IDENTIFYING LESSONS FROM EXERCISING, OPERATIONS AND TRAINING FOR STRATEGIC EMERGENCY MANAGEMENT DECISION-MAKING

Associate Professor Ben Brooks
National Centre for Ports and Shipping, Australian Maritime College, UTAS, Tasmania


THW
NSWFB

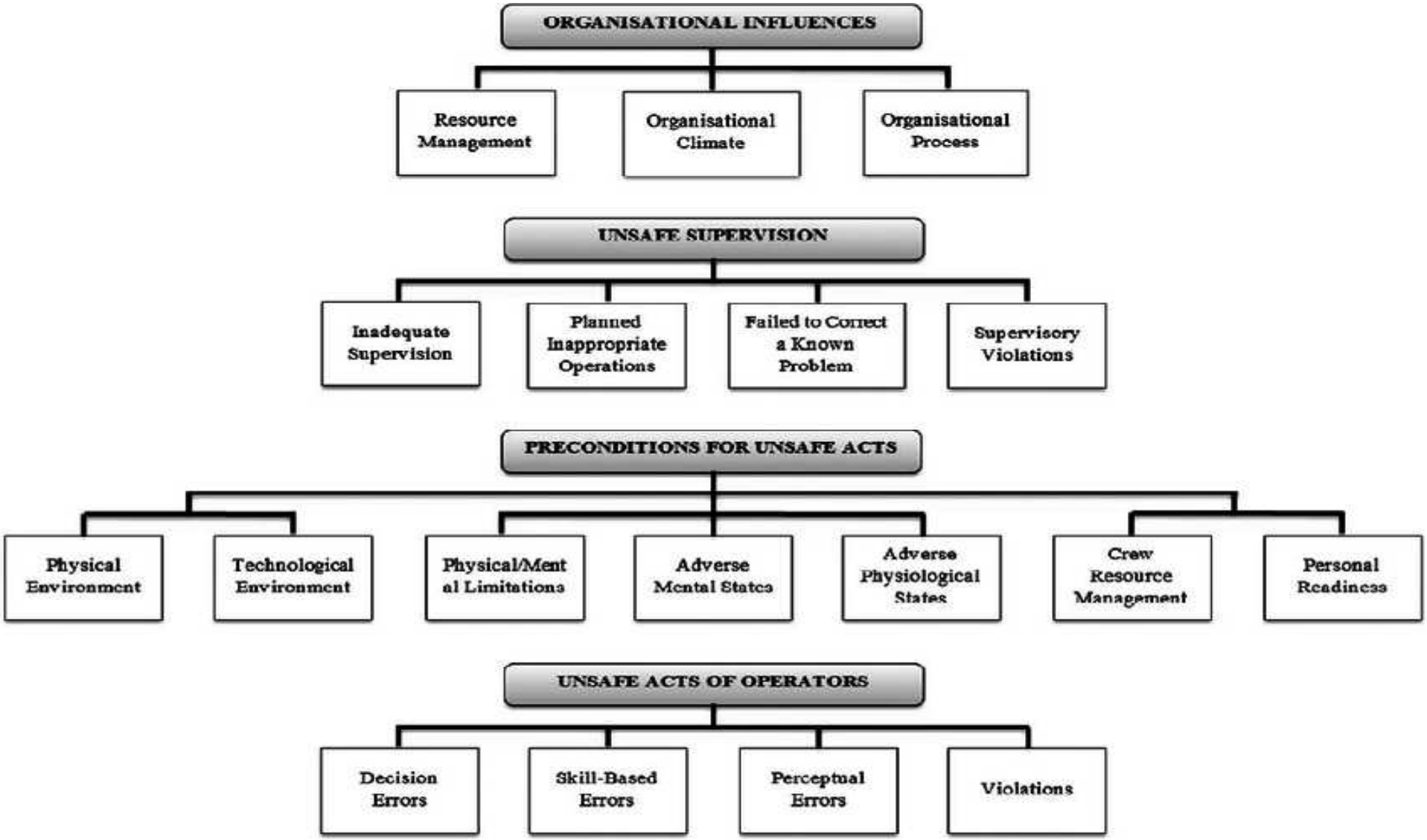
STUDY 1 – HFACS ANALYSIS

- The 2003 Canberra Bushfire Storm in the Australian Capital Territory (ACT).
- The 2005 Wangary Bushfire on the Eyre Peninsula in South Australia.
- The 2009 Black Saturday Bushfires in Victoria with a focus on the Kilmore East Fire.

- Linguistic triggers such as ‘failed to’ ‘overestimated’ ‘did not ask’ ‘did not recognize’ ‘without knowing’, ‘received no hand-over’.
- Identified departures from policy such as ‘the resources were less than required according to Standing Operating Procedure 7 for a code yellow day’, ‘

bushfire&natural HAZARDSCRC

MULTIPLE LAYERS OF DEFENCE



HFACS RESULTS FOR IMT'S

Incident Management Teams n= 62	% Errors
Unsafe Acts (Decision Errors)	10
Unsafe Acts (Exceptional Violations)	10
Preconditions (Crew resource Management)	27
Unsafe Supervision (Inadequate Supervision and Planned Inappropriate Actions)	37
Other	15

HFACS STATE COORDINATION

State Level n= 30	% Errors
Unsafe Acts (Decision errors)	33
Unsafe Acts (Exceptional Violations)	20
Preconditions (Crew Resource Management)	20
Organizational Issues (Resource management and organisational processes)	27

FORMALISED DECISION-MAKING

Decision Concept	Coverage in Surveyed Orgs.
Awareness of applying different Decision-Styles (heuristics, classic-rational, gut-feel)	<15%
Monitoring themselves and their teams for evidence of bias or decision errors.	<15%
Record Keeping: recording why/how aspects of decision-making have influenced the decision (e.g., biases)	<15%
Creating psychologically safe decision environments that build and maintain trust between teams.	50%

Fukushima SAR Deployment

- Critical Decision Method
- Search and Rescue (SAR) Commander was interviewed about the decisions made during an international SAR deployment (The Fukushima Disaster).

"A critical decision method is described for modeling tasks in naturalistic environments characterized by high time pressure, high information content, and changing conditions."

1. Set of 10 decisions identified.
2. Subsequently 4 team members interviewed.
3. Subsequent to this we re-interviewed the commander.

Decision context – first interview

In establishing the base of operations the team leader had numerous complex decisions to make due to locally identified risks. The risk of subsequent earthquakes was high with the country still experiencing up to 20 aftershocks per day that could result in further tsunamis. However there were other risks to be considered – hypothermia from the extreme cold and the radiological hazard from the Fukushima nuclear reactor. The team leader also needed to balance risk against the ability to meet the task

Info from 2nd interview

The team leader was highly rational in his approach to determining the level of risk. In this situation the team leader identified 4 high level risks: (1) tsunami; (2) earthquake; (3) cold; and (4) radiation (the latter was actually manageable due to strict regulation surrounding radiation). He was constantly reassessing the risks and confirming on a regular basis that the team could pull out in 4 hours if required. If the severity is held constant in this situation (i.e. the worst case scenario involves multiple fatalities in the team),the team leader was making judgements about probability of that outcome and ranking them in order of likelihood and ability to reduce likelihood through the teams actions

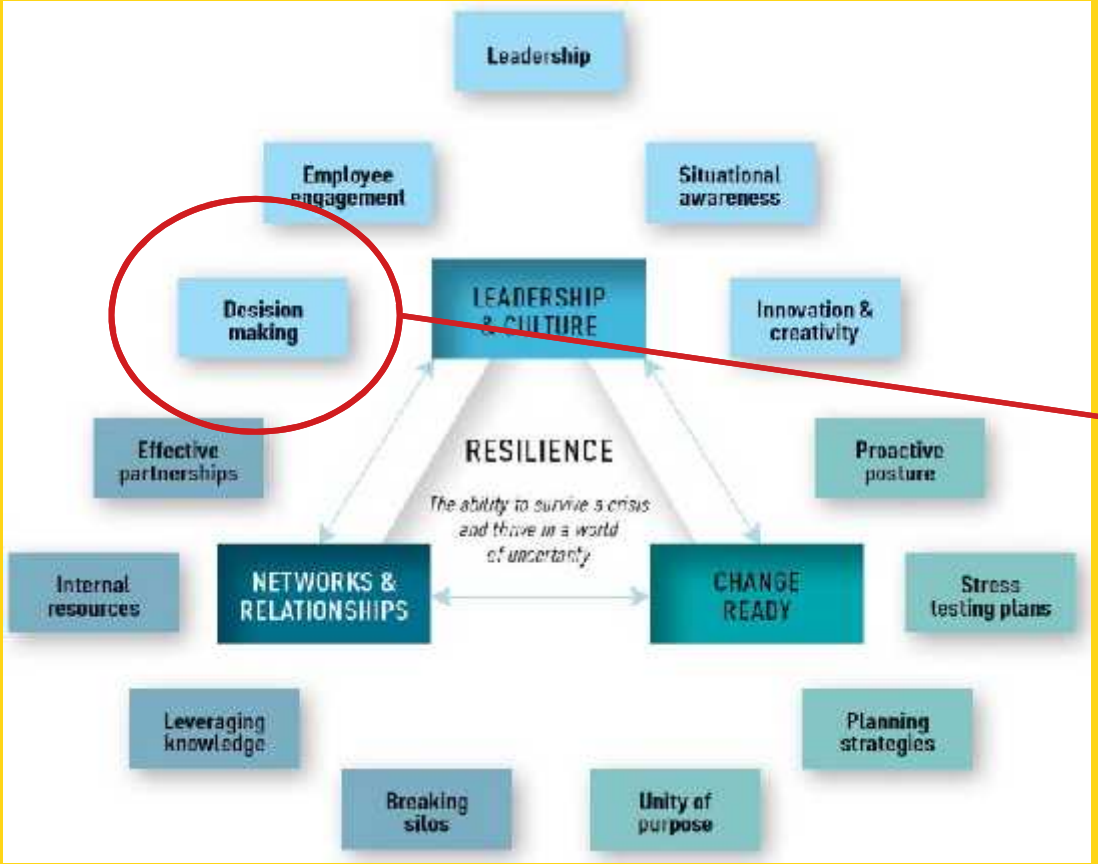
Info from Team interview

Team-member – Initially thought baseball field where BOO (Base of Operations) was going to be grass but only when they arrived they realised it was dirt. Addressed risks in that were away from the coast on elevated ground and not in close proximity of any tall buildings. Knew prior to arriving that the baseball filed was large enough to accommodate team and had not previously been impacted by the tsunami. ID site through google maps etc. but importantly trust the locals.

WHAT DOES GOOD DECISION-MAKING LOOK LIKE?

- Team leaders build **psychologically safe** environments where team members can speak up.
- Decision-makers are **aware of their own thinking** (meta-cognition), particularly when they are moving between different decision-styles (e.g., from intuitive to more rational analyses).
- They **evaluate important decisions** for the influence of possible bias or error.
- They manage external pressure.

QUALITY OF DECISION-MAKING IN EXERCISES



5 point Likert scale 21 statement survey – indicative items

The team maintained a 'safe space' so they could voice any concerns

The team were encouraged to speak up about errors and concerns

Decision-making Theme	Score*
Sense-making	83
Structural support for adaptive decision-making	80
Clarity in decision-making processes	75
Encouraging employees to engage in decision-making	71
Management of bias	81
Record keeping	69
Managing stakeholder expectations	79

*Preliminary data n=32; Score = combination of two scores – a 5 point likert scaled response and a measure of inter-rater reliability across the data, multiplied to create a score out of 100.

RESEARCH UTILISATION

AIDE MEMOIR: Situational Awareness:

PERCEPTION: Are we comfortable with the quality and quantity of intelligence we are receiving/producing? What are we missing?

COMPREHENSION: Are we transferring our analysis of the intelligence into SMEAC's or similar and contributing to building a Common Operating Picture?

PROJECTION: Are we planning for what is going to happen next shift, next 24 hours, next 48 hours or next 7 days?

QUALITY IN USE SCORING SCALE

Effective

0	Useless	No useful functionality at all. Might as well not have it.
1	Inadequate performance	It provides very little help with performing a task. Even if you use all the features, you still get a very poor result.
2	Does the job	You can achieve adequate performance but nothing more than that.
3	Functional	You can get a good outcome. It enables you to perform your tasks.
4	High performance	You can achieve your goals completely. You get very good outcomes under all circumstances.
5	Transforms the task	You get outstanding results and can achieve exceptional performance. Even a regular user will award this score very rarely.

Efficient

0	Impossible	It takes so much time and effort that it prevents you from doing the task. Dysfunctional, and prevents you achieving any outcome.

Safe

0	Dangerous	It puts people in harm's way, or provides no protection whatsoever .
1	Risky	Using it puts you or someone else at risk, and it can only be used with considerable care.
2	Neutral	It has no impact on safety or security.
3	Dependable	It provides good protection and you would feel safe if you used it again.
4	Trusted	It provides very good protection against all threats.
5	A real protector	It provides completely assured protection. Even a regular user will award this score very rarely.

Satisfying

0	Horrible	You refuse to use it unless it is absolutely necessary.
1	Unpleasant	Unpleasant to use, and is only used with considerable

Criteria	Median Descriptor	Mean and SD
Effective	Functional – You can get a good outcome. It enables you to perform your tasks. 75% chose this descriptor or better.	Mean = 2.80 SD = 0.5
Safe	Dependable – It provides good protection and you would feel safe if you used it again. 71% chose this descriptor or better.	Mean = 2.83 SD = 0.6
Efficient	Helpful – It is efficient and tuned to your needs. 71% chose this descriptor or better.	Mean = 2.83 SD = 0.6
Satisfying	User friendly – You are happy to use it and use it out of choice. 83% chose this descriptor or better.	Mean = 2.80 SD = 0.4

bushfire&natural HAZARDSCRC

DECISION-MAKING TRAINING COURSE

Best/Worst & Most likely Case Scenario Planning

Anticipatory thinking

Managing Pressure & Bias. Maintaining Situational Awareness and a Common Operating Picture

Building and Maintaining Psychological Safety

BNHCRC REFRESH

- Exploring the role that neuro-plasticity can play in supporting decision-makers.
- Exploring links between decision-making, creativity and divergent thinking.
- Developing research utilisation tools from this research to embed the outcomes into training and operations.

benjamin.brooks@utas.edu.au
0409 768 583

Associate Professor Ben Brooks
National Centre for Ports and Shipping, Australian Maritime College, UTAS, Tasmania