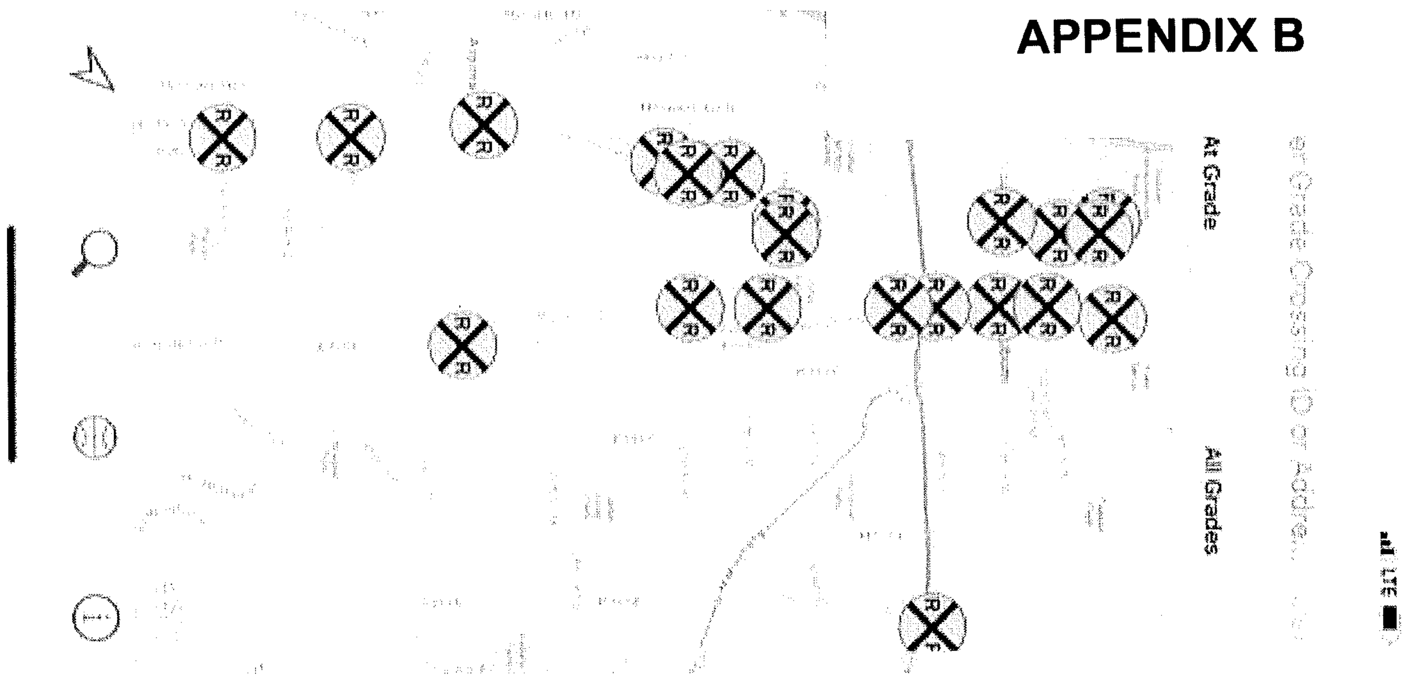
APPENDIX A

APPENDIX B



Federal Railroad Administration
Office of Safety Analysis

8.01 - Query by Location

Total Records: 18

Report Type: (•) Inventory ( ) Accident

Inventory: (•) Current ( ) History

Generate Report | Show All | Reset

Note: Selecting multiple crossings will increase the time required to generate a report. It is recommended that one record be generated at a time.

Number of Results per Page: 20 1 Results: **1 - 18** of 18

	Crossing#	State	Rr	Type	Position	Status	Milepost	County	City	Division	SubDivision	Branch	Street
☐	**085157R**	WA	BNSF	Public	At Grade	Open	0101.95	KING	AUBURN	NORTHWEST	STAMPEDE	ELNSBURG-AUBURN	M ST
☐	**085158X**	WA	BNSF	Public	At Grade	Open	0101.595	KING	AUBURN	NORTHWEST	STAMPEDE	ELNSBURG-AUBURN	AUBURN BLK DIAMON
☐	**085233G**	WA	BNSF	Public	At Grade	Open	0091.530	KING	AUBURN	NORTHWEST	STAMPEDE	ELNSBURG-AUBURN	216TH AVE SE
☐	**085234N**	WA	BNSF	Public	At Grade	Open	0094.710	KING	AUBURN	NORTHWEST	STAMPEDE	ELNSBURG-AUBURN	COVINGTON WY SE
☐	**085647H**	WA	BNSF	Public	At Grade	Open	0019.160	KING	AUBURN	NORTHWEST	SEATTLE	SEATTLE-VANC WA	37TH STREET NW
☐	**085650R**	WA	BNSF	Public	At Grade	Open	0019.653	KING	AUBURN	NORTHWEST	SEATTLE	SEATTLE-VANC WA	29TH ST NW
☐	**085652E**	WA	BNSF	Public	At Grade	Open	0021.262	KING	AUBURN	NORTHWEST	SEATTLE	SEATTLE-VANC WA	3RD STREET NW
☐	**085655A**	WA	BNSF	Public	At Grade	Open	0021.439	KING	AUBURN	NORTHWEST	SEATTLE	SEATTLE-VANC WA	WEST MAIN ST
☐	**085661D**	WA	BNSF	Public	At Grade	Open	0022.297	KING	AUBURN	NORTHWEST	AUBURN YD, WA	GSA TRACKS	C ST SW GSA TRK
☐	**396586D**	WA	UP	Public	At Grade	Open	0164.460	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	44th Street Northwest
☐	**396587K**	WA	UP	Public	At Grade	Open	0164.030	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	37th Street Northwest
☐	**396588S**	WA	UP	Public	At Grade	Open	0163.540	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	29th Street Northwest
☐	**396591A**	WA	UP	Public	At Grade	Open	0161.770	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	West Main Street
☐	**396593N**	WA	UP	Public	At Grade	Open	0160.970	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	15th Street Southwest
☐	**872207N**	WA	UP	Public	At Grade	Open	0162.140	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	6th Street Northwest
☐	**906458G**	WA	UP	Public	At Grade	Open	0161.990	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	H Street Northwest
☐	**922992C**	WA	UP	Public	At Grade	Open	0160.960	KING	AUBURN	Pacific Northwest	Seattle Sub	#N\A	15th Street SW
☐	**945561A**	WA	BNSF	Public	At Grade	Open	0020.982	KING	AUBURN	NORTHWEST	SEATTLE	SEATTLE-VANC WA	A ST

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Customer Notice
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our COVID-19 information page or visit our COVID-

APPENDIX C

UTC
Washington Utilities and Transportation Commission

Site Search Companies Search Dockets Search

WA Rail Crash Stats

2011-2021

These statistics are for crashes that occurred at highway-rail grade crossings and along railroad rights-of-way. Data is subject to change based on ongoing investigations.

Year	Crossing Collisions	Crossing Injuries	Crossing Fatalities	Trespass Fatalities
2021	40	11	4	28
2020	45	7	5	20
2019	41	9	8	15
2018	39	11	7	17
2017	47	5	13	21

Year	Crossing Collisions	Crossing Injuries	Crossing Fatalities	Trespass Fatalities
2016	40	13	7	8
2015	37	7	5	23
2014	35	10	5	9
2013	20	10	4	17
2012	33	18	2	10
2011	29	4	8	22

Notes: Crossing Collisions include property damage incidents. As of 2016 forward, Link Light Rail fatalities are included and counted within the Trespass Fatalities.

APPENDIX D

JUSTICE AND PUBLIC SAFETY

Aerial Drone Aids in Chemical Train Derailment Response

Birds-eye technology kept emergency personnel out of harm's way while delivering photos of accident scene.

• Brian Heaton

The use of unmanned aerial drones may raise privacy and safety questions for some people, but the technology's life-saving benefits are well worth the risk for Louisville Emergency Management Agency Director Doug Hamilton.

Faced with a chemical train derailment in the southwest area of Jefferson County, Ky., in October, Hamilton sent in an aerial drone to take photographs and observe the scene. The drone sent back valuable information that helped Hamilton evaluate the situation without risking the lives of emergency personnel who normally would have approached the area on foot.

The derailment of the Paducah & Louisville Railway train occurred in an area where the tracks were elevated on a hill, and the side where the train derailed slopes down toward the Ohio River. As a result, responders could only get to the train from one side. The drone provided Hamilton's team with a view and focus that they wouldn't have otherwise had in the situation.

"It helped us refine our questions when the contractors submitted their plans for moving the cars, what the risks were going to be and what the evacuation zones were going to

be, where we would not have been able to do otherwise," Hamilton said.

The drone was brought in after a fire ignited as contractors were preparing to move a rail car containing butadiene — a flammable gas that is shipped liquefied and can cause irritation to the eyes, nose and throat, and drowsiness and dizziness. Exposure to butadiene can also damage the central nervous and reproductive systems.

That car was up against another car containing hydrogen fluoride, a chemical that can cause severe respiratory damage. The fire set up a potentially explosive situation where the toxic chemicals could be released in the air. Residents were evacuated throughout the area.

Hamilton explained that when the butadiene car ignited and the flame was hitting the top of the rail car holding the hydrogen fluoride, it began to boil the latter chemical. Without keeping the temperature down, a Boiling Liquid Expanding Vapor Explosion (BLEVE) could occur, which could hurl the rail car thousands of feet and vaporize the hydrogen fluoride, creating a toxic inhalation hazard.

While water at a rate of 1,200 gallons per minute was being dumped on the railcar for several hours to keep it cool and avoid an explosion, Hamilton felt his team had to have a better view on what was going on.

"Ordinarily, we as a jurisdiction don't get involved in the 'ifs', 'ands' and 'buts' of how a contractor is going to deal with a hazardous materials response and clean up," Hamilton said. "But as a result of the fire on Wednesday [Oct. 31], there was somewhat of a jolt to our confidence and more of an awareness on our level that we needed to be exactly clear on what the contractor intended on doing."

Responders first called in a police helicopter to take fly-over photos. But while Hamilton said the photos from it were handy, the possibility of a large explosion made using the helicopter a risky move.

At that point, Hamilton was told an aerial drone called the Datron Scout was available. Provided by Drone Systems, the drone and the company's president Joel Embry was on-scene on Nov. 1, to control the vehicle. Able to zip in and out of the scene in 20-minute increments, the drone took photos of the area without putting the lives of responders in jeopardy.

"It's a hell of a lot better [quality] photos than we were getting from a helicopter, which can't be as stable as a drone is," Hamilton said.

Mixed Results

Although the drone operated well, the deployment in this particular situation wasn't perfect.

The initial plan was to use the drone for live video transmissions so that responders could evaluate the situation in real time. But the idea was nixed due to connectivity and compatibility issues between the drone and the incident command center.

Hamilton explained that the drone's video operated using Apple's QuickTime software. While that doesn't seem too big of a hurdle, the equipment being used by emergency responders didn't have the software. In addition, the state's command vehicle also couldn't connect to the video, and in the interest of time, Hamilton abandoned the idea and went with just aerial photos from the drone.

The images weren't delivered wirelessly, however. The drone flew out to the site, took pictures and then had to fly back to where responders were located so they could download them and view the scene.

Rick Bobo, regional response manager for Region 4 of Kentucky Emergency Management — a division of the Kentucky Department of Military Affairs, said his goal is to make sure that the communication link between the state's command vehicle and the drone is established for the next time the technology is used.

While Bobo wasn't on the scene, he said state representatives tried to establish the uplink, but were lacking the proper equipment to get the drone's video feed to function properly. But they now know what they need to make it happen and it's just a matter of

getting it completed.

Despite the video hiccup, Hamilton is fully on board with using an aerial drone during other emergency situations in the future. Because the incident lasted for 19 days, emergency personnel had plenty of time to talk about the drone and other applications where it would be valuable to use.

"If we had the drone on day one, we would have had a better appreciation initially of exactly what kind of a problem we had here," Hamilton said. "The drone moved from down at the bottom of our grant request list to closer to the top."

Brian Heaton
Brian Heaton was a writer for Government Technology and Emergency Management magazines from 2011 to mid-2015.

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APPENDIX E

Cepton Expands Footprint in Metro Detroit

According to Drone Systems spokesman Joel Embry, the expense associated with using a Scout UAS for monitoring a Kentucky train derailment represents a fraction of the cost of deploying a helicopter for this type of aerial observation and intelligence gathering.

A Scout unmanned aircraft system (UAS) proved to be an invaluable asset to public safety agencies after a train derailment in Louisville, Ky., on Oct. 29, 2012, and subsequent chemical fire on Oct. 31. Joel Embry of Drone Systems used the Scout UAS, which was developed by Aeryon Labs in partnership with Datron World, to assist incident command and emergency crews on the accident scene, providing streaming aerial footage to the command post as well as high-resolution photographs to planning section officers.

Local, state and federal agencies involved in the derailment response described the video, photographs and weather data provided by the UAS as critical to the incident's safety, mitigation, cleanup and documentation. The ability to immediately access and control the Scout's imagery from the command post provided an unprecedented perspective to commanders during the planning and execution of incident operations.

"We were able to fly directly over the site of the derailment at various altitudes on multiple days to provide high-resolution video as well as still photography to the teams on the ground," said Embry. "They were literally taking the photography we provided and using them in real time in their situational briefings to make decisions on progress as well as next steps."

Image courtesy of Drone Systems.

Read the full story.

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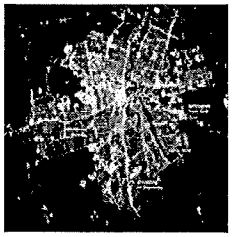


Winnipeg at Night

TECH & COMM > DRONES

Fire Technology: Hazmat Response—Drones Are a Necessity

Charles Werner explains how flying drones at a hazmat incident provides information that might not be otherwise available quickly, if at all.

Charles Werner

Dec. 1, 2020

A drone that is equipped with a thermal imaging camera can see the liquid levels in hazmat containers.

View Image Gallery

LATEST IN DRONES

nes

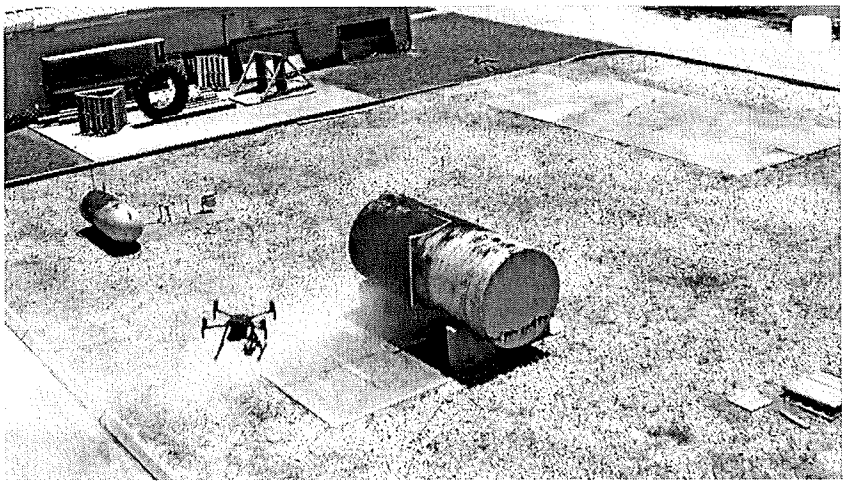
Hazmat incidents are among the most dangerous and most challenging responses for public safety agencies. These incidents often involve a number of unknowns, including but not limited to substance involved (chemical, biological, radioactive, nuclear, explosives), cause of the problem, and the environmental dangers to people and responders. Hazmat responses usually require fully encapsulated protective suits that have SCBA and call upon firefighters to enter an unknown and potentially dangerous environment. These operations usually can't be monitored visually, and communication is limited to verbal radio communications. Additionally, if a tool is needed during the operation, it requires one of the technicians to go to the "Warm Zone" to get it or to have another technician bring it to the site, which increases the overall time to mitigate the incident. (Equipment that's identified as needed can be pre-loaded.) Also keep in mind that when the hazmat mitigation process is underway, the facility and nearby roads might be required to be shut down for hours or, sometimes, days.

Drones make a significant difference, such that mitigation might be improved dramatically, which enhances safety and reduces time, which allows roads and facilities to be re-opened more quickly.

Game changer

Upon arrival, a drone can be launched within minutes to provide aerial reconnaissance and remote hazmat monitoring/identification of an environment that is immediately dangerous to life and health. This combines with the capability to: quickly identify injured persons; determine exposure issues; and even determine the problem (leaking/ruptured tank, broken valve, fire/flame impingement, structural integrity, direction of spill flow, etc.). The latter provides invaluable information regarding the dangers to personnel and the identification of the proper protective suits and tools that are required, to more effectively mitigate the incident.

All of this can be done while operations and decontamination are being established while keeping firefighters out of harm's way unnecessarily.



A drone that is equipped with a thermal imaging camera can see the liquid levels in hazmat containers.

Drones that are equipped with thermal imaging cameras can identify heat signatures, which can

show existing ignition sources and display liquid levels in hazmat containers. They also can: visualize an otherwise invisible dangerous vapor cloud or plume; see the effect of flame impingement on a tank, which could lead to a catastrophic boiling liquid expanding vapor explosion; and see heat signatures of responders and injured persons at night or in situations in which smoke might obscure vision.

A drone can be used to observe the effectiveness of suppression operations and to direct the application of extinguishing agents more effectively via both visual optics and thermal imagery. This information can help to identify conditions that require evacuation of people who are or could be in danger.

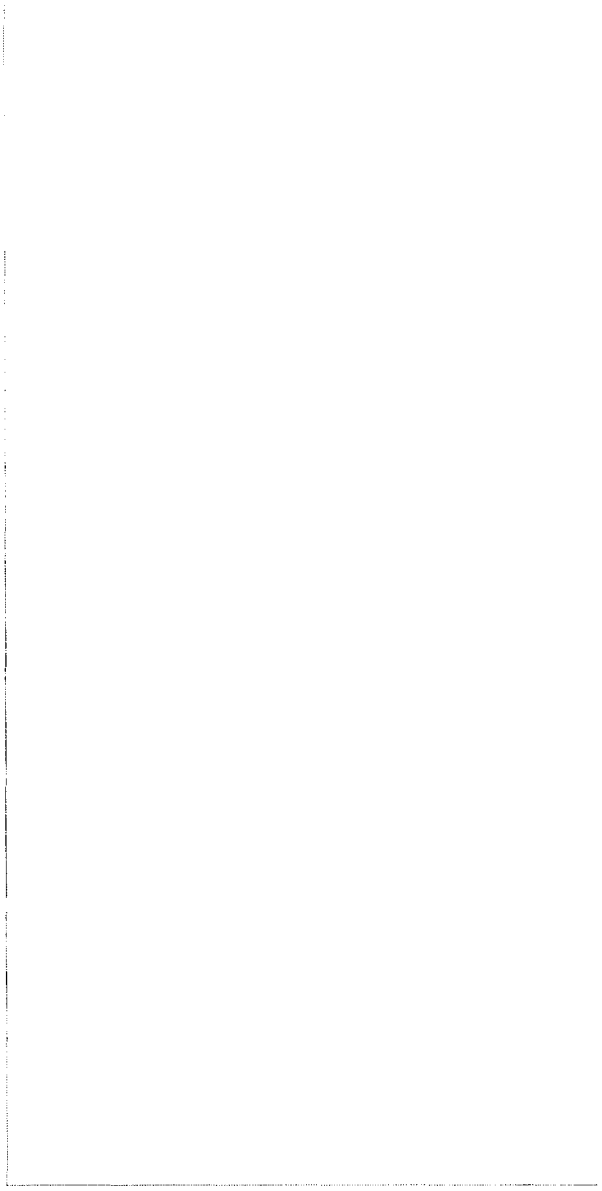
Hazmat spills can be monitored as to their direction of travel and sheen on the water as well as in regard to the effectiveness of containment efforts.

Use of a drone for overwatch can alert personnel to potentially changing and dangerous conditions that might escape the awareness of hazmat technicians. Video streaming can be provided (on scene or wherever necessary) for real-time situational awareness.

A drone that's equipped with a speaker can be utilized for additional warning, which might be critical should traditional radio communications be ineffective.

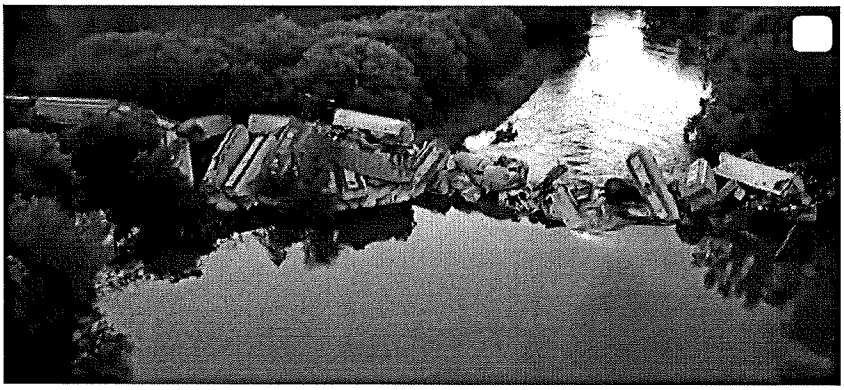
A hazmat-monitor-equipped drone can be landed and serve—rotors turned off—as a "perched" remote hazmat sensor for hours. A drone can deliver a needed tool nearby to the operation. With an add-on light, it can help to illuminate a dark area whether during day or night operations.

Visual imagery can be captured and be converted into a 3-D model to evaluate later. The same imagery can provide damage assessments, which might be shared with the media and the community as appropriate.



Train derailments often occur in remote rural areas. A drone can be launched quickly to see the magnitude of the derailment and the number of cars that are involved. A drone can be used to determine whether there is fire, whether hazmat cars are present/involved and whether there is a spill or release. Placards can be read, and nearby exposures (people, homes, schools, etc.) can be identified. For transportation accidents, a drone

can fly over and around the incident to read placards and even to see into an open box trailer.



A rural location of train derailments serves as an optimal reason for first responders' use of a drone. If not for a drone, hours might have to be invested in determining the magnitude of the derailment, whether hazmat cars are involved and, if so, whether a spill or release occurred, among other factors.

A department to emulate

Southern Manatee, FL, Fire and Rescue (SMFR) is the pioneer and leader in the use of drones for hazmat response. For example, during a difficult sulfur fire (hot, toxic and obstructed view) and an anhydrous ammonia leak (extremely volatile and toxic), SMFR used a drone to provide initial situational assessment via a full 360-degree overhead view of the area. In such circumstances, the critical assessment that can be made can ensure that the situation is safe enough for firefighters to enter, to pinpoint the specific problem and to identify plumes or other existing conditions that will affect the firefighters.

During the sulfur fire (which was their a-ha moment on hazmat drones), SMFR was able to identify hot spots with a drone that otherwise

APPENDIX G

BY ALAN M. PETRILLO

Drones continue to make their way onto fire apparatus for deployment at incident scenes. Fire departments are using drones, also known as unmanned aerial vehicles (UAVs), for recon of wildfires and motor vehicle accident scenes, hazmat incidents, hot spot identification at structure fires, and even in rescue scenarios.

ADVANTAGES OF DRONES

Rod Carringer, former chief of the Center Township (IN) Fire Department, says, "With the demands on limited staffing so many agencies deal with, any asset such as a drone that can be used to provide real-time situational and operational awareness is equipment that should be integrated into operations. As the United States Marines are learning as they are reconfiguring their basic squad size and function to integrate a drone system, maximizing technology to do our job better and safer is the new normal."

Carringer points out that besides the recon function and hot spot identification, additional uses for drones include search and rescue, even in urban settings; preplanning with aerial photos and video identifying water supply sources, utility shutoffs, and apparatus location planning; winter and ice rescue; and disaster assessment and post-disaster recon after weather events such as floods or tornados.

FDNY EXPERIENCE

The Fire Department of New York (FDNY) has been deploying tethered drones at incident scenes since March 2017, says John Hodgens, deputy assistant chief of operations. "We primarily fly HoverFly tethered drones that carry both video and infrared cameras, and their greatest feature is allowing us to see where a fire is traveling in a roof space," Hodgens says.

"We have three HoverFly drones and recently got a nontethered DJI Phantom that gives us a better capability for hazardous materials incidents and search and rescue. We also plan on getting a DJI Matrice 210," Hodgens says. "We had a situation during Hurricane Sandy where people were on the roofs of their homes. With a Phantom or a Matrice 210, we could

1 The FDNY has flown HoverFly tethered drones at fires and emergency incidents since the spring of 2017. *(Photos 1-3 courtesy of the FDNY.)*

"Our pilots try to give the incident commander (IC) a view of the building that the IC cannot see—the rear of the building or the roof level," he says. "The drone is able to assess fire travel, structural issues like cracks in a building or danger of collapse, and roof operations to determine if anything is unsafe and needs corrective action. We all are concerned with firefighter safety and getting a better view of an incident, and drones are great tools to use to your best advantage."

MILLSTONE VALLEY (NJ) FIRE DEPARTMENT EXPERIENCE

Stephen Stashek, unmanned aerial systems (UAS) program coordinator for the Millstone Valley (NJ) Fire Department in Franklin Township Fire District No. 1, says his department uses DJI drones, including the Phantom 3, Phantom 4, Inspire 1, Mavic, and Matrice 210 models. Stashek says that his district covers a lot of woods and hiking trail areas. "We have an off-road search and rescue team that uses Polaris Ranger utility terrain vehicles and a

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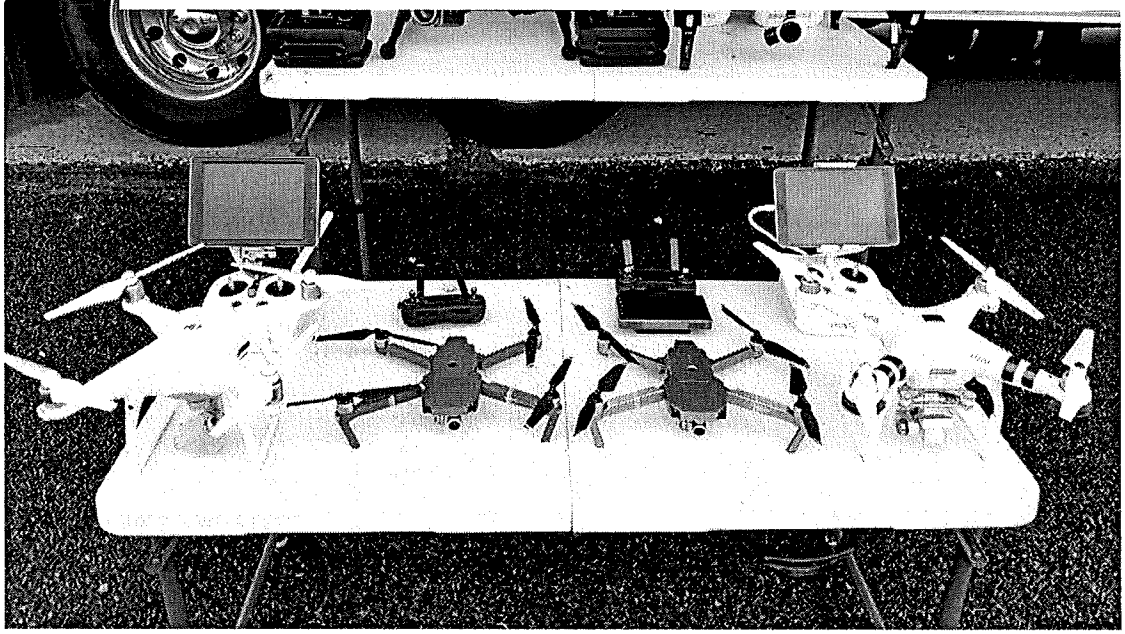
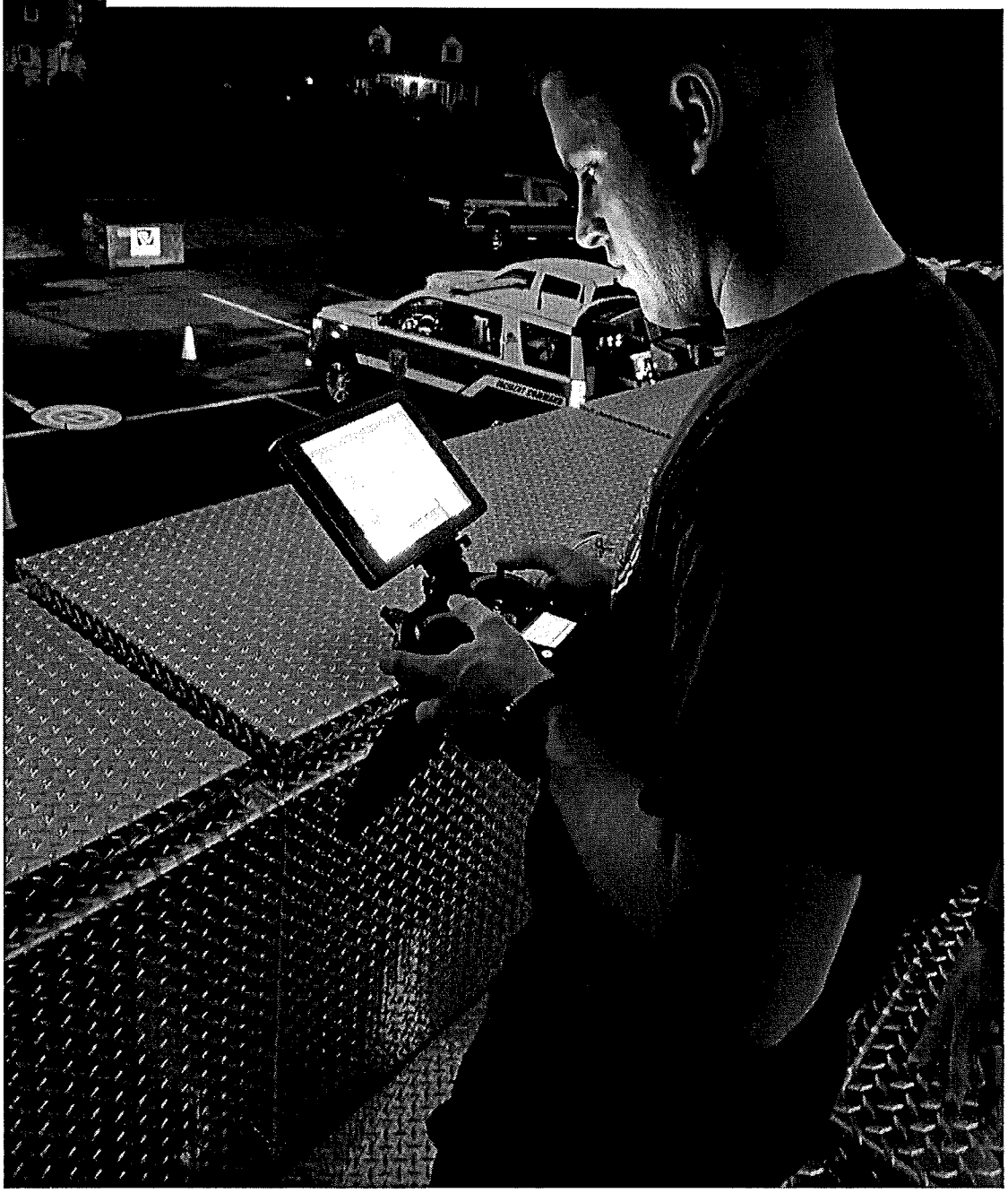


4 The Millstone Valley (NJ) Fire Department uses a number of DJI drones, including the Phantom 3, Phantom 4, Inspire 1, Mavic, and Matrice 210 models. *(Photos 4-5 courtesy of the Millstone Valley Fire Department.)*

STARTING A DRONE PROGRAM

Departments considering starting a drone program should do an assessment of how they want to use a drone, Carringer says. "First, I would offer that to properly implement a drone strategy in a fire department, you should really have folks who are licensed to the FAA Part 107 certification," he says. "Next, they should assess what they want to use a drone for, create operational guidelines, and take training and maintenance of equipment as seriously as if it were a self-contained breathing apparatus."



5 A Millstone Valley firefighter controls one of the department's drones during a night operation.

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Peter Darley, Darley's chief operating officer, says that "using drones makes a dangerous job less dangerous by giving firefighters and incident commanders better situational awareness. But, a department needs all the guidelines, protocol, and standards in place to implement a drone program, which all takes time. However, I think in a few years most fire departments will use drones because they are such viable, multipurpose tools."

Matt Sloane, founder and chief executive officer of Skyfire Consulting, says his company helps fire departments identify their drone needs and can put together an entire program for them. "We currently are working with fire departments in Orlando, Florida; Los Angeles City, California; Houston, Texas; and Miami-Dade County, Florida; as well as smaller departments in Iowa and Indiana," Sloane says. "These departments have varied needs, but typically drones can be used for everything, from fire surveillance, identifying hot spots and giving 360-degree views, search and rescue, hazardous materials recon, and fire scene and motor vehicle accident reconstruction."

DJI UAVs

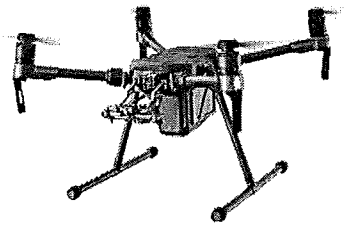
Romeo Durscher, director of public safety integration for DJI, says that a main advantage to using a drone "is it can be sent to the other side or top of a building to give a view where the commander might not have access. Or, the drone could be set up 10 to 20 floors to get eyes on a scene up there."

Durscher says DJI's Matrice platform has become a favorite with fire departments because the drone can be customized with sensors and payloads. "We can have a second-generation thermal camera and a visible light camera side by side," he says. "This is the Zenmuse XT2 camera we developed in partnership with FLIR. It has the option of regular view, infrared, side by side, picture in a picture, or thermal image overlay on top of the visible light image."

6 The Zenmuse XT2 camera carried by a DJI drone can show both regular view and infrared images at the same time. *(Photos* 6 and 7 *courtesy of DJI.)*

INSTANTEYE ROBOTICS DRONES

InstantEye Robotics introduced its GEN5 UAV 8.8-ounce unit, a nano drone that carries an integrated infrared and electro/optical camera, according to Chris Pickett, customer relations manager. "It's small enough that it can go from outdoors to indoors, giving added capability to fire departments," Pickett points out. "It uses stabilization that doesn't require GPS, has a 15- to 20-minute flight time, a one-hand controller, and a tablet for video display."



Lockheed Martin builds the Indago line of vertical takeoff unmanned aerial systems, according to Michael D. Carlson, Indago program manager. "These are small units weighing 4.4 pounds that have been used by the Bureau of Alcohol, Tobacco, Firearms, and Explosives in investigating arson fires and also by others, especially law enforcement, for search and rescue," Carlson points out. "For search and rescue, we partner with Project Lifesaver International, where we integrated an antenna on Indago that can find an individual wearing a beacon similar to a FitBit. The signal gets stronger when it gets closer to the beacon and can vector the searchers in to the lost person."

Carlson says Lockheed Martin has three main payloads for Indago: a Duo Plus electro-optical daytime sensor and an infrared thermal sensor that can be switched on the fly; an Ion 30X high resolution daytime-only camera that can read a license plate from 1,000 feet high; and the Noctis high-resolution thermal infrared imager that can display in white-hot, black-hot, or the Ironbow display from FLIR, an orange/purple color scheme. Carlson says that the Indago 2 has a data line range of two to three kilometers, while Indago 3 has a data link range of 10 to 12 kilometers.

APPENDIX H

DroneDJ

Drone reveals trouble brewing in 'harmless' drum during Florida hazmat scare

Ishveena Singh - Aug. 23rd 2021 8:44 am PT @IshveenaSingh

FIRST RESPONDERS THERMAL

Comments

Residents and businesses in the 4000 block of Louis Avenue in Holiday, Florida, knew things were serious when Pasco County Fire Rescue issued evacuation orders last week. But just "how serious" is something that even first responders didn't fully understand until they had a thermal drone up in the air to monitor what was initially considered a "small fire?"

The hazmat incident occurred on the afternoon of August 19. Pasco County Fire Rescue's Engine 12 arrived on the scene and found a 55-gallon barrel of sodium hydrosulfite that was causing a toxic cloud of smoke to blow across the street. While extinguishing a small fire coming from the drum, firefighters created a 500-feet safety zone and evacuated nearby homes and businesses.

In powder form, sodium hydrosulfite is hazardous to handle. But mix the powder with water, and the chemical becomes even more volatile. With this in mind, when firefighters from Pasco County Fire Rescue performed further reconnaissance, they suspected a violent chemical reaction was taking place inside the barrel containing the substance.

Also read: Can drones prevent drownings at Lake Michigan, the deadliest Great Lake?

It was then that they launched a thermal drone to check the temperature of the barrel containing the chemical. Drone data told them that the barrel was stable but holding high heat. Local hazmat and environmental cleanup crews were called to the scene, and they were able to remove the barrel from the business around 2 a.m.

Drones makes the invisible visible with thermal sensors

The video below shows a side-by-side comparison of the thermal images and the visual images the drone took. Note that objects appear whiter as they get hotter in the thermal image. The team from Pasco County Fire Rescue highlights in their report:

> The barrel appears harmless in the visual image, but under the thermal image, the chemical reaction of the sodium hydrosulfite is clearly visible. Hazmat crews took great care to keep the chemical stable until cleanup crews could arrive. We are thankful that everyone in the surrounding residents and businesses evacuated quickly and that no one was hurt.

Hazmat drones are a gamechanger

As any first responder would tell you, drones are amazing and useful tools in emergency situations. Having a drone in the air is very different from looking at something with binoculars from a distance. Moreover, with thermal drones, firefighters get an unprecedented level of situational awareness, with the biggest advantage being that no person needs to be put in harm's way.

Read more: Houston firm launches autonomous drone platform for 911 calls

FTC: DroneDJ is reader supported, we may earn income on affiliate links

Become a Drone Pilot

In order to fly your drone under the FAA's Small UAS Rule (Part 107), you must obtain a Remote Pilot Certificate from the FAA. This certificate demonstrates that you understand the regulations, operating requirements, and procedures for safely flying drones.

Are you a first time pilot or an existing Part 61 Certificate holder?

Do you need to keep your Remote Pilot Certificate current?

First-Time Pilots

Eligibility

To become a pilot you must:

- Be at least 16 years old
- Be able to read, speak, write, and understand English
- Be in a physical and mental condition to safely fly a drone
- Pass the initial aeronautical knowledge exam: "Unmanned Aircraft General – Small (UAG)"

Requirements for Remote Pilot Certificate:

- Must be easily accessible by the remote pilot during all UAS operations
- Certificate holders must complete an online recurrent training every 24 calendar months to maintain aeronautical knowledge recency

Navigating the Process to Become a Drone Pilot:

Step 1: Obtain an FAA Tracking Number (FTN) by creating an Integrated Airman Certification and Rating Application (IACRA) profile prior to registering for a knowledge test.

Step 2: Schedule an appointment with a FAA-approved Knowledge Testing Center. Be sure to bring a government-issued photo ID to your test.

Step 3: Pass the initial aeronautical knowledge test: "Unmanned Aircraft General – Small (UAG)". Knowledge test topic areas include:

- Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation
- Airspace classification and operating requirements, and flight restrictions affecting small unmanned aircraft operation
- Aviation weather sources and effects of weather on small unmanned aircraft performance
- Small unmanned aircraft loading and performance

- Emergency procedures
- Crew resource management
- Radio communication procedures
- Determining the performance of small unmanned aircraft
- Physiological effects of drugs and alcohol
- Aeronautical decision-making and judgment
- Airport operations
- Maintenance and preflight inspection procedures
- Operation at night

Step 4: Complete FAA Form 8710-13 for a remote pilot certificate (FAA Airman Certificate and/or Rating Application) using the electronic FAA Integrated Airman Certificate and/or Rating Application system (IACRA)*

1. Login with username and password
2. Click on "Start New Application" and 1) Application Type "Pilot", 2) Certifications "Remote Pilot", 3) Other Path Information, 4) Start Application
3. Follow application prompts
4. When prompted, enter the 17-digit Knowledge Test Exam ID (Note: it may take up to 48 hours from the test date for the knowledge test to appear in IACRA)
5. Sign the application electronically and submit for processing.

Step 5: A confirmation email will be sent when an applicant has completed the TSA security background check. This email will provide instructions for printing a copy of the temporary remote pilot certificate from IACRA.

Step 6: A permanent remote pilot certificate will be sent via mail once all other FAA-internal processing is complete.

Step 7: Have your Remote Pilot Certificate available whenever you fly your UAS.

Existing Part 61 Certificate Holders

Eligibility:

- Must hold a pilot certificate issued under 14 CFR part 61
- Must have completed a flight review within the previous 24 months

Requirements for Remote Pilot Certificate:

- Must be easily accessible by the remote pilot during all UAS operations
- Certificate holders must complete an online recurrent training every 24 calendar months to maintain aeronautical knowledge recency

Navigating the Process to Become a Drone Pilot:

Step 1: Create an account, or log into your existing account, on the FAA Safety Team (FAASTeam) website.

Step 2: Complete the Part 107 Small UAS Initial (ALC-451) online training course. The course will cover these topic areas:

- Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation
- Effects of weather on small unmanned aircraft performance
- Small unmanned aircraft loading and performance
- Emergency procedures
- Crew resource management
- Determining the performance of small unmanned aircraft
- Maintenance and preflight inspection procedures
- Operation at night

Step 3: Create an account, or log into your existing account, in IACRA.

Step 4: Complete Form 8710-13 for a remote pilot certificate (FAA Airman Certificate and/or Rating Application) in IACRA.

1. Login with username and password
2. Click on "Start New Application" and 1) Application Type "Pilot", 2) Certifications "Remote Pilot", 3) Other Path Information, 4) Start Application
3. Follow application prompts
4. Sign the application electronically and submit for processing.

Step 5: Make an appointment with one of the following entities to validate your identity. Bring your completed Form 8710-13, proof of your current flight review, photo ID, and your online course completion certificate.

- At an FAA Flight Standards District Office (FSDO)
- With an FAA-designated pilot examiner (DPE)
- An airman certification representative (ACR)
- An FAA-certificated flight instructor (CFI)*

Please note: * CFIs cannot issue temporary certificates. They can process applications for applicants who do not want a temporary certificate.

Step 6: The representative will sign your application and issue you a temporary airman certificate.

- You'll receive your permanent certificate via U.S. mail within several weeks.

Step 7: Have your Remote Pilot Certificate available whenever you fly your UAS.

Keep Your Remote Pilot Certificate Current

It is important for all pilots, including Certified Remote Pilots, to keep their aviation knowledge up to date. If you have a Remote Pilot Certificate, you are required to have completed one of the following online training courses within the previous 24 calendar months to operate UAS under part 107:

Anyone who holds a part 107 remote pilot certificate (regardless of aeronautical knowledge recency):

- Complete the Part 107 Small UAS Recurrent (ALC-677) online training course (no cost)

Part 107 remote pilots who **are also** certificated with a current flight review under part 61:

- Complete the Part 107 Small UAS Recurrent (ALC-515) online training course (no cost)

You can read the Remote Pilot –Small Unmanned Aircraft Systems Airman Certification Standards (PDF).

Last updated: Monday, June 6, 2022

USA.gov

Web Policies and Notices

Web Standards

NFPA.org

APPENDIX J

NATIONAL FIRE PROTECTION ASSOCIATION
The leading information and knowledge resource on fire, electrical and related hazards

NEWS & RESEARCH

NFPA releases Drone Knowledgebase and encourages U.S. fire departments to provide local insights to help inform best practices

December 2, 2021 – The National Fire Protection Association (NFPA) has created a Drone Knowledgebase to help more than 29,000 fire departments in the United States improve existing public safety drone programs or to establish new drone initiatives.

Drones have become a key instrument for public safety efforts in recent years with first responders increasingly deploying aerial technology to achieve greater situational awareness during structural fires, wildfires, natural disasters, rescue efforts, and large public gatherings. However, many U.S. fire departments find themselves without the proper information, knowledge, and experience needed to establish, administer, operate, and maintain a cohesive public safety drone program.

To help with this issue, NFPA has developed a Drone Knowledgebase as part of the Association's broader public safety drone educational program. The interactive public safety tool was created with information-sharing and collaboration in mind so that U.S. public safety entities are apprised of what other fire departments across the nation are doing in terms of drone technology, staffing, and processes as they look to establish or revisit departmental drone programs.

U.S. fire departments are encouraged to contribute to the NFPA Drone Knowledgebase so that the tool provides the greatest value to all users. As with another popular NFPA crowd-sharing tool, Codefinder™, the Drone Knowledgebase is only as strong as the information received from stakeholders. The new response resource is expected to become more robust as fire departments learn about the resource, contribute local information, and invite neighboring jurisdictions to add their program details.

The NFPA Drone Knowledgebase was made possible by a FEMA Fire Prevention and Safety Grant that also paved the way for new online drone training from NFPA. The training, which was released in September, was designed to help fire service administrators and operators create, manage, and maintain drone programs that are in sync with proper public safety protocols.

NFPA has established a dedicated landing page, nfpa.org/drones, so that members of the fire service can access the 4-hour training, NFPA 2400, *Standard for Small Unmanned Aircraft Systems (sUAS) Used for Public Safety Operations*, a training teaser video, research, related content, and the Knowledgebase in one convenient location.

For this release and other announcements about NFPA initiatives, research, and resources, please visit the NFPA press room.

NFPA: 125 Years of Protecting People and Property

Receive expert instruction in the administration and operation of a public safety drone program in support of modern fire department challenges. Introducing NFPA® Public Safety Drone Guide Online Training, free for members of the US fire service!

The use of unmanned aircraft systems (UAS), also known as drones, in firefighting operations is on the rise. However, public safety drone users are often operating with a lack of general knowledge, planning, and education that can result in accidents, injuries, life-saving operations delays, interference with other aircraft, and exposure to liability.

To assist you in navigating this rapidly evolving landscape, NFPA has custom-built a web-based training curriculum offering instruction and best practices for the proper administration, operation, and maintenance of a public safety drone program. Based on NFPA 2400, *Standard for Small Unmanned Aircraft Systems (sUAS) Used for Public Safety Operations,* the course is a must-have for anyone responsible for drone programs that support the following:

- Structural and wildland firefighting
- Search and rescue missions
- Hazardous material responses
- Natural disasters
- Active shooter/hostile event response (ASHER)
- Other events where public safety operations would benefit from increased situational awareness

This all-new NFPA online training offers valuable instruction for all levels of fire service personnel in an innovative online format that lets you work at your own pace and convenience.

Fire departments in the US endeavoring to add drones to their arsenal of tools must be up to date on guidance, information, and training on this emerging technology. This includes the need to understand and conform to the Federal Aviation Administration's (FAA) Requirements (part 107, 91), NFPA 2400, and the *Code of Federal Regulations — Aeronautics and Space* (Title 14 CFR).

Whether your department is looking to launch a UAS program or wants to take your existing one to a higher level, NFPA Public Safety Drone Guide Online Training provides the information and guidance you require. The intuitive web-based and mobile-friendly interface makes it possible to access state-of-the-art instruction at the time and place of your choosing.

Features and benefits include:

- 360-degree video and interactive menu navigation
- Immersive virtual reality tools, including 3D simulations and gamified content that provide a full suite of educational experiences
- Option to view the 3D simulation via mobile VR headset
- Badge Challenges to confirm your knowledge as you complete course modules
- Desktop and mobile device optimized user interface
- "Lite" version of the interactive elements available if dealing with reduced internet bandwidth
- Action planner allowing you to document answers to key questions as you progress through the course and then download and print it as a PDF once completed

NFPA Public Safety Drone Guide Online Training offers direction, practices, and procedures valuable to fire department decision makers, policymakers, and those responsible for managing a UAS program.

This three-hour learning module is designed to provide fire departments and personnel who have drones and the know how to operate them with the knowledge to build a comprehensive program that helps optimize safety and effectiveness. The course is divided into two primary sections, one focusing on program administration and the second on operations.

After completing the Administration section of the training, you should be able to:

- Evaluate the need for a public safety drone program.
- Identify the missions and platform that will best serve their institution's goals, needs, and operational objectives.
- Establish policies and procedures for a drone program consistent with applicable regulations, standards, laws, ordinances, etc.
- Establish policies and procedures for system care and maintenance.

After completing the Operations section of the training, you should be able to:

- Identify the components of an operation framework, including defining needs, assessing risk, preparing for operations, running operations, and performing post-flight responsibilities.
- Identify pre-flight, flight, and post-flight considerations, including pre-flight inspections, line of sight, atmospheric conditions, landing protocols, and data acquisition.

Sign up for this ground-breaking training on unmanned aircraft systems for public safety operations developed specifically for the fire service by NFPA.

With proper training and guidance on establishing a compliant drone program, your department can help to reduce the liability aspects of fire service drone usage. Take the opportunity to help give your department an operational advantage and put your program on the cutting edge by registering for NFPA Public Safety Drone Guide Online Training.

Who Will Benefit:
Responders looking to establish a public safety drone program or enhance an existing one.

NFPA Public Safety Drone Program

Specifications for Online Training

Also in Training & Certification

Free Catalog Customer Service Payment Policy Privacy Policy Terms of Use Customer Support

Contact Us: Call Toll-Free 1-800-344-3555
Customer Contact Center: 11 Tracy Drive, Avon, MA 02322
Headquarters: 1 Batterymarch Park, Quincy, MA 02169
Canadian Customers | International Customers

COMMUNITY RISK > COMMUNITY RISK REDUCTION

FEMA Grant Helps NFPA Push Public Drone Safety

The NFPA has received nearly $1 million dollars from FEMA to develop a free public safety drone compliance program that includes educational training.

Oct. 28, 2019

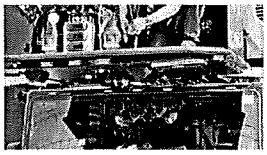
Related To: National Fire Protection Association

LATEST IN COMMUNITY RISK REDUCTION

Leadership

Serve the Work

Kris Blume June 17, 2022



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ne 4, 2022

Community Risk Reduction

Woman Used Sign Langua...

May 16, 2022

The National Fire Protection Association (NFPA), has received just shy of a million dollars in Fire Prevention and Safety Grant money from FEMA to develop a free public safety drone compliance program that includes educational training and a searchable knowledgebase that tracks fire service drone programs and usage.

Fire departments have rapidly expanded the use of drones as more communities have realized the lifesaving impact that aerial technology can have in response to structural fires, wildland firefighting, search and rescue efforts, hazardous material responses, natural disaster efforts, and any other events that would benefit from increased situational awareness.

Although drone safety policies and standards continue to evolve, many U.S. fire departments are without the proper information, knowledge, and experience needed to establish and maintain a legally sound public safety program that is compliant with FAA regulations, and the standards produced by ASTM International, National Institute of Standards and Technology (NIST) and NFPA. Without proper understanding of how to integrate drones into public safety efforts, fire departments may deploy unmanned aerial devices inaccurately; may inappropriately gather information during an incident; and may interfere with manned and unmanned flight operations in the area. All these missteps needlessly expose fire departments to liability.

The NFPA drone project will generate the guidance, learnings, and best practices that U.S. fire departments need to establish a compliant, successful drone program by:

1. assessing the current level of understanding, policies, and standards on public safety drone usage;
2. developing a drone program framework, including resources, education, and an accessible portal which allows departments to comply with current regulations and standards;
3. tracking fire service drone programs and their relevant use cases; and

4. freely disseminating essential information and training so that departments can establish regionally and nationally compliant public safety drone programs.

The new initiative will follow the successful NFPA Emerging Technologies training development and dissemination model that has been in effect since 2010.

1. The Fire Protection Research Foundation, the research affiliate of NFPA, will begin by performing a literature review of the fire service drone landscape and collecting compliance and usage data.
2. NFPA will then collaborate with subject matter experts at the Center of Excellence for Advanced Technology Aerial Firefighting at the State of Colorado, Department of Fire Services to conduct a comprehensive review of the latest public safety drone usage research, testing, regulations, policy, and training content.
3. The Research Foundation will convene a technical advisory panel consisting of fire authorities, standards developers, public safety officials, emergency managers, researchers, regulators, and government leaders to advise on the project's scope, messaging, curriculum, and deliverables.
4. The NFPA data and analytics team will synthesize the collected information to support

curriculum development efforts and populate the portal.

5. The Research Foundation will host a public safety drone workshop for interested stakeholders and findings will be distributed.
6. Public safety drone subject matter experts and curriculum developers will build a self-paced, interactive online training program, educational videos, and immersive augmented virtual reality tools as part of a full educational suite. The curriculum will cover proper administration, operation, safety, and maintenance of public safety drone deployment.
7. All materials, research, and information collected as part of this project will be available for free to U.S. firefighters on the NFPA website.
8. The NFPA data team will build a freely accessible online repository for all information captured, and host all deliverables on a dedicated, interactive, searchable web portal so that departments can upload and search drone action incident reports.

"As we have seen with NFPA alternative fuel vehicle and energy storage system training, the fire service is eager to learn about emerging technologies that may present new hazards, or in this case, help to mitigate and monitor safety challenges," said Christian Dubay, P.E., NFPA vice president and chief engineer. "The new educational resources and

portal will help fire departments across the country confidently establish and maintain public safety drone programs."

In 2018, NFPA released NFPA 2400 *Standard for Small Unmanned Aerial Systems* to help the fire service address organizational deployment, professional qualifications, system selection, as well as care and maintenance for public safety drone programs. The new NFPA drone research project will begin in fall 2019, with deliverables expected to be completed by September 2021.

About the Fire Protection Research Foundation

The Fire Protection Research Foundation plans, manages, and communicates research on a broad range of fire safety issues in support of the NFPA mission. The Research Foundation is an affiliate of NFPA.

APPENDIX L

Managing Unmanned Aerial Systems in Emergency Response – Railroad Operations Powered by DroneDeploy (MUASER-RO)

COURSE DURATION: 4 DAYS, 32 HOURS

PRICE: $1,500 AAR MEMBERS & GUEST / $2,000 GENERAL PUBLIC

Course Currently Unavailable – Coming 2023

Recommended Prerequisites –
- General knowledge of railroad operations and equipment
- Current Part 107 Remote Pilot Certificate; or
- Be an authorized pilot under an agency COA

Required Prerequisites – In order to operate UAS at SERTC, participants must possess a current Part 107 Remote Pilot Certificate or be an authorized pilot under an agency COA. The course will be taught from a "train like you fight" perspective and will give you the experience needed to operate your UAS platform during railroad operations. Participation is allowed without a pilot certificate but will be limited to non-PIC activities such as camera operation, data processing, and classroom sessions.

Equipment Requirements – Participants should bring their own drones in order to learn how to properly utilize their platforms in railroad operations. Attendance is welcome without equipment or a pilot certificate, although some of the data collection tasks will be limited by the equipment on hand. Access to the DroneDeploy software will be provided at no cost for the duration of the course. All Pilots operating their own equipment must have personal UAS Liability Insurance in the amount of $1M, and is required to be in effect for the entire duration of the class. Insurance may be provided through an on-demand provider such as Verifly.

Course Description – Participants will learn how to utilize drone technology to increase efficiency and safety during railroad operations and emergency response. This course will give participants the knowledge necessary to utilize their equipment and the DroneDeploy platform during both emergency response (derailments) and for day-to-day operations such as track and bridge inspections. Operational track, crossings, infrastructure, and real derailments will be used throughout the course. It will be taught by a combination of SERTC and DroneDeploy instructors to ensure that you have access to the real-world experience offered by each.

Course Objectives – Upon completion of the course, participants will have completed the classroom and field instruction necessary to utilize the DroneDeploy software during both railroad emergencies and for day-to-day operations.

Target Audience – Railroad employees, railroad contractors, and other organizations that wish to learn how to utilize drones in their operation.

Lawson, Mike R.

APPENDIX M

From: Self, Kurt <KSelf@PugetSoundFire.org>
Sent: Wednesday, June 8, 2022 11:41 AM
To: Carson, Brian; Graziani, Jon; Brown, Ernie; BBigger@RentonRFA.org; Lawson, Mike R.; 'Jeff Hendrickx'; Chambers, Beau; Case, Brian; Rock, Rich; Hardman, Daniel; Self, Kurt; Richardson, Alex; Bonilla, Giovanni; Renn, Adam; Cox, Patrick
Cc: Reher, Tyler; Catlin, J. Monte; Jones, Jennifer; James, Garrett; Seery, Mike; Kuske, Tyler; Butler, Ryan; Scarduzio, Meade; Morrow, James; Vanderhalf, Jacob; Fox, Jason; Dean, Zachary; Schoonhoven, Brian; Hudson, Elias; Tonda, Robert; deMestre, Cameron; Merrell, Gary; Hayward, Andrew; Frazier, David; Phillips, Brandon; Kelley, Gregory; Rawson, Caleb; Maybee, Coleman; Frank, Andrew
Subject: BNSF Railway Drill
Attachments: Hazmat zone 3 BNSF Drill Summary.docx; Learning outside about railcars.jpg; Rail top learning.jpg; Decon.jpg; Classroom portion.jpg; Lifting strongback.jpg; Crew making entry.jpg; Crew getting ready to stop leak 2.jpg; Preincident saefty meeting.jpg; Crew on top of railcar.jpg; Crew getting ready to stop leak.jpg; Crew in MT94 working on tank.jpg; Drill safety briefing.jpg

Hey Guys,

Attached is the the zone hazmat drill summary for last weeks drill at the Auburn Railyard as well as some pictures.

Chief Cox and Graziani thank you for working so hard to get the rescue down there for a couple days. It really made the drill more realistic having an ops team arriving first to the scenario part of the drill. Hopefully your teams got something out of it that will help out if they every have a railway incident.

Brett, Mike and Jeff please forward the summary to your crews.

And once again as always I just wanted to say special thanks to you all and your crews for the

Thanks again.....Kurt

Kurt Self, *76A Hazmat Station Captain*
Puget Sound Regional Fire Authority | Operations
20676 72nd Ave S
Kent, Wash 98032
Main Phone Number 253-856-4376
Direct Phone Number 253-677-2743

Hazmat zone 3 BNSF Drill Summary

1.The drill

The Zone 3 hazmat drill that took place May 31st thru June 3rd was a 2-part drill. Drill took place at the Auburn BNSF rail yard located at 1399 A St SE, Auburn, Washington. With a total of 53 students from different agencies thru out zone 3 participating.

First part was a railroad safety and hazmat best practices on railcar emergencies taught by BNSF personnel (Kent Farquhar) as well has zone 3 hazmat personnel (Kurt Self). This was taught inside the classroom using a PowerPoint slide show as well as handouts and outside using a training railcar as a prop to show the different parts of railcars we might need to address during a railcar incident. Classroom and outside show time was approximately 90 minutes in length.

The second part of the drill was a scenario involving the training rail car that had both a victim as well as a chlorine leak on the railcar. Crews were tasked with a rescue/recon element in the first part for the first arriving teams and a plugging and patching element in a level A assembly involving all crews as the second part.

For a summary of the rescue/recon portion all 4 days all crews were able to identify a line-of-sight viable victim within minutes of the first arriving unit and crews were able to get said victim out of the hot zone into a safe cold zone with a gross decon with the fastest occurring within 3 minutes of arrival longest 7 minutes upon arrival. With these crews able to also identify that we had a chlorine leak as well and to start a zone 3 major hazmat leak response.

For the summary of second part of the drill involved crews stopping a chlorine leak onto of a railcar. Crews were tasked with identifying the hazards involving a chlorine leak, research the proper PPE, meters, and equipment to stop the leak. And then execute the plan to stop the leak with drill ending when the leak was stopped at the valve itself. With teams able to stop the leak anywhere from 45 minutes to 1 hour and 4 minutes.

2. Lessons learned and best practices

Some of the lessons learned and best practices that we identified in the 4 days are as follows.

A) First dispatched hazmat unit identify the hazmat play call early and announce over responding fire frequency. And if information makes unit feel response should be ungraded. Upgrade early to get a full zone hazmat response.
B) First arriving unit be prepared to affect rescue. This means full bunkers, SCBA and if a hazmat unit have meters running and bear claws ready to attach to personnel entering the hot zone to rescue victims. With one member of unit staying outside in cold zone as a safety person in full bunkers and SCBA.
C) Set up emergency decon with first arriving engine.
D) Isolate 360 with an ops team and 1 tech with a meter ASAP.
E) For large isolation zones consider shelter in place with people effected told to stay inside shut off HVAC and if gases and or fumes are heavier than air stay out of low areas in house and/or businesses. Use reverse 911 to call these folks and PD to shut down roads.
F) Enroute or as soon as we know the chemical, techs should be generating a plume model in FIRST or WISER and emailing to IC and HMGS. FIRST allows EM to import the maps into most reverse 911 programs.
G) First arriving ops officer take IC and first arriving hazmat officer take hazmat group.
H) If hazmat group have IC assign arriving hazmat teams directly to you and hazmat group will assign those units specific tasks. Using the preplanned hazmat handouts.
I) **Use the preplanned hazmat handouts!!!**
J) If the incident involves personnel climbing in or onto railcar or highway trailers use fire department ladders to gain access and if you need to go level A strong consideration for MT94's if conditions allow as they are a way easier level A assembly to move around in than an enclosed level A suit.
K) Entry teams should be 3 techs with a backup/standby team of 3 as well.
L) Call Chemtrec and DOE early as they have helpful information that could help in safely and effectively taking care of your incident. As well if incident

involves chlorine Chemtrec will dispatch a chlorine response team to your incident immediately.

M) Have equipment ready to be used before you send the teams into the hot zone.

3. Instructors comments

The instructors from BNSF stated that they were impressed with the professional learning attitude our units had when it came the classroom and outside learning portion of the drill.

And for the part of the drill that involved the scenario. They stated that our teams were some of the most competent hazmat units that they had ever worked with thru out the United States and the skills and the knowledge and the efficiently that we operated under was second to none as far as they were concerned. And stated and I quote" We would go into any hazmat incident with your teams, any day, any time".

And I would agree with that statement.

Thanks again to all our teams for the hard work.....Kurt

APPENDIX N

A TRADITION IN PRECISION

KR

Remit To:
21601 - 66th Ave W, Unit A
Mountlake Terrace,WA 98043, USA
Tel: 425-771-7776 | Fx: 425-774-7538
sales@krinc.net | www.krinc.net
Toll Free: 1-800-454-1310

Date	Number
06/20/22	

SO-487575

Bill To:

SOUTH KING FIRE & RESCUE
31617 1ST AVE S.
FEDERAL WAY, WA 98003, USA

Ship To:

SOUTH KING FIRE & RESCUE
31617 1ST AVE S.
FEDERAL WAY, WA 98003, USA

Ent. by:	Sales Rep.:	Picked by:	Packed by:	No. of Parcels:	Weight:	Page No.:
	56-MACK					1 of 1

Cust. Acct. No.	Customer P.O. No.	Order Date	Ship Date	F.O.B. Point	Ship Via	Terms
1017734		06/20/22	06/21/22	SEA-RET	05-BEST	**COD**

Ordered	Shipped	Back Ordered	Unit	LOC	Serial Number	Catalog No. / Description	Unit Price	Extension
1.00	1.00	-	ea			102000945 AUTEL ROBOTICS EVO II DUAL RADIOMETRIC ENTERPRISE BUNDLE	12,300.00	12,300.00
1.00	1.00	-	ea			102000199 AUTEL ROBOTICS EVO II BATTERY	219.00	219.00
2.00	2.00	-	ea			102000198 AUTEL ROBOTICS EVO II LOW NOISE PROPELLERS	18.00	36.00
2.00	2.00	-	ea			102000202 AUTEL ROBOTICS EVO II PROPELLER GUARDS	19.95	39.90

SUBTOTAL	SHIPPING	TAX	**TOTAL**
12,594.90	0.00	1,272.08	13,866.98