Today’s Speakers

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Why ATGs?
Why ATGs?
Parts of a Tank Gauge

Console
Parts of a Tank Gauge

Probe

Console
Mag Probe – How it Works

“Mag”
Short for
“Magnetostrictive”
Mag Probe – How it Works

Electronics
Mag Probe – How it Works

[Diagram showing the components of a Mag Probe]

- Electronics
- Product Float with Magnet
- Water Float with Magnet
Mag Probe – How it Works

- Electronics
- Thin Wire Runs Down Center of Rod
Mag Probe – How it Works

Short Electric Pulse is Sent Down the Wire, Creating Magnetic Field Around Wire
Mag Probe – How it Works

Short Electric Pulse is Sent Down the Wire, Creating Magnetic Field Around Wire

Magnetic Field Around Wire Interacts with Magnet in Float, Causing the Wire to Twist Slightly
Mag Probe – How it Works

This Twist Travels up the Wire and is Sensed by the Electronics
Mag Probe – How it Works

This Twist Travels up the Wire and is Sensed by the Electronics

How Fast the Twist Travels Along the Wire was Measured at the Factory when the Probe was Made, and is Accurately Known
Mag Probe – How it Works

This Twist Travels up the Wire and is Sensed by the Electronics

The Time from when the Electric Pulse was Sent Down the Wire to the Arrival of the Twist at the Electronics is Measured and Converted to Distance
Mag Probe – How it Works

The Distance from the Float to the Electronics (H) is Subtracted from the Total Length of the Probe (T) to Give the Depth of Liquid (D)

\[ D = T - H \]
Thermistors

Thermistors are placed at different positions along the probe to measure the temperature at specific depths.
Common ATG Abilities
Common ATGAbilities

✓ Product level, gross volume, net volume
Common ATG Abilities

✓ Product level, gross volume, net volume
✓ Water level, water volume
Common ATG Abilities

✓ Product level, gross volume, net volume
✓ Water level, water volume
✓ Ullage Volume, 90% ullage
Common ATG Abilities

✓ Product level, gross volume, net volume
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✓ High/low product alarm,
Common ATG Abilities

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Common ATG Abilities

✓ Product level, gross volume, net volume
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✓ Delivery needed, delivery volume
Common ATG Abilities

✓ Product level, gross volume, net volume
✓ Water level, water volume
✓ Ullage Volume, 90% ullage
✓ High/low product alarm,
✓ High water alarm
✓ Delivery needed, delivery volume
✓ Monthly leak detection (0.2 gph)
Common ATG Abilities

✓ Product level, gross volume, net volume
✓ Water level, water volume
✓ Ullage Volume, 90% ullage
✓ High/low product alarm,
✓ High water alarm
✓ Delivery needed, delivery volume
✓ Monthly leak detection (0.2 gph)
✓ Tightness test (0.1 gph)
ATG Leak Tests

Periodic
ATG Leak Tests

Periodic

No product dispensed during test period of several hours. Test data gathered while facility is closed – typically overnight.
ATG Leak Tests

Continuous
ATG Leak Tests

Continuous

No interruption of product dispensing. Test data gathered automatically during quiet intervals between dispensing events.
ATG Peripherals

✓ Sensors
Sensors

- Non-Discriminating
ATG Peripherals

✓ Sensors
  • Non-Discriminating
  • Discriminating
✓ Sensors

- Non-Discriminating
- Discriminating
- Ineffective
ATG Peripherals

✓ Sensors
For more information on sensors, see “Making Sense of Sensors” in LUSTline #58, September 2008 available on the NEIWPCC web site: http://neiwpcc.org/our-programs/underground-storage-tanks/l-u-s-t-line/l-u-s-t-line-archive/
ATG Peripherals

✓ Sensors

✓ Line leak detectors
ATG Peripherals

✓ Sensors

✓ Line leak detectors

For more information on LLDs, see “Of Blabbermouths and Tattletales” in LUSTline #29, June 1998 available on the NEIWPCC web site:
http://neiwpcc.org/our-programs/underground-storage-tanks/l-u-s-t-line/l-u-s-t-line-archive/
ATG Peripherals

✓ Sensors
✓ Line leak detectors
✓ Remote communications
ATGs Come in Many Flavors
Purposes, Perspectives, Potentials and Positive Identification of the

The ATG
Ben Thomas
UST Training
Clinton, WA
Outline

• Purpose of the ATG
• Operator Perspective
• Inspector Perspective
• Compliance Potential
• How to Identify in the Field
PURPOSE: The Automatic Tank Gauge is

- A multi-purpose tool that can do many things
- The brain of the UST system
- The “box” that consolidates important information
- Something the operator uses to manage their UST system
- Something the inspector uses to confirm compliance
- A device that comes in many shapes, sizes, colors and versions
Common names

“The Veeder, The Incon, The Evo....”

“That loud thing in the back”

“The ATG”

“Tank monitor”
PERSPECTIVE: What the Operator probably knows it does

• Checks fuel levels
• Checks water levels
• Checks sales activity
• Checks for ordering/receiving fuel
• Checks to do inventory reconciliation
• Checks for alarms (maybe)
• Checks for leaks (hopefully)
PERSPECTIVE: What the Inspector should know it does

• Verifies interstitial monitoring compliance
• Verifies leak test compliance
• Verifies electronic line leak detection compliance
• Searches alarm history
• Verifies setup (third party certification)
• Verifies overfill alarm settings
• Verifies sensor set up
POTENTIAL: Using the ATG for Release Detection

- In-Tank Monitoring
- Interstitial Monitoring
- Line Pressure Testing
POTENTIAL: Using the ATG for Release Detection

• In-Tank Monitoring
  • 0.2 GPH periodic
  • 0.2 GPH continuous
  • 0.2 GPH SIR
POTENTIAL: Using the ATG for Release Detection Interstitial Monitoring Tanks and/or Piping

- Dry
- Hydrostatic
- Vacuum
- Pressure
POTENTIAL: Using the ATG for Release Detection

Line Pressure (ELLD)
- 3 GPH
- 0.2 GPH
- 0.1 GPH
More POTENTIAL:

• High and low level fuel alarms
• Probe and sensor identification and functionality
• Alarm and test result histories
Pro Tip: Hit the Veeder Root <Function> button to see what the ATG is programmed to do

- Hit Function a number of times
- Will tell if the UST system has
  - 0.2 GPH
  - CSLD
  - Interstitial
  - PLLDs
- Make sure you go back to All Functions Normal
ATG can tell us

**Past:** Alarm history (*what happened*)

**Present:** Functions and conditions (*what’s happening*)

**Future:** Program settings (*what can happen*)
First Look for

- Brand name
- Model number
- Overall condition
- Internet connection
- Power
- Any alarms
Also look for

- Lights working
- Paper/printer
- Special “notes”
- User guide
- Blockage/access/security
POSITIVE IDENTIFICATION: Name that ATG
DO NOT
Throw away anything that comes out of this fixture.
I need to see it.
Thank you, Carla.
FUEL OIL TANK MONITOR SYSTEM

EMC DSL TNK 01 (South)
EMC DSL TNK 02 (North)
EPA manual, August 2000, EPA 510-B-00-009, Reference manual for UST inspectors, has detailed instructions on how to obtain reports.

Tank Savvy Minute videos on YouTube for the Veeder Root TLS 350 and the Franklin EVO 550.
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Former regulator (TX) and environmental analyst (7-11)
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On average, how many ATG alarms occur per month at a retail facility?

• Less than 1
• Between 1 and 5
• Between 5 and 10
• Above 10
What impacts a site’s risk profile?
Alarm volume

2018 study data

Over a 2 month period at 700 sites, 30,000 total unique ATG alarms occurred

<table>
<thead>
<tr>
<th>NOISE</th>
<th>30,000 Alarms 🔔</th>
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<tbody>
<tr>
<td></td>
<td>17,000 Compliance-related Alarms 🔔</td>
</tr>
<tr>
<td>SIGNAL</td>
<td>2,000 Issues ✅</td>
</tr>
<tr>
<td></td>
<td>350 Dispatches 🚚</td>
</tr>
</tbody>
</table>
On average, how long do ATG alarms remain active?

- Less than 1 day
- 1-2 days
- 2-7 days
- More than a week
### 2018-2019 study data

100 sites over six months

*Excludes all alarms that were active for <24 hours*

<table>
<thead>
<tr>
<th>Alarm</th>
<th>How many times did this type of alarm occur?</th>
<th>On average, how many days was alarm active?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank CSLD Rate Increase Warning</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Tank High Water Warning</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>PLLD Periodic Test Fail Alarm</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Tank High Product Alarm</td>
<td>27</td>
<td>3</td>
</tr>
<tr>
<td>Sensor Fuel Alarm</td>
<td>26</td>
<td>3</td>
</tr>
<tr>
<td>PLLD Gross Test Fail Alarm</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>PLLD Shutdown Alarm</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>Tank No CSLD Idle Time Warning</td>
<td>22</td>
<td>2</td>
</tr>
</tbody>
</table>
True or False?

ATG alarms always accurately represent what is occurring at the site

- True
- False
What impacts a site’s risk profile?
Alarm data integrity

Settings Audit Results
Percentage of Tanks with Correct Settings

- **High Water Limit (1.5”)**
  - 98% Incorrect

- **High Water Warning (1.0”)**
  - 91% Incorrect

- **Delivery Needed (15%)**
  - 90% Incorrect

- **Low Product Limit (7-10%)**
  - 48% Incorrect

- **High Product (95%)**
  - 32% Incorrect

- **Overfill (90%)**
  - 25% Incorrect

Data anonymized and aggregated from 49 sites, 165 tanks
What is valid reporting?

Is this site passing?

- Yes
- No
- It depends
- Beats me

Source: “Whack-A-Leak: The Holes in Our Leak Detection” by Marcel Moreau; published in LUSTLine 80 (June 2016)
What is valid reporting?

Is this site passing?

- Yes
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- It depends
- Beats me
What is the industry doing to tackle data integrity challenges?
Thank You, Speakers!

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