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Published Quarterly by

hemming information services

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8 The Old Yarn Mills, Sherborne,
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www.hemmingfire.com
© 2014 All Rights Reserved
Fire & Rescue (ISSN 0964-9727)

Annual Subscription:
Europe £40.00 or €60 (incl. p&p); rest of world £50.00 or US$80.00 (incl. p&p). Subscriptions queries to: m.spillane@hgluk.com

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FIRE & RESCUE JOURNAL (ISSN No: 0964-972719, USPS No: 003-930) is published quarterly by Hemming Information Services and distributed in the US by Asendia USA, 17B S Middlesex Ave, Monroe NJ. Periodicals postage paid at New Brunswick, NJ and additional mailing offices. POSTMASTER: send address changes to Fire & Rescue Journal, 17B S Middlesex Ave, Monroe NJ 08831.

Artwork by
Graphic Examples Ltd, Sherborne

Printed in England by
Latimer Trend & Co Ltd, Plymouth

DISCLAIMER: The views and opinions expressed in FIRE & RESCUE are not necessarily those of Hemming Information Services. F&R is in no way responsible or legally liable for any statements, picture captions, reports or technical anomalies made by authors in their commissioned articles.

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IWMA International Water Mist Association

AFOA AIRPORT FIRE OFFICERS ASSOCIATION

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Front cover artwork by: Darren Small, www.smallphoto.co.uk

INDUSTRIAL FIRE JOURNAL FIRE & RESCUE FIRETRADE EUROPE 2013 FIRETRADE ASIA & MIDDLE EAST 2013

EDITOR'S COMMENT

Are increasingly more advanced rescue tools changing the way we extricate people from crashed cars during road traffic collisions? The advent of battery-powered combi tools has meant responders are now ready to deploy in minutes during an RTC. Trained as most firefighters are according to the principle of the 'golden hour' they are programmed to start responding immediately.

However, Rescue Instructor Eric J Rickenbach points out that in many cases a step is missed during the rescue process. Proper assessment of the scene of the incident and the vehicle before grabbing the tools can prevent bad things from happening to the occupants of the car, but can also save time because the avoidance of bad decisions such as cutting the wrong posts. He rightly points out that with inherently safer cars on the roads, the number of 'real' trauma patients is lower than it was several years ago. 'Some of you might be thinking that you are not in patient care, that is the EMT's job. If that is your opinion, you need to seriously re-evaluate if you want to be a rescuer or someone that wants to play with tools,' said Eric in his article on page 14. In this latest Fire and Rescue you will find an extensive focus on vehicle extrication insights from top instructors all over the world.

Ann-Marie Knegt, Editor.

AFOA – the Chairman's comment

Paul Hardiman is Chairman of AFOA and is Airport Fire Manager at London Luton Airport.

The Airport Fire Officers Association (AFOA) has been in existence for over 16 years and 2014 has again been very successful. The 11th annual conference in January saw a record number of delegates with a bumper 160 visitors attending the event at the venue at Dublin Airport. The conference was kindly sponsored by Terberg DTS.

Year on year, AFOA has experienced a steady increase in numbers and the committee are confident that 2015 will be just as successful. The AFOA annual conference has become a key date in the aviation firefighting calendar.

As a technical body, AFOA is dedicated to promoting and maintaining the professional image and status of airport fire services within the United Kingdom and Ireland, ensuring continued communications between them, through an on-going dialogue of information and knowledge on all relevant technical and operational matters.

Throughout the aviation industry, there has been much debate surrounding firefighting foams, and, in particular the benefits of environmentally friendlier products. AFOA ran a successful 'Foam Masterclass', which was well attended by some six UK and Irish airports. The success of this workshop will lead to another session in early part of 2015 followed by a new workshop, which will look at the requirements of the Task and Resource Analysis process. Details of this event and all other events will be published on the AFOA website at www.afoa.co.uk

The 2015 AFOA annual conference will be held at the Radisson Blu hotel, Dublin Airport on 21–22 January, and we are very pleased to announce that Terberg DTS is again the main sponsor, while we look forward to welcoming delegates to another fact-filled industry-leading event.

Demand for Ebola protection impacting on supply channels

Since the first laboratory-confirmed case of Ebola was diagnosed in the United States on September 30, 2014, healthcare and emergency responders have rushed to provide the proper protection to their staff, commented hazmat manufacturer DQE (Fishers, Indiana). As a result, infection control orders have been limited to healthcare and emergency response personnel only, so that those with the greatest need receive them first.

'The SafePaq blood and virus protection kit has been our best selling product for the past two weeks,' said DQE president Tony Baumgartner. 'We have been answering calls non-stop and helping our customers prepare for an infectious event. These are the types of events that we plan for and DQE is continually updating its supplies to support the evolving CDC standards.' The SafePaq provides coveralls that meet ASTM F1670/F1671 Standards for blood and viral penetration resistance. Its contents provide a foundation of protection against a wide range of fluid and viral threats and have applications in healthcare settings as well as with emergency responders who may encounter a patient with an infectious disease.

'Another product we carry that has a significant application to waste management during an infectious outbreak is the Sani-Bag+,' says Baumgartner. The Sani-Bag+ is used, removed, sealed, and disposed of without the caregiver having direct contact with the waste, therefore eliminating the possibility of cross contamination from infectious microbes.

New Ebola guidelines for emergency departments published by the CDC

The American College of Emergency Physicians (ACEP) has been working with the Centers for Disease Control and Prevention (CDC) and the Emergency Nurses Association to establish procedures to help emergency personnel evaluate and manage emergency patients suspected of possible Ebola infection.

The CDC published the new guidelines for emergency departments during ACEP's annual meeting where experts from across the country are meeting to discuss key issues, including Ebola.

The new guidelines were evaluated and approved by a panel of experts – consisting of emergency physicians and emergency nurses with expertise in infectious disease and disaster preparedness – appointed by ACEP's president. They establish consistency for emergency care workers and reflect lessons learned from the recent experiences of US hospitals caring for Ebola patients.

'It's critical to protect the emergency medical staff who are on the front lines of caring for patients who may have Ebola,' said Alex Rosenau, MD, FACEP, immediate past president of ACEP.

'They are the ones most at risk for contamination, because they come in direct contact with the patient, as demonstrated by the infections of the nurses in Dallas and the recent case of the emergency physician in New York. On behalf of our 34,000 members, we are so grateful for the recovery of the nurses and we are optimistic that Dr Spencer will recover as well.'

The CDC guidelines include advice for:

- Assessing patients, including those for whom travel histories are unavailable (for example, when patients are unconscious).
- Putting on (donning) and removing (doffing) of personal protective equipment (PPE).
- Managing and isolating patients who may have Ebola.
- Informing hospital personnel and other authorities about possible infection.
- Providing direct observation of health care workers during the donning and doffing processes for PPE.

'ACEP's Ebola panel of experts are dedicated to providing expertise to help emergency care workers and the emergency patients they serve,' said Stephen Cantrill, MD, FACEP, chair of ACEP's panel. 'The new guidelines provided needed direction and drill down on specific situations to safely and effectively manage patients suspected of Ebola.'

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RESEARCH REVEALS THAT THE UK FRS COULD SAVE MILLIONS ON THE PROCUREMENT OF PPE

Fire and rescue services across the UK could save millions in taxpayer cash by improving the way it sources and purchases firefighting clothing and equipment says research published by the Department for Communities and Local Government. The findings highlight examples of fire services buying identical kit at vastly different prices. The report found that across the country the 46 fire and rescue services could save millions by streamlining this process and standardising how they buy clothing and equipment. Key differences include:

- prices for the same kit can vary by as much as 200% – a pair of protective trousers cost between £125 ($198) and £274 ($434)
- then the same supplier was used prices varied by a quarter: for example a fire helmet can cost between £105 ($166) and £131 ($208)
- even when the same contract was used there is still a significant price range of 66% – a fire coat can cost between £220 ($348) and £366 ($579).

The report concludes that fire and rescue authorities could achieve savings of £18 ($28.5) million from a total spend of £127 ($200.10) million a year. The savings could be even greater if applied to all purchases by all fire services, which spend an estimated £600 ($950) million each year on buying equipment and fire engines.

ASSISTANT CHIEF FIRE OFFICER PAUL RILEY, METROPOLITAN FIRE BRIGADE (MELBOURNE, AUSTRALIA), 14/11/47-15/10/14

Long serving and highly respected MFB Assistant Chief Fire Officer Paul Riley passed away on the morning of 15 October 2014.

Paul was a larger than life character, a mentor to those that worked with him and a passionate supporter of all MFB employees. He will be sadly missed by all who knew him.

Paul started his firefighting career with the London Fire Brigade where he served for 18 months before emigrating to Melbourne in 1969. After working various jobs he joined MFB on 6 July 1973 and has served the Brigade and community for the last 41 years. MFB records show Paul as always being on 'B' Platoon and that he served at FS1, FS31, FS39 and FS10. Promotion saw him transfer to the Fire Protection Department where he served for many years. As an ACFO Paul has served in Southern District, Emergency Response Management and, most recently, as the ACFO South East Metro Region – Director of Operations.

His passing is a massive loss, not just for MFB firefighters and the corporate staff who worked with him, but also for the Firefighters Charity Fund. Paul was a member of the steering group that developed the model of the fund and then became a founding and current committee member. His work with the Firefighters Charity Fund is a legacy that will endure for the next generations of firefighters.

Paul will be fondly remembered by all those that he worked with, particularly for his good humour and his sharp wit, but most importantly for his support for his fellow firefighters.

Paul's funeral was held at Mornington Race Club on Friday 24 October and was attended by more than 500 people. He leaves behind his wife Ann, daughter Tasha, and son Cameron.

THE LATEST ROSENBAUER PANTHER HAS BEEN ANNOUNCED

Rosenbauer, a leading fire industry supplier, will bring a new generation of its Panther ARFF crash tender onto the market. The latest Panther 4x4 and 6x6 models will make their debut next year at the Interschutz Trade Fair in Hanover, while the launch of the Panther 8x8 version is planned for 2017.

Design continues to play a decisive role with regard to the next Panther generation. 'Indeed, the self-assured form language of the predecessor has been retained and accentuated. Clear lines and a freshly designed front section are all set to emphasize the Panther's dynamic image,' said Rosenbauer's Gerda Königstorfer.

'The front section of the truck provides the crew with an improved panorama view from the cab. The lighting system not only highlights the design accents, but also contributes to vehicle safety. In addition, the newly developed, FEM-optimized cabin cell offers greater crew protection and is being subjected to extensive crash testing in order to document passenger safety,' she continued.

The instrumentation layout in the cockpit has been rearranged and in general, functionality and user comfort levels have been raised considerably.

'Apart from the superstructure and the cabin, the extinguishing technology systems has also been upgraded. Pumps, proportioning systems and monitors are further enhancing firefighting performance of what is already the world's most powerful ARFF truck' concluded Gerda.

NEW CBRN TRAINING PARTNERSHIP

CBRN Academy/Swedish Rescue Training Centre AB and Lutra Associates Limited form partnership offering strategy, doctrine and equipment advice and realistic training for CBRN, hazmat, civil and disaster relief.

The new CBRNe training partnership capitalises on the skills of the CBRN Academy (SCP)/Swedish Rescue Training Centre (SRTC) based in Skövde Sweden and Lutra Associates of Stalbridge (Dorset, UK). The partnership is designed to assist organisations better understand, prepare and deal with the problems caused by CBRN, hazmat, civil and disaster relief.

The new team will serve government, civilian emergency services, the military and private corporations and individuals alike. Physically centred on the highly qualified instructors and outstanding and extremely realistic SRTC's training facilities near Skövde in Sweden and making use of Lutra's worldwide network of instructors, and subject matter experts, the new partnership will be able to offer a single provider of these capabilities across the wide and diverse spectrum these subjects represent. The partnership's specialists include current and former members of government laboratories, armed forces, civil rescue services, academia, law enforcement organizations, procurement agencies and the medical profession as well as noted strategists and commentators on the subject.

SRTC and CBRN Academy have worked in partnership for more than three years.

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Fire Ninja & firehouse pranks

Say those two words to anyone that has been in our industry for a while and you are guaranteed to start up a conversation and generate some memories. But there's more to the story, so let's start from the beginning. Why do we prank?

We prank because our job is to deal with people's worst days. Think about it. You or I may have a really bad day, but how many people do you know that make a living out of dealing with people's worst days? Your house burns down. Your family is in a car crash. You get your hand stuck in a sausage maker… We are the people that show up to deal with those bad days, so we need a coping mechanism.

Pranks, firehouse shenanigans, dark humour – all are part of that coping mechanism. Throw in the fact that a theme of bonding/acceptance generally accompanies these activities and you really see why firehouse pranks have a long and colourful history in the emergency services.

With that said, it needs to be understood that the society that we live in today has changed a lot since the 'good old days'. Pranks that might have seemed harmless and well intentioned then might now be interpreted as inappropriate or even illegal. It's a fine line and, as a fire officer, it's a delicate subject to approach. I know the value of these types of activities and I'm confident that if done correctly and with proper forethought, they can add strength to individual teams and to the department as a whole. But due to the world in which we find ourselves today, I would recommend the following guidelines be reviewed and the 'prank idea' be measured against them.

A prank should never interfere or delay with our responsibility to respond quickly to an emergency. While duct taping a heavily sleeping firefighter into his bunk may seem like a hilarious prank, if that responder can't get up when the bell rings, what effect will that have on your response?

A prank should never involve a responder's personal protective equipment. Sand in boots, shoe polish around the facemask, tying a knot in a bunker coat liner's arm. Great stuff, right? But remember the context here. If the bell rings, people are relying on us to respond quickly. Not preventing an avoidable delay is a betrayal of the trust that society awards us. Not to mention the fact that we are trained to enter environments that are IDLH (immediately dangerous to life and health). If your lifesaving equipment has been tampered with, that might be funny in the station, but how funny is it as you enter a hazardous environment? You've really got to think these things through.

Those are the easier guidelines in reference to our ability to do our jobs. The more difficult ones revolve around more nuanced issues.

Obviously, we never want to do anything that would get someone hurt, but have you considered how embarrassing the prank will be for the victim? Have the filters of race, gender and political correctness been considered? It's not easy, but as I pointed out earlier, I still think there's value to be achieved. Here's a great example that proves the concept.

At my first department, we had a firefighter that was known for speeding. Early one morning, we snuck out to his truck and attached a cardboard box to his rear bumper with a label that said: 'Free kittens!'. As he headed home that morning after shift, he had no idea that he'd be raising eyebrows all the way home.

The reward came on our next rotation, when he told us the story of how cars had honked and waved at him for miles, causing him to slow down when he'd normally be speeding home. But even funnier, was when a police car actually pulled him over and he was intently set on telling the officer that he hadn't been speeding. If we could have only been there to see his face as the cop walked to his driver's door with an empty cardboard box!

No risk to operational readiness, no tampering with personal protective equipment, no racial, gender or political implications. Just a simple, well thought out prank that brought us all together in laughter and united us as a family.

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JANUARY 18-20, INTERSEC, DUBAI INTERNATIONAL CONVENTION AND EXHIBITION CENTRE, DUBAI, UAE

The Middle East and Africa's fast-growing security market has been underlined by the anticipated double-digit growth of the 2015 edition of Intersec, the world's largest trade fair for security, safety, and fire protection.

The global demand for security equipment is estimated to grow 7% annually, reaching US$117 billion by 2016, with the underdeveloped Asian, Eastern European, and Middle East & African markets leading the charge.

The 17th edition of Intersec is setting the pace for market, as organiser Epoc Messe Frankfurt said the event will register a 15% growth in exhibition space year-on-year.

Intersec will feature more than 1,300 exhibitors from over 50 countries, including 300 newcomers.

With two additional exhibition halls booked for 2015, the three-day event focuses on the five core areas of commercial security; information security; fire and rescue; safety and health; and homeland security and policing.

'The Middle East and Africa region continues to emerge as a key security market, and Intersec functions as the leading event that showcases the current trends prevailing across the globe, while presenting vital indicators of future developments in the industry.

'With a footprint that spans the entire region and active participation from a majority of the leading international players, Intersec is today a must-attend event for the global security, safety, and fire protection communities,' said Ahmed Pauwels, CEO of Epoc Messe Frankfurt.

Intersec continues to enjoy widespread support and cooperation from Dubai Police and Civil Defence authorities, who have played an integral role in supporting and guiding the show's development over the years.

The fire and protection section has recorded the largest percentage growth year-on-year, largely due to UAE-based Founding Sponsor NAFFCO, which booked an entire hall for 2015.

For more information visit: www.intersecxexpo.com.

JANUARY 21-22, AIRPORT FIRE OFFICERS ASSOCIATION CONFERENCE, RADISSON BLUE, DUBLIN AIRPORT, DUBLIN, IRELAND

The Airport Fire Officers Association's annual conference is aimed at aviation fire professionals, blue light services, and anyone who plays a role in emergency planning at airports.

Sponsored again by Terberg DTS, the event will see 160 emergency professionals coming together in Dublin to discuss the latest developments in aircraft rescue firefighting, emergency management and incident command at airports.

The world class conference programme kicks off with a welcome from Alisdair Couper, MD of Terberg DTS as the main sponsor, and Ed Anderson the Chairman of the Airport Operators Association will deliver the keynote address, by which he will set the tone for the event to follow.

Neil Gray from the CAA SRG and Graham Day from London Heathrow will update the attendees on the latest CAA/EASA rules and legislation, after which Dale Carnes from the San Francisco Fire Department will take over the helm to talk about the Asiana crash that took place at San Francisco Airport in July 2013, where two people were killed – of which one was run over by the responding crash tender.

Other highlights include presentations from the CAA's Phil Williams and Dave Sloggett on current terrorism threats.

Day one is closed off by the annual gala dinner, which will take place in the evening.

Day two kicks off with a presentation from Gary Perkiss from the East of England Ambulance, who will tackle multi-agency cooperation between the AFRS, police, municipal fire brigades and HART (Hazardous Incident Response Teams) during mass-casualty incidents at airports and surroundings. Frederic Coombes from Airbus will be covering how Airbus is redesigning its aircraft after a maintenance failure caused a fire on a BA flight from Oslo in 2012.

The conference is closed off by two sessions on improving leadership and management, delivered by a lifestyle specialist and a military expert from Sandhurst.

People who would like to attend the 2015 AFOA conference should email Mrs Susan Clifford at accounts@afoaweb.co.uk, or visit: www.afoa.co.uk.

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WORLD CHAMPIONS

THE TEAM FROM HAMPSHIRE FRS WAS CROWNED WORLD EXTRICATION CHAMPION AT THE BIGGEST ROAD TRAFFIC COLLISSION AND TRAUMA COMPETITION ON THE GLOBE. THE WORLD RESCUE CHALLENGE 2014 TOOK PLACE OCTOBER 9-11, AT THE FIRE SERVICE COLLEGE IN MORETON-IN-MARSH, UK.

The top 28 extrication and trauma teams from all over the world took part in this year's challenge, including, Spain, Romania, Germany, Portugal, UK, USA, Ireland, Australia, Italy and many other countries.

After battling against teams from all over the world in road traffic collision scenarios, the Hampshire (UK) team took the winner's title. County Carlow, Ireland, were the runners up and the team from Valencia, Spain, took third place.

The Hampshire team also brought home the titles of Best Overall World Extrication Team Leader, Best Overall World Extrication Team Medic and Best Overall World Extrication Limited Tools Challenge. The team took second place in the challenges for Best Technical Team and Best Trauma Team, beaten by the team from Humberside Fire and Rescue Service (UK).

Hampshire's Extrication Team Leader Lee Havey, who took the title of Best Overall World Extrication Team Leader, said: 'It is absolutely fantastic to take away the winner's title from the World Extrication Challenge. We are very confident in our firefighters' abilities when they attend road traffic collisions and now that we have been crowned world champions, it just shows that what we do, we do very well.'

The 16th World Rescue Challenge saw teams taking part in a number of multi-vehicle road traffic collision scenarios where casualties needed rescuing – some of which had deteriorating conditions. Contestants also had to show experience of using all types of rescue equipment used in extrications.

Hampshire's extrication team are the current UK champions in extrication and have previously held the winners' trophy at the World and European championships during the team's 28-year history. The Hampshire team was made up of: Watch Manager Lee Havey (Team Leader/Incident Commander), Firefighter Steve Morris (Medic/Trauma), Firefighter Gary Cross (Trauma), Watch Manager Trevor Griffin (Technician and Second Medic), Firefighter Martin Gritt (Technician), Firefighter Brian Saunders (Technician) and Crew Manager Paul Jarrett (Technician), who are all pictured above.

The team from Blackheart MDFR in the USA also took part in the challenge.

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Are we moving too fast?

ERIC J RICKENBACH ARGUES THAT RESCUERS SHOULD TAKE MORE TIME TO ASSESS PRIOR TO MAKING THE FIRST CUT AT VEHICLE EXTRICATION SCENES.

'I feel the need. The need for_____.'

Most people can quote this famous line from Tom Cruise's 1986 hit movie Top Gun. But for the purposes of discussion, I left off the last word. I did this because when it comes to today's vehicle extrication process we need to think about what is the best word (or words) we should be putting there. Maybe 'speed' is not the proper word in the vehicle rescue environment today. Maybe we should be thinking that 'slower' may be better?

What sparked my thoughts on this topic was a recent conversation I had with a long-time friend and fellow rescuer. We were talking shop and the conversation turned to our mutual concerns related to the increased number of battery-powered hydraulic and other time-saving rescue tools that are out in the streets today.

Before I go any further, this is not intended to be a knock on any of the rescue tool manufacturers. They have developed various tools to respond to the market demand of their customers. Today, we have some of the best tools for extricating trapped victims, and we continue to see improvements and new developments that will aid rescuers in their job.

Preparing 'old fashioned' extrication tools for action gave rescuers time to assess and identify hazards. Today's modern tools are ready to go in seconds. Photo credit: Jesse Shutt.

However, one concern I have with all of these advancements is whether we are becoming too fast at vehicle extrication scenes.

Before the advent of many of today's newer extrication tools, a crew arriving at an accident scene needed a few minutes to get their hydraulic and/or other tools assembled and operational. Depending on their organisation's equipment set up and standard operating guidelines, they had to assemble the tools, pull off the hydraulic hoses, electric cords, or compressed air supplies and move everything towards the vehicle in preparation to move metal. During the time it took to set up the tools (hopefully) the scene was being properly assessed, identified hazards were being controlled, and the vehicle itself was being stabilised and assessed. Rescuers had a few moments to mentally evaluate the tasks and think about how best to approach the scenario.

Fast forward to today. Rescuers can pull into the scene and come right off a rescue truck and run up to the vehicle with fully functional untethered tools. In a matter of seconds, they can be turning a vehicle into Swiss cheese. This is great from the speed point of view and some will argue that with today's staffing issues this is necessary. I have to disagree.

At vehicle accidents today, rescuers need to slow down. What? Yep, I just said rescuers need to slow down. This statement obviously goes against everything you have ever been taught in the past.

Modern vehicle technology is one reason why we need to slow the vehicle rescue process. Today, I still see far too many times when rescuers walk up to a car and blindly start cutting, bending, prying, etc. This occurs whether they have traditionally powered tools or battery-powered tools.

Don't believe me? Get a car to practice on and simply tell your crew to go out and cut it apart. Now watch and see how

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WARWICKSHIRE FRS EQUIPS FRONT-LINE TRUCKS WITH A NEW VEHICLE STABILISATION SYSTEM FROM PARATECH

Following extensive trials, Warwickshire County Council's Fire and Rescue Service (UK) has become the first UK brigade to acquire the new Paratech Supporter vehicle stabilisation system from Vimpex. Twenty-five sets were purchased allowing a pair of Supporter struts to be carried on all front-line vehicles.

The Supporter brings a whole new level of safety and versatility to vehicle rescue and extrication and allows crews to safely stabilise not only passenger vehicles but also trucks and HGV tractor units. The Supporter is fully rated at its maximum of 9 tonnes through the entire stroke length. This means that rescuers are no longer left calculating strut integrity during a rescue and can instead apply the Supporter knowing that it is working well within its capabilities.

Technical Support Officer Graham Vann-Turner of Warwickshire FRS commented: 'Paratech's new Supporter gave us a real dilemma when deciding which strut to purchase to refresh the fleet. As soon as we first used the new Paratech system we were keen to put it on trial alongside the other contenders. It fast became clear that the Supporter was the best choice for us with respect to ease of deployment and safety features.'

Vimpex is the UK distributor for the Paratech range of stabilisation, air lifting and forcible entry products. Paratech's products are available over the entire globe through the company's network of distributors

your crew performs, maybe even video the activity. Do they assess the vehicle completely? Are they ensuring that the vehicle has been properly stabilised and fully depowered? Have they identified SRS locations? Or are they just blindly cutting, bending, prying, breaking, etc?

If rescuers are not properly assessing the vehicle for alternative energy components, supplemental restraints, or other vehicle components before actual disentanglement and extrication efforts begin, could this potentially affect their operations? If vehicles are not properly assessed, something bad will happen – maybe not this rescue or the next, but eventually it will.

Another similar reason for us to slow down is that cars are getting tougher to cut. By now, hopefully every rescuer has heard about ultra-high strength steels, and the difficulties they pose for rescuers today. Some of the tried and tested techniques for moving or cutting metal no longer work. Many times today, rescuers have to resort to alternate techniques to affect extrications.

If rescuers are coming right off the truck and going to work cutting or bending, have they taken the time necessary to analyze various options? In some cases, doing A before B works, but in many more cases today plan C works better than plan B, but only if you purposely skip plan A. If crews are not evaluating the damage and deformation to the vehicle before they begin working they may end up having to work harder to complete the extrication in the long run.

The final (and what should be the most compelling) reason to slow down is our victim(s). I know that that comment flies in the face of the 'golden hour' concept (or 'golden period' if you are so inclined). We have literally been taught since the 1970s that we need to rip the victim out of the car, perform an extensive amount of on-scene interventions, and then literally airmail [sic] them to a trauma centre within 60 minutes of an accident or they are going to die.

Fast forward to today. Have you looked at the currently emerging trends in trauma patient management? If no, maybe you should. Then think about this; are we actually seeing as many 'true trauma' patients at vehicle accidents today as we did in the past? How many times are we just popping a door so someone can get up and out of the vehicle and ultimately refuse any medical care or other assistance?

Today we should be assessing and treating our patients based upon their injuries, not a pre-determined notion that everyone in a car accident will die if we do not rip them out of a car as quickly as possible. We need to stop and take the appropriate amount of time necessary to complete a proper assessment of the patient, 'before' we go cutting, bending or prying. If we do not, how do we actually know what rescue evolutions are necessary based on the patient's condition. Are we going to remember to do this when we go running to the car with tools already in hand?

Now I know some of you are thinking you do not have to worry about that since you are not doing patient care. 'That is the EMT's or paramedic's job.' If that is your opinion, you need to seriously re-evaluate whether you want to be a rescuer or just somebody that wants to play with tools.

At this point, you are asking, or probably just assuming, that 'the author has lost it'. I am telling you to slow down. This completely contradicts everything you have probably been taught about vehicle extrication. I will be the first one to agree that time is still of the essence, however we need to take the appropriate amount of time to properly assess and evaluate the scene, the vehicle, and the victim before we perform any significant evolutions. Failing to do so could cause us to miss critical assessment and rescuer safety points, and ultimately have detrimental or even disastrous effects on the entire rescue operation.

As I alluded to earlier in this article, we have some of the best and most efficient tools available to us today, the key is using them in a manner that creates the safest and most efficient extrication scene for both rescuers and victims.

This is not about a race; it is about patient-oriented vehicle rescue.

ABOUT THE AUTHOR

Eric J Rickenbach ("EJR") is a 30-year veteran of the volunteer emergency services from Rehrersburg, Pennsylvania (USA). He is a rescue instructor specialising in vehicle rescue, with particular interest in new car construction, energy, and safety systems. In addition to teaching and research, Eric is active in several vehicle rescue-related committees.

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LUKAS HAS LAUNCHED THE SECOND GENERATION OF ITS EDRAULIC RESCUE TOOL RANGE. KURT PLEINER FROM LUKAS EXPLAINS THAT THE LATEST SERIES OF EQUIPMENT WAS DEVELOPED FOLLOWING FOUR YEARS OF FIELD TESTING AND TRIALS BY FIREFIGHTERS, WITH THE OUTCOMES BEING INCORPORATED INTO THE NEW RANGE.

'We aim to provide more power with a lower weight,' said Kurt. 'Our performance data reveals that most electrical hydraulic tools are now even stronger than comparable hose line tools. We have designed the new encasing of the equipment so that it is more dynamic, while also being smaller and more compact. We have improved the LED lighting so it is better embedded into the casing so it will illuminate the scene of the incident better.'

The new Edraulic range consists of several types of tools. Firstly, the SP 310 E2 meets the force requirements of the BS class tool Euro norm. It weighs 23.9kg with its battery, and offers a spreading distance of 720mm. The SP 310 is equipped with the tip quick-change system and comes with universal tips. There is also a Diamond Tip package which can be purchased additionally.

'The SP 300 E2 Edraulic spreader has undergone significant improvements,' said Kurt, 'especially with regards to its weight. It now provides an optimal mix of strength and easy opening and handling.' It weighs 19.9kg (excluding battery) and comes with Diamond tips.

'The previous S 700 E2 cutter was already unmatched, but it is now raising the bar even higher. The cutter is at the top of its class, and is 10% lighter than before, weighing only 21.8kg (excluding battery). Its blades have been redesigned for maximum strength and improved handling, while the opening has been increased up to 192mm. The tool is able to cut round material up to 44mm,' commented Kurt.

Its little brother, the S 311 E2 cutter, weighs only 17.7kg (excl. battery), but it achieves the highest EN cutting class standard H, with a round bar cutting capacity of 34 mm.

A new combi-tool is replacing the SC 350E, and the new model is a battery version of the hose line model SC 357. Kurt explained that the SC357 E2 has increased cutting capacity, and it has achieved the 'all 7' NFPA standard (classes A7/B7/C7/D7/E7). The power has also been increased, but the weight hasn't, as it is still 1kg lighter than the older model, weighing only 18.8kg (excl. battery).

Other changes include: a reduced weight for the SC 250 E2 combi tool from 16.9kg to 15.6kg, and Lukas has also doubled capacity in its high-performance rescue battery 5AH. Kurt explained that this means that it provides twice the operating time during real incidents. 'We have also significantly improved the ergonomics of the battery change. Additionally, the charge indicator is now positioned so that it is visible when the battery is still in the encasement. All batteries are backward-compatible, so that they can be used with first generation E-draulic tools.'

Lukas has also designed a new power supply cable. It is now 10 metres long, split into 2 x 5 metres, with one half being integrated on the input side of the filter box and the other half on the output side. The extra length of the cable makes the power supply cable a bit heavier than before, but the larger radius of movement is a compensating factor, says Kurt.

The filter box is now also made out of aluminium and has been marked with signal colours, so that it is highly visible when placed on the ground. Furthermore, the electrical connecters have been designed in a more robust way and have been classed as IP 65, so the unit is as good as waterproof. Existing power supplies can be utilised with the Edraulic 2.0 generation as well.

The updated Edraulic range from Lukas has an overall lower weight than its predecessors.

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Creating a definition for Rapid Intervention

Rapid Intervention is a term that is often used when talking about extrication, but it seems to mean different things to different people and is often confused with Rapid Extrication (the rapid removal of a casualty from a vehicle for medical or safety reasons); something very different, writes Ian Dunbar, Rescue Consultant for Holmatro.

There is little (if any) reference to the concept available in literature or standard operating procedures and it is not reflected in the Team Approach to road traffic collisions. As the use of Rapid Intervention is increasing as a concept, it seems entirely appropriate to offer a definition, apply some rationale and introduce a method that assists with pre-planning, training and implementation.

Ian Dunbar, Rescue Consultant for Holmatro, was also present at the World Rescue Challenge 2014 at the Fire Service College.

The Team Approach to Rapid Intervention – a definition

'A two-stage response to vehicle extrication initially using specifically chosen resources to establish a safe system of work, prior to gaining access to the patient. The arrival of additional resources facilitates extrication with the completion of the Team Approach.'

Some fire and rescue services provide a two-stage attendance to road traffic collisions. The Rapid Intervention response will usually arrive in the form of a smaller, often specially designed vehicle which carries strategically chosen equipment, including hydraulic rescue equipment (eg with combi-tools) and a reduced number of personnel. Their role is to ensure that a safe system of work (strategic planning) is established before commencing the Team Approach and gaining patient access on scene. The Supplementary Response Team provides support with additional personnel and equipment (dedicated cutter/spreader and ram) to complete the extrication.

From this model we can clearly see:

- The term 'rapid' refers to the time taken to arrive at the incident due to the use of smaller, more agile vehicles and not the actual time taken to gain access to the patient (or to extricate them).
- There is a need to commence the initial phases of the Team Approach with fewer personnel than it was originally designed for (ie 5/6 personnel on scene).
- There is a clear distinction between the tools and equipment required for both phases of attendance.
- The two-stage response actually splits the Team Approach, based on personnel and equipment that is likely to be on scene initially.
- We are still endeavoring to extricate in 20 minutes or less.

Smaller vehicles, less equipment

The Rapid Intervention response will usually mean there are less tools, equipment and personnel available in the early phases of the rescue. Despite this, the same rules still apply and the Team Approach should be followed as far as

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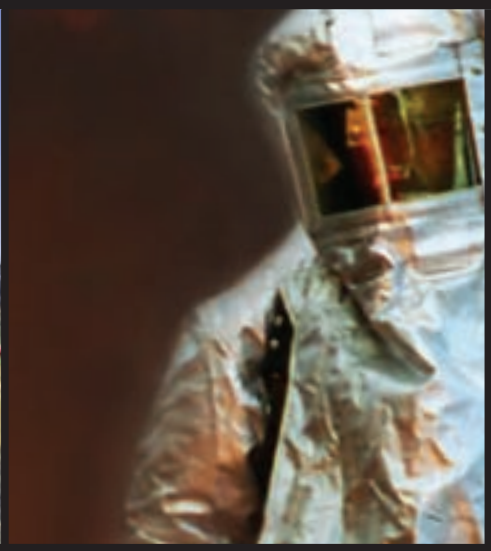

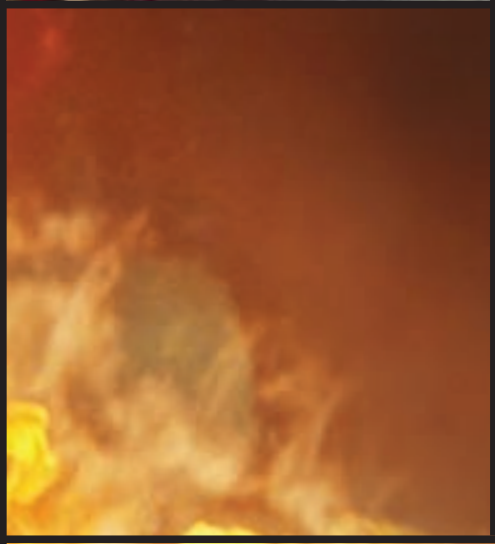
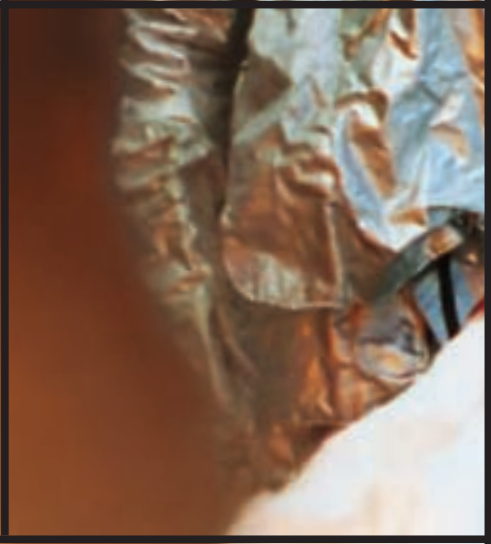

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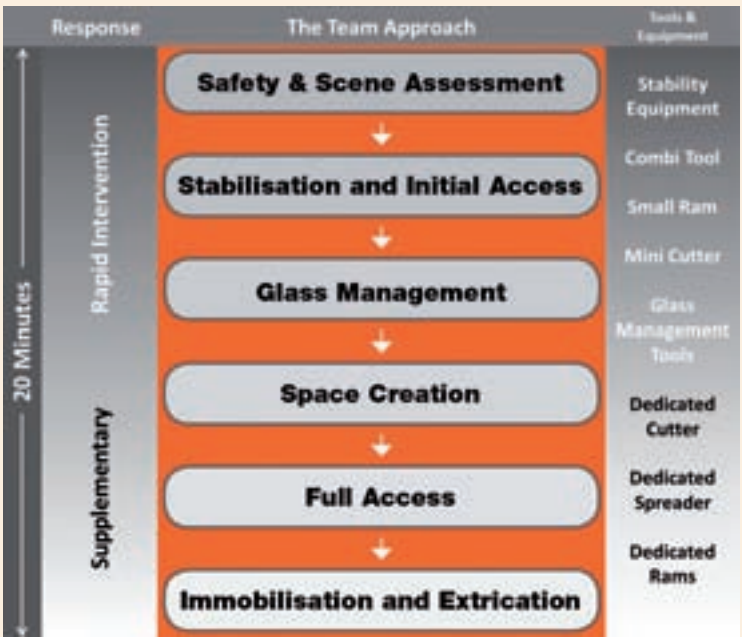

Above: the Team approach is a method used by many rescuers worldwide when they attend the scene of a crash. This offers a realistic training scenario, keeping in mind all the steps of a well-coordinated extrication. Right: an example of a rapid intervention vehicle.

practicable with the resources available. Due to the use of smaller vehicles the choice of tools and equipment for the rapid intervention attendance is crucial; size and weight is important whilst still ensuring that you have the necessary equipment to perform the required tasks. We know that once stabilisation has been completed the main priority is gaining access to the patient. This allows a full primary survey to be completed and the degree of entrapment to be established: vital information to formulate the extrication plan.

In terms of hydraulic extrication equipment, the combi tool is ideal for rapid intervention as it provides both spreading and cutting capacity and will allow the rescuer to gain entry through doors (if the vehicle is on its wheels or its roof) and through the rear hatch (if on its side or roof). Of course there is now a wide choice of combi tools with varying power sources ie battery powered, hand powered or standard hose/pump configuration (with the ability to also utilise a battery powered pump). Another advantage of combi tools is that they will save weight and can weigh as little as 8.2kg. Other equipment may include a ram for space creation and a minicutter which is ideal for removing pedals and head restraints. In addition to this, smaller assist tools are required to complete tasks such as peeling and revealing (removal of interior trim) prior to the space creation phase.

Dynamic on the scene

The implementation of the concept as described above means that rescuers have to be aware of the role they play in the Rapid Intervention response and should pre-plan and train accordingly. The splitting of the Team Approach allows crews to develop a strategy and train for a two-stage attendance; it provides a clear illustration of what is expected by the Rapid Intervention and Supplementary crews.

Although the approach is identical to a standard attendance (ie the Team Approach) the dynamic on scene will be subtly different due to reduced numbers of personnel and a smaller equipment set. The on-scene objectives of the Rapid Intervention response should be fully communicated and understood. If the incident is more complex (multiple casualties, multiple vehicles or restricted access) then it may be that creating a safe area, performing stabilisation, gaining access and establishing casualty contact is all that can be achieved prior to the Supplementary crew arriving. It is critical that incident commanders identify, prioritise and allocate their limited resources appropriately (this should also include a triage where there are multiple casualties involved). When extra personnel do arrive, safety critical information along with any plan that has been formulated must be communicated and the crews must immediately 'gel' to allow seamless integration and timely progression of the extrication.

Remember that just like with any other incident, an initial appraisal of the scene may mean that additional resources are required (in addition to the oncoming Supplementary response) and these should be ordered as soon as possible. Conversely, it may be that due to the time critical nature of the patient's injuries the Rapid Intervention crew must extricate immediately in order that the appropriate medical interventions can be performed. Finally, the concept should be integrated into multi agency training to ensure the most effective on-scene working relationship with police and ambulance services.

Conclusion

Rapid Intervention is often talked about but rarely defined. It is becoming more common in many parts of the world and it provides fire and rescue services with a different option for deploying personnel and equipment whilst at the same time changing the type and size of vehicle that responds in the first instance. This change often calls for small, lightweight yet powerful tools, and rescuers must be familiar with their use for gaining access to the patient. The Team Approach still applies although Rapid Intervention means fewer people and equipment on scene in the early stages of the rescue; this requires a subtle adaptation of our thought process and crews must become familiar with the change in dynamic this approach brings. They should be aware of the clear objectives of the Rapid Intervention response, and incident commanders must identify immediate priorities; brief the crew accordingly; and oversee the arrival of additional resources to ensure continuous working.

Finally, it must be remembered that such a model must incorporate multiple agencies on scene and it cannot extend extrication times – 20 minutes (or less) is still the aim.

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The 'dos' and 'don'ts' of swift water rescue

ASSISTANT CHIEF FOR FIRE AND EMERGENCY OPERATIONS AT WEST POINT MILITARY ACADEMY (NY) JACOB MCAFEE OUTLINES A DETAILED APPROACH TO SWIFT WATER RESCUE OPERATIONS.

Swift water rescue is one of the most challenging and physically demanding operations rescue personnel can face. Water in itself can be a daunting enemy. As a rescuer you must at all times respect the water, its strength, and inherent dangers. Although training for rescues in a water environment have increased, much more is yet to be done. Many organisations don't see the need for swift water training if their response area doesn't have a large fast moving body of water. Keep in mind; swift water is as simple as it sounds; any amount of water running downhill at speed. Don't be fooled – as the water's volume and speed increases it creates its own set of rules and is littered with traps which are difficult to see for the untrained eye. These traps can easily take the life of any 'would-be' rescuer without the proper awareness, training, and equipment.

Swift water rescue crosses into other technical rescue spectrums that are ultra-high risk as well, including advanced rope skills and high angle rescue. If you know your department only has minimal personnel trained in swift water or advanced rope, be prepared to request those technical teams. Personal protective equipment (PPE) is specialised and mandatory. No rescuer should get within 10 feet of the shore without a personal floatation device (PFD). And absolutely no bunker gear. Some of the most common mistakes resulting from rescuer injury or death result from inadequate PPE and a lack of swift water hydrology, strategies or tactics. Here are some dos and don'ts of swift water rescue;

The peak of the downstream 'V' indicates where rapid water is free of obstructions.

Do

Wear a PFD (Personal Floatation Device) within 10 ft of shore
Have a plan A, B, and C
Always have downstream safety teams
Deploy upstream spotters
Use the strategy with the lowest risk to your personnel
Use the right equipment
Always remember your priorities.

Don't

Put your feet down
Count on the victim to be cooperative
Tie a rope around a rescuer
Never use a rope at a 90-degree angle
Stand in the bight of a rope
Do not wear fixed brim helmets
Lose the victim
Modify or change your PPE outside of what it's designed for.

Let's get into some swift water basics; I will outline basic PPE, swift water hydrology, strategies, tactics, and incident command structure. Personal protective equipment falls into three basic categories; thermal protection, physical protection, and flotation. Here is some of the basic and recommended PPE for swift water rescue.

- Helmet; make sure you use a water rescue helmet (nore fire service helmets).
- Personal flotation device (PFD)– preferably US Coast Guard Type III. Ensure PFDs have a sewn-in chest harness with a quick release buckle for the tether. Chest harness should have an attachment point on the back near the shoulder blades to tether a rescuer to rope, and a release that can be operated with one hand in fast moving water.
- Knife: knives are critically important when working with any type of rope or lines in water. Any entanglement issues or malfunctions with your quick release buckle might necessitate the need of your knife to save your life.
- Visibility is key so reflective strips on your PPE, chem lights, and strobes will help you remain visible.
- Clothing: no bunker gear! Water rescue clothing typically consist of a wet suit or a dry suit depending on situation and conditions. Wet suits use a layer of water trapped

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between the suit and the body that creates an insulation barrier for the wearer to keep warm. It does not fare well out of the water, however, as the suit leaves the rescuer open to environmental conditions such as wind and temperature, possibly causing hypothermic conditions. Dry suits keep the wearer dry and are sealed by rubber gaskets at the neck, arms, and legs accompanied by a water proof zipper. Warm clothing will need to be worn in the dry suit as thermal insulation. Dry suits may be better used in contaminated water and to keep the rescuer dry. Because of the heat-retaining properties the rescuer can be subjected to overheating in labour intensive operations. Water robs the body of heat 25% faster than air of the same temperature.

- Foot protection; normally consists of neoprene water booties, sneakers, a non-slip boot, or swim fins. Swim fins may greatly increase the speed of the rescuer in the water but their use takes training and frequent use to be an advantage.
- Throw bags are available in many lengths and styles; choose what works best for your team. Throw bags contribute to almost all styles of water rescue. Having one and knowing how to use it makes you a more dynamic water rescuer.

As with all disciplines that the modern fire service faces, swift water rescue finds its foundation in a series of basic skills sets. The stronger and more proficient we are with our basics the bigger and better departments can build your team. Two of the most embedded basics that often get overlooked are swimming and the use of throw bags. Swimming is the core of water-based rescue. Personnel need to be comfortable in the water, able to free themselves and swim clear of obstacles.

Too often the ability to swim and the physical challenge that comes with it is believed to be replaced with PPE selection.

Swift water crosses into advanced rope rescue skills. Some common technical rope skills during a swift water rescue might include high-angle rescue tactics for cross canyon/high angle pickoffs, tension diagonals, and boat operations for in-water contact rescues.

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Swimming should be practiced in varied conditions, with different techniques and while wearing full PPE. Throw bags are often looked at as a simple concept and therefore deemed simple. This is not the case! Throw bags open up many options to rescuers. They can quite literally be our lifeline at times. We as rescuers need to know how to make our throw bags work for us and not against us.

Techniques like belaying a victim from our downstream hand allow us to keep our footing while not rotating our whole torso as the victim floats past us. Remember that a victim floating in a moving body of water is moving the same speed as the water. So the proper placement of a thrown line is at and through the victim ideally traveling over their head and falling on their shoulders. We don't want to lead or trail the line making the victim unnecessarily have to swim. These skills and others like them are they key to an effective rescue. Training on the basics and being proficient in these skills will allow us to quickly determine the tactics that work best for our team during a rescue situation.

Rescuers need to be planning two steps ahead so that they can immediately move on to the next step if the first doesn't work.

One thing that always amazes me is the number of ways swift water challenges a rescuer. Swift water is relentless and powerful. There is no break while in the water, and the consistent and relentless power is always working against you. Knowing how to move in the water and how to counter its offensive is critical knowledge for anyone attempting a water rescue. Maneuvering in the water is all about angles, body position, and knowledge of basic hydrology. When swimming in the current always use a ferry angle.

- When swimming against the current or to move from one object to the other swim with your body positioned at a 45 degree angle to the current in the direction you want to swim. This will essentially cause the current to push you in the direction you're facing as it hits the side of your body, otherwise you're fighting current the whole way and you will just exhaust yourself.
- If you are going downstream you will use angles as well. When floating in the water always keep your feet up. One of the most common entrapments in the water is from people getting their feet wedged in the water's floor. Swim with your feet downstream, toes up, arms out to paddle and breath at the bottom of a swell not the top.
- While floating you will use your legs as rudders and your arms to aid steering or slow descent. You will position your body at a 45-degree angle with your feet pointing in the opposite direction you want to travel. If you want to go right your body will be at a 45 with your feet pointing left.

Common water features and hydrology include:

- Helical flows: corkscrew motion spinning off the banks downstream, which push objects mid current.
- Downstream 'V': free of obstructions, safe route down river
- Upstream 'V': avoid upstream Vs, it could be difficult to get back into the current
- Strainers: avoid strainers at all cost. These are objects in the river that water flows through but objects do not. Note: if you have to negotiate a strainer, face it, extend your arms fully and push your body over. If you get into a strainer it's almost impossible to get free.
- Eddy: a calm area behind an object. An eddy is created by water flowing around an object. Safe haven.
- Vertical drops: these can be a dangerous entrapment issue for rescuers because of the vertical feet down position it forces rescuers in. To avoid this put your knees to your chest and ball up when going over a vertical drop.
- Holes/keepers/low head dam: as the water dives down over an obstacle it causes a recirculating current and flow back up stream. Common place for swimmers to get trapped.

Just as with any incident, gathering of information, size up, and assessing the risk will help us determine the tactics we should take. Typically swift water tactics are based on the level of risk to the rescuer and the probability of a survivable victim. Our #1 incident priority on a swift water incident is life safety, and the safety of our personnel should be at the top of that list. Normally, water rescues are broken down into these categories; shore-based, boat-assisted, boat-based, in-water contact and helicopter rescues.

Tactics in order of lowest risk to the rescuer:

- Talk (shore based)
- Reach (Shore based-hose, pole, etc.)
- Throw (Shore based-throw bag)
- Row (boat assisted/boat based)
- Go (in-water rescue)
- Tow (boat-assisted)
- Helicopter.

With water being such a dynamic environment, we have to be prepared to progress our tactics quickly. We need to be planning two steps ahead and immediately ready to move to the next step, if our first doesn't work. On the command side, this means always having additional assets moving towards the scene. A rope team, helicopter and secondary swift water team could be a big help if our rescue begins to deteriorate. As for operations, we need to be willing to advance in tactics and not get stuck in the tunnel vision of our first choice if it doesn't work. Having a rescue plan for foot entrapments and strainers before they happen is a must. Tethering our rescuer as he goes to 'throw' enables for a quick transition into a 'go' if necessary. We need to be as dynamic as the environment

we're operating in.

As I mentioned earlier, swift water crosses into advanced rope rescue skills. Some common technical rope skills during a swift water rescue might include high angle rescue tactics for cross canyon/high angle pickoffs, tension diagonals, and boat operations for in-water contact rescues. Almost everything done during a swift water incident (outside of boat-based and unassisted in-water rescue) involves some type and level of technical ropes skills. Remember, whenever you transition from swift water to another technical discipline, a whole new set of rules can apply. For example, hard tethering a rescuer without a quick release device is a definite 'don't' in swift water rescue, but it is a definite 'must' of high angle rescue. Make sure you have qualified competent technicians on scene to make those determinations.

A strong incident command structure will be needed quickly to be successful. Many river-based rescues could span miles before you realise it. A typical incident command structure can vary widely but here is a common structure. IC, safety, public information officer, liaison officer, search group, rescue group, EMS group, rigging group,

downstream safety, upstream spotters. It may be necessary to create divisions because of the large geographic area it may cover, as always expand or take away as needed. When assigning your group leaders don't be afraid to look outside of your current rank structure. Being an outstanding structural officer does not make you a shoe-in for a technical rescue officer's position. Assign commanders who have technician training and are suited to lead your team through these low-frequency, high-risk calls.

Get out and train! Sometimes having a basic awareness of how the water moves, its inherent dangers and knowing how to select the proper PPE will increase situational awareness and help prevent a swift water line-of-duty death or near-miss. Having the knowledge to identify a rescue as being out of your teams' scope due to equipment or training deficiencies can end up saving more lives than trying to attempt the rescue itself. Swift water rescue is a very dynamic field, and while this article gives some basic principles of swift water rescue it just barely touches the surface. There is no substitute for hands-on training, and I encourage you to at least provide training to your members that will give them the ability to identify and respect the dangers the water presents and how to operate safely around it.

ABOUT THE AUTHOR

Jacob McAfee is a 14-year veteran in the fire and emergency services profession, serving in a variety of positions across the military and Department of Defense. He is the assistant chief of operations at the West Point Military Academy Fire & Emergency Services, West Point, NY.

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Schiphol Airport implements virtual training

FOLLOWING A SUCCESSFUL TRIAL PERIOD AND AN OFFICIAL TENDER PROCESS, AMSTERDAM AIRPORT SCHIPHOL BECOMES ONE OF THE FIRST AIRPORTS WORLDWIDE TO FULLY IMPLEMENT VIRTUAL INCIDENT COMMAND TRAINING IN ITS COMMANDER CURRICULUM.

To stay at the pinnacle of the international ARFF world, Schiphol Airport's Fire Brigade set out to look for a state-of-the-art 3D virtual training platform to enhance its practical training and further prepare its emergency response crews and airport safety personnel for any number of airport and aircraft incidents. The objective was to find a safe, flexible and effective way to enhance the practical training schedule and allow training of any thinkable incident, far beyond what is possible through practical incident training.

Following a trial period of different virtual training solutions, Schiphol Airport selected the RescueSim emergency response training platform for this project. To optimise realism and accuracy, VSTEP (developer of RescueSim) and Schiphol Airport worked closely together to develop an extensive Airport Incident Management module for the simulator, incorporating all relevant aircraft types, emergency services equipment and vehicles as well as general airport equipment.

The simulator includes a full virtual 3D model of Amsterdam Airport Schiphol and the surrounding area, spanning over 100 km². It also incorporates a driving simulator, allowing the fire crews to practice driving towards the incident through the actual 3D environment. In the simulator, the Schiphol fire brigade and emergency have all their real life vehicles and equipment at their disposal, guaranteeing realistic simulation and training of any thinkable incident at Schiphol Airport.

The project was recently awarded ICT Project of the Year by the 7th Computable Awards.

With almost 50 million passengers and over 420,000 aircraft movements in 2011, Amsterdam Airport Schiphol is one of the busiest airports in the world and a leading air traffic hub in Europe. Safety has the highest priority at Amsterdam Airport Schiphol and is watched over by a dedicated 140+ strong fire brigade. Amsterdam Airport Schiphol operates one of the most advanced airport firefighting training centres in the world, and the combination of state-of-the-art emergency response equipment and well-prepared emergency response crews, makes Schiphol amongst the world's best prepared airports.

Pjotr van Schothorst, VSTEP Director, said: 'We are extremely proud that Schiphol has chosen RescueSim as their virtual training platform. Airports are an important customer group for RescueSim virtual training and Schiphol is one of the finest reference customers in the world. The Schiphol Fire Brigade and VSTEP are working closely to further enhance RescueSim and meet the rigorous demands of the airport sector. With Amsterdam Airport Schiphol, Dutch Railways, Port of Rotterdam and leading Fire & Rescue Safety Regions using RescueSim, it has become the training tool of choice for Holland's emergency services.'

The virtual training project of Schiphol Airport and VSTEP won the ICT Project of the Year Award in the Netherlands, awarded by an independent panel of industry professionals during the 7th Computable Awards show in the Grand Hotel Huis ter Duin in Noordwijk aan Zee, The Netherlands.

Read our e-magazine at www.hemmingfire.com

Major investment at Manchester

Manchester Airport's Fire Service has officially unveiled six brand new state-of-the-art Oshkosh Global Striker vehicles, supplied to the airport by Oshkosh's UK distributor Terberg DTS, as part of a £4.2m ($6.5m) investment into the airport fire operation.

The six new Oshkosh fire vehicles from Terberg DTS are equipped with the latest technology to assist in making firefighting operations safer, including: Forward Looking Infra-Red Cameras, High Reach Extendable Turrets (also known as 'Snozzles') and more environmentally-friendly foam.

With all six fire vehicles manufactured in and shipped from Wisconsin (USA) over the last three months, the sixth and final vehicle arrived at the airport in late September. All 84 firefighters who are based at Manchester Airport are now fully trained to use the vehicles and equipment.

Alisdair Couper, Managing Director at Terberg DTS, commented: 'By pre-planning the operator training, which was completed prior to delivery, this has enabled Manchester Airport to put the new Oshkosh fire vehicles into operation immediately upon arrival. We have worked closely with the firefighters at Manchester and Oshkosh to provide a vehicle solution specific to their operational needs and the results have been astounding.'

The new fire vehicles were showcased to 150 guests at an event held at Manchester Airport's Runway Visitor Park. Guests from emergency services around the country as well as MAG colleagues, former Manchester Airport firefighters, Oshkosh and Terberg DTS representatives were also shown a demonstration of the new vehicles in action using the airport's training ground, Big Rig.

At the unveiling of the new Oshkosh fire vehicles, Steve Metcalf, Manchester Airport's Chief Fire Officer & Emergency Services Manager, said: 'The introduction of this fleet has presented us with the opportunity to introduce a new operational model incorporating a completely fresh approach, adopting revised tactics and techniques to enable us to create a safer environment for our passengers, operating crews and firefighters. These are exciting times for the Fire & Rescue Service at Manchester Airport as these new procedures, supported by our new vehicles, have modernised our operation.

Manchester Airport has taken delivery of six Oshkosh Global Striker vehicles.

'We're investing in a safer future and it's of the utmost importance to us as an airport that both our staff and passengers are in a safe environment at all times, and our investment in these vehicles underlines our commitment in this area. The Oshkosh Global Striker Vehicles are equipped with the latest technology which helps to make firefighter jobs safer and more efficient, protecting both them and our passengers in the event of a crisis situation, which while we hope never happens, we must be prepared for.'

Echoing Steve Metcalf's comments, Jim Johnson, Oshkosh President of Fire and Emergency, said: 'We are honoured to have been a part of this project at Manchester Airport and to provide these new vehicles for Manchester Airport's Fire Service. We worked very closely with the airport on this project to deliver the best appliances and service possible. It's been fantastic to see the new vehicles in action and the firefighters here showcasing their new skills.'

TOP OF THE GAME

IN THE SPOTLIGHT – EXCLUSIVE INTERVIEW: *F&R* SPEAKS WITH BARRY ALDERSLADE, DEPUTY AIRPORT FIRE MANAGER AT LONDON GATWICK AIRPORT, ABOUT LIFE AT THE SHARP END.

Gatwick Fire's equipment is 'top notch', and includes six Rosenbauer Panthers, an HRET capability, rescue stairs, CAFS, a 747 hybrid simulator, and even a SuperVac SU-50 PPV.

What are the main challenges faced at Gatwick Fire and Rescue?

We are a first strike service. For protracted incidents we rely heavily on our supporting services – fire, ambulance, HART [Hazardous Area Response Team] and police. Trying to keep abreast of how that support is going to look like in the future is a challenge with our ongoing modernisation.

What is the most severe incident that Gatwick FRS has attended recently, and how was it dealt with?

Although not life threatening, the floods at the beginning of the year took everybody by surprise. One of our main runway electrical substations was submerged under water, and because the runway lighting is so risk critical they have been designed not to trip out – you don't want an Airbus 380 on finals for landing and then the lights go out. Pumping the station out was a priority, so trying to do the Risk Assessments when nobody was sure what was live or not, coupled with the fire strikes, was very challenging. We now have our own high volume pumps along with an enhanced water rescue capability which provides us with extra resilience.

What type of internal firefighting strategies do you employ and why?

Internal fires in some of the older aircraft will have burnt through within 2-3 minutes, they are far safer to fight for fire crews and for passengers to evacuate with all the hot gases escaping in a ventilated fire. Modern aircraft, however, have a high proportion of new generation GLARE [Glass Laminate Aluminium Reinforced Epoxy] composite material in their make-up. Burn through takes a lot longer >20 minutes. A prime example was the Dreamliner incident at Heathrow, where very high temperatures in very difficult conditions presented a prime compartment fire with all its associated risks. All our crews have a very high level of fire behaviour training and awareness, and we have quick-attack hose reels that deliver 220 litres at the branch, full large output PPV capability along with the only rescue stairs in the UK, which provides a safe stable platform for crews to work on any plane including an Airbus 380.

We also use Stat X and DSPA-5, which are basically portable 'hand grenade' volumetric fire suppressants – another tool in the box.

What are the best vehicles in your fleet?

We are very lucky, all our equipment is 'top notch'. We have six Panthers and an HRET [High Reach Extendable Turret] capability, rescue stairs, a SuperVac SU-50 large output PPV fan, CAFS, domestic ladders and rescue pumps, along with command vehicles. We also have an all-terrain trailer. Really simple but – with a tractor towing it – that trailer can get to almost anywhere, delivering equipment and crews to the scene and, more importantly, it will transport casualties back to a hard standing. To the west of Gatwick we have some very muddy fields. I love the SuperVac PPV – some people think I was whacky getting it but it's the future, honest!

How are Gatwick Fire and Rescue staff trained, and what type of training takes the priority?

We have a full in-house compliant maintenance of skills and competence programme along with being a CAA-approved training provider. Each watch has a full range of instructors including Aviation, Compartment Fire Behaviour, Breathing Apparatus, Tactical Ventilation, Trauma First Aid, Emergency Response Driving, Physical Training, and Road Traffic Collision Instructors. All the instructors attend CPD [Continued Professional Development] and standardisation meetings to remain competent and keep at the top of their game.

We have great relations with other emergencies services local as well as international, which is great for knowledge sharing. Being a first-strike service we ensure the crews prioritise the first five minutes of an incident. Frequent training is the key – get the basics right, there is no time to get it wrong on the real thing.

Why should firefighters come to train at Gatwick Fire?

We truly have a world-class training facility, with access to some of the very best instructors available, and with our partner training providers we can cover almost all requirements.

We recently completed a 12-week training course for a Middle East client in collaboration with Surrey FRS and Alpha Safety. Training was as diverse as the BA, CFBT, Swift Water Rescue 3, Powerboat 2, high rope access, confined space disciplines. It was very challenging on the logistics but it was great fun. Furthermore, we are only 30 minutes

UPGRADED TRAINING FACILITY FOR DALLAS FORT WORTH ARFF FIREFIGHTERS

The DFW Airport Fire Training Research Center (FTRC) has undergone a complete 21st century transformation in the way Aircraft Rescue Firefighters (ARFF) train, writes Michael Foster, Assistant Fire Chief/Training.

The facility has a new high-tech classroom that is second to none, and the learning environment is exceptional for the student. This classroom includes 32 work stations complete with computers for inactive learning. The instructor has at their fingertips a wide variety of visual aids for aircraft familiarisation, airport familiarisation as well as a tactics and strategy program that will challenge the student in his/her own environment.

A training class at the FTRC will give firefighters in the fire service the ability to learn in an environment that is compatible with the computer generation. The student will be able to interact with the instructor on such things as walking through the Airbus A-380. The interactive aircraft familiarisation gives the student the ability to get a hands-on, three-dimensional look at the flight deck of an aircraft they may have never been in. This gives the ARFF student an insight that is much more expansive in their learning than previously experienced.

The airport familiarisation will take the students around the airport in a safe environment where they can learn runways and taxiways without fear of watching out for taxiing aircraft. These visual aids have assisted the instructor with providing outstanding hands-on, interactive training never before seen in the ARFF community. The student can learn signage, lighting, and markings at their own pace. Whether a student learns visually, or the written word, the programs developed for the FTRC provide this capability at all levels.

The high-tech classroom also has a very interactive video wall. The instructor can use the wall and have students follow along, or used in conjunction with the computer at the student's desk for assignments. A program built into the system is the quiz section. This gives the instructor the ability to put a 'pop quiz' question up on the student's computer screen. After the student answers the question the instructor has immediate feedback on scores. The ability for the instructor to have this feedback is invaluable in evaluating

where the class is in the teaching process. The instructor can stop and go back over material covered if the class percentage is low. In the past, instructors would have to wait until the end of the class to give the final test. It was then an instructor would find out the effectiveness of his teaching methods.

The purpose of this technology is to put the student into the environment in which they normally operate. This type of training scenario will be more effective for them. To do this, the FTRC instructor has the ability with the Tactics and Strategy Programme to place the student's airport on the interactive wall. When the instructor begins placing aircraft and vehicles into a tactical scenario, the student has an immediate ability to use the information they have received in class and apply it to a tactical situation that they may actually encounter at their airport.

This training system is unique in that it can be broadcast worldwide. Cameras have been placed in the classrooms to provide interconnectivity with the internet. Recently, this technology was showcased in Europe, the Middle East, and at fire trade shows across the United States where members of the DFW Airport FTRC staff presented the capabilities to ARFF Working Groups. This truly gives the FTRC the ability to be a world leader in ARFF instruction. The staff at the FTRC has an average of 18 years of experience. This, coupled with the unique features of the FTRC's high-tech classroom, make for an effective teaching model for other organisations to emulate.

Gatwick Fire has the only rescue stairs in the UK, enabling a safe platform for crews to work on any size of plane – including the Airbus 380.

from Central London and we can provide top quality accommodation in the Gatwick Hilton.

How does the experience gained at Gatwick FRS and other rescue services influence your training courses?

We mix with such a diverse set of people and organisations – including our – ongoing work with London Fire Brigade. Recently, we were training firefighters from Athens, Greece and we have had the Guernsey local authority firefighters here for training.

Everybody brings something to the party – knowledge sharing is so important and working together to do the very best job we can is our main aim.

What type of training can international students follow at Gatwick Fire?

We pride ourselves at providing bespoke training, and we can tailor anything while being a cost-effective delivery solution. For example, we use XVR – a virtual training platform created by Dutch company Esemble – for our command training. The training team can take this anywhere in the world to deliver training and assessments.

The future of training delivery needs to be a lot smarter but delivered to a high standard, and this is exactly what we strive to do.

What is the single most important lesson a new recruit firefighter should learn and what is the one an experienced firefighter should always remember?

Someone once told me: 'At any incident, it is going to the worst day of somebody's life. The very least they should expect from us is that we do our very best to help them'. You can have the very best processes, SIPS, SOPS in place but it means nothing if you can't deliver at the sharp end.

What type of rigs and training props do you have at the fire training school?

Our fire training ground features a full-size 747 Hybrid aircraft simulator, a multi-level carbonaceous 'villa' unit, a full range of fire behaviour simulators, MD-80 aircraft, XVR Incident Command simulator, an RTC compound, a method of entry rig, a confined space training rig, and working-at-height props. We also use shared facilities at Surrey FRS Training Centre at Wray Park, in Reigate.

What is the single most important ARFF training development you can foresee for the near future?

The San Francisco Asiana incident is a good example of how aircraft training props will need to include debris trail along with casualty props and body-parts props. Internally, the layout should simulate the mess a crash incident will be in reality. We just need to become as realistic as possible with an efficient incident command system in place.

With numbers being cut in fire services all around the world it is extremely important that the few resources and people we have are all used to their full potential.

What next for Gatwick Fire?

I cannot say too much, but in the near future we will be announcing a very exciting collaboration, which will set us apart from all the competition. Watch this space!

ABOUT THE AUTHOR

Barry Alderslade is Deputy Airport Fire Manager for London Gatwick Airport plus a NILO (National Inter Agency Liaison Officer). Barry worked at the RAF Fire Service, then served at Heathrow for 17 years before moving to Gatwick on promotion. He also served 18 years as a retained firefighter.

HOT ON RESILIENCE

THE FIRE SERVICE COLLEGE AND TRAINING 4 RESILIENCE HAVE STARTED A NEW COLLABORATION – PLUS THE FSC HAS ALSO LAUNCHED A NEW MOBILE CARBONACEOUS TRAINING UNIT. JOHN HALL, TRAINING DIRECTOR FOR THE COLLEGE, AND BEVERLEY OSBORNE, SENIOR PARTNER FROM TRAINING 4 RESILIENCE, OUTLINE THE EXCITING NEW DEVELOPMENTS.

The Fire Service College recently celebrated its 40th anniversary, and we took the opportunity to take a look at what we did well, and where we thought that fire training needed a fresh set of tools. We're very proud of our excellent record of delivering accredited and assessed training at our permanent facility at Moreton-in-Marsh – but we're aware that sending team members for intense training programmes can be difficult, and prohibitively costly. We realised that we needed to find a way to deliver our training flexibly and locally.

As we reviewed our training facilities and services on offer, we put ourselves in the position of chief fire officers and tried to understand at how we could meet their training requirements. We spoke to several rural fire and rescue services, with teams of firefighters who rarely came across serious fires. These services often had limited training facilities available to them and even more limited budgets. The CFOs were concerned that their teams were missing out on key experiential training. Despite the talent and dedication of their teams, without regular experience and exposure to extreme fire conditions they were at risk of losing their edge.

After a year of design and development, the Fire Service College launched its new Mobile Carbonaceous Training Unit (MCTU) at the Emergency Services Show in Birmingham in September 2014. The new mobile simulator is designed to provide a cost-effective solution for services across the UK – and further afield – to give their teams training within real fire conditions.

The 23-tonne fire compartment and separate filtration unit contain a number of new innovations. The cutting-edge filtration unit uses 'blast filtration' to ensure minimal particulate emissions; enabling the unit to produce no black

The Mobile Carbonaceous Training Unit has been designed to provide real fire exposure training to more firefighting teams.

smoke, despite the intensity of the burn inside. The laminated insulation system, which contains the fire compartment enables us to produce upto 600 °C of extreme fire behaviour – while the external surfaces of the unit remain safe to touch. We've also installed a unique fire water retention unit, capturing the waste water produced during training and allowing for safe disposal at a later date. All of this allows for a simulation experience that can be run almost anywhere – without risk of environmental restrictions or safety concerns.

The training programme itself has been designed by the College's team of fire professionals and is based on the requirements of our international client base. Working with different services, the team has been able to design and develop customised training programmes to meet the specific needs and risks that the firefighters may face. The unique construction of the simulator allows for huge flexibility. Different internal configurations enable the creation of a variety of training scenarios, and our team can simulate a wide range of extreme fire behaviour.

We feel that this meets the needs of Chief Fire Officers. For example, one of the rural services mentioned above could meet with College instructors to explain the specific requirements of their teams. Our instructional staff would then develop a customised programme, using techniques designed to address all appropriate competences detailed within the National Occupational Standards (UK), and fully accredited by Skills for Justice (a UK standard).

Once prepared, the design of the MCTU and its filtration unit means that it can be setup almost anywhere for example in a supermarket car park or school playground – without the normal environmental restrictions that can limit carbonaceous training activity.

Then, with limited downtime and minimal cost, large numbers of firefighters can be exposed to extreme fire conditions training. They can test new equipment, check their skills and regain their confidence in fighting real fires. The versatility of the unit means that the training can also become a powerful public relations tool; encouraging spectators from the local community will provide reassurance that their fire service is well prepared.

Senior fire service personnel will be reassured that they've done all they can to train their teams, and keep them safe; while firefighters will be confident that their skills are kept up to date. The MCTU has been designed to fill the gap between knowledge and experience for firefighters, and will become a key tool in the training arsenal of services across the country. It will make firefighters safer, minimise the risk to the public and allow fire chiefs to demonstrate that they have done all they can to provide 'best practice' training.

School of Resilience and Emergency Response

Over the last few months, we've been working together to develop and launch a new collaboration – the School of Resilience and Emergency Response. Using the unique skillsets of both our organisations (Training 4 Resilience), we are aiming to deliver emergency planning and business continuity responsibility training which is assured, accredited and delivered by the most experienced trainers possible.

Most organisations are already aware of the importance of ensuring that their teams are as prepared for emergencies or other disruptive challenges as they can be. Each day, people at every level of different organisations face challenges that place the public, employees, property or reputations in danger – and developing strong organisational resilience is the most powerful tool available to minimise these risks.

As organisational resilience becomes a more high profile

The School of Resilience and Emergency Response aims to deliver emergency planning and business continuity responsibility training, which is assured, accredited and delivered by experienced trainers.

topic, there is an increasing expectation that businesses will have plans in place. Once an emergency incident has been resolved, pressure will fall on those in positions of responsibility to demonstrate that they were prepared for every eventuality.

This is where the School of Resilience and Emergency Response steps in. We intend for the School to become the benchmark of effective resilience planning; a trusted symbol showing that plans have been tested exhaustively and have performed well. Whether the audience is the public, your stakeholders or your investors, assurance from the School of Resilience and Emergency Response will give them confidence that they are in safe hands.

We are able to offer this assurance because of our credentials. Training 4 Resilience has been working over the past seven years to help organisations develop, measure and strengthen their resilience; and has built up an impressive expertise and varied client list. This includes Glastonbury Festival Ltd, the Tour de France and NATO's recent summit in Cardiff (see page 42). The school combines its skills and experience with the resources, reach and assurance of the Fire Service College, which has been training emergency responders for over 40 years.

Together, we're bringing forward an offer which will provide companies with the assurance that they've worked with the best experts available to develop and validate their response plans, to coach their key emergency response decision makers, and to identify and deliver training requirements.

In particular, our scenario testing provides the opportunity to work with multiple agencies, organisations and stakeholders to deliver a holistic response to any potential emergency situation. This cross-party collaboration means that we can provide a detailed and thorough analysis of readiness, response capability and the suitability of emergency planning across any issue. This will ensure that – should the worst happen – staff in all roles will understand what they need to do, and how they need to do it.

We are supported in our efforts by the Royal United Services Institute (RUSI), as well as other delivery partners for specific training, including the College of Policing, National Ambulance Resilience Unit, and the Police Chemical, Biological, Radiological and Nuclear Centre. Our latest customer – the London Borough of Sutton – is the most recent partner to work with us under the School of Resilience and Emergency Response brand; and we are looking forward to training and exercising its teams as part of its annual Borough Emergency Control Centre validation arrangements. As other clients come on board, we will be working to establish the School as a benchmark of resilience planning in the UK.

Attacking with ATILA

AFTER MANY YEARS MANUFACTURING AND TESTING FIREFIGHTING FOAM CONCENTRATES, VS FOCUM IN THE NORTH OF SPAIN DECIDED TO DEVELOP A CONCEPT FOR A NEW FOAM THAT WOULD PROTECT TANK STORAGE FARMS IN A SAFE AND EFFECTIVE WAY – WHILST USING MINIMUM AMOUNTS OF WATER AND CONCENTRATE. MANAGING DIRECTOR MANUEL ACUÑA EXPLAINS THE POWER OF ATILA.

The requirements for the development of the new foam were:

1. The foam had to be synthetic: to guarantee long product lifetime whilst maintaining extinction features.
2. It had to have a low Newtonian viscosity: to avoid the problems inherent with high viscosity pseudoplastics.
3. The foam had to be usable with a low percentage of concentrate (≤ 1%): to benefit from logistical (eg storage, transport) and economic advantages.
4. Be an alcohol-resistant, aqueous film forming foam (AFFF/AR): to achieve the lowest application rates possible on all types of fuel and water.
5. Be freeze-resistant: for flexibility of use in all weather conditions.

The result is Atila: a 1% AFFF/AR foam that can be used at -15ºC and has freeze-resistant properties. The first certification milestone for Atila was the award by the UK Civil Aviation Authority of ICAO level C at 1% and ICAO level B at 0.5%. The foam concentrate Atila has been tested on different types of fires and fuels, at different percentages and with differing types of water, using low, medium and high expansion devices – all with excellent results.

In addition, Atila has been tested in comparison with a well known fire fighting foam concentrate AFFF/AR 1x3 that is commonly used in tank storage farms and refineries. The results have shown better performances for Atila - especially when decreasing the percentage and the application rates.

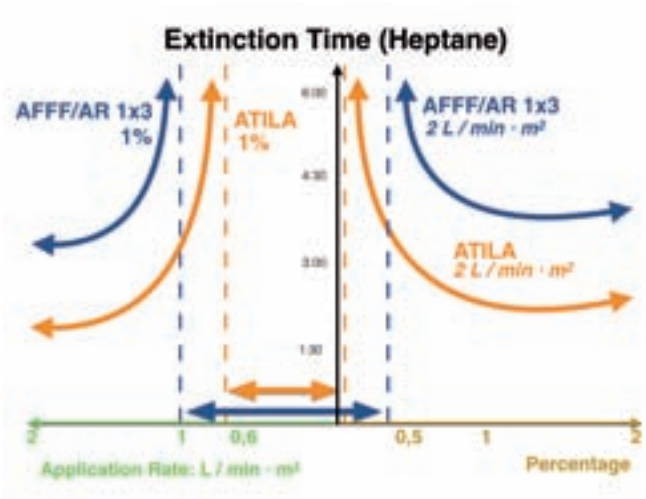
We can visually represent the fire performances of a foam concentrate using a double axis of coordinates. On the y axis we can include features such as control, extinction or burnback resistance.

The result looks like a volcano, where the diameter of the 'crater', ie. the distance between both asymptotes (lowest % and lowest application rate), measures the efficacy and the effectiveness of the foam. The foam with the smallest 'crater' is therefore the better one.

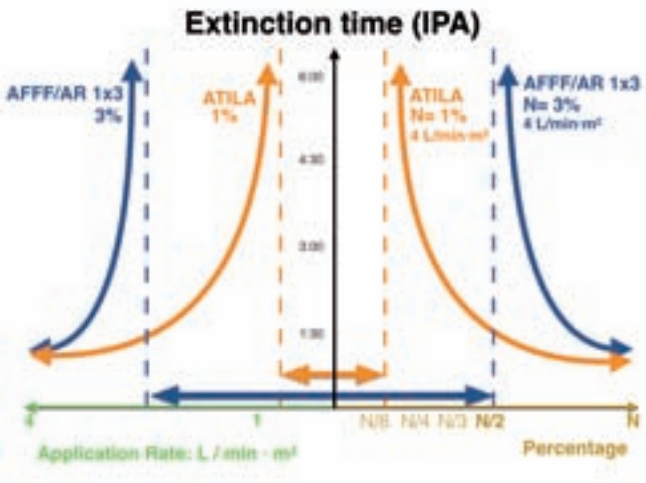
In order to guarantee a fast and safe extinction we have included in Atila a comfortable safety margin. This means that even though Atila has been designed to run at 1%, it is still able to extinguish the fire al 0.5% at nominal application rate (EN-1568-3:2008, 144B (2.5 l/min.m2) and EN-1568-4:2008, 55B (6.6 l/min.m2)), as well as extinguish the fire at 1% with a reduction in the application rate (EN-1568-3:2008, 233B (1,61 l/min.m2) and EN-1568-4:2008, 144B (2.5 l/min.m2)).

These tests afford a safety margin as well as a reliable extinction process even with a reduction in dosage or an increase in the size of the fire, or with a lower application rate.

Atila meets the high-specification standard launched by ICAO in 2013, which sought the ultimate performance in fire fighting foam with the minimum of water. VS Focum is now driving that same paradigm into tank storage protection.



Right x axis: percentage of use (%) - Left x axis: application rate (l/min. m^2).



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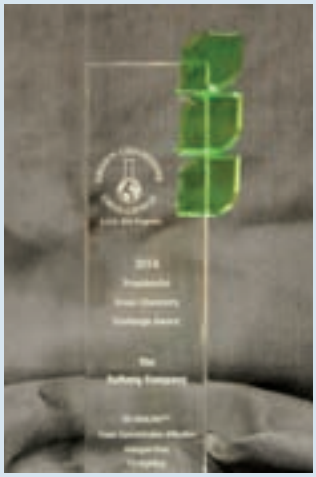
Green chemistry



The Solberg Company, the a global manufacturer of firefighting foam concentrates and systems hardware, has won the 2014 EPA Presidential Green Chemistry Challenge Award.

Awards are presented in five categories: Academic, Small Business, Greener Synthetic Pathways, Greener Reaction Conditions and Designing Greener Chemicals. Solberg was honoured with the category award for Designing Greener Chemicals for its development and commercialisation of Re-Healing Foam.

RE-Healing foam concentrates from Solberg are an innovative environmentally sustainable fluorosurfactant and fluoropolymer-free firefighting foam used to effectively extinguish Class B fuels with no environmental concerns for persistence, bioaccumulation or toxic breakdown.

The Presidential Green Chemistry Challenge Awards promote the environmental and economic benefits of developing and using novel green chemistry. These prestigious annual awards recognise chemical technologies that incorporate the principles of green chemistry into chemical design, manufacture, and use.

EPA's Office of Chemical Safety and Pollution Prevention sponsors the Presidential Green Chemistry Challenge Awards in partnership with the American Chemical Society Green Chemistry Institute and other members of the chemical community including industry, trade associations, academic institutions, and other government agencies.

'Firefighting foams suppress combustion by smothering burning fuels and cooling fires. For years, these foams have used long-chain fluorinated surfactants as the active ingredient,' stated Solberg's General Manager Steve Hansen, adding: 'But they have significant toxicity concerns, thus Solberg developed Re-Healing foam specifically to address the use of fluorinated surfactants. Re-Healing foam replaces halogenated materials with a blend of non-fluorinated surfactants and complex carbohydrates.'

Throughout the 19 years of the awards program, EPA has presented awards to 98 winners. Since its inception, in 1996, through 2014, EPA has received nearly 1,500 nominations. By recognising groundbreaking scientific solutions to real-world environmental problems, the Presidential Green Chemistry Challenge has significantly reduced the hazards associated with designing, manufacturing, and using chemicals.

An independent panel of technical experts convened by the American Chemical Society Green Chemistry Institute formally judged submissions from among scores of nominated technologies and made recommendations to EPA for the 2014 winners.

'We are truly honoured to receive this award,' continued Hansen. 'We are profoundly committed to developing high performing foam products that have an environment-friendly profile to protect our fragile environment. The Green Chemistry Award confirms that next generation product that does not contain halogenated materials can be commercialised and more importantly will have an impact on firefighting foam something the fire protection industry has not experienced in fifty years since in the introduction of Aqueous Film Forming Foam (AFFF).'

'Solberg now offers the world's only true fluorine-free foam concentrate that is multi-agency product certified (UL, FM, EN, ICAO). Re-Healing foam is a very effective firefighting foam concentrate for flame knockdown, fire control, extinguishment, and burn-back resistance,' said Dave Pelton, Vice President, Global Marketing for Solberg: 'Control, extinguishing time, and burn-back resistance is paramount to the safety of firefighters everywhere, and Re-Healing foam has shown excellent performance in each.'

Solberg, the firefighting foam products division of Amerex Corporation, is based in Green Bay, Wisconsin with operations in Bergen, Norway and Sydney, Australia. The company has been involved with the manufacture of firefighting foams since the mid-1970s. In addition to the Re-Healing foam product line, Solberg manufactures a complete range of C6-compliant AFFF/AR-AFFF foam concentrates, Class A and High-Expansion foam concentrates including foam systems hardware. Solberg's technology is used by customers in the aviation, chemical, fire service, mining, oil and gas, petrochemical, pharmaceutical, solvent and coatings and utility markets.

Madrid statement calls for more action on PFASs

SCIENTISTS FROM AROUND THE WORLD SIGN THE MADRID STATEMENT TO HIGHLIGHT THAT PFASS SUBSTANCES ARE PERSISTENT AND HARMFUL – WHICH INCLUDES C6 FLUORINATED AFFF FOAMS.

The Madrid Statement documents widespread scientific consensus regarding the persistence and potential for harm of poly- and perfluoroalkyl substances (PFASs), and lays out a roadmap to gather needed information and prevent further harm.

Polyfluoroalkyl and perfluoroalkyl substances (PFASs) are organic compounds with multiple carbon-fluorine bonds. They are used in various commercial products, including aqueous firefighting foams (AFFF), products with non-stick coatings, and waterproof clothing.

The two most persistent and widely detected PFASs are perfluorooctanoate (PFOA) and perfluorooctane sulfonic acid (PFOS). Other fluorinated compounds, such as fluorotelomer alcohols (FTOHs), can transform to PFOA and PFOS in the environment via biological and physico-chemical processes.

177 scientists and consultants from universities, laboratories and research organisations from across the world have signed the Madrid Statement.

The Madrid Statement calls on the international community to cooperate in limiting the production and use of PFASs and in developing safer non-fluorinated alternatives.

The scientists' proposals go way beyond those adopted in 2006 by the US Environmental Protection Agency when it launched a global stewardship with two goals:

- To commit to achieve, no later than 2010, a 95% reduction, measured from a year 2000 baseline, in both facility emissions to all media of PFOA, precursor chemicals that can break down to PFOA, and related higher homologue chemicals, and product content levels of these chemicals.
- To commit to working toward the elimination of these chemicals from emissions and products by 2015.

The Madrid Statement follows the publication in June of the Helsingør Statement on poly- and perfluorinated alkyl substances (PFASs).

The Helsingør Statement summarises key concerns about the potential impacts of fluorinated alternatives (such as C6 fluorinated AFFF foams, which are deemed acceptable by the US EPA) on human health and the environment in order to provide concise information for different stakeholders and the public.

These concerns include, amongst others:

- the likelihood of fluorinated alternatives or their transformation products becoming ubiquitously present in the global environment;

- the need for more information on uses, properties and effects of fluorinated alternatives;
- the formation of persistent terminal transformation products including PFCAs and PFSAs;
- increasing environmental and human exposure and potential for adverse effects as a consequence of the high ultimate persistence and increasing usage of fluorinated alternatives;
- the high societal costs that would be caused if the uses, environmental fate, and adverse effects of fluorinated alternatives had to be investigated by publicly funded research;
- and the lack of consideration of non-persistent alternatives to long-chain PFASs.

The Madrid Statement urges scientists, governments, chemical and product manufacturers, purchasing organisations, retailers, and consumers to take the following actions:

A. Scientists:

1. Assemble, in collaboration with industry and governments, a global inventory of all PFASs in use or in the environment, including precursors and degradation products, their functionality, properties, and toxicology.
2. Develop analytical methods for the identification and quantification of additional families of PFASs, including fluorinated alternatives.
3. Continue monitoring for historical-use PFASs in different matrices and for environmental reservoirs of PFASs.
4. Continue investigating the mechanisms of toxicity and exposure (eg. sources, fate, transport, and bioaccumulation of PFASs) and improve methods for testing the safety of alternatives.
5. Bring research results to the attention of policy makers, industry, the media, and the public.

B. Governments:

1. Enact legislation to require only essential uses of PFASs and enforce labeling to indicate uses.
2. Require manufacturers of PFASs to:
   - conduct more extensive toxicological testing
   - make chemical structures public
   - provide validated analytical methods for detection of PFASs
   - assume extended producer responsibility and implement safe disposal of products and stockpiles containing PFASs.
3. Work with industry to develop public inventories of products containing PFASs.
4. Make public annual statistical data on production, imports, and exports of PFASs.
5. Whenever possible, avoid products containing, or manufactured using, PFASs in government procurement.
6. In collaboration with industry, ensure and enforce that an infrastructure is in place to safely transport, dispose of, and destroy PFASs and PFAS-containing products.

C. Chemical manufacturers:

1. Make data on PFASs public, including chemical structures, properties, and toxicology.
2. Provide scientists with standard samples to enable environmental monitoring of PFASs, including precursors and degradation products.
3. Provide the supply chain with documentation on PFASs content and safe disposal.
4. Work with scientists and governments to develop safe disposal methods for PFASs.
5. Develop non-fluorinated alternatives that are neither persistent nor toxic.

D. Product manufacturers and other professional users:

1. Stop using PFASs where they are not essential or when safer alternatives exist.
2. Develop inexpensive and sensitive PFAS quantification methods for compliance testing.
3. Label products containing PFASs, including chemical identity and disposal guidelines.
4. Invest in the development and use of non-fluorinated alternatives.

E. Purchasing organizations, retailers, and consumers:

1. Whenever possible, avoid products containing, or manufactured using, PFASs. These include many products that are stain-resistant, waterproof, or non-stick.
2. Question the use of such fluorinated 'performance' chemicals added to consumer products.

Some commentators have pointed out that internationally one of the key regulatory triggers (for example by the Stockholm Convention) for considering restricting a material – in addition to the PBT profile – is if there is evidence of long-range transport (LRT/LRAT) either in the atmosphere or in the oceans.

CHOICE MONITORS

FIREFIGHTING MONITORS COME IN A VARIETY OF SHAPES AND FLAVOURS – WHICH ONE IS BEST FOR YOUR BRIGADE? NICO ZORZETTO OF MONITOR MANUFACTURER SANCO SPA IN NORTHWEST ITALY EXPLAINS THE OPTIONS.

Monitors are the most suitable way to discharge large volumes of extinguishing agent (water, foam or dry chemical powder) for cooling or for fire suppression.

In fact, their flow-rates are usually higher than the ones of portable nozzles and their throw is much longer than that achieved by standard branch pipes.

Monitors are very flexible – they can be portable, wheeled, they can be mounted on trailers or on vehicles and they can be used for fixed installations. A monitor's body can be cast (with bronze or special alloys) or welded (in particular for stainless steel versions).

Monitors can be operated in several ways:

- manually: thanks to devices such as hand wheels, chains or handlebars
- self-oscillating: the monitor moves horizontally in a pre-set angle thanks to a self-oscillating system (as well as operate in manual mode). This movement can be adjusted both with angular speed and with a pre-set angle.
- remote control system: by hydraulic or electric motors for instance.

Monitors are normally mounted on a rotating base that allows a 360° horizontal movement, whilst the vertical movement can be adjusted to a total angle of around 150°.

The horizontal and vertical orientation is provided by a handlebar/handwheel that – by means of a worm drive – provide stability to the outlet device during its operation.

Most monitors are manufactured for use with water or foam solution, and with a single or double-barrel. Where the extinguishing agent has a protein base, foam can be produced only by means of a barrel (and not by other types of nozzle).

A self-aspirating nozzle can be installed on the monitor, sucking the foam concentrate and water via a built-in foam proportioning device. Self-aspirating monitors are commonly installed on trailers with or without accompanying tanks, with capacities that can vary between 500-10,000 l/m.

A manual monitor can be turned into a self-oscillating monitor via the installation of self-oscillating unit between the inlet flange of the monitor and the piping flange. Its angular speed and orientation movement can then be adjusted and preset.

Remote-controlled monitors (RCM)

These electric/hydraulic-operated monitors are usually located in areas where their manual operation would expose a person to a hazard. Although they can be operated at distances of 50-200m away, they also have a manual mode depending on the type of emergency.

Electrically controlled monitors have proven themselves to be more reliable and easier to maintain than hydraulic types, whilst affording a more rapid intervention.

As well as available in a standard version, remote-controlled monitors are also offered in ATEX-approved versions for use in hazardous areas. Their operation is via a joystick or – if in a hazardous area - using explosion proof (ATEX) panels.

The remote-control console can be used to control different parts of the monitor to adjust foam stream and change between straight jet/spray patterns at the nozzle.

The same console can also control other devices, opening and closing water valves, adjusting foam solution flow as well as controlling the cooling water curtain.

Large flow-rate monitors

This kind of monitor is very suitable for extinguishing large fires in a short time. Its high flow rate achieves longer throws, which is why many oil refineries; petrochemical plants and

Above: stainless-steel, wheeled-drive monitor on top of a vehicle. Right: bronze remote-controlled monitor.

power plants demand this monitor.

Traditionally, autonomy of the system has been considered more important than the specific discharge application rate (lpm/sqm) of the system. More recently, accuracy has become an important consideration for larger flow-rate monitors that are normally used both for fixed and mobile installation and on fire tugs (onshore and off-shore operations).

The Red Typhoon

A typical unit designed and manufactured by Sanco SpA is the Red Typhoon mobile large flow rate monitor (40,000 l/m @10 bar). This unit has been designed for the extinguishment of massive petrochemical fires. It can provide cooling and fire suppression support for large fires, and provide protection to personnel, whilst operating at a safe distance. It has been especially designed for oil tank farms, chemical, petrochemical facilities and refineries, and other areas where large fires occur. Complete with a self-locking worm/gear for horizontal and vertical movements, the stainless steel (AISI 316) Red Typhoon can be locked at any position for flowing water or foam with a straight stream or full fog pattern.

This unit comprises a double-axe trailer made of large steel profiles that are welded (not bolted) with two trims and four wheels, and which can be towed by a truck.

The towing bar is complete with an automatic mechanical road brake plus a manual parking brake. The towing bar is mounted on a bolted counter plate for ease of adjustment and to match different truck/van hooks. In order to obtain the largest ground footprint - and thus achieve the greatest stability - the unit comprises four vertical manual jacks fixed on horizontal extendable stabilizers. A manoeuvring wheel enables the operator to place the unit in the best operational position.

The unit carries four fire hose containers (two on each side) integrated in the bodywork, with ample capacity for storing 5 ½'' hoses and an 'easy coil' system for fire hose winding.

The trailer is fitted with several inlet connections, butterfly valves and relevant couplings in accordance with the standards of the country where the unit is to be used.

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A SAFE SUMMIT

SOUTH WALES FIRE AND RESCUE SERVICE NATO LEAD PLANNER BRIAN THOMPSON EXPLAINS HOW SWFRS PREPARED FOR AND DEPLOYED DURING THE RECENT NATO SUMMIT AT THE CELTIC MANOR RESOR IN NEWPORT, WALES.

Once again the eyes of the world fell upon Wales at the start of September 2014 when NATO came to the Celtic Manor Resort (CMR) in Newport for the start of a two-day historic summit on September 4 and 5. This was the largest security operation in the UK's post war years, with the Heads of State from over 60 countries, including President Obama, David Cameron and Angela Merkel visiting Wales. Additionally, there would be over 60 defence ministers and foreign ministers; 2,400 accredited delegates and 2,000 unaccredited delegates as well as media teams from across the world. In all, there were expected to be up to 150 protected persons at any time in our area.

The footprint for the NATO Summit would have far reaching planning consequences for our service. Whilst the actual summit itself would be held at the CMR, there would be significant impact on our transport infrastructure. The primary airport would be Cardiff International Airport and significant air movements were expected with delegations transferring to the venue and their accommodation through a combination of helicopter and road transport, so a significant impact on the motorway system – especially between Cardiff and Newport – was expected. Also, the official evening functions for NATO all took place on September 4. Additionally, there were an expected 20,000 people coming to both cities, many with the intention of protesting peacefully throughout the duration of the summit.

The SWFRS NATO Planning Team recruited a number of key task managers to deliver specific objectives.

Planning for NATO

Operation Ismay was the policing and security operation for NATO. Our plans for NATO were devised so that we would be able to respond to any minor or major incidents as per a normal operating day, with limited impact on the day-to-day services our communities would expect. The South Wales Fire and Rescue Service (SWFRS) NATO plan facilitated this through the use of embedded assets at appropriate NATO 'island' sites – CMR and the Cardiff evening function venues – combined with the availability of specialist assets, to manage and mitigate NATO specific risks in the wider community.

The multi-agency strategic intention for the summit was:

To deliver a multi-agency operation that enhances the reputation of Wales and the UK by taking all reasonable and proportionate steps to ensure the safety and security of all those affected by the summit including participants, the surrounding community, protestors and those facilitating the event.

To ensure SWFRS delivered on the strategic intention, the following objectives were formulated. They enabled our service to contribute to the delivery of a safe and successful summit and would ensure that SWFRS:

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- prepared for and responded to potential areas of conflict during the summit that would usually be dealt with as 'normal business'. This would include response to and dealing with fires in tunnels, rescues involving potential protestors, as well as dealing with incidents in potential protestor camps;
- prepared for and responded to incidents arising on the transport infrastructure and included the use of multi-agency crewed vehicles for rapid scene assessment;
- prepared for and responded to potential chemical biological radiological nuclear explosives (CBRNe) incidents during the summit. This would include proactive profiling of venues, hotels and the CMR, as well as providing Detection Identification Monitoring (DIM) Officers for multi-agency initial assessment team vehicles and search sites;
- prepared for and responded to potential incidents during the lock down of the CMR during the summit. Assets were embedded for the duration of the lock down and included two fire appliances, a water rescue type B team (trained in swift water rescue and powered boat rescue operations), a special rescue unit, fire safety and DIM Officers, as well as expert aircraft firefighting assistance from Defence Fire and Risk Management Organisation (DFRMO). Similar assets were provided for the lockdown of the Island sites for the evening functions;
- prepared and trained SWFRS staff for responding to potential Marauding Terrorist Firearms Attack (MFTA) attacks during the summit. This would include proactive multi-agency training for MTFA, as well as developing bespoke solutions to responding to public disorder during the summit;
- carry out fire precaution related checks at venues and hotels prior to the summit, to check that fire risk assessments were fit for purpose. To liaise with other UK Fire and Rescue Services (FRS) to ensure they were aware of the need to conduct inspections of hotels in their service area;
- to liaise with councils to provide fire safety at protestor camps as well as conducting arson vulnerability assessments of empty/derelict buildings, which had the potential to be used by protestors.

Delivering the summit

Figure 1 shows the command and control structure for the management of the Summit.

A number of key task managers (KTMs) were recruited into the SWFRS NATO Planning team, with the knowledge, skills and abilities to deliver on the objectives detailed above. Each of these KTMs produced an operational order for their specific reference, which were held at each command location and provided the level of detail needed to ensure that each officer had shared situational awareness across the wide spectrum of NATO activity.

Our planning team managed the logistics and movement of all NATO assets until the command rooms stood up, and upon this stage the decision making switched to the relevant command location – in essence this was the transitional movement from planning to operations.

Outcomes

NATO provided an opportunity for the whole of the UK FRS family to showcase what the Fire and Rescue Services are capable of achieving and delivering on such a large scale. SWFRS were able to call upon the support of a number of UK FRS and the Defense Fire and Risk Management Organisation (DFRMO), to bolster our local plans for which Assistant Chief Fire Officer Richard Prendergast would like to acknowledge his personal thanks.

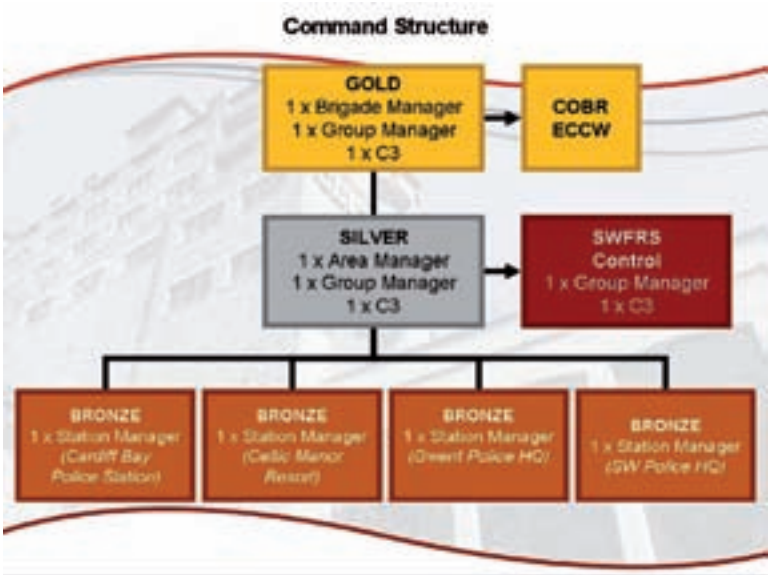

Figure 1: command and control structure for the management of the summit: ECCW = Emergency Co-ordination Centre Wales. COBR = Cabinet Office Briefing Room. C3 = Control staff member.

Other than the arrests of some protestors during the NATO Summit, the event passed without any significant incident of note. During a speech to Parliament after the event, Prime Minister David Cameron remarked: 'I want to thank the local council in Newport, the Welsh Assembly, the First Minister, the Secretary of State, our armed services and police and all those who worked so hard to deliver a safe, secure and successful summit. The biggest gathering of world leaders I think has ever taken place in our country. And most of all let me thank the Welsh people for their incredibly warm welcome. They did our United Kingdom proud.'

The First Minister for Wales Carwyn Jones concluded: 'First and foremost the conference passed off securely and without incident, either for those directly engaged with the conference or for the wider Welsh public. I wish to pay tribute to the months of planning on security and resilience arrangements by the police, Welsh Government, local authorities, the NHS and a range of other agencies.'

Whilst it is fair to acknowledge that this was in the main a police-lead operation and indeed the police planning team should take great credit for how they prepared and executed their plans for the summit; SWFRS (with support) certainly played their part in delivering a safe and successful summit juxtaposed with reducing risk to our communities during this heightened security operation.

Assets utilised for the summit included two fire appliances, a special rescue unit, as well as expert aircraft firefighting assistance from Defence Fire and Risk Management Organisation.

Sensors for safety

DR IAN GREATBATCH AND DR ANDREA KLEINSMITH ARGUE THE CASE FOR INTEGRATED TECHNOLOGY IN FIRE AND RESCUE CLOTHING TO SENSE RESPONDER'S VITAL FUNCTIONS AND LOCATION.

Since the turn of the century most western governments have embraced the concept of urban search and rescue, although of course the concept of training to extricate survivors from collapsed structures can be traced back to the early days of modern firefighting operations and in particular lessons learned in the UK during the Blitz. Although a residual capability has been ever present globally it is only in the last 20 years that specialist units have been developed.

As we all know, the work of USAR teams has always been arduous and complex. They could be working at extreme height, suspended from cranes, or in the superstructures of skyscrapers, or more commonly in the hazardous environment of a collapsed building. This environment is obviously dusty, can contain toxic materials such as asbestos or combustible or noxious gases released by the collapsed structure. As USAR teams face the risk of being crushed or trapped by further collapse, they build shoring and use construction tools and techniques to attempt to make their environment safer.

Motion-capture suits that are used in the movie industry to capture physical movement of people could be used to identify the physical and psycohological states of USAR workers. Picture credit: Tímár Tamás.

This in turn means working in cramped conditions whilst using heavy breaking and construction equipment, which is unwieldy, heavy, vibrating and (in the case of nail guns) potentially a lethal weapon in its own right. In some cases this equipment has to be used whilst using BA sets, or even hanging in SWAH (safe working at height) kit, having been lowered into position from above. In all USAR jobs, as in firefighting in general, there is a requirement for personnel to wear PPE at all times and this can itself be heavy, uncomfortable and cumbersome, potentially leading to longer term strain on crew.

Clearly all of these factors make the role of an USAR technician difficult and with the potential for injury – either short term as a result of a further collapse or accident in the response, or longer term from an injury resulting from repetitive use of heavy equipment with poor posture. On top of the physical risks of injury, the wider circumstances surrounding USAR work can have other impacts. The likelihood is, given the nature of the events, that there will be significant numbers of traumatised casualties, fatalities and traumatised survivors on scene, which can in turn psychologically traumatise responders. This trauma may be extremely hard to spot, and has the potential to flare up without warning at some point in the future.

This we all know already.

The problem is that monitoring of the physical and emotional demands of firefighters is technically difficult to achieve, in real time and in situ – ie the fireground. Vibration and dust affects common monitoring equipment, the cramped conditions and distance away from the command post also makes wired monitoring equipment ineffective. We could wear heart and breathing rate monitors under tunics, but these alone only give a limited picture of overall physical performance.

Psychological monitoring is even trickier. It requires trained staff to carry it out, buy-in from operational staff and the time and money to run the program effectively. To further compound the situation, rescue workers are notoriously difficult to talk into taking a break. They will often minimise how tired or upset they are feeling in order to remain on the

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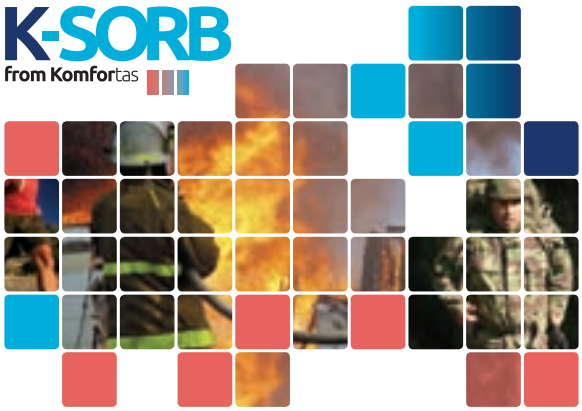

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Previous generations of sensors were bulky and impractical for firefighters to wear, requiring cabling and recording hardware. But today's systems are smaller, more lightweight, and can operate via wifi. Picture credit: Tímár Tamás.

job, often well beyond what is safe for them or – worse – beyond their capability to properly help those trapped. Their drive to help people and be at the heart of the action is why they do the job they do, but it does make managing their mental and physical health more difficult.

This all comes within the context of a fire and rescue sector, where firefighters are being asked to work longer, and where resources are precious; so losing firefighters to avoidable long term injuries should be a priority.

But what if we could monitor the physical and emotional state of USAR workers, unobtrusively, remotely and without wires or bulky sensors? What if we could tell the emotional state of a firefighter, their levels of fatigue, or even how upset they were? What if we could pick up on activity likely to cause a long term injury (such as using a powertool in a stress position) and either instruct the firefighter to stop, or rotate operators frequently enough to minimise damage? What if we could tell if a firefighter was too tired to continue safely, despite what they were telling us?

The same kind of technology that allows actors to portray apes, dinosaurs, robots or mythical creatures such as Gollum in movies may be part of the answer to this problem. Motion capture suits are routinely used in the video game and movie industries to capture the physical movement of people and electronically capture it to apply it to a CGI model on screen.

If this motion capture technology was used to track body movements, innovative Affective Computing techniques could then be applied to that body movement data to identify the physical and psychological states of firefighters and USAR workers. It could be used to inform a crew manager or on-scene commander that a firefighter was either engaging in a potentially damaging activity, or were too tired or too upset to continue. It could also work in a similar way to the Draeger Bodyguard BA Safety system, and identify when firefighters are unconscious or trapped in a more sophisticated way.

This technology could also be expanded to monitor crew to ensure that they were not too tired, upset or even intoxicated to operate machinery of vehicles. We could have 'smart' machinery that refused to work for any operator that was not behaving in a normal manner.

The term Affective Computing was coined by Professor Rosalind Picard at MIT in the late 1990s. One branch of Affective Computing focuses on building systems that automatically recognise a person's emotional and mental states through different kinds of verbal and nonverbal communication channels. We recently proposed a system, whereby motion capture sensors could be sewn into the leggings and tunic and fitted within the helmet of firefighters to track body expressions as the nonverbal communication channel in order to build such a system.

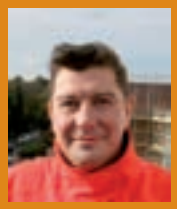
Although motion capture technology has been around for a long time, it has not been possible to use it very easily in the real world situations in which firefighters often work. The sensors themselves were quite bulky, heavy, and required cabling between the sensors and the recording hardware. However, motion capture technology has advanced considerably in the last few years and there are now systems on the market that are much smaller and more lightweight than previous systems, and can operate via wifi.

Many of these sensors combine contain accelerometers and gyroscopes, thus giving the ability to track not only the numerical position of the sensors on the body in 3D space, but also the speed of movement as well as angle rotations of different body joints. This allows for a complete, precise representation of the body to be tracked and recorded.

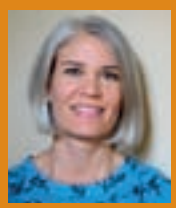
Affective Computing uses artificial intelligence techniques to automatically associate different emotional and psychological states with different body expressions; just like humans do in real face-to-face interactions. We start with human behaviour experts who would review example body movement recordings and judge the state of the person. This judgment gets combined with the numerical representation of the body and then a model is built. Once the model is trained it can be used in real time to recognize others.

The technology currently exists, but now we need to do the research to understand how best to apply it to the domains of USAR, firefighters and other emergency services. There is a virgin market out there for a genuinely new piece of firefighting technology. In our opinion it is only a matter of time before this becomes a standard component of firefighter PPE, sewn into every firefighter tunic in the world; the question is – who will exploit it first?

ABOUT THE AUTHORS



Dr Ian Greatbatch is Senior Lecturer in GIS at Kingston University London, where he works primarily in operational research concerning search and rescue, fire and the emergency services.



Dr Andrea Kleinsmith is a Postdoctoral Research Fellow in the Virtual Experiences Research Group at the University of Florida where she investigates the use of virtual humans in simulation training; examining the role that virtual patients can play in training medical students' interpersonal communication skills.

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Getting the most out of thermal imaging

UNDERGROUND FIRES, ROLLOVER FIRES AND CHIMNEY FIRES – KALMTHOUT FIRE SERVICE IN BELGIUM IS USING THERMAL IMAGING CAMERAS FOR A WHOLE HOST OF APPLICATIONS.

In addition to their general duties, firefighters based in Kalmthout – a village north of Antwerp in Belgium – are responsible for an environmentally sensitive nature reserve. Known as Kalmthout Heath, the 8,000 hectares site is home to many species of flora and fauna and it becomes particularly susceptive to fires in the hot and dry summer.

To ensure the fire service is best equipped to respond to any incident in the village or on the heath, thermal imaging has been part of its armoury for many years. However, the recent addition of a Flir K50 has brought additional advantages for fighting wildfire, detecting roll-over, investigating chimney fires and in search and rescue situations.

'Thermal imaging is definitely not new to us,' explained commanding officer, Lieutenant Ronny van Riel. 'We started using the technology about 10 years ago and initially invested in a FireFlir, which works well and has proven its worth. 'Now we have added a Flir K50 which is much more practical to carry. It is mounted on a charger in the truck that always arrives first at the scene. Firefighters can then clip it onto their kit so it's instantly available when they need it.'

Flir thermal imaging proved invaluable when a fire broke out on the Kalmthout Heath. It spread rapidly and around 600 hectares of this unique habitat were destroyed. Extinguishing the fire was a massive operation that involved many forces and thermal imaging was particularly effective at detecting underground fire. This occurs when the wildfire is extinguished but smouldering continues, fuelled by subterranean roots and other organic matter.

Ronny van Riel continued: 'Although not visible to the human eye, the fire rages underground and it can lead to an outbreak several metres away from the original ignition. Thermal imaging showed us clearly the areas on the heath where the ground fire was active. And by further extinguishing and cooling down these areas we prevented spontaneous self-combustion. In this instance we used handheld thermal imaging as well as helicopters equipped with gimbal-mounted infrared cameras to detect the hotspots.'

More recently Flir thermal imaging was used to search for a child that was lost on the heath. Although on this occasion the child was found before nightfall, the team knew it had the necessary equipment to pick up any heat signature in the undergrowth during the daylight or in complete darkness.

Protection from rollovers

Thermal imaging is known for its efficiency for detecting structures and victims in smoke-filled environments. The Flir K50, however, is a radiometric device that can also measure temperature and this ability is helping to protect Kalmthout firefighters against the dangerous fire condition known as rollover/flameover, which involves a mass of superheated gases at ceiling height or upper levels of a fire scene. It is not the materials in the room that are burning but the flammable gases they give off. And when these concentrated gases reach ignition point, the temperature in the room rises rapidly.

'If we go inside a building and expect to be confronted with

a rollover, we now closely monitor the ceiling temperature with the Flir camera while we try to cool down the smoke,' Ronny van Riel added. 'If the temperature exceeds a certain value then we exit to avoid endangering the lives of our firefighters. The camera is also used to help direct water from the fire hose.'

Chimney fires

Incomplete combustion of fuel is often the cause of chimney fires. Unburned volatiles are heated to their vapour state but not consumed due to a lack of adequate heat and oxygen within the hearth that is connected to the chimney. When they escape into the chimney and come into contact with cooler surfaces they condense, forming tar-like deposits and soot. Successive layers accumulate until either the chimney becomes blocked or they ignite.

'When we are called to a chimney fire we always use Flir thermal imaging to determine the hottest spot in the chimney,' Ronny van Riel advised. 'This hotspot is clearly visible on the thermal image and we also use the technology to monitor our progress in extinguishing the fire.' He concluded: 'A thermal imaging camera is a great tool for multiple applications. With the Flir K50 in our primary vehicle and the FireFlir in our secondary, we are well equipped. These cameras help protect the lives of our firefighters and help save the lives of others.'

Left to right: Flir K50 and FireFlir. Kalmthout Fire Service uses the K50 on its primary appliance and the FireFlir on the secondary vehicle.

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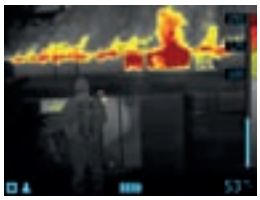

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Fired up for smart fleets

London Fire Brigade and Ghent Fire Brigade have become FIRED-uP partners under a project that runs until August 2015 and which is funded by the Competitiveness and Innovation Fund of the European Commission, writes Anne Finanne, Fired-Up Project Secretariat.

The aims of both Ghent Fire Brigade and LFB are to increase the sustainability of their front-line firefighting fleets whilst learning how the other engaged with the market.

Research had indicated that the market for some of the more familiar environmental technologies – such as electric, hybrid or alternative fuel vehicles – was too immature for fire service vehicles; would be prohibitively expensive; or would not meet operational needs (eg limited battery life for electric and hybrid vehicles). In fact the partners were already using some other technologies such as lightweight body panels on vehicles, and as the project evolved so did the focus of its technologies, with each partner veering off in different directions as a result of its specific requirements.

LFB had recognised the need to measure and reduce the impact of the existing fleet with an emphasis on the usage of data, logistics and life-cycle, and specifically data telematics. These technologies promised to measure existing fuel and power use, and could result in a management information tool that would have an impact on the way vehicles were used and maintenance cycles managed. By taking a more strategic approach to data management LFB would potentially be in a better position to make a more accurate analysis of the cost versus benefits of new technologies such as alternative fuels. These technologies were deemed mature and capable of having a considerable impact in reducing the environmental impact of vehicles – and LFB as a whole.

For Ghent, the emphasis shifted towards analysing whether environmental and economic gains could be made from a multi-functional, second-line vehicle. A prototype vehicle using the latest environmental technology would be developed, and it would support front-line firefighters at a range of emergency situations, carrying out logistics activities. As the vehicle would be the second to arrive, it would contain emergency equipment capable of dealing with different types of incidents. This would benefit Ghent Fire Brigade because it currently sends different types of vehicles depending on the emergency situations and events (see the diagram below, right).

Engaging the market

To gain an understanding of the latest technologies both partners attended a number of specific events including workshops and conferences. Each partner supplemented these activities by hosting open days where suppliers were invited to showcase their latest innovative solutions.

As well as enabling a dynamic engagement with the market, these sessions provided food for thought for both partners. Some suppliers found the engagement challenging from a brand protection point of view, as these sessions took place with their competitors. However, the potential benefits to the suppliers in the form of collaboration, partnerships and joint ventures outweighed the perceived challenges.

The City of Ghent undertook a particularly innovative approach to market engagement by hosting a moderated workshop with suppliers and end users. The session was built around a needs assessment on two themes revolving around usage: who would use a second-line vehicle; and who else would be impacted by it. These usage themes were then prioritised with a 'planning poker' methodology. Planning poker is a consensus technique that is based on expert evaluation. It is a teambuilding activity with the added value that it ensures that each person actively participates and contributes his or her knowledge. Within the needs assessment of the City of Ghent, planning poker estimated the innovation potential of each idea from a user's perspective.

As the procurement process is still underway the final contracts have not yet been announced, but more information is available on the website: www.fired-up.eu.

Left: LFB recognised the need to measure and reduce the impact of the existing fleet with an emphasis on data, logistics and life cycle, specifically telematics. Right: Ghent Fire Brigade currently sends different types of vehicle depending on the emergency. Under the new procurement strategy these vehicles could be replaced by one multi-tasking unit.

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