TOOLS TO ENHANCE EMERGENCY MANAGEMENT TEAM PERFORMANCE

▲ **Above:** THIS RESEARCH HAS BEEN USED BY THE COUNTRY FIRE SERVICE TO ENSURE THEIR TEAMS ARE WORKING SAFELY AND EFFICIENTLY. PHOTO: MARK THOMASON, CFS

ABOUT THIS PROJECT

This research was conducted as part of the *Improving decision-making in complex multi-team environments* project. It has developed tools to help identify and resolve issues in teamwork.

AUTHORS

Dr Chris Bearman, Dr Sophia Rainbird, CQUniversity; Dr Christine Owen, Dr Benjamin Brooks, University of Tasmania. Contact c.bearman@cqu.edu.au

SUMMARY

Effective teamwork is vital when managing emergencies, which can exert extreme pressures on response and management teams, their leaders and co-responders. These pressures sometimes cause breakdowns in teamwork that can lead to impaired operational response. This research helps to improve teamwork through better real-time identification and resolution of teamwork issues. To do this the project has developed two tools: the Emergency Management Breakdown Aide Memoire (EMBAM) and the Team Process Checklist (TPC). The tools' flexibility and ease of use helps emergency managers to strengthen teamwork before, during and after emergencies. The tools can be used during training, in actual emergencies, and in after-action reviews, with emergency managers finding the tools to be highly valuable.

CONTEXT

The highly demanding nature of managing emergencies can disrupt effective team performance. These disruptions can lead to an impaired operational response, creating risks to public safety, property and other assets. This project is helping to foster cohesive teamwork when it is most needed – when teams are responding under pressure to emergency events.

BACKGROUND

Teamwork is an essential part of emergency management. To a large extent, emergency management can be characterised as teams of people interacting within the hierarchical structure of an agency. Within this structure, information flows within a specific team (for example, a strike team), between that specific team and a broader team (that includes radio operators or brigade officers), other teams (for example, other strike teams) and teams at more senior levels (such as group officers or regional-level personnel).

During emergencies, individuals and teams often work under considerable pressure that can disrupt effective team performance. The implications of these disruptions can be serious. An analysis of three large-scale bushfires in Australia, (Bearman *et al.*, 2015) showed examples where team breakdowns led to confusion, miscommunication and inconsistent fire-management plans.

It is important, however, to acknowledge that people managing emergencies will sometimes make errors and that

▲ **Above:** THE STRAIGHT-FORWARD, PRACTICAL TOOLS DEVELOPED THROUGH THIS RESEARCH WILL BE OF GREAT BENEFIT TO EMERGENCY SERVICE AGENCIES. PHOTO: NEW ZEALAND FIRE SERVICE

disruptions to teamwork will occur. Many organisations now recognise that error is a normal part of human performance and emphasise both error recovery and minimisation. This shifts the focus from blaming people, to designing mechanisms and systems that can identify and resolve disruptions as quickly as possible (Bearman *et al.*, 2017, Grunwald and Bearman, 2017).

BUSHFIRE AND NATURAL HAZARDS CRC RESEARCH

Since 2015 the project team has been developing two tools that help to identify and resolve breakdowns in teamwork. These tools are known as the Emergency Management Breakdown Aide Memoire (or EMBAM) (Grunwald and Bearman, 2017) and the Team Process Checklist (TPC). The TPC is based on research into teamwork breakdowns by Wilson *et al.* (2007) and Bearman *et al.* (2015b). These tools are checklists that help people to think about teams and team processes and are designed to be used in real time during an incident, training sessions or debriefs post-incident.

The two tools take slightly different approaches to monitoring teams. EMBAM is designed to be integrated into the activities of a senior officer and focuses on the outputs of teams and organisational

networks. This checklist is reasonably quick and easy to apply and identifies problems at a general level. EMBAM also includes different strategies that can resolve issues in teams (see About the Emergency Management Breakdown Aide Memoire, above).

If EMBAM identifies a problem, or if a more detailed health check of the team is needed, then the TPC is used. The TPC contains questions about the coordination,

ABOUT THE EMERGENCY MANAGEMENT BREAKDOWN AIDE MEMOIRE

The Emergency Management Breakdown Aide Memoire is a checklist that helps people to recognise teamwork breakdowns through team outputs (for example, incident action plans) and formal/informal organisational networks. It also provides some practical resolution strategies shown below:

How you might resolve breakdowns:

1. **Delegate:** find someone who is close to the breakdown or has the most appropriate skills and have them resolve the issue.
2. **Resource:** breakdowns can be caused by missing resources. Find out what is missing, or what will assist the other teams, and get it to them.
3. **Mentor:** a subtle form of resolution, mentoring allows you to tactfully suggest alternatives, opinions and strategies.
4. **Assert:** if you have tried more subtle strategies without success, you can use your authority to resolve the problem.
5. **Replace:** if breakdowns are caused by disruptive personalities in the management team, or even factors like fatigue, you can stand the disruptive people down or give them other duties.

cooperation and communication processes that should occur in effective teams. The team's performance is considered in relation to each of these questions. Any issues that the tools identify should be discussed with the team (see About the Team Process Checklist, page 3).

RESEARCH FINDINGS

The researchers developed the tools together with end-users through an iterative cycle of

▲ **Above:** DURING EMERGENCIES, INDIVIDUALS AND TEAMS OFTEN WORK UNDER CONSIDERABLE PRESSURE THAT CAN DISRUPT EFFECTIVE TEAM PERFORMANCE. THIS RESEARCH IS HELPING TO ADDRESS THIS. PHOTO: BEN SHEPHERD, NSW RURAL FIRE SERVICE

ABOUT THE TEAM PROCESS CHECKLIST

The Team Process Checklist is designed to provide a health check for teams and, if there is a problem, to help determine what that problem is. This tool is designed to assist people to think through three aspects of teamwork: communication, coordination and cooperation. Examples of the communication items are below:

- Are team members passing on information in a timely manner?
- Are team members passing on information accurately?
- Is communication between team members clear?
- Are team members providing appropriate feedback?
- Are team members providing updates on the situation?
- Are appropriate communication procedures being used?

testing and redevelopment (see Bearman *et al.*, 2017). The initial version of the tools was based on an extensive literature review of methods that could be used by an observer to monitor teams (which was the original intention of the tools). A preliminary evaluation study of the tools suggested that they both showed promise and should be developed further (Bearman *et al.*, 2017).

The tools were then developed and evaluated by a team consisting of four state-level end-users during five regional exercises. These exercises required a fully staffed regional coordination centre to manage one or more significant large-scale bushfires. During the exercise, actors simulated radio traffic on the fireground and adopted the roles of key stakeholders (such as police). Observers used the TPC to help assess the team and to inform the debrief at the end of the exercise. After each exercise, the team met to provide feedback on the checklist, evaluating whether each question needed to be removed or amended. Any changes were made before the next exercise, where the process was repeated.

The tools were also evaluated by six regional and state coordinators during two large-scale storm and flood events. During these emergencies, the research team conducted a telephone interview with each of the coordinators participating in the study. In these interviews, the coordinators considered the performance of teams against each item on the TPC. This allowed the coordinator to identify issues in those teams that needed to be considered in the next hour, the next

shift, the next day and the next week. As part of the discussion, the participant evaluated whether each item on the checklist provided useful information.

Finally, two senior officers (a state controller and state information officer) used both tools throughout a fire season. This fire season contained many significant bushfires. At the end of the fire season, the researcher team interviewed the two senior officers about how they used the tools and whether

FURTHER READING

Bearman C, Grunwald JA, Brooks BP and Owen C (2015), Breakdowns in coordinated decision making at and above the incident management team level: an analysis of three large scale Australian wildfires, *Applied Ergonomics*, **47**, pp. 16-25.

Bearman C, Rainbird S, Brooks BP, Owen C and Curnin S, (2017), Tools for monitoring teams in emergency management: EMBAM and TBM, *Australian Journal of Emergency Management*, **32**, pp. 40-43.

Grunwald JA and Bearman C (2017), Identifying and resolving coordinated decision making breakdowns in emergency management, *International Journal of Emergency Management*, **13**, pp. 68-86.

Wilson KA, Salas E, Priest HA, Andrews D (2007), Errors in the heat of battle: taking a closer look at shared cognition breakdowns through teamwork, *Human Factors*, **49(2)**, pp. 243-256.

▲ **Above:** THE TOOLS DEVELOPED THROUGH THIS PROJECT CAN BE USED DURING AN INCIDENT, IN DEBRIEFS OR IN TRAINING. PHOTO: NSW RURAL FIRE SERVICE

the tools were effective. The participants found the tools to be valuable, and had used them as memory aids to ensure nothing had been overlooked, to conduct team health checks and to resolve team problems before they escalated.

HOW IS THIS RESEARCH BEING USED?

The tools are a very flexible way to examine teamwork from many perspectives.

They are being used as a health check to ensure the team is functioning effectively, to identify suspected problems, as a debrief tool and to foster better teamwork. They are utilised in real time during an incident, as a way to reflect on teamwork during periods of relative calm, and as an assessment and/or debrief tool during training. They are being used by team members, team leaders, external people

who have operational oversight (for example, regional coordinators) and by independent observers. If your agency can benefit from these tools, contact the author for further information.

FUTURE DIRECTIONS

The tools have been developed together with end-users and used in a number of different settings. In each setting, the tools have provided useful information to the user. All of the agencies involved in developing the tools have either adopted them, or are considering adoption. More testing to validate the use of the tools in different settings will be done over the next year (2017-2018). However, both EMBAM and TPC have shown considerable promise as a viable way of identifying and managing issues in teams.