State and Federal Safety Obstructions on Water Towers

The water tower industry is not without its safety risks. Thankfully both State and Federal regulations exist to reduce hazards on towers.

Workers who maintain and clean these vessels perform a critical job for stored drinking water per AWWA and State standards. Although State and Federal safety codes exist to mitigate workplace injury and death, most water towers are observed having current violations. Most of these violations are related to the attachment of communications cables to the access ladders of these towers. The disregard for these safety violations has gone under-reported or ignored for decades. The recent introduction of a new technology, magnetic cable bracketing, can bring towers into safety compliance.

As many as 2,000 towers are inspected every year within our state, however many inspections fail to report the existence of State and Federal safety code violations. Many times, this is the result of under-trained crews not fully applying State, OSHA and AWWA inspection criteria. Following are two unfortunate effects of under-reporting or ignoring these safety code violations. First, the tower inspector re-exposes other crews to safety violations during the next inspection. Secondly, the tower owner, such as a City or PWSD, is not made aware of the code violations existing on their tower. Tower inspection reports are typically filed in the municipal office and made available upon request. When State field inspector reviews the inspection report, they may use the reports de-facto, observing only the deficiencies which are outlined in the report. This scenario occurs frequently in our profession and may explain why water towers exist with code violations. Let us now define a primary cause of these code violations.

Photo 1 (a cellular company has installed cables on the side and face of ladder)

Photo 2 (access ladder with violating cable/conduit on stand-off bracket)

A high percentage of water towers have cables or conduit fastened directly to access ladders. Devices installed on any portion of a ladder may be defined by OSHA as safety obstructions, thus violating State and Federal regulations (see Table 1). Poor installations range from telemetry cables to bundles of cellular cable fastened to areas of ladder (see Photo 1). Per code outlined in Table 1, the welded ladder stand-off brackets may be regarded as an integral component to the ladder, rendering the area equivalent to obstruction codes (see Photo 2). Further addressing stand-off tab areas, OSHA codes further define a seven inch obstruction free zone around the ladder structure.

Perhaps revolutionary in thought and supported by code application, the ubiquitous 115 Volt power cable, surrounded by rigid conduit, is no longer appropriate fastened to the stand-off tabs of a ladder. This power cable, when only used for aviation obstruction warning lanterns may be removed and replaced with an FAA equivalent magnetically attached solar powered LED lantern.

Federal: OSHA Law
29 CFR 1910.27 (ii-iv 2,4), (5 vi) **29 CFR 1926.1053** (11), (A)(13), (a)(14), (a)(15), (a)(17), (a)(21)(iv), (b)(4) **OSHA CFR 1910 Subpart D:** **OSHA CFR 1910.23** (5)(i), (6)

Table 1

States and municipalities do not fall under the jurisdiction oversight of OSHA, however states must form and adhere to a state safety plan equal to or greater than safety laws defined by OSHA. In the occurrence of an injury or death on a water tower, a municipality may be subject to inspection and fine by OSHA or the state. Therefore, municipalities should adhere to both the state and OSHA safety regulations. Many municipalities are choosing to address these code deficiencies prior to the issuance of a violation or accident by removing cable obstructions from tower ladders. .

Two traditional methods for moving obstructions from ladders, described below, have been regarded as prohibitively expensive and damaging to coatings. A newly patented magnetic product offers tower owners the advantage of budget value, protection to coatings and removability.

1. **(Traditional) Cluster Brackets**
   Welding of cluster-brackets onto the tower leg and sidewall. Includes grinding of coatings near the weld areas, re-coating and inspections. Produces burned coatings under the weld-area which is difficult to repair. Costly and requires specialized equipment and certification. Tower welding has led to damaged coatings and tower fires.

2. **(Traditional) Straps and Bands**
   Stainless steel and galvanized bands are known to cause damage and corrosion to water tower surfaces. This type of damage occurs when the straps/bands loosen over time and abrade the coatings away, causing corrosion. It is very difficult to repair this type of damage.

3. **Magnetic Bracketing System (MBS)**
   This method is new to most tower owners and has been in use since 2011, with over 7,000 brackets installed. High strength rare-Earth magnetic fixtures are capable of holding a wide range of cables, including a cellular and wireless cable bundles. They have survived yearly cycles of rain and snow while also having proven successful against tornado force winds and. An important aspect is the ability of attaching to any diameter of steel curvature, convex or concave. Fully adjustable and removable, useful during tower maintenance renovations.

There is now a best-practice solution for updating the safety of towers with the use of these Magnetic Bracket Systems.

The combination of field experience and engineering has produced a solution which captures the power of magnetics and regulatory compliance. There is now a best-practice solution for municipality responsibility to workplace safety and water tower condition integrity.

(Each) State's own plan, which must be approved by the U.S. Department of Labor. Each State-plan must include coverage of public employees of the State, and it must be "at least as effective" as Federal OSHA's protection of private sector employees. -Richard E. Fairfax, DirectorDirectorate of Enforcement Programs, OSHA

www.osha.gov

Photo 3 (Estech LLC's Magnetic Bracketing System)

Photo 4 (Estech LLC Magnetic Bracketing System installed on water tower)

AWWA Article Author:

Eric Stechmann
CEO, Civil Engineer, NACE #48963

Estech LLC Magnetic Bracketing Systems
Liberty, Missouri

Patent #9,252,581

Estech LLC /estechinbox@gmail.com / 816 529 8459 / www.estechinnovations.com