

# TANKS & STORAGE FACILITIES

## “PRESERVING STRUCTURES AND WATER QUALITY”

Vol. 3 Issue 1

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### Extech Goes to the Magic Kingdom

In September of 2004, an Extech crew headed to Orlando, Florida to inspect six water storage tanks for Mickey and the gang at Disney. The engineers at Reedy Creek Energy Services had the opportunity to see our ROV inspection and cleaning technology earlier that year at a nearby city in Florida. Seeing the equipment and how the crew performed *first hand* made such a favorable impression that they decided to have us come to Disney World and inspect their tanks.



Five of the tanks inspected with the TankRover were standard potable ground reservoirs that ranged in size from 1 to 2 million gallons. The sixth tank was a very special 5 million gallon tank used for the storage of chilled water. Reedy Creek and Disney are properly concerned with the quality of their tank inspections but also with system and personnel safety as well. They had no interest in utilizing divers for this work and preferred not to drain these tanks. Extech was able to inspect all six tanks within three days without any interruption to their service or risky confined space entry the reservoirs remained full and online throughout the inspections.

The chilled water tank posed many unusual challenges for an *online* inspection. Due to its specialized purpose, it has many complex internal structural components. Since the design

is proprietary, we cannot describe it in detail, but suffice it to say that a free flying ROV offered the best method to evaluate the interior conditions without impacting the day-to-day function of the tank. The low temperature of the water makes it very difficult for divers to spend very much time inside. Also, since it is a key component for the park’s cooling system, the engineers are reluctant to take it off line for any length of time.

Reedy Creek now has all of the information they need to plan for maintenance painting, cleaning and future inspections.

### Water Treatment Chemical Storage Tanks

The water industry uses numerous chemicals for treating drinking water that are stored in bulk quantities. Chemicals such as sodium hydroxide, hydrofluoric silicic acid, ferric chloride, ammonia, etc are stored in steel or fiberglass tanks. Failure of these tanks can mean significant safety hazards to employees, damage to equipment and building structures, leakage to the environment and the need for emergency expensive temporary storage. Storage of these chemicals is typically regulated by various federal, state and county agencies.

The primary standard that addresses bulk storage tanks is API-650 (steel tanks) and ANSI (fiberglass tanks). These standards described how the tanks are to be constructed and how piping and secondary containment should be configured.

API-653 is the Inspection standard written for atmospheric tanks constructed in accordance with API-650. Under API-653 tank owners are required to have in place a tank inspection program to monitor tank conditions and prevent corrosion failures. In general chemical storage tanks should be inspected every five years unless a specific corrosion rate has been determined for the specific tank and the specific chemical it contains. Once an inspection interval has been determined it does not need to change unless there is a “change in service”. A change in service would be a change in chemical, stored, major modification to the tank, change in pressure or change in temperature of the product.

Inspections of chemical storage tanks can be in-service or out of service depending on the known corrosion rate for the chemical and the tank condition. Out of service inspections require the tank to be emptied and a confined space entry. In-service inspections are conducted with the tank full and from the exterior only.



Typically an out of service inspection would cover the following observations and measurements;

- Exterior steel/FRP condition,
- Condition of any exterior coating
- Vent and fill pipe sizes
- Hatch covers
- Overflow pipes
- Secondary containment
- Interior coating or lining condition
- Interior metal or FRP condition
- Depth of pitting
- Ultrasonic metal thickness measurement
- Tank supports and saddles
- Connected piping
- Sight glasses
- Low or high voltage spark testing for linings
- Hardness testing for rubber linings or FRP materials

Tank condition must be thoroughly documented by means of notes, diagrams and digital pictures so that historical trending can be done from inspection to inspection. Proper documentation allows the inspector to establish the appropriate inspection interval and to possibly allow for future in-service inspections.

API-653 Inspections must be conducted by an inspector certified to the API-653 standard. This is a specific standard and the inspector should have proof of certification. In addition to the inspection certification the inspector should be qualified in the evaluation of

protective coatings such as a NACE Coating Inspector and the use of various ASNT non-destructive testing methods such as ultrasonic testing, dye penetrant, etc.

Out of service inspections must be strict confined space entries and need to be approached accordingly with qualified personnel and the proper equipment.

If your facility stores bulk chemicals and does not have records for inspections in the past five years then you are at risk and have potential environmental liabilities. Extech has the specially trained personnel and equipment to conduct these inspections. For more information please call Ted Lund in Deep River, CT or Joe Benoit in Park City, UT.

### **The Subject of Regulations Concerning Potable Water Storage Tanks**

As a tank consulting and inspection firm, we've had the opportunity to see many recommendations by our competitors to tank owners calling for physical upgrades on their **existing** water storage tanks. Often times these *recommendations* are phrased as if they were *regulations*. A whole host of *official* organizations are referenced in a confusing alphabet soup of acronyms. Tank owners are lead to believe that they have few options open to them other than to spend large amounts of money or take a chance with non-compliance and possibly incur fines.

**State** and **local** regulatory bodies may *quote* standards written by such organizations as AWWA, ANSI and NFPA that they want to see followed. They may have inspectors who can enforce the local codes and possibly levy fines for non-compliance. But it is the state and local officials that do this, **not** the organizations whose standards are being referenced. On the Federal level, only OSHA has the power to set regulations and enforce them in the context of occupational health & safety. Most of the OSHA regulations that affect tank owners are covered within Standard 29 CFR 1910 - Safety and Health Standard for General Industry & 29 CFR 1927 - Safety and Health Standard for Construction.

Some typical examples of recommendations made by our competitors involve ladders and safety railings. They would have you believe that a 50-foot high ground reservoir requires a safety railing around the entire roof perimeter in order to be OSHA compliant. They will also say that the exterior ladder is required to have a full safety cage and rest platforms every 10 feet. In both cases, there are alternative options. Safety lines anchored to the roof are one option in lieu of railings. A fall arrest system can be used on the shell ladder to satisfy climbing regulations. Another example of expensive and unnecessary recommendations is the roof vent. A vacuum-pressure, frost proof vent and screen is often recommended for tanks even in southerly-located tanks. These costly physical upgrades are not the only way to comply with OSHA regulations.



The structural characteristics of the water tank are only one part of the equation when considering the requirements for OSHA compliance. The tank owner's policies for their employees is directly related to the owner's responsibilities in relation to OSHA compliance. For example, if a utility does not allow any of its employees access to climb or be on top of the water tank, then the utility is not requiring its employees to work in an unsafe environment. And in this specific example, would not be out of compliance, if there were no safety railing around the circumference of the roof.

If you are faced with costly recommendations from a recent tank evaluation and would like to explore other options, please give us a call. There are more options out there than our competitors would have you believe. This can now be done underwater with the TankRover vehicle!!!

### **WEBSITE UPDATE**

The Extech Website at [www.extechllc.com](http://www.extechllc.com) has been upgraded to include new pictures of the underwater cleaning robots as well as actual underwater footage. There will be two links a visitor can download for underwater inspection and cleaning footage. The smaller link is for all of us with simple dial-up modems. This clip is brief but of high quality and shows the capabilities of our equipment. The full-length clip should be downloaded by visitors with DSL or high-speed cable modems.

All Extech company literature is now available in CD Format. This allows us to include video footage as well as reduce paper cost. If you prefer paper copies it will be available.

### **EXTECH WATER TANK SEMINAR APPROVED FOR NY STATE CEU'S.**

Extech's luncheon seminar "Water Tank Operations and Management" has recently been approved for Continuing Education Credit for NY State Professional Engineers. The Practicing Institute of Engineers of New York has certified the seminar for one CEU. The seminar can be conducted at your office for the convenience of your staff. If you are interested in providing this course for your staff engineers please call **860-526-2610** for more information.

### **NEW CERTIFICATIONS**

As our name implies we provide Expertise and Technology and we continue to improve our expertise with new certifications for our personnel. We have added the following certifications to our staff:  
API-653 Certified Tank Inspector  
NACE Certified Coating Inspector  
NACE Level I Coating Inspector  
ASNT Level II Dye Penetrant

**If you would like to receive our newsletter by email send your request to [patmeskill@extechllc.com](mailto:patmeskill@extechllc.com).**

**UPCOMING SHOWS:**

**CT ATCAVE February 23rd  
NEWWA Worcester April 6-7**

**If you'd like a quote for a tank  
inspection fill out the enclosed  
tank questionnaire**

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## WATER TANK SERVICES INFORMATION QUESTIONNAIRE

### Tank Names or Numbers

#### Tank Data

1. Tank Style (see list below)					
2. Construction (see list below)					
3. Overall Height					
4. Tank Height					
5. Interior Columns (yes or no)					
6. Tank Diameter					
7. Roof Manway Size and number					
8. 110V Power on site (yes or no)					
9. Cathodic Protection (yes or no)					
10. 2WD Truck Access (yes or no)					
11. Ladder Height from Ground					
12. Last Inspection					
13. Last Cleaning					
14. Past Inspection Method (list below)					
15. How many tanks in system					
16. When is work to be done					
17. Tank Volume					

**Name and Title:** \_\_\_\_\_ **Utility Name** \_\_\_\_\_

**Address:** \_\_\_\_\_ **City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Phone:** \_\_\_\_\_ **Fax** \_\_\_\_\_ **Cell Phone** \_\_\_\_\_

Ques No. 1: Standpipe, Elevated, Ground Reservoir or Hydropillar

Ques No. 2: Welded, Concrete, Riveted or Bolted

Ques No. 14: Tank Empty, Float Down, Diver or ROV

<b>Send or Fax to:</b>	Extech, LLC	Extech, LLC	Extech, LLC	Rep-Hughes Sply	Rep-Hughes Sply	Rep-Hughes Sply
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