RESEARCH ADVISORY FORUM
HOBART 23-24 MAY 2012

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BCRC, University of Tasmania
RESEARCH TEAM

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Dr Ben Brooks
Dr Chris Bearman
Prof Douglas Paton
Dr Roshan Bhandari
Steve Curnin

A collaboration between
- The University of Tasmania
- The University of Central Queensland and
- The University of Sydney

2012
<table>
<thead>
<tr>
<th>Layers of emergency management</th>
<th>Description</th>
<th>Australia/New Zealand application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>First responders; front line personnel working directly on the fire or incident ground</td>
<td>First responders; incident ground personnel</td>
</tr>
<tr>
<td>Tactical</td>
<td>Local level incident management work directed at developing an incident action plan to contain or mitigate the event.</td>
<td>IMT</td>
</tr>
<tr>
<td>Strategic</td>
<td>Activity occurring above the local operational and tactical level that may involve regional and state-based activity. Concern for addressing the strategic issues across the whole-of government and community</td>
<td>Regional/State National (NZ)</td>
</tr>
</tbody>
</table>
2011-2012 RESEARCH METHODS AND DELIVERABLES

Reporting on:

• Secondary sources analyses of human factors issues prevalent in coordination failure in secondary sources
• Organisational survey (n=206)
• Interviews (n= 37)
• End of year reporting to industry

Developing reviews of

• Training pathways and simulation scenario opportunities
• Information system HCI interfaces
RESEARCH QUESTIONS

1. How is emergency management coordination above the IMT organised?

2. How has a lack of shared mental models by key personnel in emergency incident management led to breakdowns in coordination in previous incidents?

3. What are the implications for how information flows between the layers of emergency management and how does this influence the capacity to adjust to emerging conditions?

4. How might we best train and educate personnel in the most effective emergency management coordination above the IMT?

5. What changes are needed to support effective emergency management as well as effective multi-agency coordination at regional and state levels?
206 responses (75 agree to interview)

Most states covered (plus 12 from NZ)
DEMOGRAPHICS

All types of emergency services agencies

Good coverage of emergency events
TYPES OF EVENTS

Grass fire (32)
Forest/Scrub (73)
Structure fires/structural collapse (49)
Flood (56)

Hazardous materials (14)
Earthquake (17)
Storm (24)
Cyclone (10)
All but 3 people stated they were in a team

92% of participants stated they had contact with teams other than their own

The “most important” other team was within their own organisation
Types of inter-dependence

Wait on others to complete task (46%)

- Yes
- No

Give/get feedback to/from others as task progresses (78%)

- Yes
- No

Work with others to complete task (60%)

- Yes
- No
### Organisations involved in incidents

<table>
<thead>
<tr>
<th>Organisation</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air attack/support</td>
<td>118</td>
<td>59</td>
</tr>
<tr>
<td>Ambulance service (incl St Johns)</td>
<td>147</td>
<td>74</td>
</tr>
<tr>
<td>Bureau of Meteorology</td>
<td>159</td>
<td>80</td>
</tr>
<tr>
<td>Communication utility</td>
<td>86</td>
<td>43</td>
</tr>
<tr>
<td>Coroner</td>
<td>55</td>
<td>28</td>
</tr>
<tr>
<td>Forest based fore service</td>
<td>87</td>
<td>44</td>
</tr>
<tr>
<td>Gas or electrical utility</td>
<td>130</td>
<td>65</td>
</tr>
<tr>
<td>Human services organisation</td>
<td>126</td>
<td>63</td>
</tr>
<tr>
<td>Land management agency</td>
<td>134</td>
<td>67</td>
</tr>
<tr>
<td>Local government</td>
<td>182</td>
<td>91</td>
</tr>
<tr>
<td>Military</td>
<td>66</td>
<td>33</td>
</tr>
<tr>
<td>Police</td>
<td>188</td>
<td>94</td>
</tr>
<tr>
<td>Port authority</td>
<td>32</td>
<td>16</td>
</tr>
<tr>
<td>Primary industries/agriculture department</td>
<td>96</td>
<td>48</td>
</tr>
<tr>
<td>Private forest company</td>
<td>44</td>
<td>22</td>
</tr>
<tr>
<td>Red Cross</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Road authority</td>
<td>139</td>
<td>70</td>
</tr>
<tr>
<td>Rural fire organisation</td>
<td>158</td>
<td>79</td>
</tr>
<tr>
<td>State emergency service</td>
<td>155</td>
<td>78</td>
</tr>
<tr>
<td>Technical specialist</td>
<td>116</td>
<td>58</td>
</tr>
<tr>
<td>Transport organisation</td>
<td>102</td>
<td>51</td>
</tr>
<tr>
<td>Urban fire organisation</td>
<td>132</td>
<td>66</td>
</tr>
<tr>
<td>Water utility</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>No other agencies involved</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Median number of organisations per incident**
An “H” on a map denotes:

(a) A Fire Hydrant
(b) A Hostage situation
(c) A Helipad
(d) (a) and (c)
(e) (a) and (b)
(f) All of the above
(g) None of the above
A QUICK QUIZ

On an incident management advice form the term “LOL” means

(a) Local Office Location
(b) Lots of laughs
(c) Little Old Lady
(d) Liaison Officer Logistics
(e) (a) and (d)
(f) All of the above
(g) None of the above
A VIGNETTE

In an area of wide-spread flooding, a local emergency service gets a call from a nearby town that a tree has fallen across the road, blocking access.

The emergency service responds and sets up two cars on either side of the tree with warning lights for safety and proceeds to remove the tree.
TYPES OF CHALLENGES

Operational Demands

- Sheer size/scale of event - complexity
- Escalating or large immediately- no time to scale up
- Overwhelmed communications
- Degraded infrastructure/technology/communications
- Lack of resources
- Unpredictability of event
- Competing priorities/demands
Factors that prevent job effectiveness

1. I didn’t get the information I needed (57%)
2. There were competing views about what needed to be done (41%)
3. The event changed in ways that were unpredictable (39%)
4. Roles and responsibilities were unclear (37%)
5. Other people didn’t know how to do their job (37%)

1 IN 3 REPORTED “YES”
Participants who reported experiencing factors that prevented them from doing their job effectively also reported:

**Less** satisfaction with:
- Briefings
- Accuracy
- Leadership
- Team functioning

**Greater** problems with:
- Discrepancies between own goals and others
- Capacity to coordinate
How is emergency management coordination above the IMT organised?

Mirror of what is below?

What new challenges are faced?

Division of labour

Systems/ processes/ in use?
How is emergency management coordination above the IMT organised?

1. Problem detection (situation assessment) assessment; risk

2. Task execution - mobilising resources

3. Anticipation planning prediction

4. Interpretation; consequence management

5. Evaluation/risk /assurance
## 1. PROBLEM DETECTION, CHALLENGES

<table>
<thead>
<tr>
<th>Demands</th>
<th>Challenges for information flow between layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establishing communication flows</td>
<td>• Understanding who is where and doing what</td>
</tr>
<tr>
<td>Situation assessment</td>
<td>• Multiple incidents, rapid changes, slow information flow</td>
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<tr>
<td></td>
<td>• Consideration of stakeholder needs, needs of public</td>
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<td></td>
<td>• Alerting personnel to transitions in incident activity (e.g., shifts toward escalation)</td>
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<tr>
<td>Intelligence gathering</td>
<td>• Impact assessment of risk</td>
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<tr>
<td></td>
<td>• Information gaps, inconsistencies</td>
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<td></td>
<td>• Time lags</td>
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## 2. TASK EXECUTION

<table>
<thead>
<tr>
<th>Demands</th>
<th>Challenges for information flow between layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managing resources</td>
<td>• Insufficient resources</td>
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<tr>
<td></td>
<td>• Fatigue management</td>
</tr>
<tr>
<td></td>
<td>• Lack of capability and assessing existing capability</td>
</tr>
<tr>
<td>Managing competing priorities</td>
<td>• Prioritisation of resource requests</td>
</tr>
<tr>
<td>Managing systems</td>
<td>• Duplication of processes, manual handing of the same information by different stakeholder agencies</td>
</tr>
<tr>
<td></td>
<td>• Other agencies not knowing the arrangements or their role responsibilities</td>
</tr>
<tr>
<td></td>
<td>• Failure of existing incident management arrangements to identify consequences and report up</td>
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</tbody>
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### 3 PLANNING AND PREDICTION

<table>
<thead>
<tr>
<th>Information-related demands</th>
<th>Challenges for information flow between layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaining and maintaining situation awareness</td>
<td>• Developing predictions with incomplete/inconsistent information</td>
</tr>
<tr>
<td>Determining potential impacts</td>
<td>• Developing triggers for use when anomaly detection requires transition to escalation</td>
</tr>
<tr>
<td></td>
<td>• Locations for evacuations;</td>
</tr>
<tr>
<td></td>
<td>• Contingency planning</td>
</tr>
<tr>
<td>Developing strategic plans</td>
<td>• Inadequate resources to achieve predictions</td>
</tr>
<tr>
<td></td>
<td>• Goal and priority conflicts</td>
</tr>
</tbody>
</table>
## 4 SENSE-MAKING INTERPRETATION

<table>
<thead>
<tr>
<th>Demands</th>
<th>Challenges for information flow between layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a State strategy</td>
<td>• Competing priorities across different agency and political interests</td>
</tr>
<tr>
<td></td>
<td>• Interagency liaison</td>
</tr>
<tr>
<td></td>
<td>• Conflicting levels of risk tolerance between agencies</td>
</tr>
<tr>
<td>Providing meaning for different stakeholder groups</td>
<td>• Identifying warnings to the community</td>
</tr>
<tr>
<td></td>
<td>• Translating key messages to media, to whole of government and to politicians.</td>
</tr>
</tbody>
</table>
### 5 EVALUATION, QUALITY ASSURANCE

<table>
<thead>
<tr>
<th>Demands</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring safety health of incident management</td>
<td>- Inaccessible information, not timely</td>
</tr>
<tr>
<td></td>
<td>- Challenges in knowing whether or not actions have been completed and</td>
</tr>
<tr>
<td></td>
<td>information loops have been closed</td>
</tr>
<tr>
<td>Quality assurance</td>
<td>- Incomplete information, withholding of information</td>
</tr>
</tbody>
</table>
Problem solving activities regional and state

Activity by AIIMS-related role functions

- Detection/Sit Asses
- Execution/Res Man
- Anticip/plan/predict
- Interpret/sensemaking strat
- Evaluation/QA
Distribution of information-related challenges by layers in Emergency framework: National Survey

Information-related demands:
- Detection
- Execution
- Planning
- Sense-making
- Evaluation

- State
- Regional
- Local

%
WHAT MECHANISMS ARE IN PLACE TO ASSESS THE EFFECTIVENESS OF THE OBJECTIVES?

Incident management evaluation mechanisms

- End product: 28%
- Internal criteria: 17%
- External feedback: 10%
- Shift briefings: 4%
- Afterwards: 8%
- Unsure/no eval: 4.5%
- Didn't answer: 29%

Responses of regional and state level participants
End of year 1 review of outcomes - wiki

Multi-agency EM Coordination

Welcome to the end of year outcomes review for the research project "Organising for Effective Incident Management".

We are proud to present the findings from our first year of research into multi-agency coordination above the IMT level. We need your feedback to assist us with evaluation of our emerging findings and their relevance to your agency, and to find out where you would like to see the research going in 2012.

The Review Process

Review the information presented on each of the Year 1 research output pages below. You may like to choose one, two or all areas of interest to you.

Each research output page contains:
- attached preliminary analysis reports and supporting material
- and a short narrated presentation from the researcher summarising the research delivered

Research Questions

Keen to see our guiding research questions?
You’ll find them on the Research Questions page.

Introducing the Project

Watch an interview with Dr Christine Owen at the 2010 Annual BCRC conference talking about the complexities of multi-agency emergency management coordination...
END OF YEAR 1 REVIEW OF OUTCOMES - WIKI
FEEDBACK FROM STAKEHOLDERS - WIKI

1. Importance of recognising ground has shifted - more exposed; greater expectations

2. Old ways of doing things need to be challenged
   • “my way or the highway”;
   • over-reliance on reacting – will never have sufficient information

3. Need to change the way we do things around here to get past “just suck it up and get on with it type attitude”

4. Changes result in huge drain on capability (e.g., data capture)

5. Never sufficient resources - always making do