

MINDING THE P's AND Q's OF YOUR ASTs

AS THE AST MARKET MATURES IN CANADA, SO DO THE TECHNOLOGIES THAT ARE USED TO MONITOR THEM

Trying to pin down the exact number of aboveground storage tanks (ASTs) that dot the Canadian landscape and are being used for the containment and control of petroleum products – be they petrol, diesel fuel, biofuels, heating oil, aviation fuels or lubricants – is essentially a lesson in futility. But one thing is certain though: the popularity of ASTs for petroleum-product storage received a major boost in the early 1990s. That's when it was discovered that many of North America's underground storage tanks (USTs) used for petroleum product storage did not meet regulatory standards and were leaking.

This was a major catastrophe for the petroleum industry since many of these leaking USTs had been doing so unbeknownst for years, introducing potentially harmful carcinogens into the ground, as well as contaminating local and regional water supplies as part of this process. This forced site owners to expend precious capital to upgrade, remove, replace or completely close USTs that did not meet regulatory standards, while the associated cleanup costs and court-ordered reparations to affected parties reached into the hundreds of millions of dollars.

Among the fallout from all of these leaking USTs was an increase in the use of ASTs to store petroleum products, since these commodities would remain a crucial link in the motor fuel supply chain and the corresponding amount of storage capacity would have to be maintained. Historically, bulk storage plants, which--are designed specifically to receive, store and transfer petroleum products--were not required to meet any uniform standards during

their construction, resulting in a wide variety of styles and methods of installation.

Over the years, that has changed, with the vertical AST becoming the most common form of product storage

at bulk plants. After the nightmares of the leaking UST era, bulk-plant operators found greater peace of mind in using ASTs for product storage, mainly because their stature above ground made them much easier to be visually



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inspected for leaks. In general, ASTs utilized in petroleum-product bulk-storage facilities are 20-to-50 feet tall and have a capacity of 60,000 litres (16,000 gallons) to 1.9 million litres (500,000 gallons).

FINDING THE RIGHT LEVEL

While ASTs may help bulk plant operators sleep better because they are easier to visually monitor for leaks, they do have their share of operational challenges. One of the main ones is the ability to accurately monitor their product levels through a tank gauging system. That is often easier said than done.

"What you're generally doing is taking a giant tape measure and measuring the height of the product," explained Ed Ventura, operations vice president for Hi-Sharp Products, Inc., Toronto, a petroleum-equipment distributor that has been servicing Eastern Canada for 20 years. "With

250,000-gallon tanks, if you're off by an inch when you measure that can be hundreds of gallons off in recorded inventory. That makes a big difference in what you actually have and what you think you have."

With that in mind, there are some basic performance parameters that any AST tank gauging or monitoring system should meet:

- 1. The system should** accurately provide full information about the product, including level, multi-point and/or average temperature, water content and net volume. This information needs to be highly accurate and easily repeatable.
- 2. There must be** reliability in the probe used to measure and gauge product level, temperature, etc.
- 3. The system should be** low maintenance, self-calibrating and easily configurable with no scheduled maintenance or recalibration required.

4. System installation should require only one tank entry with the option of having different opening sizes.

5. The components in the system should be compatible with a large variety of products and configurations, ranging from petroleum products to chemicals, as well as with horizontal and vertical ASTs.

6. The system must have an open communication standard in which data is obtained from the instrument; wireless transmission of this data may be an option, where applicable. This information should also be available in as close to real-time as possible.

Over the years, the types of technology that can be used to monitor ASTs have evolved from simply sticking a tape measure in the tank. Still, these technologies do not possess all of the qualities that lead to a reliable, trustworthy tank gauging

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system. Among the more popular systems in use today (and their pros and cons) are:

- **Mechanical Floats** These are the easiest to use, but also the most primitive, with the potential for level-skewing hangups on the cable guide arrangements that control the cable and float.
- **Bubbler Systems** These systems use the amount of pressure needed to force a bubble of nitrogen gas out of a tube into the bottom of an AST to determine the liquid level in the tank. Their fatal flaw is that there are too many variables associated with their use for them to be a reliably accurate measurement option.
- **Radar Tank Gauging** While these systems do a remarkable job measuring the liquid level in the tank, they are extremely expensive and provide a base product level only.

A CUTTING-EDGE SOLUTION

There is one other form of tank-gauging system that is gaining momentum for its accuracy and ease of use. Using a combination of magnetostrictive and flexible probes, remote monitoring capabilities and Internet protocols, this new type of tank gauging system provides bulk plant operators with a new solution that is easy to use and install while offering complete inventory, delivery, automatic reconciliation, exception alarms and environmental-compliance information for as many as 256 ASTs. In addition, this system gives operators the ability to access and communicate via the Internet with real-time information, and offers standard POS protocol support for the ability to share data with other programs.

One company that has made advances in this area is OPW Fuel Management Systems, Hodgkins, IL,

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"Until the creation of the iSite, there was not a monitoring system out there that adequately did 25-to-50 foot tanks," said Hi-Sharp's Ventura. "There were some tank gauging systems out there that worked on ultrasound, but they weren't reliable. The big thing is reconciling your products, making sure what goes out in your trucks is being recorded, and the iSite's accuracy is much better for that than reading off a stick. I highly recommend the iSite if you have a bulk plant."

CONCLUSION

When you're dealing with a bulk-storage facility that can have millions of gallons of petroleum products both arriving and departing on a daily basis, accurate measurement of product levels is of the utmost importance. Too often, the tried and (supposedly) true methods of monitoring product levels in ASTs have been found wanting. With the recent advances in tank monitoring technology, however, the day is rapidly approaching when bulk-plant operators will be able to confidently access the product levels in their storage tanks at any time of day or night, whether they are at the plant itself or thousands of miles away. ■

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For more information on fuel management systems, go to: www.opwglobal.com