The National Emergency Risk Assessment Guidelines: The Bumpy Road to National Consistency

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ABSTRACT:
Since 2010, there has been a national version of the international risk management guidelines for assessing risk of natural disasters, known as the National Emergency Risk Assessment Guidelines or NERAG. States and territories have been encouraged to take up these guidelines as a means of consistently assessing risks of emergencies, with mixed results.

When endorsed on 2010, there were national resolutions for Australian governments to use the NERAG for risk assessments, review the NERAG after three years, and publish state-wide risk assessments.

A process of reviewing the NERAG commenced in mid-2012 to improve it following its use by stakeholders. This resulted in many refinements and amendments to the process, and a revised NERAG was endorsed in 2014.

The recent draft report of the Productivity Commission Inquiry into Natural Disaster Funding has cited the NERAG as a potential means of evaluating and prioritising mitigation funding. If this occurs, it could greatly improve NERAG's utility, linking risk assessment to implementation and strategic risk reduction.

Furthermore, the recent Sendai Framework for Action has targets that can link NERAG risk assessment activities to international efforts in disaster risk reduction.

This paper describes the national governance of emergency management, the activity that resulted in the reviewed NERAG, its improvements, and associated products to assist practitioners. It is an example that highlights the sometimes bumpy process many of us go through to achieve nationally agreed consistency in our policies and practices.

Keywords: National Emergency Risk Assessment Guidelines, Risk Management, Mitigation

Introduction

This paper describes the development of an Australian national guideline for the assessment of disaster risk. Table 1 summarises the timeline of many key events in this area.

The intent is for the NERAG to be used for risk assessment, to inform treatment choices and reduce flood risk. For example, Chapter 6 of the *Managing the Floodplain* handbook (Commonwealth of Australia 2013) describes the importance of the risk management process in floodplain management.

The guidelines were developed in the of national emergency management context, which is briefly described, which has unique challenges and opportunities due to the division of responsibilities and resources in the Australian federation.

Table 1: Significant events relating to national risk assessment

	Relevant National Resolutions by SCPEM and LCCSC	NERAG Versions	Other Activities
2007		Publication of National Risk Assessment Framework, describing the need for a national risk guideline	
2008			
2009			Release of ISO 31000:2009
2010		Publication of NERAG	
2011	States and Territories • agreed on the importance of being able to compare risk assessment and hazard mapping across jurisdictions • adopting the National Emergency Risk Assessment Guidelines		
2012	States/territories publish a state-wide risk assessment prior to June 2013	Commencement of NERAG Review	NSW, Qld and Tas published risk assessments
2013	States and territories • Produce public versions of state-wide risk assessments (if not currently available) by the end of 2013; • A number of states and territories work to ensure their state-wide risk assessments will be consistent with the National Emergency Risk Assessment Guidelines by the end of June 2015 • By the end of June 2017, all states and territories will publish a new, revised or updated state-wide risk assessment		WA published risk assessment
2014	LCCSC endorsement of revised NERAG	Completion of NERAG Review	ACT, NT, Vic and SA publishes risk assessments Productivity Commission (PC) Inquiry into Natural Disaster Funding
Future 2015		Publication of: • Reviewed NERAG • Online Training Course • Practice Guide • Data Guidelines	PC Inquiry report published
2016		Publication of further NERAG tools: • Software • Treatment Guidelines • Local Govt guidelines	
2017			States and territories to publish updated risk assessments

The guidelines are broadly described, along with their application by the states and territories, and their recent review. Finally, directions for the future of the NERAG are discussed, and possible future directions for its use are discussed in the context of the recent Productivity Commission Inquiry and also the Sendai Framework for Disaster Risk Reduction 2015-2030.

The Case for Risk Assessment in Australia

The Problem: Losses from Disasters

The losses to Australia from natural disasters carry a regular and high unbudgeted cost, in life and property, punctuated by occasional very large events, such as the 2010-11 Queensland floods. It is well documented in Australia as a liability needing to be reduced.

The most recent report documenting these losses was by the Productivity Commission (PC) in the draft report of its Inquiry into Natural Disaster Funding (PC 2014), which includes headline figures such as:

- Australian Government unbudgeted expenditure for the last 10 years (2004- 2014) of $8 billion on post disaster reconstruction and recovery;
- State and territory expenditure of $5.6 billion over the past decade on post-disaster reconstruction and recovery;
- A further $5.7 billion estimated to be spent completing existing reconstruction programs during 2014-2016; and
- National insured asset losses of around $29 billion (2011 dollars) from 1970 to 2013.

These financial costs do not include loss of life, and the indirect and intangible losses they cause.

- Loss of life from natural disasters 1900-2011 is estimated to be around 8,255 fatalities, with over half of those from heatwaves (van den Honert *et al* 2014).

A similar headline statistic from Deloitte Access Economics (2013) is an estimate that current losses from disasters in Australia is over $6.3 billion per year, forecast to grow at 3.5% p.a. due to increased population, infrastructure and population movements to vulnerable areas, such as low-lying coastal areas, floodplains and vegetated peri-urban areas.

The Solution: Investment in Risk Assessment and Mitigation

These forecasts of natural disaster losses have focussed the attention of policy-makers to target investments in pre-disaster mitigation. It recognises the view that preventative mitigation is more cost-effective than continuing to fund response, relief and recovery programs.

Risk management planning is seen as the means of assessing and prioritising risks to determine where to mitigate first for the greatest benefit. This view has driven risk management activities at the national level for several years, and is the main subject of this paper.

National Emergency Management Governance in Australia

Management of emergencies and safety of citizens in Australia is predominantly the responsibility of the states and territories. National structures recognise this state and territory sovereignty. 'National', when used in this paper, collectively describes nine jurisdictions (6 states, 2 territories and the Commonwealth).

States and territories are therefore responsible for undertaking risk assessments, and each state and territory is free to choose their methods, governance and processes. National agreement across the nine jurisdictions on these matters occurs by consensus.

The national governance structure on emergency management is shown below (Figure 1). It reports to the Council of Australian Governments (COAG) through a council of relevant Ministers, with much of the business managed by a national senior officials group, the Australia-New Zealand Emergency Management Committee (ANZEMC). There are also four topic-based subcommittees, each chaired by an ANZEMC member and each with national representation.

The national application of risk management has been led by the Risk Assessment, Measurement and Mitigation Subcommittee (RAMMS) of ANZEMC.

Figure 1: National Governance Structure for Emergency Management

Risk Management in Australia

The risk management process has been part of the portfolio of Australian standards for 20 years, following publication in 1995 of Australian Standard (AS) 4360, which was updated in 1999 and 2004.

The process came of age in 2009 when it was elevated by the International Organization of Standardization (ISO), and became known as ISO 31000. The 2009 update added extra components, with the intent of risk management becoming not just a 'back room' technical exercise, but part of organisational planning processes.

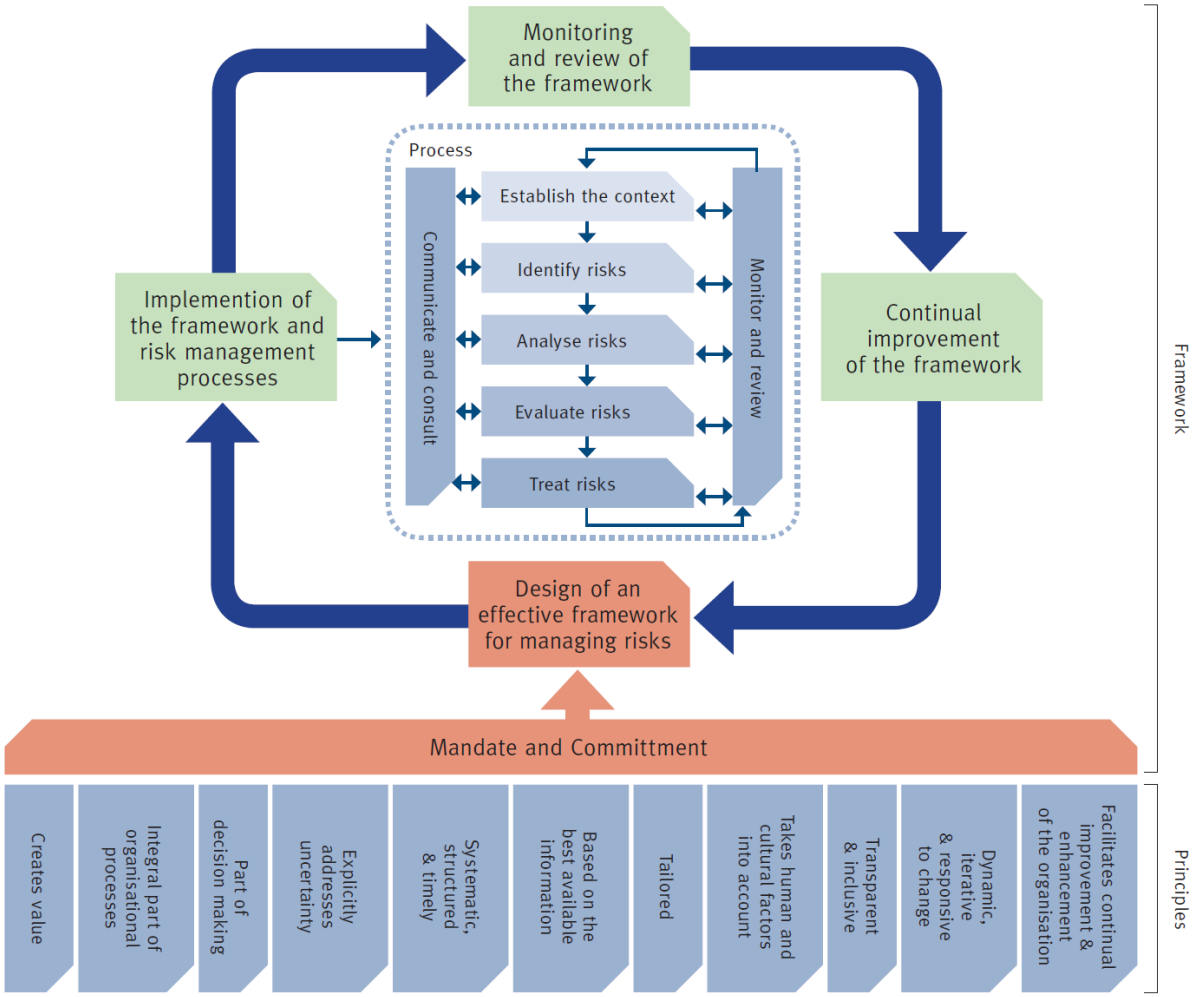
This is reflected in:

- The inclusion of ***11 Principles of Risk Management*** (Figure 2), including *'be an integral part of organisational processes'* and *'be part of decision making'*, encouraging risk management processes be woven into strategic business processes; and
- The addition of the ***Risk Management Framework*** (Figure 2) overseeing risk management planning, formalising the need to institutionalise risk management into organisational governance.

Risk Management and Risk Assessment

Figure 2 (copied from NEMC 2010) illustrates the full Risk Management process of ISO 31000:2009. Within the seven phases of ***Risk Management***, (the centre of Figure 2 inside the dotted line), ***Risk Assessment*** consists of the three phases of ***Identify Risks***, ***Analyse Risks*** and ***Evaluate Risks***.

Figure 2: ISO 31000 Risk Management Process



National Emergency Risk Management Activities

In recent years, the national effort applying risk management to disasters commenced in 2007 with publication of two documents by Geoscience Australia:

- the background document *Natural Hazards in Australia: Identifying Risk Analysis Requirements* (Middelmann 2007) presenting national information on the likelihood and consequence of a range of natural hazards (tropical cyclone, flood, severe storm, bushfire, landslide, earthquake and tsunami); and
- the strategy document for the Australian Emergency Management Committee (now ANZEMC) *A national risk assessment framework for sudden onset natural hazards* (NRAAG 2007).

The national risk assessment framework described a number of actions, including the preparation of a set of national risk guidelines, described as follows:

- *'Risk assessment guidelines will assist practitioners at all levels of government to undertake risk assessments that support the National Risk Assessment Framework. The guidelines will be focussed on production of consistent and improved information on risk, i.e., outcomes.*
- *The guidelines extend the relevant risk assessment components of the processes outlined in AS/NZS 4360:2004 and EMA's Emergency Risk Management Applications Guide.'*

(Source: NRAAG 2007)

These guidelines, known as the National Emergency Risk Assessment Guidelines (NERAG), were developed in this 2007-2010 period (NEMC 2010). .

Following completion of the NERAG, Emergency Services Ministers:
'agreed on the importance of being able to compare risk assessment and hazard mapping across jurisdictions by adopting the National Emergency Risk Assessment Guidelines.' (SCPEM 2011)

The 2010 NERAG process

The NERAG (NEMC 2010) applies the risk management standard (ISO 31000:2009) to assessing the risk of Australian natural disasters. The value of the NERAG is this standardised risk assessment process, allowing examination of different natural hazards using the same risk criteria.

NERAG's process is intended to assist planning and prioritising mitigation investment. This is distinct from other risk assessments, such as deployment of resources during an emergency response, or health and safety assessments.

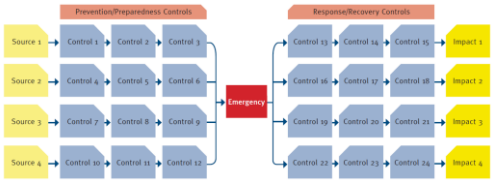
The 2010 NERAG states a clear preference for an inclusive stakeholder workshop process supported by technical evidence for assessing risks.

The risk assessment process is described in Figure 3. Each stage is accompanied by tables, flowcharts and diagrams to assist the assessor.

Figure 3: NERAG 2010 Risk Assessment Process

Risk Identification

1. The 'Bow-Tie Diagram' describes Risk Sources, and their link to Emergency Events and Impacts across the 6 categories;



2. Determine the existing risk-mitigating controls for:
   a. prevention and preparedness prior to the emergency ('PP' controls); and
   b. response and recovery that reduce impacts after the emergency ('RR' controls)
3. Compose risk descriptions (or 'risk statements') based on the hazard-emergency-impact links, and the controls relevant to that risk description.

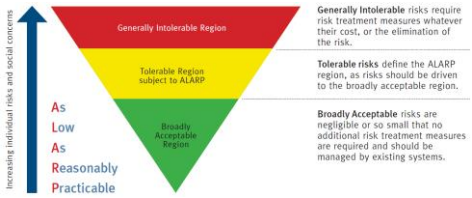
Risk Analysis

4. Determine the *Level of Control* for controls relevant to that risk, and undertake the remaining analysis based on those controls;
5. Determine the *Likelihood Level* based on the likelihood of the consequence, (as opposed to the likelihood of the event);
6. Determine the Consequence Level;
7. Determine the *Level of Confidence* in the above determinations, based on:
   a. The data used to support the analysis,
   b. The knowledge of the team, and
   c. The level of agreement of the team;
8. Based on the Consequence Level and Likelihood Level, determine the *Level of Risk*

	Consequence Level				
Likelihood Level	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium
Very Rare	Low	Low	Low	Low	Medium
Almost Incredible	Low	Low	Low	Low	Low

Risk Evaluation

9. From the levels of Confidence, Likelihood and Consequence, determine each risk's *Tolerability* as either
   a. 'Intolerable',
   b. 'Tolerable subject to ALARP' or
   c. 'Broadly Acceptable'



10. A decision point classifies each risk as:
    a. Requiring further *Detailed Analysis*, re-analysis and re-evaluation (to improve confidence);
    b. Requiring immediate *Treatment Planning* to address the risk; or
    c. No action, merely Monitoring and Review.

At the end of the process, it is intended that practitioners have a register of risks, each risk having:

- A described link between hazard, emergency and consequence;
- A list of the controls relevant to that risk, and an assessment of the effectiveness of those controls;
- Likelihood, consequence and confidence levels of the risk;
- A risk level;
- A determination of whether each risk is 'Intolerable' 'Tolerable Subject to ALARP' or 'Broadly Acceptable'; and
- A determination of whether each risk requires treatment planning, further analysis or monitoring and review.

One feature of the NERAG is the 'scalable' nature of some of its consequence criteria. For People and Economy consequences, losses are not measured in absolute terms, but relative to the community in question:

- Deaths relative to the population of interest (e.g. 'Catastrophic losses' are considered greater than 1 death per 10,000 people);
- Economic loss relative to the government income for the community of interest (e.g. 'catastrophic loss' are considered equal to 3% or more of that jurisdiction's Government income)

The intent of scalability is that consequence levels are meaningful to the community undertaking the risk assessment.

This feature allows NERAG to be applied to a risk assessment of Australia, each individual state, or regions and communities within those states. A good example of this application at state, regional and local levels is in Western Australia's 'State Risk Project'. (https://www.semc.wa.gov.au/riskmanagement/stateriskproject/Pages/default.aspx)

The other four categories of consequence are:

- Public Administration;
- Environment;
- Social Setting; and
- Infrastructure.

These categories do not readily lend themselves to the universal scalability of People and Economy, where population and government revenue data are readily available from public sources. Practitioners can apply relevant criteria to make these categories relevant to their contexts.

It is not a requirement to use every criterion from the 2010 NERAG in risk assessments, and there is some flexibility to choose criteria to suit local circumstances and context.

State and Territory Published Risk Assessments

In response to the 2010 NERAG publication and national resolutions, states and territories across Australia published risk assessments and risk information for their jurisdictions. Some had established processes while others, particularly the smaller jurisdictions, had very limited resources, which made the process more difficult.

With the benefit of hindsight, there was little guidance on what a 'state-wide risk assessment' actually was, how it should be formatted, and what risks it should include. There was also

limited guidance on what these documents were intended to achieve by their publication, or what use they were to be put to.

All documents were whole-of-government publications, requiring high-level approval for publication by their jurisdiction. State and territory governments have different appetites for what information on natural hazards and risks is published, leading to variety on the published results.

By the end of 2013, all states had produced or were well advanced towards some form of a public state-wide risk assessment, and these were all published by 2014. However, they varied widely in their presentation, and did not all explicitly address all requirements of the NERAG.

Figure 4 presents a pictorial summary of the public risk assessments of the states and territories, illustrating the variety in application and presentation across jurisdictions. Information was presented as either

- a likelihood-consequence risk matrix ,
- a text description of priority risk outcomes, or
- a presentation of historical information, either summary statistics of previous losses from hazards or notable historic emergency events.

The published risk assessment documents are principally intended to be a community education tool, informing the community about the natural hazard risks they are exposed to at a state level.

Some jurisdictions are very open with their risk information, the best example being from Tasmania. The full risk assessment documents, including risk registers of 'Intolerable' risks, are all publicly available (TDPEM 2012). Others, like Victoria, illustrate and compare risks for small, large and worst cast scenarios (VDJ 2014), which adds extra detail to an 'averaged' risk.

There is also significant variance in the underlying analysis undertaken by the states and territories that led to the presented risk information. Some opted for a data-centred solution developed through a consultancy (e.g. QDCS 2012). Others undertook high-level risk assessments for their jurisdiction as a whole (e.g. ACT Govt 2014, NT DCM 2014, TDPEM 2014, VDJ 2014). Others undertook a workshop-based approach including a number of regional and hazard-specific assessments, which were then aggregated (e.g. SA Govt 2014, WASEMC 2013).

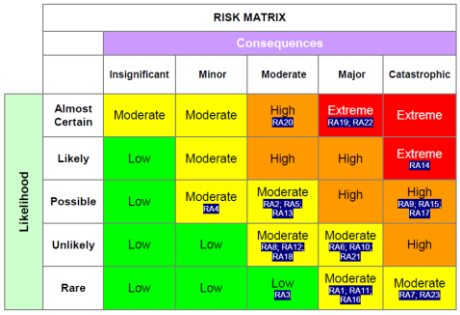
Summarising risk information to present the 'overall' risk also differs. Some generated a single risk description for the state, and others aggregated and averaged dozens of risk from the risk register to a statistical average.

The result of all of this this valuable work presents both challenges and opportunities for future developments in risk assessment.

- The challenge is that the current publications are not consistent or comparable. With the process described above and sovereignty of the states in this matter, this was always going to be difficult to achieve.
- The opportunity is that there is the variety of techniques that have been applied. As described below, there is a planned update of state risk assessments by 2017, and the best elements of the existing processes could be assessed and combined into improved risk assessments in future.

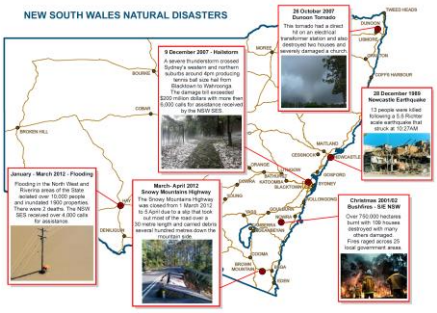
Figure 4: Published state-level risk assessments by states and territories

ACT (ACT Govt 2014)

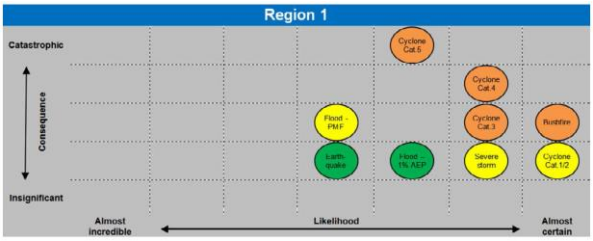


RISK MATRIX		Consequences				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain	Moderate	Moderate	High RA20	Extreme RA19; RA22	Extreme
	Likely	Low	Moderate	High	High	Extreme RA14
	Possible	Low	Moderate RA4	Moderate RA2; RA5; RA13	High	High RA9; RA15; RA17
	Unlikely	Low	Low	Moderate RA8; RA12; RA18	Moderate RA6; RA10; RA21	High
	Rare	Low	Low	Low RA3	Moderate RA1; RA11; RA16	Moderate RA7; RA20

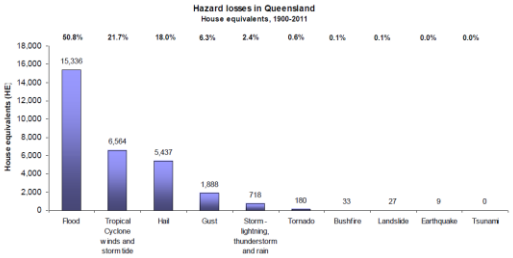
NSW (NSWMPES 2012)



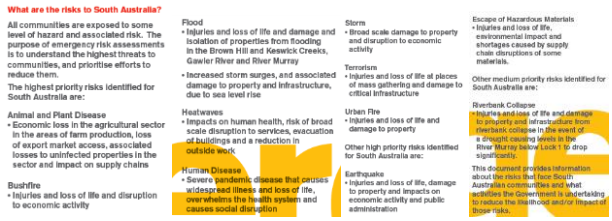
NT (NT DCM 2014)



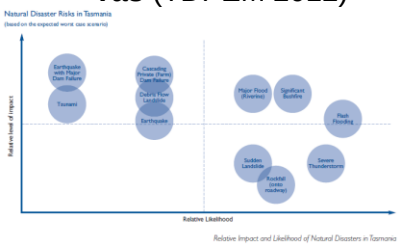
Qld (QDCS 2012)



SA (SA Govt 2014)



Tas (TDPEM 2012)



Vic (VDJ 2014)

WA (WA SEMC 2013)

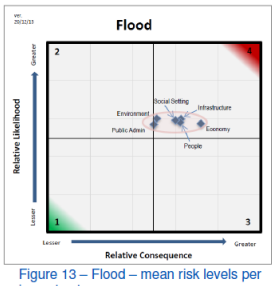


Figure 13 – Flood – mean risk levels per impact category

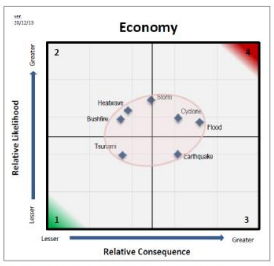


Figure 17 – Economy – mean risk levels per hazard

The revised NERAG

Why revise?

As part of the NERAG endorsement of 2011, there was also a commitment also made to review and update the guidelines after three years. A national working group was created to consider revisions to the document and provide a revised NERAG to RAMMS.

It became clear as states used the 2010 NERAG that some improvements in the process could be made. What seemed straightforward when writing the document proved difficult to implement in practice. The intent of the review was to benefit from the experience of the NERAG's use to make it a better product.

The working group had membership from the Commonwealth Government, including the Australian Emergency Management Institute and Geoscience Australia, states and territories, three local government associations (WA, SA and Qld), and three risk management academics.

The review commenced in mid-2012. The reviewed manuscript was finalised and endorsed nationally in mid-2014. The spectrum of views towards the NERAG across states and territories and local governments was highly varied, and agreeing on a single reviewed document took time as a result.

Revisions of the NERAG

The process of consultation, debate and amendment of the NERAG document resulted in many changes in the process (Figure 5).

Figure 5: Revisions to the NERAG 2010 Risk Assessment Process

Establish the Context

1. The context of the risk assessment expanded to include its purpose, and to whom the risk assessment will be reported to.
2. Increasing need for the risk assessment team to define relevant criteria for certain consequence categories (e.g. environmental assets, important infrastructure)

Risk Identification

3. Use of the 'Bow-Tie Diagram' is no longer required. Practitioners may choose whichever method they feel is appropriate to identify risks.

Risk Analysis

4. *Level of Control* can now be applied to a single item, or to a group of controls making up a system (e.g. telephonic warnings). Criteria to determine Level of Control are modified, based on the 'Strength' (effectiveness) and 'Expediency' (ease of implementation) of the control;

	Control expediency[b]			
Control strength[a]	Very low	Low	Medium	High
High	Low	Medium	Medium	High
Medium	Low	Medium	Medium	Medium
Low	Very low	Low	Medium	Medium
Very low	Very low	Very low	Low	Low

a How well does the control reduce the risk?
b How easily can the control be activated and used?

5. *Likelihood Level* is more clearly described as being based on the likelihood of the consequence, (as opposed to the likelihood of the event), and the descriptors and probabilities have been modified.

Likelihood Level	Frequency	Average Recurrence Interval	Annual Exceedance Probability
Almost Certain	Once or more per year	< 3 years	> 0.3
Likely	Once per ten years	3 – 30 years	0.031 – 0.3
Possible	Once per hundred years	31 – 300 years	0.0031 – 0.03
Unlikely	Once per thousand years	301 – 3,000 years	0.00031 – 0.003
Rare	Once per ten thousand years	3,001 – 30,000 years	0.000031 – 0.0003
Very Rare	Once per hundred thousand years	30,001 – 300,000 years	0.0000031 – 0.00003
Almost Incredible	Less than once per million years	> 300,000 years	< 0.0000031

Likelihood	Annual exceedance probability (AEP)	Average recurrence interval (ARI) (indicative)	Frequency (indicative)
Almost certain	63% per year or more	1 year or less	Once or more per year
Likely	10–63% per year	Between 1 and 10 years	Once per 10 years
Unlikely	1–10% per year	Between 10 and 100 years	Once per 100 years
Rare	0.1–1% per year	Between 101 and 1000 years	Once per 1000 years
Very rare	0.01–0.1% per year	Between 1001 and 10,000 years	Once per 10,000 years
Extremely rare	0.001–0.01% per year	10,001 years or more	Once per 100,000 years

6. Consequence Level descriptors have been significantly modified, including:
   - removal of 'Infrastructure' as a consequence category, as infrastructure disruption is not a consequence in itself. The knock-on effects of economic cost, life loss etc should instead be considered as consequences;
   - removal of displacement and health system capacity as criteria under 'People' consequences, for similar reasons to Infrastructure above;
   - inclusion of injury under 'People' consequences;
   - increased clarity under 'Environment' consequences defining environmental assets based on their level of protection or amenity value;
   - changing the 'Economy' consequence to be based on Gross Product of the community of interest (i.e. Gross Domestic, State and Regional products, GDP, GSP or GRP). This significantly increases the dollar value thresholds for major and catastrophic consequences
   - amending the 'Social Setting' consequence to include impacts upon 'community connectedness', and also impacts on events (in addition to objects) of cultural significance
   - focussing on the essential functions of government under 'Public Administration' consequence

7. Increased the number of 'levels' of confidence from three to five, giving some more resolution to a sensitive feature of the risk assessment

8. Amended the risk matrix

	Consequence Level				
Likelihood Level	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Low	Low	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium
Very Rare	Low	Low	Low	Low	Medium
Almost Incredible	Low	Low	Low	Low	Low

	Consequence level				
Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Medium	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	Extreme	Extreme
Unlikely	Low	Low	Medium	High	Extreme
Rare	Very low	Low	Medium	High	High
Very rare	Very low	Very low	Low	Medium	High
Extremely rare	Very low	Very low	Low	Medium	High

Risk Evaluation

9. Removes concept of ALARP, similar analysis using levels of Confidence, Likelihood and Consequence to determine each risk's *Priority,* relating risk back to governance*:*

Priority	General descriptor: action pathway
1	Highest priority for further investigation and/or treatment, and the highest authority relevant to context of risk assessment must be formally informed of risks. Each risk must be examined, and any actions of further investigation and/or risk treatment are to be documented, reported to and approved by that highest authority.
2	High priority for further investigation and/or treatment, and the highest authority relevant to context of risk assessment should be formally informed of risks. Further investigations and treatment plans should be developed.
3	Medium priority for further investigation and/or treatment. Actions regarding investigation and risk treatment should be delegated to appropriate level of organisation, and further investigations and treatment plans may be developed.
4	Low priority for further investigation and/or treatment. Actions regarding investigation and risk treatment should be delegated to appropriate level of organisation, and further investigations and treatment plans may be developed.
5	Broadly acceptable risk. No action required beyond monitoring of risk level and priority during monitoring and review phase.

10. The decision point examination is refined, and risks are assigned formal categories as:
    - Category 1: Risks requiring treatment
    - Category 2: Risks requiring further analysis and subsequence re-evaluation; or
    - Category 3: Risks (currently) requiring ongoing monitoring and maintenance of existing controls

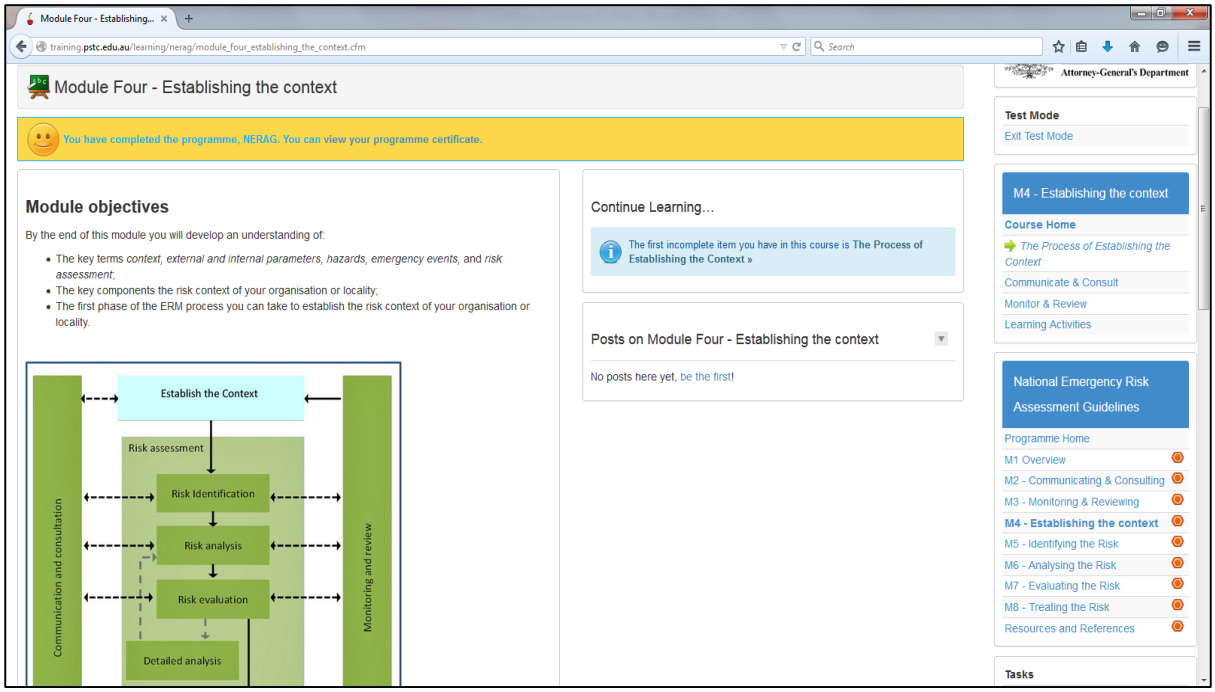
Associated NERAG Products

In addition to the NERAG document, a number of other products are being developed to assist practitioners in implementing emergency risk assessments.

These include a free online training course that any practitioner can experience a brief course (four hours total across eight modules) introducing them to the NERAG, its use and application. A screenshot is shown in Figure 6.

Practitioners often cannot get to formal training courses, and this is intended to provide an introduction and overview. The Australian Emergency Management Institute will continue to offer courses for practitioners to facilitate emergency management.

Figure 6: Screenshot of NERAG Online Training Course



A 'Practice Guide' to assist practitioners is also being prepared as a 'how to' document. The online version is intended to allow practitioners to upload and share information on their own risk assessments that can be used by others, such as documentation, templates and reports.

Other products are also in development, their need identified during the NERAG Review

- Data guidelines to assist practitioners seeking evidence to support context and risk analysis;
- A software product to assist in the recording of risk registers and producing reports;
- Guidelines for the assessment of risk treatments; and
- Guidelines for local councils using the NERAG

Towards nationally consistent risk assessments

National Resolutions for Risk Assessment, 2013, 2015 and 2017

Given that the states and territories have primacy in emergency management, it is debatable as to whether risk information needs to become more consistent, and what the costs and benefits of achieving consistency would be.

The Ministerial Council, now LCCSC, made resolutions for states and territories to identify and publish state-wide risk assessments based on the NERAG.

- **November 2011**: that NERAG be the consistent methodology for future use by Australian governments to assess risk for priority hazards (SCPEM 2011);
- **June 2012**: States/territories publish a state-wide risk assessment prior to June 2013 (SCPEM 2012);
- **July 2013**: States and territories (SCPEM 2013):
  - Produce public versions of state-wide risk assessments (if not currently available) by the end of 2013;
  - A number of states and territories work to ensure their state-wide risk assessments will be consistent with the National Emergency Risk Assessment Guidelines by the end of June 2015
  - By the end of June 2017, all states and territories will publish a new, revised or updated state-wide risk assessment
- **July 2014**: Endorsement of the revised NERAG to '*support effective and nationally consistent emergency risk assessment approaches, helping to build more resilient communities and businesses by enabling access to consistent disaster risk information across jurisdictional borders*' (LCCSC 2014)

The Productivity Commission Inquiry and NERAG

The NERAG was mentioned in the draft report of the Productivity Commission Inquiry into Natural Disaster Funding (PC 2014) relating to the draft recommendation on mitigation (Figure 7).

The draft report recommended that the Australian Government increases mitigation funding around four-fold, from $50m p.a. to $200m p.a., with project proposals being *'supported by robust and transparent evaluations … consistent with NERAG risk assessments'*.

The ramifications of this recommendation, if implemented, would need to be fleshed out. However, it has the potential to advance the direction of risk assessments towards being true decision making tools for allocating mitigation resources.

Figure 6: Productivity Commission Recommendation for Mitigation (PC 2014)

DRAFT RECOMMENDATION 3.2

If the Australian Government reduces the relief and recovery funding it provides to state and territory governments, it should increase annual mitigation expenditure gradually to $200 million, distributed to the states and territories on a per capita basis. The amount of mitigation spending could be adjusted over time to reflect the imputed 'savings' from reduced relief and recovery funding.

Increased mitigation funding should be conditional on matched funding contributions from the states and territories and best-practice institutional and governance arrangements for identifying and selecting mitigation projects. These would include:

- project proposals that are supported by robust and transparent evaluations (including cost–benefit analysis and assessment of non-quantifiable impacts), consistent with National Emergency Risk Assessment Guidelines risk assessments and long-term asset management plans, and subject to public consultation and public disclosure of analysis and decisions
- considering all alternative or complementary mitigation options (including both structural and non-structural measures)
- using private funding sources where it is feasible and efficient to do so (including charging beneficiaries)
- partnering with insurers to encourage take-up of adequate private insurance and private mitigation through measures such as improved information sharing and reduced premiums.

Sendai Framework for Disaster Risk Reduction 2015-2030

The World Conference for Disaster Risk Reduction (WCDRR), held in Sendai, Japan in March 2015 resulted in an international framework for action (WCDRR 2015) for countries, including Australia, to contribute to international efforts in reducing disaster risk. This succeeded the 'Hyogo Framework for Action' which operated from 2005 to 2015.

Within the 'Sendai Framework' (WCDRR 2015), Article 18 describes seven global targets to demonstrate progress in achieving disaster risk reduction. Four of these seven targets have strongly supported by the NERAG processes and criteria:

- Reducing mortality, described as '*average mortality per 100,000 population*'.
  This is identical to the 'People' consequence of NERAG;
- Reduce economic loss, described as '*direct disaster economic loss in relation to global gross domestic product (GDP)*'.
  This is identical to the 'Economy' consequence of the revised NERAG;
- Reduce '*disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities'*,
  This has close similarity to the 'Public Administration' consequence of NERAG; and
- *'Substantially increase the number of countries with national and local disaster risk reduction strategies'*,
  This is supported by Ministerial Council resolutions and state/territory risk assessment activities described above.

Conclusions

The NERAG has come a long way in the eight years since it was first proposed in 2007. It has been written, applied and reviewed, used in a variety of ways by states and territories, and been the subject of national resolutions, workshops and inquiries.

Current LCCSC resolutions indicate that there will continue to be development and publication of state-level risk assessments by states and territories for the next few years. There is the opportunity for jurisdictions to collectively benefit from their varied approaches to date and improve the overall quality of risk assessments.

Implementation of the draft Productivity Commission Inquiry recommendation has the potential to formalise and finance the linking of risk assessment to mitigation, bridging the gap between risk assessment and strategic risk reduction.

The Sendai Framework also has the potential to link Australian risk assessment criteria to reporting on our international commitments in disaster risk reduction.

The revised NERAG will soon be published with a range of products to help practitioners undertake risk assessments across the nation at all levels. However, this is still just the beginning of the risk journey in Australia and there are many options for how this work could develop further.

There will be future national decisions by Ministers, but the longevity of the NERAG will rely on state, regional and local level risk assessments to be undertaken, and the results supported by state, territory and local governments.

Acronyms used in this paper

ACT	Australian Capital Territory
AGD	(Commonwealth) Attorney-General's Department
ALARP	As Low as Reasonably Practicable
ANZEMC	Australia-New Zealand Emergency Management Committee
AS	Australian Standard
CDSC	Capability Development Subcommittee
CESC	Community Engagement Subcommittee
COAG	Council of Australian Governments
DCM	(NT) Department of the Chief Minister
EMA	Emergency Management Australia
GDP	Gross Domestic Product
GRP	Gross Regional Product
GSP	Gross State Product
ISO	International Organization of Standardization
LCCSC	Law, Crime and Community Safety Council
MPES	(NSW) Ministry for Police and Emergency Services
NEMC	National Emergency Management Committee (now ANZEMC)
NERAG	National Emergency Risk Assessment Guidelines
NRAAG	National Risk Assessment Advisory Group (now RAMMS)
NSW	New South Wales
NT	Northern Territory
PC	Productivity Commission
QDCS	Queensland Department of Community Safety
Qld	Queensland
RAMMS	Risk Assessment, Measurement and Mitigation Subcommittee
RSC	Recovery Subcommittee
SAFECOM	South Australian Fire and Emergency Services Commission
SCPEM	Standing Council for Police and Emergency Management (now LCCSC)
SEMC	(WA) State Emergency Management Committee
Tas	Tasmania
TDPEM	Tasmanian Department of Police and Emergency Management
Vic	Victoria
VDJ	Victorian Department of Justice
WA	Western Australia
WCDRR	World Conference on Disaster Risk Reduction

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