Albany County Sheriff's Office
Critical Incident Emergency Management Unit

September 2022

Critical Incident/Emergency Management Unit

This is the monthly newsletter for the Albany County Sheriff's Office Critical Incident Emergency Management Unit. If you have events that you would like posted in this newsletter please email them to the Fire Coordinator's office.

Trench Rescue

In this issue

Office of Emergency Management

P.O. Box A
58 Verda Ave.
Clarksville, NY
12041

Ph: (518) 720-8025
Fax: (518) 720-8031

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Critical Incident Emergency Management Unit

September 2022

The Sheriff's Office is working to train and staff a countywide trench rescue team. OFPC has run 2 Medium Structural Collapse Operations: Tools and 2 Trench Rescue-Operations Level Classes within the last month in our County. This training was completed as part of our goal to obtain New York State accreditation for our Trench Rescue Team. This team will be staffed by Sheriff's Office Staff, as well as, Volunteer Firefighters. Below are photos from these classes.

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Fire Engineering

Ron Zawlocki: Trench Rescue Shoring: "Our Dirty Little Secret"

9.1.2016

By Ron Zawlocki

You arrive on the scene of a trench rescue with the technical rescue team. The incident commander has been desperately waiting for your arrival. In the briefing, the incident commander (IC) tells you that two workers are trapped in a deep intersecting trench and that you are in charge of shoring. When you get to the trench and make your assessment, you find that this is a 12-foot deep T-trench that is six feet wide. One corner of the trench has caved in, leaving a huge void. You have trained on shoring T-trenches, but they always have been in passive soil with both corners intact, and they have never been this wide or deep. This is heavy, wet, and unstable soil. You feel that these conditions could easily create the lateral forces associated with C-60 soil. You are the "trench guy" and will be making important decisions today.

Your plan is to implement as much as possible of the shoring technique you learned in class. However, there are some major differences here. The wales that you will be using today will have to span 10 feet or more instead of eight feet, the spans that you trained with. Additionally, you will be back-filling the corner void with multiple (stacked) low-pressure air bags. The T-trench shoring that you learned in class did not address large corner cave-ins. You know that your team will be able to put this plan in place, but you have serious concerns about the strength of this shoring system. Is the capacity of the six-inch by six-inch wale at a 10-foot span more than the soil force that it will be set up to resist? Will the stacked air bags be stable enough to resist the forces transferred from the opposite walls through the struts–in short, is the ultimate strength of your shoring system design stronger than the potential forces of the trench walls? Twice as strong seems reasonable, but what is the minimum requirement? You had questions about this during your trench technician class, but the instructor kind of "side stepped" them. It sure would have been nice to have been taught a method to calculate safety factors for different shoring designs instead of the "no questions allowed" rote teaching method that you were given.

When the shoring is complete, the members of your team turn to you and ask, "Can we get in and dig these guys out?" They are asking you if it is safe. They deserve to know that answer. Their families and friends deserve to know that

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answer. Do you know (for sure) that the shoring system is stronger than the soil force? Well, haven't the instructors you learned this from tested the design to make sure it can resist the forces of the soil you expect to install it in? Haven't the rescue equipment manufacturers tested this system to see how it performs in a trench? Isn't there a performance standard (National Fire Protection Association, ANSI, or Occupational Safety and Health Administration) for trench rescue shoring that requires a system to be strong enough to resist the lateral forces of soil? Unfortunately, the answers to these questions are a resounding *"NO."*

Trench Shoring History

Trench recue shoring gets its roots from the underground construction industry. The basis for the use of traditional sheeting and shoring (a fading construction shoring method) is to prevent movement of the soil. This can be done by construction workers as a result of being able to start shoring soon after (and sometimes during) the excavation process. When you can stabilize a wall before it moves significantly (large fissures or cave-in related voids), some construction-related theories can be applied. Empirical evidence (witnessed results) suggests that theories like "soil arching" and "pressurization zones" created by strut activation forces have merit when soil walls are intact and not active. However, after the soil has begun to move and has created voids in the wall(s), these theories become questionable at best.

Very little testing and research has been done on trench rescue shoring. Data that compare the performance of rescue shoring systems and lateral soil forces do not exist. Standards, tabulated data, and engineered designs exist for the underground construction industry, but construction shoring and rescue shoring are not the same. In the only published study on "trench rescue shoring," Dr. Marie LaBaw concludes: (1) There is a lack of engineering analysis for trench rescue shoring and (2) underground construction shoring and trench rescue shoring are significantly different.

Clearly no quantitative value can be assigned to construction-based theories when soil is active or has caved in. As a result of the many differences between rescue shoring and construction shoring, trench rescue shoring systems must be designed and *tested* to resist "worst-case scenario" soil conditions, which include the following:

1. Soil that has not been shored (or has not been properly shored) prior to its becoming visibly active.
2. Soil that has caved in, leaving voids in the wall(s). The walls are no longer intact or "monolithic" in appearance. Soil walls will act more like damaged unreinforced masonry rather than reinforced concrete walls.
3. Visible signs (sloughing, raveling, widening, fissures, for example) may or

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may not be apparent, but the soil is considered to be unstable.
4. Portions of vertical or "near vertical" walls exist.
5. Pressures in this type of soil conditions are estimated at 60 pounds per cubic foot.

Shoring Standards
For several years, a group of rescuers and professional engineers have worked together to enhance the shoring and stabilization capabilities used at structural collapse rescue incidents. The group continues to make improvements based on gains from experience, testing, and technology. The results are published by the Department of Homeland Security's in the *Field Guide for Building Stabilization and Shoring* manual. The testing method used measures the strength of the shores by setting them up in a position of function (a building collapse replication) and subjecting them to vectors (force magnitudes and directions) that would be developed by a damaged structure. By taking the shore to failure (breaking it,) the ultimate strength can be established and compared to the force it was designed to resist. That comparison can provide a "safety factor" that validates the shore's ability to keep the building from falling down on the rescuers. Improved safety factors can be achieved by testing modified versions (nail patterns, bracing, materials, and so on) and comparing results. The published field guide has become a benchmark for structural collapse rescue instructors. The shoring designs and recommended practices have become a consensus standard for the fire and rescue service.

Unfortunately, trench rescue shoring has no such guideline. Very few shoring system being taught today have actually been tested to failure in their position of function (in a trench, not on computer software). True safety factors have not been established. Quantitative results have not been established to sort out myths, folklore, and the misplaced applications of construction-based, soil-retention methodology. Without a guide and a consensus standard, trench rescue instructors continue to pass along shoring techniques that have little or no scientific validation.

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Backyard Tests

The MUSAR Training Foundation has conducted a series of destructive tests on trench shoring components (panels, wales, and strut equipment) as well as complete trench rescue shoring systems. We recognize the fact that more precise instrumentation would be desirable and that more tests are needed to obtain replicable results. Until that occurs, the precision of our "backyard testing" results should be considered. It is our sincere hope to gain the support of subject matter experts, rescue equipment manufacturers, and professional engineers to enable trench rescue shoring to duplicate the achievements of the structural collapse discipline.

With that said, we have used two types of tests to evaluate the strength of shoring components and systems in their position of function (in the trench). In both types of tests, the magnitude of the force delivered is comparable to the soil pressures of C-60 soil. The direction of force in both tests is lateral, replicating the movement of a wall into the trench.

A Type I test takes a shoring **component** to failure by using air bags as the force. An air bag is placed directly behind the component being tested, creating a lateral force. Load cells are used to record the forces applied and to determine the maximum forces applied at the point of failure (component strength). These tests are conducted in the trench or excavation, and the tests show how the component reacts to force in its position of function (i.e., in a trench, not in a laboratory). Type I tests are also used to get a "quick look" at system strengths. If a system design can resist twice the force that 60 pound per cubic foot (pcf) soil could apply, that system is considered for further (Type II) testing.

A Type II test is used to create force on the shoring **system** rather than on an isolated component. The application of forces can be controlled to create higher forces near the bottom of the trench to test the system's ability to resist soil pressures. This test is done by digging a narrow trench parallel to the shored trench. Air bags are placed into the narrow "parallel trench." When the air bags are pressurized, a section of soil wall is moved, creating a lateral force onto the shoring system. In a Type II test, the force more closely replicates the forces of an active (moving) soil wall and its distribution into the shoring system. Video footage of some of the Type I and Type II tests can be seen on YouTube by searching MUSAR Trench.

Game Changers

The load cells that we use are scaled to measure force increments of one thousand pounds. Results in the hundreds or less pounds range are not obtainable with these instruments. As a result, we cannot provide results that

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are accurate to a pound of force. Nonetheless, there have been results from our testing that have been so dramatic that they have caused many trench rescue teams to make changes in their equipment and tactics.

1. Panels. A variety of panel/strongback configurations are used by trench rescue teams across the country. Contrary to popular opinion (folklore), Dr. LaBaw's testing revealed that strongbacks and panels each have significant structural value and have a significant effect on distributing the strut load to a larger area of trench wall. Tests conducted by the MUSAR Training Foundation have shown the ultimate failure strength of ¾-inch Finnform that is glued and screwed to a 2-inch by 12-inch strongback can resist in excess of 30,000 pounds of force (distributed) between struts that are spaced at four feet on center. The same sized Finnform and panels that are held together by bolts and nuts failed at less than one-half of that force.

2. Wales. Many trench rescue teams use 6-inch by 6-inch timers as wales. A common span (between struts) for "rescue wales" is eight feet. MUSAR tested several 6-inch by 6-inch timbers with struts spaced at eight feet and found a very large variance in breaking points (between 7,000 and 18,000 pounds of force). The most "common" failures occurred at about 14,000 pounds of force. When comparing the "common" strength to the potential force of C-60 soil, you will find that a 6-inch by six-inch is capable of resisting soil forces in only very shallow trenches. For that reason, OSHA requires much larger timbers for construction shoring C-60 soil. Tests conducted on 7-inch by 7-inch laminated veneer lumber (LVL) showed much smaller variances in strength between samples (41,000 and 48,000 pounds of force), and they were consistently two to three times stronger than 6-inch by six-inch timbers.

3. Excavation Raker Shores. The placement, direction, and magnitude of forces created by soil walls can be significantly different than created by structural walls. In an effort to replicate forces found on excavation walls, MUSAR tests created forces at both the top and bottom of the wall. Raker shores consistently broke at the point that connected the upper and lower struts. Working with Paratech Rescue Inc. an angled base plate was developed which more than doubled the strength of the "excavation raker" and established an acceptable safety factor.

In the past decade, the fire service has seen dramatic changes in equipment and practices that have come about as the result of scientific testing and advances in technology. Structural collapse and rope rescue both have used scientific testing and analysis to enhance rescuer safety. In 2009, Dr. Marie LaBaw stated, "There has traditionally been a lack of engineering analysis of technical rescue systems, including trench rescue shoring. As education and

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technology increasingly pervade the technical rescue industry and the fire service, the potential to research, evaluate, and recommend changes to existing rescue systems is becoming a reality." Unfortunately, to date, the fire/ rescue service has made no movement to research, evaluate, or recommend changes to trench rescue shoring practices. As we look away from science, testing and technology trench rescue shoring remains "our dirty little secret."

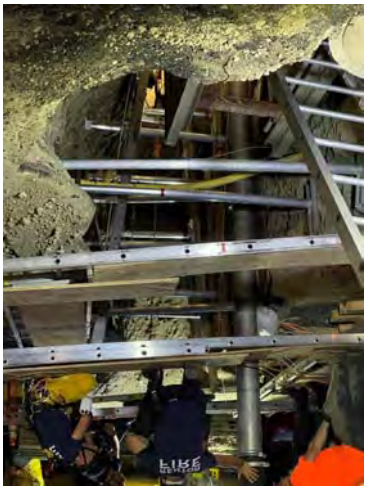
Fire Rescue 1 By Lexipol

Wash. FFs recover body after construction worker killed in trench collapse

Sep 8, 2022
Helena Wegner
The Charlotte Observer

RENTON, Wash. — A construction worker died when the trench he was inside of collapsed, rescuers in Washington said.

Firefighters from Puget Sound Regional Fire Authority and the Renton Regional Fire Authority arrived at the scene in Renton Wednesday to find a man mostly buried under 10 feet of dirt. They could see only his upper body in the 20-foot-deep trench, Puget Sound Regional Fire



Authority Division Chief Pat Pawlak told McClatchy News.

It took rescuers nearly eight hours to recover the man's body, he said. They first had to set up side walls in the unstable trench before they could get in there.

"It was a very long recovery, and it was done very safely and very methodically to make sure we maintain firefighter safety," Pawlak said.

Pawlak said it's unclear what the man was doing in the trench.

The trench collapse will be investigated by the Washington State Department of Labor and Industries, he said.

Renton is about 10 miles southeast of Seattle.

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Recruitment and Retention

The Fire Coordinator's office participated in several Recruitment / Fire Safety events this month. We were at the Altamont Fair and we want to thank all the Departments that displayed apparatus at the Hometown Heroes building . We want to particularly thank Onesquethaw Fire Department for staffing and displaying the Sheriff's tactical training trailer on Saturday and walking many children through the trailer and providing them with fire extinguisher training. We were also at the Medusa Fest.

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FASNY Training Weekend

FRIDAY – SUNDAY
SEPTEMBER 23 – 25, 2022
STATE PREPAREDNESS TRAINING CENTER
5900 AIRPORT RD, ORISKANY, NY 13424

SPACE IS LIMITED.

COURSE DESCRIPTIONS

Utility Terrain Vehicle (UTV) Operations: Date: September 23-24, 2022 Time: 8:00 AM – 4:00 PM This is a twenty hour hands on class. There will be an instructor led classroom portion followed by an inspection of the trailer and equipment that the participants brought with them. There is a mandatory tire change using only the equipment the students have with them. This will take about four hours. The next twelve hours are hands on driving skills. The students will traverse challenging terrain and use the winch on their machines. There will be multiple skills stations to work through. There will also be a trail ride with many of the skills taught put in to use to successfully complete the ride. The remaining four hours are spent on hands on maintenance and clean up of the machines and returning the machine back to service. Each department is asked to bring one machine for two operators. There is a maximum of twenty students allowed per class. There is a minimum of 10 students allowed per class.

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Swiftwater/Flood Operations: Date: September 24-25 Time: 8:00 AM – 4:00 PM This course is designed to introduce firefighters and EMS personnel to water rescue at the operations (shore based) level of response. The course contains information on: hazards, medical considerations, incident management, on self-rescue, PPE and rescue techniques. Practical training is also provided in self-rescue and shore based rescue skills. Fire Prevention and Control Fire Prevention and Control Fire Prevention and Control Water Rescue Awareness: Date: September 24, 2022 Time: 8:00 AM – 12:00 PM This course provides an overview of water safety and rescue issues including hazard assessment, responder safety, risk management, hypothermia, near-drowning, basic water search techniques, basic shore based rescue techniques, incident management issues, and water rescue equipment. Basic Wildland Search Skills (DEC): Date: September 24, 2022 Time: 8:00 AM – 4:00 PM

The Basic Wildland Search Skills course has been developed by the Division of Forest Protection in the Department of Environmental Conservation and is taught by DEC forest rangers to individuals interested in becoming wildland search volunteers. This course provides you with the basic knowledge and skills necessary to assist in conducting search missions and to acquaint you with the New York State Forest Ranger Search and Rescue Program. The primary purpose of the training program is to organize, train and maintain search volunteer resources, provide uniform and standard basic search training and to certify search volunteers. Upon completion of the course and passing a written examination, search volunteers will be issued a laminated search volunteer certification card and patch. Basic Wildland Fire Suppression: Date: September 25, 2022 Time: 8:00 AM – 4:00 PM Developed by the New York State Department of Environmental Conservation Forest Rangers and the New York State Office of Fire Prevention and Control for firefighters involved in wildland fire suppression. The course contents include jurisdiction and responsibilities, fire behavior, wildland fire elements and size-up, use of tools and equipment, general concepts related to fire suppression, securing the control line, and standards for safety. FF-1

Truck Company Refresher: 6 Hours Date: September 24, 2022 Time: 8:00 AM – 3:00 PM Truck Company Operations Refresher is designed to enhance the basic truck company skills learned in your initial fire service training program. Skill evolutions will include conventional and through the lock forcible entry, ground ladder operations, roof operations, and search and rescue operations. The Truck Company Refresher will be broken into 4 – 3 hour tracks (Please rank your choices 1 – 4. You will be assigned to two tracks based on first come first served). Each track will be maxed to 10 students. • Forcible Entry • Ground Ladder Operations • Roof Operations • Search and Rescue Operations Phone: 315-768-5689 • Email: SPTC.INFO@dhses.ny.gov • Website: www.dhses.ny.gov

FF-1 Engine Company Refresher: 6 Hours Date: September 25, 2022 Time: 8:00 AM – 3:00 PM Engine Company Operations Refresher is designed to enhance the basic engine company skills learned in your initial fire service training program. Skill evolutions will include review of various hose loads, hand line deployment and advancement, nozzle operations and water management ("Know your Flow"), standpipe operations. Various props will be utilized including: Lion Digital Attack System, flow meters, various nozzle types (automatic combination, fixed gallonage combination, and smoothbore). Engine Company Refresher will be broken into 4 - 3-hour tracks (Please rank your choices 1 – 4. You will be assigned to two tracks based on first come first served). Each track will be maxed to 10 students. • Know Your Flow and Water Mapping • Standpipes and High-Rise Operations • Hose Line Operations – Attack Lines to Monitors • Modern Fire Behavior Vehicle Rescue Operations Level: Date: September 24-25, 2022 Time: 8:00 AM – 4:00 PM Provides hands-on training in motor vehicle rescue and extrication techniques while stressing the need for scene safety and vehicle stabilization. It includes rescue theory, rescue life cycle, new technology in automotive design and rescue tools and their uses.

REGISTER You may register for this conference through the NYS Division of Homeland Security and Emergency Services (DHSES) Learning Management System:

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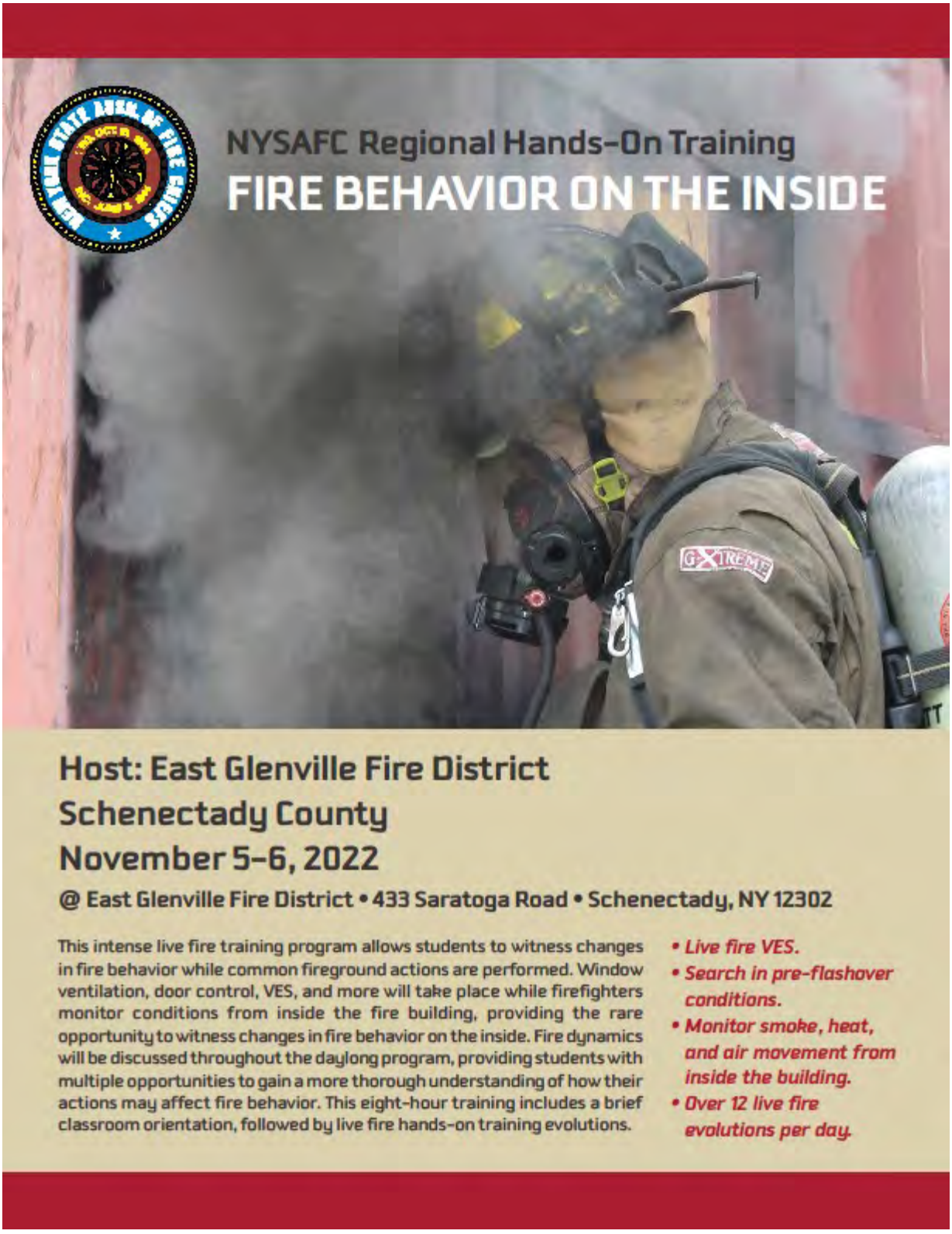

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NYSAFC 2022 SEMINAR SERIES

NYSAFC 2022 Seminar Series "The Five Points of Command"
With Chief/Commissioner Michael Lombardo, Buffalo Fire Department
Three-Hour Seminar:
The fire ground is a dynamic, ever-changing environment. It can be a daunting challenge for firefighters, company officers, and chief officers to control an emergency situation. A cohesive and smart incident action plan is critical and key to successfully controlling the chaos that we so often respond to. Personnel must understand the components of the incident action plan and how this plan effects all facets of the operation and all who are operating to attain success. Remember, this plan isn't just for and about incident commanders, but rather a framework for all on the fire ground to operate with. Whether you are a new firefighter or the chief of department, having, implementing, and understanding the incident action plan will provide the clarity and coordination for a safe and successful operation.

Instructor Michael Lombardo:
Mike Lombardo is a 43-year veteran of the fire service and was the commissioner/chief of department of the Buffalo Fire Department from 2006-2010. He is a New York state fire instructor and was a member of the development team for the New York State Firefighter Survival and Rapid Intervention programs. Lombardo has also served as a Hands-On Training instructor for NYSAFC. He is a two-time *Firehouse* magazine Heroism Award recipient and is the FDIC 1999 Tom Brennan Training Achievement Award recipient. In 2015, Lombardo was a contributor for the NFFF documentary "Giving Courage: LODD Chiefs Speak." He provides consulting services across the United States and serves as an instructor on fire tactics, live fire attack, firefighter survival, command, and fire department operations. Lombardo is also a member of the board of directors of the Fire Department Training Network, where he developed the Fire Command program. He is currently an active member of the East Amherst Fire Department and is a past assistant chief of the Christiana (DE) Fire Department.

Registration Fee:
$35 per person – NYSAFC Individual and Department Members
$50 per person – Non-Members
Seating is limited at some sites. Pre-registration is encouraged. On-site registration will be accepted if space permits.

October 24 – 7:00 p.m. – Albany County, Village of Ravena Fire Department • 116 Main Street • Ravena, NY 12143

To Register: https://www.nysfirechiefs.com/files/Events Training/Seminar%20Series%202022%20Flyer_Form%204.jpg

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Albany County Training

ALBANY COUNTY FIRE TRAINING SCHEDULE #10 2022 is now available on our website .

https://www.albanycounty.com/home/showpublisheddocument/22107/637983203903476090

There is now a link on our website with instructions on how to get an LMS sign on ID . We recommend that all new members should register as soon as they join so they have access to training opportunities.

https://www.albanycounty.com/government/county-sheriff/fire-training

Article Submissions Requested

Do you have an idea for an article for our newsletter?
Do you have a talent for writing?
Is there an area that you have a strong knowledge or interest in?
If so, please contact us. We are always looking for valuable information to pass on to the Emergency Services Community. If you seen an interesting article, let us know.

Please contact:
Chief Paul Miller
Albany County Fire Coordinator's Office
paul.miller@albanycountyny.gov
(518) 720-8034

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ALBANY COUNTY FIRE TRAINING SCHEDULE #10 2022

Pre-Registration Required: Students may register by clicking on the Learning Management System link on the NYS OPFC Home Page (NYS Division of Homeland Security & Emergency Services - OFPC)

Registration opens 45 days before the first class

COURSE	LOCATION	DATE	INSTRUCTOR	PREREQUISITES
Please Note that a training authorization letter is now required for all courses offered by the New York State Office of Fire Prevention and Control				
Firefighter II **IN PROGRESS**	Guilderland Tower	June 8, July 20, August 24, September 7, 14, 21, 28, October 5, 12, 19, 26, November 2 Weeknights 1830	DeGroff	Firefighter I or Equivalent
Basic Exterior Firefighting Operations with Hazardous Materials First Responder Operations **IN PROGRESS**	Westmere	August 15, September 8, 15, 20, 22, 27, October 4, 8, 22, 26, November 2, 7, 9, 15, 19, 21, 28, December 7, 13, 14, 19, 20 Weeknights: 1830-2130, Saturdays: 0800-1400 Units 21-25 1800-2200	Molesky	None
Apparatus Operator - Emergency Vehicle Operator **IN PROGRESS**	Slingerlands	September 6, 8, 13, 15, 17 Weeknights 1830 Saturday 0800	DeGroff	Driver's License
Modern Fire Behavior **Revised Dates and Location**	Coeymans	September 12 & 13 1830-2130	Prof. Dave Walsh	None

Medium Structural Collapse Operations: Tools	Colonie Village FD	September 14 :1800-2200, 17: 0800-1700, 18:0800-1200	Jennings	
Truck Company Operations	Colonie MTB	September 14, 21, 26, 28, October 3, 10, 15 Weeknights 1830-2130 Saturday 0900-1500	Molesky	Firefighter I or Equivalent and SCBA Qualified
Vehicle Rescue: Operations Level	Colonie MTB	September 20, 22, 27, 29, October 6 1830/2130	DeGroff	None
Fire Instructor II	Watervliet Arsenal	September 30, October 1, 2, 8, 9 0800-1700	OFPC	Fire Service Instructor I There is a lengthy pre-course reading assignment, and students complete a pre-test, final exam, independent assignments, and one presentation during the course. Course includes homework and independent study. There is a dress code for candidates attending this course.
Basic Exterior Firefighting Operations with Hazardous Materials First Responder Operations **NEW TO SCHEDULE**	East Berne	October 3, 11, 13, 17, 19, 25, 27, 29, November 2, 5, 8, 10, 14, 16, 22, 28, 30, December 6, 8, 12, 14, 20, 27 Weeknights 1830-2130 (Hazmat 1730-2130) Saturdays 0800-1400	Santabarbara	None
Apparatus Operator-Pump	Slingerlands	October 11, 13, 18,20, 22, 25 Weeknights 1830 Saturday 0800	DeGroff	Scene Support Operations/Basic Exterior Firefighter Operations or Equivalent
Trench Rescue - Operations Level **New To Schedule**	Colonie Village FD	October 26 :1800-2200, 29: 0800-1700, 30:0800-1200	Jennings	BCSO: Tools

Principals of Instruction	Elsmere	November 7, 14, 21, 28, December 5	Clawson	None
Vehicle Rescue: Operations Level	Onesquethaw	November 7, 9, 14, 16, 21	DeGroff	None
Fire Instructor II	Watervliet Arsenal	November 28, 29, 30, December 1, 2	Bachner	Fire Instructor I There is a lengthy pre-course reading assignment, and students complete a pre-test, final exam, independent assignments, and one presentation during the course. Course includes homework and independent study. There is a dress code for candidates attending this course.
Hazardous Materials Technician Modules 1,2 & 3 **NEW TO SCHEDULE**	West Albany	November 29, 30 December 3, 6, 7, 10, 12, 14 Weeknights 1830-2230 Saturday 0800-400	OFPC	Hazardous Materials First Responder Operations & SCBA Qualified
Unless changed by instructor or noted above: **All evening classes will be held from 19:00-22:00 hours.** **All Saturday and Sunday classes will be held from 09:00-12:00 hours and 13:00-16:00 hours**			**Fire Coordinator Gerald Paris**	