TANK TALK®

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CHAIRMAN'S CORNER

In 1959, when studying for my MBA, I was taught that the primary objective of any business is **service** to the customer--with collateral objectives of **service** to community and **service** to employees. I was told that the secondary objective of business was profit.

As a young engineer, I had to take this philosophy at face value--in other words, believe it or flunk the course. I spent 19 years building tanks and thought that I was getting satisfaction out of constructing tanks at an economical cost, for people who needed water storage. Needless to say, our firm had to be low bidder in order to get these contracts.

Since founding TANK INDUSTRY CONSULTANTS in 1979, I have learned the true meaning of the management philosophy to which I was exposed more than thirty years ago. When TIC® performs services which tank owners need in such a way that clients want to have us again for their next tank project-- AND they tell others about our capabilities, we then begin to understand the true meaning of the service objective of business. It's great to get new or repeat clients because people feel we will give the best service, not just because we were low bidder or took a job at a break-even price.

I have also learned the personal gratification that comes from providing meaningful work and gainful employment for co-workers. To watch our employees grow and to see their eyes light up when they get that new client or when they receive a letter congratulating them for a job well done has been one of the most rewarding experiences of my life. I am also proud when I see some of the "strange" ideas I've developed over the years become part of industry standards.

Launching TIC was actually an act of serendipity. (Isn't that a great word! My dictionary defines it as "the faculty of making fortunate and unexpected discoveries by accident.") In realigning my career in 1979, people began calling because there was a dearth of knowledge concerning the design, construction, and maintenance of water storage tanks. Even after a year of consulting, I still had no concept of the vast need for these types of services. Now, some thirteen years later, I can see a tremendous need--not just to maintain water storage tanks, but to do so in such a fashion so as to not endanger human health or our fragile environment.

I may be a slow learner, but never before have I felt more like I was realizing and fulfilling the service objective of business than when I get that letter or phone call from a satisfied client--or better yet, hear of a phone call or a letter that one of our staff of fine professionals receives. I take great pride in the growth, not only of TIC, but of the people who make up this organization. It's a great place to work--and fulfilling work to do.

Crone

ZINC-RICH COATINGS

For decades, lead-based paints were used to successfully prevent the corrosion of steel tanks, bridges, and other structures within our infrastructure. Current public focus on the removal of lead-based paints has prompted structure owners and specifiers to speculate about which other coatings may be regulated--or banned--in the future.

A group of interested structure owners, coatings suppliers and specifiers met at the Steel Structures Painting Council (SSPC) Annual Meeting in Long Beach, California last November to discuss the issue of utilizing zinc-rich coatings, and to determine their environmental acceptability. Crone Knoy represents TANK INDUSTRY CONSULTANTS on the committee which was formed to:

- collect information concerning the effect of zinc-rich coatings on the environment.
- determine current and pending state and federal legislation relating to the use of zinc-rich coatings and their effect on the environment.
- prepare a position paper outlining the findings of the committee, possible alternatives to the use of zinc-rich coatings, recommendations regarding the continued use of zinc-rich coatings, and recommendations for SSPC's proactive role in influencing pending legislation.

Due to increased regulatory restraints, there are few good coatings left to protect our valuable infrastructure. The SSPC committee hopes to be able to assess the true health risks associated with the use of zinc-rich coatings, and to get this information into the hands of the federal and state regulatory agencies so they don't blindly establish regulations on a "me too" basis, as seems to have been done in the past.

False rumors concerning the status of zinc coatings are spreading like wildfire. Even some engineers and architects who should be knowledgeable about the status of this coating are under the impression that zinc coatings have been outlawed. **They haven't been.**

It is the philosophy of TANK INDUSTRY CONSULTANTS that in order to properly protect the environment and our valuable infrastructure, we should be applying to all steel structures a coating system that will eliminate the need to abrasive blast to bare steel for many, many years into the future. At this time, zinc-rich primers appear to be the best coating to meet this objective.

If any readers have information concerning zinc coatings that should be relayed to the committee, please send the information to Crone at P.O. Box 24359, Speedway, IN 46224.

AN UPDATE ON AWWA STANDARDS

In an attempt to keep up with the ever-changing needs of the water storage industry, the AWWA Standards are in a constant state of revision and committee discussion. Through the committee and task force involvement of the staff of TANK INDUSTRY CONSULTANTS, TIC® is able to keep abreast with changes in these Standards. The following is a brief update on the status of the AWWA Standards that most directly affect the water storage industry.

AWWA D100

Almost as soon as the last revision of the "AWWA D100 Standard for Welded Steel Tanks for Water Storage" was published in 1984, committee work began on additional revisions. It appears that a consensus will be achieved for publication of a 1992 revision of D100. Major changes or additions anticipated include making the utilization of pseudodynamic design of tanks in earthquake zones 2, 3 and 4 mandatory. Presently, pseudodynamic design is required only in zone 4. The new seismic formulas are based on the latest Uniform Building Code design parameters. Other changes expected will revise and bring clarity to allowable compressive loads in conical and curved sections of steel water storage tanks. Also, allowable tolerances for contour of tanks will be incorporated.

AWWA D102

The D102 Standard is in a state of flux due to the ever-changing technology and regulatory climate within the coatings industry. Many of the regulations which currently come from the federal government are different from, or countermanded by, state and local regulations. An example of the lack of consistency in regulations are regulations concerning zinc. (See Zinc article on page 1 of this Tank Talk®.) At present, Michigan and California are the only states to regulate zinc, while the others are taking a "wait and see" attitude.

Early this summer, the D102 Revision Task Force met to "iron out" a draft that has been submitted to the Steel Tank Standards Committee for balloting. Hopefully, a revised version of D102 will be available to coatings specifiers in the near future.

Composite Tanks

Because of increased interest by tank owners in constructing composite tanks--a steel container on a concrete pedestal or tower--a new committee concerning the design, specification and construction of composite elevated water storage tanks has been established. This committee will attempt to create a standard which will decrease some of the confusion which currently surrounds composite tank projects. With the institution of a composite tank standard, the design criteria for composite tanks will be more clearly defined so that interested tank contractors will be bidding on the same tank design. The standard will assure tank owners that they will be constructing a tank that will be structurally sound and safe for their community. Watch for additional information in future issues of Tank Talk as this new technology and standard unfold.

Committee Meetings

Tank-related committees and task forces that will be meeting at the AWWA Annual Conference in Vancouver, British Columbia in June include:

D103 - Friday, June 19, 9:00 to 11:00 a.m.
Gazebo I Room, Pan Pacific Hotel
Steel Tank Manual - Friday, June 19, 10:00 to 11:00 a.m.
Windsor Room, Hyatt Regency
Composite Tank - Saturday, June 20, 1:30 to 4:30 p.m.
Oxford Room, Hyatt Regency
Steel Tank Standards - Sunday, June 21, 10:00 to 12:00 noon
Mackenzie Room, Waterfront Center Hotel
D100 Task Force - Sunday, June 21, 1:00 to 3:00 p.m.
Windsor Room, Hyatt Regency

Committee and task force meetings are open to all interested parties. Feel free to attend.

SPFA "CENTURY CLUB"

The Steel Plate Fabricators Association (SPFA) has launched a search for steel water storage tanks that are 100-years old or older, and still in service. SPFA wants to honor the tank owners with an engraved plaque designating the tank as a member of the Century Club.

In 1989, SPFA undertook a search for the oldest steel tank still in service in the United States. The 277,000 gallon standpipe in Baraboo, Wisconsin won those honors. It was erected in 1886, put in service in 1887, and has been in use since that date. As a result of that search, eight other tanks were found that have been in use for more than 100 years, and SPFA is confident that there are many more Century Club candidates around the country.

The qualifications for the Century Club are simple. The tank must be 100-years old or older, made of steel, and still in operation. If you have or know of a tank that qualifies for this distinguished honor, write or call SPFA at 2400 South Downing Avenue, Westchester, IL 60154 - 708/562-8750.

TIC SEMINARS

We have just completed another series of Water Storage Tank Design, Construction, and Maintenance seminars. It is always gratifying to see the number of water-industry professionals who have taken time out of their busy schedules to attend the seminars. Two days away from the office is a tremendous commitment, and yet we continue to get comments that indicate that the seminars cover so much information that the course should be extended to three or four days!

Plans are not yet completed for next year's seminars, but we are tentatively planning to host seminars in the following areas:

- Texas
- Orlando, Florida
- Indianapolis, Indiana

To receive advance notification of the seminar dates and locations, please phone or write to TIC's Seminar Coordinator, Linda Reed, at the Headquarters (Speedway) Office. Seminar information will also be included in our next Tank Talk mailing which will be late in 1992.

RESPONSIBILITY FOR WORKER SAFETY ON LEAD PAINT REMOVAL PROJECTS

No sooner has the ink dried on a law or regulation than people start pointing the finger--trying to determine who is and is not responsible for the implementation and enforcement of the ruling. This has certainly been the case on projects involving the removal of lead-based paints. Suddenly there is a question in some people's minds about who is responsible for the safety of workers on these projects. At a recent SSPC Lead Paint Removal Conference in Reston, Virginia, Steve Roetter, President of TANK INDUSTRY CONSULTANTS, presented a viewpoint of this controversy which is based on legal precedent and industry custom. A synopsis of Steve's presentation follows. If you would like a copy of the paper he presented, please write or phone TIC®.

The purpose of this paper is to create thought and discussion about the responsibility for worker health and safety on lead-paint removal projects. The subjects discussed in this paper are legal matters, and as such, will ultimately be decided in the courts on a case-by-case basis.

Legally Mandated Protection

Worker's Compensation is a no-fault insurance system to provide wage replacement, medical, and physical impairment benefits to men and women who suffer work-related injuries or disease. The Worker's Compensation system was developed to protect employers from devastating lawsuits, while at the same time assuring the injured employee of prompt payment of benefits regardless of fault and with a minimum of legal formality.

Introducing third-party responsibility for worker health and safety (whether it be the owner or engineer/specifier) circumvents the intent of the Worker's Compensation system and exposes the third party to huge judgments for injury or accidents over which they have no control. Many times all-encompassing words, or "CYA" wording, in specifications are ridiculed. These phrases are typically not intended to protect engineers/specifiers from their own negligence, but are intended to protect engineers/specifiers from unforeseen incidents or accidents over which they had no--nor should they have had--control. Unfortunately, when unforeseen incidents or accidents occur on the job-site and it is difficult to fix blame, in the absence of contract language clearly setting forth responsibility, the engineer is sometimes held responsible.

The basis of Occupational Safety and Health Act of 1970 can be reduced to the General Duty Clause. This clause states that "Each employer shall furnish to each of his employees employment at a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;..." This law clearly spells out that it is the **employer's** responsibility to provide the workers with a safe working environment.

Historic Precedent

The Engineers Joint Contract Document Committee (EJCDC) is a joint committee of the National Society of Professional Engineers, American Consulting Engineers Council, American Society of Civil Engineers, and Construction Standards Institute. The foundation of this committee was formed in 1963 and prepared a set of Standard Contract Documents for use between the owner and the contractor. These documents have been continually reviewed and revised and have proven to be defendable in court. The EJCDC documents are the most widely used and accepted standard contract documents in the construction industry, and wording from these documents is found in nearly every set of construction documents used. These documents clearly place responsibility for construction methods and job-site safety on the contractor and the contractor alone. This is because the contractor has or should have control of the job-site, has or should have control of his/her employees, and has or should have control of the methods he/she uses. To place responsibility for job-site safety or worker health on any other party is placing responsibility without authority.

The EJCDC documents recognize a trichotomy of authority and responsibility in the customary design and construction relationship. The documents recognize the importance that each of the parties understands what each can and cannot do, and what each party can count on from the other parties. The most common area of confusion on a construction project is typically between the two most active parties--the engineer and contractor. There is no formal written agreement of the responsibilities between the two parties, and as a result, no contractually obligated authority or responsibility exists. It is a very dangerous situation for a party to have responsibility without authority.

Conclusion

Engineers' reluctance to accept any responsibility for job-site safety is based on sound historical precedent. If an engineer assumes responsibility for any aspect of worker protection, he/she may be saddled with unlimited liability for job-site safety--without authority over the contractors' personnel. Engineers/specifiers should not accept the employer's responsibility for worker protection from the hazards of lead any more than they should be responsible for assuring that the workers are not intoxicated on the job, that the workers use all of the safety equipment provided them, that the workers are properly trained, or even that the workers do not break the speed limit on the way to the job-site in the morning. To accept such responsibility would mean shouldering tremendous ethical and financial liability, without any contractual authority over the contractors' employees. The weight of such a liability burden will either drive competent engineers out of business or force them to withdrawal from projects which involve a hazardous material. All that may be left are firms which have nothing to lose.

FOUNDATION INSPECTION

By Bob Sterling

Driving down the highways, people are always noticing the new water tower or the new paint job on some city or town's water tank. Even as a youngster, I would associate the water towers with the town. Most of those tanks had been there forever and are still there because they were well built and had a good foundation. I guess it's like my Grandpa Sterling used to say when someone would point out his size 16 shoe..."I'd rather have a foundation like a court house than one like an outhouse."

The foundation is one of the most important parts in the construction of a new water storage tank. Yet many times owners tell us that there is no need for us to send one of our trained technicians to oversee the concrete pour--they have someone they can send out to watch. Unfortunately, in many cases, the owner's representative doesn't understand what to look for.

The basis for a good foundation starts with a good geotechnical report to determine the type of foundation that will be best for your new tank project. The best foundation may be footers with piers...or perhaps piling will be required. A good geotechnical report will help in selecting the best foundation type and depth to assure a sound structural basis for your new water tank. The report should predict any anticipated settlement of the structure and should relate any anticipated site-related problems during construction.

Other things that should be monitored once the digging starts include proper shoring of the excavation to prevent cave in. The soils laboratory should verify the allowable soil bearing pressure once the foundations are excavated. Make sure the correct grade has been reached and that there is a solid, level bottom. A mud seal slab of lean-mix concrete should be poured. This slab seal can "save the day" if it begins to rain before or during the concrete pour. With the seal slab in place, a sump pump can be placed in the hole to dry it out--and the work can resume in a matter of minutes.

The next step in constructing a foundation will be assembling the form work and placing the rebar. At this stage, make sure there is the allowable clearance between the reinforcing steel and the forms, exposed surfaces and the surface in contact with the earth.

When you have made sure everything is ready--the grade is correct, the anchor bolt placement is correct, and all of the other factors that go into a solid foundation have been verified--it's time to pour the concrete. Test cylinders of the concrete should be taken. The storage location for the test cylinders should provide satisfactory moisture conditions and controlled temperature. The test cylinders should not be transported during the initial curing period. Test cylinders taken after approximately 1/8th of the concrete truck's load has been discharged give a more representative sample of the concrete than the initial material that is poured. Slump tests should also be taken and documented.

When making large pours, it is necessary to sequence the pouring operations so that the concrete does not set up prior to placing the fresh concrete adjacent to it, creating "cold joints." The concrete should not be dropped into the foundation from excessive heights. After the concrete is placed, it should be vibrated with a mechanical vibrator to assure even distribution of the material. Mechanical vibrators should not be used to move the concrete from one location to another. When the concrete pour is completed, the form work should be checked for stability, and the positioning of the anchor bolts verified. Even proper removal of the forms and shores should be verified to assure that any damaged concrete surfaces are properly repaired and all form tie holes are filled in.

Not only is quality construction necessary for a structurally sound foundation, but the quality of finishing and curing will affect the ability of the concrete to survive weathering and remain in good condition. If the foundation construction and concrete pour have been properly inspected by an unbiased, knowledgeable individual, you will have a foundation that will support your water storage tanks for generations to come.

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