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Tenth anniversary edition | India building collapse | Climate change in Australia | Smart, resilient cities feature | Future technology feature | Syria's rescuers

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CRJ IS TEN YEARS OLD

A decade of exploring crisis response lifelines

SENTIENCE
Cities empowering people

EVOLUTION
Future disaster medicine

RESILIENCE
Visionary crisis leadership

PLUS

- India building collapse
- Search & Rescue in Iran
- Queensland climate adaptation
- Terrorism in Pakistan
- Bioweapons & bacterial resistance
- Training Syria's rescuers
- Interview: Sir David King
- Smart, resilient cities
- Future technology

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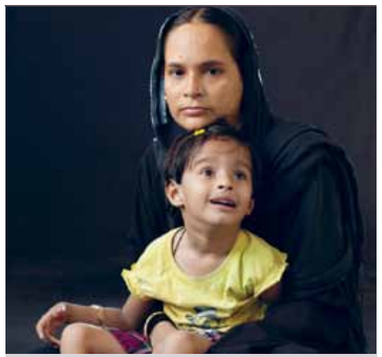

Keryn van der Walt | National Sea Rescue Institute

comment

WE ARE ENTERING our tenth volume of *CRJ*, which was launched a decade ago. The nature of the publication means celebration is inappropriate; too many incidents have occurred over this time, too many lives lost. But it is, nonetheless, a gratifying milestone.

Our founding ethos still holds true: to bridge any institutional, organisational and national gaps, to share information, enhance partnership working and improve communication. It has been good to see how dialogue between various disciplines and organisations has evolved, as shown by the increasing diversity of actors and stakeholders who have become involved in the conversation through our pages.

Despite this, in many ways the world feels no safer. The Hydra of wicked problems sometimes appears invincible, the same incidents repeating themselves, locked in a dispiritingly familiar cycle. Each time we absorb the horror of a disaster or terrorist attack, a bigger, more destructive one seems to surpass it.

The risk landscape has shifted in a decade: climate change has been added to the list of threats, exacerbating existing hazards. But the response, resilience and emergency planning community has developed accordingly in terms of leadership acuity, interagency co-operation, mutual assistance and business continuity.

And it is fascinating to observe the proliferation of emerging technology – ten years ago we hadn't heard of Twitter, YouTube, the Internet of Things, smart cities… Of course, these bring their own vulnerabilities and can be exploited to cause harm, but their potential for improving safety and resilience should not be overlooked.

So is with gratitude that we thank our sponsors, many of whom helped to launch *CRJ* ten years ago. Thanks also to our Editorial Advisory Panel – those who have been with us since the start and those who joined us along the way – and to the writers who have generously shared their thoughts, knowledge and experience. And an immense thank you to our subscribers.

To paraphrase Camus, most people are good rather than bad; it is usually ignorance that causes harm, despite good intentions. And this is why sharing experience and information is so vital: you are all working to eradicate ignorance and make the world a safer place.

It is a privilege to observe and report on this.

Emily Hough

Emerging technologies

FEMA's Chief Innovation Adviser, Desi Matel-Anderson, founder of the Field Innovation Team (FIT) is on a mission to deliver real-time innovations in disasters, says **J P Vielleux**

Having recognised the power of networks during a disaster, Matel-Anderson has pulled together 29 volunteers from diverse backgrounds (inventors, engineers, sci-fi writers, hackers, social innovators, nano-experts, the drone industry and more). The team and its collaborators have already created numerous apps; found ways to increase signal bandwidth to help FEMA Disaster Recovery Centres (DRCs) enhance operations; helped re-design the set-up and flow of FEMA DRCs; and piloted the concept of sending FEMA Corps members directly to survivors at their locations to perform disaster assistance registration on-the-spot with tablets.

FIT embraces open source solutions. When the team develops a new technology or process internally, it is shared openly on FIT's website or through other collaborative websites such as GitHub.

Among the growing list of successes are two technologies created by FIT partners—one of which has been deployed in a disaster zone. The second is ready to help and will probably be deployed in the near future.

FIT members deployed in Oso, Washington, USA soon after the mudslide, using a piece of technology that empowered engineers managing recovery efforts.

The case of Oso was particularly challenging. The muddy terrain, also known as the Moonscape, looked impossible to cross and the rescuers risked getting stuck in mud that was metres deep in places or triggering a new mudslide.

The quadcoptor UAS, or drone, is the result of collaboration between the FIT and Roboticists Without Borders, a team from the Center for Robot-Assisted Search and Rescue of the Texas A&M Engineering Experiment Station, as well as the unmanned aerial system (UAS) teams from Insitu, and PrecisionHawk.

The drone was the first of its kind to fly over a mudslide disaster zone on US soil. Its mission was to collect visual data of the Moonscape with a digital camera and then use the images and videos to create a computer-generated 3D rendering of the topography.

The UAS collected visual data within a few hours, completing seven flights over a four-hour period. Using Autodesk's OB Jet 500 3D printer, the team used the computer model to print a real-life 3D model and give a better idea of the terrain. The maps and models were delivered to the Oso Fire Chief and engineers.

> Where there is a communication blackout, responders spray the substance on trees, buildings and even people to re-establish the signal

A quadcopter UAS was the first of its kind to fly over a mudslide disaster zone on US soil after the Oso incident in Washington

FIT

There is still work to do: the high-resolution LIDAR data took two to four days from the time the data was collected to when it was received by incident management. Nonetheless, such information is precious: it saves time and keeps responders safe. The mapping prevents them from taking risks that would be otherwise unavoidable.

Underwater signal

Anyone who has been on the ground in a disaster zone knows that communication is often a challenge. Damaged infrastructure makes it hard for survivors and responders.

Tony Sutera of Chamtech and a volunteer for FIT, has developed a Nanoparticle Spray Antenna, the Chamtech Spray-On Antenna.

Responders could walk around the area where there is a communication blackout, spray the substance on trees, buildings, ground or even people, to re-establish the signal. The tiny particles act as communication nodes on the 'smart grid'. The range is frequently more than double that of a standard antenna. It does not need energy, which means no drain on battery life, nor does it get too hot like traditional antennas. The spray can be used underwater, with dramatic results: signals carried more than a mile during testing, and all this by using only three watts as opposed to the thousands of watts normally required.

The Nanoparticle Spray Antenna has been tested, but is yet to be used on the ground in the aftermath of a disaster.

Most new technologies go through some resistance before their widespread adoption. Whether it is privacy concerns or military associations, the UAS and Nanoparticle Spray Antenna technologies also face those issues.

And it does not stop there. One of FIT's upcoming project aims to work with aquanauts (astronauts under the sea) to test preparedness in Key Largo, Florida, for the next hurricane season, where they will test the underwater communication infrastructure. CRJ

Author

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