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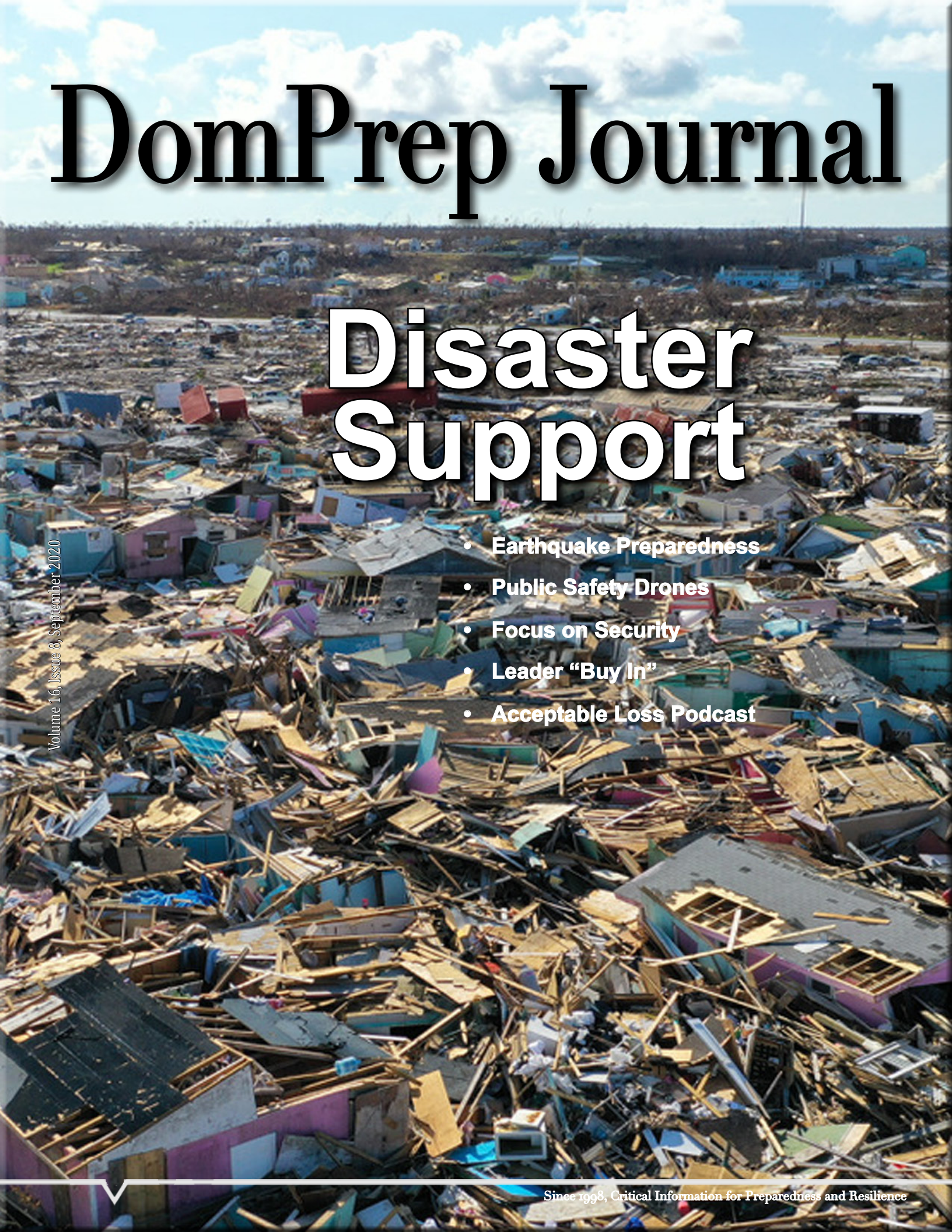

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Volume 16, Issue 8, September 2020

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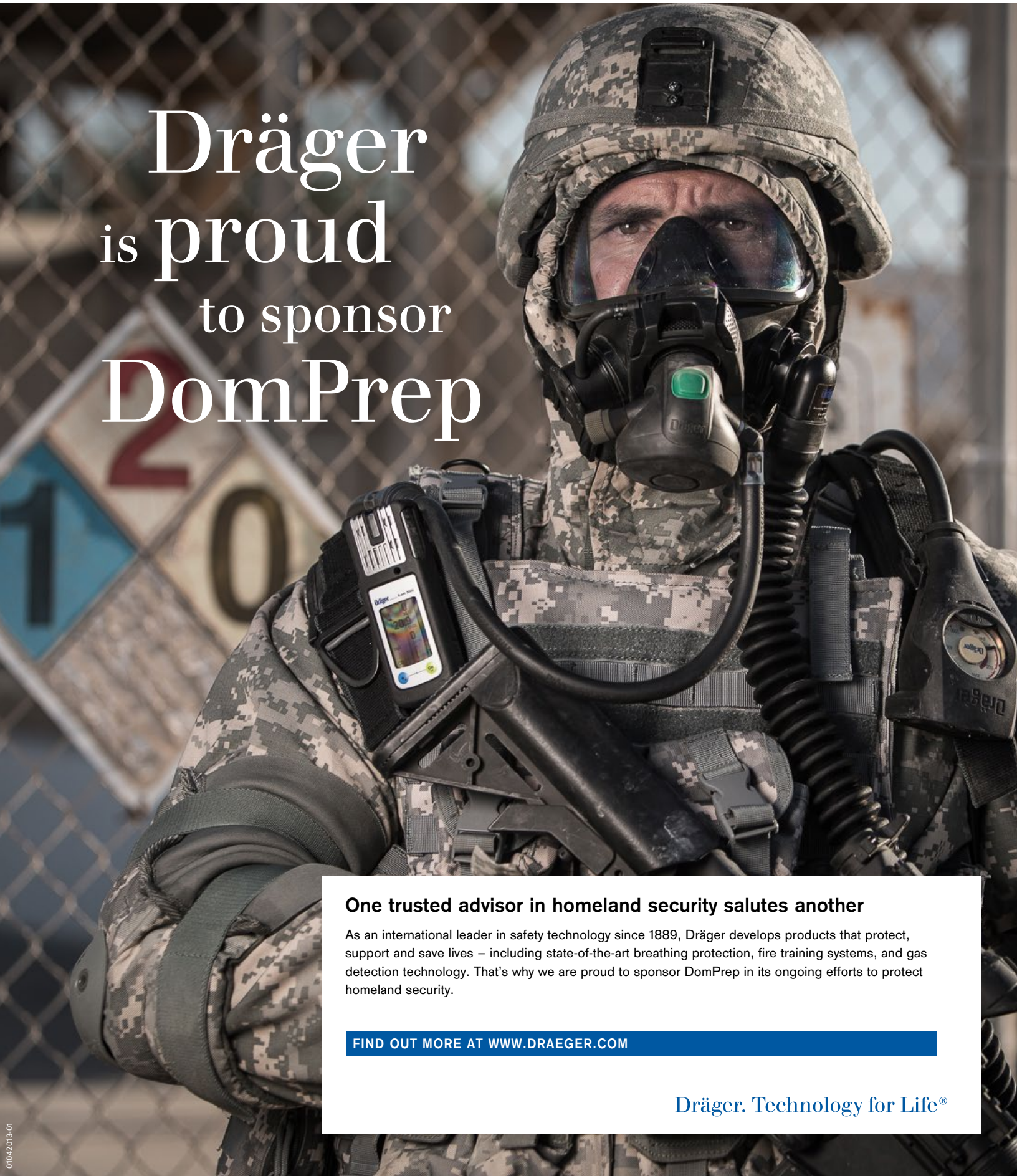

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Disaster Support – Meeting Today's Needs

By Catherine L. Feinman

Despite emergency planners using worst-case scenarios and high-impact, low-frequency events when planning for disasters, experiencing an event in real time exposes gaps in those plans that were not foreseeable (or at least not included in the plan). Furthermore, as time goes on, resources and other needs naturally change. In order to meet today's disaster support needs, continuous planning, reevaluating, and updating are necessary in order to minimize the impact of any disaster.

One type of event that can be overlooked when resources and time are stretched – due to planning for known risks and threats – is an event that is relatively new to a particular geographical area. For example, non-earthquake areas are experiencing earthquakes with greater frequency and intensity than have in past decades. Although relatively small compared to their Western earthquake-prone counterparts, recent earthquakes on the East Coast of the United States has proven to have devastating effects when such plans are not widely incorporated and practiced.

Another type of event that can leave communities underprepared is the worst-cast scenario. Despite discussing such a plan, many organizations do not dedicate a lot of time and resources to unlikely scenarios. Public health crises, for example, come in many forms and, for the most part, public health agencies are prepared for them. However, a key component to most disaster plans is mutual aid. COVID-19 has created a gap in that plan because the typical collaborating agencies may be unable or unwilling to share resources when they know that they too need or soon will need them. This is just one tough choice that decision makers need to consider.

Other difficult decisions that are not often addressed in disaster plans are acceptable losses, security, and new technologies. When resources and supply chains cannot keep up with demand, losses in lives and property are inevitable. If resources are not available to sustain an entire population, then tough decisions must be made to determine how the resources will be allocated and how these resources will be protected and secured during uncertain times. In some cases, new technologies can offer significant benefits during disaster response and recovery, but these purchasing decisions come with other regulatory and privacy concerns that will leave gaps if not addressed in advance of a disaster.

Regardless which type of disaster a community faces, there needs to be buy in from the whole community. Each stakeholder has a role to play. If a stakeholder(s) does not play that role when the planning scenario emerges in real time, gaps will widen when resources may not be able to fill them. After all, a plan is only as good as its execution. This edition of the *DomPrep Journal* addresses how disaster planning and response efforts are adapting to provide critical support during disasters that are emerging or evolving in new and sometimes unexpected ways.

Earthquake Preparedness in Non-Earthquake Country

By Stephen Maloney

On the afternoon of 23 August 2011, a rumbling in the ductwork was heard overhead in a chemistry classroom on the fourth floor of a brand-new building at Montgomery College in Maryland. As a laboratory safety class was getting ready to begin, the noise quickly transitioned to a swaying of the building – a motion that was soon recognized as an earthquake. The view from the window showed no ripples in the pond below, but dozens of students, faculty, and staff were evacuating multiple buildings. Although the consequences of an earthquake affecting the college would typically be low, the need to more formally address the risk than it had been in the past became apparent. By early in the Fall semester, the college developed a set of practical procedures and protocols to address the actual hazards that present themselves in a region of low earthquake risk, while considering the potential need to quickly assess damages and hazards that an earthquake might present.

Every year, thousands of people die around the world due to earthquakes. Almost all are killed by building collapses. In the United States, though, such collapses are much less likely to occur. The vast majority of injuries due to earthquakes in the United States are caused by nonstructural building materials falling on people. It is for this reason that the United States Geological Survey (USGS), the Federal Emergency Management Agency (FEMA), and the American Red Cross (ARC) all urge people *not to evacuate* buildings during an earthquake.

2010 Potomac-Shenandoah Region Earthquake

The 2011 earthquake, known as the Virginia Region Earthquake (Magnitude [M] 5.8), was not the first that Montgomery College had experienced in recent history. On 16 July 2010, the college experienced a magnitude 3.4 earthquake, with its epicenter just over a mile south of the Germantown Campus. That earthquake was much closer than that of the future 2011 earthquake (about 80 miles), but it provoked little interest, for two reasons. First, the intensity of the shaking at the campuses and in the region was weak, due to the quake's low magnitude. Second, it occurred at 5:04 a.m., when few people were at work or school. The shaking did awaken some, though.

ShakeCast

Despite the limited nature of hazards that earthquakes pose in that area, a significant (and easy) step of downloading ShakeCast to particular emergency management computers improved preparedness shortly after this earthquake. ShakeCast is a free application that automatically retrieves shaking data from USGS's ShakeMap system, and provides almost instantaneous structure damage estimates for locations chosen by the user. Applying ShakeCast to the 2010 earthquake about two weeks after the event – and including data for the three campuses, two offsite facilities, and a significant dam that the college owned – the program correctly predicted (again, after the fact) damage at all locations to be "unlikely."

In 2010, it was necessary to download the entire ShakeCast application, which was not very user friendly. Currently, the system is available as Standalone ShakeCast, ShakeCast Lite, or ShakeCastCloud, depending on information needs and capabilities. At Montgomery College, ShakeCast continued to be monitored and location information improved after the 2010 earthquake, despite the low likelihood of a similar event occurring at the college.

Local Seismicity & the ShakeCast-Driven Investigation

Most earthquakes occur along tectonic plate boundaries. Quakes that occur in other areas are sometimes referred to as the product of "intraplate seismicity." Such activity, generally less severe than that along plate boundaries, is uncommon but not rare in the Washington, D.C. metropolitan area. Subsurface faults, leftover from significant geologic events like the formation of the Appalachian Mountains, can be found all around the Eastern United States. Occasionally, they are "reactivated," and create a little jolt.

The earthquake that hit Montgomery College in 2011 was one of these reactivations, centered beneath the town of Mineral in Central Virginia. At a magnitude of 5.8 and a depth of less than four miles, it caused significant shaking throughout the region. Substantial damage occurred to the National Cathedral, the Mormon Temple, and the Smithsonian Castle. The Washington Monument was so severely damaged that it was closed for repair for most of the subsequent eight years.

At Montgomery College, there were three campuses and 55 buildings, but only one college architect who could assess damage. Efficiently assessing buildings for safety with such limited resources was a challenge that ShakeCast overcame by providing instantaneous damage forecast data for all three campuses, the dam, and two major offsite facilities. ShakeCast suggested focusing initial inspections on the Rockville campus, which the software identified as most likely to have suffered damage as significant as broken windows. The software accurately predicted that none of the locations would have experienced structural damage.

Upon inspection, led by the college architect, the Rockville Campus was confirmed to have been the most impacted by the earthquake. Buildings on campus suffered cracks in interior walls and floors, fallen light fixtures, and cracks in brick facades. The other campuses and facilities had significantly less damage. By prioritizing inspection locations based on predicted damage, the focus was put on areas expected to have been most severely impacted and quickly confirmed that all buildings were safe to continue to occupy.

Montgomery College's Preparedness Actions

It was still critical to ensure the college was addressing the building shaking threat, whatever the cause, adequately. In October 2011, the Metropolitan Washington Council of Governments (MWCOG) hosted a one-day Earthquake Preparedness for Schools Training. Representatives of the Los Angeles Unified School District and the Southern California Earthquake Center led the seminar. Representatives of Montgomery College, other local colleges, public school systems, and local governments were in attendance. Along with the emphasis on mitigating nonstructural damage, the biggest takeaway from this training was learning about ATC-20.

ATC-20

In 1987, FEMA and the State of California awarded the Applied Technology Council (ATC) a contract to develop "procedures for postearthquake safety evaluation of buildings." The result of that project was the September 1989 *Procedures for Postearthquake Safety Evaluation of Buildings*, also known as ATC-20.

ATC-20 explains the simple three-level evaluation procedure that may be employed immediately after an earthquake. It is written for volunteer inspectors, assuming the availability of professional building inspectors and other competent local government employees might be too limited after widespread shaking to make fast decisions regarding occupancy of damaged buildings.

Subsurface faults, leftover from significant geologic events, can be "reactivated," and create a jolt in areas that are typically unprepared for earthquakes.

In October 1989, the Loma Prieta Earthquake, also known as the World Series Earthquake, caused extensive damage and loss of life in Northern California, and required hundreds of safety evaluation inspections. ATC-20 was widely used following that earthquake, immediately leading to the identification of some gaps in coverage that the document did not anticipate. In particular, the Loma Prieta quake caused many gas leaks, hazardous materials releases, and building closures due to the release of asbestos-containing materials (ACM). ATC-20 had not addressed hazardous materials at all.

ATC was brought back, with funding by USGS, and produced the 1995 *Addendum to the ATC-20 Postearthquake Building Safety Evaluation Procedures* (ATC-20-2). ATC-20-2 adds guidance to ATC-20 on how to address possible hazardous materials releases during rapid building assessments. Together, ATC-20 and ATC-20-2 allow for the development of simple and effective procedures for assessing building damage after an earthquake.

Protocols & Procedures

At Montgomery College, the ATC documents facilitated development of a half-page Rapid Evaluation Inspection checklist to be used by the college's security officers after an earthquake. It allowed for the rapid designation of a building, portion of a building, or an area as INSPECTED (apparently safe), UNSAFE, or RESTRICTED USE. All evaluations could be performed from outside the structures. Along with ShakeCast data, the Rapid Evaluations could be used to focus the efforts of the college architect or a structural engineer after basic

conservative safety decisions had already been made. The college also developed Earthquake Procedures, to be followed by students, faculty, and staff during and after an earthquake. The emphasis was on not evacuating during strong shaking.

In October 2012, Montgomery College went on to be the largest organization participating in the Great Southeast Shakeout earthquake drill. The drill, along with a month of emergency preparedness fairs and educational articles, promoted general safety and preparedness among community members.

Recommendations

For any organization in the United States, it makes sense to develop a simple approach to earthquake preparedness.

- First, recognize that the greatest threats are nonstructural: bookcases falling over, pictures falling off walls and their glass breaking, roof tiles or parapet walls falling, ductwork or pendant lights falling from ceilings, etc. All of this can be quite dangerous, and people should be educated to limit exposure to these hazards by following the simple rule: Drop! Cover! Hold On!
- Second, write a simple rapid building assessment protocol based on ATC-20 and ATC-20-2. These documents help to tailor procedures to an organization's capabilities and resources. Remember, this is a rapid assessment that should err on the side of safety. A building or portion of a building can always be closed off until a structural assessment can be arranged. Also, the assessment procedure can be used to rapidly assess a building for damage, no matter the cause.
- Third, consider using ShakeCast to guide the initial stages of any assessment. Download it now and begin adding location information. Alternatively, simply refer to the USGS website immediately after an earthquake and look at the ShakeMap data. When taking this route, it is important to become familiar with the online products ahead of time.

Conclusion

Hazards associated with earthquakes in much of the United States can be expected to be relatively minor in their severity. Even so, safety and emergency management professionals should prepare for earthquakes, particularly when given the fact that preparedness is as straightforward as writing some simple procedures and protocols, driven by the ATC documents and ShakeCast or the USGS website. The Occupational Safety and Health Administration (OSHA) provides recommendations for preparing a workplace for earthquakes. Compare your current emergency plans with the OSHA guidance, and make any necessary changes. If you choose to use products like ShakeCast, learn and drill on those tools.

Stephen Maloney, CEM, is an emergency manager with the U.S. Federal Reserve Board. He has a B.S. in geology from the University of Maryland, an M.S. in environmental science and policy from Johns Hopkins University, and is a graduate of the National Emergency Management Executive Academy and Harvard University's National Preparedness Leadership Initiative. At the time of the 2010 and 2011 earthquakes described in this article, he was the environmental safety manager for Montgomery College, but had worked as a professional geologist for 16 years prior to taking that position. He spearheaded the college's effort to improve its earthquake preparedness and resilience efforts.

Public Safety Drones: Disasters & Drones for Good

By Charles L. Werner

Drones are having a dramatic impact on public safety and emergency management operations. While some form of public safety drone has been in place for a while, drones did not begin to see wider adoption until 2016 when the Federal Aviation Administration (FAA) implemented 14 CFR Part 107 (Part 107) commercial flight authorization and later with Certificate of Authorizations (COA). These FAA regulatory changes made it easier for public safety and emergency management agencies to meet regulatory requirements.

Following the new FAA regulations in 2016, drones were initially used to search for lost persons and traffic crash reconstruction. Even with limited use, early on, public safety drones showed much promise to enhance situations with valuable information otherwise not visible from the ground. Limited air support could now be provided to agencies without an air wing and at a very affordable cost. Drones also demonstrated their ability

Fig. 1. Santa Rosa CA Wildfire. This is a HANGAR hi-res snapshot, which on a computer can be manipulated in a 360-degree view and zoomed into specific areas. This also reinforces the devastation and total destruction of almost all ground features which makes it difficult to know what area this involves. Agencies are now combining visual imagery with GIS so the drone imagery can be overlayed on geographic layers such as street centerlines and/or satellite map data to provide geographic location identifiers. *Source:* Courtesy of Alameda County CA Sheriffs Office (2020).

to enhance performance of (not replacement of) manned aircraft. And when some weather conditions would restrict and/or be unsafe for manned aircraft, drones could be launched quickly to provide essential information and inform "how bad is bad."

Drone Uses & Caveats

Advance to the present, the DRONERESPONDERS Spring 2020 Research Study revealed that government public safety agencies use of drones dramatically increased to over 17 different use cases (mission types). In addition to the original use cases, other missions such as: situational awareness, tactical overwatch, hazmat, structure fires, wildfires, mapping, earthquakes, tornadoes, volcanic activity, incident command and control, swift water rescue, security overwatch, public information, transportation of cargo, and COVID19.

Drones became instrumental during hurricanes Harvey, Irma, and Maria in 2017, with thousands of successful missions in concert with manned aircraft. The major wildfires in 2018 – like the Camp Fire (California) – reinforced the value of drones by providing critical information for responding agencies such as direction of fire, hotspots that may have been missed, new fires identification, and major damage assessments. The 2018 volcanic activity in Hawaii further validated the value of drones as they could provide real time information of fissure activity, lava flows endangering homes, and detection of toxic sulfur dioxide gas released from the volcanic activity. This became paramount to warning and evacuating residents from the volcanic dangers. The Lee County (Alabama) Tornado, which caused a wide path of destruction resulting in 23 deaths, marked one of the first news stories reporting that responders immediately deployed drones to compliment ground search. In each of these disasters, drones helped to better serve their respective communities.

In response to COVID19, drones have been used to monitor and promote social distancing, provide public information, spray disinfectant, and even to monitor COVID19 symptoms (cough, temperature, etc.). Although these flights were well intended, they were not always successful and, in some cases, were rebuked by citizens. One example was in Connecticut where a drone was proposed to fly around areas and monitor and detect people that displayed symptoms of COVID19. The community collectively stopped this because they felt that it was too invasive and an intrusion to their individual privacy. This scenario reinforces that drone missions should be selected when they are the best method to achieve the desired outcome and not to use the drone just because it is available.

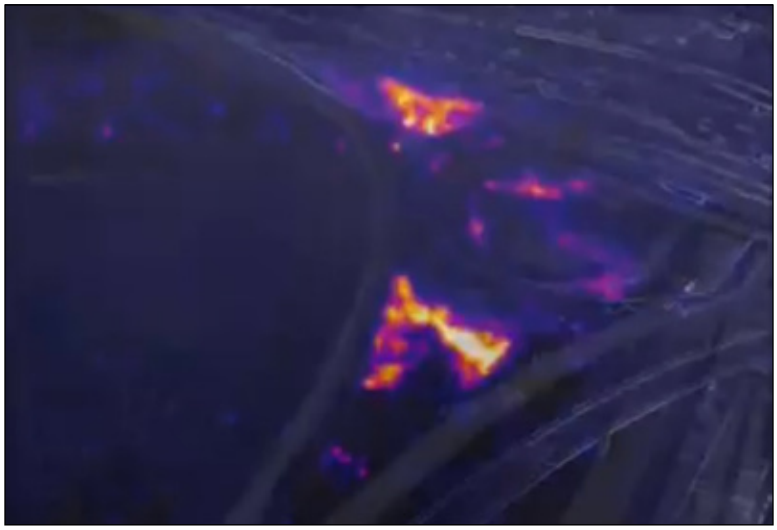

Fig. 2. Colorado Brush Fire. *Source:* Courtesy Los Angeles City Fire Department (2020).

Growing Demand

Another result noted in the study was that, as the mission types and actual mission requests increase, there is a need for more remote pilots, additional aircraft, and more training. Also revealed was that, if one agency is flying drones, they will see requests from other agencies for missions that may be beyond the initial scope of mission types.

The popularity of drones for disaster response, humanitarian missions, and public safety is very much global and present in over 40 countries. Drone programs are now present in the United States, Canada, South America, the United Kingdom, France, Croatia, Australia, New Zealand, Japan, China, Africa, Saudi Arabia, Scotland, Ireland, Germany, Belgium, to name a few. The main reasons for the popularity of public safety drones are:

1. Enhance civilian and responder safety
2. Improve operational effectiveness
3. Provide real time situational awareness – "How Bad is Bad?"
4. Help to monitor and gauge recovery status/progress

As the global proliferation of public safety drone programs and drones for good continues, it is important to set some ground rules to maintain public trust. To address this issue DRONERESPONDERS, in collaboration with Skydio, published the "*Five C's – Principles on the Responsible Use of Public Safety Drones*." Although the Principles document is focused on the United States, the general principles are applicable to public safety agencies around the world. Drones are clearly making a huge difference and are here to stay.

Fig. 3. Photo from Hurricane Dorian, Marsh Harbor. *Source:* Courtesy AIRT (parent to DRONERESPONDERS, 2020).

Charles Werner is a 46-year public safety veteran. He served 37 years with the Charlottesville Fire Department, the last ten years as fire chief. Most recently, he served as senior advisor and acting deputy state coordinator for the Virginia Department of Emergency Management. He has also served in numerous national leadership roles on public safety technology, communications, broadband, applications and devices. Presently, he serves as director, DRONERESPONDERS Public Safety Alliance, chair of the National Council on Public Safety Unmanned Aircraft Systems, chair of the Secure Virginia Unmanned Aircraft Systems Sub Panel, member of the Virginia CIT Unmanned Systems Advisory Board, the National Information Sharing Consortium Advisory Council, the Association of American Railroads Public Safety Rail Advisory Committee and the International Fire Chiefs Technology Council.

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In an Era of Coronavirus, Do Not Forget Security

By Andrew Roszak

The United States is currently facing historic challenges. Against the backdrop of a global pandemic, the United States is experiencing an historic rise in gun violence and civil unrest. Social issues, such as a dramatic increase in unemployment, a rise in domestic violence, an increase in substance abuse, social isolation, mental health issues, and uncertainty surrounding when the pandemic will end are leading to increased anxiety and frustration. In an era of coronavirus, do not forget that reopening plans need to focus on security, as well as health and safety.

As a concrete example, the State of Virginia has reported a 76% increase in domestic violence cases since the pandemic began. Further, a recent *NBC News/Wall Street Journal* poll captured the sentiment of the nation, with 80% of respondents saying that things are out of control in the United States.

New Threat With Common Dangers

The nation is currently focused on reopening facilities and continuing the battle against the coronavirus. However, do not lose sight of other dangers, such as active shooter events and attacks. Society is facing extreme dangers as depression and anxiety increase throughout the population. Gun sales have skyrocketed while many are facing mental health issues due to job loss, domestic violence issues, loss of income, solitary lifestyle, and loss of routine and structure. Alarmingly, historical records show that a high rate of attacks occur after a break in routine. In fact, as many as 41% of all school attacks have occurred within one week of returning after a break.

When thinking about safety and security in a post-pandemic era, several significant changes in society since the COVID-19 coronavirus pandemic began need to be accounted for:

- Both gun and ammunition sales have skyrocketed since February 2020.
- In June 2020, the Federal Bureau of Investigation (FBI) conducted more than 3.9 million background checks – the highest month on record since the agency began record keeping in 1998. This follows the previous record, which was 3.7 million checks in March 2020.
- On 16 March 2020, three days after President Trump declared a national emergency for coronavirus, over 176,000 guns were sold.
- After the Minneapolis police station was burned on 28 May 2020, gun sales topped 150,000 per day in early June.
- Numerous cities across the country have reduced funding for law enforcement and some have removed law enforcement officials and school resource officers from public school buildings, leaving them largely unprotected in case of attack.

Recognizing and taking into account these new societal trends – along with current events and the overall mood of the country – are vital for developing new coronavirus protection procedures and reopening plans.

Beware of Flashpoints

In addition to the normal confrontations, coronavirus adds new rules and regulations that may cause additional flashpoints. Visitors, parents, or customers may object to or resist wearing masks, adhering to new drop-off protocols at schools or childcare programs, or take issue with newly established health safety guidelines. Unfortunately, this has already transpired in restaurants and grocery stores throughout the country – including a murder in Los Angeles after a dispute over wearing of a mask.

A high rate of attacks occur after a break in routine. COVID-19 is the ultimate disruptor for schools, businesses, childcare programs, and houses of worship.

For children, the coronavirus has caused a dramatic rise in the use of online education. With many turning to online education, the occurrences of cyberbullying have also increased. These confrontations can increase in frequency, especially as children are left largely unmonitored by adults to attend remote schooling. The Marjory Stoneman Douglas High School is a painful reminder of how bullying can lead to tragedy.

Now more than ever is the time to remain vigilant. In the battle against the coronavirus, it is important not to forget security while focusing on health and safety. Schools, businesses, childcare programs, and houses of worship should take advantage of the downtime from temporary closures to receive training on these critical topics and ensure security is included as part of all health and safety reopening plans.

Andrew Roszak, JD, MPA, EMT-P, serves as the executive director for the Institute for Childhood Preparedness and as an advisor for the Domestic Preparedness Journal. He is the author of the Preparing for the Unexpected Series of books, which includes "Preschool Preparedness for an Active Shooter". Andrew has spent over 20 years working on emergency preparedness, response, and recovery issues. He is admitted to the Illinois and District of Columbia Bars and is admitted to the Bar of the U.S. Supreme Court. Find him on Twitter: @AndyRoszak.

Leader "Buy In" Is Not Enough in Emergency Management

By James Rush

Too many elected leaders are not taking the leadership role in developing, reviewing, and implementing their emergency management programs. Many plans have been published by jurisdictions, only to be discarded when it is time to put those plans into action. During disasters, jurisdiction leaders are implementing ad-hoc plans that are not coordinated with their respective jurisdictions' agencies and, too often, have disastrous results. This is indicative of jurisdiction officials delegating all aspects of planning to their emergency management agencies, without even being briefed on the plan, let alone taking ownership.

Of course, jurisdiction leaders have many priorities, but protection and care for the folks who elected them must be the top job priority. Elected officials must own their plans and gain enough confidence in those plans to execute them when disaster strikes. In some jurisdictions, there are mayors and governors who are truly the owners of their emergency management programs … and it shows. Another aspect of disaster preparedness responsibility lies with the citizenry. If citizens demand competency and true leadership from those they elect, they will eventually get it.

For decades, emergency managers have been speaking about how important it is to get buy-in from their mayors and governors for their jurisdictions' emergency plans and procedures. Mayors and governors face numerous and sometimes conflicting priorities each and every day. However, the primary duty of jurisdictional leaders is still the safety and security of all residents of their communities. Since the 9/11 terror attacks, the federal government has shouldered the major burden of funding disaster preparedness and giving well-intentioned guidance on how states and cities could achieve a high degree of readiness for a wide spectrum of disasters.

The fact is, early on, state and local governments expected all emergency management activities and funding to be the responsibility of the federal government, with funding through federal agencies. It is the opinion of this writer that approach was wrong then, it is wrong now, and it will be wrong in the future. Local, state, and territorial leaders must take a "leadership" role in preparing for, responding to, and recovering from future disasters.

Despite the numerous and conflicting priorities that mayors and governors face each day, their primary duty is the safety and security of all residents of their communities.

James M. Rush Sr. has over 45 years of healthcare administration and community emergency management experience in the U.S. armed forces, the U.S. public-health community, and the nation's civilian healthcare industry. He served as the Region III project officer for the National Bioterrorism Hospital Preparedness Program, and the CDC's National Pharmaceutical Stockpile, always dedicated to assisting healthcare and public health organizations prepare for "all hazards" events and incidents. He is author of, among other published works, the "Disaster Preparedness Manual for Healthcare Materials Management Professionals," and a self-published book "Unprepared."

Acceptable Loss: Presentations From Experts

The COVID-19 pandemic has raised many discussions on the topic of acceptable losses. For community decision makers, this is a difficult yet necessary issue to consider before making decisions that may have life-threatening consequences. Spurred by two articles and followed up with a nationwide survey and report, this podcast was presented at the National Homeland Security Association's virtual conference in July and is now available as a rebroadcast of commentary by leading healthcare experts.

Click to listen.

Carmit Rapaport, Ph.D., *Academic coordinator of the MA programs in Disaster Management and Fire Studies at the Department of Geography and Environmental Studies at the University of Haifa, Israel*

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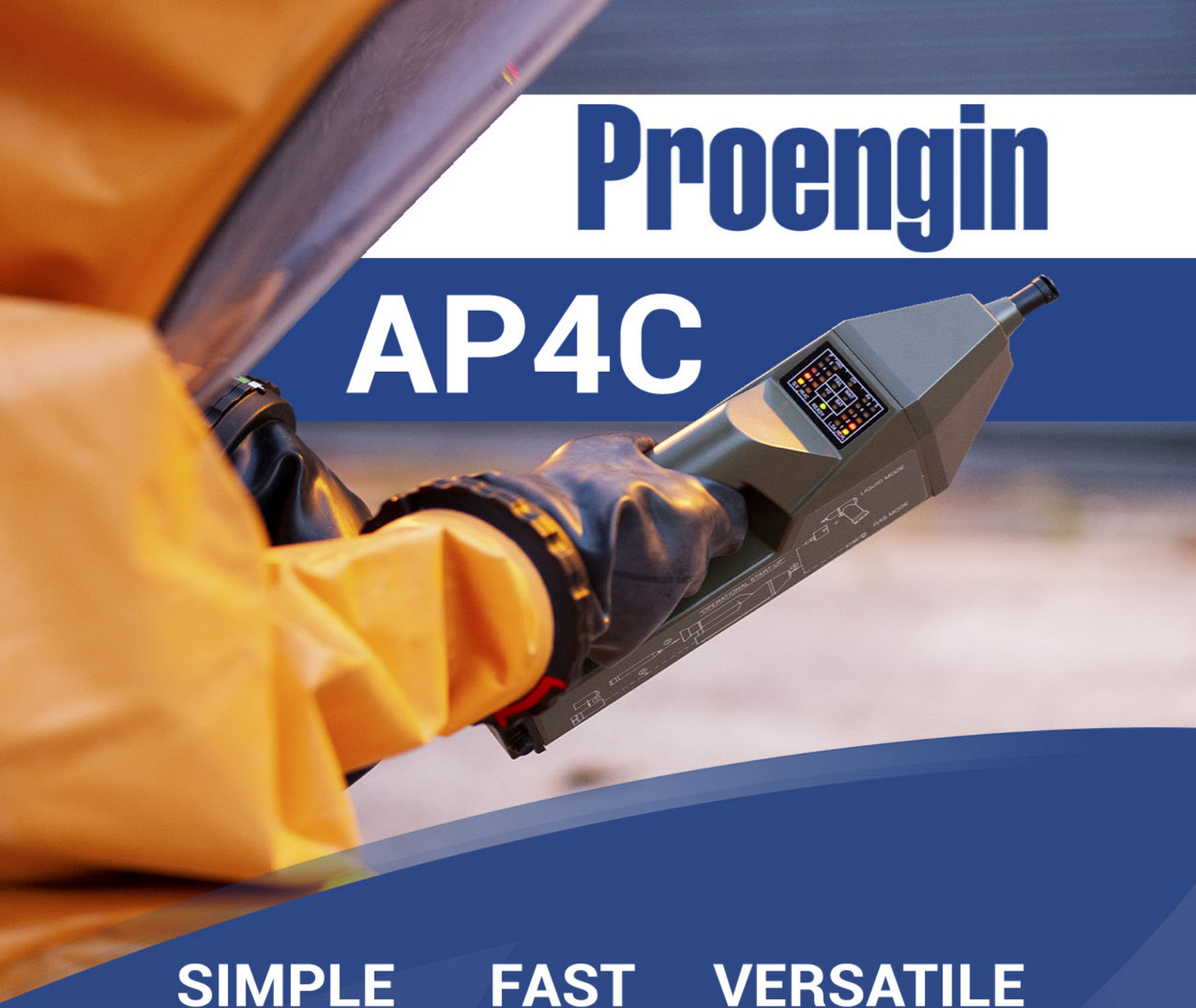

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