National Work Group on Leak Detection Evaluations

St. Louis, MO – March 21-23, 2012

March 21, 2012. Meeting opened for guests at 1:45pm.

The first presenter was Joe Carvitti, formerly of Battelle. Ms. Anne Gregg with Battelle was also present. Mr. Carvitti provided an update on the testing and technology assessment sponsored by U.S. EPA's OUST and ORD, specifically an evaluation of the effects of ethanol on leak detection equipment. 40 CFR 280 requires water checks to the nearest 1/8th inch when using an automatic tank gauge (ATG). He specifically reviewed two of the tests:

1. Test 1 tested water detection of continuous ingress with and without a splash to determine the minimum detection height and increment.
2. Test 2 tested water ingress from a quick water dump, followed later by fuel dump(s).

Mr. Carvitti reviewed test equipment and the testing procedures. They looked at the "areas of uncertainty" with a focus on water detection ability of some of the most commonly used technology (ATGs). The draft report was submitted to EPA December 2011 and is currently undergoing peer review. It has not yet been publically released.

The second presenter was Ken Wilcox of Ken Wilcox Associates, KWA. Mr. Wilcox started by noting that the diesel fuel in his fuel tanks was recently analyzed and does not yet need to be replaced. He also informed the workgroup that he will soon be retiring and that his son will be taking over his duties. Ken stated that the old protocols needed to be reviewed and rewritten. They do not always fit well to the new equipment being tested. Specifically, the statistical inventory reconciliation (SIR) protocol needs to be updated. The source of data is always a question, especially the quality control of vendor supplied data. It isn't just the SIR protocol that needs to be re-evaluated- they all do.

Lamar Bradley asked Ken about testing equipment for use at high-throughput facilities. Ken indicated that those would best be field tested, but that is much more difficult to do, especially at a high-throughput facility. It is hard to keep field tests "blind." Mr. Wilcox did indicate that there is a high-throughput facility nearby should field testing ever be needed.

The third presenter was Tony Rieck, T.R. Consulting, presenting on behalf of Tank Tech, Inc. Also present from Tank Tech were Rob Russell and Jonathan McNeely. Mr. Rieck explained how the Tank Tech "Stand Alone System" double walled "tank" is constructed inside an existing underground storage tank. He indicated that they mold the ribs and the new ends (need to be concave) to create a stronger FRP system, which does reduce the tank capacity. The tanks do need a new gauging chart after stand alone system installation. He indicated that the company believes the interstice can be monitored using

wet, dry, vacuum or pressure methods. He stated that he believes that the system should qualify as a new FRP system and that the company has UL1316 approval. Lorri Grainawi (Steel Tank Institute) asked if the "tank" has a UL1316 label affixed upon completion. He said yes. She asked if they have to have a UL representative on site. He answered no. He indicated that UL is rewriting the standard to better allow field constructed systems and acknowledged that this may be a case of the cart being put before the horse. Tank Tech's Jonathon McNeely was asked about their warranty and explained it was a 30 year warranty without the steel shell having to be maintained. The Stand Alone System was designed by Tank Tech and is not affiliated with the Xerxes ZCL system. They use and train all of their own staff, all of whom have been with Tank Tech for many years. The UL listing was again discussed with a request for clarification of the "upgrade" reference on the webpage. Bill Moore also requested an explanation of how they confirm interstice communication, and indicated that they would need to confirm interstitial communication just like any other double-walled system.

Tank Tech discussed that in actuality an old tank is being closed and a new tank is built inside the existing tank. The outer tank is not used for anything other than the original mold. Mr. McNeely indicated that they are currently in discussion with EPA concerning the new regulations and the applicability of the closure requirements to these systems. He also discussed the QA/QC procedures to check the system and the interstice- indicating that it can be checked visually at each step. Procedures include: allowing the entire interstice to cure, pressurizing the interstice and placing small holes in wall to confirm communication. The pin holes are then covered and the entire tank is soap tested. They also vacuum test the interstice of the system for at least one hour. They were asked if they had established limitations of the use of any tank tightness test (TTT) methods after installation. If so, what are the maximum pressures allowed? Mr. McNeely indicated that these thresholds are listed in the warranty. He also stated that they use the "Braddock" method to test the interstice. Lamar Bradley requested further documentation of the "Braddock" method to be submitted.

The fourth speaker was Tony Mills, OPW. Tony wanted to discuss the listing of their float based sensors. He indicated that there are no compatibility issues with the materials with which the sensors are constructed. He indicated that they had done some performance testing, but some of the sensors are "black flagged" for E-10. Tim Smith indicated that Ken Wilcox's evaluations of approximately 20 sensors were evaluated using E10, E15, and E85, indicating that the policy lists testing in ethanol blends. The concern is that all testing has been in pure blends, not any blends with water, which would likely occur in real-world, field settings. Testing with pure fuel blends may not be representative of the conditions to which the probe may be exposed. As such, it may not accurately represent probe functionality. The indication is not that the probes do <u>not</u> work in these applications, instead indicating that it is not known if they will work. Tim indicated that there is a need to enhance the protocol to cover this more practical application.

The fifth speaker was Greg Young, Vaporless Manufacturing. He explained recent changes to the 2000U (ullage) and 2000P (liquid level) testing apparatus (Vaporless Monitoring/USTest). He indicated that there are basic software system changes and the outer case is different, however, the testing equipment, functionality, and analysis are the same. The leak detector functionality remains unchanged. As such, he wanted to confirm that no additional testing is required and wanted to explain that, while it looks different, the piece of equipment is actually the same. Members of the NWGLDE discussed whether any review or third-party testing/confirmation was warranted. Lamar Bradley pointed out that while the workgroup has a probe comparison protocol, we did not have a "console" comparison protocol until recently. Members discussed that if the acquisition equipment is the same and the data processing is unchanged, testing probably isn't needed but if VMI wants the VMI-PMTT data acquisition unit listed with the USTest 2000 systems, then they should get a letter from a third party stating that the performance of the testing equipment is not changed by the VMI-PMTT. Steve Purpora pointed out that it sounded like they simply added "bells and whistles." The NWGLDE members indicated that they may want to add something to the comment field in the certificate.

The group also discussed the acoustic pressure test currently in use. Specifically, the acoustic pressure test is not ear/person oriented, but is instead a computer program looking for single or multiple repetitive sound anomalies. One time sounds (e.g. pops) are not necessarily a failure. The method eliminates background sounds.

The official presentations concluded, a general, public input discussion was opened.

Steve Purpora, Purpora Engineering, asked the electronic monitoring system manufacturers to consider "sound files" to help identify significant leak alarms versus maintenance or overfill alarms to make it easier for facility staff to identify. He also suggested the use of colored (yellow) probe wires for alternative fuel probes so that these can be identified without removal from the tank. He also noted that, at some point, air pockets' affect on leak detection equipment needs to be addressed. ATG manufacturers also seem to be now putting out maintenance recommendations for annual ATG system testing.

Greg Young brought up the possibility of in-tank sensor testing systems. He noted that pulling float sensors out and re-installing them is not necessarily the best way to handle them. There is always a possibility for human error somewhere in that process. In-tank testing may be able to close the test area off and adequately check the functionality of the float. He also raised some concerns about resiliency at high-throughput facilities and whether they have enough time to test. He questioned the appropriate amount of time between testing and also indicated there may be an issue if certain equipment has more than 200ml bleedback.

Steve Purpora discussed that often there automatic electronic line leak detectors allow only one entry for bulk modulus but you need different ones for steel, flex and FRP since there can be different kinds of piping all at one site. Incorrect bulk modulus entries can affect the functionality of the leak detection equipment. He said there are times when technicians question what to enter for the bulk modulus, and he wonders whether all technicians out there are considering this problem. Tim Smith indicated that he would like to capture these types of issues in the EPA guidance document currently being developed. Peter Rollo indicated that sites in his home state were only allowed to install one type of piping with a set slope which would address this concern.

Steve Purpora suggested eliminating the listings for “orphaned” equipment which he defined as not including testing, calibration and recertification requirements.

Meeting adjourned for the day.

ATTENDANCE LIST
National Work Group on Leak Detection Evaluations
St. Louis, MO
March 21, 22, 23, 2012

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Thursday, March 22, 2012

The meeting opened with each team leader providing their updates since the last meeting:

1. ATG/VTTT- Nothing completed. Nothing under review. Same for VTTT.
    a. Responded to inquiry from Taeyoung I&T Co (Seoul, Korea) about getting a mag probe ATG listed. Received product literature and illustration of probe, but no third party evaluation.
    b. Made wording modification to 4 Alert listings at their request: *"The manufacturer does not support test results if the technician does not hold a current Alert Technologies certification when the test is performed. Recertification is required by the manufacturer every two years."*
    c. Dresser Wayne Europe- TIG 5000 0.1gph precision test and quick test (Q0400-4xx magnetostrictive probe) no response to inquiries. Listings removed. For TIG 1000 model, listings modified to remove references to 0.10gph leak detection certification.
2. CITLDS- Nothing to report.
3. NVTTT-
    a. Received request to list Leak Detection Technologies MDleak Enhanced Leak Detection Method under Bulk Methods. Forwarded this request to the AST/Bulk Methods team.
    b. Received request to add manufacturer certification statement to Alert listings as did the ATG/VTTT team. The ATG/VTTT team added the statement to all four listings.
4. LLD-
    a. Three certifications were added- United Testing System and two from Leak Detection Technologies (one for standard LLD and one for large diameter piping).
    b. The group recently received a submittal from Franklin Fueling, but it has not yet been reviewed.
    c. There is an outstanding request from Vaporless. There is some confusion between the 99 LD-3000 (old) and LD-3000 (new) models. The visible physical appearance of the 99 LD-3000 and LD-3000 unit has changed, such as the discharge female threads vs. the male threads, additionally, the cap and cylinder assembly have changed. However, the metering portion of the 99 LD-3000 and LD-3000 unit has not changed. It has been requested that a third-party evaluator, such as Ken Wilcox, verify through a letter to the Line leak Detection team that the functional components of the leak detector was not changed, and the leak detector should operate as originally tested. We will list the 99 LD-3000 after we receive the letter. In addition, it was requested that Vaporless provide the component drawings of the 99 LD-3000 and LD-3000 models, both external and internal, as that should show there is no difference in the design of the different models of leak detectors, other than external.

d. Hansa (Germany) has also requested a revised listing for the large diameter piping line leak detection, specifically to include a more precise threshold. Additional information has been requested from Hansa, Germany, but it has not yet been provided.

5. SIR- One review has been completed.
   a. Fairfield Environmental Wetstock Wizard Version 4.4 (UK Company). Draft listing developed and awaiting vendor response.
   b. Also discussed was trying to ensure that all SIR evaluations are listed with data sets that are blind to the vendor or data sets being provided by regulator. Discussing making related comments more consistent. The protocol is not very clear or restrictive on data sources.
6. Interstitial monitoring and out of tank detector methods
   a. <u>Completed Activities</u>

      i. Fuels Oil Systems
         - ✓ Date listing revised: January 24, 2012 – original November 21, 2011
         - ✓ Reason: Clarified language regarding sensor operations.
         - ✓ Gems LS-750, Innovative Solutions L176-0108-0803 (Kele FS7SS), and Madison M4602-XXXX Sensors with Fuels Oil Systems Console - FOS-0160-1, software version 001. Interstitial Detector – Liquid-Phase.

      ii. Franklin Fueling Systems
         - ✓ Date listing revised: January 20, 2012
         - ✓ Reason: Added results for used oil, and unleaded E85 (for the S404 sensor since it is float-based. E85 results not listed for S406 sensor, at this time, operates using refractive index of liquids.
         - ✓ Model 404-4 Controller with Models S404 and S406 Liquid Level Sensors. Interstitial Detector – Liquid-Phase.

      iii. Leak Detection Technologies International
         - ✓ MDLeak Enhanced Leak Detection Method is listed by NWGLDE under the four following testing methods: Non Volumetric Tank Tightness Test Method (Tracer); Line Tightness Test Method; Large Diameter Line Leak Detection Method; and Bulk Underground Storage Tank Leak Detection Method.
         - ✓ NWGLDE has determined that it is unnecessary to list the MDLeak method under a separate interstitial monitoring test method listing. The reason is that each comment section of the other testing method listings contains the statement: "This method can be used to test single-walled and double-walled components for leakage to soil by sampling in the backfill or to test the primary containment integrity of a double-wall component by sampling in the interstitial space."

      iv. Containment Solutions, Inc.
         - ✓ Hydrostatic Precision Tank Test for DWT-Type II Tanks.
         - ✓ FCI Liquid Filled Interstitial Monitor Tank Model with Model FHRB 810 Level Sensor

- Received request from Containment Solutions – "for these wet annular space methods, the fuel in the tank can be any fuel and the methods are not affected by the fuel type in the tank. I am asking that those listings include language that makes those methods applicable for any type of fuel in the tank. They could just say: "Applicable for all fuels" or if a less general description were required "Gasoline, oxygenated fuels and fuel blends, motor fuels, diesel, biodiesel and biodiesel blends, aviation fuels, fuel oils, and motor oil."
- After group discussion during the meeting in St. Louis, MO, NWGLDE decided that it is unable to modify the listings as requested. However, a process is in place for manufacturers to identify additional liquids for consideration. The approved protocol used for evaluating this type of equipment allows other liquids to be tested after consultation with the manufacturer (as indicated on NWGLDE's listings). It is then up to the manufacturer and applicable regulatory authority whether or not the leak detection equipment can be used for a particular application.

b. <u>Under Review</u>

i. Omntec Mfg.
   a. Requested to add "BX-LWF" sensor to existing Omntec listings. Third-party evaluation completed but older document unavailable by manufacturer.
   b. Received supporting documentation from NWGLDE member – sufficient to add the BX-LWF sensor to existing Omntec listing.

ii. Steel Tank Institute (STI) – Requests revision of two currently listed Interstitial Tank Tightness Test Methods:
   a. Evaluation of the Permatank Interstitial Monitor for Detection of Air and Liquid Leaks.
      i. Received third-party evaluation, dated: Feb 15, 2012.
   b. Evaluation of the STI-P3® Act-100® and ACT-100U® Double Wall Steel Underground Tanks Interstitial Monitor for Detection of Air & Liquid Leaks.
      i. Received third-party evaluation, dated: Feb 23, 2012.
   c. Received protocol: Evaluation Procedures for Leak Detection on Double-Wall Underground Tanks (October 14, 2011).

iii. Tanknology
   a. Vacuum interstitial test for double wall tanks.
      i. Non-Volumetric Tank tightness Test Method (Vacuum).
      ii. Comments: IMOTDM Team and NVTTT Team working together to review request. Method was evaluated using the NVTTT method. Evaluation indicates the purpose of the test is to determine the tightness of a double-wall UST with a dry interstitial space. The STI sponsored protocol should be applicable to this method.

iv. All sensor listings currently posted by NWGLDE with ethanol-blended fuels.

- Recent concerns have been raised regarding the scope of test protocol used to evaluate sensors – does it sufficiently evaluate sensor functionality with varying ethanol, product, and water levels?
- Determining steps forward in addressing new requests to list sensors with ethanol-based fuels.
- Determining whether to expand NWGLDE's current position to list float-based sensors with ethanol-based fuels (functionality unaffected by proportions of ethanol, product, and water) to other type sensors such as those using the operating principle of light refraction.

7. AST & Bulk methods
    a. MassTech used the wrong protocol. It was sent back with a reference to the corrector protocol- awaiting response.
8. Secondary and Spill Containment test methods. No action items. Will discuss new RP later.

Next, the workgroup opened the discussion for elections for Chairman and Vice-Chairman. Lamar indicated that he would likely be considering retirement before the next term would expire and, as such, was withdrawing his name from consideration. Curt will likely be considering retirement shortly after the next term expires. It was decided that two new "temporary" positions should be created- Chair-Elect and Vice Chair-Elect. Curt and Lamar could then retain their current positions but train someone to fill in when their terms expire. The workgroup voted unanimously to move forward with this proposal and re-elected Curt as Chair and Lamar as Vice Chair. Helen was elected Chair-Elect and Peter was elected Vice-Chair-Elect. Both Helen and Peter will train throughout the term to learn the duties of the positions.

The workgroup then reviewed the Wednesday Vendor presentations.

Battelle's tentative findings that the leak detection equipment cannot currently detect water in E85 was anticipated. The E15 findings were discussed more thoroughly. Specifically, that the water ingress was detected but then after a fuel delivery, the float returned to the bottom. The workgroup discussed potential ramifications of those findings and how that could or could not alert facility staff to water intrusion in ethanol blended fuels. The workgroup concluded the discussions as the findings are not yet official. The workgroup eagerly awaits the final release of Batelle's report. EPA anticipates potential reviews to update the original EPA protocols as well.

The workgroup discussed Tank Tech's presentation and the NWGLDE jurisdiction over the release detection methods being used with these systems. The workgroup decided that whether the system is considered or accepted as a double walled system falls to the local/state regulatory authority. If the tank system is being monitored using an interstitial sensor that is already NWGLDE certified, we would have no additional authority. This determination may not apply for vacuum testing, post installation tightness testing or other interstice-dependent test methods.

In response to the OPW presentation, the workgroup would like confirmation that there have been no significant changes to the equipment's testing ability. This does not need to be a full equipment test or assessment.

The workgroup agreed that while everyone liked Steve Purpora's suggestions about different alarms on electronic monitoring systems and color-coded probe wires, action on those ideas would fall outside of this workgroup's authority. We support these suggestions, but do not believe we can request or require action.

Regarding air pockets on line leak detection, test protocols require consideration of trapped vapor when testing. Trapped vapor and excessive bleedback will result in line tightness test failures. Unfortunately, the configurations that allow trapped vapor are typically unusual, poor, or special installations which fall outside of the purview of the Work Group. Oversight of piping installations is the responsibility of state and local agencies. We concur that trapped vapor is a problem and piping should be installed to enhance, not inhibit or impair, piping release detection.

The workgroup reviewed the current third party tests and certifications for issues with bulk modulus. A review of the certifications seemed to allow for the different kinds of piping, by incorporating the volume of each type of piping in the thresholds. Many of the certifications already cover this topic and the remainder of the issues appear be a result of improper installation.

New business

PEI RP 1200- The workgroup discussed commenting on this recommended practice. Tim Smith expressed reservations as compliance with the RP was an option, not a requirement, but others felt that since it is the only real option, it may likely become a requirement to follow the RP in many states. The workgroup voted and the majority decided provide NWGLDE comments concerning this RP to PEI during the open comment period. Specific comment language will be sent around via email and then formally submitted.

EPA proposed regulation changes- After concluding the above discussion, the question was raised whether or not the NWGLDE should comment on the federal regulations. Tim Smith abstained from this discussion and left the room. The workgroup decided to send comments to EPA concerning the recommended practice. Mike would put together some draft language as a start and pass it around the entire workgroup, excluding Tim Smith.

Tim Smith raised concerns about the few sensors that are currently listed with ethanol based fuels. The discussion was how to proceed with existing certifications and new requests for listing of these certifications. As outlined in earlier meeting notes, the concern is whether testing sensors in pure fuel/ethanol blends (without water) is a realistic test of field functionality where water is often present. The decision was made to leave the existing certifications, with the option to review this topic and request additional information when an appropriate protocol is developed. Tim was requested to develop a list of concerns to share what would be the basis for the expanded sensor testing. Upon review, that additional testing would be shared with Tony Mills. The workgroup would await the results of those tests, as well as Battelle's findings before finalizing a formal procedure. Lamar also said that he would ask Ken Wilcox his opinion of optical sensors, refractive index, and water blends.

The workgroup was asked about using an evaluation conducted for the bulk method to be approved for smaller tanks. The response was confirmed- vendors must use the correct protocol for the tank system and method being tested.

The workgroup reviewed the Tank Tech presentation noting that a tank system being monitored with a certified sensor does not require the sensor to be evaluated with the tank. Using brines with approved sensors/probes is also already NWGLDE certified. If Tank Tech wants their proprietary post-installation tank tightness test method approved, that would need to be third party tested and submitted to the NWGLDE for review.

It was suggested that the workgroup provide a link to all manufacturers' installation manuals, as proper installation is key to the success of the NWGLDE release detection certification and the monitoring system. It was decided that this topic would be tabled until the records retention discussion.

Curt asked for future LUSTLine article topics. One suggested topic was for Tim to put something together on the concerns about testing sensors in pure gasoline and gasoline/ethanol blends without the introduction of water. It was also suggested that we should have an article on the impacts of the Battelle research when released, but it was decided that we should have another meeting after the research results are finalized and then discuss this subject matter.

A motion to consider advertising on the webpage to fund the cost of the webpage was made. After extensive discussion about the appropriateness of potential advertisers and potential conflict of interest concerns, the workgroup voted to continue to pay the costs ourselves and not allow advertising on our website.

Meeting adjourned for the day.

Friday, March 23, 2012

Meeting opened Friday with the first two scheduled topics (Battelle QAAP and ATG testing, and Battelle technology assessment) being reviewed/re-discussed from the previous two day's dialogues. The workgroup requested an opportunity to review the QAAPs and to be able to provide feedback and input on the updating of the release detection evaluation protocols.

A suggestion has been made to link each certificate with an image of the equipment, whenever available. Marcia suggested potentially linking to images already stored on the manufacturers' webpages to avoid extra storage on ours.

The next topic was the possibility of including specific software versions of electronic monitoring equipment on the certifications. It was noted that many companies regularly update their software package and it is often difficult to determine which software changes are "superficial" and which ones could potentially affect the functionality of the release detection equipment. While the workgroup acknowledged that including the software package as part of the third party testing would be beneficial, adding and updating software packages with each change would likely be very burdensome, time consuming, and result in an exponential increase in the number of certifications

online. A lengthy discussion ensued. While the workgroup decided not to change the certifications at this time, Greg and Bill will be requesting some general information about software changes from some of the vendors and sharing the responses.

Lamar pointed out that the language about obsolete and unsupported equipment is not entirely consistent and indicated that some language needed to be added to three of the RedJacket listings. Greg will send Curt the final version of the language decided upon during the last meeting to add to the appropriate listings.

A hearing test requirement is already listed on some of the acoustic tank tightness test methods, as required by the manufacturer. It is not currently a required component of the NVTTT protocol, but it was suggested it should be considered when this protocol comes up for review by EPA.

SOP Manual- Tim has recently written a draft modification to Policy Memo #3. When approved by the workgroup, it will be updated on the webpage.

File retention- Bill is continuing to go through and scan boxes of workgroup files. To ensure consistent data storage, Bill will provide a procedure for everyone to follow if others decide to upload records.

It was suggested that all unsupported equipment could be removed from the primary listing and moved to a separate "unsupported equipment" section, but the workgroup decided that could make finding the listings more difficult and the equipment is still in use at many sites. No changes were made.

Tim or Curt will be sending around a draft revision to clarify the language associated with the ethanol disclaimers.

The next meeting will be held in New Hampshire. The target time will be September. Numerous dates and locations have been considered by NEIWPCC, but a final date and location have not yet been determined. The 20th anniversary of the NWGLDE will be next year. Tampa was suggested for the spring meeting location. It is anticipated that the anniversary celebration may be a part of the next tanks conference.

Meeting adjourned.