EMBEDDING NON-TECHNICAL SKILLS AS PART OF CORE BUSINESS IN EMERGENCY MANAGEMENT

Improving decision-making in complex multi-team environments – Final project report Part A

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EXECUTIVE SUMMARY

Non-technical skills are increasingly being seen as a vital part of effective performance in industries where there is a high potential for catastrophic outcomes (such as medicine, maritime, aviation and the military). In these industries non-technical skills have become an integral part of core business and a variety of tools and training programs have been developed to support and enhance their use. Emergency management has been somewhat slower to adopt non-technical skills management programs, although such programs are now starting to emerge. The Bushfire & Natural Hazards CRC has been instrumental in facilitating research in non-technical skills over the last 10 years and a reasonable body of work has emerged on non-technical skills. This project draws together much of this body of work by providing an overarching integrative framework and by developing a set of training materials that can be used to train people in emergency management. This set of materials is an important resource that can help the adoption of non-technical skills by agencies so that they come to be seen as core business.

END-USER PROJECT IMPACT STATEMENT

Roger Mentha, *Assistant Commissioner Education and Training, Fire and Rescue NSW*

Non-technical Skills are crucial to effective emergency management, and developing our people to understand their roles and functions within a team fundamentally underpins our capability for the future. The project is delivering value to our emergency management leaders through the utilisation of tools and products that directly link to improving understanding of team needs and enhancing decision making skills. Further utilisation of the tools will help prepare individuals and emergency service organisations to better respond to the increasing challenges being faced across the emergency management sector. The challenge for Emergency Services is to continue to utilise the research in the multi-agency format to continue to develop our managers of the future.

BACKGROUND AND INTRODUCTION

Non-technical skills can be defined as the 'cognitive, social and personal resource skills that complement technical skills and contribute to safe and efficient task performance' (Flin et al., 2008, p. 1). Technical and non-technical skills typically work in combination so that shared situation awareness drives good decision making in the context of effective teamwork, supported by strong and supportive leadership. This set of non-technical skills underpins the performance of technical skills concerned with the management of the incident or emergency.

Non-technical skills have been well established in industries where there is a high potential for catastrophic outcomes (such as medicine, maritime, aviation and the military) for many decades. In aviation, crew resource management programs, which seek to enhance various aspects of non-technical skills have been around since the early 1980s and non-technical skills programs have been common in maritime and medicine since the early 1999s. In these domains there are typically a number of tools that can assess non-technical skills in operational environments (such as LOSA in aviation), supported by training programs and continuous improvement initiatives.

Emergency management has been somewhat slower to adopt non-technical skills management programs, although a clear need for such programs has been identified.

Periodic independent reviews, inquests and reports have continued to highlight significant problems in the use of non-technical skills both in Australia (e.g., Linton (Johnstone, 2002), Canberra (McLeod, 2003), Wangary (Schapel, 2007), Black Saturday (Teague, McLeod, & Pascoe, 2010), the Lake Clifton, Red Hill, and Roleystone fires (Ellis, 2011) and in other parts of the world (Storm King Mountain, Hackensack, and Cherry Road fires (IAFC, 2003)). Coordination, cooperation, communication, situation awareness, decision making and leadership have all been highlighted as problematic in these reports.

The Bushfire & Natural Hazards CRC has been instrumental in facilitating research in non-technical skills over the last 10 years and a reasonable body of work is now starting to emerge. This work has highlighted errors and breakdowns in coordinated decision making in large-scale fires (Bearman et al., 2015; Brooks et al., 2018); pressures on the decision making of volunteer incident controllers (Bearman & Bremner, 2013); strategies used by regional commanders to identify breakdowns (Grunwald & Bearman, 2017); and psychological behaviours, such as 'coping ugly' (Brooks, 2014). A number of tools have also been produced to help people better manage non-technical skills. These tools support the broad suite of non-technical skills (EMNoTS; Hayes & Bearman, 2021), the management of cognitive biases (Brooks et al., 2020); the evaluation of teamwork (TPC; Bearman et al., under review); facilitate psychological safety (Brooks & Curnin, 2020); and identify key tasks that need to be completed in regional and state emergency management centres (KTCA, Hayes et al., 2020).

The current project is an extension of the previous work funded by the Bushfire & Natural Hazards CRC. This project draws together much of this previous work using an overarching integrative framework, called Emergency Management

Non-Technical Skills (EMNoTS), developed by Hayes et al., (2021). This framework articulates seven key non-technical skills that are essential in incident and emergency management. These seven non-technical skills are: communication, coordination, collaboration, decision making, situation awareness, leadership and coping with stress & fatigue. The EMNoTS framework is used to develop a non-technical skills training workshop, support materials for trainers/assessors and guidance on how to use the various non-technical skills tools.

WORKSHOPS AND SUPPORT MATERIALS

The key output from the project are two workshops. The first workshop is designed to train participants in non-technical skills. The second workshop is designed for more advanced personnel who want to know more about non- technical skills and need to train others to use non-technical skills. The outline of these workshops are as follows:

WORKSHOP 1 – NON-TECHNICAL SKILLS FOR EMERGENCY MANAGEMENT: KEY CONCEPTS FOR PRACTITIONERS

This workshop provides an introduction and overview of non-technical skills for emergency and incident management. This 4-hour workshop covers:

- what are non-technical skills,

- why non-technical skills are important and valuable,

- the non-technical skills important for emergency and incident management,

- the language and taxonomy of non-technical skills, and

- an introduction to tools that can be used to support the use of non-technical skills and to identify non-technical skill related problems in teams.

The workshop draws on human factors and emergency management literature to help participants develop a broad understanding of non-technical skills.

WORKSHOP 2 – DEVELOPING INDIVIDUAL AND TEAM NON-TECHNICAL SKILLS: A WORKSHOP FOR SENIOR PRACTITIONERS AND INSTRUCTORS

This workshop focuses on the development of non-technical skills for individuals and teams. The workshop is designed to help instructors deliver non-technical skills training activities and to assist senior practitioners to support the development of these skills for the individuals or teams that they are managing. Developing non-technical skills in an organisation typically follows the three distinct phases of: awareness, practice and feedback, and continual reinforcement loop. This 6-hour workshop outlines these phases and discuss how instructors and senior practitioners can:

- evaluate a team's non-technical skills,

- use tools to support the development and use of non-technical skills in teams,

- incorporate relevant non-technical skills content in other types of training, and

- identify the broader issues relevant to non-technical skills training.

The workshop draws on human factors, emergency management, and training and development literature to help participants acquire a sound understanding

of non-technical skills. Workshop participants will engage in various activities that will be useful for their own practise of teaching or supporting the development of non-technical skills.

In addition to these workshops a comprehensive guide to non-technical skills has been produced to support the workshops. This guide provies an introduction to each of the non-technical skills, identifies behavioural markers of these skill that can be observed in operational situations, discusses some of the challenges of managing the non-technical skill and provides links to further resources.

Finally, based on discussions with AFAC a set of recommendations were made on 1) how to better integrate non-technical skills into the selection criteria and continuing professional development of the Emergency Management Professionalisation Scheme, and 2) material on non-technical skills that could be included in units of the Public Safety Training Package (PSTP).

MILESTONES

Milestones achieved in the project include:

- initial discussions with end-user participants completed

- NTS training materials developed

- recommendations on incorporating NTS tools and concepts into PSTP units and/or EMPS CPD resources provided to AFAC

- workshops conducted with end-users in South Australia, New South Wales and Victoria

- post-workshop follow-ups with agencies completed

- supplementary materials developed and provided to end-users

- final report submitted.

MILESTONES

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UTILISATION AND IMPACT

SUMMARY

The utilisation of non-technical skills so that they become a core part of how agencies function is an ongoing process, of which this project is one element. Broadly we have adopted a number of utilisation strategies designed to: increase visibility of non-technical skills in agencies, leave a lasting footprint of non-technical skills material, provide key personnel with skills to enhance both their own non-technical skills and to facilitate them in others, and improve the non-technical skills content in the Emergency Management Professionalisation Scheme and the Public Safety Training Package (PSTP).

EXTENT OF USE

- 7 workshops have been run in South Australia, New South Wales & Victoria.

- 92 participants in total have attended the workshops. 43 participants have attended Workshop No1 and 49 participants have attended Workshop No2

- 92 people have been trained on how to use the EMNoTS checklist

- Workshops have been delivered to people within agencies who are responsible for accrediting new incident management team members.

- Recommendations have been made to AFAC on how to better integrate non-technical skills into the selection criteria and continuing professional development of the Emergency Management Professionalisation Scheme,

- Recommendations have been made to AFAC on how to include material on non-technical skills in units of the Public Safety Training Package (PSTP).

- Recommendations have been made to the National Aerial Firefighting Centre (NAFC) for the incorporation of the EMNoTS tool into the training and on the job professional development of Air Observer, Air Attack Supervisor and Air Operations Manager roles (see Hayes, 2021).

UTILISATION IMPACT

- The impact of the non-technical tools that we have developed has been documented in previous final reports for this set of projects (see Bearman et al., 2020)

- Training personnel within agencies who are responsible for accrediting new IMT members will increase the acceptance and use of non- technical skills in IMTs

- Enhancing the non-technical skills content in the EMPS and PSTP increases the visibility and perceived importance of non-technical skills by emergency managers.

CONCLUSION AND NEXT STEPS

Non-technical skills are clearly an important aspect of effective teamwork in emergency management. The management of non-technical skills has become core business for many high consequence industries (such as aviation, medicine, military) and is starting to be seen as such in emergency management. The work undertaken in this project provides an overarching framework to integrate previous work on non-technical skills, known as the Emergency Management Non-Technical Skills (EMNoTS) framework. This framework articulates seven key non-technical skills that are essential in incident and emergency management. These seven non-technical skills are: communication, coordination, collaboration, decision making, situation awareness, leadership and coping with stress & fatigue. The EMNoTS framework has been used to develop non-technical skills training workshops, support materials for trainers/assessors and guidance on how to use the various non- technical skills tools.

The next steps in helping agencies to embed non-technical skills into core business is to develop a modular approach to training non-technical skills that allows non-technical skills training to be interweaved with technical skills training. This provides a seamless delivery of both types of skills. For example, someone who is learning about relay pumping not only needs to learn about how to operate the controls of the pump but also about coordination and communication so that the flow of water is regulated between trucks so as not to damage any of the pumps. Similarly, someone learning about road crash rescue needs to learn not only how to operate the cutting and spreading equipment but also how to communicate, coordinate and maintain situation awareness. In this way the hard distinction between technical and non-technical skills can be broken down so that both types of skills are seen as 'how we do the job'.

PUBLICATIONS LIST

PEER-REVIEWED JOURNAL ARTICLES

1 Hayes, P., Bearman, C., Butler, P., & Owen, C. (2021). Non-technical skills for emergency incident management teams: A literature review. *Journal of Contingencies and Crisis Management. 29(2), 185-203.*
2 Hayes, P., Bearman, C., Thomason, M., & Bremner, P. (2020). Staying on task: a tool to help regional and state coordination centres. *Australian Journal of Emergency Management, 35,* 38-44.
3 Brooks, B., Curnin, S., Owen, C., & Bearman, C. (2020). Managing cognitive biases during disaster response: the development of an aide memoire. *Cognition, Technology & Work, 22.* 249–261.

HAZARD NOTES

4 Bearman, C., & Hayes, P. (2021). Improving emergency management teamwork using non-technical skills. *Hazard Note, 92,* 1-4.
5 Hayes, P., Bearman, C., Thomason, M., & Bremner, P. (2021). Supporting emergency management team performance during emergencies. *Hazard Note, 93,* 1-4.

TECHNICAL REPORTS

6 Hayes, P., Bearman, C., & Gyles, D. (2021). Non-technical skills: A guide for instructors, senior practitioners, coaches and mentors. Melbourne: Bushfire & Natural Hazards CRC.

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