



## Tankamp 2000

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I don't know of anyone who would argue that poorly installed equipment will not work as planned and can fail prematurely. Equipment users, contractors, state regulatory officials and manufacturers have tried numerous ways of teaching correct tank installation. In October, I attended a week-long hands-on training session for field engineers. Tankamp 2000 was the 22nd such camp put on by G.R. (Glen) Marshall of Equiva Services, LLC.

Over the past 15 years there have been numerous innovations in electronic monitoring and leak detection systems, supplementary containment, new types of piping systems and advancements in virtually every aspect of underground tank systems. One aspect of the overall quality of a finished installation is how the equipment was installed.

Where the failure of something is of critical concern, the costs can be totally unacceptable. Such failures could include an unreliable respirator, the structural failure of an airplane at 30,000 feet or a leaking underground fuel storage system within reach of sensitive receptors. Also, remember that there is no single solution for anything. Every design and decision is a collection of compromises. The purpose of Tankamp is to expose engineers and job-related personnel to the following:

- How typical underground storage tank (UST) systems and their components behave and why
- The available hardware and services to address system needs
- The particular solutions that the alliance companies have chosen and why
- How to install such UST systems for the best long-term operation n What to look for during installation and how to interpret it to ensure we are getting what we intended
- How to troubleshoot and repair misbehaving systems or components
- Other available resources and guidance to help you solve UST system problems



**Classroom lectures included refresher course safety, the properties and hazards of gases, components selection, materials compatibility and corporate standards and policies.**

**A considerable amount of time was devoted to preventing the infiltration of water into contained spaces, including containment sumps, penetration fittings, manhole covers, conduit and piping.**



### **Purpose**

The purpose of Tankamp is to review Equiva Engineering's equipment standards, where they came from, what they were intended to accomplish and what might be done in case the company standards could not be achieved. The instructions are designed for a single company and a single, albeit flexible, set of requirements. It also included problems with equipment and possible solutions, refitting existing systems to meet the new standards, and utilization of up-to-date technology.



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### **What I learned. . .**

The classroom discussions were led by Glen Marshall, who shared not only his knowledge of the current standards, but also the evolution in design and the criteria for equipment selection. This background was very valuable to the student body who are a mix of facility engineers, construction engineers, environmental engineers, geohydrologists or hydrogeologists, and anyone else who interfaces with and supports engineers. The experience level of each student varies from virtual "new hires" to those with a full career already under their belt. Topics discussed in the classroom included:

### **Theoretical**

- Properties of various fuel vapors n Converting units of measure
- Guidance on flooding n Surcharge loading on tanks
- Materials strength
- Chemical compatibility
- Establishing blend ratios

### **Design**

- Motor fuel systems overview
- Tank placement on station layouts
- Tank construction design
- Tank float out calculations
- Tank deflection limits
- Fills/Stage I vapor recovery standards
- Delivery transport wheel loading on sump access lids



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## **Construction**

- Tank arrival, handling and inspection
- Precision testing
- Tank hole excavation
- Tank bedding
- Tank anchoring
- Tank top hardware
- Yard piping
- Dispenser islands and containment
- Electrical requirements
- Checklist
- Tank entry
- Inerting
- Access, assessment and sampling



**The most unique feature of Tankamp is the tank pit in which the students set, anchor and partially backfill 12,000-gallon tank. After completion of the backfilling by a contractor, the students installed tank top components, discussed installation problems, tank system upgrading, and oversight requirements.**



I was impressed with the format of Tankamp, but also with the facility. Located at the Xerxes Corporation manufacturing plant in Sequin, Texas, the unique installation training facility is a concrete lined pit capable of holding a 12-foot diameter 30,000-gallon capacity tank at the normal burial depth. The students, myself included, had an opportunity to test and set a 12,000-gallon tank, strap it to deadmen anchors and begin the backfilling. This provided the students with the opportunity of testing for, and finding, voids in their carefully placed backfill and to emphasize the critical backfill support at the bottom of the tank. Although we had all had experience in tank installation, it was stressed that safety is a part of every aspect of the training.



**Actual components used in the current and previous design standards were allowed for hands-on discussion of the fine points of the designs and installation requirements**



## **The end?**

Tankamp 2000 was an invaluable experience for me. Thanks to Glen Marshall, such a training program exists. Based upon the types of questions from field personnel and problems observed during field inspections in the 1980s, Glen decided that a better means was needed to more fully

explain UST specs. He made a 40-minute installation video and gave out over 300 copies free to anyone who asked for one. Unfortunately, he felt that the types of field problems and questions that concerned him hadn't subsided enough. Therefore, he decided that a more positive means of communication and training was necessary, so he came up with the concept of a hands-on school based upon "I heard but I forgot, I saw and I remembered, I did and now I understand, I cannot perform if I do not understand."

Glen Marshall is a staff engineer for Equiva Services, LLC. (Shell Oil + Texaco + Saudi Refining). He is responsible for developing company specifications and standards for retail operating equipment and all tank/piping systems associated with the handling of motor fuels at retail stations. Glen also provides technical support and instruction for the head office retail staff as well as for all engineers in retail field assignments. In January 2001, after 30 years (and 22 Tankamps), Glen Marshall will retire from Equiva, LLC. (See profile in May June 1997 page 13 of PE&T.) While holder of several equipment patents, I consider Tankamp to be his greatest invention. Tankamp 2001 will continue under the direction of Brett Hovland. We wish both of them well.