



*Published as an informational service to Owners and Engineers of Steel Water Storage Tanks by
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EDITOR'S CORNER

Time goes fast when you are having fun and are over fifty. A year has gone by since the last TANK TALK. It went out as we were leaving for Denver AWWA Annual Conference, and here we are headed for Kansas City for the '87 Conference.

To those of you who are reading your first Tank Talk and are perhaps unfamiliar with TIC, we are an engineering firm specializing in the evaluation of and specifications for existing tanks, and the inspection of work done on those tanks. We also do design, specification and inspection work on new tanks.

Last year I preached (do I dare use that word any more?) about firms using similar names and our artwork logo, apparently in an imitation of our firm. Then I stated that we had no branch offices. Now, I want all to know that TIC does have a Southwest Regional Engineering Office manned by Don Stites. Don is a Registered Professional Engineer in seven states. He joined us in October of 1985 after 16 years in engineering and construction positions with two large steel tank construction firms. In the fall of 1986, Don and his wife Barb, who is Office Manager, opened the first official TIC regional office at 7211 Regency Square Boulevard, Houston, TX 77036 - 713/789-0989. We have already moved to larger quarters in the same building, and are pleased to report that Texans have responded well to our services.

Within the next few months Ed Knoy is scheduled to establish a Mid-Atlantic Coast Regional Inspection Office. Details will be announced later. It will become a full fledged engineering office when Ed becomes a P.E. in 1988. He just received his Master of Science in Mechanical Engineering from Rose-Hulman Institute of Technology in Terre Haute, Indiana. His undergraduate Civil Engineering degree is from Duke University. Both studies concentrated heavily on steel plate design and analysis.

Also added to the TIC staff since the last edition of Tank Talk is Todd Moore. Todd is a Structural Engineer with a B.S. in Civil Engineering from the University of Notre Dame. He is about to receive his Master of Science in Civil Engineering from Rose-Hulman (where else?).

Tim Knoy has returned to TIC, serving in field and support functions. Mike Doolittle has successfully completed the National Association of Corrosion Engineers Certified Coating Inspector Program. Dan Bickel has attended Session 1 and is on his way to certification. Steve Roetter, now our

Engineering Marketing Manager, is half way through his MBA program at Indiana University.

Again, thanks to all our friends, clients, and colleagues in the industry. Without your blessings, we would not be here.

THE ENVIRONMENT

About a year ago, I promised that the next TANK TALK would feature environmental concerns of tank maintenance. If there ever is an article that will be obsolete before it is completed, this is probably the one.

I am defining the environment in the largest connotation possible -- the immediate area surrounding the structure, the total community or geographic area, and the working environment of the workers and inspectors - including the health and the aesthetic effects on the environment. Primary emphasis in this article is being placed on the area surrounding the tank and how it is controlled by regulation and neighborhood pressures. What are some of the things that cause problems?

- ▶ Fugitive dust
- ▶ Free silica
- ▶ Lead based coating residue
- ▶ Volatile Organic Compounds
- ▶ Paint overspray or droplets

For years the greatest environmental problems we thought we had to deal with during tank painting were the nuisance of the sandblasting dust and paint damage claims due to overspray or drops from rollers and brushes. We even specified that white silica sand be used for exterior blast cleaning of steel to minimize the probability of nuisance claims from neighboring property owners. We stopped this a few years ago when we found that lawsuits cropped up all over the country concerning silicosis (a disease of the lungs reportedly caused by small particles of "free silica" being inhaled). Not only were adjacent homeowners suing, but workers were suing sand suppliers and other third parties.

Alternative materials such as power plant boiler coal slag, metal mining slag, and other by-product materials have been replacing silica sand. The substitution of other abrasives for sand has lead to other problems:

- ▶ Black or dark colored abrasives are more noticeable when they land on adjacent property.
- ▶ Black or dark colored abrasives cause the abrasive blasted steel to appear darker than the visual standards developed with silica sand.
- ▶ Slag abrasives may contain contaminants (such as salts or reactive metals) which may be det-

rimental to the performance of the coating applied to the steel.

- ▶ Slag abrasives may contain other elements or compounds which are harmful to the workers.

- ▶ The removal of the old coatings, rust, or mill scale may occur without imparting the proper profile to the steel.

Other Problems. Besides the abrasive, there is a big question as to the effect on the environment of the old coatings which are removed in the abrasive blasting process. The present EPA standard states that when a standard extraction procedure is performed on the solid waste from blasting operations, and there is more than 5 ppm of leachable lead in the debris; it is considered a hazardous waste, and must be disposed of accordingly. The question then arises as to who has title to this hazardous waste -- the owner, or the contractor?

Options. Many options have been tried and are being developed. High pressure water blasting with and without abrasives, manufactured abrasives, and carbon dioxide pellets -- you name it. Will the problem be solved? Yes, but only with time and money. The money appears to have to come from within the free enterprise system, and the size of the market is relatively small to support independent research.

V.O.C.'s. Another area which is changing the coating materials being specified concerns the requirements for the limits on Volatile Organic Compounds which may be released into the atmosphere during coating application. These restrictions, along with the requirements to meet EPA Clean Drinking Water Standards for organic compounds leaching from the interior tank coatings, will undoubtedly lead to new formulations in coatings. Approvals for direct and indirect water additives are presently under a new program of the National Sanitation Foundation in Ann Arbor, MI. I am now representing AWWA on the NSF Protective Coatings Task Force.

DIVING INSPECTIONS

A question which comes up frequently, is whether to perform drain-down or diving inspections in tanks. We perform both types, and we have divers with PADI certification who are Registered Professional and Structural Engineers, NACE Certified Coating Inspectors, and experienced technicians. We think that we have the most experienced tank engineering and inspection diving teams in America. BUT, we don't promote the performance of diving inspections unless there is absolutely no way the tank can be drained, or if it is required to dive to locate leaks in concrete tanks. In addition, infiltration into or potential collapse of underground concrete tanks may make diving inspections necessary. There are many diving inspectors who are quite experienced in diving, but have limited tank experience. Many of these divers are using the removal of sludge at a price per inch to get price increases after getting into the tank. Our experience with diving inspections has been:

- ▶ Even if the tank does not have to be drained, there is a need to close and lock out all valves and piping leading to and from the tank. Divers have been sucked into piping and been disemboweled when adequate lockout provisions have not been made. Therefore, the tank may not actually be in service during the inspection.

- ▶ It is difficult to give an opinion of the corrosion and coating condition patterns in a tank, as the diver can see only a few feet of surface at a time, and cannot develop a feel for the overall condition of a tank until all the pieces of data are put together (if then).

- ▶ Tanks should have all surfaces washed down and disinfected periodically. Merely removing sludge with a sweeping attachment does not accomplish this.

- ▶ Since the inspector comes in contact with the potable water, the highest degree of sanitation of the diver's suit and equipment is required. In a drain down inspection, the surfaces contacted can be disinfected after the inspection.

- ▶ The presence of cathodic protection anodes, interior piping, baffles, and radial rods may make a diving inspection impractical.

As I said, we do perform diving inspections, but we want the tank owner to be aware of the additional costs and limitations of this type service.

We have not found that draining a water tank for inspection causes premature coating failure. This is apparently true for some of the epoxy-phenolic coatings used in nuclear vessels, but has not been found by our firm to be a problem with the coatings in potable water tanks.

LEARNING OPPORTUNITIES

See us at TIC's Booth #1533 at AWWA in Kansas City. In addition, I'll talk about "Assuring Quality Application of Protective Coatings" and Dave Cull, our Vice President of Engineering will tell about "Water Tanks for the 80's and Beyond" on June 17.

On Nov. 2 at the Steel Structures Painting Council (SSPC) Annual Meeting at Orlando, I will be leading a two hour seminar on "Tank Coatings for Potable Water and the Presence of Organic Compounds". If you are a user of coatings you may register for \$100 before Aug. 15 for the full four day program.

The TIC Maintenance and New Tank Seminars will take on a new look this year. A two day format on New Tank Construction and Maintenance of Existing Tanks will replace the one day New Tank and the two day Tank Maintenance seminars. There will not be a decrease in content -- just a more compact method of presentation. Proposed locations are Houston, Washington, DC and Indianapolis.

For information concerning any of the above educational opportunities or to be placed on the TANK TALK mailing list, please call or write.