opportunity for outreach.
- Facilities appreciate the option of having a virtual inspection or continuing with a physical inspection if they do not have the onsite staff available to support a virtual inspection. ■

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Missouri's Remote UST Inspections

The Covid-19 Successes and Challenges

by Michael Martin

The COVID-19 pandemic has presented some unique challenges for which most of us were not prepared, and Missouri's Underground Storage Tank Program was no exception. Like everyone else, our work had to continue, but in ways that kept our customers and program staff safe. We had to find creative solutions to problems, such as how to safely maintain our customer service and conduct UST inspections if we are not allowed to go on-site.

Thankfully, our staff are always ready to think outside the box when faced with challenges like these. When we were told all inspections would cease until further notice, our Preventative Program staff devised a plan to continue working with our regulated community and contractors within the new constraints COVID-19 has created.

First, we had to reprioritize the program's workload. Fortunately, we had completed nearly all of this fiscal year's compliance inspections; we just had to figure out how to safely conduct the handful of remaining inspections. This also relieved a lot of pressure, because it minimized the number of sites that we would have to report to USEPA as missing the three-year inspection requirement.

Second, we had to come up with a way to continue conducting inspections if we were prohibited from actually visiting a site in person. Since we would be unable to perform on-site compliance inspections for an indefinite time period, we turned our attention to new installation inspections.

Developing the Procedure

While not required by USEPA, Missouri places a high priority on these inspections to ensure proper component documentation and installation. Missouri is one of only two states that adopted the financial responsibility requirement for installers and manufacturers as an option within the 2005 Energy Policy Act, for which this type of inspection was vital. Although Missouri has now switched to secondary containment, we still place great emphasis on these

inspections due to the benefits they provide.

So we had to determine how to conduct the new installation inspections. The first step was to reassign all new installation coverage to one inspector. The designated inspector made telephone calls to contractors to discuss the procedures they were using and to identify what photographs they would need to submit to show each step of the process. In some cases we also used Zoom video conferencing, which allowed our inspector to see the installed equipment, much as if we were on site.

Under the circumstances, we consider these workaround solutions a success and we saw a variety of benefits. One inspector effectively covered the entire state and our program was able to conduct more inspections in less time. Using phone calls and Zoom conferencing also helped ensure consistency in the documentation we requested. Together, these measures helped us to save on travel costs. Further, contractors quickly learned what photos and other documentation they would need to submit, which made it easier and faster to get their customers up and running.

The Technology Glitch!

While we were able to successfully develop and implement some creative solutions to COVID-related problems, the virtual inspections also came with some distinct technical challenges. The first issue we faced came with the documentation photos. Most contractors used their cell phones to take and transmit the photos. Unfortunately, the photos were in a format that was too large for our servers to handle. This created extra steps and delays when the contractors had to resize each photo before it could be sent to us. Also, some members of the department's inspection team must rely on the rural internet services available to them, which are often unable to adequately handle all of the large amount of photos and other electronic documentation.

The remote inspection process also created a challenge regarding timing of the installation notifications. Sometimes contractors neglected to notify the program until the day before an installation and at least one contractor declined to provide any notification or photo documentation. Together, these challenges also underscored for us the importance of investing in current, capable technology.

Now that we are able to conduct field inspections again, we can look back on this experience and take stock of the lessons we learned that will help us plan for future challenges. Among other valuable takeaways, we now understand the value of up-to-date equipment and software. As it comes time to replace aging equipment, we can make more informed decisions on how best to invest taxpayer dollars in equipment that, while more expensive at the outset, can reap even greater savings in time, effort, and money in the long run. ■

Michael Martin is Unit Chief for Missouri's UST Compliance and Technology Department of Natural Resources. He can be reached at (573)526-2417.

■ Prepare, Don't Panic from page 4

Storage Tank Fund balance was protected, ensuring \$30,000,000 is put back into Colorado's economy annually through its reimbursement.

We're certain there will be challenging adaptations to come, and that the pandemic will continue to feel limiting at times. But through innovation, paperless processes, a team with diverse duties, and strong partnerships, OPS has enhanced our role in the storage tank industry and positively impacted release prevention, remediation, and reimbursement in 2020. ■

Zach Hope is Colorado's Petroleum Program Manager. He can be reached at (303)318-8545.

A Message from Mark Barolo

Acting Director, USEPA's Office of Underground Storage Tanks

Updates from USEPA's Office of Underground Storage Tanks... aka OUST

2020 has presented us with significant upheaval. Our world's call for social justice and the ongoing pandemic continue to affect us all in countless ways. Our personal lives and routines have been significantly altered. Many of us are working from home; wearing masks when going out; keeping safe distances; and adjusting our lives in ways we never imagined. I hope you and your families are staying well, and I send best wishes for good health and safety.

Our underground storage tank (UST) world, too, is changed by the pandemic; it is affecting inspections, UST system operation and maintenance, cleanup procedures and schedules, how we connect with each other, and how we carry out our ongoing UST work. Even though we are affected by the pandemic and uncertain as to what the next months will bring, we are continuing as best we can with our work to prevent, detect, and clean up UST releases.

I've heard from many of you about the significant challenges you are facing, but also your creative solutions to solving those challenges. I commend our state and tribal partners for finding new ways to conduct your important work under these challenging circumstances. I also commend our industry partners for continuing the crucial work of ensuring that UST systems are properly operated and maintained and that releases are properly assessed and remediated. Much of that work has been done on site, despite increased risks. While there is much uncertainty before us, your creativity and commitment bode well for continued success, no matter the challenges we face.

Below I provide updates about assorted happenings in our UST world:

- **Goodbye to Carolyn Hoskinson and Ellen Frye**
- **States' progress in achieving state program approval (SPA) under the 2015 UST regulation**
- **USEPA's revised flood guide**
- **UST Finder, a national UST and releases web map application**
- **Virtual UST and LUST webinars.**



Goodbye to Carolyn Hoskinson and Ellen Frye

Who thought the UST program would say goodbye to two pillars of our UST community over such a short period of time? Many of you know about Carolyn Hoskinson's departure from OUST in mid-September, when she left the UST program to become the director of USEPA's Office of Resource, Conservation, and Recovery (ORCR). And Ellen Frye, the editor of *LUSTLine* since its inception, retired after completing this issue of *LUSTLine*. Below are a few thoughts about each of these people who gave so much to the national UST program. On behalf of OUST and the national UST program, best wishes to Carolyn and Ellen.

Carolyn Hoskinson joined USEPA in 1991 and served in several programs at USEPA before coming to

the UST program. Beginning in August 2006, she served as OUST's Deputy Office Director, and in February 2009, she became OUST's Office Director.

Over her 14 years with OUST, Carolyn ably led the national UST program through many milestones—from implementing UST requirements in the 2005 Energy Policy Act, to overseeing work using LUST Trust Fund money allocated under the 2009 American Recovery and Reinvestment Act, to proposing in 2011 and finalizing in 2015 the federal UST regulation, to implementing the 2015 federal UST regulation, and lots more in between. That's a substantial body of UST work.

Carolyn considered the UST program to be a family, and she treasured you all as family members. The national UST program and those of us in OUST will miss Carolyn and her energy, passion, and unwavering commitment to

excellence. She will forever be a part of our family.

Ellen Frye has been synonymous with *LUSTLine* for 35 years and 88 incredible issues—beginning in August 1985 with *LUSTLine* #1 through December 2020 with *LUSTLine* #88. Over these three plus decades, Ellen has been *LUSTLine*'s chief information sharer and editor. She has been the heart and soul of *LUSTLine*. Ellen will no longer serve as *LUSTLine*'s lifeline to the world of underground storage tanks. All of us in OUST and the national UST program will miss her very much, both professionally and personally.

Every issue of *LUSTLine* contains the perfect blend of technical information, humor, and Ellen's personal touch. Each issue provides important insights and information into current happenings in the UST industry,

A Message from Mark Barolo...continued

historical perspective to keep us all in touch with where we've been, and forward-looking information to help us navigate the future.

We sincerely appreciate Ellen's years of dedication to *LUSTLine* and underground storage tank issues. Over these many decades, she provided an important service to the entire UST stakeholder community. We send Ellen the very best wishes as she begins this new phase of her life. We hope she enjoys her family and friends, animals, farm, and life in retirement.

Status of State Program Approval

Since the 2015 UST regulation was published in final, implementing those changes has been an ongoing priority of the UST program. Many states, territories, and the District of Columbia (referred to as states) have been working to incorporate the regulation and obtain approval to operate their UST programs in lieu of USEPA. Ensuring our state partners complete their regulations and obtain approval remains a key UST program priority. As of November 2020, USEPA approved 15 state programs under the 2015 UST regulation. Congratulations to these states listed below in alphabetical order. In addition, USEPA is reviewing re-SPA applications for 13 additional states.

Colorado	New Mexico
Georgia	North Dakota
Idaho	Oklahoma
Kentucky	Oregon
Louisiana	Texas
Maine	Utah
Montana	West Virginia
New Hampshire	

USEPA's Revised Flood Guide

In addition to the pandemic-related complications, we continue to have significant impact from natural disasters. To help in that respect, in August 2020, USEPA revised its *Underground Storage Tank Flood Guide*, www.epa.gov/ust/underground-storage-tank-flood-guide. The guide provides useful information for state, local, and tribal authorities in the event of a threatened or actual flood. It provides information about preparing for a flood, important actions

after the disaster strikes, information on financial assistance, and consolidates information from various federal, state, nongovernmental, and UST industry resources. The guide will help prepare for, prevent, or lessen the catastrophic effects and environmental harm that could occur as a result of flooded UST systems, as well as help return these UST systems to service as soon as possible. And spoiler alert—OUST is starting to work with colleagues to develop a guide that addresses UST issues associated with wildfires, which has been a growing challenge in recent years.

UST Finder—National Underground Storage Tanks and Releases Web Map Application

In September 2020, USEPA launched *UST Finder*, a national underground storage tanks (USTs) and releases web map application via USEPA's GeoPlatform <https://gispub.epa.gov/ustfinder>. In the application, you can see a quick start guide and user manual. You can also access *UST Finder* via USEPA's UST website www.epa.gov/ust/ust-finder. I think *UST Finder* will be a useful addition to other resources you currently use to implement the UST program.

UST Finder is a web map application containing a comprehensive, state-sourced national map of UST and leaking UST (LUST) data. It contains information about USTs, UST facilities, and LUST sites from states as of 2018–2019. *UST Finder* includes information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; an estimated number of private domestic wells and number of people living nearby; and flooding and wildfires. The application can import additional data layers and export UST facility and LUST site information for use by other software programs.

USEPA's Office of Research and Development (ORD), with support from the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and OUST, developed *UST Finder*. Many thanks to Fran Kremer and Alex Hall of ORD for leading this effort and to ASTSWMO for their coordination and support role. This is a robust application and I encourage you to consider

how you can use it to advance the causes of your organization.

Virtual UST and LUST Webinars

Over the past few months, NEIWPCC and ASTSWMO have sponsored a series of webinars about UST and LUST issues. Some of the subjects presented so far include: sources and causes of releases; spill buckets and containment sump testing and repair; evaluation of remediation workplans; high resolution site characterization data; emergency power generator UST systems; cross-program communication and training in the UST community; LUST cleanup corrective action methods and remedial design characterization; and impacts such as COVID-19 to state funds and environmental insurance. You can access the webinars, as well as other useful tank information, through the UST web areas for NEIWPCC neiwpcc.org/our-programs/underground-storage-tanks/ and ASTSWMO astswmo.org/category/tanks/.

I especially appreciate the work of both NEIWPCC and ASTSWMO in organizing and bringing this wide variety of UST and LUST issues to our UST community. Thank you to those responsible in both organizations for making the webinars a reality. Look for more webinars to come over the next months.

Looking Ahead

I am pleased to serve as OUST's Acting Director, and I look forward to working with you in the months ahead. I have known many of you for years, and I appreciate all you've done in support of the national UST program. Like Carolyn, I consider the UST program a family—the only professional family I have known! While I started as a newborn (for an internship with OUST when I was in college), I've spent decades in OUST and now have the white hair, which leads people to refer to me as a gray-beard...or would that be whitebeard? I value your continued support and partnership in achieving our common goal of reducing and remediating releases from USTs. ■

Field Notes

from Rick Long, Executive Vice President, Petroleum Equipment Institute (PEI)

PEI Revises RP100 Fill Riser Recommendations

All Petroleum Equipment Institute (PEI) recommended practices (RPs) are reviewed and, if necessary, revised approximately every five years. Although the five-year review cycle normally proves sufficient, occasionally faster action is needed.

Early revision is not a step PEI's RP committees take lightly. It's employed only to deal with exceptional situations such as:

- **Mistakes** Occasionally, an oversight or clear error in an existing RP needs to be corrected.
- **Seismic Shifts** A major technological advancement or regulatory development may require a quick response. To put it another way, when a document was based on one set of facts, new recommendations may be required if those facts change.
- **Regulatory Requests** When regulators ask for additional guidance, the responsible PEI committee always listens and, sometimes, takes immediate action.

In these cases, PEI's process is similar to the approach the National Fire Protection Association (NFPA) takes with its codes. The NFPA uses "temporary interim amendments" (TIAs) to make code revisions that cannot wait until the next regularly scheduled review cycle.

A recent instance involving *PEI/RP100: Recommended Practices for Installation of Underground Liquid Storage Systems* provides a textbook example of why early RP reviews are sometimes necessary—and how they are handled.

Fill Riser Piping?

Since 2005, Sec. 10.13 of PEI/RP100 has included this simple but clear recommendation:

"Do not use nonmetallic piping for fill risers."

For the next 15 years, this recommendation was uncontroversial. Metallic fill riser piping was almost universally accepted in the industry. Underground storage tank (UST) system owners, operators, installers, and contractors were comfortable with metal because of concerns about fiberglass's durability and the potential for static. In fact, PEI did not receive a single comment on riser piping material in the regularly scheduled RP100 reviews conducted since 2005.

However, in January of this year, industry stakeholders started contacting PEI about a new generation of heavy-duty fiberglass reinforced plastic (FRP) tank riser piping. The new FRP risers, they insisted, were durable, reliable, and would reduce the risk of corrosion associated with metallic products. Several state regulators said they were interested in approving the FRP risers but hesitated to do so, given the Sec. 10.13 language.

So, in February 2020, the PEI Tank Installation Committee solicited public comments on RP100's recommendation against nonmetallic risers. More than 40 installers, contractors, manufacturers, tank owner/operators, and regulators responded. Only two of the commenters recommended that PEI leave Sec. 10.13 alone. In developing its response, the committee asked three questions.

Question 1: Should PEI/RP100 retain the recommendation against nonmetallic risers?

Letting the 2005 recommendation stand—essentially maintaining the status quo—was certainly an option. As mentioned above, interim RP revisions are undertaken sparingly. Declining to act would essentially defer consideration of any Sec. 10.13 revisions to 2022.

However, with so many commenters favoring some sort of immediate change, the committee began discussing other options. In the course

of that discussion, the committee realized that Sec. 10.13's preference for metallic risers directly contradicted another PEI/RP100 provision, namely Sec. 1.3, which sets out the document's scope, and says:

"This document...does not endorse or recommend particular materials."

"Nothing in this document is intended to discourage the development and implementation of new installation methods and procedures."

Why had the inconsistency between Sec. 1.3 and Sec. 10.13 never before been an issue? Because the industry was almost universally committed to metallic risers until the new FRP risers entered the market earlier this year.

To make RP100 internally consistent and refocus Sec. 10.13 on installation practices rather than materials, the committee decided the admonition against nonmetallic risers had to go. The committee also realized that if RP100 could not recommend metallic risers, neither could it recommend FRP or any other riser material. The new Sec. 10.13 would have to be neutral as to materials.

Question 2: Should RP100 provide any guidance at all on riser construction?

At this point, the committee could have called it a day. However, taking seriously its obligation to provide recommendations that will "minimize the possibility of storage system failure," the committee added several new guidelines.

First, the committee adopted a new, logical approach on riser pipe materials:

"Prior to installation, verify riser pipe is compatible with the product being transferred/stored and approved for use by the AHJ [authority having jurisdiction]."

Field Notes...continued

This language reinforces the importance of materials compatibility, while giving AHJs the opportunity to decide what is best for their jurisdictions.

Second, the committee put in two guardrails around riser piping installation:

- **Static Electricity** To reduce the risk of static electricity, the new RP100-20 adds a new warning (the highest level of caution in RPs) on grounding: ***“WARNING: If a non-conductive riser pipe is installed, use proper grounding techniques to dissipate any static charge accumulation.”***

- **Drop Tubes** The new document also recommends the use of drop tubes. ***“NOTE: Drop tubes should always be installed in tank-fill risers to reduce turbulence and eliminate vapor buildup during fuel deliveries. Drop tubes also help prevent the possibility of static charge accumulation during fuel deliveries to a storage tank with a nonconductive fill riser.”***

Question 3: What's Next?

The PEI Tank Installation Committee will meet again in 2022—less than 18 months from now—for the regular RP100 review cycle. By then, installers, contractors, and owners/operators will have more experience, data, and perspective on the performance of FRP (and perhaps other) riser materials and configurations. They will have seen how these alternative materials work in difficult climatic conditions, at facilities with varying throughput levels, and with UST systems of different sizes. They may have refined their grounding techniques for FRP applications. Regulators who chose to allow nonmetallic riser materials also will be able to comment on what they learned.

PEI's expectation is that the knowledge gained during the next 18 months may lead to additional riser pipe recommendations in 2022. If necessary, the 2020 revisions will be fleshed out with more details at that time. Seen in this light, the PEI Tank Installation Commit-

tee's 2020 actions are a first step—not necessarily the last step.

Published in August 2020, PEI/RP100-20 is available in both English and Spanish. For more information, see www.pei.org/RP100. ■

A Tribute to Leland Freeman

If you were to list all the standards and practices that have guided the installation of UST systems since the late 1980s, *PEI/RP100: Recommended Practices for Installation of Underground Liquid Storage Systems* would be at the top of that list. And no person has contributed more to the continued relevance of PEI/RP100 than Leland Freeman.

Way back in 1985, when PEI began work on the first edition of RP100, Leland, who was then PEI president, took on the added role of chairing the drafting committee. He continued to serve as chairman of the PEI Tank Installation Committee until his retirement this past summer.

Over those 35 years, installation techniques have evolved, new technologies have been introduced, and UST regulations have expanded. Thanks to Leland's leadership, PEI/RP100 has remained an indispensable resource through it all—providing UST regulators, installers, contractors, and owners and operators with consistently sound guidance for reducing the risk of UST failure, without needlessly increasing installation costs.

Leland's mentorship of a staggering number of today's industry leaders is an equally lasting part of his legacy. As a small sample, PEI asked two prominent petroleum equipment distributors to comment on the role Leland played in their careers:

John Keller, JF Petroleum Group Vice President for the Southwestern region:

“Leland Freeman and his family welcomed me in 1988 to a small town, a new job, and a new beginning for my life. This is not unlike the way he conducted business: welcoming, warm, and caring. These attributes, along with his determination, allowed him to conduct business, influence the marketplace, and help transform the industry. Leland's desire to prepare customers for change while creating an environment of quality and affordability is what I believe made him successful. These timeless lessons continue to be used by myself and my cohorts who were led by him.”

Joey Batchelor, President and CEO of Florida-based Guardian Fuel Technologies:

“I've had the pleasure of knowing Leland Freeman for nearly 30 years. I began my industry career working for Leland at his business, Station Equipment & Maintenance. He had a big influence on me both professionally and personally at a point in my life when I needed it most. I've always admired him for his integrity, hard work, leadership, and strong commitment to his people and his family. When I told Leland I was leaving his company to buy my own business in Florida, I'll never forget his words of encouragement and support. I have leaned on him over the years for advice and occasional pep-talks as I faced challenges in my own business. I absolutely love the man, and without his influence, am not sure where I would be right now. For his mentorship and friendship I will be forever grateful. Leland's contributions to PEI and the many people he has impacted during his storied career will continue to be part of the bedrock of our industry.”

Leland, on behalf of PEI and the industry you served so well for so long, thank you for your leadership, your wisdom, your integrity, your kindness, and your commitment to doing things the right way.

—Rick Long

Tank

-nically Speaking

by Marcel Moreau



Marcel Moreau is a nationally recognized petroleum storage specialist whose column, **Tank-nically Speaking**, is a regular feature of LUSTLine.

As always, we welcome your comments and questions. If there are technical issues that you would like to have Marcel discuss, let him know at marcel.moreau@juno.com.

PEI Punts on FRP Risers

Some 35 years ago I wrote a letter (a real letter in those days) to Howard Upton, then Executive Director of the Petroleum Equipment Institute (PEI). I was a regulator in the state of Maine then, and I wrote to encourage PEI to help solve a regulatory issue: that the existing standards for underground tank installation were woefully lacking. While major oil companies had pretty good blueprints for how to install USTs, the major oil companies were no longer operating in Maine. Of course, there were many cheaper ways to install USTs than those the major oil companies specified, and inventive Yankees went about implementing as many as they could. Unfortunately, most of these practices (e.g., using native soil for backfill, dragging tanks over the ground and rolling them into holes rather than lifting them, plugging corrosion holes in tanks with sheet metal screws) were not environmentally sound.

There needed to be rules governing USTs, I thought back then, and there needed to be baseline standards for how to install USTs. The American Petroleum Institute had a Recommended Practice on UST installation (RP 1615, Installation of Underground Petroleum Storage Systems, published in 1979), but in that era the document did not provide enough detail.

While I saw that regulations would be pretty toothless without effective UST installation standards, I did not feel qualified to write such standards. It seemed to me that the people who knew about these things should be the ones to specify how it should be done. Hence my letter to PEI urging them to publish a detailed document that regulators could cite or incorporate into their rules.

While the concept of an industry writing rules for itself made sense from my point of view, in that era the thought of any form of regulation was as welcome as the Black Death to most in the petroleum industry. My letter had no discernable effect, but sometime later when USEPA asked PEI to publish an installation standard, the request fell on fruitful ground. In 1986, PEI RP100 Recommended Practices for Installation of Liquid Underground Storage Systems was born.

That Question About FRP Risers...

All of this is a roundabout introduction to the topic I addressed in the last issue of *LUSTline* (*Will Fiberglass Rise to a New Occasion?* *LUSTline* #87, June 2020) about whether fiberglass risers would be deemed acceptable for use by the committee responsible for the content of PEI's RP 100. As you may remember, the 2017 edition of RP100 stated, "Do not use nonmetallic piping for fill risers." There are very few outright prohibitions in RP 100, so it is reasonable to assume the RP 100 Committee had substantial reasons for not allowing nonmetallic piping for fill risers.

Despite this, a fiberglass pipe manufacturer was marketing a fiberglass pipe specifically for use in constructing tank risers, including the fill pipe. Regulators who relied on RP100 were asking PEI what to do. At the conclusion of my last *Tanknically Speaking* article, we were all waiting on the edge of our seats to see what the RP100 Committee would decide.

The RP 100 Committee Punts

The RP100 Committee has punted the issue back to regulators. The newly published 2020 edition of RP 100 made several changes in Section 10.13, the section devoted to fill risers:

- The prohibition against the use of nonmetallic risers for fill pipes was deleted. This opens the door for the use of nonmetallic risers.
- New language was added in place of the nonmetallic fill riser prohibition: "Prior to installation, verify riser pipe is compatible with the product being transferred/stored and approved for use by the AHJ [Authority Having Jurisdiction]." By specifying regulatory approval for nonmetallic fill risers, the RP100 Committee punted the ball back to the regulatory folks who had asked the RP100 Committee for guidance on whether to approve nonmetallic risers in the first place.
- The RP100 Committee also added a note: "Drop tubes should always be installed in tank-fill risers to reduce turbulence and eliminate vapor buildup during fuel deliveries. Drop tubes also help prevent the possibility of static charge accumulation during fuel deliveries to a storage tank with a nonconductive fill riser." This note provides some background to the original concern with nonmetallic fill risers: the possibility of static charges accumulating and perhaps discharging in close proximity to flammable and combustible liquids.
- The RP100 Committee then added a warning to call specific attention to the static charge issue: "If a nonconductive riser pipe is installed, use proper grounding techniques to dissipate any static charge accumulation." The RP100 document does not provide any guidance

on what “proper grounding techniques” might be.

Is This Helpful?

I find the RP100 changes unhelpful for several reasons.

A “warning” to use proper grounding techniques with a nonconductive fill riser should be accompanied by some guidance on how to accomplish this. Grounding a metallic riser (which should be done when a metallic fill riser is not surrounded by backfill, e.g., in a tank-top containment sump) is straightforward: attach a grounding clamp and run a sturdy wire to a standard ground rod driven into native soil outside the tank excavation. Grounding a nonconductive riser is another matter. Attaching a grounding clamp directly to the nonmetallic riser would only dissipate charges in the immediate vicinity of the clamp, not along the entire length of the riser. The warning itself is appropriate, but the RP provides no guidance on what “proper grounding techniques” might be.

Perhaps the “warning” and adjacent “note” in the text were meant to complement one another and what is being recommended is to install a conductive drop tube whenever a nonconductive fill riser is installed. If so, this is not clearly stated, although it is implied in the note language, “Drop tubes also help prevent the possibility of static charge accumulation during fuel deliveries.”

But I believe this statement concerning charge accumulation on drop tubes is technically incorrect. A metallic drop tube by itself does not “prevent” static charge accumulation. The conductivity of a metallic drop tube only allows the charge generated to be easily carried away (e.g., to a ground rod) rather than accumulating on nonconductive material to the point where a spark is generated. In other words, the conductive drop tube must be grounded to have the desired effect of preventing static charge accumulation. Thus, the warning to use “proper grounding techniques” still applies when a conductive drop tube is installed with a nonconductive riser. That a conductive drop tube must still be grounded is not clearly stated in the RP100 text.

Then the next question becomes, “How do you ground a drop tube?” Attaching a wire directly to the drop

tube and somehow running it to a ground rod installed in native soil does not seem practical. However, in many cases the drop tube will be electrically continuous with the fill adapter at the top of the fill riser, so that might be a more practical location to fasten a ground wire. But then how do you get the wire to the ground rod? Many spill buckets today are nonmetallic and so holes would need to be drilled to pass a wire through the sides of the spill bucket to a ground rod. Drilling holes in spill buckets doesn’t seem like a good idea to me. A spill bucket could be designed that provided a conductive path from the threaded connection at the bottom of the spill bucket to some external lug connection where a ground wire could be attached. But I know of no such spill bucket that exists today.

What Is the Role of a Recommended Practice?

In my view, the role of a recommended practice is to provide explicit procedures for how to do something, such as install an underground storage system. Because FRP fill risers are new to the industry, I would like to see specific installation steps included in RP100 to accompany the use of these risers. For example, RP100 could directly state:

- If a nonconductive fill riser is used, a conductive drop tube must be installed that is electrically continuous with a ground rod installed in native soil.
- The requirement for a conductive drop tube’s installation if a nonconductive fill riser is used (e.g., an electrically continuous line with a ground rod installed in native soil).
- The maximum allowable electrical resistance between the body of the drop tube and the ground rod.
- Some description of how electrical continuity between the drop tube and the ground rod is to be accomplished.

If the Committee believed these precautions were necessary but did not know how to accomplish them, it might have required the manufacturer to produce detailed instructions for the Committee to review. Once the Committee believed the manufacturer’s instructions were adequate, it could then have simply specified in RP100

that a conductive drop tube that was grounded should be used with the non-metallic riser and that the manufacturer’s instructions for how to do this with a nonconductive riser should be followed.

I firmly believe that a recommended practice should promote clarity, not confusion. Either the manufacturer or the RP100 Committee should provide detailed, practical instructions for how to install an UST component. This is especially true where there are safety concerns to be addressed that did not exist before. If it is not possible to describe a necessary installation procedure for a new component, then, in my opinion, that component is not ready for inclusion in a recommended practice document.

If I’m a Regulator, What Do I Do?

If I were wearing a regulatory hat today, I would conclude that though RP100 no longer prohibits nonmetallic risers, it raises significant issues with these risers that RP100 does not adequately address. I would only allow nonconductive risers at an UST installation if I were provided with detailed stamped drawings produced by a competent engineer detailing exactly how these risers were to be installed and how the static electricity issues raised in RP100 were going to be addressed.

PS.

If you would like to learn more about flowing fluids and static charges, see the National Fire Protection Association’s *NFPA 77, Recommended Practice on Static Electricity*, and the American Petroleum Institute’s *RP 2003, Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents*. ■

Can’t Get Enough LUSTLine?

Every issue published since 1985 can be accessed via the *L.U.S.T.Line* Archive. If you are looking for content on a specific topic, consult the *L.U.S.T.Line* Index. Both resources can be found on the *L.U.S.T.Line* homepage of NEIWPCC’s website: <https://neiwpcc.org/our-programs/underground-storage-tanks/l-u-s-t-line/>

Operator Training 10 Years Later... Are We There Yet?

by Marcel Moreau and Ben Thomas

And They Should Know!

Ben and Marcel share a longstanding interest in UST operator training. Marcel gave his first operator training class in 1993 in West Virginia and presented many more operator training classes across the US throughout the 1990s. He can be reached at marcelmoreau@juno.com. Ben taught the nation's first state-approved Class A/B operator course in Oregon in 2003. Since then, nearly all of Ben's days have focused on providing Class A, B, and C UST operator training. He can be reached at ben@usttraining.com.

A Glance Back...2010

In June, 2010, we published an article in *LUSTLine* (Bulletin #65) about operator training called *Operator Training Has Left the Station: So Where Are the State Programs Headed?* You can find the original article in the *LUSTLine* archive on the NEIWPCC website: http://neiwpcc.org/wp-content/uploads/2020/07/lustline_65.pdf

At the time we wrote the article, some states had already established their training programs, but most were still working toward the August 8, 2012 deadline established in the 2005 Energy Policy Act (EPA) for the implementation of operator training. In the article we outlined four approaches that states were taking to implement operator training.

We focused on how states were implementing Class A/B training because that is where states had the biggest role to play, inasmuch as the EPA Act allows Class C operators to be trained by Class A/B operators. In addition, we were very interested in how operator training might improve compliance with the UST rule, given that the duties of the typical Class A/B operator were closely linked to UST operational compliance. The four basic approaches that states were taking to implement Class A/B operator training that we described in 2010 are summarized in Table 1. See our original 2010 article for a more detailed description of how various states were implementing these approaches.

As far as we can tell today, about two-thirds of states and territories have the operator fund the training, while in about one-third of states and territories the implementing agency funds the operator training. Online training is the most popular method of providing the training, with about two-thirds of states and territories offering or approving

State funded, Internet Based	State funded, Classroom Based
The implementing agency provides an online program to train operators at no cost to the operator.	The implementing agency provides live classroom training (either by state personnel or private contractors) at no cost to the operator.
Operator Funded, Market Based	Operator Funded, Examination Only
The implementing agency approves training provided by private entities. The training can be live classroom or online. Approved training providers also administer exams they have created and provide successful trainees with a certificate. The operator bears the cost of taking the course.	The implementing agency specifies an exam that must be passed to show that a person is a competent UST operator. The operator pays the exam provider to take the exam. The implementing agency plays no role in providing or approving training.
Table 1. Summary of the four basic approaches to operator training that states were taking in 2010. These four approaches are still useful in describing how states are implementing operator training today.	

online only, and another fifth of states and territories offering or approving both online and classroom training. Only a few states and territories have gone with the exam only or the classroom only approaches to operator training.

A question we asked in 2010 that remains relevant today is how to measure the success of the operator training program. Here's what we wrote in 2010:

"All too often, regulators measure success by the mere fact that a required program exists. While the existence of a program is no doubt a significant achievement, the purpose of the EPA Act was not to increase bureaucracy. So how will the states measure the success of their UST operator training programs? Will it be measured by the number of certificates issued? By the number of people who take the various courses? By the increase in

reports of suspected or confirmed releases? By increases in the rates of significant operational compliance?"

What made the most sense to us in 2010 was that because the goal of operator training was to increase compliance with UST requirements, the rate of significant operational compliance (SOC) as measured by implementing agencies during facility inspections would be a reasonable way to measure the effectiveness of operator training. USEPA began reporting rates of SOC in the USEPA semiannual report of UST compliance measures in 2002. For a description of the SOC measures, go to: <https://www.epa.gov/ust/significant-operational-compliance-soc-performance-measures>.

In 2010, we looked at this SOC parameter for California and Oregon, two states that already had operator training rules in place for five and six years respectively. We found that there was a clear improving trend in Oregon's

SOC but not California's. We were heartened by the Oregon trend and disappointed by the California trend. But we recognized that California's UST rules were much more complex than Oregon's, so improving SOC in California might be more of a challenge than in Oregon. Clearly, just two states was too small a sample to draw any firm conclusions about the effectiveness of operator training.

Measuring Effectiveness...2018

We took a nationwide look at state-level SOC data during a workshop at the 2018 UST National Conference in Louisville, KY. With a roomful of attendees, we reviewed state-level SOC numbers as reported in USEPA's semiannual report of UST performance measures for the period of 2008 to 2018. We graphed the percentage of facilities in compliance with combined release prevention and release detection components of SOC. The plots also indicated the year of the state's operator training deadline, so any trends from before and after the deadline could be visually discerned.

We found that many states had considerable variation in their SOC numbers over time, with the percentage of facilities in SOC increasing in some years and decreasing in others. Some states showed significant improvement in SOC over time while others did not. The presentation slides which include the graphs for each state are available at: <https://neiwpc.org/wp-content/uploads/2018/10/Thomas-1.pdf>.

'Tis a Puzzlement

We couldn't identify specific factors responsible for this variability in state and territory SOC numbers. Our "best guesses" for factors that might be behind the variability include:

- Some states and territories had operator training deadlines well after the federal deadline of August 8, 2012, so there was little time to show training effects on SOC numbers.
- We didn't know the rate of compliance with operator training for each state or territory. Theoretically, the lower the percentage of trained operators, the less the effect of the training on the SOC number.
- During our study period, some states adopted stricter rules,

making it harder for a facility to achieve SOC. Although there is a nationally defined SOC, some states have more stringent regulations than USEPA and base their SOC on these more stringent requirements.

- There could be variability in how states and territories interpret the SOC measures.
- Not all operator training is equally effective in communicating the regulatory requirements.
- Some states and territories offer a single method of instruction (e.g., state-funded online or state-funded classroom). Not all learners learn the same way, so a single approach to instruction may not meet the needs of all students.
- Becoming trained may not translate into operators changing their behavior in the desired direction (e.g., operator comments Ben has received range from "At least now when I go to jail I'll know why," to "Now I look at and respond to ATG alarms when I used to ignore them."

From our armchair perspective, it sure seems like SOC numbers should provide some indication of the effects of operator training on regulatory compliance. But the substantial variability in many state's SOC data from year to year likely indicates that there is a lack of consistency in how the data are gathered. In addition, we were not able to effectively isolate certain variables like

new, stricter rules that could influence SOC numbers. Understanding SOC trends over time likely requires much more in-depth study of state programs than we can undertake.

Aha, the Technical Compliance Rate

We considered carrying the Louisville study forward two years to 2020 for this article, but we were foiled by the 2015 UST rule changes. These changes introduced new responsibilities for owners and operators, which then required changes in the criteria for SOC. The new criteria for compliance were given a new name: Technical Compliance Rate (TCR). Some states began reporting the TCR rather than the SOC in 2018, so the pre- and post-2018 compliance rates are not comparable. We decided that looking for longer term trends in SOC beyond 2018 as we did for our Louisville methodology was not feasible.

How About the Folks with Their Boots on the Ground?

If the hard SOC numbers don't provide convincing support for the benefits of operator training, how does operator training appear to the folks who are working with it on a frequent basis? We decided to circulate two brief surveys to see what the two populations most affected by operator training, regulators and the owner/operators (O/O) themselves, thought about the program.

We surveyed regulators via the ASTSWMO emailing list to get some anecdotal data on whether state personnel felt that operator training was

Our Online "SurveyMonkey"

The ASTWMO survey:

- Sent out to about 110 addresses representing all 50 states and US territories.
- Requested the respondent's state, but did not identify the respondent by name.
- Received 27 responses from 23 different states and territories. One respondent did not identify their state, and we received two responses from three of the states.
- Not every respondent answered every question.

Ben's newsletter mailing list survey:

- Sent out to more than 9,000 individuals representing primarily UST O/Os, and to a lesser degree inspectors and technicians. Only UST O/Os were asked to complete the survey.
- Respondents were asked about number of UST facilities for which they were responsible.
- Respondent or respondent's company were not identified by name.
- Not every respondent answered every question.
- Received 83 responses.

worthwhile. Regulatory respondents could be field inspectors or program managers. We surveyed the O/O community using essentially the same survey via Ben's USTtraining newsletter mailing list. The majority of people on this list are Class A/B or C UST operators.

Respondents were asked to:

- Rate the effectiveness of operator training on a scale of 1 to 5, with 1 being "Terrible" and 5 being "Awesome."
- Indicate their primary method of accomplishing operator training. We used the same methods listed in Table 1 except that we divided the "Operator Funded, Market Based" category into classroom and online subcategories.

resent a random sample of either the regulatory or the O/O populations. Because of this, the data that the survey respondents provided cannot be extrapolated to the entire population of regulators or O/Os.

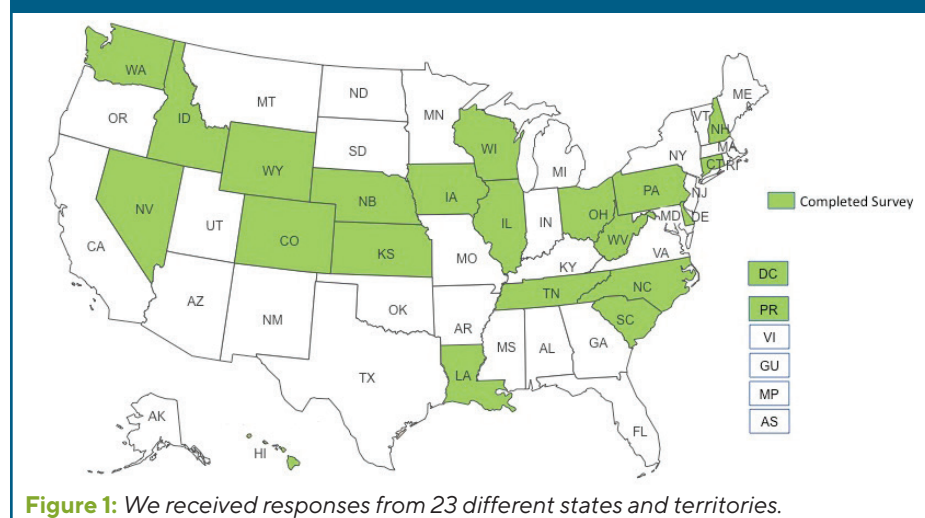
A great many of the recipients of Ben's UST newsletter are people who have taken either Ben's live or online operator training classes. As a result, many of the O/O respondents are likely to be biased for or against Ben's training and do not reflect opinions of the broad universe of training that is available across the country.

Despite the unscientific nature of the surveys we thought they would at least give us some preliminary idea of what regulators and O/Os think about operator training. We are not aware

the primary goal of the operator training program.

- Four (16%) regulator respondents felt that operator training helped improve O/O and inspector relations. We got the sense that these regulators conducted live classroom training and felt the face-to-face time helped break down barriers between regulators and O/Os.
- Another 4 (16%) regulators praised the quality of the training.
- Three (12%) regulators felt the training helped reduce the number and/or size of releases.
- Three (12%) regulators felt that operator training made enforcement easier by identifying who was responsible for a facility and removing ignorance of the requirements as an excuse for noncompliance.

States and Territories that Responded to Our Survey



Both surveys then asked the following questions that respondents could answer however they wished:

- What in your opinion is the BEST thing about UST operator training?
- What in your opinion is the WORST thing about UST operator training?
- If you had to do operator training over again, what would you do differently?

We recognized that these free text answers would be more difficult to summarize, but we didn't want to bias the answers by providing our own notions of what the answers might be.

Some Caveats

The completed surveys do not rep-

resent any other effort to gauge how the operator training program is doing some eight years after most states have established their programs.

Responses

What Did Respondents Say Was the BEST Thing About UST Operator Training?

What the Regulators Said

Twenty-five regulators responded to this question, while two skipped it. All 25 responses could be categorized into five general areas.

- Eleven (44%) regulator respondents opined that increased awareness of rules or equipment was the best thing about operator training. This is encouraging as improving the competency of UST operators seems to us to be

What the O/Os Said

Sixty-six O/Os responded to this question, while 17 O/O respondents skipped this question.

- Twenty-six (40%) O/O respondents opined that the training increased awareness of rules and/or UST equipment, while another 7 (11%) gained an increased awareness of the environmental risks posed by USTs, 4 (6%) increased their knowledge of their UST related responsibilities, and another 4 (6%) thought the training increased safety. Overall, 41 (62%) of respondents said that an increase in some type of knowledge was what they liked best about operator training.
- Ten (15%) O/O respondents liked the online nature of the training best.
- Two (3%) O/O respondents indicated that there was nothing that they liked best about operator training.
- We categorized 13 (20%) of the responses as "other." These were generally vague responses such as "all good" and "very detailed."

What Did Respondents Say Was the WORST Thing About UST Operator Training?

What the Regulators Said

No regulator skipped this question, and many cited more than one item that they thought was the worst thing about operator training. No dominant issues emerged.

- Three (11%) regulatory respondents cited high turnover among operators as a training challenge.
- Three (11%) felt that refresher training was needed because the O/Os training faded with time.
- Three (11%) thought there was too much information being presented in the training.
- Another 3 (11%) respondents felt operators did not take operator training seriously enough.
- We categorized 13 (56%) of the responses as “other.” With issues ranging from the burden of administering the program to the boring content of the training.

What the O/Os Said

Sixty-two O/Os responded to what was the worst thing about operator training; 21 skipped the question.

- Of those who responded, we were surprised that 12 (19%) said there was “nothing” wrong with the training.
- Eleven (18%) O/Os thought the training took too long or covered too much material. We suspect that these O/Os took training that was not site specific.
- We were not surprised that 6 (10%) of O/O respondents did not like to take an exam at the end of the training.
- Four (6%) O/O respondents felt the training was just another bureaucratic requirement that was not relevant to the operators’ core business.
- Three (5%) complained that the training was not site specific.
- Three (5%) did not like the cost.
- Three (5%) thought there should be refresher training.
- We categorized 20 (32%) of the O/O responses as “other” one-off complaints.

If Respondents Had to Do Operator Training Over Again, What Would They Do Differently?

What the Regulators Said

Twenty-six regulators responded to this question while one skipped it. Two strong themes emerged and 2 lesser ones.

- Seven (27%) respondents would require refresher training of some type.
- Six (23%) would provide facility-specific training. A number of states provide facility-specific training by linking online training to information in their UST database. When an operator identifies the facility that he/she is interested in, the program presents only the training modules that apply to the equipment present at that facility (as documented by the facility registration). The operator’s certificate is then tied to that facility.
- Three (11%) respondents would provide more online training, while 2 (8%) would provide more classroom training. Allowing both online and classroom training options is perhaps the ‘best’ route because it allows for multiple learning styles, although this places an additional burden on regulators to develop or approve both online and classroom courses.

What the O/Os Said

Sixty-two O/Os responded to this question; 21 skipped the question. The dominant responses to this question had to do with the method of training.

- Twenty-two (35%) O/Os would do “nothing different,” while 6 (10%) would use a classroom setting. The dominant method of training for our O/O respondents was online training, so this seems to be a reasonably strong endorsement for online training.
- Five (8%) O/Os would prefer to have facility-specific training.
- Three (5%) O/O respondents would like to have refresher training, while 2 (3%) would train additional staff. Though small, these numbers point to the value that some O/Os place on operator training.
- Two (3%) O/O respondents wanted training specific to emergency generator systems. We know of no operator training that specifically targets emergency generator UST systems.

We think the norm of the UST program should be ‘continuous improvement’ rather than accepting the status quo.

We sympathize with operators of emergency generators who must sit through much irrelevant content to obtain their certification.

- We categorized 17 (27%) of the responses as “other.”

Are We There Yet?

We feel obligated to repeat that the survey results presented here are not based on random samples of regulators or O/Os and the results cannot be extrapolated to the entire UST community. That said, the respondents to our survey hint at the following:

- A significant portion of regulators and O/Os see some value in the operator training program.
- Although online training is more prevalent, both online and classroom training techniques have their proponents.
- Many regulators and some O/Os would prefer site-specific training.
- Many regulators and even some O/Os would prefer more refresher training.

So, are we there yet? Stepping back and considering our previous study for the Louisville workshop, the present-day surveys, and our many years of direct contact with thousands of O/Os, we think the operator training program has covered a huge distance since its inception 15 years ago. There is no question the EPA Act of 2005 launched a massive program with significant effects on thousands of regulators and hundreds of thousands of UST O/Os.

It’s a big program, but is operator training beneficial? Both regulators and O/Os see some benefit, and we were a bit surprised to find that in our small survey samples O/Os were a bit more positive about the program than the regulators (see Figures 3 and 4). Surely this speaks well for the value of the program to many O/Os.

But given the seemingly endless variety of UST systems, O/Os, learning

The Type of O/Os Who Responded to Our Survey

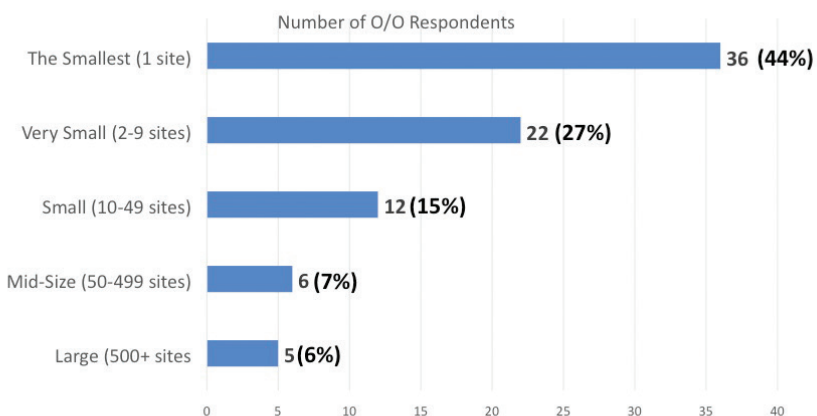


Figure 2: The majority of O/O respondents were small, with 44% running a single store, and another 27% responsible for 2-9 stores.

How Regulators Rated Operator Training

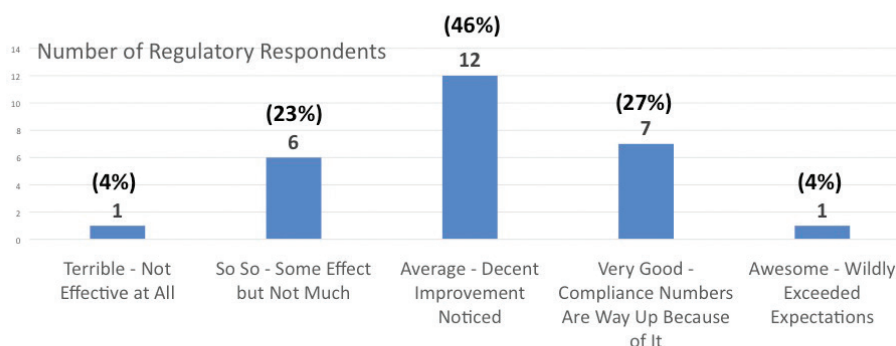


Figure 3: State/Territory UST agencies rated the effectiveness of operator training on a fairly symmetrical bell curve, with 'Average' as their most frequent response and 'Terrible' and 'Awesome' each garnering a single response. On a scale of 1 to 5, the weighted average of the responses was 3.0.

How O/Os Rated Operator Training

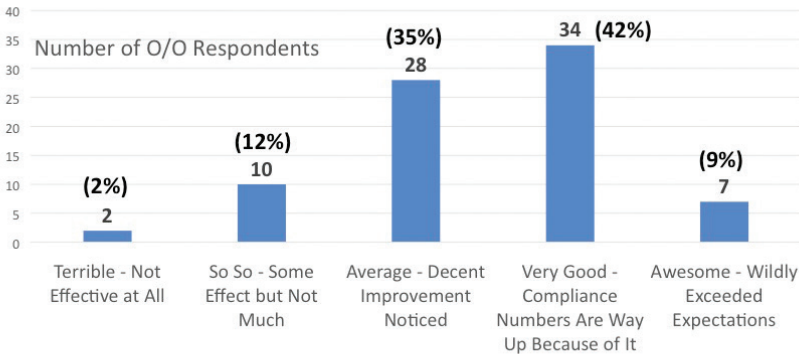


Figure 4: Owner/operators rated the effectiveness of operator training on a curve that leaned slightly toward the higher end of the scale, with the most frequent response being 'Very Good.' There were 2 ratings of 'Terrible' and 7 ratings of 'Awesome.' On a scale of 1 to 5, the weighted average of the responses was 3.4.

'continuous improvement' rather than accepting the status quo.

Here are some of the challenges that we see and possible approaches to continued improvement:

- **Organize and share reviews.**

There is huge diversity among the people to be trained, from the UST managers of national chains with thousands of facilities to mom and pop operators of single convenience stores. There is likely room for many different successful and effective training strategies from a variety of vendors. But how is a UST O/O to evaluate them? Perhaps an operator training rating website could be created where users could leave comments and ratings to help steer O/Os in search of good training to the better vendors. This would encourage all vendors to up their game to improve their ratings in hopes of attracting more customers.

- **More discussions.** Perhaps there could be a session at an upcoming national conference focused on 'best practices' in operator training, with presenters not only from the regulatory sector but also from O/Os who could talk about what they like and don't like about current approaches to operator training.

- **National Evaluation Protocols.**

Perhaps USEPA could publish a document for operator training similar to the leak detection evaluation protocols that are used to evaluate leak detection methods. The operator training protocol would flesh out the generic guidance for operator training contained in the EPA Act of 2005, providing a description of the minimum content for the various topics that should be present in an operator training course. Vendors could use the document to be sure their courses covered all the bases and implementing agencies could use the protocol in their evaluation of which vendors would be accepted in their jurisdiction.

These are our thoughts. What are yours? ■

techniques, training venues, end-user motivations, enforcement models, state and territory UST regulations, and compliance metrics, it would require a much more sophisticated study than we can provide to quantitatively determine the

effectiveness of operator training in achieving the ultimate goal of the UST program: protecting human health and the environment. But with a nod to Ron Brand, founding father of today's UST program, we think the norm should be

The Risk Factor

Patrick Rounds is president of an Iowa-based insurance company that provides insurance for owners of petroleum USTs. The company was created by and is owned by UST owners. Pat can be reached at: PJR@pmmic.com.

Am I In Compliance? Go Ask ALICE

The ASTM E50.01 Storage Tank Subcommittee is currently updating *E1990 Standard Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR, Part 280 Regulations*. Also known as “ALICE”, E1990 adopted in 1998 is an example of how regulators and industry can work together to create solutions.

In 1996 the UST regulatory world was changing. The final deadline for the 1988 federal regulations would be in full effect in 1998, and owners, vendors, and regulators were all trying to manage compliance with the new rules. Lenders, insurers, and real estate professionals were looking for a mechanism to determine if their clients were making the correct decisions with respect to UST management.

In April of 1996, Sammy Ng from US EPA’s Office of Underground Storage Tanks (USEPA OUST) approached ASTM International about developing a standard for a third-party inspection and certification program for USTs. ASTM is one of the largest voluntary standards-developing organizations in the world. As a not-for-profit organization ASTM International provides a forum for the development and

publication of international voluntary consensus standards for materials, products, systems, and services. USEPA has recognized that industry codes and standards provide a means for developing UST system management practices in a timely manner. The preamble to the 1988 UST regulations (Federal Register, Vol. 53, No. 185, Friday, September 23, 1988 page 37185) noted that “EPA does not intend to adopt inadequate codes but wants to provide a flexible approach to codemaking by relying on nationally recognized organizations to develop new and improved codes and practices through a public process.”

The venture began with the concept that a certificate could be issued by entities documenting compliance with technical regulations. A compliance inspection protocol was envisioned that would allow tank owners or third-party inspectors to certify compliance. The certificate could be used by UST programs to supplement their inspection and compliance programs.

A task group was formed within ASTM International’s subcommittee on storage tanks (E50.01). The group included tank owners, trade associations, insurers, lenders, several state UST programs, and OUST. Concerns

over a new inspection mandate, disagreements over who could inspect, and the impact on state regulatory requirements soon derailed the inspection certificate concept. However, through this collaborative effort the concept evolved into a guide that would assist all parties in understanding the federal UST regulations.

Why Is the Guide Named ALICE?

Referring to the *Standard Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR Part 280 Regulations* by name takes time and is not as cool as a short nickname (e.g., RBCA, RNA...). With few options to create an easy-to-remember acronym with the letters SGPEUSTSOC, Sammy Ng suggested naming the standard “ALICE.” Ng noted the name had no particular meaning or connection to the standard, rather it was his mother’s name. Hence, the standard being developed became known as ALICE.

If you have participated in the development of a consensus standard, you know that such standards take time, and sometimes a consensus is never achieved. The ALICE Task Group

ASTM’s Standard Development Process Summarized

ASTM regulations provide a set of rules to ensure that consensus standards develop in accordance with rigorous democratic procedures. Members of ASTM are required to uphold the principles of the consensus-based process through openness, transparency, balance, and respect.

1. Task groups appointed by a subcommittee develop work items.
2. Work items are approved by the subcommittee chair or by majority approval of the voting members of the subcommittee.
3. Work items are submitted for approval as a New Standard.
 - a. Subcommittee must approve the Standard.
 - b. Main committee must approve the Standard.
 - c. All standards require Society Review.
4. Standards are reviewed by the responsible subcommittee and are balloted for reapproval, revision, or withdrawal within five years of their last approval date. If the standard has not received a new approval date by December 31 of the eighth year since the last approval date, the standard is withdrawn.
5. Voting.
 - a. Members in ASTM committees and subcommittees are assigned official voting rights to ensure balance among voting producers, users, consumers, and general interest members. Only one vote is assigned per voting interest. In this way, various interests can be protected, and no single viewpoint can dominate the proceedings. The Regulations Governing ASTM Technical Committees defines voting interest.
 - b. All negative votes must be resolved.
 - i. Negatives may be withdrawn by the negative voter;

- ii. Negatives may be found “not related” or “not persuasive” in a meeting or via ballot;
- iii. Negatives may be found “persuasive” and the draft is sent back to the committee for reworking.
- c. At the subcommittee and main committee level, a valid ballot requires 60 percent of the official voters to return their ballot.
 - i. The balloting process requires a two-thirds percent affirmative at the subcommittee level;
 - ii. The balloting process requires a 90 percent affirmative at the main committee level.
- d. Non-official voters participate in the standards development process and have access to all applicable ballots. Negative statements from non-voting members will stop a document from going forward until considered by the technical committee. Only official voting members can vote on actions to find negative votes not persuasive or not related.
6. Member Participation Requirements
 - a. Perform all duties required of them by their committee. This includes completing and returning ballots;
 - b. Conduct themselves in a professional and respectful manner;
 - c. Express viewpoints through the making of proper motions, through participation in the formal debate on those motions, and voting on motions and ballots;
 - d. Refrain from knowingly disseminating false or misleading information;
 - e. To ensure the necessary balance of interest, members have a continuing obligation to provide ASTM with timely, accurate, and complete information concerning their voting interest.

Tank News From NEIWPCC

Alas, the time has come for NEIWPCC to say goodbye to Ellen Frye. Ellen has served as the editor of *L.U.S.T.Line* since the very beginning—first as a NEIWPCC employee back in 1985, and then as an independent contractor for many years. We cannot express enough gratitude for Ellen and her countless contributions to the UST community through her work. For more than 35 years, she has worked with authors from the states, tribes, federal government, consulting firms, industry, and other stakeholder groups. Long-time readers will agree that while *L.U.S.T.Line* has covered many important developments in the UST world during her tenure, it is Ellen's penchant for working with contributors to discuss technical and regulatory issues in entertaining ways that keeps us coming back for more. NEIWPCC is proud and humbled to carry on her legacy, but we will greatly miss working with her; *L.U.S.T.Line* will simply not be the same. We wish Ellen all of the best in retirement!

As you may have noticed, the 27th National Tanks Conference (NTC) was not held in 2020 due to challenges related to the ongoing pandemic. However, we were able to work with our state, tribal, and federal partners to provide a series of webinars based on the themes planned for the conference. The four-part series covered topics related to emergency power generator UST systems, in-situ remediation, state funds and environmental insurance, and collaboration across regulatory programs. You can access archived webinar recordings and presentation slides and stay updated on the next conference by visiting: **NTC website:** <https://neiwpc.org/our-programs/underground-storage-tanks/national-tanks-conference/>

Are you interested in free UST and LUST training? NEIWPCC continues to plan, provide, and archive webinars that cover a wide variety of topics determined in collaboration with our partners and other stakeholders. Upcoming and archived webinars can be found on NEIWPCC's website via the links below, which are updated as information is made available.

Upcoming UST Inspector Training webinars: <https://neiwpc.org/our-programs/underground-storage-tanks/ust-training-resources-inspection-leak-prevention/upcoming-ust-inspector-training-webinars/>

Archive: <https://neiwpc.org/our-programs/underground-storage-tanks/ust-training-resources-inspection-leak-prevention/webinar-archive-inspector-training/>

Upcoming LUST Corrective Action webinars: <https://neiwpc.org/our-programs/underground-storage-tanks/lust-training-resources-corrective-action/upcoming-lust-corrective-action-webinars/>

Archive: <https://neiwpc.org/our-programs/underground-storage-tanks/lust-training-resources-corrective-action/webinar-archive-corrective-action/>

Please contact Drew Youngs (dyoungs@neiwpc.org) if you have any questions or comments, would like to be added to our distribution lists, or are interested in writing an article for *L.U.S.T.Line*. If you are looking to peruse all of our related resources, the above and much more can be accessed from:

NEIWPCC's UST/LUST Program homepage: <https://neiwpc.org/our-programs/underground-storage-tanks/> ■

worked through 1996 and in 1997 a formal work item was approved. With the concept developed, subcommittee and committee consensus were necessary. USTs are under the jurisdiction of ASTM's committee on environmental assessment, risk management, and corrective action (E50), and the subcommittee storage tanks (E50.01). Today, committee E50 includes approximately 850 members from across all sectors of the industry.

With many differing opinions among the various stakeholders, consensus was required in order to develop a new standard. After technical discussions and a shared goal to develop a standard to address the need, consensus was achieved. The standard was formally approved in October of 1998. ASTM E1990, the standard's official reference number, guides tank owners, operators, and other users on UST requirements and management practices. Since its first adoption, the standard has been updated three times. USEPA has recognized this standard by

including it in the listing of standards on their website under the category of "General UST Topic." An ASTM task group has been formed to update the standard to address the most recent regulatory changes.

Regulatory agencies, tank owners, consultants, and other stakeholders don't always play well together. This was evident when the ALICE Task Group was initially formed. Human nature being what it is, most of us seem to play nicer when our mother is nearby. ALICE was just a name, but maybe having Sammy's mom subconsciously in the discussions made everyone a little more understanding and open to other opinions. Maybe all parties played nicer. Meaningful collaboration and consensus were achieved. ALICE set a great example of how voluntary consensus standards are supposed to be developed. E1990 has now provided industry with compliance guidance for over 20 years. With another successful update, it will hopefully continue to guide us for another 20 years. Thanks ALICE.

ASTM Standards Currently in Progress

ASTM E50.01 Storage Tank Subcommittee is currently working on the following standards:

- *WK 69275 Non-Intrusive Test of Automatic Tank Gauge Probes* (New Standard);
- *E1990 Standard Guide for Performing Evaluations of Underground Storage Tank Systems for Operational Conformance with 40 CFR, Part 280 Regulations* (Revision);
- *E2681 Standard Guide for Environmental Management of Underground Storage Tank Systems Storing Hazardous Substances or Petroleum* (Revision).

If you are interested in participating in the development or revision of these ASTM Storage Tank standards, please contact ASTM Staff Manager Molly Lynyak at mlynyak@astm.org. ■



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LU.S.T.Line is a national bulletin that promotes the exchange of information among UST and LUST stakeholders. NEIWPCC has published L.U.S.T.Line since 1985, and it has become the publication of record for UST matters nationwide. Do you have a good idea for an article? NEIWPCC is currently seeking authors to provide content on a variety of pertinent topics related to release prevention, corrective action, and financial responsibility. To learn how NEIWPCC can help you become a contributor, please contact Drew Youngs (dyoungs@neiwpc.org). ■