New Zealand Fire Service
Research Report

Improving the safety culture and practices of Rural Fire Personnel in relation to near miss reporting

Heathrose Research Ltd
December 2016

This research sought to find out what leads to a lack of near miss and non-injury accident reporting within the Volunteer Rural Fire Forces (VRFFs) in New Zealand and the approaches that can be used to improve this. It was conducted August to November 2016 through a literature scan, interviews with 12 Principal Rural Fire Officers (PRFOs) and case studies in 20 VRFFs.

The findings of this research show there is a firm base from which to build improvements to near-miss reporting in the rural fire forces. The key levers for change at VRFF level include:

- Volunteers' views on safety of themselves and their crew
- Volunteer engagement and participation in their own forces
- Evidence of health and safety knowledge and behaviour changing and improving over time
- Positive PRFO and VRFF relationships.

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Prepared for

The New Zealand Fire Service Commission

By

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14 December 2016

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Executive Summary

This research sought to find out what leads to a lack of near miss and non-injury accident reporting within the Volunteer Rural Fire Forces (VRFFs) in New Zealand and the approaches that can be used to improve this. It was conducted August to November 2016 through a literature scan, interviews with 12 Principal Rural Fire Officers (PRFOs) and case studies in 20 VRFFs.

In line with recent New Zealand literature the volunteers' general attitudes and behaviours towards health and safety are improving with the volunteers saying they pay more respect to health and safety than they have previously. In part this is due to the increased focus being given to it in workplaces as a result of recent legislative changes. But it is also due to the importance placed by volunteers, crew leaders and Force Controllers (FCs) on their own and others' safety.

The volunteers' health and safety knowledge, attitude and behaviours show they:

- acknowledge that work associated with fire fighting, medical assists and motor vehicle accidents is inherently risky and requires them to act safely
- are conversant with the concept of situational awareness and the practices associated with hazard identification, minimisation, isolation, elimination
- are prepared to wear and remind others to wear full Personal Protective Equipment (PPE)
- conduct regular audits of vehicles and equipment
- document callouts and orally debrief on what happened and what could be improved.

However, while the few who were closer to urban centres had formal systems in place for reporting health and safety incidents (supplied by their PRFOs) and dedicated volunteers to support this, the majority were just starting to implement formal reporting systems or did not have them in place at all. The extent to which there were formal Health and Safety systems in place varied. The VRFFs fell into three categories:

- Those with limited formalised systems, but who talk about being health and safety conscious and undertake a range of practices with the focus on safe fire ground / incident behaviours, oral reporting, with some paper work completed about events. These tend to be smaller, more rural forces with a limited number of call outs.
- Those who are moving on from a focus on oral reporting and are starting to introduce more formalised approaches through, for example, health and safety manuals, forms, dedicated staff, documenting health and safety in meeting minutes. The formalised systems are being introduced by PRFOs.
- Those with a fully formalised system up and running as part of their business as usual approach. They have a combination of log books, incident/injury reports, health and safety as a meeting agenda item, and are likely to have a dedicated health and safety person. These are the larger forces, close to urban centres with a high number of callouts.

Underpinning their lack of formal written reporting was their overwhelming dislike / resentment of paper work. Many of them pointed out the time factor associated with paper work and the fact they signed on for practical purposes and to serve their community. "We are volunteers" was a common

catch-cry. However they are prepared to either report orally or to complete paper work when it is simple, easily accessible and they know what happens as a result of the information they report.

While health and safety reporting was something that was starting to be done, on the whole this was not the case for near miss reporting. There are a number of reasons for this. Volunteers thinking about near misses was on a continuum ranging from "no such thing" through to reporting them. Their views are outlined below.

- There is no such thing as a near miss – it is either an incident or it isn't.
- Don't know what a near miss is and want a definition or examples to help them understand.
- Recognise it's when things "go a bit pear shaped", when you say "oopps", "oh shit", "crikey", "blimmen heck", or "anything that has the potential to injure or damage and that there has been a bit of luck that has prevented it", and deal with them in oral debriefs.
- Don't have any as situations are managed and controlled, hazards are identified, minimised, isolated, eliminated.
- Don't report because of the hassle involved or don't want to say what's happened for fear of getting "a bollocking".
- Believe it doesn't matter that they are not reported.
- Report but are not sure what happens or think nothing happens with the reports.

However, this thinking does not mean near miss reporting is a lost cause and should not be pursued. Attitudes and behaviours towards health and safety are strong and improving. This provides the platform to build from. However, a systemic approach is required to change attitudes, behaviours and beliefs so there is a cultural change to integrate near miss reporting into volunteers' health and safety practices.

Given that the VRFFs are at different levels of understanding and behaviour in relation to health and safety and subsequently near miss reporting, the proposed solution is a step-change approach. This needs to operate in a ground-up and top-down way so that each part of the system (volunteer; VRFF; RFA/NRFA/FENZ) has responsibility and accountability for near miss reporting. As such it relies on the capability and capacity that each part of the system has to take on board near miss reporting and acknowledges that associated culture change will take time.

The continuum of practice moves each part of the system from first order change that operates from a compliance / process basis, with volunteers reporting because they have to, through to second order change which sees changes in beliefs with practices being value rather than compliance driven.

Near Miss Reporting Maturity Framework

	Emergent	Maturing	Mature
Volunteers *(knowledge, attitude and behaviour)*	Know what a near miss is and its role in health and safety. Know there is no stigma attached to reporting. Identify near misses. Orally report for compliance purposes.	Actively participate in formal systems (oral debriefs) around near misses. Recognise the value of reporting. Orally report near misses knowing the importance of them to health and safety.	Believe in and value near miss reporting and its role in health and safety systems. Take full accountability for reporting (oral or written).
VRFFs *(attitude, behaviour, systems, resources)*	Have an environment where it is acceptable / comfortable to talk about near misses – a 'no blame' approach. Have formal systems (oral debriefs) available to talk about near misses.	Encourage the use of formal systems for reporting – oral or written. Include near miss reporting in debriefs and as formalised meeting agenda items.	Have health and safety officers to act as champions, support and monitor reporting and changes in behaviour.
RFA/NRFA/FENZ *(systems, resources, policies, data analysis and reporting)*	Provide communication and training materials to increase knowledge about near misses and its role in health and safety systems. Provide 'easy-to-use' systems for oral and/or written reporting. Actively encourage and monitor reporting.	Actively encourage and support a 'no blame' approach. Show interest in, monitor, and provide feedback on near miss reporting at the local level.	Have a system that captures national data. Use the data to report on trends, the learning and actions to be taken from this. Openly acknowledge near miss reporting as a lead indicator.
Community *(attitude, legislation)*	Is cognisant of, but takes a compliance view towards health and safety legislation generally.	Is cognisant of the health and safety legislation and recognises the importance of transferring this to the volunteer sector.	Expects good standards of health and safety, and recognises excellent behaviour.

In keeping with the ground-up, top-down approach the framework places responsibility and accountability on all players in the system.

- For volunteers the onus is on their personal attitude and behaviours, the capability they have to accept and recognise the importance of reporting near misses;

- For VRFFs the onus sits with developing an enabling culture that encourages a positive attitude towards near miss reporting, provides opportunity for volunteer participation and provides an internal resource to support and monitor this;

- For the NRFA/FENZ the onus is on developing useable systems and approaches that enable VRFFs and individual volunteers to report and see value in reporting.

The findings of this research show there is a firm base from which to build improvements to near-miss reporting in the rural fire forces. The key levers for change at VRFF level include:

- Volunteers' views on safety of themselves and their crew
- Volunteer engagement and participation in their own forces
- Evidence of health and safety knowledge and behaviour changing and improving over time
- Positive PRFO and VRFF relationships.

The drivers for change exist primarily at regional and/or national levels where there is an underlying commitment for the development and promotion of an effective, modern health and safety system. Such systems recognise the value of lead indicators as effective mechanisms for minimising risk and harm. The value of near miss reporting will need to be demonstrated to VRFFs and volunteers. This will require an enabling culture and open communication, easy to use systems and effective monitoring and communication back out to VRFFs. Only when volunteers can see value for them in near miss reporting, will the drive to proactively participate be realised fully. In the interim, improving understanding of what near-miss reporting is, making it easy, blameless and 'part of what we do around here' can start that process of change. As such the first order change to systems may act as enabler to second order change - that is a change to fundamental beliefs, values and practices in relation to near miss reporting by volunteers.

Recommendations

Based on these findings, recognising that the VRFFs are at different places on a health and safety continuum, and using the information in the maturity framework the Fire Service should think about:

In the short-term:

- Sharing the key findings and maturity framework with PRFOs so that they get an understanding of the work.
- Providing clear and simple information in poster form about what a near miss is and why it is important to report. (Note downstream this could be turned into a short video clip.)
- Providing simple forms for reporting so that volunteers can either report orally or complete the form themselves.

- Providing advice to VRFFs about ways to have near miss conversations in oral debriefs and formal meetings.

In the medium-term:

- Providing or embedding information about near misses into new and/or existing training materials.
- Establishing a system for monitoring, collecting and collating near miss data at a national level and providing feedback to VRFFs at the regional and national level.

Introduction

The New Zealand Fire Service (NZFS) is concerned about the under reporting of near miss or non-injury accidents by Volunteer Rural Fire Forces (VRFFs). This means Rural Fire Authorities (RFAs) do not have the information they require to fully understand the situations leading to the injury of fire personnel and any subsequent interventions that could be put in place to prevent injury. While near misses (or near-hits) are talked about after incidents they are not always recorded or formally reported, thus limiting their value as potential lead indicators of injury prevention.

Given this situation the NZFS wants to understand more about the reasons for the lack of near miss reporting and what it would take to remedy this situation. This is important as near miss and non-injury reporting can provide information to assist services to reflect, learn, and maintain high standards of health and safety.

As such this research looked to find out more about why the 3,500 Rural Fire personnel do not report near misses as often as they perhaps should and gain an understanding of what it would take to get the required knowldege, attitude and behaviour changes that will lead to an improvement in near miss reporting.

Background

A near miss is a "*close call"* or a "*narrow escape*" – something that has the potential to lead to harm. Health and safety guidelines and literature show near miss reporting is important for preventing accidents that may occur in the future. This idea builds from Heinrich's theory around the ratio of near misses to injuries and fatalities.[1]

Figure One: The Safety Triangle
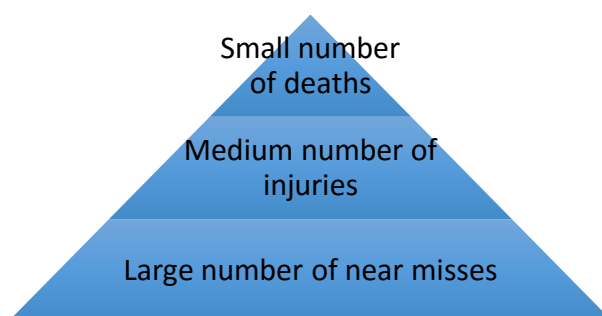
Recent New Zealand research shows health and safety is an issue in industry sectors such as forestry and agriculture and in fire and emergency services generally. Research commissioned by WorkSafe New Zealand (Nielson, 2015a) found New Zealanders working in high risk sectors such as forestry and agriculture recognise they work in potentially unsafe industries, but do not acknowledge the potential for harm. Statistics released by WorkSafe (2016) show the highest number of fatalities

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[1] SiteSafe. (2015). *The safety triangle explained.* Accessed 20 November 2016 from:
http://safesiteapp.com/blog/tag/heinrichs-triangle/

occur in agriculture (15 in 2016), followed by construction with six fatalities, and forestry and manufacturing with four fatalities each. High numbers of rural volunteer fire fighters work in the agriculture and forestry sectors.

However, the research also shows attitudes can change and as a result, cultural change can occur. Nielson, (2015b) found the forestry sector is leading the way in terms of how it is looking to establish a culture of health and safety in its workplaces. Here, forestry workers:

- accepted they had responsibility for their own health and safety
- thought their bosses encouraged them to speak up about unsafe practices and they had a say in matters related to their health and safety
- under-reported serious harm, near misses and hazards
- (just over half) reported receiving formal training in the previous 12 months
- (around three quarters) reported there were formal structures in place for reporting and discussing health and safety issues.

In relation to those working in the agriculture sector, Nielson(2015c) found that in addition to having the characteristics common to workforces in forestry, construction and manufacturing, i.e. being, "driven by pride; masculine and hierarchical; under pressure … [those in the agricultural sector were] independent and isolated … Health and Safety is considered important but something that can get in the way of day-to-day farming," (p. 5).

The Nielson findings are similar to those of Glover et al, (2013) who suggest a range of reasons for New Zealanders' seemingly casual approach to health and safety and not reporting near misses, including:

- a "she'll be right" attitude, along with a "harden up" and "suck it up" one
- a reluctance amongst New Zealanders to stand out from the crowd and speak up in case they draw attention to themselves
- being creative and innovative in ways that lead to short cuts
- a generally relaxed attitude to health and safety.

These attitudes, combined with rural volunteer firefighters general dislike of paperwork (Alkema et al. 2013), frustrations with bureaucracy (Birch, 2011) and lack of debrief systems (Parker, Bayne and Clifford, 2014) are likely contributors to the under reporting of near misses.

Research Approach

Data to inform this research were gathered through a literature scan; interviews with 12 Principal Rural Fire Officers (PRFOs) who had responsibility for around 120 VRFFs and key informants in the Fire Service and the Forestry Industry; site visits to talk with Force Controllers (FCs) and volunteers in 18 VRFFs; and phone interviews with FCs in two other VRFFs.

The research took a socio-ecological approach and looked at the attitudes, behaviours and practices of volunteers, VRFFs, RFAs and communities in relation to health and safety, health and safety

reporting, near misses and near miss reporting. The full research approach is described in Appendix One.

The VRFFs

The 20 VRFFs had between five and 30 volunteers, with an average membership of 16. The 315 volunteers from these VRFFs ranged in age from around 18 to mid 70s, with the bulk of them being in the 30-50 age bracket, and the majority of them (around 90 percent) being men. The majority of volunteers held jobs as farmers or trades' workers.

There was considerable variation in both the number of callouts attended and the type of callouts – fire, Motor Vehicle Accidents (MVAs), and medical assists. The range went from one VRFF saying they attended between 150-200 callouts a year through to a few who said they had fewer than 10. Around half of them said they attended between 30-80 callouts.

The VRFFs were a mix of close urban, rural, and very rural and were located in:

      a.   North and West Auckland
      b.   The Coromandel
      c.   Hawke's Bay
      d.   Wairarapa
      e.   Marlborough
      f.   West Coast (South Island)
      g.   North and Mid Canterbury.

Attitudes to Health and Safety

The building blocks of a health and safety culture within the VRFFs start with the attitudes and behaviours of the volunteers themselves. The 12 PRFOs placed their forces on a continuum from "couldn't care less" about health and safety, through to it being "upper most in their minds". However, they noted there were differences within and between forces in their authority.

Figure Two: PRFOs' Views on Volunteers' Health and Safety Approaches

Couldn't care less / An inconvenience

Not a lot of commitment / Take it a bit lightly

Conscious of it / Aware of messages / Look after mates

Pretty good/ Pushed hard within the forces

Upper most in their minds / Have it drummed into them
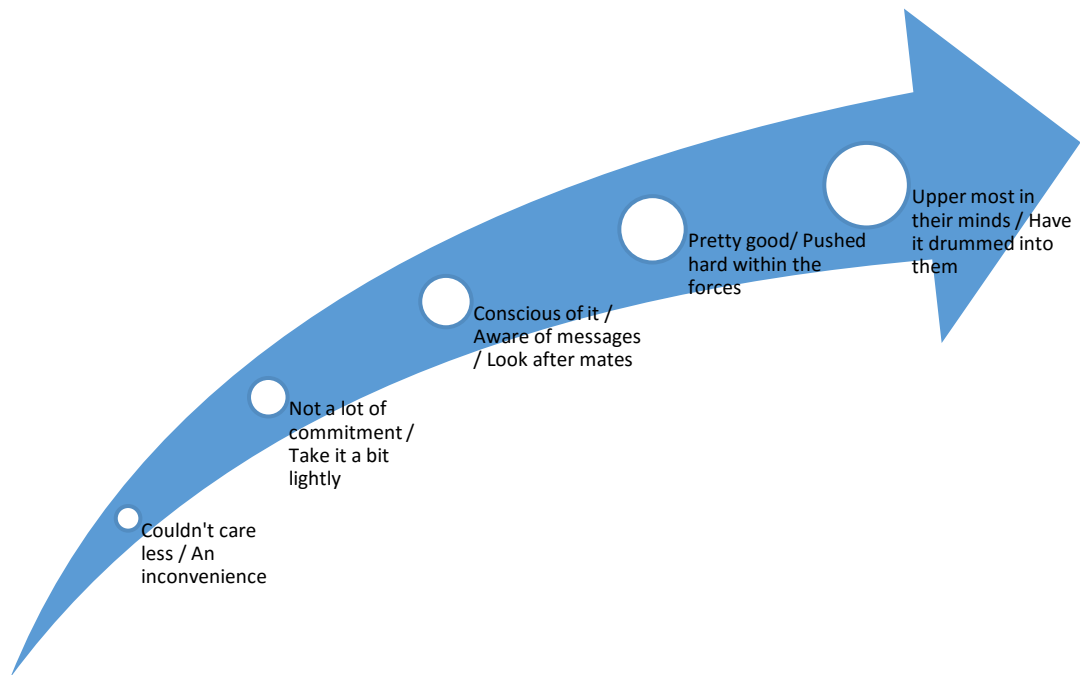
Health and safety… It's pretty good. We push it hard … Push situational awareness and a culture of reporting and resilience and learning from others' mistakes. We use our website as our connection as crews are scattered. For near misses we are like everyone else … It depends on what you class as a near miss / hit. Day-to-day we don't get any generally - but on fire call outs it [health and safety] is rigidly enforced and we have very few.

Generally not a real gungho attitude or disregard for safe working, but there's not a lot of commitment to systematic health and safety. If you start talking safety plans, working more safely, they glaze over. They're okay in practice. In terms of near-misses - we've had one incident report in three years. This falls well below what is ideal, what I expect.

The VRFFs held the same views as the PRFOs. In terms of the individual volunteers' attitudes to health and safety they thought these ranged from 'improving' through to 'very good'. Those who said the volunteers were 'very good' thought this was the case as the forces included volunteers who were in jobs where health and safety is "*rammed down their throat, so they are risk averse as implications are fatal in mining and fishing. They might chuck off when they talk about it, but take it very seriously.*"

All done heaps of health and safety over the years (workwise), especially in the last year. So very well aware / familiar but it might not feature big in the business, but talked about regularly. Aware, but casual about it. They are open and honest and don't hold back on what they think. … I think they would be open and honest about near misses, but we don't have them. Because of their jobs they are very aware. Know what a near miss is. When we have discussions –they are led by the forestry guy as he is heavily involved …

Those who think the volunteers are 'improving' thought this was happening as people had become more aware of health and safety generally and they are motivated by not wanting to get hurt themselves and then on this basis, want to help others. It is also helped by changed attitudes in relation to what is safe practice and behaviour. They are no longer, "*hanging off utes*" on the way to a fire and don't think, "*you can fight fires wearing jandals anymore.*"

There were mixed views on the extent to which there were differences within the VRFFs and whether age impacted on this. Some think the younger volunteers do not have the experience or are so protected by new health and safety legislation in their jobs that they don't know how to react when controls are no longer in place. Others think the younger ones are better as they've grown up with safe practices as a way of working. A view confirmed by the younger volunteers. The views of the older volunteers are that they have the experience, but view health and safety as, "*pc crap – we're intelligent and don't need to be bound by rules.*"

The attitudes of the individuals morph into the collective when they come together as a fire force. Here the majority of those at the sites talked about feeling safe as a unit as they looked out for each other and knew others were looking out for them. As with the individuals there is a sense that this has been changing over time, that each individual knows they have a role to play in the collective approach to a callout.

> *In the early days it was pretty bad. No training. You were on your own with no idea what a fire could do. It's not like that anymore. You feel safe. You can see that build through getting to know the crew and their capabilities. Everyone wants to get home safe. We pull each other up. The crew can speak up.*

> *It's absolutely hammered into us. [PRFO] is brilliant. We have lots of crew leaders in our crew – high consciousness. We all shout at each other for not having gloves or anything – don't let anyone get away with anything. … It's fine to call out others. We all put our hands up if we're in the wrong, learn from each other.*

As with the attitudes of the crews, the majority of FCs take health and safety seriously because of the knowledge and learning they take from their day jobs and the desire they have to protect and keep their crews safe. Here too is a sense there has been a change in attitude and behaviour over time as health and safety is strongly reinforced in the industries in which many of the fire fighters work.

> *Farm safety is a big concern to me. Forestry is right up there. Three years ago I would have said what a load of rubbish - … It's about experience. I look at the guys and see what they are up to. Make decisions about whether they are capable even though they are ticketed. It's a thinking process and about access and delegation. I would like to see more done to monitor mental health as there is risk where people are depressed or suicidal.*

However, there were also contrary views expressed by a very few who had concerns that the behaviours of those 'on the ground' were being taken over / dominated by new legislation.

> *WorkSafe have created a bloody great bureaucratic monster that has no intelligence. It's getting to the stage of stupidity. Guys are going to say, "To hell with this shit." Concentrating on it too much*

creates a problem. In terms of the crew – before I send people on a job I have thought about it. Fire is an ever changing brute of a thing and you don't know 'til you get there so people need to think for themselves.

While health and safety attitudes and behaviours are changing, a key point made by the PRFOs and those at the sites is that reporting remains an issue.

In terms of reporting they probably take it a little bit lightly. Safety wise they are safety conscious, but in terms of reporting, a lot that should be reported, near misses and minor incidents, they don't bother. They don't consider it important. Can't be bothered with the admin involved. There might be a thought that it is a blame game, they don't want to dob in mates, they don't want to be seen as a stirrer.

Lack of reporting was also raised at the case study sites. While those interviewed had rated themselves reasonably well on the continuum presented in Figure One, with most of them placing themselves towards the second to top category, some of them did admit that reporting was poor.

Health and safety is generally good. [Volunteers] participate in meetings, put their hands up, don't hesitate. We're strict on standards on jobs and they are very good at that and don't mind being pulled up. They're engaged, follow standards. But poor at reporting. The job is risky, challenging, dangerous and they accept that this is the way it is. With training and equipment they know how to work from safe angles. Know it is inherently dangerous if they get it wrong.

I don't think we are reporting enough near misses. They are part of the job. Also, you expect minor injuries such as muscle strain and volunteers are not good at reporting it. We don't know it has happened and we sometimes don't see them for a couple of weeks. They report major injuries - those where you have to stop work at fires.

Health and Safety Systems

The PRFOs talked about the systems that are in place in each of their organisation and the expectation that these be used by the VRFFs. However, PRFOs are aware the systems are not as well used as they might like. It seems that while most VRFFs do their call out reporting there is lack of incident or near miss reporting. The PRFOs think the strength of the health and safety system at the VRFF level are the debriefs and the ability FCs or volunteers themselves have to ring and talk about health and safety concerns they might have.

As might be expected the extent to which there were formal Health and Safety systems in place varied. The VRFFs fell into three categories:

- Those with limited formalised systems, but who talk about being health and safety conscious and undertake a range of practices with the focus on safe fire ground / incident behaviours, oral reporting, with some paper work completed about events. These tend to be smaller, more rural forces with a limited number of call outs.
- Those who are moving on from a focus on oral reporting and are starting to introduce more formalised approaches through, for example, health and safety manuals, forms, dedicated staff, documenting health and safety in meeting minutes. The formalised systems are being introduced by PRFOs.

- Those with a fully formalised system up and running as part of their business as usual approach. They have a combination of log books, incident/injury reports, health and safety as a meeting agenda item, and are likely to have a dedicated health and safety person. These are the larger forces, close to urban centres with a high number of callouts.

Common to all the VRFFs were the health and safety practices associated with pre- and post- call outs. A strong theme from those interviewed was that no one jumps out of the truck and gets straight into it. Follow-up debriefs are an important mechanism for talking about what happened, what went well and didn't, and what could be improved. These immediate post-event debriefs are seen as informal, but the follow-up debriefs at training and meetings are seen as more formal and often minuted.

> *We do incident reports [call out reports] after every call out. Have a form on the computer - who attends, how long, any comments. Paper work side is not our strength, as farmers we do enough of it.. … When we get to a fire we have a toolbox meeting about how to tackle this. Afterwards we have a debrief and debrief at training. ... there's a lot of verbal over a beer at the end of practice. …*

The group of VRFFs who fall into the category of little in the way of formalised systems have high awareness of health and safety, but are either wary of the paper work or are starting to think about how they might take a more formalised approach.

> *Incident (call out) reports go to [the PRFO] what was used, who was there. We have debriefs afterwards - ask questions about how it went, but also let the boys talk amongst themselves. Where there are queries I don't believe in giving one person an ear bashing - but will talk one-to-one. I won't say in front of others, "You buggered up there - you didn't put enough cones out." … As rural people we are aware of health and safety automatically. … I'm going to appoint a health and safety person - to make sure the vehicles are up to scratch, keep an eye on PPE and it'll be their job to report back to [the PRFO].*

> *There's no real reporting. It's done orally. … We talk about things and if there is anything serious - where a member of the crew is affected, for example after a road accident a counsellor is available. We have debriefs about what we could do better. Back here [fire station] afterwards we relax with the crew, talk about what happened for example driving over power lines that weren't confirmed to be off. We now talk about health and a safety, talk about it more – 'what if' and 'would we do something differently'..*

The advantage of this less formal approach is that it leads to volunteer engagement. This engagement and participation comes through as a strong theme in the VRFFs. The disadvantage is that it shifts the responsibility to PRFOs to provide and complete the paper work.

The VRFFs who are starting to take a more formalised approach talk about having manuals and forms and starting to use these alongside their less formal approaches. This paper-work has been introduced through PRFOs who are looking to create a more formal system. While the ideal way to bring about change is two-way, top-down and ground-up, (US Fire Administration, 2015) it is the case with the VRFFs that it has to be introduced in some way.

There were mixed reactions to the new approaches, from those who appreciate it through to those who see it as a bit of a burden.

Formal systems are starting to come - through the transition. Under the RFA there was not much in the way of forms. Anything major the PRFO was notified. There was no paper work - didn't need it. Why have paper work when you are a volunteer? Police can do this. … In the last few years PPE is something we have pushed - safety glasses, helmet mandatory. … I suppose we talk about PPE from a health and safety perspective.

Near miss forms. [PRFO] nags about this. We tend to go "oh hell" and brush it over but [PRFO] needs to know about this. Have had no on scene injuries to ourselves, or accidents or gear breakage. We wear PPE - strictly adhere to this. Forms go to the bosses. Forms are there to fill out. We have a debrief at the monthly meeting - look back at calls and talk about it. Have a chat about what was different, wrong, taking risks. It's a chance for newer guys to say they didn't know. We put the call out for the paper work to be completed.

The VRFFs who have a fully formalised approach do much the same as those in the other two categories with the addition of dedicated health and safety staff and formal systems.

Health and safety stuff is on the wall and in books we carry with us. We have a briefing before we go on a fire ground – survey risks, dangers, escape routes. … We debrief about what we did – most things are right or wrong, but we have some good, and heated debates. It's good for people to get involved in it. … In terms of reporting, we have good records here.

We work to [X] Council who are very health and safety conscious. We use their system. I drive from the top. I'm delegated to - got to go through the process. Know it should go both ways [top- down, ground-up]. … Every two months health and safety is a topic at the Brigade meeting. At monthly management meetings we start the meeting with health and safety.

We have a book to record incidents and near misses and a health and safety person. Health and safety is discussed at the monthly meeting. The health and safety person follows up on the reporting to make sure everything is reported. We're confident about their reporting of incidents but not the near misses. … Anything that poses a risk we fill it out in the book. It is then scanned and the health and safety person emails it to the Council. It is closed out by the crew talking about the learnings. … This approach is the only way we know at the moment. The book leaves a paper trail, a record and we can come back to it. [We use paper because] volunteers don't want to wait for a computer to start up. …. If it's not filled out the health and safety person chases up at training. He also leads a discussion at the monthly meeting and they reflect back on what happened. The process works because it is simple, everyone knows it and knows it has to be done. We come at it from the perspective that it is there for them and their whole team's good. Not a "you must". They know the health and safety person wants the book filled out and there are no repercussions.

While the VRFFs have health and safety systems that vary in formality, what they have in common is the opportunity for engagement and participation. While most of this occurs in debriefs of varying formality there is the opportunity to build from this. Where formal reporting systems have been introduced they are being used. However, where they are well used they are in the more urban forces and and in forces where the PRFOs feedback information about what has happened as a result of the information.

… We have no choice but to fill them out. These get returned to [the FC] or whoever is in control of the whole fire. …. We get feed back from [the PRFO]. He puts the recs out and also emails other brigades as reminders to do this and why.

Leadership

While being very much of the community and wanting to have some or considerable autonomy over what they do, the VRFFs look to their PRFOs for guidance and support, and for the PRFOs to work on their behalf – particularly where it relates to taking responsibility for reporting and paper work. In terms of leadership on health and safety, the volunteers recognise the PRFOs have high expectations that VRFFs will operate in safe ways and have the paper work that supports this. There is a genuine appreciation of what the PRFOs do along with the idea that the support and guidance is there without the forces needing to be micro managed.

> *The PRFO is very clear. He expects us all to do the job and to go home safe. Very clear, always safety focused. … [FC] has to make the call, but others are able to question. She listens, takes views on board. We work with urban sometimes - tarseal cowboys. We have to take the lead, show how things happen in the forest and on the farm.*

> *[PRFO] is quite a laid back person, but takes health and safety seriously. He's inclusive, thinks, gets information and puts it together and presents it. He expects brigades to run themselves. … He knows what's going on - so shares his learning and the collective knowledge.*

> *[PRFO] occasionally sends out information … He's good, gets it about right, not too draconian. He's realistic and realises we are volunteers. With the changeover [amalgamation] there are now hazard boards, first aid kits. I send forms to [PRFO] and he collates and reports to the AGM.*

However there were a small number of cases where the VRFFs expressed concerns about what their PRFO expected them to do in relation to health and safety. One FC expressed concern about what he was expected to know and understand, *"There's a wad of paper this thick and when am I going to get time to read it? I'll sign it and put it on the shelf. If it was a one pager I'd put it on the notice board.* Two others expressed concerns that there were high expectations related to health and safety but that when incidents were reported little seemed to be done with the information. "*They expect it to be done, even though we are volunteers. I think stuff just gets filed and it might just be arse covering.*"

The PRFOs look for leadership from their FCs and generally find it in relation to health and safety. The FCs push home the message with their forces and the PRFOs believe their FCs generally have a strong sense of responsibility and accountability. This confirms the views provided by the FCs and the volunteers.

Health and Safety Training

While knowing how to behave safely comes from the volunteers' own knowledge and experience, it is furthered through health and safety training. Such training happens in two ways. Firstly, through the mandated training that takes place to ready people for the fire ground and assessment against unit standards, with the most cited being 3285, *Demonstrate knowledge of protection of personal safety at vegetation fires.* The second and most popular form of health and safety training occurs where it is integrated into the ongoing training that happens as part of regular or specialised training programmes / practice sessions or when training with other fire forces or emergency management services.

The VRFFs thought integration into practical training happens through, for example, wearing full PPE, learning how to carry equipment and operate it in safe ways, and learning about safe ways to operate with or around specialist equipment such as monsoon buckets, or to fight fires where helicopters are used.

As with attitudes to health and safety it seems that learning how to operate in safe ways is a behaviour that is changing over time.

> It's included in training. For example a portable pump exercise, the first thing is gloves, earmuffs. It's subconscious health and safety – it's becoming natural. Three years ago I had to remind them. It's a habit now.

> We train with other forces. … In competitions a stronger focus is being given to health and safety. … Health and safety is incorporated into training, for example best practice in how to roll out a hose, jump out of trucks - backwards three points of contact. 'Common sense'. Also recognise that we don't do health and safety just because the course says so. We know, for example that we need to wear ear muffs when operating pumps.

The training need is determined by season and situation. It is reliant on VRFFs having a person who is prepared to design, organise and run training sessions. As such integration into quality training is not universal. In addition there was the sense from some that the messages and training needs to be ongoing, that everyone needs to turn out to training so they know how to work together safely as a team, and there needs to be the opportunity to attend specialist courses. With the latter it seems courses are either not offered as often as volunteers might like or that they are cancelled as there are too few people wanting to attend.

> We've been trying to set up two-weekly training. People don't show. It's important as I don't really feel that safe with the crew. We've done few training sessions with [X VRFF], on pumps. But we need more familiarity with gear, handling heavy equipment.

The PRFOs have confidence that health and safety training happens in preparation for unit standard assessment and through formal courses, but had mixed views on the extent to which it happens in other training that takes place at station level.

> It's ingrained in all the fire line training - from the first unit … it's all about safety. Spend a lot of time on this and when they move on to crew leaders we also spend a lot of time on approaches to health and safety. It's pushed home at regular meeting nights. The focus is on getting people home.

> It happens formally via unit standard training and informally at station training level. The wider implications of health and safety aren't dealt with well. As an example the fire engine was clearly unsafe and no-one reported it. If it's outside of what is externally trained or directly related to fire suppression then it gets pushed off to the side. A "she'll be right attitude."

While safety aspects are covered off to a certain or lesser extent, it seems that health does not have as high a priority. Mental health and emotional wellbeing were talked about in a few of the forces, in terms of how witnessing traumatic incidents impacts on people and also in terms of how depression can impact on volunteers' behaviour at call outs.

… We need to be able to identify members with depression, especially issues with men who won't admit to it. Need to be able to tap a guy on the shoulder. I'm not there to be a counsellor, but there to get them help. Also need something around peer-to-peer support, for example after one incident where a guy was splattered on the road, some really struggled to cope. There is a line to the Council, but guys are reluctant to pick up the phone. This is about the health of my brigade. If a guy is suicidal he doesn't give a f**k and may take risks and put others at risk. I've got no skills [in this area] …. I have the role of chief - people look to me, expect an answer, that I can do something.

Near Misses

It is clear from the PRFOs and VRFFs that attitudes towards health and safety along with health and safety behaviours were reasonably sound and have been improving in recent years. The improvement has come about as a result of new legislation and greater prominence being given to it. However, near misses and the reporting of them remain an issue. This is shown by the PRFOs where on 1-5 scale (1 = low; 5 = high) they rate the volunteers an average of just over 3 for health and safety and just on 2 for near miss reporting. The figure below shows the differences.

Figure Two: PRFO ratings of volunteers' Health and Safety (HS) and Near Misses (NM) N=12)
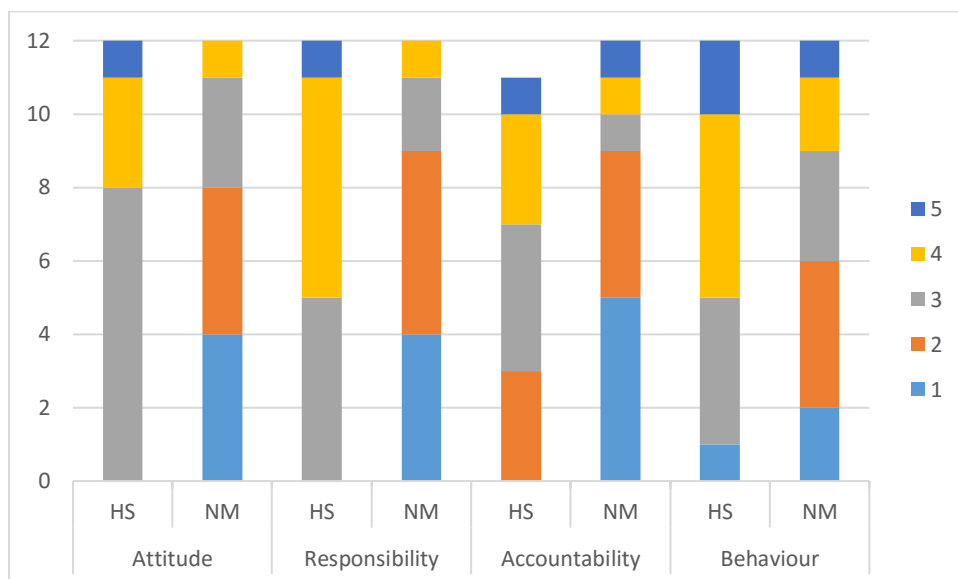
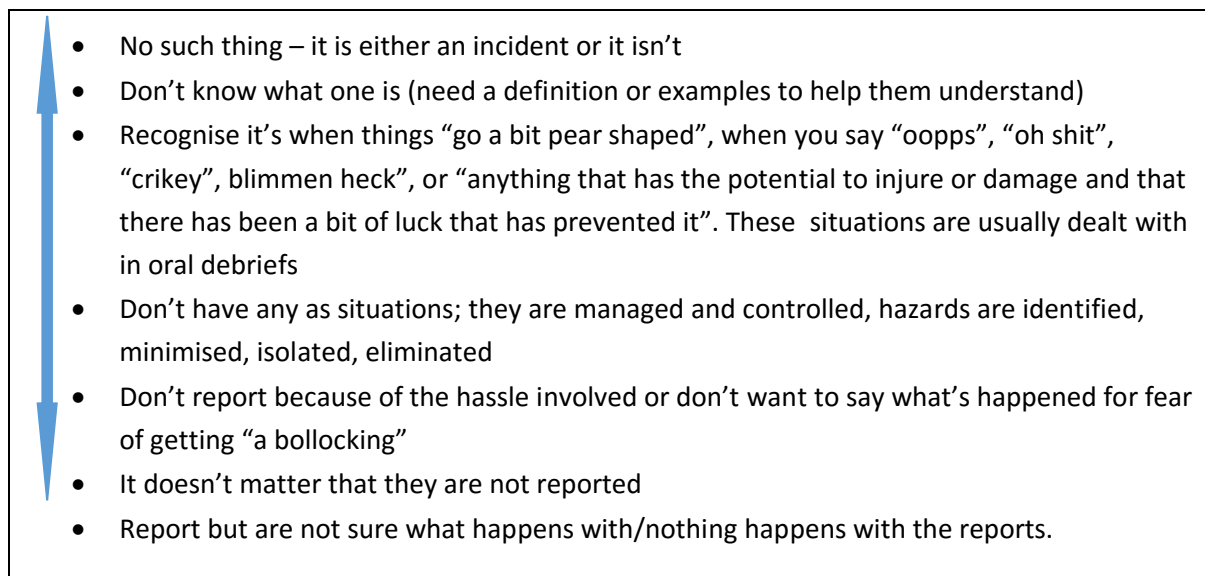The PRFOs gave a number of reasons for the differences including volunteers:

- thinking if there was no accident/incident/injury it didn't happen
- not seeing the relevance or value of near miss reporting
- not liking the idea of bureaucracy / big brother
- not liking paper work or reporting
- thinking they can handle their own and others safety
- not seeing the connection between near misses and possible accidents.

Although we've pushed it there is the good old kiwi attitude o,f "Shit I got away with it". It requires constant work. Management have to create an environment [where it's safe to report] without an undertone of punishment. It has to be seen as a positive thing.

Typical cockies. They don't give two hoots about formal health and safety. But they all understand how to be safe and have a very good attitude to keeping their guys safe…

Within the VRFFs volunteers' knowledge, attitudes and behaviours towards near misses ranged from denial that there is such a thing, through to occasional reporting of them. The continuum of practice is outlined in the figure below.

Figure Three: VRFFs' knowledge, attitudes and behaviours towards near misses

- No such thing – it is either an incident or it isn't
- Don't know what one is (need a definition or examples to help them understand)
- Recognise it's when things "go a bit pear shaped", when you say "oopps", "oh shit", "crikey", blimmen heck", or "anything that has the potential to injure or damage and that there has been a bit of luck that has prevented it". These situations are usually dealt with in oral debriefs
- Don't have any as situations; they are managed and controlled, hazards are identified, minimised, isolated, eliminated
- Don't report because of the hassle involved or don't want to say what's happened for fear of getting "a bollocking"
- It doesn't matter that they are not reported
- Report but are not sure what happens with/nothing happens with the reports.

Around half the case study sites said they either couldn't think of an example or had not had near misses. They thought this was the case as they were well trained, recognised the situations they were in, put people into situations that they were capable of operating in, or that the near misses were not sufficient to report (e.g., not wearing helmets when walking through bush and the potential for scratched faces). There was a sense from the comments that work practices carried over to callouts, but also a hint that things happen that would get reported at work, but do not get reported in a volunteering situation.

Never had to have one. The only thing is to warn of near misses - it's the type of people and the attitude of the people in the group - give people jobs they are capable of doing. Send the experienced person up the hill. Rural people have common sense. Those in the contracting business have OSH standards.

No near misses as such. We avoid things before they happen. There was a helicopter dropping water on a toitoi fire that we were fighting. I spoke to the pilot and told him to be careful of the crew on the ground. The crew on the ground were likely to be affected by the smoke coming off so we'd leave the hose running and back off before the water was dropped. This reduced the risk - it was managed and isolated and we came up with the solution.

> *The guys slip over regularly - they don't report this as they expect it. At a car fire there's water, grass, mud, petrol, foam and it's slippery. It's a different story if it's dangerous. We pull people out if we see this. … They can get a bit of tunnel vision, especially if they haven't seen much [action]. And it is hard to replicate the real thing in training.*

> *The environment- the whole job is a near miss, flames, falling trees, hot embers. You can't control the environment, but work with it and around it. You know you're in that environment and it brings awareness up. It's dangerous so you are more aware. ... It's all about getting the right skills sets, the right jobs - this is why we don't have many injuries. Also people own up to injuries. The guy with the crook back owns up and he won't be given a job that will make it worse. … We have a good team and they can speak up - some of this is confidential - behind closed doors…*

However the near miss stories told by those who had them, the majority of which had not been reported, show the potential there is for various levels of harm when things get out of control, happen inadvertently, or when people do not consider the consequences of their actions.

Road side: *"The only one I can think of is when a car wouldn't stop when we were trying to flag it down before an accident site. I ended up yelling at the driver, who yelled back quite aggressively. We did talk about it at the debrief. We agreed we needed to pack a grab bag so we have more equipment to ensure we are visible and official looking.*

Fire Ground: *We were told to defend two houses. There was a fire on the slope and it had three quarters moved on. We were watching for pinecones as they light up and roll down. We were waiting around for ages. One rolled and a crew member smashed it with a spade and a ball of flame erupted. It could have really damaged the guy. His face shield was up and he had no gloves on. There was no report. At the same fire we see smoke over the hill and put a spotter on the hill as we were worried it would take off. He walked into unspent fuel at the same time as the helicopter was coming over. He didn't account for how much the updraft would raise the flames. He had to really run out of there. We were not going to fess on that as we'd get a bollocking as we'd left the houses, even though they were fine….*

Fireground: *A while ago - at a fire by an irrigation pond someone put their foot on the matting and went into the pond. We had to walk the person out with a hose as the bottom was too slippery to walk. He was sent home. He wasn't hurt. We didn't report it as we thought it was a joke. Didn't take it seriously. But attitudes have changed now. At another fire at a winery I found a crew member sitting in a drain - exhausted, low blood sugar. I gave him a muesli bar and sat him in the truck. I didn't report this, but probably should have.*

Training: *The hose was running and a new fire fighter nearly put the water up onto a 400 volt powerline. It's the only near miss I've seen in 20 years. I didn't report it. We talked about it afterwards. He was a new person who got a bit carried away. I made everyone aware at the time.*

The few who reported did so when there was the potential for serious harm or because they said they always reported. Examples include reporting when a near miss could have resulted in serious consequences.

> *There was another brigade on the way to a fire. They did a U turn in the middle of the road as they'd forgotten to take some gear to the fire. The truck stalled and our truck going at speed nearly T boned it. We would report if consequences were severe or major. With near misses it is difficult to understand the limit. If overalls get caught on a fence and the person falls, is this a near miss, incident or event?*

I always report. I'm good at coming clean. … You need to report near misses as it's a learning. It's a risky job and you have to make judgment calls even if the risk is low. … At debriefs we talk about whether we made bad calls. …

What helps and hinders near miss reporting

As can be seen from the comments and examples, changing knowledge about near misses and improving near miss reporting needs further work. While VRFFs report they are health and safety conscious, near misses and the reporting of them are not a priority. The PRFOs thought it was difficult to get buy in to near miss reporting because volunteers did not want to admit they had made a mistake and that because they are volunteers, it was not their problem. However, PRFOs thought that if there were incidents, these were reported and where there were near misses or where something goes wrong, these were talked about informally, with a view to doing something differently next time.

People don't want to admit they are at fault, or they have difficulties reporting. They can't write as they have literacy and numeracy issues. English is not the first language for some people [and some] are probably computer illiterate.

They are getting better as I've been pushing it. I've had a number of reports over the last year and half - because I have chased, but some have come of their own accord – eight since the beginning of 2015. I chase and encourage and remove the barrier and stigma of doing something wrong.

A few PRFOs also expressed concern that formal reporting of near misses would not go down well with the VRFFs, who joined to help communities, not do paper work – a finding confirmed and repeated by the VRFFs. PRFOs were also concerned that there was no national system, so they were not able to see trends which possibly accounts for a few of the VRFFs not seeing the full value in near miss reporting.

The VRFFs thinking aligns with that of the PRFOs and can be teased out to identify factors related to culture, attitude and leadership. The table below shows what they thought might help, hinder and improve near miss reporting. (Note four sites thought there was no need for improvement.) The strongest themes in relation to help and hindrance are the need for positive and supportive cultures and issues related to systems, i.e. paper work and compliance. The strongest theme to come through with improvements relates to the introduction of simple reporting systems.

Table One: What helps, hinders and would improve near miss reporting

Helps Near Miss Reporting	Gets in the way of near miss reporting	Would improve near miss reporting
Attitude and culture A positive attitude about health and safety, talking about it and a positive attitude to reporting; focus on, praise and talk about doing the right stuff; openness and team morale.	*Attitude and culture* The stigma associated with having done something stupid, embarrassed, feeling like a "bit of a dick".	*Attitude and Culture* Keeping an open approach at VRFF and RFA level; have a no blame culture; encourage people to talk about it
Systems Basic, user friendly forms. Oral reporting – or where there is paper work required this should be done by paid employees. Where reporting is done feedback on what happens as a result adds value to the process.	*Systems* The hassle of having to do paper work doubled with the time it takes to do it. Having a tick box system that is about compliance rather than getting committed buy-in. Not knowing what happens with reporting when it is done. Different systems across those responsible for VRFFs.	*Systems* Keeping it simple – basic forms - paper, computer, phone app (although there was some acknowledgement that computers could be an issue in some places because of lack of internet connection and volunteers' lack of digital literacy). Specific, simple near miss forms - with prompts / examples; Yes/No options. Log books – with tear off sheets. Oral reporting. A crew member or paid staff with responsibility for reporting. Visits from "someone" on a monthly basis to talk about near misses. Take a compliance approach – it just has to be done.
Leadership PRFOs, Health and Safety Officers, FCs who will guide and listen, not make judgments, give constant reminders.	*Leadership* Lack of feedback when reports are completed.	*Leadership* Feedback to the value of reporting is seen. Provision of directives about what constitutes a near miss.
Volunteer Knowledge and Behaviours An inherent belief in the value of health and safety practices. Knowledge and attitudes that carry over from work. Approaches that value personal safety and safety of others Knowledge about what a near miss is.	*Volunteer Knowledge and Behaviours* Not recognizing a near miss or not knowing what needs to be reported on. Volunteers with literacy issues who are not able to complete written reports.	*Volunteer Knowledge and Behaviours* Increasing knowledge of what a near miss is. Getting VRFFs to accept that near miss reporting has to be done.
Training Making its importance transparent in training.	*Training* Not having it as part of training.	*Training* The need for additional or refresher training.

What hinders is pride, pride, pride - I'm better than this; and not understanding what a near miss is. Compliance - paper work probably wouldn't work. Paper work has escalated. More of it won't make us a better brigade. It has to be a mentality - forms won't get you there. It needs to be a process that the brigade owns.

It would help if you could make a phone call - like if there's a fire and you have to call others. Volunteers would hate paper work - they are volunteers. …. If too much is put on them we will lose some. People in jobs have enough paper work so I'd like to see as little as possible.

We have literacy issues - a station officer who can't read and write. He knows his way around the roads in the area, but can't read the names on the signposts / road signs. And can't fill out forms. There are also two others with literacy issues so you can't get them to fill out forms. You also have to realise we volunteer to squirt water on fires not to do paper work. We don't do any near miss reporting. After seven hours on the fire ground we simply don't want to fill out forms and then answer follow-up questions. No one wants to step up to FC or DFC - they don't want the paper work that it involves. There are also concerns that if things are written up they will be held accountable and they don't want this.

As can be seen from the table, the most commented on methods for improving near miss reporting relate to systems and ease of reporting. But the volunteers also realise that this on its own is not enough, and that getting people to use the system requires people to understand what a near miss is and that the VRFF has to have a culture where it's okay to talk about things that have happened.

Everyone needs to take ownership. … Two things are needed - greater awareness of what a near miss is and getting people to speak up. For example if [PRFO] says – "if this happens … report it. We don't want to be pedantic – for example tripped getting out of the truck, but we do want to know about gear failure."

Forms need to be as simple as possible. Have an over-arching one pager. A whole lot of forms have irrelevant junk. They need to be layered. … Simplicity first will get buy-in. Understanding what a near miss is and not a penalty, or being crucified for doing it. Prepare the brigade to be better; have recognition that we could do things better. We have to break some hero stuff down. … Have health and safety front and centre from Day One. Having a positive attitude to health and safety is the first hurdle for them to jump through (at the first interview). Training officers could give it more credibility. There needs to be an ethos of wanting to belong to an ever improving organisation … it's about learning.

To get it front and centre you must start with health and safety. Get people to admit to issues for example, a hole in a glove, a torch not working. I would probably use a computer based system - if I had a portal and a touch screen and loaded directly into it. It's annoying to have to print and scan forms.

The PRFOs' views on what could improve near miss reporting aligned with those of of the volunteers. The most frequently talked about approaches related to improving the systems and process for reporting, followed by changing cultural approaches and giving a stronger focus to it in training.

What gets in the way is a lack of process. We don't make it easy for them … Our guys have to fill in paper and fax it in. They don't see the outcome from it. We're small by comparison [to the rest of the country] so we don't see the collective results… We have to develop better systems and for them to see an outcome…

This thinking was reinforced when the PRFOs talked about what they see and believe works well and why. Here again it relates to the beliefs and attitudes of the volunteers, a culture of inclusivity that is established within their own VRFF and across the VRFFs, and training that supports behaviours. These things enable systems to work as there is likely to be buy-in, when the value of safe behaviours and reporting is understood.

If you're looking at systems, you're looking at the wrong place. You need to have a [health and safety] culture where it gets used.

You need a good attitude demonstrated by leaders. [They need to] lead by example, wear PPE, do assessments of risk before actions, involve their crew in the decisions. This builds a more cohesive team who look after each other better. We provide good equipment and look after the volunteers. We demonstrate we value them and this is a big contributing factor.

Discussion

So what do these findings suggest for ways to improve near miss reporting? The VRFFs show a strong health and safety culture and improved practices have been evolving over time. This has happened in the main through legislative changes and higher priority being given to health and safety in volunteers' workplaces, which in turn transfers over to their behaviours in the VRFF. The value base for this is personal safety and the health and safety of others. There was no sense from the VRFFs that health and safety was solely about compliance, although some expressed the view that it was a "bit over the top" or "overly pc".

This provides a sound base from which to further develop the health and safety culture so that it incorporates an understanding of near misses and the value gained from reporting them. However, the solutions to put in place require an understanding of the nature of the problem and the extent to which the problem is accepted as a problem or priority. The solutions also need to be informed by the type of change the Fire Service wants to bring about – first or second order change.

Influencing, managing and leading change in near miss reporting

First order change can take place within the existing structures and systems, but leaves the basic values unchanged. This tends to take a more 'top-down' change approach. It could mean for example introducing resources that explain near misses and the importance of reporting them, the inclusion of near miss material into unit standards, a simple process or system for reporting near misses. At the outset change of this nature is unlikely to "disturb" the fundamental beliefs of the VRFFs, as it tweaks what is currently being done.

Second order change goes beyond this to challenge the assumptions, beliefs and values that are generally held by the VRFFs and gets them to change their practices in the light of this, and thus is focused in change from the 'ground'. Here it means enabling them to truly understand the value and

importance or near miss reporting. As such it requires deeper change that will need to get to the culture of the VRFFs.

In relation to fire services, 'culture' is described as ways of thinking, behaving or working in the individual service or overall organisation, (Angle, 2016); or as assumptions and beliefs, values and behaviours, (U.S. Fire Administration, 2015). Culture change is not easy to effect and it is especially challenging with dispersed and volunteer fire forces. The literature around changing culture in fire services helps explain why this is the case.

> "It was noted that unsafe attitudes and behaviors often prevail in spite of the common knowledge that there are less risky alternatives that could result in fewer deaths, injuries and illnesses. In fact, it was noted that efforts to promote health and safety were often met with resistance and scorn, reinforcing the notion that they created conflict with established attitudes, assumptions and values," (U.S. Fire Administration, 2015, p. 10).

An additional challenge to creating culture change occurs when there have been no or limited negative impacts from risky or unsafe practices in fire services. This results in these practices being accepted as the normal way of doing things and becoming ingrained into the history and tradition of the way things are done, (ibid, 2015).

However the conversations with the rural volunteers show change has been occurring over time and there is no longer a general acceptance of putting themselves and others at risk. There is no "hero mentality" over the saving of vegetation. Instead there is acceptance that the overriding driver of their behaviour is that everyone gets home safely to their families. Their practices that ensure this include:

- equipment is maintained in full working order
- PPE is up to standard and worn
- hazard identification at incidents is business as usual
- call outs are written up
- oral debriefs encourage volunteer participation and discussions cover what worked and what could be done differently or better.

Paper work to support health and safety and reporting is well integrated into the forces close to urban centres, is starting to be introduced in those a little further out from the centres (with mixed reactions from VRFFs), and non-existent in the more rural forces.

As such the approach to improving near miss reporting will need to be one of measured step-change that includes leadership from PRFOs and FCs, champions from within VRFFs and all volunteers taking responsibility for their actions in relation to near misses. This approach is supported by other research in this field.

Culture change starts with and must be driven by senior levels in the fire service (Angle, 2016). Most powerfully however, this also needs to be combined with ground-up approaches (U.S Fire Administration, 2015). These work on changing how fire fighters think about their health and safety practices by getting them to think about their assumptions and beliefs and subsequently their

values. The U.S. Fire Administration (2015) believe this is likely to get more buy-in than the top down approach on its own. As such they see cultural change as needing to include, "leadership, management, supervision, accountability and personal responsibility," (p. 11).

Combining leadership, systems, expectations, and training

Wider workplace health and safety research (Heathrose Research, 2013a; 2013b) has demonstrated attitudes and behaviours can change when there is committed leadership, clear systems and structures (including simplified reporting), training and expectations that workers will adhere to workplace safety policies, including reporting near misses.

Rural volunteers are also firmly nested within the communities in which they work and live. As such they operate within a social-ecological system.[2] While they will act according to their own values and beliefs and take personal responsibility for themselves, their behaviours are further influenced by the expectations, attitudes, behaviours, practices and systems exhibited within their own VRFF, by the RFA/NRFA/FENZ and ultimately by the communities in which they live, work and serve as volunteers.

Figure Four: Social-ecological model for rural volunteer fire fighters
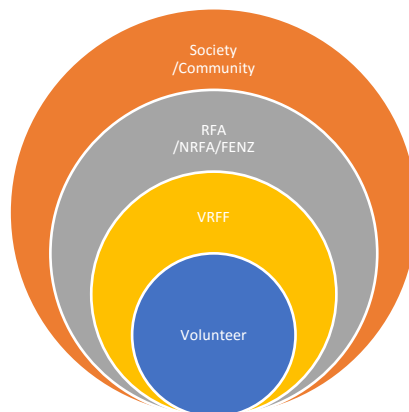
While each component of the system has an influence it also acts as a barrier or enabler for interventions that ultimately lead to changes in attitude, behaviour and culture in relation to near miss reporting.

The maturity framework below outlines what might be expected from each part of the system. As such it provides examples of knowledge, attitudes, practices and systems to inform step change to improve near miss reporting from emergent through to mature practices. It is informed by the literature and the information from the PRFOs and volunteers.

The framework recognises that the VRFFs are at different levels of understanding and behaviour in relation to health and safety and subsequently near miss reporting and shows the steps that each part of the system needs to work through to get to a stage where near misses are reported and the information valued and used. It operates in a ground-up and top-down way in that all parts of the

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[2] Adapted from Krug E, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, eds. World Report on Violence and Health. Geneva, Switzerland: World Health Organization; 2002:1-56.

system need to be responsible and accountable for near miss reporting. It is reliant on the capability and capacity that each part of the system has to take on board near miss reporting and acknowledges the associated culture change will take time.

Table Two: Near Miss Reporting Maturity Framework

	Emergent	Maturing	Mature
Volunteers *(knowledge, attitude and behaviour)*	Know what a near miss is and its role in health and safety. Identify near misses. Know there is no stigma attached to reporting. Orally report for compliance purposes.	Actively participate in formal systems (oral debriefs) around near misses. Recognise the value of reporting. Orally report near misses knowing the importance of them to health and safety.	Believe in and value near miss reporting and its role in health and safety systems. Take full accountability for reporting (oral or written).
VRFFs *(attitude, behaviour, systems, resources)*	Have an environment where it is acceptable / comfortable to talk about near misses – a 'no blame' approach. Have formal systems (oral debriefs) available to talk about near misses.	Encourage the use of formal systems for reporting – oral or written. Include near miss reporting in debriefs and as formalised meeting agenda items.	Have health and safety officers to act as champions, support and monitor reporting and changes in behaviour.
RFA/NRFA/FENZ *(systems, resources, policies, data analysis and reporting)*	Provide communication and training materials to increase knowledge about near misses and its role in health and safety systems. Provide 'easy-to-use' systems for oral and/or written reporting. Actively encourage and monitor reporting.	Actively encourage and support a 'no blame' approach. Show interest in, monitor, and provide feedback on near miss reporting at the local level.	Have a system that captures national data. Use the data to report on trends, the learning and actions to be taken from this. Openly acknowledge near miss reporting as a lead indicator.
Community *(attitude, legislation)*	Is cognisant of, but takes a compliance	Is cognisant of the health and safety	Community expects good standards of

	view towards health and safety legislation generally.	legislation and recognises the importance of transferring this to the volunteer sector.	health and safety, and recognise excellent behaviour.

In keeping with the ground-up, top-down approach the framework places responsibility and accountability on all players in the system.

- For volunteers the onus is on their personal attitude and behaviours, the capability they have to accept and recognise the importance of reporting near misses;

- For VRFFs the onus sits with developing an enabling culture that encourages a positive attitude towards near miss reporting, provides opportunity for volunteer participation and provides an internal resource to support and monitor this;

- The RFA/NRFA/FENZ onus is on developing useable systems and approaches that enable VRFFs and individual volunteers to report and see value in reporting.

Levers and drivers for changes to near miss reporting

Introducing new ways of doing things and changing culture is challenging in paid fire services even where a command and control approach can be used as the driver for change. Such an approach is not possible with volunteer fire forces where the drivers and motivations for behaviour and culture differ. Volunteers tend to be compensated through a sense of purpose and achievement and because of this may be less likely to embrace organisational directives that diminish or ignore their contributions, (Stirling et al. 2011).

They love the voluntary activity and association with others in their fire service, are looking for the future rewards it might bring in terms of skills, experience and contacts, are driven by a strong sense of community and are genuinely motivated to work for the good of others, (McLennan and Birch, 2008; NZIER, 2008; PriceWaterhouseCoopers, 2009). Volunteers work with each other and within their communities based on a culture of trust and respect. This sees them working in ways that:

- recognise the need for initiative, diversity and flexibility
- do what works
- use distributed leadership
- have a community volunteer ethos
- have decision making at the local level, (Ferguson Report, 2016, p. 253).

The information gathered from the PRFOs and VRFFs shows there is a sound base of health and safety practice to build from and build into. While the VRFFs are at differing levels of maturity in relation to this, especially in terms of formal and less formal systems for reporting, change can be incorporated into the current system in small and incremental ways.

As such the levers for change exists in the volunteers' fundamental views around the safety of self and others and the level of participation and engagement they have within their own forces. Raising awareness of near misses and getting them to understand what a near miss is and how information about them can contribute to improving health and safety would only be a short stretch for them. Such understanding can happen through materials, for example a poster for notice boards or a one pager of training material. It should not be dense written material that is unlikely to see the light of day in many of the fire stations.

The next step is to introduce simple systems for reporting – be they oral or written (paper-based or digital). Here the overarching feature of whatever is done is to keep it simple and take into account the volunteers' views of paper/computer work – the hassle of it; the time it takes to complete; the fact they didn't join to do paper work; and the literacy (including digital literacy) skills of some volunteers.

> *It's basic - we are not here to fill in paperwork. We should be reporting, no question, but it should be a paid employee who follows up, gets more information. They can also pass on lessons, ensure they help us deal with it appropriately. … We just don't have the time, and often the expertise to respond to all the questions asked on some forms for example whether we think treatment is necessary. … Would just do it if we had an incident or a near miss. I understand risks are high, training is critical, and it's about personal responsibility and keeping self and others safe…*

Another lever is to build off the developing knowledge and behaviour changes that exist within the VRFFs. Many of the volunteers have undergone significant change to their work practices as a result of the recent legislative changes. While some see it as 'over the top', others recognise it is the new way of working. In some case PRFOs are supporting this by introducing health and safety manuals and reporting forms to their VRFFs.

> *We're more proactive now than in the past. We've just started recording - been given a new kit from [PRFO]. I think we've got better as a result of government policy. And rural fire is real good at putting stuff out. We don't take risks. It's drummed into us that it's vegetation and not worth a tiny accident for a bit of grass.*

A third lever is to build from the positive relationships that exist between the PRFOs and the VRFFs. Many VRFFs spoke highly of the active role played by PRFOs in getting information out to them and in actively overseeing what they do. This is easier to do in forces that are relatively urban or close to urban centres than those in very rural environments. The value-add of the PRFOs in terms of near miss reporting comes in the feedback VRFFs receive about what is being done with the information and that perhaps what has been reported is being used to inform changes.

The drivers for change are not so clear cut. The VRFFs are clearly of the view that they are on top of health and safety and have been improving over the years. They say they wear full PPE, identify hazards and minimize, isolate and eliminate them where possible, operate safely around their equipment and work in environments with which they are familiar. They check their trucks and equipment, watch out for their mates and say they do not take risks.

On top of these safe practices, or as a result of them, around half of the VRFFs report they have no near misses and have little appetite for reporting of them if they do have them. As such if a

compliance approach to reporting is introduced it is unlikely to work as volunteers will continue to work from the premise that they do not have near misses.

A driver for change could be to incentivise reporting by, for example, celebrating health and safety practices and reporting generally. However the volunteers were of the view that they were simply not interested in this approach. The concept of a reward and recognition did not fly with them! While they have social gatherings and dinners these tend to be celebrations for and of the community rather than service to the community.

Conclusion

There is a firm base from which to build improvements in near miss reporting in the rural fire forces. The key levers for change at VRFF level include:

- volunteers' views on safety of themselves and their crew
- volunteer engagement and participation in their own forces
- evidence of health and safety knowledge and behaviour changing and improving over time
- positive PRFO and VRFF relationships.

The drivers for change exist primarily at regional and national levels where there is underlying commitment for the development and promotion of an effective, modern health and safety system. Such systems recognise the value of lead indicators as effective mechanisms for minimising risk and harm. The value of near miss reporting will need to be demonstrated to VRFFs and volunteers. This will require an enabling culture and open communication, easy to use systems and effective monitoring and communication back out to VRFFs. Only when volunteers can see value for them in near miss reporting, will the drive to proactively participate be realised fully. In the interim, improving understanding of what near miss reporting is, making it easy, blameless and 'part of what we do around here' can start that process of change. As such the first order change to systems may act as enabler to second order change - that is a change to fundamental beliefs, values and practices in relation to near miss reporting by volunteers.

As is shown in the report, the RFAs, PRFOs, VRFFs and volunteers are at differing levels of maturity in relation to health and safety and near miss reporting. The maturity framework highlights the systems and behaviours that can be expected within a well-established health and safety sytem. As such it provides ideas for a step change process that can be used to inform cultural and behaviour change.

Recommendations

Based on these findings, recognising that the VRFFs are at different places on a health and safety continuum, and using the information in the maturity framework the Fire Service should think about:

In the short-term:

- Sharing the key findings and maturity framework with PRFOs so that they get an understanding of the work.
- Providing clear and simple information in poster form about what a near miss is and why it is important to report. (Note downstream this could be turned into a short video clip.)
- Providing simple forms for reporting so that volunteers can either report orally or complete the form themselves.
- Providing advice to VRFFs about ways to have near miss conversations in oral debriefs and formal meetings.

In the medium-term:

- Providing or embedding information about near misses into new and/or existing training materials.
- Establishing a system for monitoring, collecting and collating near miss data at a national level and providing feedback to VRFFs at the regional and national level.

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Appendix: Research Approach

The outcome sought from this project was an improved understanding of why rural fire personnel do not report near misses and an understanding of what it would take to get the required attitude and behaviour changes that will lead to an improvement in near miss reporting. To achieve this outcome, the key research question was:

What leads to a lack of near miss and non-injury accident reporting within the Rural Fire fighting sector and what approaches can be used to improve this?

The research objectives are to:

1. Identify factors from current literature and key sector informants on how to build safety cultures within sectors from which volunteers are drawn, and in fire and other emergency services.

2. Examine the cultural values, behaviours and attitudes of Rural Fire personnel in relation to health and safety and how this leads to under reporting of near miss and non-injury accidents.

3. Review the experiences of Rural Fire personnel in relation to near misses, incidents, accidents and reporting and what it would take to change attitudes and behaviours and subsequently increase reporting.

4. Develop a framework for health and safety reporting practices.

5. Recommend how the NZFS can better influence, inform and incentivise the culture, behaviours and attitudes of Rural Fire personnel to improve more systematic and consistent near miss reporting.

The culture i.e. the assumptions, beliefs values and behaviours of Rural Fire personnel were examined using multi-method qualitative methodology based around exploratory case studies. The case study approach was chosen for its suitability for answering "how" and "why" questions and for its potential to explore in depth what is happening within a real life context, (Yin, 2009).[3] They are 'exploratory' as they look to provide insight into what is happening within individual VRFFs and this in turn informed the development of the maturity framework.

The research was informed by a literature scan on the existing literature around changing health and safety cultures generally in fire, other emergency services and with a focus on industries from which rural fire fighters are likely to be drawn. The literature was used to inform the interview schedules for the exploratory case studies. Key informant interviews with representatives from the Fire Service and forestry industry were also conducted.

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[3] Yin, R. (2009). *Case study research. Design and methods fourth edition.* (Applied social research methods series, Volume 5). Thousand Oaks, California: Sage.

Framework to inform PRFO and case study interviews

Rural volunteers operate within a social-ecological system.[4] While they will act according to their own values and beliefs and take personal responsibility for themselves, their behaviours are also influenced by the expectations, attitudes, behaviours, practices and systems exhibited within their own fire force, by the RFA and NRFA and ultimately by the communities in which they live, work and serve as volunteers. While each component of the system has an influence it also acts as a key point for interventions that ultimately lead to changes in culture and practice.

Figure One: Social-ecological model for rural volunteer fire fighters
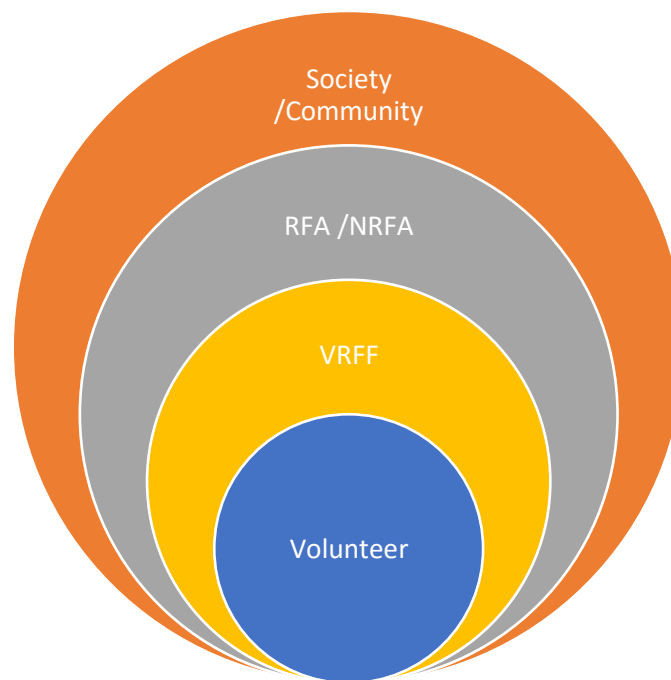
Given the volunteers sit within a system, the structured phone interviews with 12 PRFOs explored:

At the volunteer level:

- Personal attitudes, responsibility, accountability, behaviours in relation to health and safety generally and near miss reporting in particular (reasons, barriers, enablers)

At VRFF level:

- Culture – prioritisation of health and safety, value of it to Force Controllers, health and safety officers, volunteers; openness to change
- Attitudes, responsibility, accountability, behaviours, leadership of Force Controllers in relation to health and safety generally and near miss reporting in particular (e.g., roles and responsibilities, monitoring, risk management)

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[4] Adapted from Krug E, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, eds. World Report on Violence and Health. Geneva, Switzerland: World Health Organization; 2002:1-56.

- Systems in place to support a health and safety culture and near miss reporting, (e.g. formal - debriefs, reporting mechanisms (and what gets reported and what doesn't), recognition and rewards; informal -feedback)
- Barriers and enablers
- Good practice examples of how some encourage a culture of health and safety

At RFA/NRFA level

- Expectations, supports, communications, systems to support a health and safety culture and near miss reporting
- Health and safety training for volunteers (what, when, how)
- Recognition and rewards
- Barriers and enablers

At society / community level

- Expectations, attitudes, behaviours in relation to health and safety in the community

The PRFOs identified two-three rural fire forces in each of their districts who they saw as being best placed to provide information about their health and safety cultures, behaviours, systems and practices. Visits were then made to 18 of these sites where FCs and volunteers told their stories. Two interviews were conducted by phone.

This purposive sampling approach is more strategic than random sampling and ensures those sampled are relevant to and well placed to answer the research questions. In addition the sample size is sufficient for data saturation, i.e. the point at which no new insights are likely to be gathered, (Guest et al, 2006). [5]

At the sites we used semi-structured interview schedules to ask about:

a. The general attitudes to health and safety/health and safety reporting

b. The health and safety systems (including reporting requirements) that are in place and the extent to which volunteers adhere / want to adhere to these

c. Health and safety training

d. Leadership – the expectations from the PRFOs, the role of the health and safety officer

e. A near miss they should have reported and didn't, and the reason for this

f. What helps and hinders their reporting of near misses

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[5] Guest, G., Bunce, A. and Johnson, L. (2006). 'How many interviews are enough? An experiment with data saturation and variability'. *Field Methods* 18(1): 59-82.

g.   What would help to improve the reporting of near misses – reporting formats, changed attitudes, compliance requirements, incentives, motivation.

Data analysis

As the research is theory-informed we used a systematic, theory-guided approach to analysis. This meant categorising the themes at the outset and looking for the strength of these in each case study site and then across the sites. This systematic approach helped to build and extend the theory. As such it allowed us to tease out recurring themes and provided the basis for informing the maturity framework.

Ethics

The ethical standards used for this research were informed by the Australasian Evaluation Society *Guidelines for the Ethical Conduct of Evaluations*.[6] Standard protocols were used to inform interviewees about what they could expect from the research.

At the start of the interview they were:

- thanked for agreeing to be interviewed
- told that what they said would remain confidential to Heathrose Research and that they would not be identified in any reports or publications
- told they could withdraw from the interview at any stage.

Advantages and limitations of the research approach

Given the qualitative approach to this research, it includes a relatively small sample. As such, we cannot say the findings are generalisable to the population of 3,500 volunteers. However as stated above the sample size was such that we did reach data saturation in that we found no new ideas or themes after visiting around 15 sites. The sample was also purposively selected by the PRFOs, rather than it being a random sample of the population of volunteers. However, this was driven by the need to be able to access a range of VRFFs with differing attitudes and a range of health and safety practices.

The strengthes of the research include

- Using semi-structured interviews allowed for in-depth exploration of the 'why and how' there is a lack of near miss reporting. The qualitative interview data was rich and covered aspects related health and safety and near miss reporting.

- The combination of the method and the sample size allowed for generalising to theoretical propositions that are likely to be applicable to the rural fire force population.

- Using different types of evidence and evidence from different sources allowed for data

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6 http://www.aes.asn.au/membership-ethical-guidelines.html

triangulation and thus increases validity.

- Capturing data as closely as possible to verbatim privileged the voices of the volunteers. As such it has allowed their ideas to inform the solutions and the maturity framework. They shared their reality and lived experiences and it is their perceptions and words that underpin this research.

- Using two researchers to collect data, develop the analytic categories and analyse the data improved the reliability of the findings.