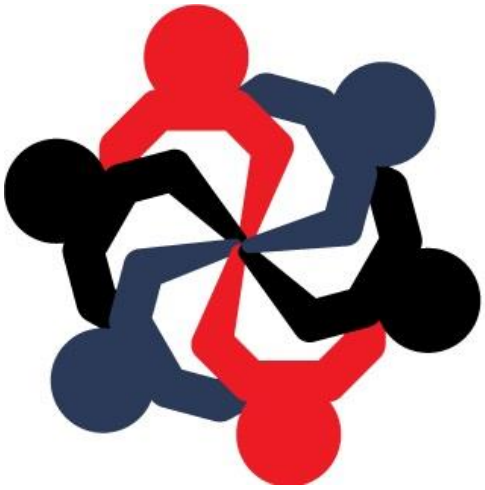

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Contents

Intervening Early and Preventing PTSD in First Responders

Intervening Early and Preventing PTSD in First Responders

ABSTRACT: Working in a frontline environment will routinely expose an individual to trauma and PTSD is recognised as an unintended consequence of workers experience. Although the negative impacts are widely known, there is almost an acceptance within the industry that it is an inevitable part of the job. When combined with pre-existing psychological experiences, this can be a trigger for traumatic injuries including PTSD. Emergency services have effectively increased the awareness of traumatic injury in their people and the wider community and they have been very supportive about access to early intervention. However, the prevention of traumatic injury is an area that has not been afforded much focus. It doesn't matter what type of injury was sustained in the line of duty - direct physical trauma or observed trauma – the impact is synonymous. The experience of trauma has a neurobiological impact on the brain, and 'multiple' impacts will place a person into a state in which they may no longer cope. Their ability to absorb the implications of any given situation, and the triggered negative self-reference, becomes overwhelming. By routinely providing psychoeducation on the rationale for immediate intervention (promotion), teach self-help techniques that are neurobiologically effective (prevention), and provide more structured support from leaders and other health professionals (early intervention), then we have a much greater opportunity to prevent traumatic injuries developing.

Keywords: Emergency Services, PTSD, Promotion, Prevention, Early-Intervention

Introduction

In 2004, the World Health Organization recognised that taking a preventative approach to Mental Disorders was more effective and preferable to treatment once the disorder was established. They recognised that the stigma and discrimination experienced by those with mental health problems and their families were inextricably linked to human rights issues. They also recognised that these problems are often a consequence of the fact that many people, including many health professionals, believe that there is no effective preventive or treatment options that can combat the development of disorders. The WHO determined that effective prevention can significantly alter the perception of society in relation to mental health and change the way individuals are affected (World Health Organization, 2004).

The DSM-V determines that a potentially traumatic event is the exposure to actual or threatened death, serious injury, or sexual violence by either directly experiencing the event, witnessing the event as it occurred to others, learning the event occurred to a close family member or

friend, or experiencing repeated or extreme exposure to aversive details of traumatic events (American Psychiatric Association, 2013).

There are a variety of other events that emergency service workers are routinely exposed to that could be deemed as traumatic, including events that unfairly impact children, involve multiple fatalities or shooting another person in the line of duty (MacEachern et al, 2011). In addition, emergency service workers may be exposed to the details of other events and as a result, may experience what is known as secondary traumatisation (Wollman, 1993). This is believed to result from a sharing of the emotional burden of the traumatic experience (MacEchern et al, 2011).

Others consider that traumatic events become problematic as they can result in significant distress to the worker. This may be because they remind them of their own mortality, they may identify with the victims of a crime or experience some other role ambiguity (Williams et al, 1988).

Natural disasters create significant levels of distress for community members and emergency service workers alike. Kerswell et al (2019) found that four-weeks after one large-scale potentially traumatic event (natural disaster) in Queensland, that involved police officers and civilian staff, 24% of the two hundred and sixteen surveyed had elevated levels of general distress, while 13% had PTSD symptoms at a clinical level.

PTSD is recognised as an unintended consequence of first responder's experiences. Although the negative impacts are widely known, there is almost an acceptance within the sector that there are no effective preventive or treatment options that can combat the development of disorders. It is clear that a different approach is needed.

In support of the WHO's recognition of the importance of prevention in the reduction of mental health issues, the National Mental Health Strategy and subsequent Plans recognise the importance of promotion, prevention, and early intervention.

Promotion, prevention, and early intervention approaches are relevant across the entire spectrum of mental health problems and disorders, from behavioural disorders and depressive and anxiety disorders, through to psychotic disorders. **Promotion** is any action taken to maximise mental health and wellbeing among populations and individuals. **Prevention** is defined as *'interventions that occur before the initial onset of a disorder'* to prevent the development of disorder. Prevention relies on reducing the risk factors for mental disorder, as well as enhancing the protective factors that promote mental health. **Early intervention** refers to interventions targeting people displaying the early signs and symptoms of a mental health problem or disorder, and people developing or experiencing a first episode of mental disorder (Commonwealth, 2000).

Working in a frontline environment will routinely expose an individual to trauma. This exposure, combined with pre-existing psychological dispositions, can be a trigger for psychological injuries, including PTSD. Therefore, a promotion, prevention and early intervention approach to mental health care within frontline services would appear to offer some easy wins.

Benefits may include improved resilience and increased mental health outcomes for the cohort, but also offer significant financial savings for these services over the long term, including:

- Reduced workers compensation claims
- Reduced access to leave entitlements
- Improved claims management for members
- Increased resilience
- Enhanced coping skills
- Improved outcomes from active trauma intervention

Implementation of a significant promotion and prevention approach would align with the Mental Health and Well Being strategies of many services, although they may require further expansion to accommodate the proposed psychological intervention process. This would include capacity building, education of personnel, continued improvement of process that incorporates research, advocacy, and the allocation of resources and infrastructure to support implementation.

Implementation of promotion, prevention and early intervention requires several steps to be taken and a multi-staged approach should be adopted. This would require iterative evaluation and monitoring, adaptation and tailoring, and a strategy for ensuring sustainability into the future.

One issue that is often raised is the impact of moral injury and the development of PTSD (often develops in emergency dispatch roles), as opposed to direct engagement in other forms of traumatic injury and PTSD. This appears to be creating complexity in an area that doesn't require differentiation. In essence, it doesn't matter what type of injury was sustained in the line of duty - direct physical trauma or observed trauma – the impact is synonymous.

The experience of trauma has neurobiological impact on the brain, and 'multiple' impacts will place a person into a state in which they are no longer able to cope with anything. Their ability to absorb the implications of any given situation, and the triggered negative self-reference, becomes overwhelming.

Most services seek to address these issues in their strategies with a multi-faceted approach that incorporates promotion and early intervention. These strategies incorporate stigma reduction strategies to aid improved organisational culture within the services and enhanced

standardised ‘intervention’ processes pre- and post-recruitment. However, although it is clear that psychoeducation is important, it is not enough to prevent the development of PTSD. A focus on prevention is essential.

For many emergency services, crisis intervention techniques and critical incident debriefing are utilised after a potentially traumatic event has occurred. Crisis intervention techniques consists of helping with intellectual understanding of the emotional relationship and discomfort arising after an incident, facilitating a space to express feelings and reduce anxiety, provide coping mechanisms and encourage emotional support from family, friends and others (Morley et al, 1967). Critical incident debriefing involves group sessions in which members of the workforce are encouraged to discuss their experience of the event and provide mutual support, education and establish support for their reactions and emotional responses (Patterson, 2001).

Whilst encouraging employees to speak up about their emotions and experiences may assist in the reduction of PTSD, there are some concerns with this approach. Firstly, many personnel within emergency services share a belief that increased stress as a normal aspect of the job and seeking help is a sign of weakness. Therefore, when presented with interventions such as these, they tend to resist intervention, especially when these interventions are led by people who do not have shared experiences with the participants (Patterson, 2001).

Secondly, people perceive situations differently and traumatic events will be interpreted and affect people in varying ways. During debriefing, one participant may recount the experience in a way that is more graphic than other participants and this may increase the potential for secondary traumatisation for some individuals.

Thirdly, most interventions are implemented too late. Employees should be afforded psychoeducation very early in their careers, so that they have the skills to recognise traumatic triggers and are provided coping mechanisms that may assist when presented with traumatic events (Lewis, 2001).

What is The Trouble With Trauma?

Let me share an analogy to explain how trauma impacts our lives. I utilise the notion of an inner ‘locked box’ to describe the repressed negative experience that we hold inside us, somewhere in your gut. This locked box is where negative experiences get stored over the course of our lives. When something bad happens, we mentally open the box, throw the incident in and shut the lid. As a result, most people in their early to mid-adult lives (depending on their life experiences) have a very full internal box.

Exposure to particularly negative or impactful working environments will add many items to the 'locked box' over a short period of time. PTSD often develops when someone's locked box is overflowing. In the case of emergency service personnel, their locked box is so full that it has developed cracks in it. It is like holding nuclear waste inside, and as a result, the poisonous waste is leeching into their system.

To better prepare emergency service personnel for exposure to negative environments (without building on existing negative beliefs), a regular process of 'spring cleaning' of their negative experience is required. There is an active process that could be completed, pre-probationary release, that would allow members the opportunity to clean out their existing 'locked box' before they are exposed to further trauma. The result is likely to be a major reduction in the development of PTSD from 'routine' exposure.

In addition, through all stages of their careers from recruitment, through service and in leaving we can teach members to engage in some very effective 'self-help' techniques. Whether they are in country or deployed, this would allow them to process their perspective on incidents, both routine and whilst in the field.

A traumatic incident has a window of approximately six-hours for the *'cellular consolidation'* process to complete. This process causes plastic and/or structural changes in the neural networks consolidating the memory. It takes a further three to four weeks before the *'system consolidation'* process is complete and the memory is fully processed within the brain (Kida, 2018). If we can intervene early, then we are able to resolve an issue before it develops into a more serious mental health problem.

Psychologists cannot be everywhere for emergency service personnel. If we routinely provide psychoeducation around the rationale for immediate intervention, and teach members self-help techniques that are neurobiologically effective, in addition to providing them with support from leaders and other health professionals, then we have a much greater opportunity to prevent mental health problems developing.

While there is an awareness of what events are considered the most stressful, these services require a model that outlines which crisis events require immediate intervention (within the first six hours), and which events need intervention within the first few days, and which require attention within the first three weeks – I refer to this as the 'Traffic Light Model'. The most severe events, those involving children or death or serious injury, would be considered 'red' events. These require immediate intervention before the experience consolidates within memory.

Our Proposed multi-staged approach:

- Recruitment - incorporate mental health 'literacy' and stigma reduction strategies that focus on a biological, rather than a psychosocial, attribution across all levels within the organisation, beginning in recruitment.
- Post-Recruitment - assessment of the existing developed psychological belief system.
- Pre-Service - provision of EMDR Therapy to resolve the existing negative beliefs that support the development of PTSD.
- Service - add training around the use of EMDR Therapy into SMART programs, including self-help tools that can be utilised by individuals in the field, and stigma reduction training around the post-deployment process.
- Service - mandatory external mental health process, implemented three weeks after return, focused on the mental health and wellbeing of the individual. This process needs to be aligned with the planned stigma reduction strategies.
- Promotion courses – to incorporate detailed education around the impact of psychological injury on personnel, how to manage this with empathy and provide access to support in a confidential manner, and the clear distinction that this is not a 'disciplinary' problem.

For affected members, the importance of feeling valued by the organisation is hugely beneficial to the overall reduction of mental health stigma and critical to ensure that there is no exacerbation of PTSD symptoms and their comorbidities (Howard, 2020).

Emergency services would obtain significant benefits from retention of the skills and expertise of their highly developed workforce. Developing a plan whereby these members may be better redeployed within the organisation is paramount if there is to be a reduction in the suicide rates of 'ex-serving' members. In the long term, such a strategy would provide increased savings through the retention of highly skilled members, reduced stigma, increased help-seeking behaviour and significantly improved morale. In the long-term, this would also result in the reduction of ongoing support payments to ex-serving members.

As we respond to changing global politics and the threat of terrorism continues to impact us, the need to support those who choose to commit their lives to protecting us, in their varied capacities, will increase.

Just as a promotion of rank requires exposure to education and physical training through a course, deployment should have a more comprehensive program around it. A highly self-aware workforce operates as a strong culture of support, assisting the prevention of mental health disorders

and ensuring access to early intervention programs that will minimise the development of severe and unremitting PTSD.

Significant benefits include improved mental health outcomes for the cohort by reducing the incidence of unremitting PTSD and suicidal ideation. In addition, this will reduce the likelihood of developing comorbid disorders like depression, anxiety or drug and alcohol dependence. In turn, this will also provide significant scope for reducing the social and financial burden of PTSD on emergency services in the longer term.

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Optimising Night Vision Technologies

Paper Presented at the

Australian & New Zealand Disaster & Emergency Management Conference

Gold Coast, Queensland, Australia, 1-2 October 2020

ABSTRACT: *Electro Optic (EO) searching particularly at night is an invaluable part of Search and Rescue (SAR) operations. EOs have been used for night searches for over 20 years and are an essential search aid. That said the IAMSAR Manual affords infrared searches a mere 6 sentences and Night Vision Goggles (NVG) very little more. With such scant guidance for operators and RCCs there is a very varied approach to night searching techniques and very little sharing of information between agencies.*

As part of our work at Yellow Scorpion, we are allowing RCCs and operators to optimise their assets and technologies by providing tools to calculate maximum detection ranges and designing computer models to optimise maritime search patterns for any given night sensor. The findings not only increase the chances of finding survivors quickly but also, for many operators, allow them to conduct helicopter searches within safer flight parameters.

Introduction

With over 20 years' experience in airborne sensors and helicopter search and rescue around the world, I found myself tasked to a night search and rescue mission for the crew of a helicopter who had crashed into the sea at night. We arrived on scene in the early hours of the morning, it was still 6 hours until sunrise, but we were on the most advanced helicopter in the region and equipped with a very good FLIR system and NVG. To my surprise we were not allowed into the search area by the RCC and instead told to wait until first light. By first light the search area was too large, and we had too little remaining crew duty time in order to conduct an effective search. When I questioned why we were asked to wait for first light it became apparent that the RCC did not know how to task an aircraft on an electro optic search so had a policy of waiting until it got light.

This situation got me thinking, I know how to conduct a night search because I am fortunate enough to have a thorough grounding in night searching, but if I had not, where would I get the information from? I would turn to the IAMSAR Manual, here there should be enough information to allow RCCs to better utilise their assets and plan an effective night search.

Setting the Scenario

Yellow Scorpion Pty Ltd have been consulting with RCCs and SAR crews around the world and offer advice and guidance to allow operators to better prepare themselves for night searching.

In order to offer realistic training, we often start with planning a search for an overdue boat. As the situation develops, we then move the scenario to a person who is known to have fallen from the boat but are not equipped with a floatation device, light or beacon. It had just got dark; the tasked aircraft is equipped with FLIR and NVG. We then allow crews to discuss options and open debate on the matter.

This debate is great and shows how much the operators and RCCs understand the technology. We then look at the same problem in a more calculated manner in order to see how the plan can be optimised.

NVG Searching

If we wish to conduct an NVG search for the for-mentioned task we must decide a sweep width for the search. The IAMSAR manual discusses factors that may affect the search but no guidance on calculating sweep widths. We can look at this in one of two ways.

Simplified

First is the simplified method. If we were conducting this search by day then the sweep width would be 0.1 nm. NVG are, at best, half as good as normal eyesight so the sweep width should be at least half that of by day leaving us with a sweep width of 0.05 nm or less depending on the conditions.

When we get down to sweep widths below 0.1 nm we run into a lot of problems. Firstly, unless the search area is very small it grows faster than it can be searched. If an aircraft was conducting a creeping line search at 60 kts with 6 nm legs and a 0.1 nm track spacing, it would only be advancing at 1 kt. Any drift of 1 kt or greater would mean that the aircraft never finds the survivor.

For those of you who are familiar with search patterns that are driven by an aircraft's onboard Flight Management System (FMS) will know that sweep widths can only be entered to one decimal place (0.1) and anything smaller cannot be entered. This is not impossible to get around, but it is very time consuming and takes away a valuable member of the crew for long periods of time whilst planning.

This generally means that although better than nothing, a pure NVG search for an unlit/non-reflective object such as a person in the water is unlikely to succeed unless the search area is very small.

Calculated

Using Johnson's Criteria we can create a predictive model for the Detection, Recognition and Identification (DRI) ranges of the sensor. We can predict that most modern Night Vision Goggles have a maximum detection range for a head in the water of 0.1 nm. This is before we add atmospheric attenuation and taking into account that our eyes now have a 40° field of view instead of the normal 120°. It is easy to see that we need to be significantly below a sweep width of 0.1 nm and a sweep width of 0.05 nm seems realistic.

Figure 01

$$R = \sqrt{\frac{0.07 D_{\text{in}} f_{\text{ob}} \tau_{\text{o}} \tau_{\text{a}} S_{\Sigma} \delta E K A_{\text{ob}}}{M \Phi_{\text{min ph}}}}$$

Figure 1 is taken from the Bulgarian Academy of Sciences and used to calculate the working range in m of Night Vision Goggles where:

D_{in} is the diameter of the inlet pupil, m,

f_{ob} objective focal length, mm,

τ_a , τ_o atmosphere and objective transmittance,

$\Phi_{min\ ph}$ IIT photocathode limiting light flow, lm,

δ IIT limiting resolution, lp/mm,

S_Σ IIT luminous sensitivity, A/lm,

M signal-to-noise ratio of IIT,

E ambient light illumination, lx,

K contrast,

A_{ob} target (surveillance object) area, m.

Their research in this area during different lighting conditions backs up our own findings with regards to estimating DRI ranges for NVG searches.

Conclusion

In order to conduct an effective NVG search for a person in the water at night whom does not have a light source would mean a sweep width of approximately 0.05 nm. This generally means that although better than nothing, a pure NVG search for an unlit/non-reflective object such as a person in the water is unlikely to succeed unless the search area is very small.

Infrared Searching

As with Night Vision Goggles, we can calculate the DRI ranges for a given target. Again, this is the maximum range and we must then take into account the atmospheric attenuation and emissive IR differences. We have found that for most modern, high end, FLIR systems the maximum detection range for a person in the water is approximately 0.5 nm. This would mean that if we planned a search with a 0.5 nm sweep width there would be ample crossover between sweeps where the target would be detectable.

Using this information, we then created a computer model to visualise the FLIR search patterns used by operators today to see if they could be optimised.

Most operators use the "autoscan" function for maritime FLIR searching. This is a system where some pre-set information is programmed into the system in order to search for a given target (camera elevation, sweep speed, etc). The aircraft is then flown at a given height and speed whilst the camera scans the water ahead of the aircraft. We analysed these parameters in order to offer efficiencies.

Table 1

Field of View	Scan Sector	Camera Elevation	Sweep Speed
Wide	60° (30° either side of the nose)	-15°	8 Sec

Table 2

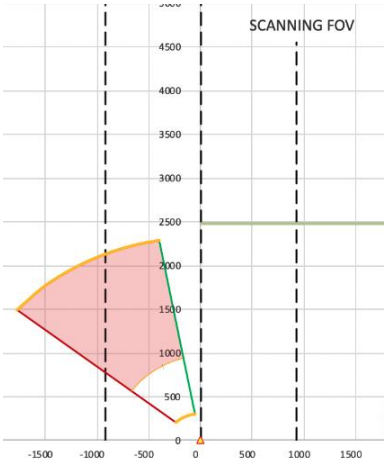
Search Object	Height	Ground Speed	Track Spacing	POS Elevation	FOV
Person in Water	500 ft	40-60 kts	0.5 nm	-15°	WFOV
Life Raft	500 ft	40-60 kts	0.5nm	-15°	WFOV
Small Boat with Outboard	500 ft	60 kts	1 nm	-15°	WFOV
Small Fishing Boat / Pleasure Craft	1000 ft	80 kts	2 nm	-10°	WFOV
Yacht	1000 ft	80 kts	2nm	-10°	WFOV
Fishing Vessel and larger	1000 ft	80 kts	5nm	-10°	WFOV

Above Table 1 and Table 2 show a typical setup for a FLIR search using the autoscan function.

Field of View

Initially, we found that for most operators the camera was looking far beyond the maximum detection range of the target.

Figure 02



In

Figure 02 the area between the red and green lines shows the area being searched by the camera. The area shaded in red is beyond the maximum detection range of the sensor. This would mean that over half of the screen is unusable but is still distracting to the observer.

This seems like a very easy fix to change the camera angle in order to make full use of the screen however, as we change one parameter it has a knock on affect elsewhere such as the coverage either side of the track line.

Computer Modelling

We needed the ability to be able to change all aspects of the sensor and aircraft parameters in order to derive the optimum settings for a given sensor. We developed the below simulation programme and ran thousands of simulations.

Figure 03

Figure 03 is a screen shot of a simulation. Using the simulator, we could calculate for how long a given target would be detectable and visible to the observer. We could then manipulate the sweep width to determine the total time that the target was in view once the aircraft has flown the next leg of the search pattern.

Optimisation

We found that by changing the parameters of the aircraft and camera we could dramatically improve the search. This had some great knock on effects to holistically improve the service. By increasing the aircraft height and depressing the camera angle the search became more focused on the detectable areas of sea. The Aircraft was now in a safer configuration and the increased angle reduced surface reflection and was better able to see between waves halving the area hidden to the observer.

Table 3

Field of View	Scan Sector	Camera Elevation	Sweep Speed
Wide	60° (30° either side of the nose)	-30°	8 Sec

Table 4

Search Object	Height	Ground Speed	Track Spacing	POS Elevation	FOV
Person in Water	1000 ft	40-60 kts	0.5 nm	-30°	WFOV

Our modelling would suggest that the search parameters used in

Table 3 and Table 4 would have a great advantage over the original parameters used in Table 1 and Table 2 and we can calculate that a target would be detectable and in view of the observer for at least 11 seconds (at 40 kts).

Conclusion

The results of our research showed us that most maritime electro optic searches could be improved for both probability of detection and safety of the aircraft. One of the key advantages is at least knowing how long the target is detectable and visible to the observer. We can then make calculated decisions about aircraft parameters and sweep widths in order to best utilise the assets. Although there are a multitude of variables, by calculating a maximum detection range we at least have a starting point by which to base our search planning on. We understand that the current FLIR parameters are based on having a number of sweeps of the target, but we see no benefit of that if the target is undetectable. It seemed much better to have the target in the detectable range and visible to the observer for longer.

We concluded that FLIR and NVG searches needed very different aircraft parameters. Thus, the two search methods cannot be conducted effectively from an aircraft at the same time.

We did not find the basis for the advice from the IAMSAR manual to conduct a FLIR search for small targets between 200 ft and 500 ft and would suggest that 1000 ft – 1500 ft would be more appropriate.

We found that in favourable conditions a FLIR search for an unlit/non reflective object was 10 times faster than a search using NVG alone. This would suggest that FLIR should be the primary search sensor with NVG used mainly for the safety of flight.

We also found it very difficult to conduct a FLIR search for a person in the water from a medium/large jet aircraft. The high speed (compared to a helicopter) made the search for a small target very difficult.

Even more than day searching, night searching is extremely fatiguing. With fatigue comes a reduction in observer performance. It is apparent why the Royal Air Force and HM Coastguard train all of the rearcrew on the use of the FLIR in order to allow periods of rest during long searches.

Figure 04

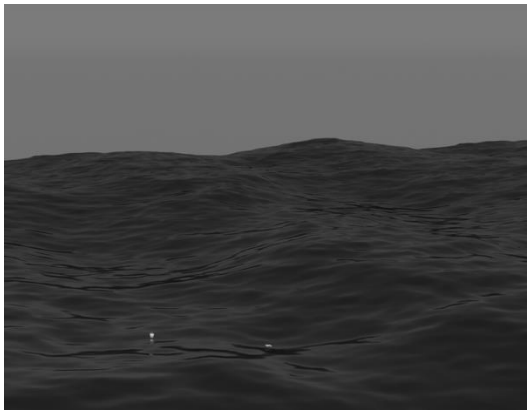


Figure 04 is a screenshot from our current project where we hope to create realistic simulations of FLIR searches in order to better estimate a probability of detection of any given set of parameters or conditions.

We hope to open this topic up to debate in order to share experiences and practices with the aim of improving the way maritime electro optic searches are conducted. Hopefully, we can work towards offering more guidance to service providers and RCCs and allow them to make calculated decisions when tasking assets.

We welcome feedback on this paper and would be happy to share our findings with anyone who is interested in seeing if there is any room for improvement within their night search planning tools.

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Termination of a Search and Rescue Incident

Paper Presented at the
Australian & New Zealand Disaster & Emergency Management Conference
Gold Coast, Queensland, Australia, 1-2 October 2020

Termination of a Search and Rescue Incident

ABSTRACT: *This paper looks at the process behind the termination of a search and rescue operation for a missing person within Queensland. Approximately 1-2% of all searches for lost and missing persons in Queensland involve the target not being able to be found, a situation acerbated if it occurs off shore as a result of a marine incident. The term termination for a search and rescue incident is unique to Queensland and signifies that there is no longer any likelihood of the missing person being found, let alone being found alive. Termination is not done lightly and this paper will identify the rigorous process involved before a search is*

stopped. As can be imagined this is a very emotional time for the relatives and friends of the missing person, as well as for those involved in the search.

Keywords: Search and rescue; termination; suspension; Coroner's Inquest

Introduction:

Within each Australian State and Territory the respective Police Jurisdictions are responsible for most search and rescue (SAR) operations for lost and missing persons. They are ably assisted by the Joint Rescue Coordination Centre (JRCC) in Canberra who monitor all beacon activations and deal with aviation and SOLAS Class marine incidents, and on occasion also by the Australian Defence Force (ADF) (Whitehead, 2020).

While most SAR incidents are finalised with the target missing people being found, either alive or deceased, there are a small number of incidents where the targets are unable to be located despite the efforts of all involved. In Queensland this accounts for between 6 and 30, out of approximately 1,900 to 2,200 missing/lost people annually (Australian Maritime Safety Authority, 2019). From a SAR perspective this does not include runaways, people seeking a new life or the like, only those who need assistance because they are lost, in imminent danger or distress, have medical issues or are suicidal.

Discussion

Queensland Police coordinate between 1,100 and 1,300 SAR incidents annually, and although coordination is undertaken by a SAR trained officer each incident is owned by the relevant District Officer. They are responsible for the resources and outcomes for these, and all other, police matters within their area of control.

A SAR incident commences with the seeking of information, and among the many questions of which will be asked of the family and friends are ones relating to the actual missing person, their health, medical or mental issues, any military or survival experience and their ability to utilise this knowledge. As can be imagined, there can be considerable differences in response from these questions by various informants, some seeing the missing person as being stronger than in reality, others seeing the opposite. To counter this, a prudent coordinator will seek information from as many sources as possible to get a comprehensive picture of the person involved.

Survivability can be a very subjective question, and to counter the emotional affects a medical opinion is always sought from a doctor specialising in either SAR or emergency medicine. To aid a proper opinion being developed the National SAR Manual recommends the mnemonic INSPECTOR be used as a means of gather pertinent information (Whitehead, 2020).

I Incident details pertaining to the missing person's medical condition.
N Name of the missing person
S Scenario, the back ground information leading up to the SAR incident
P Physical/medical/behavioural characteristics of the missing person
E Experience. What skills does the missing person have to assist in their own survival
C Clothing and/or equipment carried by the missing person
T Terrain, topography, vegetation, sea conditions, wave heights, swell, distance to help
O Oral, when did the missing person last eat and drink, do they have food and water with them or the ability to find it.
R Rain or weather in the search area, before, during and after the incident.

Using the above information a SAR Coordinator will consult with a doctor and obtain an opinion of the survival prospects for the missing person. The opinions are based on the collective experiences of each doctor and reference to the tables contained in Chapter 7 of the National SAR Manual, Medical Factors Affecting SAR. The basic rule of thumb is the 3,3,3 rule; survival time is limited to 3 minutes without air, 3 days without water and 3 weeks without food. Variations are then factored in based on the weather, medical issues of the missing person, survivability of the situation and what aids are available. Maria Soper (Nunnan, 1999) and Gabrielle Grossmueller (Chivell, 2000) both perished in short periods of time in extremely hot outback conditions. Both women had access to water but because of the effects of hyperthermia would have been unable to recognise it for its life giving qualities. It is an unfortunate fact that very few people survive beyond the time frame provided, although there are some example of people surviving long enough to raise the alarm for others. Ruben McDornan clung to the hull of the upturned FV Dianne for six hours before having to paddle and swim without a life jacket many mile out to sea for a further six hours before being spotted by a passing yacht (O'Connell, 2019).

Seeking the TFFS is not generally done on the first day of the search, given that 81% of missing and lost people are found within the initial reflex or fast search (Australian Maritime Safety Authority, 2019). Day two of a search represents an ideal time for determining survival. Day two also provides the opportunity to revisit the information gathered on day one. The first cache of information is known as the preliminary communications, and this is what the search formed around. Historically, it has been found that this information is not always accurate, people's perspectives are different, their memories of particular incidents differ and some information is based on rose coloured glasses.

Why is Queensland the only state to 'terminate' a SAR operation when all other states and territories use the term suspend? Suspension is used when the search has to stop, for things such as nightfall, a weather event or because there is nowhere else to search without further intelligence. Using the term suspend gives the family the impression that the search will resume at some stage in the future, and indeed that is generally the case. Termination is used at the conclusion of a SAR operation. Search and rescue, by its nature, refers to the search for and rescuing of a living person, someone who was in distress and/or required assistance. This is why the JRCC and the ADF generally cease searching after the time frame for survival has elapsed. Police continue to search because they have obligations under their respective Coroners Acts to recover deceased persons. Terminating a SAR operation means that the survival time has elapsed, all searching has been completed and there is no likelihood of finding the missing person. From a SAR perspective the missing person is deceased. It may be harsh but it is definitive.

No single person has the ability to terminate a SAR operation. There is a strict protocol involved and several steps to make sure everything possible has been done to find and recover the missing person.

Prior to any termination consideration the incident has to be examined in depth, and this includes:

- Review the decisions made during the search, ensuring that the planning scenarios were valid and could be backed up the intelligence.
- Review the accuracy of the last known position and any drift modelling/ lost person behaviour used to calculate the search area.

- Review any clues found and assumptions made from them.
- Review the datum calculations.
- Ensure that all possible sources of information have been exhausted.
- Ensure that no information or intelligence had been overlooked.
- Review the search plan to ensure that all search areas were tasked an asset and that all search areas were searched to an acceptable Probability of Detection (POD).
- Ensure that compensation was made for any weather effect.
- Review the survivability of the missing person/s, the effects of the elapsed time, environmental conditions, physical, mental and experience parameters of the missing person and survival equipment if available.
- Reference studies and information on similar situations.
- Review the rescue plan to ensure it was sufficient for the incident.

This information is detailed in either a Peer Review Form (QP0957 or a Request to Terminate a SAR Incident form (QP0852). In the case of termination this review is always undertaken by the State Search and Rescue Coordinator & Training Officer, whereas a Peer Review is undertaken by a Senior Search and Rescue Officer from another SAR region as a means of providing impartiality.

It is good practice for a SAR Coordinator to constantly brief the family of the missing person to show that everything is being done to locate and rescue their kin. It allows for them to seek clarification and ask any questions that they may have regarding the search and the processes behind it. It is also provides the opportunity to introduce the survivability of the missing person into the process. It has been found that as the search progresses through day three and four the next of kin will often broach the subject of survivability. This is the ideal time to be frank and open (Whitehead, 2020).

It is policy that any search will continue for several days beyond the time frame for survival, giving the missing person the greatest chance of being found, if not alive then deceased. With any SAR incident exceeding 24 hours or where a death is suspected the Search and Rescue Mission Coordinator (SMC) will consult with the State SAR Coordinator on a daily basis, allowing for a continuous assessment of the search in real time. When it becomes clear that survival may be an issue consultation is also made with the Coronial Support Unit, notifying

the Coroner of the situation and seeking any advice or directions that may be offered. There is a two-fold reason behind this, it allows early notification to the Coroner of a potential death situation and provides an opportunity for additional searches or information gathering from a coronial perspective. Doing so during the search often alleviates the need to revisit the scene at some later time.

Once it has been determined that the survival time of the missing person has expired the SMC will commence a form QP0852, seeking official approval to terminate the search. This form outlines the search process, the areas searched, and the mathematical probability of detection achieved. The SSARCTO provides an overview and reasoning behind the decision to stop searching, confirming that the family have also been advised. This completed form is then supported by the District Officer where the incident has occurred before being forwarded to the on-call Deputy Commissioner. In Queensland a SAR termination can only be approved by a Deputy Commissioner, the catalyst being the failed search for David Eason in 2001 (Barnes, 2004). As a result of the checks and balances it is rare that this recommendation is questioned, although on occasion it is necessary to explain some of the more technical aspects of the incident. Approval is generally granted within three hours and the search is wound down.

Does that mean we forget about the missing person? No, it means that any subsequent searching is done for a deceased person or remains thereof. The termination only relates to a living person, although through obligations under the Coroner's Act police are required to continually look for those that are believed to be deceased. Don Marchant disappeared on a day visit to the Green Mountain resort in the Lamington National Park in April 2017, with the search being terminated after a concerted 12 day effort in very thick rain forest. Subsequent searches with both Park Rangers and State Emergency Service found Mr Marchant's remains in July 2018. They were located within the initial search area but because of the thick vegetation were not observed initially (Ryder, 2019).

Conclusion

The introduction and use of the termination request form has ensured that all SAR incidents where the missing person has not been able to be located are given a thorough review before any searching ceases. The review covers all aspects of the search operation, and where areas need researching this can be done in real time during the active phase of a search. The system was developed so that no single SAR coordinator can make the decision to stop searching

alone, the checks and balances ensure that the best search had been undertaken and the missing person was given the greatest chance of being found.

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Can community fractures, post disaster, be minimised by listening to the community?

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Abstract

At approximately 9:00pm on 17 March, 2018 a fierce windstorm hit the South West of Victoria. In excess of 23 grass and scrub fires were ignited. Fortunately, most of the fires were extinguished quickly, however two of the fires continued to burn well into the next day. Both fires had devastating consequences for the rural farming communities that were impacted. More than 7,000 hectares were destroyed along with 5 homes and over 10,000 livestock across 80 farms were lost.

Understanding the recovery stages that affect communities post disaster was instrumental in enabling us to focus our attention on developing a holistic outreach recovery model that not only eliminated the opportunity for community fractures to appear but also built social capital.

Our model responded by enabling everybody who was affected with an opportunity to equally engage, therefore providing a focus on human capital rather than on built capital.

Providing multiple places where fire affected communities gathered in easily accessible and neutral locations without formalities or agendas enabled the affected communities to interact in safe and non-threatening places where they created new friendships, shared ideas, where peers supported each other. These gathering opportunities brought the communities together and built social capital.

Recovery Stages

On 17 March, 2018 at approximately 9pm a fierce windstorm hit the South West of Victoria. This windstorm ignited over 23 grass and scrub fires. Fortunately, most were able to be extinguished quickly, however two of those fires continued to burn well into the next day, burning through rural farming communities. Both the Gazette Fire and the Garvoc Fire destroyed more than 7,000 hectares, razed 5 homes and numerous outbuildings and sheds, and killed thousands of livestock.

None of the community impacted by these fires woke up that morning and thought that they would be involved in a disaster that would ultimately change their lives forever. But when a disaster strikes, a community has no choice but to respond and cope as best they can with the event. Many scholars including Gordon and Aldrich have researched how a disaster might impact a community and the stages that an impacted community goes through during recovery. What we do know is that "At impact, danger makes people highly aroused and they respond to the specific demands of the situation.[1]" The focus on the immediate problem can be so intense, people lose awareness of their social world, removing and isolating themselves from their usual social ties. The normal structures that tie a community together begin to fracture. According to Dr Rob Gordon there are three stages a community moves through during recovery; Debonding, Fusion, and the breakdown of fusion called Differentiation.

During the Debonding stage people tend to build barriers around themselves and shut out those people with legitimate roles, preferring to seek information from friends regardless of their expertise[2]. We observed many of the fire affected community become deeply focussed on essential farming tasks and were caught up in the rapid response of re-fencing and taking care of livestock. Having an understanding of Gordon's disaster social process theory we could clearly identify that the community were entering the most destructive stage of recovery: the Fusion stage.

"The Fusion breaks the continuity of normal community structures in a highly energised reorganisation of the communicational system. It is a secondary source of disruption after Debonding and is a threat to the pre-emergency structure that provides for long term needs." [3]
Gordon further states that, "Anything that prevents or reduces the phenomenon of Debonding will intercept the process at its start."[4]

Working in the field and talking, but most importantly listening to the fire affected community, we could see at first hand that they were entering this most destructive state of recovery and we needed to interrupt this by designing a model that encouraged social participation.

Disaster Recovery Principles

In order to design the most successful model we investigated the traditional approaches to recovery in Australia and discovered that the most recommended mechanism was to develop community recovery committees (CRC). The intent of a CRC is to make strategic decisions about recovery and coordinate activities to rebuild, restore and rehabilitate the social, built, economic and natural environments of the affected community. These committees are very formal with an elected Chair where minutes and agendas are prepared for meetings that usually occur monthly. The Australian Disaster Resilience Recovery Handbook suggests membership of the committees include representatives from government, non-government organisations and community.[5]

In Australia we can reference The National Principles of Disaster Recovery. These principles are designed to facilitate a comprehensive and consistent approach to recovery. This document states that successful recovery relies on:

- Understanding the community context
- Recognising the complex and dynamic nature of emergencies and communities
- Using community-led approaches that are responsive and flexible, engaging communities and empowering them to move forward
- A planned, coordinated and adaptive approach based on continuous assessments of impacts and needs
- Effective communication with affected communities and other stakeholders
- Recognising, supporting and building on community, individual and organisational capacity

Together with the guidelines and principles we still felt it was important to ask the community how they would like to be engaged with during recovery.

Community led recovery; listening

Recovery Managers can be tricked into thinking that heeding the loudest voice provides the information needed to plan for recovery. However, from our experience it was important to ensure that all the affected community were listened too, most importantly the quieter ones or the ones who think they have nothing to say. Understanding that the loudest voice did not represent all the community, we actively listened to all the affected community and encouraged conversations. In the weeks post disaster we used a variety of methods to engage with the fire affected communities, including food hamper deliveries, telephone calls, texting, and on farm visits. This combination of methods allowed us to have an understanding of not only what stage of recovery they were in, but gave them an opportunity to communicate with us about what they needed to be supported in recovery.

By engaging and listening to all the community we gained a deeper understanding that they were starting to disengage from their normal routines of going to the local football, attending social outings with friends and withdrawing from regular commitments. As time progressed we continued to notice a larger segment of the fire affected community were moving into a state of anger and rumour, where cracks started to emerge between friends and neighbours.

We knew we had to develop a model going forward and six weeks after the fires we conducted a series of informal meetings with the community with the only agenda of establishing how the community wanted to move forward with their recovery and how we could support them. The timing and location of these meetings were crucial and well considered to fit farmers' routines. This simple act demonstrated to the fire affected community that we understood them and we were supportive of them. It was also important for the meeting to be relaxed, informal and welcoming. The room was set up unlike a formal meeting with all the chairs arranged in a circle visually demonstrating that nobody was more important than anybody else. Upon arrival everybody was individually welcomed and offered a cup of tea or coffee.

Suggestions of how to engage were proposed including the idea of establishing a community recovery committee to manage recovery. The overwhelming response from the fire affected communities across both fires and at all meetings was that they would not attend any formal meetings. They were clear that they wanted something informal with no agendas or agency representatives lecturing them; they requested a model that was flexible and came to them and that

could adapt to their changing needs through recovery. Farmers were very clear that they were not going to get changed and travel into town to participate in a meeting. We were mindful that we had to meet their needs and so set about developing a model that not only engaged with the community and reduced the likelihood of fractures growing with the community but also built social capital at the same time.

Social capital

Sociologists have been writing about social capital since the early nineteenth century with Alexis de Tocqueville in 1835 writing about American citizens penchant for "forming associations" going further to say that "if they never acquired the habit of forming associations in the normal life, civilisation itself would be endangered".[6] Putnam described it as "civic virtue"[7].

Putnam's definition involves three aspects of social capital; trustworthiness; norms, and networks. However, Woolcock describes it as the wires through which information runs and uses three key factors to describe it;

1) Bonding social capital (ties between immediate family members, neighbours, close friends, and business associates sharing similar demographic characteristics),
2) Bridging social capital (ties among people from different ethnic, geographical, and occupational backgrounds but with similar economic status and political influence), and
3) Linking social capital (ties between community and those in positions of influence in formal organizations such as banks, agricultural extension offices, schools, housing authorities, or the police).[8]

Nakagawa and Shaw further expand Woolcock's definition of social capital, by including trust, social norm, participation and network, under "bonding social capital", and under "bridging social capital". They use multidisciplinary interactions, participation and networks and to further describe linking social capital, they define it as formal collaborations.

Aldrich's research proves that "Survivors with strong social networks experience faster recoveries and have access to needed information, tools and assistance."[9] And Goldschalk and Olshansky, confirm that "Local participation in recovery planning helps build social capital and adaptive capacity, which in turn increase community resilience to disasters in the long run. [10]

Our decision was made. Our aim would be to not only provide immediate support to the affected community but design a holistic recovery strategy that would build social capital. However, we were faced with some challenges to overcome.

Challenges to overcome in designing a successful model included:

- Distance, as there was over 100kms between both fires.
- Liaising with three local Councils.
- Limited availability of infrastructure where the community could gather close to their farms.
- The preference of some farmers to avoid social gatherings.
- A history of fire. Garvoc had previously been affected by Ash Wednesday in 1983 with some farmers having lost their homes for a second time during these 2018 fires.
- Suicide statistics of the Great South Coast doubled between 2009-2014, with 84 per cent of GSC suicides middle aged men between 35 and 63 years[11].
- Funding was initially a challenge because the fires did not destroy any public infrastructure the criteria were not met to activate the National Disaster Relief and Recovery Arrangements

The Van

To build social capital and prevent the fusion stage from continuing to affect the community we needed to design a model that encouraged the community out from their homes into a neutral safe location that allowed them to share their experiences, discuss their concerns, receive factual information and connect them to services.

"Vantastic" or "The van" as it was commonly known, did just that. It was a holistic recovery outreach model that, through design, drew the community to it. As North and Westerhaus state, "*Outreach by community-based services provides trusted support to people who can maintain contact with those affected. It is an effective form of assistance."*[12]

The van was mobile and it came to the community and simply pulled up on the side of the road in four locations across two fires each week. The four locations were specifically chosen to make it easy for farmers to drive their tractor or quad bike to. The van was not formal, so there was no

need to change clothes before attending and each stop was specifically designed not to coincide with important farm work such as milking.

Initially the van provided essential information regarding grants, council services and recovery supports over a cup of tea or coffee. These regular interactions is where trust was built and friendships developed between farmers who had never met before. However, it quickly became apparent that the time people were staying was increasing and we began to serve lunch or morning tea at each stop. On multiple occasions we catered for over 40 people.

The van provided the community with new routines. Regardless of the weather, the van stopped at the same location and time each week. A dairy farmer from Garvoc, who regularly attended the van said, "That when you go to the van you found out that other farmers had similar problems and were going through the same things you were going through. It was just good to talk to them and discuss things with them. Sometimes we had the same worries and other times it was just a day out. A coffee and a talk. It was a good place to get rid of your stress."

Importantly, relationships were built at all four locations across both fires, where peers would look out for each other, with one farmer noticing that his neighbour wasn't at the van and followed up with him on his way home, basically saying "If you're not at the van, then why not?"

It provided a safe, neutral, weekly social gathering that allowed participants to discuss any concerns that they may have had and to address issues with their peers, dispel myths and rumours, receive up to date and relevant recovery information, meet with other agencies to support their recovery and most importantly, build social capital.

The Statistics

There were over 700 visits to the van with an average of 20.4 each week. The statistics below provide further details:

Van Statistics		Total
Individuals who visit the van	71 (Garvoc) 33 (Gazette)	104 people
Gender	Males 20 (Gazette) Females 13 (Gazette) Males 43 (Garvoc) Females 28 (Garvoc)	Males 63 Females 41

	Weekly	Total (40 weeks)
Sausages cooked at the van	48	1,920 sausages
Kilometres driven by the van	213.4 kms	8,536 kms
Fuel to fill up the van	40 litres	1600 litres
Tim Tams eaten at the van	48 tim tams	1,920 tim tams
Hot drinks served at the van	36 hot drinks	1,440 hot drinks
Connections	416 connections	14,976

Communication and building of trust has proven outcomes for the community. The following communication statistics outline our commitment to conversation.

Communication	Weekly	Totals (40 weeks)
Weekly SMS/Texting	160 messages sent weekly	6,400 texts 320 hours (mostly after hours)
Newsletter distribution	280 per month	2800
Telephone conversations	12 calls weekly (on average)	480 calls 80 hours of conversations

Home visits	4 per week	160 visits
Non-judgemental conversations at the van	10 hours	400 hours

The van was extremely successful in engaging with men between the age of 35 to 63 years which is a critical age group at a higher risk of suicide.

Age of males who visit the van		Total
Males (35-63yoa)	16 (Gazette) 23 (Garvoc)	39
Males (+63yoa)	3 (Gazette) 13 (Garvoc)	15
Males (<35 yoa)	7 (Garvoc) 1 (Gazette)	8

Conclusion

By listening to the community we were able to design a holistic outreach model that was able to not only intercept the most destructive recovery stages and stop their effects within the community but also build social capital across four different locations. By building social capital it allowed the fire affected community to establish and build new social relationships, create new norms, gain a wider perspective of their situation, support and care for their neighbours and build resilience.

The model was adaptive and flexible and was in operation for over 40 weeks where over 400 hours of non-judgemental conversations occurred. These conversations built robust and resilient communities long after the van departed.

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ABSTRACT
In the early days of COVID-19, the Australian medical system required procurement, supply chain and logistics planning and execution to secure and deliver vital Medical Personal Protective Equipment (PPE). Supply lines and critical transport infrastructure were disrupted and much needed goods were in short supply. Rapid, innovative solutions were needed to meet the 'new norm' of market requirements. Aspen Medical sought help from the Vaxa Group to provide procurement, supply chain and logistics support to deliver huge volumes of medical PPE to the Federal Government.

In isolation, notwithstanding the backdrop of rapidly changing geo-strategic circumstances, the environmental challenges of climate change and the recent bush fires, this could be seen as 'nothing new.' The concept of government/business and supplier response to disaster or emergency situations where management of short notice supply and demand challenges is required has been experienced before. However, this challenge highlighted that Australia's disaster management plans, writ large had virtually overlooked a pandemic and the associated long term effects posed for governments, communities, agencies and businesses operating in all sectors. Australia's dependencies on offshore supply chain solutions and markets for goods and services across a range of sectors were exposed, including those the disaster and emergency management arena.

Such circumstances are demanding a re-orientation towards reduced dependencies, growth of indigenous 'capabilities' and innovative thinking.

The 'environment' – strategic, political and economic

For the disaster and emergency management sector, this would require government(s) to rapidly develop policy, revise funding and plans for agencies to review service delivery and business models. Emergency management plans support communities and business models by ensuring business continuity and delivery of services well established and generally robust in times of crisis. In the main however, these plans are orientated towards response to natural disaster catastrophic events such as fires, floods, loss of power and increasingly, cyber threat. Climate change has progressively featured more and more in 'testing' collective approaches and posturing to disaster and emergency management, but the COVID-19 pandemic was throwing up more questions and challenges.

To some, disaster and emergency response had developed an extended meaning when considering the immediate and long-term response to the COVID-19 pandemic. A nationwide crisis with the scope and scale of COVID-19 in itself was (and is) going to test our collective capacity to respond across the entire Australian community in an enduring way. This is compounded by the need to meet demands of our high-risk weather season that through the impact of climate change has increasingly become a broadening operating window beyond historical norms. The pandemic also called on 'different' solutions to those traditionally associated with catastrophic weather events and natural disasters writ large. COVID-19 brought unforeseen requirements as a national (and international) health crisis for the type and scale of services and material response solutions needed. Solutions required innovative thinking, 'cross-levelling' across traditional lines of operations and arguably, across business sectors. The seemingly simple supplies, like PPE, was increasingly difficult to source (in the quantities and locations needed) and supply.

Australia's indigenous capacity to respond to the crisis has 'exhausted' capacities in selected industry services and material solutions – including across the disaster and emergency management sectors. The economy has been adversely affected and our dependencies on offshore markets and suppliers were exposed. Businesses have struggled to stay viable and remain competitive. Given the enduring nature of the COVID-19 pandemic, our disaster and emergency management plans are at risk given the same stakeholders, serves and material solutions are going to be required for multiple disaster and crisis response scenarios concurrently.

'Sector Convergence' and a Grand Strategy

The rapidly changing geo-strategic circumstances, environmental challenges and a 'widening' in definition of national security is presenting both challenges and opportunities in Australia's Disaster and Emergency Management arena. Talk of a national Grand Strategy to pursue (and protect) Australia's interests has been around for a while. The exact nature and composition of such a strategy is debatable, but it would encompass our ability and capacity to posture for disaster and crisis response to health, economic and security orientated threats. The ducks are rapidly aligning for the Federal Government to develop such a strategy, thanks to the geo-strategic environment, climate change and the COVID-19 pandemic. It also presents an opportunity to renew our thinking and industry posture for disaster and emergency management in Australia.

An Australian grand strategy should factor in China's high-tech ambitions, rising US concerns over maintaining technological pre-eminence and an appreciation that keeping China sensitive to disruptions in global supply chains brings strategic advantages. Commercially, companies are investing in both diversifying their supply chains to avoid sole reliance on China and building duplicate facilities: one inside China to cater to its giant market, the other outside for safety and security. As Strategy commentator and visiting Fellow at the Griffith Asia Institute Peter Layton recently wrote in an editorial "[a Grand Strategy] design needs to be shaped by the three factors of economic interdependence, Chinese technological aspirations and increasing unpredictability. The future of the relationship is in our hands as much as China's. Australia has real agency; let's use it." 1

I think what we might see under a grand strategy or similar is a 'convergence of sectors', centered on the key tenet of 'national interests.' To me, such a strategy would not only articulate roles along the lines of traditional thinking for the areas Defence, Home Affairs, Health, Emergency Management and their industries, but drive revised thinking on the nature of threats to our interests. Such threats would recognize an extension beyond military conflict to include health and economic prosperity – in an enduring and responsive sense. The Federal Government (and States for that matter) have advocated for building indigenous industry capabilities – primarily in response to the COVID-19 pandemic and the associated exposure of our dependencies on overseas markets and supply chains. No matter the reason, the idea of harnessing everything under a national strategy not only has merit, but will present the roadmap for government and industry across all sectors, including emergency management on how to posture for business and disaster/crisis response going forward.

Under such a strategy, I would envisage that these traditional sectors are inextricably linked in terms of the type, nature, scope of services and solutions requiring enduring and guaranteed supply - and rapid response during crisis. Arguably, our recent history of multiple agencies or whole of government response outside of traditional norms during community crisis is already providing useful insights. Specifically, the way we need to be postured going forward, including the review of traditional roles and responsibilities for key agencies, departments and even industry support. For businesses now, target opportunities need to support organisations during disaster and crisis response. In order to remain viable, a change of thinking in terms of the type and nature of services offered and clients to engage may be necessary.

1 Layton, P (2020) "Designing an Australian grand strategy for China", The Strategist, Australian Strategic Policy Institute available from https://www.aspistrategist.org.au/designing-an-australian-grand-strategy-for-china/

Entrepreneurial and Innovative thinking required

For businesses operating in the disaster and emergency management orientated arenas, it requires innovative 'outside the box' thinking that challenge extant business models to remain viable and competitive. The provision of services and equipment by suppliers for disaster and emergency response scenarios is nothing new, but COVID-19 and natural disaster response demands together are directly challenging how businesses engaged into that arena and are postured for the long term. No doubt, traditional 'services and solutions' in response to disaster and crisis events will continue to be in demand, but economic, health and supply chain challenges brought on by COVID-19 now demand a change in thinking and approach. More than ever, businesses in Australia need to be able to respond rapidly to crisis in all forms with solutions that demonstrate innovative thinking and entrepreneurial behaviours, and not just within traditional markets and sectors.

Under a Grand Strategy or not, this is all well and good but does require government direction and commitment (read funding) to drive opportunities across the economy and into the disaster and crisis response arenas. Optimistically, you'd like to think that the rapidly developing geo-strategic (and economic) pressures, combined with an enduring pandemic and the effects of climate change will promote a bi-partisan approach for governments to 'show the way'. As it were for agencies and industry alike across the economy, including those in and associated with disaster and emergency management. It'll need the necessary policy changes, legislation (if applicable) and initiatives (read incentives) for industry to create the conditions for business opportunities.

The key for businesses that operate in and around the Disaster and Emergency Management 'market' is to view opportunities through a wider lens. This is a lens beyond traditional target markets and stakeholders to identify where products and services are in demand and how they can be offered. Critically, business strategies will need to take heed of the lessons being borne out through COVID-19 and recent natural crisis events (floods, drought, bushfires) not the least with respect to risk reduction measures against manufacture, supply and supply chain degradation. Diversification in offerings (or at least consideration) should feature more prominently in business leaders thinking (and government departments and agencies for that matter) when developing commercial arrangements to meet demand across the disaster and crisis response arena.

No business owner or leader wants to be subjected to 'challenging' economic times of course, but they can become the catalyst for change. One can gain optimism from the revival of some pockets of the Australian manufacturing sector. Increased demand against supply shortages of essential product and disruption to global supply chains have prompted homegrown companies to demonstrate entrepreneurial flare and innovative resolve to produce a range of products from personal protective equipment (PPE) to essential medical supplies. Hopefully, this phenomenon will increasingly continue with companies identifying niche opportunities to diversify their capabilities and offerings, attracting positive support from consumers and clients. "Consumers are keen to 'Buy Australian' because they want to support an economic recovery…They realise that by buying Australian-made products they are helping to create local jobs." 2

There is the associated 'mindset' change required in all of this too. As I mentioned earlier in this paper, I see convergence of economy and security orientated sectors moving forward. This will necessitate government agencies and industry partners to think more laterally about how the disaster and emergency management sector will 'operate' in future. For larger commercial enterprises and SMEs with niche (likely tech orientated) capabilities to offer, there may be opportunities to service 'multiple' sector communities and clients beyond historical business models and client bases.

2 Business Australia CEO Stephen Cartwright quoted in (2020) "Road to recovery: Where to now for a post-COVID Australia?" - available from https://business.nab.com.au/road-torecovery-where-to-now-for-a-post-covid-australia-41015/

Gone are the days of considering Defence as a unique and standalone sector in my view. We should be viewing security in a wider sense that encompasses Defence, domestic security, border protection, economic security (read production, manufacturing, and supply chain security) and health. If you do so, the alignment, cross pollination and common requirements will become evident. All these sectors have an association of sorts already, some more obvious (and practiced) than others but if nothing else, our geo-strategic circumstances, COVID-19 and climate change are collectively grouping them in the eyes of the community – and this should be viewed as an opportunity for business. Things like the Australian Business Register (ABR) are useful key tools to assist government departments and agencies in collaborating with the business communities to identify opportunities including in the Disaster and Emergency Management arena.

Summary

The world has changed and is continuing to change. Geo-strategic pressure and the associated economic and security threats, coupled with the effects of climate change should make us change the way we think. I hope that when history books one day recount the COVID-19 pandemic of 2020, it reads as a tale of human ingenuity and adaptability. Our government and industry sectors have collectively realised that our indigenous and organic capabilities to service many parts of our economy, including the disaster and emergency management arena, are overly dependent on overseas markets suppliers and those who control critical supply chains. That said, there is opportunity in a 'widened' market viewed through a convergence lens that can positively shape our approach to management of disaster and emergency management in Australia. This is something to ponder as we manage COVID-19 and ready ourselves for the upcoming High Risk Weather Season (HRWS).

A Case Study – Provision of PPE in an environment of inadequate supply and reduced supply chain options

I want to share a recent example that highlights the dilemma faced by government and industry to respond to the COVID-19 pandemic and it is described below. Although centered on the provision of PPE, it demonstrates initiative, utilisation of IT data analysis capability, thinking outside of the box and the complexity of our environment right now. I think it's a good case to show that entrepreneurial and innovative thinking (by both business entities in this case) can result in successful outcomes (rapidly attained) and at the same time, offer some real indicators on how to posture in government and industry (and individual businesses) for disaster and crisis response moving forward in what I would describe as a 'converged market'.

In the early days of the COVID-19 crisis, the Vaxa Group (www.vaxagroup.com), who offers business advisory, communications and project management services (with a long, proven history in supporting disaster and national security efforts), was asked to help Aspen Medical (https://www.aspenmedical.com/) establish procurement, supply chain, and logistics planning needed to deliver huge volumes of medical PPE to the Federal Government. The inherited interim supply lines were mainly through brokers and did not possess the experience or contacts needed to deal with quality assurance, overseas producers, manufacturers, freight forwarders, foreign diplomatic and customs requirements, and warehousing. Because Australia's disaster management plans had virtually overlooked a pandemic and there were limited stockpiles of medical PPE or manufacturing capability, the Aspen team had to look "outside the box" to source and deliver what was required.

Vaxa evaluated the systems and procedures required in sourcing and shipping large volumes of medical PPE, including quality assurance, risk management, supplier profiling, movement control, Customs and clearance requirements, load planning and booking charter aircraft. The data and software required for tracking and real time reporting of product movement, pricing, contract management and quality assurance programs were built by Vaxa to a bespoke specification to provide specific outputs related to the Commonwealths requirements. The software and data sets were stood up within 7 days. With the Federal Government slow to implement the required procurement plan and logistics requirements for PPE, the team found themselves in an environment where other countries were already in the market, prices were skyrocketing (ventilators worth $US8000 selling for $US85,000) and questionable business tactics were being used by some countries to lock down the production of entire factories. Of note the Vaxa Team was able to leverage its previous experience in managing complex supply chain and logistics in remote and austere environments during times of disaster. Also, through relationships with manufacturers, Vaxa and Aspen secured vital medical PPE and 9 even established a factory within 14 days to produce TGA approved Isolation and Surgical Gowns - producing 160,000 per day to Australian standards.

The last mile proved challenging – Chinese Customs and Air/Sea Freight. Leaning on their experience and networks in China along with international logistics firm Ligentia, the team had a thorough understanding of what it would take to ensure smooth passage of goods through Chinese Customs when "regulations" were changing daily. With regard to aviation and freight requirements the team vetted available suppliers, booked and pre-paid for a large number of dedicated charter freight aircraft (of which were in high demand) and ship charters to bring the supplies into Australia, as well as securing favourable landing slots at major airports and ensuring the goods cleared Customs quickly.

Key learnings:

The need to have adequate stockpiles of PPE medical equipment
The COVID-19 experience has shown us that while Australia had plans in place to deal with natural disasters such as bushfires, floods, and cyclones, plans to deal with a pandemic had been overlooked. For example, there were only 20,000 masks in the medical stockpile when the crisis began.

The need to have established supply chains
When COVID-19 took hold, we had two national airlines at our disposal – one was financially unstable and the other had a quarter of its fleet sitting on the ground unable to mobilise due to crew requirements. Coupled with this, the asking price for air charters sky rocketed overnight from USD$80k-$250k. Our Asian carriers were much more affordable. We need to have standing arrangements in place and governments need to be made to realise that clear supply chain plans (air and sea freight) need to be in place and cannot focus only on one chain.

The need to have established procurement strategies and methodologies
If we are not going to be a manufacturer of essential items (in the case of a pandemic – PPE masks, gowns, ventilators etc) then we need to have established procurement arrangements in 10 place with manufacturers. While China has been the "go to" country during COVID-19, we need to spread our procurement arrangements (and risks) further afield – internally (domestically) and externally. During COVID-19 we have been buying essential items "just in time", as opposed to "just in case". Governments and other frontline organisations need to look at their procurement methodologies and strategies so that balance is changed to a focus on "just in case".

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