EXTENDING YOUR STEEL WATER TANK'S LIFE THROUGH PROPER MAINTENANCE

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Eight years ago, the village of Sea Cliff, New York lost a local landmark when the old water was dismantled (Griffin, 2010). The standpipe was built for $6,849 in 1893, with an additional $500 spent to add a roof in 1935. It stood tall in the Long Island village for 117 years, making it one of the oldest standpipes in the nation when it was torn down.

Before it was dismantled, the Sea Cliff structure was one of about 20 water tanks named to the Steel Water Pipe Century Club. Tank owners that can verify their tank's age are eligible to be inducted into the club, which is overseen by the Steel Tank Institute. The oldest member of the club is a standpipe that was erected in Easton, Maryland in 1886.

The lifespan of a water storage tank, under the right conditions, can span a century or more. Of course, not all steel tanks last 100 years but with proper maintenance it is possible.

COATINGS AND LININGS

Water towers are local landmarks, easily recognizable from a distance. The towering tanks are among the first objects seen, so they can help shape people's first impression of a place. A rust-streaked tank makes a bad first impression.

Acidic rainwater, industrial pollutants, and bird droppings wear down a tank's exterior and can make it vulnerable to corrosion. Not only does a fresh coat of paint spruce up a tank's appearance, it helps guard against corrosion.

Environmentally-friendly coatings can be applied to tanks, often with minimal or no abrasive blasting prior to application, that won't contribute to air contamination.

Routine observation checks by tank operators are the best way to prevent exterior corrosion. Special attention should be paid to anchor bolts and nuts, rods, and rod pins and clevises – all of which are prone to rust. A little rust isn't necessarily an issue. However, if water is leaking from a rust spot, that is a sign of a bigger problem.

Ever heard the expression, "out of sight, out of mind?" Forget that phrase when thinking about interior tank maintenance. Forgoing interior maintenance and repairs jeopardizes the integrity of the tank and could be costly for the tank owner.

The inside of the tank is in constant contact with water. Galvanic erosion occurs when two different metals interact with an electrolyte, like water. For instance, a tank's container and an interior ladder are sometimes different types of steel. The container and ladder are brought into electric contact underwater, so that common setup is ripe for corrosion.

Tanks can be lined so that the steel doesn't interact with water. Liners do wear out with age, eliminating the barrier between water and steel. Cancerous pits may develop that weaken the steel and cause leaks. Replacing the liner helps prevent this from happening. Cathodic protection adds another layer of defense against corrosion.

INSPECTIONS AND CLEANOUTS

Inspecting tanks regularly can help keep them in good shape and extend their lifespan. The National Fire Protection Association recommends that tanks with cathodic protection be inspected every five years, while those without it should be checked at three-year intervals. Some tanks should be inspected annually or biannually if warranted, such as if there are repeated sediment issues.

Tanks might not vary too much from one year to the next, but if several years go by without a tank being inspected, what might have been a minor problem that was simple to fix turns in to expensive repairs. Over time, the paint will deteriorate, develop holidays, and then flake off, leaving the tank vulnerable to corrosion. Through regular inspections, paint deterioration can be identified early on as a problem and fixed with spot touch-ups, prolonging coatings' life prior to having to add a new coat of paint.

Dry, remote vehicle and dive are three different types of inspections. Dry inspections require a tank to be drained, whereas remote vehicle and dive inspections can be performed without

emptying the tank. Divers and robots must be disinfected before they enter the tank to perform inspections.

If the ROVs or divers find something critical during their inspections, like a paint failure or if the ultrasonic testing shows the steel is thin in some places, the tank would then need to be taken out of service so that repairs could be performed. If taking your tank out of service creates a usage or pressure issue, then a temporary tank can be brought in to supply water while the tank is being repaired.

Inspections generally start from the ground up, beginning with the foundations, then up to the legs, rods, struts, and ladder.

Inspections should also include but not be limited to ultrasonic testing, which detects the thickness of steel; dry fill thickness tests determine how thick the paint is, and crosshatch tests measure coating adhesion. All of these are considered spot checks and will give a general idea of the condition of the tank.

STANDARDS AND CODES

Keeping tanks in compliance means meeting codes and standards, which are regularly updated and will change several times over the course of a tank's lifespan. Improper ventilation is one of the most common code violations (Henderson, 2014). Missing screens on vents can leave room for critters to crawl or slither their way into the tank, contaminating the water.

Most reputable inspectors adhere to AWWA, OSHA and NFPA standards. Tank owners should be mindful of AWWA M42 2013 Periodic Inspection and AWWA M42 2013 Tank Washouts. The former standard states that "the tank should be inspected at least once every 3 to 5 years or as required by state regulatory agencies." The latter states that "tanks should be washed out and inspected at least once every three years, and where water supplies have sediment problems, annual washouts are recommended."

MODIFICATIONS

Sometimes a tank's foundation is sturdy, and its legs are sound, but the tank shell has decayed beyond repair - usually due to lack of maintenance. That doesn't necessarily mean the tank needs to be replaced. In fact, it might be more economical to replace the container instead of the entire tank.

Is water pressure a problem because the tanks are at different elevations? It is possible to raise or lower tanks as needed so that the water pressure is consistent throughout a system. Like with container replacement, this might be a cheaper option than building a new tank.

There are many options when it comes to maintaining tanks. They all have the same end goal – keeping the tank operational. If regular upkeep is performed, the tank just may last several decades or even a century. 💧💧💧

REFERENCES

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