Tank Talk©

SUMMER 2019 TANK TALK® 45

INSIDE THIS ISSUE OF TANK TALK

Tank Industry Consultants

7740 West New York Street
Indianapolis, Indiana 46214
(317) 271-3100 (phone)

Pittsburgh, PA
El Paso, TX
San Luis Obispo, CA

www.TankIndustry.com

TIC Celebrates 40 Years!

by: Gregory R. "Chip" Stein, P.E., Managing Principal

Tank Industry Consultants is celebrating its 40th Anniversary – WOW! It has been said that you should never look back…that's not the direction you are going. But at a time like this, it seems not just right, but mandatory that we look at where we have been in order to move forward into the future.

Forty years is a long time for a company to be in business. I've been with TIC for *only* 31 of those years, but I remember well the stories of the early years at TIC – Crone and Cindy Knoy working out of their home – Crone climbing tanks during the day and writing reports on Cindy's old Royal manual typewriter at night. They were a two-person operation except when Crone's son, Ed, was out of school for summer breaks and accompanied his dad to the tank sites. It's not an exaggeration to say that Crone and Cindy ate, lived, and breathed TIC. Crone used to say that TIC was founded in response to the water industry's need for (1) qualified, unbiased evaluation of water storage tanks, and (2) the specialized professional engineering knowledge and expertise necessary to properly design, construct, and maintain water storage tanks in order to maximize their service life. That is the foundation upon which TIC was built.

When I joined TIC in April of 1988, the Knoys had just moved out of their dining room and into an office in the USAC building on West 16th Street in Speedway, Indiana. My first week there, I was sent out to evaluate four tanks in Montana with a real-life "tankie," Joe Norvell. I have never been so dirty and tired as I was after climbing into those wax-grease tanks, but Crone believed in learning tanks from the ground up, and believe me, washing out wax-grease tanks is the bottom of the bottom.

But I digress...from TIC's founding in 1979 when Crone performed tank evaluations for a few area utilities, TIC grew in size and reach. In 1980 TIC added clients in Michigan, Georgia, Wisconsin, Ohio, Maryland, and Virginia, and designed a new tank for the Town of Batesville, Indiana. 1985 was a year of firsts for TIC – first TIC Tank Maintenance Seminar, first expert opinion case, and first dive evaluation. In 1986, Crone was charged with developing and putting on nationwide Steel Water Tank Seminars for the Steel Fabricators Association, TIC wrote a Tank Manual for the US Navy, and conducted a failure analysis for a tank collapse in Radcliff, Kentucky. That was also the year we inspected our first Navy tanks, which were located at NEC Lakehurst, New Jersey.

The ensuing years saw the continued growth of TIC and the expansion of our tank engineering and inspection expertise. As the industry changed and technology evolved, TIC matched it step-for-step. TIC has not just seen, but led the way as industry standards have been developed, refined, and revised. We were instrumental in the development of an AWWA standard for

Continued on Page 3

Complacency by the Numbers

Spotlight on Safety

by: Shelley Brewer, DrPH, CSP, Safety Director

The Safety Triangle is used daily in workplaces to report safety results to both internal and external customers. The triangle is a standard tool in reporting metrics despite many companies not understanding its foundation. The triangle was first proposed by Herbert Heinrich in an article published in 1931 "Accident Prevention: A Scientific Approach." The article presented results of a large insurance company's accident data analysis conducted by Heinrich. The accident ratio presented as a triangle by Heinrich was a new concept and not widely used. Heinrich's work became better known when the work was replicated and further developed by Frank E. Bird in the 1970s. The work resulted in what is commonly referred to as Heinrich's Ratio or Accident Triangle. The triangle represents the expected ratio between fatal accidents, accidents, injuries and minor incidents as 1 – 29 – 300 (Figure 1).

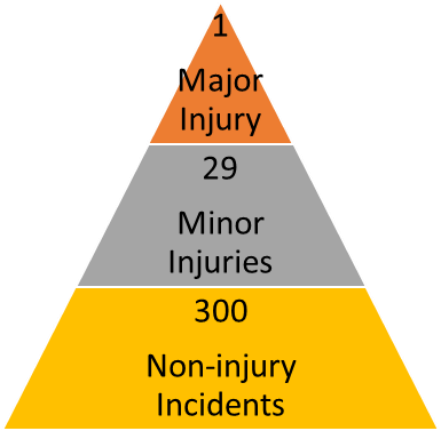

Figure 1

Employers have adapted the Accident Triangle, as it is now more commonly called, to include measures for both leading indicators (incidents involving unsafe behaviors or unsafe conditions, near miss incidents, and HiPo – a class of near-miss incidents that signifies potential severity), and lagging indicators (incidents requiring first aid, recordable incidents, restricted or lost work incidents, and fatalities) (Figure 2).

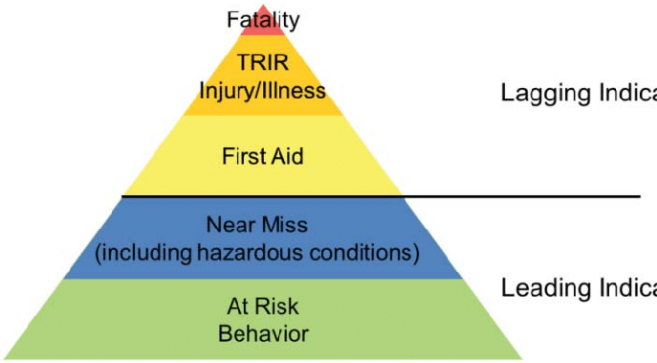

Figure 2

However, the question is whether it is a valid tool to use when analyzing and trying to predict incident occurrence? Researchers have examined this question and have come up with conflicting outcomes. The data seems to reflect that the tool's usefulness is dependent on an understanding of the severity of incidents versus frequency of incidents in the industry being evaluated. With this in mind, let's discuss how we can effectively use this tool when considering tank-related work.

Frequency

The most common injuries occur in the following categories when working on tanks: falls on the same level, bruises/ contusions/lacerations, and foreign bodies piercing body parts. When looking at these types of injuries, one could argue that all three could result in a very serious injury. The question is how likely is it that these incident classifications will result in a serious incident or a fatality. A hand tool used incorrectly that results in a smashed finger is not likely to result in a fatality; even if it happens frequently. The injury mechanism can be repeated several times and the injury severity range will likely stay between a near miss and a recordable incident. Falls from the same level can result in serious injuries, but are unlikely to lead to a fatality. These examples dispute Heinrich's conclusion of "predominant causes of no-injury accidents are, in average cases, identical with the predominant causes of major injuries and incidentally of minor injuries as well."

Severity

High-severity injury exposures that are prevalent in the tank industry are falls from heights and those posed by confined space entry. The severity of consequences from these exposures must be evaluated and controlled without relying on the concept of Heinrich's Ratio. High-hazard work, such as working at heights, can result in serious injuries and fatalities, regardless if an organization has been incident free for two years or more. Incidents that result in catastrophic losses are often the result of a series of failures involving both management and employees. A quote from the 2010 Deep Water Horizon Accident Investigation Report, prepared following fatal explosions and fire on an oil rig supports this concept, it reads, "The team did not identify any single action or inaction that caused this incident. Rather, a complex and interlinked series of mechanical failures, human judgments, engineering design, operational implementation and team interfaces came together to allow the initiation and escalation of the accident."

Continued on Page 3

Noted Safety Professional Joins TIC
Shelley Brewer, DrPH, CSP

Shelley Brewer, noted industry safety professional, has joined TIC as Safety Director. Shelley has more than 25 years' experience working with both private and public sector clients initiating and implementing safety and regulatory programs for domestic and international projects.

Shelley has a Doctor of Public Health (DrPH) in Occupational Injury and Illness Prevention Policy and Practice from the University of Texas; a Master of Science in Environmental Management from the University of Houston Clear Lake; and a Bachelor of Science in Safety Management from Indiana State University. She is a Certified Safety Professional (CSP) and a member of the American Society of Safety Engineers (ASSE). Shelley has been published in peer-reviewed publications including the Journal of Occupational and Environmental Medicine, Healthcare Management Review, and the Journal of Occupational Rehabilitation.

Brewer@TankIndustry.com
317/271-3100
7740 West New York Street
Indianapolis, IN 46214

Safety Spotlight - Continued from Page 2

With today's emphasis on 0 injuries, companies often focus heavily on behavioral safety and neglect investing adequate resources in engineering, technical, and organizational improvements. Placing too much emphasis on the expected ratio of incidents can lead organizations away from thorough risk evaluations and into complacency. Companies have the potential for a fatality every day if they have employees performing a high-risk activity, such as working at heights.

Putting It All Together

Management often feels as though they were blindsided following an incident. A disconnect occurs because too much emphasis is placed on past performance, as represented in the Accident Triangle, instead of discussing risks and processes. Solely focusing on past performance can lead to detrimental outcomes.

Injuries are rare events and rare events are the hardest to predict. The key is to integrate tools such as the Accident Triangle with ongoing risk evaluations that identify incident frequency and severity potential. Integrating these tools will help companies ward off complacency in safety by having on-going conversations about risk.

*Additional information on reference sources available upon request.

TIC Celebrates 40 Years! Continued from Page 1

composite elevated tanks, and the overhaul of structural requirements contained in AWWA D100, AWWA's standard for tank construction. I am chairing the AWWA committee charged with revamping the AWWA standard for tank inspection, AWWA D101, which was last revised in 1953. Following in the footsteps of Crone Knoy and Steve Meier, I am now also chairing the AWWA Steel and Composite Tank Committee.

Recent years have seen the retirement of several key members of TIC's engineering and management teams, but on the bright side, we are continually adding sharp, dedicated new team members to carry on the traditions of TIC. Steve Meier, though retired, remains on the company Board of Directors to offer his vast knowledge as we continue into the future.

This milestone presents all of us at TIC an opportunity to reflect on our legacy and to focus on the future. TIC's emphasis is on asset management, utility risk and resiliency, and water quality. Customer satisfaction and engineering excellence are the bedrock of our company. Our 40th Anniversary offers us the chance to revisit our core values and our founding principles, and use these tools to continue to assist tank owners in providing clean, abundant water to the populations they serve in the future.

Thanks for the memories!
Here's to many more!

Chip Stein Appointed Chair of AWWA Steel and Composite Tank Committee

The American Water Works Association (AWWA) Standards Council has appointed Gregory R. "Chip" Stein, P.E., chair of the AWWA Steel and Composite Tank Committee. Stein, a thirty-one year veteran of the storage tank industry, has served as interim chair of the committee since the retirement of Stephen W. Meier, P.E., S.E., and was vice chair of the committee under Mr. Meier. In his capacity as chair, Mr. Stein will oversee all standards development and revision processes for all steel and composite tank standards, including D100 (design and construction), D101 (tank inspection), D102 (coatings), D103 (bolted tanks), D104 (impressed current cathodic protection), D106 (sacrificial anode cathodic protection systems), D107 (composite elevated tanks), D108 (aluminum dome roofs), M42 (Tank Manual), Standard for General Requirements for Water Tanks, the Steel Tank Asset Management Guide, and the proposed new stainless steel bolted tank standard. Mr. Stein also chairs the D101 Standard Subcommittee for the Inspection of Water Tanks and Related Facilities and the AWWA M42 Steel Water-Storage Tanks Manual of Water Supply Practices revision task forces.

In announcing the appointment, Franklin S. Kurtz, P.E., AWWA Standards Engineer remarked "Throughout this process you (Stein) have enjoyed overwhelming support from your fellow committee members, the Standards Council, and the AWWA standards staff, not to mention the enthusiastic endorsement from Steve Meier. You have earned the full confidence and respect from all involved. I know you'll do a great job. Congratulations, and thank you for taking on this responsibility. I look forward to working with you over the next several years."

Tank Talk® is published as an informational resource for the storage tank industry. For past issues of Tank Talk, or to learn more about the services offered by TIC, please contact us. Articles from previous issues of Tank Talk can be found on our web site.

www.TankIndustry.com

Email: Snodgrass@TankIndustry.com

Offices Nationwide

Tank Industry Consultants
7740 West New York Street
Indianapolis, IN 46214