THE CHANGING NATURE OF EMERGENCY MANAGEMENT COORDINATION

Dr Christine Owen
Department of Education, University of Tasmania
Why is it that in every overwhelming emergency event, there is almost inevitably a failure of organisation?
RECENT INQUIRIES INTO EMERGENCY EVENTS

A Shared Responsibility
The Report of the
Perth Hills Bushfire
February 2011 Review

2009 VICTORIAN BUSHFIRES
1: Review how has emergency services work changed

2: Examine what we know now about the challenges of multi-agency EM coordination

3: Consider implications for the future
Research undertaken:

Secondary sources, inquiries
Interviews = 130
Survey = 870
Observations = 18 IMT simulations, 4 real-time events

• Review information and communication flows;
• Review how teams work with the AllIMS system
• Identify areas for improvement
The Evolution of Australian Emergency Management Theory and Practice

**Time frame**
- Post WW2
- 1970s
- 1980s
- 1990s
- 2000s
- 2010s
- Future

**Contexts**
- War (Civil Defence)
- Natural and technological Disasters
- Lifelines & Critical Infrastructure
- ‘Security’
- Complexity & Turbulence

**Concepts**
- Shared responsibility & Resilience
- Whole of government
- Community as ‘Target’
- Planning Prevention Response Recovery (PPRR)
- Response and relief

**Concepts**
- Community as ‘Target’
- Planning Prevention Response Recovery (PPRR)
- Response and relief
Challenges:

- Multiple stakeholder interests
- Increasing community expectations
- Doing more with less
- Losing expertise
Supporting agencies in incidents

- <4: 48%
- 5-6
- 7-9
- 10+
Perceived complexity by Number of supporting agencies

Percent

Scale of Complexity

1-5 agencies
Reporting wildfires
Reporting: Earthquakes & Storms

Did You Feel It?

Community Internet Intensity Maps

To view a map or report a felt earthquake, select your region from the map or the list below the map.
Post VBRC

When I walk in this room and I look at the people inside, I don’t feel confident that we have highly skilled people to do the job any more --- we have had a drain of resources over the last few years and we’re not spending enough time or resources in training and mentoring.

The problem is they have no-idea about how to discern if a situation is turning from routine to non-routine. They need to be able to identify the risks and ... and flag it to the rest of us.
Centralisation – Decentralisation

Accountability – Adaptation

Bureaucracy – Agility

Unitary command and control – multiagency collaboration

Degrees of information veracity: foundational, dynamic, opportunistic

1:1  1: Many  Many:Many
2. What do we already know about the challenges of emergency management coordination?
2. What do we already know about the challenges of emergency management coordination?
4 levels of emergency management organisation

State level (n = 52)

Regional level (n = 44)

IMT Officers (n=207)

IMT functional Unit (n= 168)

Fire- Incident ground (n= 177)
Teamwork, interaction and organisation

4 Intra-team factors

1: Team-working
2: Weak Signals/Preoccupation
3: Shift Resources
4: Timely Responsiveness
Teamwork, interaction and organisation

2 Inter-team factors

1: Distributed Collaboration
2: Flexibility
3 intra-organisational factors

1: Systemic capability
2: Personnel Capability
3: Organisational impediments

1 inter-organisational factor
– inter-operability
<table>
<thead>
<tr>
<th>Within Teams</th>
<th>Teamworking</th>
<th>Pre-Occ w failure</th>
<th>Shift Resources</th>
<th>Temporal responsiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Teams</td>
<td>Distributed Collaboration</td>
<td>Flexibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra-organisational</td>
<td>Systemic Capability</td>
<td>Personnel Capability</td>
<td>Organisational Impediments</td>
<td></td>
</tr>
<tr>
<td>Inter-organisational</td>
<td>Inter-operability</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Org Impediments**

The degree to which personnel experienced demands where they needed to go outside normal procedures and/or outside of the chain of command; and where they experienced contradictions in policies guiding the management of the incident.
<table>
<thead>
<tr>
<th>Within Teams</th>
<th>Teamworking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Occ w failure</td>
<td></td>
</tr>
<tr>
<td>Shift Resources</td>
<td></td>
</tr>
<tr>
<td>Temporal responsiveness</td>
<td></td>
</tr>
<tr>
<td>Between Teams</td>
<td>Distributed Collaboration</td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
</tr>
<tr>
<td>Intra-organisational</td>
<td>Systemic Capability</td>
</tr>
<tr>
<td>Personnel Capability</td>
<td></td>
</tr>
<tr>
<td>Organisational Impediments</td>
<td></td>
</tr>
<tr>
<td>Inter-organisational</td>
<td>Inter-operability</td>
</tr>
</tbody>
</table>

### Personnel Capability

The level of confidence personnel have that their training and informal knowledge of the incident provides them with sufficient familiarity with incident management systems in use, including policies and procedures and confidence to do what needs to be done.
### Teamwork

The processes, decisions, and activities that team members use to coordinate their behavior, including information sharing and resources to attain shared goals.

<table>
<thead>
<tr>
<th></th>
<th>State Coord</th>
<th>Reg’nl Coord</th>
<th>IMT IC/Officers</th>
<th>IMT Func units</th>
<th>Div/Sec Comm</th>
<th>Crew/Strike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teams</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teamworking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-Occ w failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shift Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporal responsiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Teams</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distributed Collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra-organisational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systemic Capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel Capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organisational Impediments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-organisational</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-operability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Types of Teams</td>
<td>Teamworking</td>
<td>Pre-Occ w failure</td>
<td>Shift Resources</td>
<td>Temporal responsiveness</td>
<td>Distributed Collaboration</td>
<td>Flexibility</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td>------------------------</td>
<td>--------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>State Coord</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reg’nl Coord</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMT IC/Officers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IMT Func units</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Div/Sec Comm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crew/Strike</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dist’d Collab**

The ways in which IMT and fire-ground personnel communicate with one another to share information and risks in a constructive manner.
### Teams

- Teamworking
- Pre-Occ w failure
- Shift
- Resources

### Between Teams

- Temporal responsiveness
- Distributed Collaboration
- Flexibility

### Intra-organisational

- Systemic Capability
- Personnel Capability
- Organisational Impediments

### Inter-organisational

- Inter-operability

---

**Interoperability**

The technological systems, policies and procedures and culture that enables the effective inter-operability between agencies.
<table>
<thead>
<tr>
<th></th>
<th>State Coord</th>
<th>Reg’nl Coord</th>
<th>IMT IC/Officers</th>
<th>IMT Func units</th>
<th>Div/Sec Comm</th>
<th>Crew/Strike</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within Teams</td>
<td>Teamworking</td>
<td>Pre-Occ w failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shift Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Teams</td>
<td>Temporal responsiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distributed Collaboration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra-organisational</td>
<td>Systemic Capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Personnel Capability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Organisational Impediments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter-organisational</td>
<td>Inter-operability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Theory building: theory testing

- Team Communication
- Distributed Collaboration
- Organizational Processes
- Interoperability
- Information Quality
- Shift Resources

SEM

Theory Dev database
n=444

Theory Testing database
n=426
IMT Simulation Observations

Camera 1

Camera 2

Camera 3
Observations
The changing nature of emergency management coordination
Observations IMT simulation
Self-reflections:

Incident Controller Simulation

(Phase 3 observations)
Impression Management
- convey (and shape) an interpretation of the situation
- “Commander “presence”
Reality Check
The research Observations

Before

After
Team processes

- Good understanding of responsibilities
- Spent time identifying strategies
- Openly discussed mistakes
- Adapted to changes in tasks/goals

Mean Rank

Pre training Post training

<table>
<thead>
<tr>
<th>Good understanding of responsibilities</th>
<th>Spent time identifying strategies</th>
<th>Openly discussed mistakes</th>
<th>Adapted to changes in tasks/goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre training</td>
<td>Post training</td>
<td>Pre training</td>
<td>Post training</td>
</tr>
</tbody>
</table>

Bar chart showing the comparison of mean ranks between pre-training and post-training for team processes.
Good understanding of responsibilities
Spent time identifying strategies
Openly discussed mistakes
Adapted to changes in tasks/goals

Mean Rank
Pre training Post training
Team building

Mean Rank

<table>
<thead>
<tr>
<th>Category</th>
<th>Pre training</th>
<th>Post training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good understanding of responsibilities</td>
<td>50</td>
<td>60</td>
</tr>
<tr>
<td>Spent time identifying strategies</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Openly discussed mistakes</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Adapted to changes in tasks/goals</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pre training</th>
<th>Post training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>Blue</td>
</tr>
</tbody>
</table>

Team building chart showing the mean rank before and after training for various aspects.
Exercising: Team-building- not TEAM work

IMT training simulation about practicing individual roles
Leadership

240 participants; 16 groups

Confidence in IC

The IC made good decisions
The IC invited input from other IMT members
The IC assigned clear tasks/roles

Mean Rank
Pre training Post training

Leadership
Below the line Incident Controllers

• More focussed on the fire

• Tend to live in the now

• Rarely invite input

• Rarely set up the conditions to support challenging or countervailing views
Communicative practices of Incident Controllers

![Graph showing Communicative practices of Incident Controllers](image-url)
Teamwork practices of Incident Controllers

- Offering assistance
- Monitoring assistance
- Negotiation
- Team Feedback

Mean Rank

Below IC's Above IC's

Legend:
- Orange: Below IC's
- Blue: Above IC's
Incident Controller coaching/feedback

Boundary riding

Boundary Spanning (Internal Coordination)

Boundary Crossing (External Coordination)
Team feedback: Incident Controller coaching

• **Boundary riding:**

  Follow up; situation awareness; connecting expertise; connecting mental models; temporal expectations
Boundary riding

The event trajectory

Task/role demands

Reciprocal teamwork coordination

Strategies for managing event
Incident Controller coaching

- Boundary riding
- (Boundary Spanning) Internal Coordination
- (Boundary Crossing) External Coordination
Boundary spanning (internal integration)

integration within and between functional units; ensuring updating inter-positional knowledge

• “you and ops need to be hand in glove”

• “just be mindful they need a bit of notice”

• “you’ll end up with the channels totally choked”

• “I’m concerned they’re (Planning) not getting regular updates”
Boundary crossing

Inter-agency checking; lateral and vertical relationships – encouraging shared situation awareness

• “we don’t have any expertise – that’s a XX job”
• “they’re a bit concerned the fire does not leave xxx”
• “they’ll do that but you need to spell out xxx”
• “this [teleconference] is going to be intense – you need to be ready for that”
Incident controller team coaching

Boundary riding

Understanding team roles

Understanding roles in relationship to others

Boundary spanning

Boundary Crossing
Incident controller team coaching

- Boundary riding
  - Understanding team roles
  - Boundary spanning
    - Reciprocal coordination
      - △ communication climate
    - Understanding roles in relationship to others
  - Boundary Crossing
Incident controller team coaching

- Boundary riding
- Understanding team roles
- Boundary spanning
- Understanding roles in relationship to others
- Reciprocal coordination
  - Communication climate
  - Adaptiveness
  - Timeliness
  - Responsiveness
  - Team performance outcomes

Boundary Crossing
Where to next?

Research utilisation - human factors workshops

Organising for effective management

A collaboration between
- The University of Tasmania
- The University of South Australia and
- The University of Sydney

Industry engagement - meetings