



35 YEARS

2020-2021
today



Assisting Communities & Preparing Responders

www.TRANSCAER.com

Letter from Chair



Missy Ruff

Director of Safety and Technical Programs
Renewable Fuels Association
MRuff@ethanolrfa.org



We recognized the great importance of training emergency responders could not be put on hold and going digital had the benefit of allowing for a broader reach.

Welcome to TRANSCAERSM today magazine. I have had the honor of serving as Chair of the Executive Committee of the National TRANSCAER Task Group (NTTG) for the past year. Little did I—or anyone else, for that matter—realize what 2020 would bring to the table...stay at home orders, social distancing, shortage of toilet paper, a plethora of virtual meetings and conferences, and the list goes on and on.

For some of us, this meant changes in the workplace. We've worked from home and cut back on business travel. We've seen production cutbacks and transportation changes. No matter the sector you work in—be it chemical manufacturing, transportation, distribution, industry, emergency response or government—2020 has brought some sort of significant change. One part that has not changed with the pandemic and the new social norms is the need to focus on safety.

During this past year, TRANSCAER did not skip a beat in promoting safe transportation and handling of hazardous materials, educating, and assisting communities near major transportation routes about hazardous materials, and aiding community emergency response planning for hazardous material transportation incidents. Much of the in-person training in 2020 was cancelled or postponed, but the NTTG and emergency responders alike were quick to adjust to change, and a lot of the training was moved online to virtual training. We recognized the great importance of training emergency responders

could not be put on hold and going digital had the benefit of allowing for a broader reach.

I am not going to lie; I was a little nervous about moving RFA's five-hour in-person training to a four-hour online webinar, but it was a huge success. Not only were we able to train emergency responders across the country, but our training drew in attendees from across the world.

TRANSCAER also continued to focus on ways to expand and update its portfolio of services and resources. Erica Bernstein (Director, TRANSCAER) and others were busy behind the scenes, creating a new coordinator toolbox with a library full of resources for our State and Regional TRANSCAER Coordinators. They also created seven new "Seconds Count" videos, set up the TRANSCAER Hazmat Team Response Fund, established a corporate membership program, applied for new federal grants, and built a new learning management system. So, contrary to what others may have said about the year 2020 overall, TRANSCAER had a very successful year.

I want to thank every NTTG member, TRANSCAER coordinator, and instructor for supporting TRANSCAER and helping train those who keep our community, neighbors, and families safe. We hope you enjoy reading this year's magazine. Stay safe!

Sincerely,
Missy Ruff

About the COVER PHOTO

The photo depicts truly what TRANSCAER is all about – bringing together industry and emergency responders. These photos were taken in September 2020 during the filming for seven brand-new videos to add to our *Seconds Count* series. We appreciate the Milwaukee Fire Department, CP, and Union Pacific Railroad for their collaboration on this project with TRANSCAER!



"Alone we can do so little, together we can do so much."

- Helen Keller -



DISCLAIMER

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Reaching Out
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Mission Support

TRANSCAER's Sponsorship Program is designed to visibly enhance your support of TRANSCAER's mission of assisting communities to prepare for and respond to a possible hazardous materials transportation incident.



Partnership Opportunities

Companies that are responsible for promoting the safe handling and transporting of hazardous materials can access many benefits through direct connection with TRANSCAER. There are valuable partnership opportunities as a sponsor to connect with chemical manufacturers, transportation carriers, distributors, and emergency response companies and agencies.



High Profile Branding

Co-branding opportunities are available at national-level hazmat conferences, as well as at state level hazmat conferences, seminars, and training events throughout the year. All sponsoring companies benefit from logo placement in TRANSCAER's brochures, programs, magazine, and monthly e-newsletter.

Why Sponsor TRANSCAER?

TRANSCAER trains 30,000+* emergency responders each year for FREE! Since we are a voluntary national outreach program, we depend on our sponsors to financially support our training and outreach initiatives.

Sponsorship benefits your company with new channels to promote your brand and visibly promote the safe transportation and handling of hazardous materials.

Sponsorship both supplements and reinforces your more traditional training initiatives. Your sponsorship support enables TRANSCAER to provide quality training programs for emergency responders throughout the year.

*Note: Due to COVID-19 in 2020, TRANSCAER was not able to train the same level of emergency responders. The training totals for 2015-2019 have consistently been over 30,000 responders annually.

SPONSORSHIP BENEFITS	Supporter (\$7,500)	Champion (\$10,000)
Representative & Voting Ability on NTTG	✓	✓
Company logo on TRANSCAER homepage	✓	✓
Access to TRANSCAER Coordinator Portal	✓	✓
Ability to promote your support of TRANSCAER with the use of the "Proud Supporter of TRANSCAER" logo	✓	✓
Company description and website link on TRANSCAER Sponsorship webpage	✓	✓
Acknowledgement of Sponsorship & Training Program in a dedicated slide of TRANSCAER Overview Presentation	✓	✓
Supporting emergency responders and communities across North America through the TRANSCAER Program	✓	✓
Company logo on TRANSCAER Champion Sponsor banner utilized at all national-level hazmat conferences where TRANSCAER attends with an exhibit booth	-	✓
Promotion of your company logo and yearly training recap in TRANSCAER Fact Sheet (distributed at all national-level conferences that TRANSCAER attends and in the TRANSCAER Outreach Package)	-	✓
Ad in the <i>TRANSCAER today</i> Magazine (issued annually)	Half Page	Full Page
TRANSCAER polo shirts and hats for your company and/or instructors (issued annually)	5	10
TRANSCAER e-newsletter ads (distributed monthly)	3	5
Non-commercial articles in <i>TRANSCAER today</i> Magazine (issued annually)	1	3
Training event support (direct community outreach, social media highlights pre-event and post-event, on-site support as needed)	-	2

Congratulations

2019 TRANSCAERSM Award Recipients

The TRANSCAER Awards Program recognizes the achievements of individuals, companies and organizations that exceed in advocating, demonstrating and implementing the principles of TRANSCAER. We appreciate all the time, energy, and effort each of you has made and thank you for your outstanding commitment to helping communities across the country.

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DISTINGUISHED SERVICE AWARD

Glen Rudner, Norfolk Southern Corporation

CHAIRMAN'S AWARD

David Binder, Tanner Industries, Inc.
Keith Silverman, PhD, MPH

NATIONAL ACHIEVEMENT AWARD

BNSF Railway	Renewable Fuels Association
Canadian National Railway	Tanner Industries, Inc.
CP	The Chlorine Institute
CSX Transportation	The Dow Chemical Company
DANA Transport Inc.	Union Pacific Railroad
Norfolk Southern Corporation	

REGIONAL ACHIEVEMENT AWARD

Kansas City Southern Railway (KCS) & Kansas City Southern de México (KCSM)
Drew McCarty, Specialized Professional Services, Inc. (SPSI)

TORCH AWARD

Stephen Torres
Rollie Shook

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Awards were presented in 2020 for efforts in 2019. Additionally, 52 Individual Recognition Awards were awarded for outstanding efforts in 2019.





DISTINGUISHED SERVICE AWARD

Glen Rudner Norfolk Southern Corporation

In addition to his duties as a Hazardous Materials Compliance Officer and now Engineer, Environmental Operations for Norfolk Southern Corporation, Glen demonstrates an extraordinary commitment to the TRANSCAER program and to training emergency responders. Glen has been a longtime supporter of TRANSCAER and is active in his current role as Regional Coordinator for the Southeast TRANSCAER Region. Over the last 25 + years Glen has participated in a number of TRANSCAER training events and assisted the NTTG on numerous projects. His enthusiasm and commitment have helped TRANSCAER achieve great things.



Glen Rudner (left) receives his TRANSCAER Distinguished Service Award from Robert Wood (Norfolk Southern Corporation).

Glen has been instrumental in moving continuing education credits/ refresher hours for TRANSCAER training programs forward. He has already received approval in several states and presented to the NTTG on how he managed the CEU approval process and items that were required. Glen has provided contact lists to help other TRANSCAER Coordinators make contact in their states to receive approval.

for approval to meet the PHMSA curriculum requirements.

While making a difference for TRANSCAER, for communities, and for emergency responders, Glen has also been battling cancer. Even while undergoing radiation treatment he remained committed to his health and fitness by hitting the gym daily, as well as his commitment to training and providing guidance to the TRANSCAER programs.

Glen demonstrates leadership and encourages others to give back as part of the TRANSCAER Program and is passionate about moving TRANSCAER forward. A big part of that effort was his assistance in helping TRANSCAER apply for the PHMSA ALERT Grant for the first time. Once TRANSCAER received the ALERT Grant, Glen made time for conferences calls and reviewed course materials to assist the Renewable Fuels Association in getting their Ethanol Program ready

Glen has exemplified the mission of TRANSCAER and has positively impacted the communities in which Norfolk Southern operates. His skills, knowledge, willingness to help others, and dedication to TRANSCAER make him exceptionally deserving of the Distinguished Service Award.

The TRANSCAER Distinguished Service Award is given in recognition of exceptionally meritorious service to the public in a TRANSCAER capacity.



Glen conducting a drill with emergency responders at the Hot Zone Houston, TX.



A behind the scenes look with Glen Rudner assisting TRANSCAER with our Seconds Count - Are You Prepared? video series.



CHAIRMAN'S AWARD



David Binder

Director, Quality, Safety and Regulatory Affairs, Tanner Industries, Inc.

The Chairman's Award is given by and at the discretion of the TRANSCAER Chairman to recognize an individual who has contributed above and beyond to the TRANSCAER program.



Keith Silverman, PhD, MPH

Past Chair, TRANSCAERSM Executive Committee and TRANSCAER NTTG Member



NATIONAL ACHIEVEMENT AWARD



Pete Kirk

NA Emergency Response Coordinator, The Dow Chemical Company



Geoff Cooper

RFA President and CEO



The National Achievement Award is given in recognition of extraordinary achievement in support of TRANSCAER initiatives extending beyond the geographic boundaries of any one TRANSCAER region.



Cindy Kuranchie

Director – Member Services & Outreach, The Chlorine Institute



Robert Wood

System Manager Hazardous Materials, Norfolk Southern Corporation



David Binder

Director, Quality, Safety and Regulatory Affairs, Tanner Industries, Inc.



Tanner Industries, Inc.



Mark Lutz

Assistant Vice President Fuel and Environmental, Union Pacific Railroad



BUILDING AMERICA®



BNSF Railway celebrates their TRANSCAER National Achievement Award virtually as a team.



The TRANSCAER Awards Program is designed to:

- ◆ Recognize the achievements of individuals, companies, and organizations that have gone beyond the normal call of duty to advocate, demonstrate, and implement the principles of TRANSCAER;
- ◆ Enhance public recognition of TRANSCAER; and
- ◆ Increase participation in TRANSCAER initiatives.

TO LEARN MORE ABOUT TRANSCAER AWARDS, VISIT TRANSCAER.COM/AWARDS

STAY TUNED
for announcements of our 2020 Awards in the next edition of TRANSCAER today!



REGIONAL ACHIEVEMENT AWARD



Carl Akins KCS with KCS and KCSM Regional Achievement Award



(Left to Right) **John Vergis**, Wheeling and Lake Erie (TRANSCAER State Coordinator – Ohio); **Drew McCarty**, Specialized Response Services, Inc.; and **John Casey**, Casey’s Specialized Services (TRANSCAER State Coordinator – Pennsylvania).

The Regional Achievement Award is given in recognition of extraordinary achievement in support of TRANSCAER initiatives within one TRANSCAER region.

In August of 2020, Wheeling and Lake Erie Railway sponsored a luncheon to present the TRANSCAER Regional Achievement Award to Drew McCarty, Specialized Professional Services, Inc. It was a small gathering, in order to keep everyone socially distanced due to COVID. This award was to recognize both Drew and his team’s efforts to help make TRANSCAER events a success in both Ohio and Pennsylvania in 2019. Drew is truly passionate about emergency response and training others to respond to hazardous materials incidents safely. Specialized Professional Services, Inc. is located in Washington, PA and over the years has provided instructors and equipment for multiple TRANSCAER training events.



TORCH AWARD



Stephen Torres with his TRANSCAER Torch Award.

The Torch Award is given to TRANSCAER team members who have actively dedicated a portion of their professional career to the TRANSCAER mission, but are either retiring, leaving for a new job/industry, or are leaving the program due to another unforeseen situation.



Rollie Shook (right) received his TRANSCAER Torch Award from **Pete Kirk** (left).

CELEBRATING 35 Years OF TRANSCAER

We invite you to look back over 35 years of TRANSCAERSM. TRANSCAER was established as a national outreach effort in 1986 by DOW Chemical and Union Pacific Railroad. Today, TRANSCAER has grown exponentially and has nine national Sponsors, participation from many American Chemistry Council Member Companies, and all Class 1 Railroads. Our partnerships have also expanded to include multiple emergency responder organizations and federal government agencies.

One thing that has and always will remain the same is our mission of assisting communities and preparing responders for hazmat incidents.



Colorado Emergency Management Conference, Tabernash/Winter Park, CO, 1999



Colorado Emergency Management Conference, Tabernash/Winter Park, CO, 1999



Drill, Vernon, CA, 1996



Exercise in Newton, KS, May 1997



Mississippi Headwaters State Exercise, Ball Club, MN, Sept. 1997



Ed Chapman on CPDX 911, Wickenburg, AZ, 1997



Drill with Vernon Fire Dept., Vernon, CA, 1999



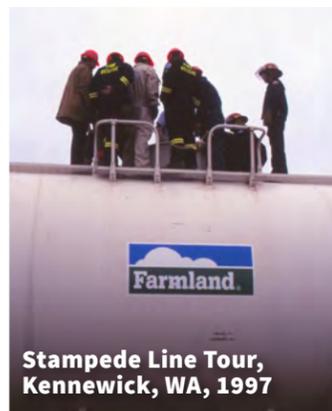
Training on Tank Car, San Bernardino, CA, 1998



Pat Brady, Ferndale, WA, 1999



CPDX 911, Flagstaff, AZ, 1996



Stampede Line Tour, Kennewick, WA, 1997



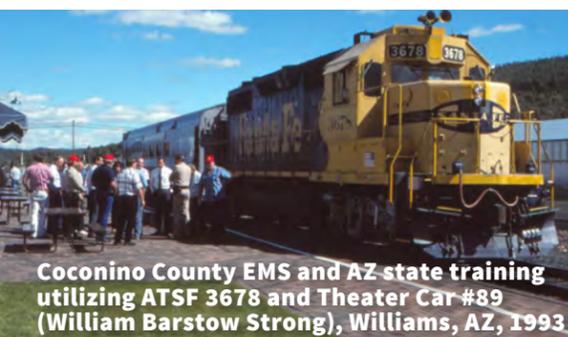
Stadium Exercise, USAF Academy, July 1997



Training with Vernon Fire Dept., Vernon, CA, 1998



Drill, San Bernardino, CA, 1998



Coconino County EMS and AZ state training utilizing ATSF 3678 and Theater Car #89 (William Barstow Strong), Williams, AZ, 1993



Exercise Entry Team, Argentine, KS, June 1993



Big Lift training for Littleton Fire Dept. and South Metro Area, Denver, CO, 1995

SEE MORE PICTURES ON THE NEXT PAGE





Norfolk Southern 2009 Whistle-Stop Tour (Photo Credit: Unknown)



CSX Transportation presented a full-scale Unified Command Center Exercise during the 2009 US EPA Region 3 Conference. (Photo Credit: Unknown)



A Hazmat Tech Requalification event at the Massachusetts State Fire Academy in Stow, MA in 2012. Dana's Jon Cragg did the hands-on cargo tank training with HazMat Techs going through requalification training. Jon is showing them the various fittings and vents; the trailer has three DOT specifications: MC-307, DOT-407 and MC-331. (Photo Credit: Gene Patten, Dana Transport, Inc.)



The Renewable Fuels Association and Norfolk Southern Corporation partnered together to bring ethanol emergency response training to six different locations in 2012. (Photo Credit: Unknown)



LSP Training Academy, 2010 - Baton Rouge, LA Schneider National Bulk Carrier's Elroy Hoover and Jim Baroni show students how various trailer valves operate. (Photo Credit: Unknown)



CSX Transportation "On Track" drill, 2010 - Asheville, North Carolina, Asheville Fire Department - "On Track" Drill applying a capping Midland kit to secure release from a defective valve. (Photo: Nick Ferroli, Compliance Associates)



Hotzone Hazmat Conference, 2010 - Houston, TX, - Dow Chemical's Joey Dugas and members of the Sugar Land FD following TRANSCAER training during the Hotzone Hazmat Conference. (Photo Credit: Unknown)



Air Decon Operation during Ammonia Drill at Delaware State Hazmat Training Workshop April 2014 - Dover, DE. (Photo Credit: George Giles)



Ed Dankbar and Dale Buckholtz of CP debut their newest mobile training prop - CP1049 - appropriately named in honor of longtime TRANSCAER® Team Member Mike Ball of CP during the Cold Zone HazMat Conference. Spring 2015 - Minneapolis, MI. (Photo Credit: Donna Lepik)



International Association of Fire Chiefs Hazmat Conference, June 2014 - Baltimore, MD. Group Picture After Ammonia Trailer Review - Happy to See "Tiger" Contained. (Photo Credit: Unknown)



The Chlorine Institute Training, 2011 - Los Angeles, CA. An instructor shows students the Pressure Relief Valve on a Chlorine Rail Car Training Aid. (Photo Credit: Photos: Andrew Johnson, iMedDesign)



Chlorine Institute and Union Pacific Railroad hosted two training days at the Belt Railway Company of Chicago in 2011. Tracy Clark of United Professional Services explains the details of the unloading valve and other parts of a caustic tank trailer. (Photo Credit: Shane Fast)



Mark N. and Robert B., both with UP Railroad, provide instruction to firefighters and hazmat specialists on proper techniques for addressing leaks from general service tank car equipment. 2015 - Las Vegas, NV. (Photo Credit: Henry Ward)



TRANSCAER Chlorine Safety Tour - TRANSCAER instructors and students during the chlorine safety and emergency response training event at the Dupont/Chemours Plant in New Castle, Delaware 2015 - New Castle, DE. (Photo Credit: Unknown)



Kansas City Southern TRANSCAER Hazmat Training Events, Fall 2010 - El Toro, Texas & Shreveport, LA. (Photo Credit: Unknown)



2011 Tuscarawas County Hazmat Training Exercise. (Photo Credit: David Schlosser, Senior Correspondent, First Responder Network & John Vergis, Environmental Officer, Wheeling and Lake Erie Railway)



CN participates in the Bishop International Airport Mock Drill, Flint, MI (Photo credits: Greg Palmer & John Junga)



Emergency responders from the Whitefish, MT area conduct a drill on the BNSF TRANSCAER Training Tank Car as a part of their recent training. (Photo Credit: Justin Franz)



Entry Team Prepares to Tarp & Cover for Ammonia Live-Release Drill, April 2016 - Zachary, LA. (Photo Credit: David Binder, Tanner Industries, Inc.)



David Binder (Tanner Industries, Inc.) and Richard Browning (Louisiana State Police - Joint Emergency Services Training Center) getting responders ready for live-release ammonia drill at the Hot Zone Conference, October 2018 - Houston, TX. (Photo Credit: Unknown)





TRANSCAER Learning Management System

By: Erica Bernstein, Director – Outreach & Special Programs, CHEMTREC®

TRANSCAERSM has released our own online Learning Management System (LMS). Each course includes timed video modules, a post-course knowledge assessment, and a course survey. Following the completion of all required course content, you will be eligible to receive a certificate of completion for each course.

The new TRANSCAER LMS is utilized for online learning courses only. All TRANSCAER events that require pre-registration including webinars and in-person training events will still be completed through the TRANSCAER website.

RAILROAD-SPECIFIC TRAINING:

TRANSCAER encourages you to take a rail-focused training from the railroad(s) operating in your area.

Norfolk Southern Corporation (4 courses)

- Railroad 101 - Rail operations, awareness and response
- Tank Car Valves and Fittings – Overview valves and fittings
- Tank Car Identification – Overview of gathering information on tank cars
- Locomotive Fire – Overview of response to locomotive fires

CSX Transportation

- The CSX Hazardous Materials Team presents Emergency Response to Railroad Incidents, and discusses safety while operating on or near the

railroad, initial response procedures for first responders, hazardous materials transported by rail, introduction to tank cars, and other equipment found of the railroad (locomotives, freight cars).

HAZMAT AND STEEL DRUM TRAINING:

Anhydrous Ammonia Safety Training

- The Fertilizer Institute in partnership with TRANSCAER created this course which is designed for emergency responders in communities where anhydrous ammonia is manufactured, stored, or shipped.

Chlorine Emergencies: An Overview for First Responders

- This course was developed to help first responders prepare to act in those critical first 15 minutes – what to do when the call comes in, what to expect on-scene, and where to find the resources needed to contain a release. The course includes information on resources for mobile devices, security & antiterrorism considerations, and an explanation of shelter-in-place, and chlorine release footage.

Crude Oil by Rail Safety Video

- This course provides general guidance on several key topics: moving crude oil by rail, the type of tank cars that carry crude oil, and the characteristics of crude oil. It also covers the Rescue,

Exposure, Containment, Extinguish, Overhaul, Salvage (RECEOS) strategies that should be considered if crude oil is present, spill response and firefighting considerations, and the need for structured incident management.

Ethanol Emergency Safety Training

- The Renewable Fuels Association (RFA) created the ethanol emergency safety training course. Attendees taking this training course will receive in-depth information on proper training techniques that emergency responders and hazmat personnel need to effectively respond to an ethanol-related emergency.

NEW - Flammable Liquids Safety (Released February 2021)

- TRANSCAER in partnership with SERTC created the Flammable Liquids Safety course. The course will provide an overview of the properties of flammable liquids, storage and transportation of flammable liquids, and emergency response techniques.

Steel Drums 101 for Emergency Responders

- The Steel Drums 101 course is designed for emergency responders to better understand the components of steel drums, including the difference between an open-head and a tight-head steel drum; and how to interpret the UN markings. ■

Create an LMS Account



Sign-Up Link: pathlms.com/transcaer/sign_up

An access code is not required to create an account



SHIPPING OR HANDLING HAZMAT?

CHEMTREC's online training helps meet U.S. DOT hazmat training requirements!



STEEL DRUMS 101: Frequently Asked Questions

Article By: The Industrial Steel Drum Institute

As a proud sponsor of TRANSCAERSM, the Industrial Steel Drum Institute (ISDI) routinely conducts trainings for first responders looking to learn more about the proper use of steel drums and how to respond to a potentially hazardous situation. These are valid concerns since steel drums are widely used to transport more than 50 million tons of both hazardous and nonhazardous materials around the world each year.



“ISDI gladly helps first responders learn how to safely handle steel drums,” said Susan Nauman, executive director of the Industrial Steel Drum Institute. “Through both our live and

virtual trainings, we’re able to share a lot of critical information – from the unique components of steel drums, to the different types of drums and their safety advantages to the typical transportation practices.”

Following the trainings, attendees are encouraged to ask the ISDI trainers questions or clarifications; the most common questions received concern damage to drums and proper use of fusible plugs with ignitable liquids. Here are the top three questions and answers:

1) Can you advise how many fusible plugs are required for 55-gallon steel drums to be considered “relieving style?”

Paragraph 16.5.1.7 in NFPA 30 states “When relieving-style containers are used, both 3/4 in. (20 mm) and 2 in. (50 mm) listed and labeled pressure-relieving mechanisms are required on containers greater than 6 gal. (23 L) capacity.”

Furthermore, when fusible (plastic) plugs are used with 55 gal. steel drums, they “shall be listed and labeled in accordance with FM Global Approval Standard for Plastic Plugs for Steel Drums, Class Number 6083, or equivalent,” per paragraph 16.3.6 in NFPA 30.

2) Where can I obtain a copy of NFPA Code 30?

NFPA30 may be accessed for free at www.nfpa.org/codes-and-standards/document-information-pages?-mode=code&code=30. You will be asked to create a free profile to access the document in read-only format. To do so, visit www.nfpa.org/Login.

3) If increasing thickness prevents denting of steel drums and rolling hoops aid in vacuum resistance, what feature can prevent distortion due to internal pressure build-up?



Increasing steel thickness can help prevent distortion. However, if the internal pressure buildup is so high the drum distorts, a vent should be considered. Vents can be used if they do not create a hazardous environment during transportation due to release of the contents. The same vendors that manufacture steel and fusible plugs can provide vented plugs.

ISDI has compiled additional frequently asked questions (FAQs) on their website in an effort to help users better understand the many aspects and use of steel drums.

First responders interested in learning more can attend one of ISDI’s scheduled live trainings, which are listed on the TRANSCAER website, or can complete the ISDI course through TRANSCAER’s new Learning Management System (LMS) which launched in December 2020. For the live trainings and the LMS course, attendees will receive a training certificate upon completion.

If you have additional questions be sure to visit the ISDI website, whysteeldrums.org or email snauman@industrialpackaging.org. ■

Steel Drums+Fusible Plugs=Safety

Steel drums equipped with fusible plugs are one of the **safest packaging solution for flammable and combustible products.***

- They can melt under fire conditions to allow gasses to vent and relieve pressure at point of buildup, preserving structural integrity and ensuring that the contents are controlled.
- They are stackable up to four-drums high, optimizing space for shipping and storage.**
- They meet strict UN and DOT requirements ensuring smooth and safe transportation around the world.

For more information, visit www.WhySteelDrums.org

*When paired with an adequately designed foam-water sprinkler system
**Approved in the National Fire Protection Association's (NFPA) revised NFPA 30 code
Sources: ISDI, Steel Containers – Testing to New Heights; ISDI, Why Choose Steel Drums? Safety & Security; ISDI, Why Choose Steel Drums? Increased Fire Safety; JUSTRITE Field Book; FM Global, Plastic Plugs for Steel Drums.
This information is intended to provide interpretative and authoritative information as a service to our members and has been offered in good faith, based on the information provided to us. We do not guarantee the accuracy or completeness of any such interpretation or information.

Safe. Secure. Sustainable.

Steel Drums are the most widely used industrial packaging in the world for hazardous goods due to their consistent durability and strength as well as their ability to be reconditioned, reused and recycled.

Learn more about the many benefits of steel drums at www.WhySteelDrums.org.



TRANSCAER Canada's new training tank car was generously donated by GATX Corporation. The tank car is being stored at Dow Chemical's Fort Saskatchewan site, where it will be kept until it is ready to be retrofitted. Photo by Randy Mak, Dow Chemical.



Canadian TRANSCAER® Receives Funding for Upgraded Training Tools to Promote Rail Safety

Article By: Kristina Adler, Transportation Policy and Program Officer, Chemistry Industry Association of Canada

A decision made in 1990 to convert a general-purpose tank car into a classroom on wheels created a legacy for the Canadian TRANSCAER program and its CCPX 911 training tank car. Maintained by the Chemistry Industry Association of Canada (CIAC), the Railway Association of Canada (RAC) and their members and partners, the CCPX 911 tank car provided public education on rail safety and chemical emergency response by familiarizing first responders with the designs, valves, safety appliances, and functionality of tank cars. Complementing this hands-on experience were education sessions delivered by chemical manufacturers on the properties

of materials being moved through communities, supporting first responders' awareness of the products being transported through their area and focused on responder preparedness should

an incident occur. The CCPX 911 was the first training tank car of its kind in Canada – a concept that has since been adopted by other organizations across North America and around the world.



Training in progress on the infamous CCPX 911 tank car at an event in Saskatoon, Saskatchewan. The new TRANSCAER tank car will function similarly to the CCPX 911 tank while incorporating modern upgrades based on lessons learned for nearly three decades. Photo courtesy of CIAC.

In 2018, after nearly three decades of providing this unique backdrop to learn about the transportation of dangerous goods, TRANSCAER's CCPX 911 training tank car was officially retired. Since then, TRANSCAER members and partners have been seeking ways to evolve the tank car training program.

In September 2019, Transport Canada, under the Rail Safety Improvement Program, granted CIAC funding to develop enhanced training tools and to expand outreach events under the TRANSCAER program. "The Canadian TRANSCAER outreach program is thrilled to have received funding through the Railway Safety Improvement

Program. That, and the donation of a railway tank car from GATX Corporation, has provided us with the opportunity to build a new up-to-date training tank car that will allow us to teach first responders, community leaders, Indigenous communities, and industry personnel about rail safety and Responsible Care® using modern equipment," said Randy Mak of Dow Chemical, and TRANSCAER Canada's National Committee Chair.

Collaboration between CIAC, RAC, and their members and partners is well underway as they work to develop an upgraded

training tank car. This new tank car will demonstrate commonly used valve arrangements to highlight some of the commodities that are transported throughout Canada.

Incorporating lessons learned from nearly 30 years of participation, the team will deliver a modernized tank car to

The Canadian TRANSCAER outreach program is thrilled to have received funding through the Railway Safety Improvement Program.

support the continued delivery of awareness level and hands-on rail safety training in communities across Canada.



The disassembly of the retired CCPX 911 tank car in June 2019 before being transported to its new home, the Fire and Emergency Services Training Institute in Mississauga, Ontario. Photo by Andy Ash, Railway Association of Canada.

Once complete, the new training tank car will embark on a cross-country tour, raising awareness about rail safety and emergency response for transportation incidents involving dangerous goods. This will enable TRANSCAER to strengthen its existing relationships with municipalities and first responders, as well as expand its reach to new communities.

With funding from Transport Canada's Rail Safety Improvement Program, TRANSCAER will also integrate the latest training tools offered by modern technology into the TRANSCAER training curriculum. "In addition, we have been able to start a virtual reality training program that will allow us to go into communities that

do not have easily accessible rail lines and provide the same level of information sharing," Mak further noted. The virtual reality program will enable TRANSCAER to engage with communities at events where the training tank car cannot be present, using virtual reality technology to show a 360-degree view of the retired CCPX 911 tank car. This will enable TRANSCAER to meet the ever-evolving needs of its diverse audience.

The national and regional Canadian TRANSCAER teams are working to sustain the legacy of specialized training, equipping first responders with the insights to safely approach a transportation incident involving dangerous goods in Canada. ■

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CHECK THE BOX



Shipping HAZMAT? Send It Safely.

Is Hazardous Matt or his friends hiding in your package?

Each year, an estimated 3 billion tons of regulated hazardous materials (hazmat) are transported within the United States. These materials include explosive, poisonous, corrosive, flammable, and radioactive materials. When these materials are not properly declared, or identified as hazmat, the increased risk of accidents poses significant safety threats to inspectors, commercial motor vehicle drivers, mechanics and vehicle maintenance personnel, transportation professionals, motor carriers, emergency responders, the general public, and the environment.

Approximately 1,500 undeclared hazmat transportation incidents are reported each year. Undeclared and improperly packaged hazardous materials can be dangerous in transportation. These incidents put people's lives at risk.

The most frequent explanation for undeclared shipments, according to Federal HAZMAT experts? A shipper's lack of knowledge. By addressing unawareness or misunderstanding of the requirements for properly declaring and transporting hazardous materials, we can prevent incidents and save lives.

Everyone has a role to play to prevent hazardous materials from causing accidents and injuries. That's why it is important to always CHECK THE BOX to ensure you are safely shipping hazardous materials.

For assistance, visit checkthebox.dot.gov or contact our Hazardous Materials Information Center by telephone at 1-800-467-4922 or 202-366-4488 or by e-mail at infocntr@dot.gov

Meet **Hazardous Matt** and his friends. They are made of hazardous materials, which means that we need to take extra care when we send them somewhere.



CHEMTREC® Celebrates its 50th Anniversary

BRIEF HISTORICAL BACKGROUND:

CHEMTREC® originally called the Chemical Transportation Emergency Center was established by The Manufacturing Chemists' Association on September 5, 1971. For the past 50 years CHEMTREC has operated on a 24-hour basis, seven days a week, providing emergency personnel with information on safety measures in handling hazardous materials incidents.

The following is an interview conducted by Erica Bernstein (Director, Outreach and Special Programs, CHEMTREC) with Joe Milazzo (Operations Center Director) an employee of CHEMTREC® for 33 years.

Joe Milazzo has been with CHEMTREC since 1988 and became the Operations Center manager in January 2007. He now serves as the director of the Operations Center, where his responsibilities encompass complete operational overview and oversight of CHEMTREC emergency services. He has attended numerous industry hazmat training sessions with various chemical manufacturer response teams, including one of the few that trained with live chemicals. He served as the CHEMTREC Training Coordinator in March 2002 where he designed operational and company-specific training and assisted the Director of Operations with day-to-day responsibilities. He is a 2007 graduate of the International Academies of Emergency Dispatch Communication Center manager course and a veteran of the United States Coast Guard.

What made you want to come work for CHEMTREC?

JM: It was a mix of both the mission of CHEMTREC and honestly the money. After five years of service in the United States Coast Guard working at the National Response Center, I was an eager 23-year-old looking to join CHEMTREC's impressive professional team, many of whom were Vietnam War veterans.

What is the biggest change you have seen in CHEMTREC?

JM: Technology has been one of the biggest changes for the Operations Center. When I started, we didn't have internet, cell phones, or email. Faxing at the time was cumbersome and made it hard to share information. We were often patched through 9-1-1 to relay information to the first responders on the scene which made it incredibly difficult to communicate effectively. I remember one call involving a chemical that was water reactive and I heard them say charge the line, and I just kept repeating "it's water reactive, it's water reactive" and felt so relieved when I finally heard the stand-down decision. Luckily, the message got through or else there would have been a steam explosion. Communication has vastly improved with cell phones, which allows the CHEMTREC Operations Center to now have a direct connection to those on the scene of an incident. Plus, the internet has also helped to increase access to information for emergency responders.

What is the most unique call you have handled in the Operation Center?

JM: I've definitely taken a lot of interesting calls over the past 33 years, and it's hard to pinpoint one that is most unique so I will recall a few. Once at a zoo, they had coated the concrete animal enclosure and a some of the coating had gotten on the orangutan's fur. The animal was not in any pain - just bothered by it, and CHEMTREC was able to link the vet to the company who produced the coating.



Joe Milazzo
Operations Center Director

If you think back on major incidents that have occurred in the United States CHEMTREC has received calls during them. After the Oklahoma City Bombing in 1995, canines were searching the scene and alerted to a strong chemical, since the product name was on the label, we were able to connect the responders on the scene to the producer. In 2001, the days following the September 11th attacks we received a call regarding a chemical in the basement of one of the collapsed towers and responders had questions regarding if the chemical was decomposing, this was another example of CHEMTREC connecting the producer with responders. CHEMTREC also fielded calls during the anthrax incidents in 2001; and, in 2003 when the Columbia Shuttle disaster occurred responders called CHEMTREC.

How has the operations center changed in the last 50 years?

JM: One of the biggest changes to the Operations Center, besides technology, is the types of calls and increase in staff. Initially, CHEMTREC received calls mainly from first responders and transportation providers, now our services and the types of calls we receive have expanded to include more industries. In 1971, there were 6 employees in the Operations Center and today we have 24.

What has been the key behind CHEMTREC's success?

JM: CHEMTREC's success is driven by its people and partnerships. CHEMTREC's employees are committed and dedicated to our mission, and truly care about their jobs.

American Chemistry Council members and our industry partners have also been extremely supportive and valuable partners in the helping communities and first responders when an incident occurs. Our partnership with first responders has also been key to our success. Our service has been provided to them for free, 24/7, since day one, no matter how long an incident lasts CHEMTREC has been there on the line for the responders on scene.

What are you most excited about for CHEMTREC's future?

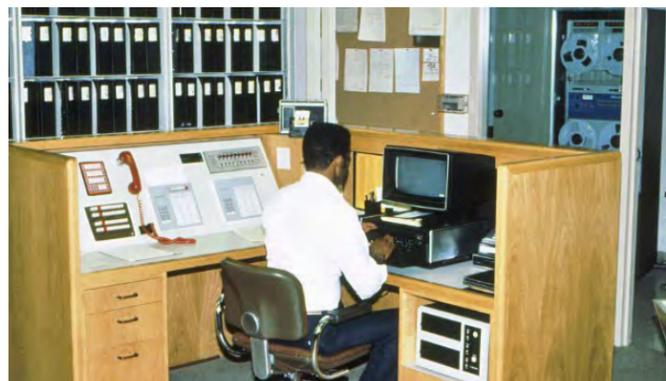
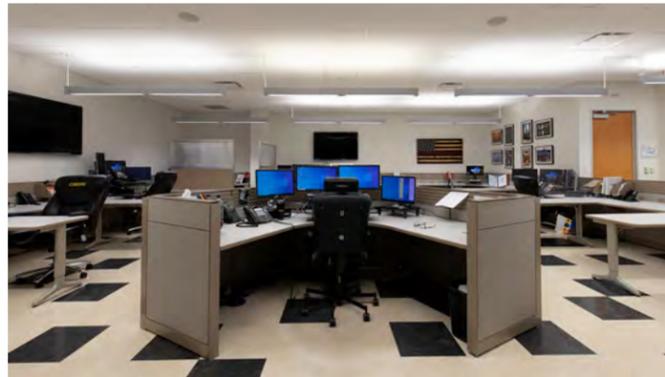
JM: I am most excited about the new generation of staff we have here at CHEMTREC. I see continued success for CHEMTREC due to the innovative and passionate employees that we have. It has been great to see the new ideas, services, and programs that we've been able to establish for our customers and first responders. I have also enjoyed seeing the evolution from handling mostly response calls to now seeing our customers utilizing CHEMTREC in a more proactive way to prevent incidents before they occur. Since I've been with the Operations Center, I've have also seen a reduction in the number of significant releases. Over the past 33 years, we've seen better reporting and improvements to packaging, transportation, and processes - so I think it's important all of us take a moment to recognize what we are doing is working! I look forward to working together with our partners on continuous improvements, training together, and providing service 24/7 for many more years to come. I see a bright future ahead for all of us. ■

	1971	2020
Total Inbound Calls	5,925	99,275
Calls Involving Emergencies	1,798	47,672
Non-Emergency Information Inquiries	865	37,810
Call Reports Prepared	801	85,482
Package Types Involved Tank Cars	34%	3%
Package Types Involved Drums	32%	8%
Package Types Involved Tank Trucks	8%	3%
All others (including small packages and barges)	26%	86%
Number of Operations Center Staff	6	24
Number of Members	161 members	14,168 accounts

THEN & NOW



CHEMTREC Operations Center.

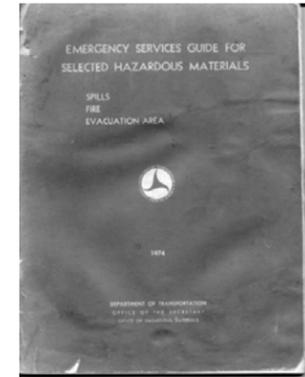


CHEMTREC Operations Center Staff.



The CHEMTREC® logo from the 1970s and its modern-day version.

THEN & NOW



Department of Transportation Emergency Services Guide from 1974 and the Emergency Response Guidebook released in 2020.



For nearly 50 years, our engagement with emergency responders around the world has been the engine that drives our success. In light of that relationship, in 2019 CHEMTREC began partnering annually with the National Volunteer Fire Council (NVFC) to award volunteer fire departments funding through the CHEMTREC HELP (Hazmat Emergencies Local Preparedness) Award.



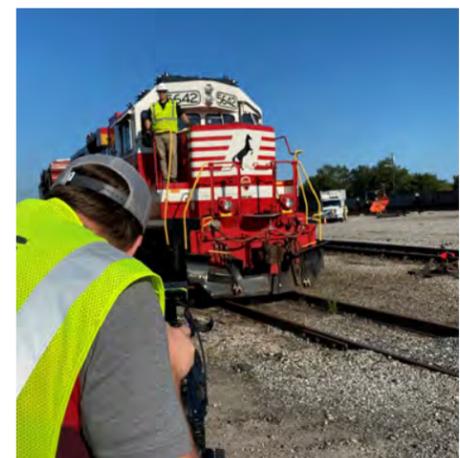
The first CHEMTREC Summit was held in 2006 in Miami and the more recent Summit was held in 2019 in Houston. The CHEMTREC International Hazmat Summit is an excellent discussion and networking opportunity for all stakeholders involved in the safe transportation, handling, and use of hazardous materials.



Retooling Your Training Program During a Pandemic

Article By: David Patten, CHMM, Norfolk Southern Corporation

The COVID-19 pandemic has changed countless aspects of our lives. Our work environment has been greatly impacted as well. We are working remotely, traveling less, and figuring out new ways to complete our duties all while complying with social distancing and COVID restrictions.



Training is one area that has been greatly hampered by the pandemic. Traditionally, Norfolk Southern (NS) hosted dozens of Operation Awareness & Response (OAR) outreach training events with classroom and hands-on training each year. Social distancing requirements has made our traditional approach virtually impossible, not to mention putting over 20 people in a box car classroom is an unacceptable risk with COVID-19 transmission possible. Even NS' internal DOT and HAZWOPER training courses could not be completed using our traditional, in-person approach.

As with many aspects of our lives in 2020, NS was forced to explore online, video, and live virtual training platforms to continue our outreach programs and internal regulatory training. Using online and video

training modules requires a lot of upfront work. Beginning early in 2020, all of NS' OAR training presentations were modified to condense the content into a shorter time frame to keep participants engaged online. Unlike in-person training where subject matter experts follow an outline, word for word scripts had to be prepared for voice over narration of presentation content for online use. This level of detail really made us focus on the content of each presentation. For NS' OAR programs, each topic area was assigned to one of NS' Hazardous Materials Compliance Officers to develop the scripts for the condensed presentations. This division of work turned out to be beneficial because each officer worked on the topic area they were the most knowledgeable in. While a great digital curriculum was coming together, and NS needed a good platform to host it.

Using Microsoft Teams video conference, the NS hazmat group rehearsed the training and perfected the scripts by reading them while presenting their PowerPoints in Teams. These rehearsals gave the group a feel for presentation length and if the scripts sounded conversational or like someone reading aloud. By July, NS hosted live trainings using WebEx to present the modified OAR program. Attendees registered for the live WebEx using the TRANSCAERSM website. The Live WebEx was a good first step, but was not sustainable long term. Staffing these live events multiple times a week became a challenge and attendance began to wane with our limited time slot offerings. To augment this training, NS Hazmat and Corporate Communications produced three short videos on tank car identification, tank car valves

and fittings, and locomotive fires. We also hired a professional video production company to narrate our OAR presentations and convert it to a video format. These videos were posted to NS' OAR website, www.joinnsoar.com. It was a great way for first responders to view our training anytime, but our website lacked the tracking NS desired.

During this time, NS was also evaluating different platforms for hosting our content in an on-demand format. We tested third-party content hosting websites that offered attendance tracking and other technical services. Since this was an initiative that all Class I Railroads were working through, it was brought to the AAR Hazmat Committee for discussion. This collaborative effort among the Roads resulted in TRANSCAER agreeing to host an online Learning

Management System (LMS) with training content from the Railroads and other TRANSCAER partners. Each Class I provided financial support to TRANSCAER for the creation of the new LMS system. The TRANSCAER LMS now has many course offerings online, including those created by NS.

The TRANSCAER LMS courses consist of videos and narrated presentations available anytime. Each course has learning checks or quizzes to assess for understanding of the presented content. Afterwards, participants are presented with a printable certificate of completion. Participants can provide feedback about the courses using an online survey for each course. The new LMS can track attendance, usage, and other useful statistics for content providers.

COVID-19 hasn't stopped the need to complete regulatory training requirements, but has changed how the content is presented. Using the same methods of converting NS' OAR program, NS retooled their internal training programs to all online and virtual classes. These classes are hosted on NS' SAP SuccessFactors LMS.

2020 was a tough year for everyone, but all of the extra work that went into adapting NS' training programs has really paid off. The content of these program received a thorough review and several updates were made that resulted in a better overall curriculum. They provide a more consistent message and are more accessible to those needing to receive the training. Participants are now able to complete courses when it fits their schedule. NS plans to continue with online learning even after the pandemic has ended in conjunction with in-person and hands-on learning. ■

SAFETY *and* LNG

Article By: The Center for Liquefied Natural Gas

With the growing popularity of liquefied natural gas, known as LNG, first responders may encounter it in a variety of environments, including in storage at natural gas and electric utilities; at one of the seven huge operational export facilities in the United States; as cargo on an LNG tanker, and as fuel for a variety of ships, fleet vehicles, trucks and even some rail cars.

TRANSCAERSM has developed several “Seconds Count” videos for first responders and will soon be launching a training course to educate first responders on the basic properties of LNG when responding to a potential incident.

LNG is simply natural gas in its liquid form. When natural gas is cooled to about -260 degrees Fahrenheit (-162 degrees Celsius) it becomes “liquefied” and reduces the volume to approximately 1/600 of its original size, making it easier to transport. LNG is odorless, colorless, non-toxic, and non-corrosive. When exposed to the environment, LNG typically will rapidly evaporate, leaving no residue on water or soil.

LNG’S GROWING POPULARITY

Until recently, LNG was most often used by utilities as a way to store natural gas. But around 2007, technological innovation helped America’s natural gas producers to unlock previously unreachable natural gas resources with improved economics and safety features. The abundance of natural gas in the United States expanded quickly and the country became the world’s largest producer of natural gas.

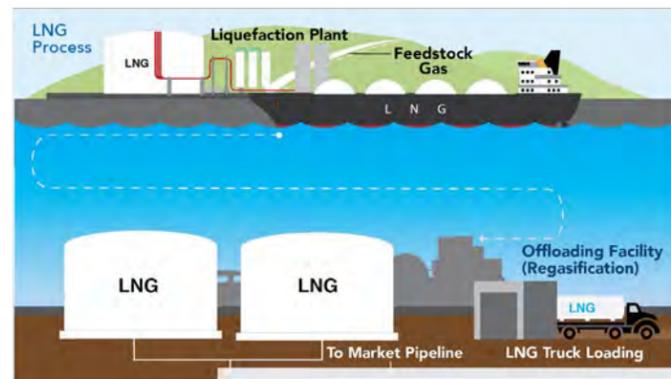
Natural gas – as a gas or as LNG -- was already popular because of its low carbon emissions and high efficiency, and it became even more popular as its abundance made it so affordable.

LNG is transported in its liquefied form, by pipeline or vehicle, and re-gasified at its destination to make it available for a variety of uses.



LNG’S USES

- Heat and Power**
 Most commonly, LNG is transported to local natural gas utilities for home heating and cooking or to power plants to generate electricity.
- Manufacturing Essential Products**
 It is also used to manufacture steel, glass, paper, brick, and many other products. In fact, natural gas is used as a raw material for common products such as medical equipment, paint, fertilizer, cosmetics, and plastics.



- Exported by U.S. to 35 Countries -- and Climbing**
 Countries around the world have been transporting LNG as cargo for more than 50 years thanks to the use of special double-hulled tanks, leak detection, and appropriate ventilation. Because of the recent abundance and affordability of LNG, the U.S. began shipping exports of LNG overseas in 2016. Since then, the U.S. has become the world’s third largest exporter of LNG to more than 35 countries around the globe.
- Fueling Ships**
 Maritime use of LNG keeps growing in popularity, as many shipbuilders and the cruise ship industry are now turning to LNG as a fuel source because of its low emissions and other environmental advantages.



Florida East Coast Railway locomotive with LNG fuel tender.

- Fueling Trains**
 LNG’s popularity is also expanding to include use in the rail industry. LNG-fueled locomotives have several benefits, including longer operating distances, reduced fuel usage, and fewer greenhouse gas emissions. LNG-fueled locomotives are best identified by their connection to an LNG tender car. An LNG tender is a tank-car like a rail car, connected by external hoses and piping that may be frosted due to the cold temperature of the LNG. LNG tenders have emergency shut off devices, like other locomotives, which are designed to stop the flow of LNG in the event of an urgent situation.
- Fueling Trucks and Fleet Vehicles**
 The majority of vehicles that use LNG as a fuel are class eight trucks with powertrains similar to those fueled by diesel and gasoline. A blue diamond-shaped LNG decal is typically placed near the fuel tank, fill location, or rear of the vehicle to help with identification. Cryogenic LNG fuel tanks can keep the fuel cold for up to five days in a parked vehicle.

Their shape, size, and location are similar to that of standard diesel truck configurations with safety features that allow for venting of the fuel in the unlikely event the truck is parked for longer than five days. LNG is also transported as a commodity in cryogenic bulk container tankers to fuel stations, businesses, and utility companies. These bulk LNG tanks can even be left onsite for extended periods of time as mobile onsite fueling stations.



Fig. 1 Blue diamond-shaped LNG decal

LNG SAFETY PROPERTIES

Should an incident occur, LNG will not ignite below one-thousand degrees Fahrenheit, which makes it much less flammable than diesel and other common vehicle fuels. Most LNG vehicle fires originate from vehicle components having no relationship to the LNG fuel system. In most cases, a vehicle fire has no effect on LNG contained within the tank because of the safeguards built in.

Incidents involving ships and LNG are extremely rare, but it is important to understand how LNG behaves in the shipping environment. TRANSCAER’s LNG course will explore what happens if LNG is spilled on water or on land, if it is released in a very confined space or if it is spilled and vaporizes in the presence of an ignition source. TRANSCAER’s course will cover common PPE and tools to fight an LNG fire. Look for more information later in 2021. ■



Truck fueled by LNG shows blue diamond placard near fuel tank.

SAFETY FIRST

From the liquefaction facility to the power plant, LNG operators have spent decades working closely with regulators and first responders-to maximize safety and reliability. To support safe operations, no amount of LNG can be transported or handled in the U.S. without the explicit approval of a host of federal overseers:

- Department of Energy
- Environmental Protection Agency
- Federal Energy Regulatory Commission (FERC)
- Federal Maritime Commission
- Maritime Administration
- Pipeline and Hazardous Materials Safety Administration
- U.S. Coast Guard
- U.S. Congress
- U.S. Department of State
- The White House

MANAGING Ethanol-Blended Fuel Incidents

Part 2: Necessary Tools in The Toolbox

Article By: Joel A. Hendelman, Battalion Chief (Retired), City of Fairfax VA Fire Department

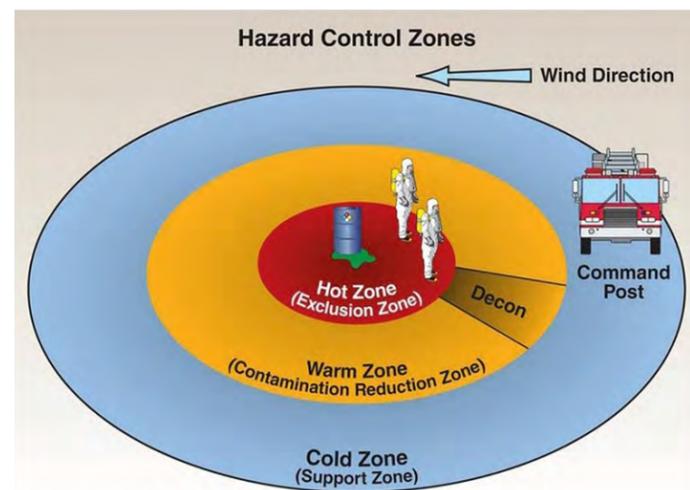
Regardless of the scope, magnitude, or location, a proper size-up of the incident scene is mandatory. Time is critical and it is standardized practice and fundamental necessity for size-up to be conducted by the first arriving tactical resource supervisor or individual. **Succinctly stated, a “size-up” is a visual and mental evaluation of what is currently happening at that scene from a safe distance.**

The critical information obtained from this initial size-up will help first responders determine issues impacting nationally recognized incident management benchmarks of LIFE SAFETY, INCIDENT STABILIZATION and PROPERTY CONSERVATION. These are easily remembered with the acronym LIP.

When accessing the general incident scene, serious consideration must be given to wind conditions, topography, and terrain. The adage of “uphill, up wind” is certainly applicable as it relates to performing a size-up at

an ethanol-blended fuel incident. Venturing too close to the actual incident scene without a proper size-up, without an understanding of the actual hazardous materials involved (in this case, ethanol-blended fuels), and without an appreciation for environmental and weather conditions may place first responders in the hot zone, or Immediately Dangerous to Life and Health (IDLH) and in eminent danger.

Once size-up is completed, then a clear and concise situation report is transmitted via radio to the appropriate parties (such as dispatch, initial command officer, and other resources in route to the scene) that defines the scope and nature of the incident and articulates an initial action plan that addresses the LIP benchmarks noted above. Therefore, the use of a simple pair of 10 power by 42- or 50-mm objective lens binoculars (10x42 or 10x50) is an inexpensive and fundamental tool allowing visual access to the incident scene from a safe distance.



Part of the initial actions performed by first responders at an ethanol-blended fuel incident is addressing life safety issues affecting both the first responders AND the community in dangerous proximity to the incident location. Evacuation of the immediate area surrounding the ethanol-blended fuel incident is imperative



**Graphics provided herein this article are simply generic public domain accessible representations of the tool or appliance discussed. Neither the author of this article, the Renewable Fuels Association (RFA), TRANSCAER (Transportation Community Awareness and Emergency Response), the American Chemistry Council, or CHEMTREC® are recommending any one specific brand or model.*



Multi-gas detector

to ensure the health, safety, and welfare of those citizens. The question becomes: How far away from the actual incident scene is a safe distance?

The standardized practice of establishing HOT, WARM, and COLD ZONES provide geographically identified hazard control zones that limit human access and define operational activities. The most accurate and expedient method for determining these zones is with the use of a multi-gas detector that can quickly identify the presence of flammable vapors and how great an area is impacted. The graphic below provides an excellent visual reference of this discussion.

Why is the use of a multi-gas detector so important at an ethanol-blended fuel incident? An ethanol-blended fuel incident that results in a fire typically indicates all available vapors are being readily consumed as part of the combustion process and simplifies somewhat the task of identifying the geographical layout of the incident. On the other hand, if the incident is spill-based, then first responders wearing the appropriate personal protective equipment (PPE) and possessing the knowledge, skills, and abilities (KSAs) to operate their organization-issued multi-gas detectors will determine where vaporizing ethanol-blended fuel is located and whether vapor concentrations are within the explosive range—and therefore an IDLH environment.

This sounds simple enough, but the complexity of the incident is subject to the chemical characteristics of ethanol-blended fuels that are unique and present significant challenges on an incident scene.

The first challenging characteristic is flammability. Remember that ethanol-blended fuel is a homogeneous mix of two different flammable liquids—ethanol and gasoline. Gasoline has a flammability range of 1.4% vapors mixed with air for the lower explosive limit (LEL) and up to 7.6% vapors mixed with air for the

upper explosive limit (UEL). Any percentage of vapors mixed with air below or above the values stated is either too lean or too rich to support combustion when exposed to an ignition source.

Denatured fuel ethanol (2-5% gasoline blended with 95-98% ethanol) has a flammability range of 3% for the LEL and 19% for the UEL. When you have an ethanol-blended fuel of E85 (15% gasoline blended with 85% ethanol) or a greater hydrocarbon content, the flammability range is 1.4% for the LEL and 19% for the UEL. This is an exponentially expanded flammability range as compared to a straight gasoline and further emphasizes the need to use multi-gas detectors at an ethanol-blended fuel incident. The second challenging characteristic involving ethanol-blended fuel is solubility in water. Any ethanol-blended fuel incident in the presence of water will result in the ethanol phase separating away from the gasoline to aggressively blend with the water. The molecular attraction for ethanol to water is greater than the molecular attraction to gasoline. Ethanol blended with water up to a 500% dilution remains flammable.

First responders wearing the appropriate PPE, utilizing multi-gas detectors that have been properly calibrated to the manufacturer’s specifications with the appropriate calibration gas PRIOR to arriving on the incident scene, deployed as a monitoring group to evaluate the incident scene is standardized practice as already mentioned.

When the multi-gas detector gets a “hit” or a reading on the appliance, what vapors is the device analyzing, gasoline or ethanol? Most multi-gas detectors are not “smart” appliances and therefore can not tell you which vapor it is analyzing. A conversion factor must be utilized as part of a mathematical adjustment to the values visually indicated on the detector in use. A failure to utilize the correct conversion factor to interpret the data visually displayed on the multi-gas detector may lead to an inaccurate analysis of the flammability range present at the incident scene, thus placing first responders and the impacted community in eminent danger.

Property	Gasoline	Denatured Fuel Ethanol
Flash Point	-45°F	-5°F
Auto Ignition Temp	530 - 853°F	709°F
Specific Gravity	0.72 - 0.78	0.79
Vapor Density	3 - 4	1.5
Vapor Pressure	8 - 15psi	~3psi
Boiling Point	100 - 400°F	165 - 175°F
Flammable Range	1.4% - 7.6%	3% - 19%
Smoke Characteristics	Black	Slight
Solubility	Trace	High

In most cases, the conversion factor for gasoline is not the same as the conversion factor for ethanol. Refer to the manufacturer's information for specifics regarding the appliance used by your organization. A quick reference of chemical properties for gasoline and denatured fuel ethanol is noted below.

The third characteristic of ethanol-blended fuels is visibility during combustion. Depending on the time of day and weather-related conditions, ethanol and ethanol-blended fuels may be on fire and not visible to the naked eye. Ethanol-blended fuels of E85 or greater (85% ethanol-blended with 15% gasoline for a transportation fuel, or up to 100% ethanol transported for medical, industrial, or distillery use) may provide no visual cues of combustion. Depending on incident conditions, first responders could arrive on a scene that lacks ordinary combustible materials adjacent to the incident, which are nonetheless burning or lack visual thermal signatures/waves in the atmosphere. First responders may not realize that the ethanol-blended fuel is burning until they are close enough to feel the radiant heat or are exposed to direct flame contact due to the use of PPE.



Ethanol-blended fuels of E85 or greater (85% ethanol-blended with 15% gasoline for a transportation fuel, or up to 100% ethanol transported for medical, industrial, or distillery use) may provide no visual cues of combustion.

First responders playing the role of the proverbial “canary” is unacceptable. It is my opinion that first responders along with all personnel handling ethanol and ethanol-blended fuels, should have access to a thermal imaging camera within their incident response toolbox. Below, note the dark background to emphasize that the ethanol and ethanol-blended fuel is in fact on fire.

The tools and/or appliances discussed in this article provide critical information to assist in risk management for first responders and the impacted community at ethanol and ethanol-blended fuel incidents. There are other tools available that should complement an incident response toolbox.

The use of these tools and/or appliances enhance our ability to establish incident objectives based on nationally recognized benchmarks LIP while also following internationally adopted standards, like those of the National Fire Protection Association for hazardous materials training, qualifications, and procedures. The ultimate incident objective is always to effectively manage risk and ensure the health, safety, and welfare of the first responders as well as the communities which they serve and protect.



Thermal Imaging Cameras

Until my next article, stay safe and healthy. Strive to be a part of the solution, not the problem. Learn, train, execute effectively and be a mentor to those standing in your shadow. ■

About The Author

Battalion Chief (Ret.) Joel Hendelman - During his 34-year career with the City of Fairfax and Fairfax Volunteer Fire Department in Fairfax Virginia Chief Hendelman served in every operational career capacity from firefighter/driver-operator to Captain.

He transferred for five years into Fire Prevention and Arson Investigations, obtaining the rank of Chief Fire Marshal before his return to emergency operations and was ultimately promoted to the rank of Battalion Chief in 2003. He served in that capacity until retirement in January of 2009 but continued to serve in the City of Fairfax Volunteer department for an additional year as Deputy Fire Chief.

Chief Hendelman is recognized as a regional expert in flammable and combustible liquid firefighting operations; teaching hazardous materials tactical operations, incident management principles, and mitigation techniques at national and regional conferences from 2003 to present.

He was a significant contributor as a subject matter expert to the NOVA (Northern Virginia) Regional Fire Departments Flammable Liquid Firefighting Tactical Operations Manual originally released in 2002 and revised three times since its inception. The manual is still in use today by 15+ jurisdictions within the Northern Virginia region, protecting almost 3 million citizens and has been shared with countless other local, regional, and state emergency response organizations across the United States.

Now in his 45th year in emergency services, Chief Hendelman continues to travel the United States as a technical consultant and subject matter expert teaching Incident Management, Emergency Operations Center Management, mitigation techniques and of course, the national Ethanol Blended Fuels Safety Seminars emphasizing strategy, tactics, management, and mitigation.

He lives southwest of Richmond Virginia on a farm where he enjoys hunting, and fishing. Most evenings you will find him on the front porch or around the fire ring enjoying a good cigar and fine whiskey, while savoring the company of family and friends.

LET'S GO INSIDE THE FENCELINE: Bulk Chemical Storage

Article By: Keith Silverman, PhD, MPH, Past Chair, TRANSCAERSM Executive Committee and TRANSCAER NTTG Member; Partner, GoldShield TEAM LLC

You are in the firehouse when the tones drop for a fire at the local chemical manufacturing facility. This is not your everyday, bread-and-butter call and you may think, do I have the experience and training to safely and effectively handle this incident? Take a moment to think about your local response area. Are you knowledgeable about the chemical manufacturing facilities in your response area and the types of emergencies they may have? Are you prepared to handle a fire inside the fenceline of your local chemical facility? What about a spill of a potentially hazardous material, a confined space rescue from inside a chemical storage tank, or an elevated rescue seventy-five feet above grade on the platform of a distillation column?

There is a lot to learn about responding to incidents inside a chemical manufacturing facility, however, the incident priorities always remain the same: life safety, incident stabilization, and property conservation. If you are interested in some basic response tips, please take a look at *Let's Go Inside the Fenceline: Tips for Responding to Emergencies at Chemical Facilities* in the 2020 Edition of the TRANSCAERSM Today magazine.¹ In this article, I will focus on chemical storage inside the fenceline and point out some of the details associated with the bulk storage of chemicals. The article is designed as an awareness for emergency responders and as such, I will not address the many regulatory requirements and standards that cover bulk chemical storage. For specific technical questions or interpretations of regulatory requirements, consult your local Authority Having Jurisdiction (AHJ).

The Basics of Chemical Storage

All chemical manufacturing facilities require some on-site, bulk storage of chemicals. For this article, bulk chemical storage simply refers to large quantities of chemicals stored in both portable and non-portable containers. Typically, chemical facilities store solids, liquids, and gases that are used as feed chemicals, solvents, and catalysts on-site. Feed chemicals, commonly referred to as raw materials, are used in the chemical manufacturing process to create the final product. Raw materials are delivered to the facility in over the road semi-trailers or tank trucks, rail cars, barges and by pipeline. Once on-site, the raw materials are stored in portable bulk containers or in stationary, fixed tanks until they are needed. The on-site quantities of raw materials are determined by planners who keep enough



Figure 1. Bulk storage of chemicals in a warehouse in portable drums (steel, plastic, fiber) and metal totes. When needed, the chemicals are moved on pallets by hand truck or forklift to the chemical processing area.

raw materials on hand to efficiently schedule the manufacturing process and ensure continuity of supply of the final products. Sometimes, a facility may temporarily increase their on-site quantities to plan for or help offset supply chain interruptions caused by natural disasters or a global pandemic. Sometimes the final product also needs to be stored on-site, in bulk portable containers and non-portable tanks, until it is shipped to a distributor or customer. Final products are shipped off-site in over the road semi-trailers or chemical haulers, rail cars, and barges.

The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 was created to help communities plan for chemical emergencies.² Section 302 of EPCRA requires notification when Extremely Hazardous Substances (EHSs) are present at facilities in quantities at or above the Threshold Planning Quantity (TPQ) established in the EPCRA regulations. Sections 311 and 312 of EPCRA focus on hazardous chemical storage reporting requirements such as Safety Data Sheet (SDS) and Tier I and II hazardous chemical inventory form requirements. States and communities, working in collaboration with chemical facilities, should use this information to improve chemical safety and protect public health and the environment. You should take the time to familiarize yourself with the chemical facilities in your area and the types and amounts of chemicals they store in bulk. For specific questions on EPCRA or the amount of chemicals that can be stored on site, consult your appropriate AHJ.

As mentioned earlier, raw materials

can be solids, liquids, or gases. Solid raw materials, such as plastics, recycled materials, minerals, and catalysts are used in many chemical processes. Many finished specialty chemicals, such as polymers, fertilizers, food, personal and household products, and pharmaceutical products are also solids. Almost all chemical processes make use of liquid raw materials or solvents and many final products, such as cleaners, lubricants, disinfectants, and pesticides are liquids. Gases are used as feed chemicals, aids in transporting chemicals through conveyance systems, or to fill the head space of tanks and chemical reactors to create an inert atmosphere.

When raw materials and other chemicals are needed in the manufacturing process, they are transported to the chemical process area of the chemical facility. This is the location where the chemical reaction and/or mechanical processes take place that produce the final product. Transportation can take place in two ways – manually using hand and fork trucks or through specially designed conveyance systems. The manual approach is typically used for drums, totes or intermediate bulk containers (IBCs), or bags of chemicals (Figure 1). Transportation of solids, liquids, and gases within the facility can also occur through a system of hoses, pipes, pumps, compressors and valves. These systems move chemicals from large capacity, fixed storage tanks directly to the process area (Figure 2). There are hazards associated with the conveyance of flammable and toxic liquids and gases and therefore, the piping and air and hydraulic systems are specially designed, inspected, tested, and maintained in accordance with many regulatory and technical standards.

In general, solids are more difficult to transport and process than liquids or gases. The equipment used for conveying and processing solids can be prone to mechanical failure due to the solid particles caking in the equipment and pipes which leads to overheating and

plugging. The mechanical processing of solids also creates dust which can accumulate due to spills, leaking seals, and poorly aligned equipment. Emergency responders must be aware that dust can cause safety and industrial hygiene hazards that must be carefully monitored and controlled during an incident. A combustible dust explosion hazard can exist in almost every manufacturing process that produces dust including those used in the chemical, fertilizer, pesticide, food, plastic, and pharmaceutical industries. Typical firefighting tactics may unintentionally create the conditions for a dust explosion by creating dust clouds, introducing air, using equipment that can be an ignition source, or applying incompatible extinguishing agents.³ If a chemical facility in your response area produces powders or dust, ask about their dust hazard assessment tools, explosion testing done on their products, and any special safety features they have installed to minimize the impact of a dust explosion.

Bulk Portable Storage

Bulk portable storage containers (e.g., drums, intermediate bulk containers, intermodal containers, and railcars) are mobile. This makes them ideal for shipping chemicals and therefore, you will find lots of these bulk containers at a chemical facility. Drums and intermediate bulk containers are generally shipped on pallets and stored in a rack storage system in a warehouse (Figure 1). Many AHJs require fixed fire detection and suppression systems in chemical storage warehouses. If a warehouse has suppression, it is important to know how the system is supplied. Depending on the design and the code requirements, the fire suppression system may be supplied by an on-site fire pump equipped with both a direct hookup to the local water utility and a backup firewater storage tank. Chemical warehouses may be classified as hazardous locations when the chemicals stored present a fire or explosion hazard. In this case, the warehouse may need to be equipped



Figure 2. Bulk storage of a chemical in a fixed tank with a hard piped conveyance system and a visual tank level indicating gauge on the right side of the tank.

with additional safety features such as electrically classified equipment, grounding and bonding, explosion venting, refrigeration, fixed air monitoring, and firewater containment. Make sure to ask about the safety systems installed in the warehouses at facilities in your area and know how they can aid you in an emergency.

Steel drums are convenient and used to ship and store a large range of chemicals. Some common chemicals shipped in drums include fuel oils, hydrocarbons, corrosives, solvents, acetone, alcohols, and flammable/combustible materials. Steel drums come in an open-head and tight-head configuration. The open head drum has a removable lid and uses a retaining ring to attach the lid to the drum body. Pressure relieving style steel drums contain a plastic fusible plug that melts during exposure to fire and relieves the internal pressure building in the drum. This reduces the likelihood of a drum rupture or BLEVE. When steel drums with fusible plugs are stored in an approved area with the proper fire suppression system, they can be one of the safest containers for flammable and combustible chemicals. To learn more about steel drums,

see Steel Drums 101 for Emergency Responders on the TRANSCAERSM webpage.⁴ Plastic drums are made of high molecular weight, high density polyethylene, and have a high chemical resistance. Plastic drums also come in an open-head and tight-head configuration and are very common for shipping and storing chemicals especially water based and corrosive materials.⁵ Fiber drums can be lined or unlined and can be used to ship dry powders, pellets, and even some liquids.

In a facility, chemicals are often transferred directly from the drum to the chemical processing equipment using a drum pump and flexible hoses. Transfers can be a common step for spills and releases, therefore, safety practices (e.g., no gravity feeding, proper grounding and bonding, and having secondary containment) need to be in place to reduce the hazards. Transferring a flammable liquid by gravity, without an emergency means to stop the flow (e.g., a self-closing valve), is dangerous and can lead to a situation where there is an uncontrolled and unstoppable flow of flammable liquid. Transferring



Figure 3. Typical setup for transferring chemicals from a drum to a chemical process. Note the use of an appropriate drum pump, proper bonding and grounding, and secondary containment below the grate.

flammable liquids from one container to another also requires the system to be electrically interconnected (bonded) and grounded to the earth. Bonding and grounding creates a pathway that prevents the buildup of static electricity by allowing it to safely dissipate into the ground. Transferring flammable liquids without proper bonding and grounding may generate a static charge which can trigger a fire or explosion. Flammable liquids need to be pumped from drums, using an approved and rated drum pump, through appropriate piping systems to the chemical process (Figure 3). Air pressure should not be used to transfer flammable material from a drum to a process vessel.

If you encounter a drum that is bulging out or collapsed in, do not approach the drum and do not move the drum. Gather information about the chemical from the manufacturing personnel on site, the labels on the drum and the SDS. From a safe distance, use the thermal imaging camera (TIC) to check for the presence of a liquid chemical inside the drum. The liquid space in the drum will have a different heat signature than the air space above the liquid. You can also use the TIC to check the drum for the generation of heat coming from an exothermic reaction occurring in the drum. Remember, a chemical reaction occurring in a closed drum will continue to generate heat causing an increase in pressure inside the drum.

Rigid intermediate bulk containers (IBCs) are plastic (high-density polyethylene), composite (plastic with a tubular galvanized steel protective cage), or metal (stainless steel and carbon steel) totes that typically carry solids or liquids. Rigid IBCs come in many shapes and sizes up to a maximum volume of around 800 gallons with 275 to 330 gallons being the most common size. IBCs hold more than drums but less than intermodal containers, hence the name “intermediate” bulk container. Plastic totes are commonly used for corrosive liquids



Figure 4. Examples of cardboard bag-in-box, metal, and plastic totes for transporting liquids.

transferred using pumps and hoses.

Dry, flowable solid chemicals typically are shipped in paper or plastic bags or flexible intermediate bulk containers (FIBCs) (Figure 6). FIBCs, also known as supersacks or big bags, are made of a flexible woven fabric, such as polyethylene or polypropylene, with integrated lifting loops. FIBCs are designed to hold 1 to 2 cubic-yards or 2,000 to 3,000 pounds of solid powders. FBIC hoists are used to lift the bag up and a spout on the bottom is used to transfer the powder from the bag to the process equipment. When FIBCs are filled and/or emptied, the



Figure 5. Composite or caged Intermediate Bulk Containers (IBCs) containing a corrosive material sitting on top of portable spill containment. Caged IBCs have a polyethylene plastic liner that is structurally supported by a tubular galvanized steel frame or cage.

flow of a finely powdered substance can cause a buildup of static electricity in the bag. The static charge must be removed when handling combustible materials or combustible dusts. If the static charge is not dissipated, a dust explosion may occur. To aid in dissipating the static charge, some FIBCs contain interconnected conductive threads that allow the bag to be bonded and grounded during discharge or filling.

An intermodal tank, also known as an ISO tank, is a tank mounted inside a metal frame of standardized dimensions (20 feet long x 8 feet wide x 8.5 feet high) and built according to International Organization for Standardization (ISO) standards (Figure 7). ISO tanks are used for transporting hazardous and non-hazardous liquids, such as food-grade liquids, corrosives, flammable and toxic liquids, solvents, alcohols, and petroleum products, in volumes from 4,600 to 6,900 gallons. The tanks are stainless steel surrounded by insulation and/or a protective layer (e.g., aluminum or polyurethane). What makes intermodal tanks so popular is they can be filled at a chemical facility and then easily shipped on a highway flatbed trailer, a railroad flatcar, or by water on a container ship. They can easily go from one mode of transportation to another without ever having to unload the contents. Intermodal tanks for liquids have a bottom valve, top outlet, top air inlet valve, a top manway, a pressure relief device, and a combination pressure/vacuum relief valve.

Some chemicals, especially those with higher vapor pressures, can create a high-pressure in the tank headspace when exposed to heat. The excess pressure can result in a catastrophic failure of the tank. In order to prevent a tank over-pressurization, tanks may have a pressure relief device (PRD) installed to relieve the internal pressure which reduces the likelihood of tank failure or BLEVE. PRDs are set to activate at specific pressures and are

classified as either reclosing or non-reclosing. The spring-loaded pressure relief valve typically found on railcars is an example of a reclosing PRD. The rupture disc found on intermodals is an example of a non-reclosing PRD. Rupture discs are usually made of metal and once the disc bursts, it will not reseal and the tank will continue to vent to the atmosphere. There are many styles of PRDs and it is common to find a dual system where the vessel uses both a non-reclosing and a reclosing PRD.

Intermodal tanks are built according to the United Nations International Convention for Safe Containers (CSC) requirements and classified according to the International Standards Organization (ISO) T-code system. The T-code system replaced the older International Maritime Organization (IMO) typing of intermodal tanks. The historical IMO types include IMO 1 (hazardous), IMO 2 (low hazardous), IMO 5 (liquefied gases under pressure), and IMO 7 (cryogenics). The T-code system uses items such as the tank test pressure, shell thickness, PRD set-up and bottom and top outlet configuration to classify the ISO tank.

Similar to rigid IBCs, intermodal tanks are cost-effective, and you may find them used for semi-permanent bulk liquid storage. In this case, the intermodal tank is located close to the process and the liquid is transferred directly to a staging or day tank or to the process through a permanent system of hoses, pipes, pumps, and valves. This is very similar to the setup used on fixed tanks.

The Pipeline and Hazardous Materials Safety Administration’s (PHMSA) label requirements, found in the Hazardous Materials Regulations, cover the transportation of hazardous materials. The Occupational Safety and Health Administration’s (OSHA) labeling requirements cover workers in the workplace and are found in the 2012 OSHA Hazard Communication (HazCom) Standard. PHMSA and OSHA issued a joint



Figure 6. A Flexible Intermediate Bulk Container (FIBC) containing a dry solid chemical. Note the yellow lifting straps and the external grounding attachment.

guidance memorandum to aid in properly labeling bulk DOT shipping containers such as intermodal tanks, tank trucks, and railcars.⁶ Essentially, HazCom requires the communication of hazards for chemicals in bulk DOT shipping containers when these containers are used as stationary process containers. HazCom allows the facility to use signs, placards, process sheets, batch tickets, operating procedures, or other written materials in place of affixing labels to individual stationary process containers. Simply put, emergency responders are likely to see DOT labels and markings on these bulk shipping containers.

Tank trucks and railcars are a convenient and efficient way to bring large volumes of chemicals on-site (Figure 8). Generally, tank trucks are unloaded into a fixed tank on delivery. Railcars generally arrive on-site before they are needed and are held in a staging area until they are needed. When the chemical is needed in the manufacturing process, the railcar is moved into position to a loading/unloading area where it gets unloaded into a fixed storage tank. Sometimes, railcars are unloaded a portion at a time. If this is the case, the chemical is unloaded into a holding tank or day tank and then transferred to the chemical process

through a permanent system of pipes and pumps. Tank trucks and railcars are used to supply many chemicals including solvents, alcohols, corrosives, and toxic inhalation hazards. To learn more about tank trucks and railcars, visit the training section of the TRANSCAERSM website at <https://www.transcaer.com/training>.

Bulk Fixed Storage

Non-portable, bulk storage typically refers to horizontal or vertical above ground storage tanks that hold solids, liquids, or gases. Generally, several fixed tanks are located close together in what is called a tank farm. Identification and signage on fixed tanks are covered under OSHA's HazCom. As mentioned earlier, OSHA's HazCom allows the facility flexibility in identifying the contents of fixed tanks. It is common for tanks to have signage that clearly identifies the contents, as well as the NFPA 704 diamond (Figure 2 and 9). When visiting facilities, always check that the signage is visible from multiple angles.

Fixed tanks for liquids offer several safety advantages. They are often designed and constructed for use with a specific chemical and they are usually located within secondary containment. The concept behind secondary containment is simple, prevent liquid leaks and accidental spills, from spreading away from the immediate area (Figure 9). Secondary containment is typically designed to

contain more than the entire volume of the largest tank in the containment area in the event of a leak or spill. For example, many secondary containment areas are designed to hold a volume equal to the volume of the largest tank plus 10 percent. Doing so allows the containment area to hold the spill, as well as some volume of precipitation, so that it can be cleaned up before the spill spreads. There are numerous types of secondary containment with dikes, berms, ponds, and curbs being some of the most common.

Bulk volumes of chemicals are delivered to the facility by trucks, rail, or barge. In order to fill the on-site fixed tanks, the carrier is moved into position at a loading/unloading station where it gets connected to the fixed tanks through a system of pumps, hoses, pipes and valves. The most common system uses a flexible hose to connect the tank truck or railcar to a pump that is connected to a piping and valving system connected directly to the fixed tank. The connecting hose has special fittings to fit the tank truck or railcar on one end and a coupler to connect to the pump on the other end. Loading/unloading areas also should have secondary containment. Concrete curbs and a sloping ramp are a common type of containment. The sloping ramp allows any spilled chemical to collect so it can be pumped out.

When a fixed tank is filled with a liquid, the air in the headspace of the tank must be vented so that the tank does not become over pressurized and rupture. Similarly, when a tank is emptied, a negative pressure is created in the headspace of the tank. This vacuum condition must be controlled by allowing atmospheric air to flow into the tank, so the tank does not implode or collapse inward. To alleviate these conditions, a pressure/vacuum valve, also referred to as a breather valve are installed on fixed tanks. The vent on a tank may simply be vented to the atmosphere



Figure 8. A railcar siding for unloading. Sidings may be adjacent to fixed storage tanks, in close proximity to the chemical process or located in a remote section of the facility.

or connected to a vent header that capture emissions from several tanks and direct them to a pollution control device. Some chemicals are stored with an inert gas (such as nitrogen) in the tank head space instead of air. This is often referred to as blanketing the tank with nitrogen. Some chemicals, especially those with higher vapor pressures, can form dangerous levels of vapors if exposed to heat in a fire. In order to prevent this, many tanks have a pressure relief device installed to relieve the internal pressure building in the tank reducing the likelihood of tank rupture or BLEVE.

Overfilling the tank will cause the chemical to come out the fill vent and spill onto the ground or into the secondary containment. In order to prevent this, many chemical facilities have administrative and engineering controls designed to prevent tank overfills. There are two common



Figure 9. Fixed tanks located within a secondary containment dike comprised of a bottom pad and walls that are designed and constructed to hold spills.

types of tank level gauges – visual gauges, which require a person to look at the gauge, and electronic systems which use sensors to detect the level in the tank. Electronic systems, can be connected directly to automatic closures for pumps or valves.

Transfers of liquids have the potential to generate static electricity so loading/unloading areas have equipment to bond and ground the carrier to the pump and the associated piping and valving. Proper grounding and bonding are important to dissipate static electrical charges especially when transferring flammable liquids. Many loading/unloading areas have emergency stop buttons that stop the transfer of liquid if a spill occurs. Loading/unloading areas may be protected by fixed fire protection systems and fixed fire monitors. These systems may be activated manually, automatically, or a combination of both and can be used for both fire suppression and vapor suppression. Lastly, loading/unloading areas may have fixed atmospheric monitoring that detect leaks or spills during the loading/unloading operation (Figure 10). If the monitor detects an elevated gas concentration, it may activate an audible alarm, send an alarm to the control room, automatically close a valve, turn off a pump, and/or activate the fire/vapor suppression system.

Cylindrical and spherical tanks are used to store gases at higher pressures, liquids under pressure, and cryogenics. High pressure gas storage tanks are designed with PRDs. Some gases are stored at low pressures in gas holders. Sometimes high-volume gases will be supplied by pipeline to the chemical facility from a nearby refinery or industrial gas plant. Flowable powders and solids are stored in bins and silos.

Loading/unloading areas also contain several elevated safety hazards. In many cases, chemical operators need to access the top of the tank car or railcar in order to do quality

control checks and make transfer hookups. These hookups involve the use of overhead hoses and cables and can present a hazard to people below. Chemical operators working at heights should be secured to a fall protection device connected to a personal body harness. If the operator slips, they may wind up suspended above the ground. When this happens, suspension trauma becomes a concern and prompt rescue is required. Loading/unloading of barges brings some additional hazards such as working around and above water and the lack of permanent secondary containment. Containing a spill from a barge may require the deployment of large adsorbent booms in the water around the entire ship. This is not an easy task and requires practice to demonstrate proficiency.

Fixed tanks may also present other hazards. For example, the space under the tank may be considered a confined space and the space inside the tank is definitely a confined space. Fixed storage tanks require inspection, testing and maintenance that require employees to enter the tanks on a periodic basis.

With the Facts, You Can Take Action

In this article, we reviewed several types of bulk storage you are likely to encounter at a chemical facility and some of the safety features and hazards associated with each one. As responders, you are probably more familiar with railcars and tank trucks than you are with IBCs, intermodals, and fixed tanks. There are some hazardous materials that have special handling procedures, but in most cases, hazardous materials in their containers do not pose a risk. Once they leave their container, either intentionally or during an incident, you need to be prepared to understand the hazards and handle them safely. The best way to learn about bulk chemical storage is to go out and visit your local chemical facility.



Figure 10. Fixed air monitoring (left) and bonding and grounding with continuity indicator (right) on a concrete loading/unloading pad. This pad is also equipped with fixed fire and vapor suppression.

Go inside the fence line and meet the key people, spend some time creating relationships, and building trust. Review the Tier II form together, ask to see their chemical storage areas, and learn how chemical transfers are done. The best way to prepare for and respond to a possible hazardous material incident is to know the facts. ■

Footnotes

1. Let's Go Inside the Fenceline: Tips for Responding to Emergencies at Chemical Facilities, TRANSCAERSM Today, 2020. <https://www.transcaer.com/news/transcaer-magazine>
2. Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, US Environmental Protection Agency (EPA). <https://www.epa.gov/epcra>
3. Precautions for Firefighters to Prevent Dust Explosions. US Occupational Safety and Health Administration. OSHA QuickCard, Publication 3674, August 2013. <https://www.osha.gov/combustible-dust>
4. Steel Drums 101 for Emergency Responders, Industrial Steel Drum Institute (IDSI). TRANSCAERSM Learning Management System (LMS). <https://www.transcaer.com/training/online-training-courses>
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6. Labeling of Hazardous Chemicals for Bulk Shipments Joint Guidance Memorandum. US Occupational Safety and Health Administration and US Department of Transportation.

NON-TECHNICAL SKILLS IN HAZMAT RESPONSE – THE MISSING LINK

Article By: Gareth Black, CHEMTREC®

Non-technical skills provide the fundamental underpinnings of an effective incident response and allow for flexibility and adaptability for evolving hazmat incidents facing emergency responders.

Hazmat training traditionally focuses on gaining detailed knowledge of processes and procedures, with a primary focus of upskilling individuals so that they have a high level of technical ability when responding to an incident. This is not a unique approach, and is mirrored in other fields where the primary preparation for any incident is to rehearse and train on technical elements so that individuals have the ability to meet the technical requirements of the incident at hand. However, research championed initially in the airline sector has now broadened to other sectors highlighting the importance of non-technical skills, both in preventing incidents from occurring, and when they do occur, mitigating their escalation and bringing about an efficient and effective outcome.

Teaching non-technical skills provides the flexibility and adaptability that are crucial when responding to unpredictable hazmat incidents. It is important to not limit

training to a single, linear set of steps which emergency responders must take to respond to an incident. Instead, it is imperative to teach the skills necessary to think on their feet and make effective decisions to respond proactively, getting the incident under control before it escalates.

So, what are non-technical skills and how do they assist in the response to a hazmat incident?

Non-technical skills are the social, intellectual, and personal skills that complement our technical know-how. They are the fundamental skills which underpin our response and complement our technical skills enabling the safe and effective performance of tasks. We use non-technical skills every day; however, honing and enhancing these skills may reduce human errors, which could lead to a hazmat incident.

There are four main non-technical skills that each play a critical role in the effective prevention of, and response to a hazmat incident:



Situational Awareness – understanding what has happened, what is happening, and what might happen next, is a crucial skill in the prevention of, and response to an incident. Effective situational awareness means not only understanding the current event, but beginning to forecast how the event may evolve, which allows you to take proactive actions, bringing the incident under control at the earliest opportunity.



Decision Making – making effective decisions to best address the challenges presented by a situation is key in the prevention of and response to an incident. Understanding when to trust your intuition and when to take a more deliberate, rational approach to responding to an evolving situation is a crucial skill in a hazmat response situation.



Communication – communication sounds like a simple task, passing information from one source to another, however it is often listed as the biggest single point of failure in incidents the world over. In the United Kingdom a review into 32 major incidents, ranging from safety issues at football grounds in 1986 to the handling of pandemic flu in 2009, there were communication failures during all 32 incidents. A notable communication failure included the Kings Cross Fire in 1987 where 30 people lost their lives. The incident response was challenged as there was a breakdown in communications between those outside the station and those trying to respond underground. Despite these failings being identified, they were not addressed and a near identical breakdown in communications occurred during the response to the 7/7 London Bombings in 2005. Failures in communication not only lead to more incidents than any other factor, but they are also typically the single biggest point of failure when responding to an incident. Failed communication leads to poor situational awareness, which in turn leads to delays in responding and can lead to an escalation of the situation.



Leadership – directing response activities to establish a coordinated response requires us to think, act and feel very differently from our day-to-day roles and responsibilities. The unique characteristics of a hazmat incident, where there is increased risk and minimal time, requires a more direct style of leadership, one that does not always come naturally to us.

The above skills may sound straightforward, and that's because they are. These are skills we use every day, they underpin everything we do, and while they may be simple, they are also vital. To understand how important these skills are, just imagine responding to a hazmat event without the effective application of these skills. Or even trying to live our day-to-day lives without the ability to communicate, understand what is going on around us and make decisions. Luckily, we can enhance these fundamental non-technical skills so that they are more effective, particularly when the time pressure and risks of a hazmat incident occur. We can adopt processes and procedures that enhance our situational awareness, communication, and decision-making skills, and we can learn how to be more effective crisis leaders. In doing this we not only enhance our non-technical response to the situation, but also enhance our technical response, by establishing a response in which we make proactive decisions to prevent the escalation of a hazmat event.

To find out more about non-technical skills and hazmat training, reach out to a member of the CHEMTREC® Crisis Solutions Team. ■

About the Author: Gareth Black is a thought leader in the field of crisis management, emergency response, and human factors. Gareth's Master's Degree in Homeland Security and Crisis Management, alongside his lecturing work at Coventry University, means he is at the cutting edge of developments in the field. Gareth has a unique ability to turn his wealth of academic experience into simple, practical, and intuitive solutions for clients, ensuring they remain in the forefront of crisis management practice.

Gareth has received accolades for his work with the National Health Service, preparing for, responding to, and recovering from a wide range of incidents whilst also working on policy and procedural developments of national and international significance. More recently, Gareth has worked with clients in the chemical, oil and gas, university, and public sector, creating inventive and intuitive solutions to maintain their crisis readiness.

TRANSCAERSM

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**Note: Due to COVID-19 in 2020, TRANSCAER was not able to train the same level of emergency responders. The training totals for 2015-2019 have consistently been over 30,000 responders annually.*

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Chairman's Club	Corporate Gold	Corporate Silver	Corporate Bronze
\$500 allocated to the TRANSCAER Hazmat Team Response Fund	\$500 allocated to the TRANSCAER Hazmat Team Response Fund	\$500 allocated to the TRANSCAER Hazmat Team Response Fund	\$500 allocated to the TRANSCAER Hazmat Team Response Fund
Five complimentary ads per year in monthly eNewsletter <i>(Size: 2550 x 600, max 500 KB)</i>	Two complimentary ads per year in monthly eNewsletter <i>(Size: 2550 x 600, max 500 KB)</i>	One complimentary ad per year in monthly eNewsletter <i>(Size: 2550 x 600, max 500 KB)</i>	-
Five complimentary month-long ads on the TRANSCAER website <i>(Size: 366 x 275)</i>	Three complimentary month-long ads on the TRANSCAER website <i>(Size: 366 x 275)</i>	One complimentary month-long ads on the TRANSCAER website <i>(Size: 366 x 275)</i>	-
Two articles in the monthly TRANSCAER eNewsletter <i>(must be pre-scheduled with TRANSCAER Director)</i>	One article in the monthly TRANSCAER eNewsletter <i>(must be pre-scheduled with TRANSCAER Director)</i>	-	-
Full - page ad in TRANSCAER today magazine	1/2 page ad in TRANSCAER today magazine	1/4 page ad in TRANSCAER today magazine	Logo included in thank you ad in TRANSCAER today magazine with all other Bronze Corporate Members
Eligible to submit a two-page article in TRANSCAER today magazine	Eligible to submit a one-page article in TRANSCAER today magazine	Not eligible for article submission	Not eligible for article submission
Logo on TRANSCAER Website under Corporate Members	Logo on TRANSCAER Website under Corporate Members	Logo on TRANSCAER Website under Corporate Members	Logo on TRANSCAER Website under Corporate Members
Company listing and link on TRANSCAER Website under Corporate Members	-	-	-
Eligible to participate in national level training events	-	-	-
Eligible to provide a company branded promotional item at one national-level conference each year	-	-	-
Logo on Corporate Member Banner at all conferences where National TRANSCAER is exhibiting	-	-	-



TRANSCAERSM

Hazmat Team Response Fund

The TRANSCAERSM Hazmat Team Response Fund was established in 2020 to assist hazmat responders in acquiring hazmat response equipment and advanced training to protect themselves and their community when responding to hazardous materials transportation incidents.

The TRANSCAER Hazmat Team Response Fund will provide annual awards between \$500-\$2,500 (based on individual needs) to hazmat teams across the United States who are seeking to purchase specific hazmat equipment or attend advanced training.

To help better equip emergency responders, the American Chemistry Council donated \$10,000 to the new TRANSCAER Hazmat Team Response Fund. Additional funding for the TRANSCAER Hazmat Team Response Fund will be through the support of our Corporate Members. From each corporate membership fee, \$500 is directed to the Hazmat Team Response Fund. As funding availability increases, the number of awards provided will increase annually. TRANSCAER will announce the number of available awards each year when the application period opens.

The 2021 application period closed on May 1st. We look forward to announcing the two recipients by July 1, 2021.

TRANSCAER encourages your hazmat team to review the criteria below and be sure to follow TRANSCAER on social media (LinkedIn, Facebook, Twitter, and Instagram) or subscribe to our monthly newsletter to be the first to hear when the 2022 application period opens! ■

CRITERIA

To be eligible to apply for funding through the TRANSCAER Hazmat Team Response Fund, hazmat teams must meet the following criteria:

- The Hazmat Team within a local or state fire department must be located in the United States and be legally organized under state law.
- The Hazmat Team must demonstrate their need to receive funding and in the application essay must describe the specific hazmat equipment that would be purchased and/or specific advanced training the hazmat team would attend to increase their response capabilities to hazardous material transportation incidents.
- Only one application will be accepted per Hazmat Team/Department. Any subsequent applications received from the Hazmat Team/Department during the application period will be disqualified.
- Past recipients of funding through the TRANSCAER Hazmat Team Response Fund must wait 5 years before reapplying for additional funding.
- The hazmat teams that receive funding must use the money to increase their hazmat response capabilities and not for any other purpose. The funding cannot be redistributed.
- The hazmat teams that receive funding agree that their department/hazmat team name, details from their application essay, and all photos taken during the award presentation may be used in media by CHEMTREC®, TRANSCAER, and the American Chemistry Council for the purposes of promoting the TRANSCAER Hazmat Team Response Fund program.
- The hazmat teams who receive funding also agree to a department visit by a TRANSCAER representative for an award presentation within 60 days of notification of being selected as a recipient.



Start Preparing Today!
www.nvfc.org/pipelines



IS YOUR DEPARTMENT PREPARED?

Millions of miles of pipelines stretch across the United States, transporting hazardous materials through thousands of communities. The National Volunteer Fire Council and the Pipeline & Hazardous Materials Safety Administration are here to help fire departments prepare for pipeline incidents.

The Fire Department Pipeline Response Emergency Planning & Preparedness (FD PREPP) Toolkit is a **FREE RESOURCE** designed to help departments plan for, and safely respond to, pipeline incidents.

Make pipeline incident readiness a priority. Access the FD PREPP Toolkit at

www.nvfc.org/pipelines



U.S. Department
of Transportation
Pipeline and Hazardous Materials
Safety Administration

RAILROAD HAZMAT: A FIREFIGHTER'S PERSPECTIVE

Article By: Jon Simpson, Hazmat Compliance Officer, Norfolk Southern



For the sake of this article, I was asked to dust off the fire helmet and place myself in the apparatus on the way to the scene once again. It didn't take much convincing for me to oblige. I am the newest member of the Norfolk Southern Hazmat Group, a Hazmat Compliance Officer based in Louisville, KY. As a recently retired Captain from Louisville Division of Fire, we thought it may be productive to give emergency responders an inside look at hazmat and emergency operations on the railroad through the lens of a recent responder. While training and outreach is more abundant from the railroads than ever before, misconceptions, forgotten training, or no real incidents involving rail may limit our knowledge. It is important to note the railroad is mandated to ship hazardous materials, a job we do with a 99.997% success rate. But as Gordon

Graham famously explained, we live in a world of low frequency high risk incidents. With that said, here are a few things I think many responders may not know, but would be of importance on any rail incident.

On the scene of any derailment, the senior transportation official will be responsible for managing operations for the railroad. All relevant representatives from the railroad are well versed in the Incident Command System (ICS) and the concept of unified command. We operate within an ICS framework that offers maximum flexibility for unified command with a public agency. Additionally, Norfolk Southern and other railroads train under a Hazmat Sentinel program that brings high level hazmat training in response and preparedness to members across our network.

This affords us a point of contact that can begin competently working with responders as Hazmat Managers, such as myself and others, are en route. Railroads have tremendous resources strategically staged throughout our footprint to aid in efficient response. A good example of this would be foam caches for response to flammable liquids. Subject Matter Experts (SMEs) have built extensive Job Safety Analysis for our most frequent and hazardous commodities. These will aid in everything from site safety and PPE to public safety guidelines and action levels. To that point, many templates and safety plans are already framed so much of the work regarding public safety issues, safety during an incident and resources needed are already in place.



NF - First derailment encountered with Norfolk Southern in July 2020 in New Florence, MO.

A first due apparatus will have comprehensive support soon after arrival from rail representatives.

I think a component of rail response often overlooked is the role of emergency response contractors and how vital their role is in relation to the operational plan chosen by emergency responders. The contractors serve as the eyes and ears for information gathering while Hazmat managers are en route to a scene. The contractors serve as a competent labor force as well, plugging into incident objectives from operations level defensive response to specialized and



Panama - Picture of wrecking contractors after derailment in Panama, IL.

offensive technician level actions. They can offset limited equipment within public agencies with a myriad of assets from various booms and remediation equipment to specialized tools to stop the leak. Do not be hesitant to fold contractors into the operational plan as they are frequently audited by the railroads and required to meet proficiencies across a wide spectrum of competencies. Given the broad spectrum of skills

being asked of today's fire service with ever limited personnel, having both manpower and knowledge, certified and able to assist, is a tool that should not be overlooked.

Finally, I want to make a comment about the dangers associated with locomotives and the proper response needed in the case of a locomotive fire. While many rail incidents will involve a municipal hazmat team, a locomotive fire could be met by any first due company. Again, it is important to note the abundant training resources available to responders regarding this and other rail emergencies. I would cite the Norfolk Southern safety and training site Joinnsoar.com and transcaer.com as two examples. But do know there are specific actions needed to promote safe and efficient suppression including accessing fuel shutoffs located on each side of the locomotive and inside the cab should that be an option. This will cause a depletion of the air pressure holding the brakes over time so ensure safe chocking of the wheels and apply hand brakes if possible if the locomotive is coupled to any cars. Proper response on the front end without properly preventing motion on the back end could result in catastrophe. This was one of the contributing factors in Lac-Mégantic, Québec, Canada in 2013.

In summary, we know responders wear many hats and it is difficult to be fully versed in every discipline. Hopefully, having new insight into aspects of the railroad not encountered prior will ease the concern about handling the rare incident involving rail. Make sure your department knows the Hazmat Officer for your railroad. They can provide various training opportunities and answer any questions to support a safe and efficient response. ■



Personal pic during my time as an instructor at Louisville Fire Academy.

Author Bio:

Jon Simpson retired as a Captain with Hazmat 19, Louisville Fire and Rescue after a 22-year career being assigned to a hazmat company along with two years at Louisville Fire Academy. Additionally, he has served as a TRANSCAER State Coordinator in Kentucky, a remote instructor for SERTC, instructed at the Center for Domestic Preparedness, and trained responders nationwide on various response technologies and response to CBRNE and hazmat incidents.



FF2 - Pic of working house fire while assigned to Hazmat 19

Locomotive Overview and Emergency Response Information

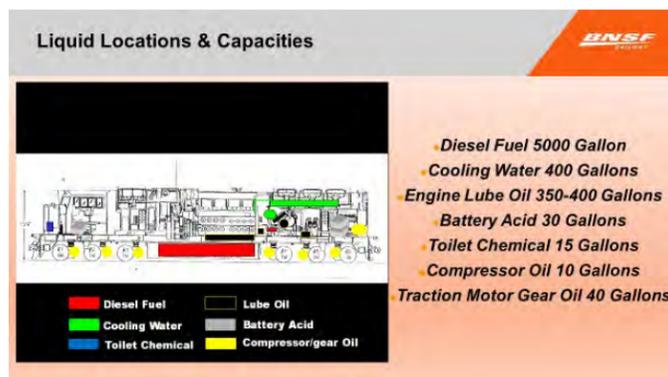
Article By: Derek Lampkin, Manager Hazardous Materials, BNSF Railway

When preparing and planning for a railroad incident, first responders have numerous incident scenarios to consider. One of those incidents may be a locomotive fire within their community. There are several key factors to take into consideration when responding to a locomotive fire to protect the first responders, the community, and mitigate the fire safely.

A typical railroad locomotive weighs more than 200 tons, is approximately 70 feet long and 16 feet high. The diesel fuel tank capacity varies from 2,000 gallons to 5,300 gallons. The diesel engine can vary from 12 to 20 cylinders and produce from 1200 horsepower to 4400 horsepower. This engine turns a large DC generator or AC alternator that have operating potentials in the 600-volt range. The electrical power is directed to traction motors, which are located between the wheels. Torque is applied to the axles through gear boxes that are a part of the traction motor assembly and may have their electric fields reversed to act as brakes, when the locomotive is moving downhill or slowing the train to a stop. The excess electrical power generated, when these motors are modified, is consumed through resistor banks called dynamic brake grids, which are located on the upper car body. These electrical components can become extremely hot during operation and may overheat causing an electrical fire.

The locomotive engine crankcase generally holds approximately 300 gallons of lube oil and the radiator and cooling system for the diesel engines contain more than 200-400 gallons of environmentally friendly treated coolant water. Two 36-volt DC, high amperage batteries are installed onboard the locomotive and are connected in series for a total of 72 volts DC. This is a source of a corrosive hazard if the batteries are ruptured in an accident.

Locomotive Schematic*



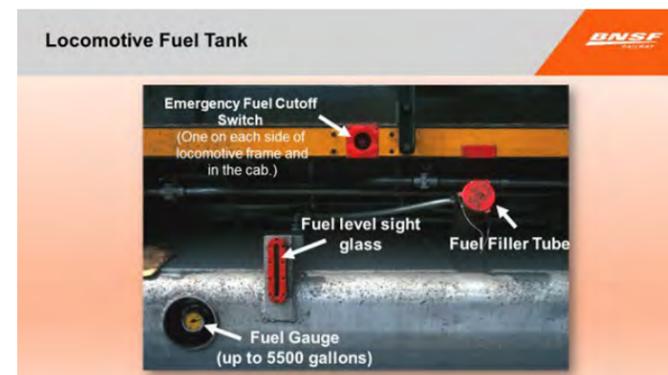
*Please note, the locations and capacities may vary based on individual locomotive design.

In any railroad related emergency, it is important to first contact the railroad whose track, equipment, or property is involved in the incident. If responders do not know who owns the track or property, ownership information can be expected TO BE POSTED at each crossing with the railroad's emergency contact information and telephone number. Immediate notification is required so the railroad can assist with the response and provide first responders railroad specific information. When contacting the owning railroad, verify that the incident is safe to approach and all train movement in the area has been stopped.



When responding to a locomotive fire, if the locomotive engine is still running, you will need to shut down the locomotive. You can expect the emergency fuel cut-off buttons in two locations; one is located on the outside of the locomotive on each side and above the fuel tank and the second one is inside the cab on the back wall. Pressing either of these buttons is designed to shut down the locomotive diesel engine in a matter of seconds, but will only shut down the engine for this specific locomotive. If there are additional locomotives in the front or back, their engines may continue to run.

Emergency Fuel Cutoff Switches



To make the locomotive as electrically "dead" as possible, enter the cab, only if it is safe to do so, open the battery knife switch compartment, which can be expected on the back wall of the cab behind a door marked "Battery Switch," and flip the Battery Knife Switch to the open position. If fire remains in the locomotive's engine compartment, utilize dry chemical fire extinguishers. For some fires, such as a crankcase or turbo fire, there may be no effective actions that can be taken beyond isolating the unit and waiting until the fire consumes itself. Due to the high voltage nature of locomotives, DO NOT use water.

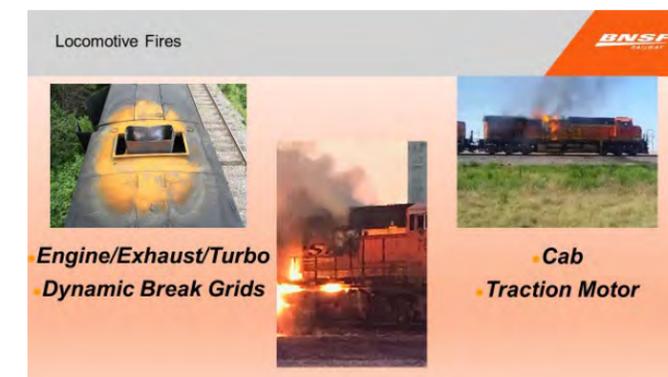
Battery Knife Switch



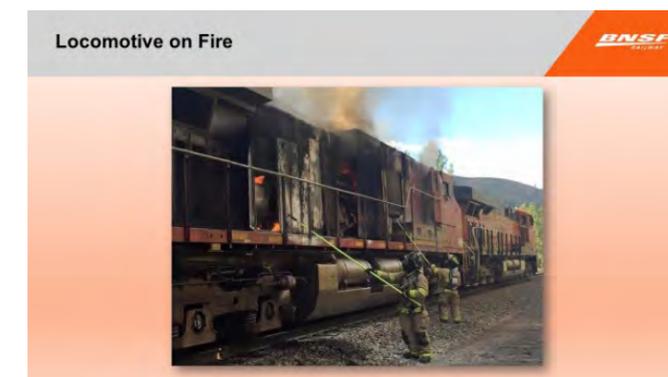
Considerations for Responding to and Fighting Locomotive Fires:

- Be aware that locomotives have limited space in the cab, on the walkways, and to inside access panels. Responders wearing PPE, SCBA, or bunker gear can have difficulty gaining access to many areas.
- **NEVER** climb on the roof of a locomotive which is on fire.
- Take response actions from the ground or walkway.
- Use dry chemical or CO2 fire extinguisher to reduce electrical risks associated with water.
- AFFF foam applications for ground fires or pooled fuel fires surrounding locomotives **ONLY**. Do not put AFFF Foam directly onto the locomotive.
- Protect immediate exposures near the locomotive, i.e. dried grass, bridges, structures, etc.

Common Locations of Locomotive Fires



Once the locomotive has been shut down and isolated, first responders can vent the locomotive by opening the engine compartment doors with pike poles from the ground to ventilate the fire and apply dry chemical extinguishers if needed.



Remember, you are not alone when responding to a locomotive fire. It is important to first identify the owning railroad the locomotive is operating on, make contact with the railroad to ensure it is safe to access the incident, and follow the proper steps to mitigate a locomotive fire. ■

Railroad Emergency Contact Information

For on-scene safety call direct to the involved railroad for assistance with any incident involving railroad property:

- **BNSF: 800-832-5452**
- **Canadian National: 800-465-9239**
- **Canadian Pacific: 800-716-9132**
- **CSX Transportation: 800-232-0144**
- **Kansas City Southern: 877-527-9464**
- **Norfolk Southern: 800-453-2530**
- **Union Pacific: 888-UPRR-COP (877-7267)**

CP'S VIRTUAL REALITY TECHNOLOGY AND APP-BASED TRAINING



Article By: Scott Croome, Dangerous Goods Officer, CP & Ed Dankbar, Hazmat Emergency Response Officer, CP

Dangerous Goods / HAZMAT Emergency Response Officers (HMO's) are strategically located across CP's Canadian and United States network. In addition, CP has a 24/7 emergency response contractor network that provides additional resources and responders for effective responses across CP's network. CP's significant resources allow the railway to provide mutual aid to other industry partners when needed. CP's emergency response fleet includes foam fire trailers, transfer trailers, boom containers, emergency operations posts, and much more. The equipment is only as good as the people who use it, and as such CP has always put a strong emphasis on training of personnel, contractors, and most importantly the municipal first responders who assist CP and other organizations when emergencies happen.

CP is committed to protecting people, communities, and the environment, and knows that training first responders throughout our network will increase the safety for all stakeholders. CP operates a Class 1 railway that forms an integrated system of nearly 13,000 miles of track across North America, including 6 provinces and 9 states. Since 2012, CP has trained over 30,000 emergency responders across North America on hazmat response. Providing in-person training and exercises for first responders across the network is a cost and time intensive task. In order to expand training opportunities, CP has recently developed Virtual Reality (VR) technology along with app-based training to help CP HMOs teach first responders how to safely respond to train derailments with dangerous goods from the safety of a classroom.

Technology has allowed for the world to become more interconnected, so leveraging technology to provide emergency response training to first responders has been key to staying in the forefront of CP's risk management. During a year of increased risk for in-person training, VR and app-based programs has shown to be an ideal tool to continue training while adhering to social distancing recommendations from public health agencies. A VR program is an innovative approach to provide lifelike experiences for first responders from a classroom, firehall floor, or from the comfort of a recliner.

Training and exercises can help facilitate safe and efficient operations during an emergency response. CP has developed four VR locations, with five different



View of air monitoring feature in the app.



View in the app of fighting a flammable liquid fire.

situations in each location which can be experienced by first responders. All the scenarios have been optimized for platforms including PC, MacOS, iOS, or Android. The scenarios were built to represent a wide variety of possible locations where a derailment may occur, including a residential rail yard, a commercial rail yard, a rural scenario, and the mouth of a tunnel. The five different scenarios allow first responders to experience events from small releases to a high hazard release of chlorine gas, or even a unit train engulfed in flames.

Development of the scenarios was completed by collecting unmanned aerial vehicle (UAV) images for the sites, compiling the images and rendering a 3D model of the sites, and adding 3D models of railway equipment. Gamefication has added a fun aspect and allows responders to move through the initial actions of assessing air

quality concerns for the site, containing released product, donning Level A Personal Protective Equipment (PPE), and attempting to control active fires within the scenario.

Training manuals have been developed for each location and situation and include mock train consists, product waybills, air monitoring plans, and other support documents relevant to the scenario. The items provided in the manuals are real world examples of what first responders would receive from CP when responding to an active derailment.

CP is committed to first responder training on all fronts. CP plans to continue the development of VR scenarios and app-based programs to continue providing quality first responder training. Please visit www.cpr.ca/hazmat and www.cprail-vr.com for the VR scenarios. Please note the the VR website works best in Google Chrome.

We would also like to thank our industrial partners GHD and Scrubby Code that have helped with different parts of our VR and APP development.

CP offers training on railroad incident emergency response for local emergency responders.

To schedule a training please contact Community Connect at 1-800-766-7912 or Community_Connect@cpr.ca to connect with a local Hazardous Materials & Emergency Response Officers. ■



Firefighter Nathan Farris (left) and Firefighter Phil Dalpe (right) using both the app and VR during a COVID-19 training scenario.



Firefighters using the app and the website scenarios for training.

DERAILMENT EXPERIENCE APP

This app allows first responders to safely experience a mainline train derailment. In the app, users can complete site overview, contain spills or fire, control entry, and meet with the train crew.



App for iOS devices



App for Android devices

DIGITAL TRAINING APP

This app allows first responders to see 3D models of railway rolling stock and the different parts. With the information, first responders can improve their understanding of railcar and locomotive design.



App for iOS devices



App for Android devices

Responding to MC307 & DOT407 Specification Cargo Tank Trailer Emergencies

Article by: Gene Patten, Vice President – Safety & Compliance, Dana Transportation & TRANSCAER Northeast Regional Coordinator

Liquid bulk cargo tank trailers, when not operated safely on highways, can overturn. Also known as rollover accidents, over 1,300 cargo tank overturns are reported each year—an average of nearly four overturns every day.¹ Cargo tank trailers are more prone to this due to the high center of gravity of the truck and its liquid load when exiting or entering highway ramps or curves in the road. Overturning occurs when the load continues in its original direction, causing the truck to lean, and then fall in the opposite direction of the curve or the turn.

Several common causes of tank trailer rollovers include:

1. A driver's failure to adjust speed for curves in the road
2. Truck driver inattention
3. Collision avoidance
4. Steering unsafely

When one of these occurs, the cargo tank trailer will usually end up on its side. For MC307 or DOT407 specification cargo tank trailers, if any valves are damaged in the accident and are no longer operable, there is a special tool known as an emergency recovery valve. This tool is designed for emergency unloading of an overturned MC307 or DOT407 tank

trailer through a capped 3" NPT clean-out without spillage of the chemical product. After clamping on the unloading fixture (as described in the operational instruction sheet), a 3" clean-out cap — typically found on the top of a cargo tank but now on its side — can be removed within the fixture and, with proper chemical transfer hoses connected, unload the product down to the level of the clean-out cap. This sounds simple, but it's not. There are several components to the emergency recovery fitting. It takes a lot of practice to assemble the fitting, attach, and remove the washout cap. If you do not get it right the first time, it can be a mess and triple the amount of time to complete the product transfer.

Other safety factors that must be considered before a product transfer begins are:

1. Safety Data Sheet (SDS) review to determine appropriate required Personal Protective Equipment (PPE)
2. Disconnecting of all power sources
3. Grounding of the trailer
4. Venting of the trailer
5. Containment around the area where the emergency fitting will be attached



Attendees at a training event get hands-on experience using an emergency recovery valve.



A training drill for attendees to practice responding to a tank truck emergency.

One way to learn more about responding to tank truck emergencies is attending a training event. As part of their community outreach efforts, usually under the auspices of TRANSCAERSM, Dana Transport — and several other Responsible Care[®] Partner bulk chemical transporters — have been providing cargo tank trailer training to emergency responders for many years in the communities in which we have trucking operations. Dana's training trailer has a side manhole and dome lid with a washout port installed so first responders and/or hazmat emergency technicians can practice installing the fixture and opening the 3" NPT cap. Bulk chemical transporters typically subcontract with hazardous materials environmental contractors — that have plenty of experience with tank truck overturns — to do the actual work. ■

About the Company:

Founded in 1970 by Ron Dana, the Dana Transportation Companies have been hauling liquid and dry bulk chemicals throughout the continental U.S. over the last 50+ years, with a network of 56 terminals.

Dana Transport Inc. is the proud recipient of the annual TRANSCAERSM National Achievement Award for the past nine years. Both Dana Transport and its sister company, Liquid Transport LLC, are third party certified Partner companies in the American Chemistry Council's Responsible Care[®] Program.

About the Author:

Gene Patten currently serves as the Northeast Region Coordinator in the TRANSCAERSM Program. Gene has worked in the bulk chemical transportation industry since 1977 and has been working for Dana Transport since 2005, currently serving as the VP – Safety & Compliance and Responsible Care[®] Coordinator. Gene is currently the Partner Leadership Chair in the ACC Responsible Care[®] Program and has been the recipient of the Partner Employee of the Year in 2012 and 2020.



1. https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Cargo_Tank_Rollover_Fact_Sheet_V2_508.pdf

Most cargo tank rollovers are preventable.

Preventing rollovers starts with you.

Scan here to watch a training video!



Or visit www.fmcsa.dot.gov/rolloverprevention



How can drivers prevent rollovers?



Stay alert behind the wheel at all times. Drivers can never be too comfortable behind the wheel. In most cases of rollovers, there is some other dangerous event that occurs before the rollover. It might be drowsiness or inattention, drifting over onto a soft shoulder, riding up over a curb, or incorrectly making a turn at an intersection. Attentive driving can prevent most rollovers.

Always be aware of the load you are hauling. Sudden movements can result in load shifts that may result in rollovers. Learning how to avoid these sudden load shifts will help ensure that drivers remain in control of their loads at all times.

Learn the warning signs of unsafe behaviors and conditions that contribute to rollovers. Many drivers might think that poor driving conditions or taking sharp curves too fast lead to most rollovers. The truth is, only 4% of single vehicle rollovers are caused by roadway and environment-related reasons. Learn how to spot all the warning signs of rollovers by visiting www.fmcsa.dot.gov/rolloverprevention.

Watch the training video. A training video that was developed by the Federal Motor Carrier Safety Administration (FMCSA) provides drivers with the knowledge and power to prevent rollovers. Watch the video now by visiting www.fmcsa.dot.gov/rolloverprevention.

IAFC HAZMAT CENTER

GET TRAINED. BE PREPARED.



The International Association of Fire Chiefs (IAFC) Hazmat Center is dedicated to training first responders for improved hazmat planning, and response at hazardous materials incidents.

WHAT WE OFFER

Planning and training initiatives - including local or regional planning, tabletop design and exercise, pipeline, rail and other hazardous materials response training topics. Check our website for trainings near you!

The Hazmat Fusion Center - is a data and information network with trainings, tools and resources for hazmat teams, first responders, LEPCs, federal, state, local agencies, and the private sector.

Learn more at www.hazmatfc.com

Attend the IAFC Hazmat Conference!

June 22-24, 2021 (Virtual Experience)

The trainings offered provide immediate, practical and valuable information designed to successfully meet the demands of hazmat response in today's challenging environment.

Learn more at IAFC.org/HazmatConf



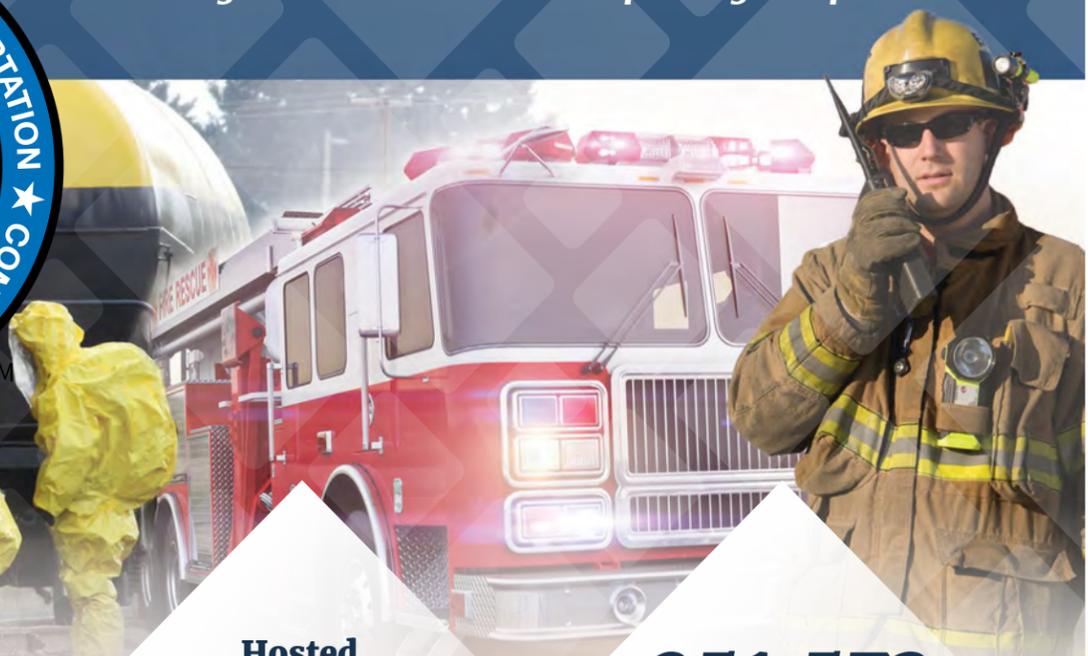
Engage with us!

facebook.com/HazMatFC

twitter.com/IAFCHazmatFC



Assisting Communities & Preparing Responders



Total Trained 2020:

24,310

Hosted

88
webinars

251,573

trained in the
past 6 years

Launched

11

courses through our
NEW Learning
Management System

15,790

trained through
virtual and web-based
opportunities

FEDERAL RAILROAD ADMINISTRATION PROVIDES GRANT FUNDING SINCE 2010

TRANSCAER receives grant funding for Transportation Emergency Response Training through the U.S. Department of Transportation's Federal Railroad Administration.



U.S. Department of Transportation
Federal Railroad Administration

\$777K

FRA Grant Support

PIPELINE AND HAZARDOUS MATERIALS SECURITY ADMINISTRATION PROVIDES GRANT FUNDING SINCE 2019

TRANSCAER receives grant funding through the U.S. Department of Transportation's Pipeline and Hazardous Materials Security Administration - Assistance for Local Emergency Response Training (ALERT) Grant and the Community Safety Grant.



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

\$350K

PHMSA Grant Support

Sign up for our **annual magazine** and **monthly eNewsletter** to stay up to date on the latest TRANSCAER news.

www.transcaer.com/news/subscribe



reaching **OUT**



Instructor Joel Hendelman at the Ethanol Safety Seminar in Frederick, Maryland on September 1, 2020.



Crestwood brought their cargo tank training trailer to the Responding to Tank Truck Emergencies Training in South Bound Brook, NJ on October 15, 2020.



Ammonia live release drill in Shreveport, LA - March 2020.



Attendees utilize the tarp and cover containment method during a live release drill in Shreveport, LA on March 10-11, 2020.



Dana Transport brings a cargo tank trailer to the Responding to Tank Truck Emergencies Training in South Bound Brook, NJ on October 15, 2020.



David Binder of Tanner Industries, Inc. held an Ammonia Live-Release Drill with the Shreveport Fire Department in Shreveport, LA on March 10-11, 2020.



First responders attend ammonia training in Shreveport, LA - March 10-11, 2020.



CHEMTREC HELP Award

Our Continued Commitment to Helping Volunteer Fire Departments

Article By: Erica Bernstein, Director- Outreach, CHEMTREC®

The CHEMTREC® HELP Award, was established in 2019, to provide funding for volunteer departments to increase their response capabilities and enhance local preparedness to respond to hazmat incidents. At CHEMTREC, we recognize that the first responder community is critical to hazmat response and we remain dedicated to working closely and effectively with responders when an incident occurs, as we have proudly supported the industry over the past fifty years. CHEMTREC is delighted to offer HELP awards for a second year and pleased to continue our partnership with National Volunteer Fire Council (NVFC). These awards represent our appreciation of the volunteer fire service and will continue to be an ongoing reminder of our commitment to emergency responders for many years to come.

The 2020 recipients that each received \$10,000 were the New Johnsonville Fire Department (New Johnsonville, TN) and Water Witch Hose Company #2 (New Milford, CT).



The New Johnsonville Fire Department is in New Johnsonville, Tennessee, was established in 1959 and is an all-volunteer fire department. The department handles on average 200 calls a year and serves a population of 1,951 over 15 square miles. Their department also provides automatic mutual aid to the Humphreys County Fire Department on a “they go; we go” basis for every call in their region. This increases their response area by another 150 square miles and 4,000 residents.

Through the HELP Award, the New Johnsonville Fire Department has set up an operations level response trailer which includes resources, such as personal protective equipment, that will keep their firefighters safe while responding to hazmat incidents and protecting their community.

Chief Allen of the New Johnsonville Fire Department said, “The grant has helped our department gain critical hazardous materials response equipment to better serve our community and mitigate a hazardous materials incident. The grant also has prepared our department to assist the industry in our area with an operational response level in case of an incident. Along with the purchase of response equipment, the grant will help move the New Johnsonville Fire Department to the next level of hazardous material response with a technician level class coming soon. We are very fortunate to have been selected for the CHEMTREC HELP award.”



Water Witch Hose Company #2 is an all-volunteer fire department located in New Milford, Connecticut and was established in 1863. The department has 65 volunteer firefighters who serve a population of 20,000 over 40 square miles and handle 650 calls annually. Water Witch Hose Company #2 will be utilizing the CHEMTREC HELP Award to update the personal protective equipment and hazmat supplies on their response trailer. They have already purchased booms, pads, and absorbent material with the HELP Award, and plan to purchase

personal protective equipment for decontamination. The HELP Award will not only benefit their department, but fulfill their mission of protecting the lives and property throughout the region and state.

Chief Squires of the Water Witch Hose Company #2 said, “The HELP Award provided by CHEMTREC allows for our department to procure a large array of equipment and supplies for our hazmat situations. As the largest geographical town in Connecticut, we answer a wide variety of situations where this equipment comes into use. By providing this grant, CHEMTREC has provided us the necessary resources that will ensure our members and our community are protected when responding to these calls for service.”

While COVID-19 did not make department visits possible to present the awards in 2020, CHEMTREC hopes to visit both departments once it is safe to do so. We are grateful for the service you provide your communities and appreciate your dedication to enhancing your response capabilities for potential hazardous material incidents.

CHEMTREC is pleased to announce that we will be continuing the HELP Award and in honor of our 50th Anniversary, we will be providing \$10,000 to five fire departments, totaling \$50,000 in funding to volunteer departments in 2021! Be sure to follow CHEMTREC on social media for an announcement regarding the award application period opening in early summer! ■

2020 CHEMTREC HELP Award Recipients!

New Johnsonville Fire Department



Chief Dale Allen (Center) holding the CHEMTREC Award Plaque.

Water Witch Hose Company



Dylan Saunders and Ali Taouil proudly displaying their CHEMTREC Award Plaque in front of their 2020 Pierce Tower Ladder 25.



The New Johnsonville Fire Dept. Special Operations Response Team (SORT) Trailer and Hazmat response equipment purchased with the CHEMTREC HELP Award Funding.



Three pallets of adsorbents were purchased to provide an ample supply at both Water Witch Hose Company's Fire Stations.



Celebrate with us!

2021 CHEMTREC HELP AWARD

As part of CHEMTREC's 50th anniversary celebration \$50,000 will be provided in 2021 for the CHEMTREC HELP Award.

CHEMTREC, in partnership with the National Volunteer Fire Council (NVFC), will award \$10,000 to five fire departments in the U.S. that are all-volunteer or mostly-volunteer and are also members of the NFVC. The awards are intended to help the fire departments enhance their response capabilities and increase local preparedness to respond to and prepare for hazardous materials incidents.

LEARN MORE AT
chemtrec.com/emergency-responders/help-award

The 2021 application period will be open from June 1 to Sept. 1, 2021.



Meet Our Team

2021 Executive Committee



CHAIR
Missy Ruff
Renewable Fuels Association



VICE CHAIR
Paul Holt
Union Pacific Railroad



ACC MEMBER
Brian Dailey
The Chemours Company



NTTG MEMBER
Robyn Kinsley
The Chlorine Institute



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Schedule a Drill

Quite often, the first time a responder interacts with CHEMTREC is during an actual emergency. So to help emergency responders, CHEMTREC offers a comprehensive drill program.

CHEMTREC's drill program familiarizes your team with our process by walking them through a mock emergency situation. By ensuring that they know what to expect when calling CHEMTREC. The drill program is comprehensive, with exercises that simulate exactly how CHEMTREC's Emergency Service Specialists respond to actual emergency calls.

Emergency responders benefit from the drill experience. By walking through the motions of an actual chemical emergency response service, they will have a better understanding of how CHEMTREC assists in these situations, as well as what resources and services we offer.

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www.chemtrec.com/training-drills/schedule-drill

Team Member Highlights



DANIEL P VASCIK

Safety Specialist / Quality and Customer Care
Canal Barge Company North/ Illinois Marine Towing
TRANSCAER State Coordinator - Illinois

Daniel Vascik is currently the regional safety specialist for Canal Barge Company North (CBCN)/Illinois Marine Towing. He oversees the safety operations for their fleet of USCG Inspected Inland Towing Vessels that operate between Chicago and Peoria, Illinois, safety operations for their full-service shipyard located 30 miles Southwest of Chicago, and safety operations for their trans-loading terminal. The employee base for CBCN is over 250 workers, including administrative support staff. CBCN is primarily focused on the safe transportation of chemicals and dry cargo products from the Gulf of Mexico to the Midwest United States Inland River system. CBC and IMT foster partnerships and relationships with government

agencies (USCG/USEPA), as well as state and local agencies and chemical manufacturers.

Vascik has been in the emergency response and safety industry for close to 30 years. He has served both active duty and reserve for the US Coast Guard. Vascik was a firefighter/EMT in both municipal and industrial response. Since joining the US Coast Guard to his current career, he has actively worked and participated in chemical response as a hazmat technician. Vascik had the opportunity to teach as an adjunct instructor for four years through the Illinois Fire Service Institute/University of Illinois Champaign training northern Illinois firefighters in all hazardous materials response disciplines. He has an extensive emergency and industrial response training background concentrated in chemical emergencies and rescue.

Vascik was asked to join TRANSCAER in 2019 after a product quality audit by Dow Chemical. In 2021, he officially joined TRANSCAER as Illinois State Coordinator. Over the past five years working for Canal Barge Company/Illinois Marine Towing, he has been a member of the American Waterways Operators, Chicago Harbor Safety Committee as Towing Vessel and Barge Sector Lead, Three Rivers Manufacturing Association Safety Advisory Committee, and Spill Response Cooperative. Vascik has spoken at safety conferences, including AWO and ILTA.

He is passionate about education and partnerships with responders to increase their exposure to learning and pre-planning tactics in their community. Vascik is truly humbled and blessed to be working in the marine transportation and safety industry ensuring all go home safe to their family and loved ones.



KATHLEEN M. SPILMAN, PE

Managing Director
Keitu Engineers & Consultants, Inc.
TRANSCAER State Coordinator - North Dakota

Ms. Kathleen Spilman is a registered professional engineer with a BS degree in chemical engineering and a Master's degree in Management, with almost 40 years of professional experience. She worked previously for an international energy company for 17 years. After two additional years with a "Big 5" interna-

tional consulting firm, she returned to North Dakota in 2001 and co-founded the firm, which specializes in environmental, hazmat, and regulatory affairs.

Spilman has made numerous presentations on technical, health, and industrial safety issues, including as an instructor at the ND State Fireman's School. She has been North Dakota's TRANSCAER state coordinator since 2011. Spilman is the longest serving

member of the ND State Emergency Response Committee. She was North Dakota's delegate on the focus group steering development of the National Hazardous Materials Fusion Center by IAFC and US DOT. Recognized by her peers, she was selected as the 1987 Outstanding Young Engineer by the ND Society of Professional Engineers.



ROBYN KINSLEY

VP of Transportation & Emergency Preparedness
The Chlorine Institute
TRANSCAER Executive Committee - NTTG Member-At-Large

The Chlorine Institute (CI) is a long-time sponsor of TRANSCAER that has provided substantial input on TRANSCAER efforts throughout the years and has become a good model for industry community outreach and conducting emergency response training throughout North America. CI trains its own CHLOREP emergency response teams and contractors, as well as rail partners and often government personnel, which in turn are used to instruct at the free hands-on training CI provides under the TRANSCAER umbrella.

Robyn Kinsley has worked for CI for over 14 years and is currently CI's Vice President of Transportation & Emergency Preparedness. Throughout her years at CI, she has helped the trans-

portation and emergency preparedness committees develop industry best practices and training resources, as well as advocate for reasonable transportation regulations and standards, all to aid CI in achieving its mission of safe and secure transportation and effective emergency preparedness and response. Kinsley's expertise at CI provides an exceptional knowledge base for TRANSCAER's mission and initiatives. In 2019, Kinsley was voted to serve on TRANSCAER's Executive Committee representing in the Member-At-Large seat.

Prior to joining CI, Kinsley worked from 2002 to 2007 for the Naval Surface Warfare Center in Indian Head, MD as a production engineer for the manufacture of energetics and explosives. Robyn was born and raised near Indianapolis, IN. She is a graduate of Rose-Hulman Institute of Technology

(Terre Haute, IN) with a B.S. in Chemical Engineering (May 2002). Kinsley also received her MBA at the George Washington University in Washington, DC in May 2011. She currently lives in Northern Virginia with her husband and 2-year-old son, along with their two cats and two dogs.



JOHN VERGIS

Hazardous Materials/Environmental Officer
Wheeling and Lake Erie Railway Company
TRANSCAER State Coordinator - Ohio

John Vergis serves as the Hazardous Materials/Environmental Officer for the Wheeling and Lake Erie Railway (WLE). The WLE is an 800-mile Regional Railroad based out of Brewster, OH. Vergis started his career on the railroad 26 years ago, hiring into the Locomotive Shop as a laborer and then proceeded through the Locomotive Mechanic Apprenticeship Program to become a certified

locomotive mechanic. He was then the lead mechanic at their Akron, OH Shop until December 2004 when the shop was closed. In March of 2005, Vergis was then promoted to the position of assistant environmental officer and then in 2012, to his current position.

Vergis's responsibilities include all emergency responses when it comes to a hazardous materials release, whether it be from rolling stock or a fixed facility. Other responsibilities include all storm water and air permitting and operation

of the company's wastewater treatment plant. In his spare time, he oversees the maintenance of the company's 32 buildings.

In 2009, Vergis took on the role of TRANSCAER State Coordinator for Ohio where he has helped train thousands of first responders of which he feels privileged to do so. In January 2021, he was voted onto the AAR Tank Car Committee and looks forward to using his 26 years of railroad experience to give helpful input.

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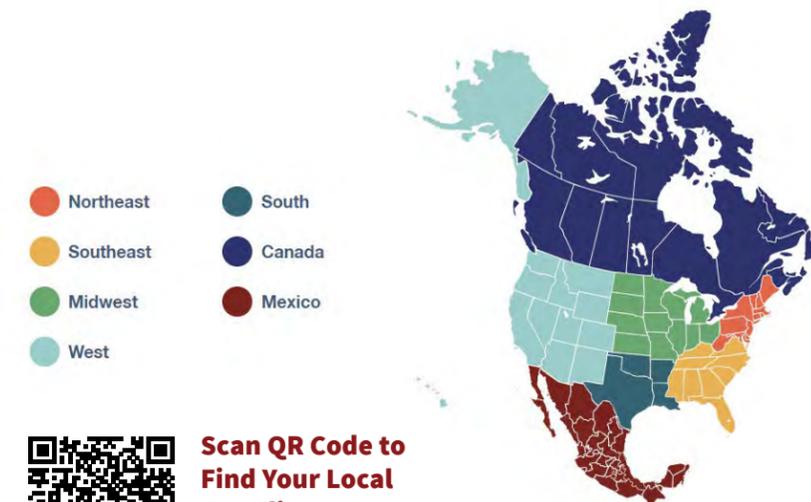
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THANK YOU

to our TRANSCAER Corporate Members



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Letter from Director



Erica Bernstein

Director, Outreach &
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I would like to thank our sponsors, partners, coordinators, and instructors that have shaped TRANSCAER into the program it is today.

Last year required a huge adjustment to the way we provide training to emergency responders, however TRANSCAERSM adapted and overcame these challenges and offered multiple virtual learning opportunities. The members of the TRANSCAER team held a combined 88 webinars last year training 11,876 attendees. TRANSCAER also established its new Learning Management System (LMS) that released ten online courses in December 2020, and we plan on releasing several more courses in 2021.

While 2020 was unlike any year we have experienced before, there are several additional successes to highlight, including the initial development of an LNG Safety & Emergency Response Training that will be released in 2021, a new Coordinator Handbook and on-boarding process for those who volunteer as a coordinator with TRANSCAER, and the addition of two new partners, including the North American Fire Training Directors and the Federal Motor Carrier Safety Administration.

A special thank you goes out to the Milwaukee Fire Department, who assisted TRANSCAER, CP, and Union Pacific Railroad last year in filming seven new *Seconds Count - Are You Prepared?* videos. These videos would not have been possible without your involvement and we appreciate that your department provided personnel and equipment to make this project a success!

To the entire emergency responder community — I cannot imagine what a challenging year 2020 was for each of you. Please know, TRANSCAER continues to stand with you and support you. We are grateful for the dedication and service you each provide to your

community. TRANSCAER is proud to have established the TRANSCAER Hazmat Team Response Fund, which will be awarded for the first time in 2021. It is our way of giving back and assisting hazmat responders in acquiring hazmat response equipment and advanced training to protect themselves and their community when responding to hazardous material transportation incidents. We appreciate the American Chemistry Council's initial donation of \$10,000 that kicked off the fund and we hope to see this fund continue to grow through our new Corporate Member Program.

As we enter a new year, we reached an exciting milestone for TRANSCAER as we celebrate our 35th anniversary! Our program continues to evolve and over the past two years as the director, it has been amazing to watch TRANSCAER transform. The one thing that remains constant is the numerous team members who are dedicated to the program and to training emergency responders. I would like to thank our sponsors, partners, coordinators, and instructors that have shaped TRANSCAER into the program it is today. Your contributions help to drive TRANSCAER's success and we are honored to have each of you as part of the TRANSCAER Team.

I look forward to seeing what is next for TRANSCAER and excited for what the future holds. I wish you each a safe, healthy, and happy 2021. I am hopeful we will all be able to connect again soon at hazmat conferences and training events across North America once it is safe to do so!

Thank you for your continued commitment to TRANSCAER!

Sincerely,

Erica Bernstein

THE TRANSCAERSM MISSION IS TO:

Promote safe transportation and handling of hazardous materials

Aid community emergency response planning

Educate and assist communities regarding hazardous materials



TRANSCAERSM

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