13th General Meeting of the CTRMC
NTTC Tank Truck Week
New Orleans, LA
10.20.16

www.cargotanksafety.org
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ed Devinney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>

[www.cargotanksafety.org](http://www.cargotanksafety.org)
Introduction

• We encourage questions and dialog – at any time.
• All slides will be available in .pdf format, afterwards.
• The next CTRMC meeting will be 3.15.17 - in Lafayette, IN; hosted by Wabash National Corp.
• If you wish to become a regular participant of CTRMC meeting, and/or receive meeting notices – just approach us at any time this afternoon.
• Please silence all electronic devices.

www.cargotanksafety.org
"The Cargo Tank Risk Management Committee is an industry group made up of stakeholders from the Cargo tank industry. We work together to create solutions aimed at reducing the hazards faced by workers on and around such equipment. Each general and steering committee meeting will follow an agenda sent to attendees prior to the meeting. General meetings are open to stakeholders of interest. Meeting topics will relate to cargo tank safety and the completion of our mission. Minutes of each meeting will be kept to document the topics discussed. Topics not on the agenda will not be discussed in detail but placed as an agenda item on a future meeting agenda if they help us address our mission. Meeting topics and group discussions must not include any of the following - either formally, or informally:

**Pricing:** individual company prices, price changes, price differentials, markups, discounts, credits, terms or other areas related to pricing

Continued...
Anti-Trust Statement

**Production:** individual company plans, production, distribution, product marketing, territories, customers or changes related to production.

**Transportation Rates:** rates, rate policies, zone prices, surcharges and related topics.

**Market Procedures:** company bids in progress, bidding procedures, proposals or bid invitations. Matters relating to actual or potential individual supplies or customers that might have the effect of excluding them from any market or influencing the business conduct of firms toward them.

**Wage and Salary Rates:** wages, bonuses, pay scales and related matters.

**Business practices:** boycotts, dividing markets and similar actions.”
The CTRMC Journey

Where We’ve Been, and
Where We’re Headed ...

Steve Torres
Schneider
10.20.16

www.cargotanksafety.org
On May 14, 2014, at 10:30 am, a 56-year-old tanker driver arrived at an oil distribution plant with 6,000 gallons of oil. He backed into the garage bay with the guidance of an employee at the distribution plant. The victim exited the cab, climbed onto the top of the tanker, and began the process of venting the oil tanker compartments. The employee was in the bay area, but the driver was not in his sightline. The employee heard the sound of the victim falling approximately 10 feet on to the concrete floor below, went to investigate the noise and found the victim injured on the ground. The oil plant employee then summoned help from other workers. EMS was notified and the victim was transported by helicopter to the nearest local trauma center where he died the following day.

• First General Meeting
  – Mar 2010
  – Fond du Lac, WI and hosted by Walker
• Critical mass of stakeholders ...
  – ... identifying an opportunity,
  – ... diversified, and
  – ... committed to making a difference
• Creation of volunteer Steering Committee
• Developed Top Ten List
The Top Ten Reasons

1. Assuring security
2. Checking equipment including ...
   - Cleanouts
   - Manhole
   - Venting
3. Extracting samples
4. Loading or unloading product
5. Assessing liquid content levels
6. Initiating ...
   - Air unloading
   - Vapor recovery
7. Performing maintenance and routine inspections
8. Washing tank
9. Removing snow
10. Discharging heel
Cargo tank industry stakeholders working together to create solutions aimed at reducing the hazards faced by workers on and around such equipment.
The issues being addressed by this group are related to workers that perform functions on both straight and combination cargo tanks.

- Chemical and food grade tanks.
A work environment where all cargo tank industry stakeholders live out the primary core value of safety first – and always. This environment will be one in which all stakeholders work in harmony to design industry-standard education, work processes, and equipment design measures that will keep workers safe on and around cargo tanks. Furthermore, the stakeholders will be represented by a committee of representatives from across the industry that are empowered with their respective segment’s knowledge and support to create and publish such guidance in a way that will be most widely accepted, universally applicable, and engineers out risk to workers as much as is reasonably possible.
Milestones

• This is our 13th General Meeting.
• Between General Meetings we have steering meetings to plan events and keep the mission going forward.
• Members have volunteered meeting room resources at their facilities across the US.
• We welcome more volunteers – and hosts!
Short Term Goals

   - Done – initial version of TTMA TB No. 125 published!
   - Available from [www.ttmanet.org](http://www.ttmanet.org)
5.0 CTRMC General Ladder:

5.1 The majority of chemical and food grade cargo tanks in service are similarly designed, allowing for a common ladder geometry. Figure 5.1 provides basic details of the general ladder.

![Diagram of CTRMC General Ladder](image)

**Figure 5.1**
Short Term Goals

2. Develop a training and education module on the proper process for ascending / descending ladders and walkway systems.

- Done – third edition on CTRMC website, [www.cargotanksafety.org](http://www.cargotanksafety.org) – for free! Click on *Trailer Climbing Guide* header.
Short Term Goals

Cargo Tank Risk Management Committee

Minimum suggested standards for driver training to reduce the potential for falls while climbing cargo tank motor vehicles.

June 2012 Edition
3. Create a North American hierarchy protocol for the protection of “workers on the top of tanks.”

- Done – first edition on CTRMC website, [www.cargotanksafety.org](http://www.cargotanksafety.org) – for free! Click on *Falls Protocol* header.
Short Term Goals

CTRMC

Workers on the Top of Tanks

North American Hierarchy Protocol for Protection of Workers on the Top of Tanks

CTRMC March 15, 2011
4. Increase participation from major industry stakeholders.

- Ongoing. We have teamed with ACC, ISBT, NTTC, TTMA, wash racks and other stakeholders.
- We need to continue to assure involvement across stakeholder groups – and geographies.
- Biggest challenge in attracting loading and unloading facilities.
Long Term Goals

1. Develop a hydraulically actuated cleanout valve assembly with standard dimensions.

   • Prototype developed – more details, later today!
2. Pursue cleaning technology and processes to preclude necessity to use cleanout nozzles near tank ends.

- Earnest effort made.
3. Develop solutions to address all ‘Top Ten Reasons’ for ‘workers on the top of tanks’.

• Just scratching the surface – this is an enormous undertaking, and will take years of effort!
4. Develop a Vision 2020 for future common tank trailer types ...
   - Cost effective
   - Weight effective
   - Ergonomic
   - Accommodating loading racks
   - ‘Balcony’ platform
   - Collapsible outer rails
   - Ladder offset from manhole

Other Initiatives and Resources

• Loading and unloading guidelines for food grade tanks: Available for free at www.cargotanksafety.org

• Electronic seals

• Benchmarking

• White papers:
  – A Clean Change: Eliminating Clean Out Caps on Cargo Tank Trailers
  – Nitrogen use and Hazard Controls in the Tank Truck Industry (Coming soon!)
Stay in Touch

CTRMC
Cargo Tank Risk Management Committee
"Enhancing The Safety of Workers On Top Of Cargo Tanks"

Should loading/unloading procedures be standardized in North America?
CLICK HERE to see the European Standard

Cargo Tank Risk Management Committee

The Cargo Tank Risk Management Committee (CTRMC) was formed on March 17, 2010 and is made up of leading industry professionals with the sole task to proactively enhance cargo tank safety. We recognize the goal of the industry is to reduce falls at the wide variety of facilities and situations where workers perform various duties while on top of cargo tanks. Our members are from every aspect of the industry. From cargo tank trailer manufacturers, truck carriers, worker's compensation insurance providers, shipper, consignees to tank cleaning.

Find us on: facebook

Join CTRMC
For Our 12th General
Let’s have a great, interactive, and productive meeting!
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Ed Devinney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
Nitrogen Exposure

Nitrogen Use and Hazard Controls in the Tank Truck Industry

Pete Vandyne
Liberty Mutual
10.20.16

www.cargotanksafety.org
Men who died while cleaning oil tanker in southwest Bexar County were brothers in their 20s

By Mark D. Wilson  Updated 1:37 pm Thursday, June 30, 2016

While the Medical Examiner has yet to release an official cause of death for the men, authorities have said that the two were overcome by fumes after going inside of a tanker that was not properly ventilated.

Tanker Entry Fatalities

- A 23-year old worker who had been sampling a load was found unresponsive in a tank trailer containing egg products and nitrogen. The company was cited for five serious violations, including “exposing employees to nitrogen hazards.”

- A serious OSHA violation is one where death or serious physical harm could result from a hazard an employee knew or should have known exists.

http://bulktransporter.com/ideaxchange/tank-trailer-nitrogen-deaths-continue
Truck Driver Dies While Cleaning Out Inside of Tanker

- The victim was informed by the truck wash manager that the person responsible for washing out tanker trailers (the truck wash worker) was not there.
- The victim responded that he would wash out the cargo tank himself, a task which he had not previously attempted.
- The victim climbed down inside the tank
- The autopsy report lists the cause of death as anoxia due to containment in a nitrogen rich atmosphere.

http://www.cdc.gov/niosh/face/in-house/full8727.html
What is Nitrogen? Why is it a Hazard?

- Nitrogen is a colorless, tasteless and odorless gas.
- Nitrogen makes up around 78% of the earth’s atmosphere.
- Nitrogen is not typically hazardous but must be mixed with the proper concentration of oxygen.
- Oxygen and nitrogen cannot be detected by the sense of smell.
- A nitrogen enriched environment can be detected only with special instruments.
- When nitrogen is too high (and oxygen too low), the body becomes oxygen deprived - and asphyxiation occurs.
What is Nitrogen? Why is it a Hazard?

• When we breathe, humans inhale air containing oxygen and exhale air laden with carbon dioxide.
• Respiration (the act of breathing) is mainly controlled by carbon dioxide concentrations in the brain and arterial blood.
• As the carbon dioxide levels increase the brain triggers an increase in respiration. When carbon dioxide levels drop, the brain sends a signal to decrease respiration.
• Without adequate oxygen intake into the lungs, carbon dioxide is not generated to trigger the brain to have the body breathe normally, and breathing can slow dramatically – or, stop.
Some believe they could “hold their breath” and attempt a rescue.

Without the stimulus to breathe, which is based on oxygen and carbon dioxide levels in the body, breathing stops.

Without adequate oxygen levels in the body, a worker could lose consciousness and die.
Why is Nitrogen Used in the Tank Truck Industry?

- Moisture control
- Reducing the risks associated with flammable or combustible materials
- Transloading of product from rail to truck, or truck to truck
Which Types of Workers are Exposed to Nitrogen?

• Drivers
• Tank wash technicians
• Mechanics
• Shipper product loaders
• Receiver product unloaders
• Emergency responders
• Transloaders

www.cargotanksafety.org
Is Tagging a Tank enough to Protect Workers?

• No, tags can be removed or not properly placed on a tanker that has contained nitrogen.
• Workers could believe a tank had not contained nitrogen and not take the proper precautions.
• Workers should assume a nitrogen enriched atmosphere exists until they prove entry is safe.

www.cargotanksafety.org
• Written programs are just part of what a company should have in place. Also...
• Companies must ensure effective implementation and communication of the program.
• They must also verify that workers and management have and maintain a working knowledge of nitrogen hazards.
• The expectations for workers must address the imperative to prove an atmosphere is safe prior to entering it.
• An attempt to rescue without proper training and equipment can have fatal consequences for both the incapacitated worker and the would-be rescuer.
Employers should ...

- Have formal programs.
- Have awareness training for those that work around tankers.
- Apply the same confined space practices to tankers that they do other confined spaces.
- Know and comply with regulations and best practices.
- Have a confined space rescue program.
- Audit their programs and practices.

www.cargotanksafety.org
Leaning in Can be as Dangerous as Entering!

- Never lean into a tanker (i.e., break the plane of any access hatch or door) for inspection assuming entering the tanker and *just leaning in* are different acts.

- If your head enters the space, you could become incapacitated because of an inert or hazardous environment inside the tanker.
Employees Should ...

• Understand and comply with their company’s policies on confined space entry.
• Assume the atmosphere within the tanker is hazardous until atmospheric testing proves it is safe to enter.
• Never lean into a tanker (i.e. break the plane of any access hatch or door) for inspection assuming entering the tanker and *just leaning in* are different acts.
• Know and follow confined space rescue protocols.
Resources

- http://www.csb.gov/hazards-of-nitrogen-asphyxiation/ (Has a link to this report with a listing of resources and references at the end of the report)
- OSHA Confined Space Standard (other resource links on the OSHA site)
  - https://www.osha.gov/SLTC/confinedspaces/
- Confined space rescue teams
  - http://www.asse.org/assets/1/7/Thomas_Fireline.pdf
- Truck Driver Dies While Cleaning Out Inside of Tanker in South Carolina – Nitrogen Blanket
  - http://www.cdc.gov/niosh/face/in-house/full8727.html
- Two Railroad Repair Workers Asphyxiated in Damaged Tank Car – Nitrogen Blanket
  - http://www.cdc.gov/niosh/face/stateface/ia/01ia021.html
- CTRMC Whitepaper www.cargotanksafety.org
Please Work and Drive Safely

Your family needs you to come home the same way you left them!

No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage or retrieval system without written permission from the CTRMC. This document is advisory. We assume no responsibility for management or control of stakeholder safety activities or for implementation of recommended measures. We have not tried to identify all hazards. We do not warrant that requirements of any federal, state, or local law, regulation or ordinance have or have not been met and meeting those requirements is the responsibility of the individual stakeholders.
Agenda

1:35p  The CTRMC Journey  Steve Torres, Schneider
1:50p  Nitrogen Exposure  Pete Vandyne, Liberty Mutual
2:20p  Data on Cleanouts  Dan Wright, KAG
      Lance Hagler, Trimac
      Randy Vaughn, Superior
3:20p  Break
3:30p  Worker Panel on Hazards  Kent Katt, ADM
      Ed Devinney, Superior
4:30p  Electronic Seals  John O’Connell, JOC Systems
5:10p  Hyd. Actuated Cleanouts  Dave Girard, Girard Equipment
5:30p  Adjourn

www.cargotanksafety.org
Data on (Eliminating) Cleanouts

The Effort Continues

Dan Wright, KAG
Lance Hagler, Trimac
10.20.16

www.cargotanksafety.org
Data on (Eliminating) Cleanouts

- Problem definition
- Case studies
- Value proposition
- Observations at cleaning racks
- Data
- Open discussion
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ed Devinney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
Agenda

1:35p  The CTRMC Journey  Steve Torres, Schneider
1:50p  Nitrogen Exposure  Pete Vandyne, Liberty Mutual
2:20p  Data on Cleanouts  Dan Wright, KAG
       Lance Hagler, Trimac
       Randy Vaughn, Superior
3:20p  Break
3:30p  Worker Panel on Hazards  Kent Katt, ADM
       Ed Devinney, Superior
4:30p  Electronic Seals  John O’Connell, JOC Systems
5:10p  Hyd. Actuated Cleanouts  Dave Girard, Girard Equipment
5:30p  Adjourn

www.cargotanksafety.org
Hazards in the Cargo Tank Industry:
How We Can Work Together to Mitigate these Risks

Ed Devinney, Superior
Kent Katt, ADM
Lance Hagler, Trimac
10.20.16
Worker Panel – Our Panelists

- Matt Childers – Superior Carriers
- Terry Walker – Superior Carriers
- Larry Anderson – National Tank Services
- Hershel Kysar – Trimac
- Dave Haynes – ADM

www.cargotanksafety.org
Worker Panel – Key Themes

• Nitrogen exposure
• End cleanouts
• Hydraulically actuated cleanout valves
• Electronic seals
• The CTRMC Top Ten List

www.cargotanksafety.org
Worker Panel – Nitrogen Exposure

• What are you faced with and what are your concerns when using a Nitrogen blanket?
• Do you feel that you received sufficient training prior to working with Nitrogen?
• Once you started working with Nitrogen, did you have any concerns or suggestions for improvement on the training that was provided?
• After listening to Peter’s presentation, is there anything that you think should change with your current procedure?
Worker Panel – Nitrogen Exposure

• How do you know when a trailer has had a Nitrogen blanket and how do you confirm it has been removed?
• Do you frequently get audited regarding working with Nitrogen?
• Who performs the audits?
Worker Panel – End Cleanouts

- Are you involved with your safety committee, or how do you pass on safety concerns?
- Has cleanouts been a safety topic?
- What issues or concerns have been brought up about cleanouts?
- Does management know of these issues?
- We just heard the cleanout presentation: In your operation can cleanouts be eliminated? Or, at least, should discussions occur on what it might take to eliminate them?
- If you have to have cleanouts, what safe guards would you like to see?

www.cargotanksafety.org
Worker Panel – Hyd. Activated Cleanout Valves

• By having a hydraulically cleanout valve actuated from ground level, what benefits could this add to your job?
• Do you feel a retrofit of standard end cleanouts with hydraulically actuated ones on your chemical tank trailers would make sense to improve safety?
What do you know about electronic seals?
Are you currently using this technology?
If you’re not familiar with electronic seals, what would you hope these device could do for you?
What issues do you currently have with your seals?
When misreading a seal, what types of issues can result?
Do you make extra steps or climbs just to get seal readings?
Worker Panel – Top Ten List

1) Assuring security
2) Checking equipment ... including cleanouts, manholes & venting
3) Extracting samples
4) Loading or unloading product
5) Assessing liquid content levels
6) Initiating ... air unloading, or vapor recovery
7) Performing maintenance and routine inspections
8) Washing tanks
9) Removing snow
10) Discharging heel

www.cargotanksafety.org
Worker Panel – Top Ten List

• What actions should we take to better address the Top Ten reasons workers access the tops of tanks?
• What should be our first priority?
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ed Devininney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>

[www.cargotanksafety.org](http://www.cargotanksafety.org)
A Review and Discussion of Methods Employed, Worldwide

John O’Connell, JOC Systems
10.20.16

www.cargotanksafety.org
Electronic Seals

- These systems have been on tankers & containers; and used in Europe, Asia & South America for over a decade.
- They are called SPD, Multiseals.
- Electronic seals offer tracking, and eliminate mechanical seals.
Sealed Parcel Delivery System

*Quote*

The Sealed Parcel Delivery System (SPD) is a global system that monitors the contents of petroleum oil and chemical tanks. The process begins when a compartment is sealed after loading a tank truck. The seal displays if it is unbroken until delivery is made to the customer. Multi Seal ensures that the quantity originally loaded at the terminal matches exactly with that delivered to the customer. The unbroken seal and the status-report-generated loading data (e.g. the load receipt or terminal bill of loading (B.O.L.)) confirm proof of the quantity delivered.
Controller on Tanker
SPD Systems

- Automatic recognition of tampering
- No additional analysis of report data in the office!
- Complete sealing from the loading up to delivery Strict compliance with DIN EN 15208
Alphons Harr Delivery System

System Description

- SPDS is based on the intrinsically safe technology. By use of encapsulated electronics
- All sensors are directly integrated in the fittings. They work with analog signals and detect manipulation at cables. The integrated storage device assures monitoring for several days, even in case of power interruption.
- Therefore the sensor function is secured which avoids any malfunction also by bad road impact.
- This provides full upgradeability and guaranteed future for the system
**Quote**

- System monitors and records the opening and closing of compartment valves and manholes and communicates that information (as real-time status reports) to a base station via an onboard fleet management system.
- These systems are ATEX approved components and manufactured in an ISO STD approved production line with high level of quality assurance.
- Fleet management system is usually based on an active fleet management system operating in several countries.
- Capabilities include monitoring the location of the tanker truck as well as the drivers’ behavior.
- It will also enable you to receive on-line alerts regarding the breach of the sealed valves and manlids.
PEMEX Tank Truck™ System

Pneumatically Operated Tank Truck - Loading and Unloading Controls and Electronic “Sealed Load” Security System Overview
• Electronic and Pneumatic Components:
  • All of the valves on the truck are operated by air:
    – Vapor Recovery Vent Valve on manhole.
    – Emergency Valve in bottom of tank.
    – API Lock (prevents API Adaptor from being opened).
    – Manhole Cover Lock (prevents manhole from being opened).
    – All the components are electronically signal to a controller:
System Overview

• Electronic solution to sealing the Tank at the Terminal and providing electronic tamper protection and tracking of each load of product.

• Each load “secured” with unique random alpha-numeric “seal code” both after loading and after delivery. Assuring monitoring of entire trip.

• Cabinet Doors are electronically monitored for opening.

• Manhole is locked & protected with a movement / tilt sensor.
System Security
System Security Parts

Manhole Pneumatic Lock

- Manhole Movement / Tilt Sensor:
  - Powered by system controller.
  - Monitors for any movement of the manhole opening.
Transactions Logged

• Each transaction captured & logged as an “Event”:
  • A single “event record” includes:
    1. “SEALED” date, time & “seal code”.
    2. “NOT SEALED” date & time.
    3. “RESEALED” date, time & “seal code / #”.
    4. “VIOLATED” date & time.
    5. “NEW SEAL” date & time.
  • Each “event record” saved as a single transaction:
Now, let’s transition to 2016 and beyond.

- Most trucks have electronics on board.
- Electronically monitoring the truck is now common practice.
- Peoplenet/Qualcom etc
- We know speeds.
- We know gear changes.
- We know locations.
- We have in-cab cameras.
New Technology

COMMAND MENU

LOADING SEAL
DISCHARG
EMPTY SEAL
WASH SEAL
Erase Memory
New Technology

- **TankSmart . eseal**

**POWER**

<table>
<thead>
<tr>
<th>TID</th>
<th>Input 1</th>
<th>PID</th>
<th>Input 2</th>
<th>Input 3</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>123456</td>
<td>Closed</td>
<td>345678</td>
<td>Closed</td>
<td>Closed</td>
<td>Jan 23, 2016</td>
<td>08:00:42 AM</td>
</tr>
</tbody>
</table>

- **CONFIG**
- **EVENTS**
- **CMND**
- **HELP**
Driver Tries to Get Seal

MESSAGE BOARD

Inputs are not closed
Driver Closes Manlids and Gets Seal
Unloads Same Seal Number
Empty Seal

TankSmart. eseeal

EMPTY SEALED
0M3K

TID 123456  Input 1  Open
PID 345678  Input 2  Open
Input 3  Open

Jan 23, 2016  08:02:47 AM

CONFIG  EVENTS  CMND  HELP
Wash Seal

TankSmart. e seal

WASH SEALED
0M3K

TID 123456    Input 1    Open
PID 345678    Input 2    Open
              Input 3    Open

Jan 23, 2016  08:03:12 AM

CONFIG  EVENTS  CMND  HELP
When New Seal is Violated
Seal Violated

TankSmart. eseal

VIOLATED
ACDD

TID  123456  Input 1  Closed
PID  345678  Input 2  Open
               Input 3  Closed

Jan 23, 2016  08:04:44 AM

CONFIG  EVENTS  CMND  HELP
Logging of Violations
Electronic Seals - Objectives

- Keep drivers off top of tanks
- No hand written seal numbers
- Continual monitoring of load status through communication
- When drivers stops for any reason, he can verify sealed status.
- Continual load status, temperature, etc.
- Eliminates wasteful plastic seals and potential contamination
- Records wash rack information, temperature, time of wash, etc.
- Records products loaded
The objective is to bring this information into the cab from the tank.

*How do we get consensus with ...*

- Shippers,
- carriers,
- wash racks, and
- consignees?

- This is part of the 2020 Vision!

- Lets keep our drivers safe and deliver products in a sealed tank!
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ed Devininney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
An Update on the Development and Testing of these Devices

Dave Girard
Girard Equipment
10.20.16
VAPOR LINE TO RUN DOWN SIDE OF TANK THEN RUN TO REAR OF TRAILER
Purpose of the HACV

1. Remotely actuated valve that can be safely opened from ground level. Keep personnel from making a potentially unsafe trip to check the tank cleanout lines (caps).

2. Allow for cleaning equipment to be inserted in the opening. Valve arrangement needs to provide complete access to the entire opening.
Hydraulically Actuated Cleanout Valve (HACV)
HACV on a DOT 407 Tank
Field Trials

• We are working with a carrier on a field trial of our HACV valve. Reports have been very positive.
• During the trial we will monitor the valves and get feedback from all stakeholders;
  – carriers,
  – shippers,
  – drivers,
  – maintenance managers, and
  – wash-rack personnel.
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:35p</td>
<td>The CTRMC Journey</td>
<td>Steve Torres, Schneider</td>
</tr>
<tr>
<td>1:50p</td>
<td>Nitrogen Exposure</td>
<td>Pete Vandyne, Liberty Mutual</td>
</tr>
<tr>
<td>2:20p</td>
<td>Data on Cleanouts</td>
<td>Dan Wright, KAG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lance Hagler, Trimac</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Randy Vaughn, Superior</td>
</tr>
<tr>
<td>3:20p</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>3:30p</td>
<td>Worker Panel on Hazards</td>
<td>Kent Katt, ADM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ed Devinney, Superior</td>
</tr>
<tr>
<td>4:30p</td>
<td>Electronic Seals</td>
<td>John O’Connell, JOC Systems</td>
</tr>
<tr>
<td>5:10p</td>
<td>Hyd. Actuated Cleanouts</td>
<td>Dave Girard, Girard Equipment</td>
</tr>
<tr>
<td>5:30p</td>
<td>Adjourn</td>
<td></td>
</tr>
</tbody>
</table>
Thank You …

… for investing your time to improve safety in our industry.

Come and see us if you’d like to be added to our email list for upcoming CTRMC General Meetings.

www.cargotanksafety.org