ABSTRACT

In 2015, the Australasian Fire and Emergency Service Authorities Council (AFAC) commissioned a review of the evidence base to establish the rationale for capabilities central to effective incident management. The review focused on the capabilities required for senior AIIMS Level 3[1] Incident Management Team roles. Results were used to inform standards for the AFAC Emergency Management Professionalisation Scheme. The review considered the human factors and emergency management literature as well as research conducted through the Bushfire CRC. Analysis and synthesis of the evidence identified three broad capabilities, each with three sub-capabilities important in incident management. The three categories were to model leadership and teamwork, to think and plan strategically and demonstrate self-awareness. This article outlines the evidence base and the capabilities developed through this review and contributes to the evidence base for incident management capability. Guidance on what will be needed in continuing professional development program is provided.

Evidence to support incident management team capability

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Introduction

There is increasing attention in the emergency management literature on the capabilities required of people managing emergency incidents (e.g. Flin & Slaven 1995, Hayes & Omodei 2011). Incident management team (IMT) members use complex sets of capabilities in often very challenging situations and environments. To develop standards for an Emergency Management Professionalisation Scheme (EMPS), AFAC commissioned a review of the evidence base to update and articulate the rationale for capabilities central to effective incident management. This article provides a summary of the evidence identified to inform the capabilities developed through this review.[2]

Central themes from the literature were considered, for example, high reliability organisations (Weick, Sutcliffe & Obstfeld 1999) and naturalistic decision-making (Orasanu & Connolly 1993). In addition, work undertaken through the Bushfire CRC and Bushfire & Natural Hazards CRC was studied (e.g. Hayes & Omodei 2011, Owen 2014) along with synthesis of that research work over a ten-year period (e.g. Ferguson *et al.* 2015). Finally, findings from industry initiatives including the Victorian Incident Management Team Training Project (IMTTP 2014) were reviewed.

The list of competencies provided by Hayes and Omodei (2011) relied on data collected in 2008-2009. As that list is now over eight years old, it contains some limitations and gaps. Emergency management in Australia has been influenced by significant events since that data collection, such as the Black Saturday bushfires in 2009 that resulted in a Royal Commission that initiated significant changes in the roles responsibilities of incident management (e.g. information sharing and sense-making).

This study updates the work of Hayes and Omodei (2011) by adding recent research and identifies new capability requirements (e.g. consequence management). The framework discussed in this paper also introduces concepts not covered in previous discussions of competencies, for example, the role of leadership in coaching and creating conducive team environments, sense-making and 'coping ugly' (Brooks 2014), the later being a term used to describe a continuum of dynamic control between operational excellence at one end and luck at the other.

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1 AIIMS is the Australasian Inter-service Incident Management System. Level 3 incidents are considered the most demanding type to manage and are described as high impact, high consequence and complex events.

2 The full document is available at www.emps.org.au/Public/Publications/About_the_Scheme/Public/Publications/About_the_Scheme.aspx.

Previous work in describing competencies (Flin & Slaven 1995, Hayes & Omodei 2011) used a technical skills, teamwork and personal competency framework. Although this is a useful way of considering capabilities, the approach can lead to the aggregation of detailed behaviours under three high-level categories of team, technical and personal. It may therefore compartmentalise, and thus constrain, a view of the competencies used. In addition, categories such as personal attributes run the risk of emphasising personality traits rather than behaviours.

This approach is a more holistic one aligned with human resource development literature (Nagarajan & Prabhu 2015) that focuses on the activities people actually do. Moreover, application of multiple interdependent capabilities is called for because their applications in practice often overlap. For example, sense-making and planning may be considered the respective front and back end of decision-making (Mosier & Fischer 2010).

The term 'capability' is preferred to 'competency' to avoid confusion with how the term is defined in the vocational education and training domain. For the purposes of this paper, a capability refers to the cluster of behaviours expected from emergency management personnel to succeed in achieving objectives.

Background

The EMPS is an Australasian program to credential emergency management practitioners' skills, abilities and experience and support ongoing professional development. During 2015, the EMPS steering group developed a set of initial guidelines and draft capabilities for the scheme. As the work of the steering group progressed, AFAC recognised that an independent review of the capabilities included in version one and literature review would help ensure that EMPS was underpinned by a sound evidence base. To achieve this AFAC commissioned a small team of emergency management practitioners and researchers to review the initial capabilities identified, to ensure alignment with the literature and to realign the capabilities where necessary.

Method

The research approach was to consider the key activities and processes that are central to incident management. The literature was used to develop behavioural indicators for each of the sub-capabilities (e.g. Hayes & Omodei 2011, IMTTP 2014, CFA-DSE 2006, AFAC 2007). Search terms used to identify the literature to be reviewed included 'capability' 'performance' and 'emergency or incident management'. Databases searched included those drawn from the organisational development (Ebsco-Host) psychology and human factors (Psych-Lit) domains. Where the published research literature identified improvements in performance, these elements were turned into an indicator of behaviour (e.g.

self-management, see McLennan *et al.* 2014, IMTTP 2014).

The draft capabilities and descriptors were subsequently reviewed by 30 experienced incident management personnel. These personnel were either currently in operational incident management roles at Level 3, or were working at regional or state levels in supervising others and had a minimum of 20 years' experience in IMTs. In addition, representation came from all states and territories in Australia and included personnel from rural fire, urban fire, state emergency services and land management agencies. Interviews were between 30 and 90 minutes in duration. The interview process resulted in some activities and behaviours being amalgamated and others were set aside.

Overview of the capabilities

IMT members use complex sets of capabilities in often very challenging situations and environments. These capabilities require the sophisticated use of team, technical and personal elements for critical incident management activities such as sense-making, decision-making and consequence management.

The review identified three broad capabilities, each with three sub-capabilities important in incident management:

- Models leadership and teamwork - the ability to act with integrity, influence others and facilitate team efforts towards achieving common goals.
- Thinks and plans strategically - the consideration of multiple perspectives and scenarios to engage in strategic planning and consequence management.
- Demonstrates self-awareness - monitoring stress and fatigue, display resilience and agility and reflect and adjust to feedback.

A summary of the three core incident management capabilities and the respective subcapabilities developed for the EMPS are shown in Figure 1. It is important to note that these are the broad capabilities to work effectively in an IMT. A particular IMT context will require specific hazard knowledge and technical capabilities.

A set of 54 behavioural indicators was developed to support the operationalisation of the capability framework. These indicators highlight the types of observable behaviours associated with each capability and help explain the various actions and behaviours required for each of the capabilities. Table 1 provides two examples of these behavioural indicators. It should be noted that these behavioural indicators are not exhaustive. A complete set can be found online at www.emps.org.au/Public/Publications/About_the_Scheme/Public/Publications/About_the_Scheme.aspx

INCIDENT MANAGEMENT CAPABILITIES

MODEL
Integrity, influence, governance

- Models ethics, inclusiveness and good governance
- Creates effective background conditions to build confident and capable teams and engaged stake-holders
- Applies effective decision-making

THINK
Sense-making, scenarios, consequence

- Pursues sense-making and encourages in others
- Practices planning and strategic thinking
- Enables consequence management

SELF-AWARE
Reflect, adapt, persevere

- Monitors and manages self for symptoms of stress and fatigue
- Displays resilience and agility
- Recognises own strengths and limitations

HAZARD CONTEXT CAPABILITIES

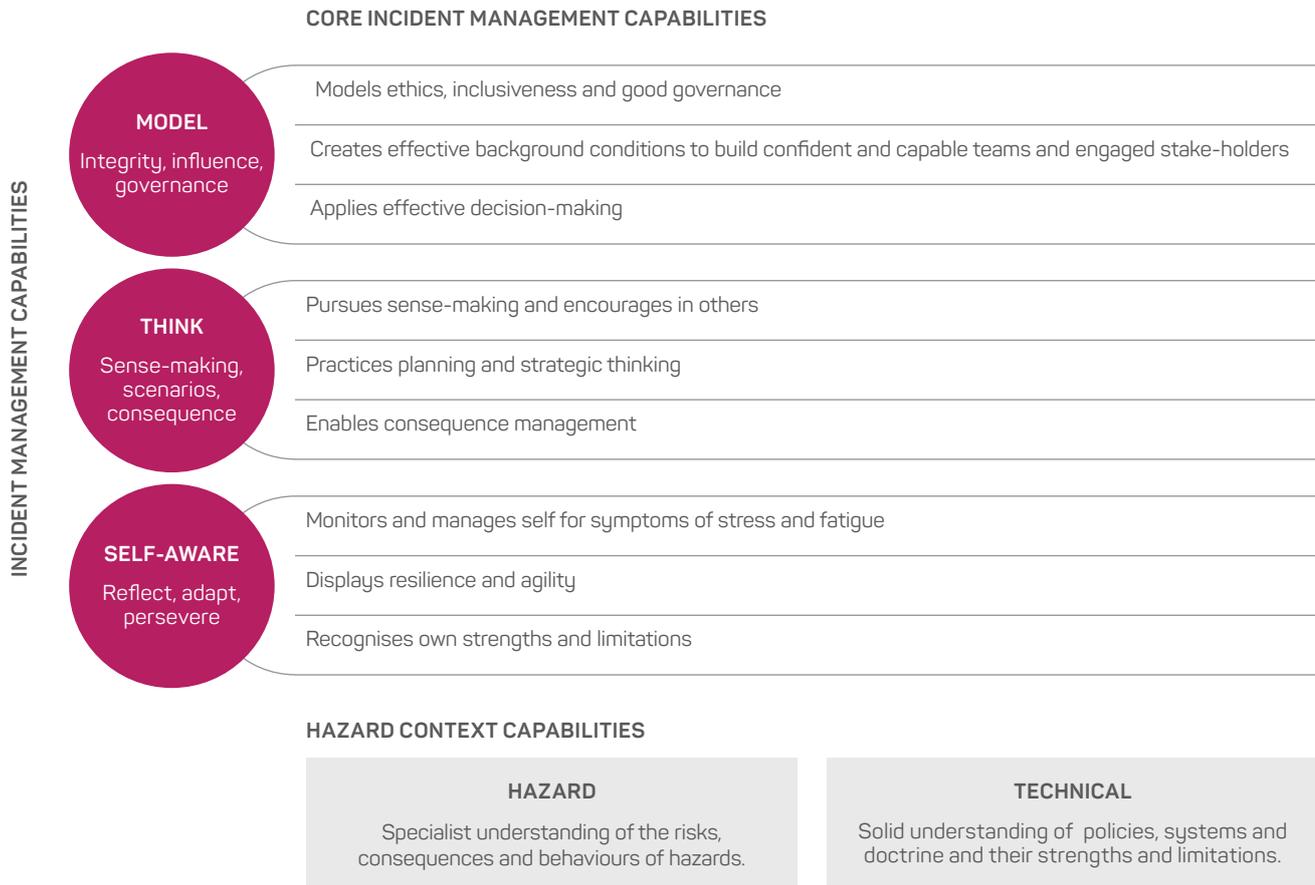| HAZARD	TECHNICAL
Specialist understanding of the risks, consequences and behaviours of hazards.	Solid understanding of policies, systems and doctrine and their strengths and limitations.

Figure 1: Core incident management capabilities.

Model leadership and teamwork

Models ethics, inclusiveness and good governance

Organisations require personnel to operate in an ethical manner and to ensure good governance. The requirement to be ethical is a common feature for professional-body membership (Friedman 2012). The International Association of Emergency Managers recognises the importance of ethical behaviour, requiring its members to adhere to a code of ethics emphasising respect, commitment and professionalism (Canton 2007).

Closely aligned with ethical behaviour is the requirement for incident management personnel to ensure good governance of the systems, processes, resources and people for which they are responsible. Over recent years increasing interdependence between social, technical and infrastructure systems has required incident managers to collaborate beyond traditional emergency service organisations (Owen 2014). This type of collaboration requires incident mangers to model more inclusive behaviours, enabling all stakeholders to speak up and contribute. Organisational, cultural and political constraints and expectations (Canton-Thompson *et al.* 2008) also mean that IMT leaders must demonstrate a high-level of political acumen and judgement in their decision-making (CFA-DSE 2006).

Creates effective background conditions to build confident and capable teams and engage stakeholders

This capability focuses on the role senior IMT members play in creating a supportive environment where individuals and teams are able to function well and work effectively. Creating a suitable team environment enables and encourages participation. Modelling appropriate behaviours helps to set norms that support high standards of team performance (Sundstrom *et al.* 2000, Hayes 2014) and to shape a supportive team environment (a psychological 'safe' space) where members will speak up and offer constructive comment (Edmondson 1999).

Leadership plays an important role in shaping team activities and thus in harnessing the best use of team resources (Hayes 2014). Although there is often a focus on the 'leader', the creation of a suitable team climate helps other members to also undertake and share leadership.

Research by Owen (2014) highlighted the important role that leaders play in providing coaching and feedback to team members and that this led to improved team performance in simulations.

Applies effective decision-making

Decision-making is fundamental to the management of emergencies. A synthesis of the research indicated that effective decision makers are able to:

- effectively use metacognition to regulate their thinking and monitor metacognition in others (Frye & Wearing 2014, McLennan *et al.* 2007)
- apply various styles of decision-making depending on the context (Lauder & Perry 2014, Flin, O'Connor & Crichton 2008)
- take into account the available time, resources, degree of ambiguity, options available, and the number and degree of risks associated with the

options (Brooks 2014) and the impact of fatigue and stress (Omodei 2012).

It is important to note that the capabilities outlined here are closely interrelated, for example, sense-making, planning and strategic thinking, consequence management, and self-monitoring/management support effective decision-making. A key observation from the literature is that decision-making is entwined with

Table 1: Examples of behavioural indicators for capabilities and sub-capabilities.

Capabilities and subcapability	Behavioural indicators
Models ethics, inclusiveness and good governance.	• acts in accordance with the (EMPS) Code of Ethics and Standards of Professional Conduct • treats others with respect • applies governance processes and procedures for the greater good • displays courage to make difficult decisions.
Creates effective background conditions to build confident and capable teams and engaged stakeholders.	• creates a collaborative team climate (e.g. communicates in a way that is open, direct, measured and approachable) • pursues honest and open input and feedback • responds promptly and constructively to questions and concerns raised • monitors team member capability and addressing any dysfunctional behaviour or gaps.
Applies effective decision-making.	• employs timely decision-making that can be assessed as likely to be reasonable at a given point in time • uses decision-making styles appropriate to the context and that demonstrates flexibility (e.g. balances the need for speed, thoroughness and inclusiveness with the time available) • outlines clearly the triggers that would require a decision change • clearly communicates decisions made to ensure intent is achieved.
Pursues sense-making and encourages in others.	• establishes mechanisms for testing and improving situational awareness • identifies knowledge gaps, uncertainty, threats and emerging issues so that these can be managed • seeks alternative opinions and perspectives including contra-indicators • projects possible outcomes based on information and intelligence gathered, weighing up difference sources of credibility.
Practices planning and strategic thinking.	• predicts options that reflect the information gathered through sense-making and evaluation • explains the assumptions on which plans are based and the triggers for reassessing plans • acts quickly to adjust the strategy as the context changes • demonstrates creativity and flexibility in adapting plans to improvise in novel situations.
Enables consequence management.	• identifies those who are potentially affected by the incident • anticipates what might go wrong and any unintended adverse effects • explains contingency planning for adverse effects • matches communication styles to the audience.
Monitors and manages self for symptoms of stress and fatigue.	• maintains focus and remains grounded when under pressure • uses coping mechanisms to manage suboptimal conditions • self-regulates emotions when under pressure in challenging circumstances • monitors self-behaviour and any impact on others.
Displays resilience and agility.	• copes with flux, the unexpected and incomplete information • recovers quickly from setbacks and perseveres to get things done despite difficulties • remains flexible when faced with suboptimal or novel conditions and improvises in response • acts promptly to signs that action is not producing the desired outcomes.
Recognises own strengths and limitations.	• appreciates limitations and avoids arrogance and hubris • accepts feedback or criticism and adjusts appropriately and objectively • critically reflects on own performance and takes responsibility • seeks opportunities to extend knowledge, skills and experience.

analysis, action and evaluation (Orasanu & Connolly 1993).

People in complex situations often 'think a little, act a little, and then evaluate the outcomes and think and act some more' (Orasanu & Connolly 1993, p. 19).

In reporting some of the challenges that can arise between meeting operational and political needs in a crisis, Bosomworth, Owen and Curnin (2016) found that one challenge is political involvement in management of significant events. While it is recognised that in times of emergency or crisis, political leaders are expected to be informed and show visible leadership (Boin & 't Hart 2010), participants in this study argued that some political responses are inconsistent, ad-hoc and concerned with 'messages for the media' or a political position.

Think and plan strategically

Pursues sense-making and encourages it in others

Sense-making is the act of rationalising or reassessing ongoing activities in order to make meaning of them (Barton & Sutcliffe 2009). Barton and colleagues (2015) noted that sense-making is important to overcome the challenges of uncertain environments, enabling the use of flexible and improvisational approaches.

Practices planning and strategic thinking

The practice of sense-making helps develop cognitive resources for planning and strategic thinking for individuals and teams. This is supported by gaining an awareness of the situation and anticipatory thinking.

Enables consequence management

Consequence management involves the ability to identify and evaluate the consequence to communities of what is happening, and what is likely to happen, as a result of the incident and the proposed actions of responders. In this way, decision-making and implementation leads to the best possible outcome for those affected by the incident.

Demonstrate self-awareness

Monitors and manages self for symptoms of stress and fatigue

A key skill, metacognition, is important in supporting monitoring and management of one's self. The literature associated with this capability highlights the need for recognition of physiological and cognitive impairment (via fatigue or stress) and the importance of self-management (McLennan *et al*. 2014).

Displays resilience and agility

The incident management environment can be highly demanding. Various projects have highlighted the central role resilience plays in effective incident management (e.g. AFAC 2007, IMTTP 2014). The dynamic decision-making environment of incident management requires significant agility and adaptability (Wieck & Sutcliffe 2007).

Recognises own strengths and limitations

Most professional bodies expect that members have self-awareness and can acknowledge their respective strengths and weaknesses (Friedman 2012). Being reflective of one's strengths and limitations is critical in incident management because personnel acting with arrogance and hubris can be dangerous (Barton & Sutcliffe 2009).

Conclusion

Considering these capabilities as clusters of behaviours underlines the multifaceted nature of the coordination, interpersonal and thinking abilities required to manage complex incidents. Although the focus of this review was on the capabilities required for AIIMS Level 3 IMT roles, the capabilities identified are pertinent to less complex types of incidents.

Given the demanding nature of the capabilities required by senior IMT personnel, emergency services organisations need to consider how to best support their personnel via professional and continuing development. AFAC has considered this issue and has published guidelines on continuing professional development programs as part of the EMPS.

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