



Australasian Fire and Emergency  
Service Authorities Council

# Submission to the Queensland Floods Commission of Inquiry

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## Introduction

### About AFAC

1. The Australasian Fire and Emergency Service Authorities Council (AFAC) is the peak industry body for government fire, land management and emergency service authorities in Australia and New Zealand. AFAC has 36 members (a list is attached). There are also a small number of associate members, some from overseas.
2. AFAC is a not for profit company limited by guarantee. It is registered in Victoria and funded primarily by its members.
3. AFAC is governed by its Council which comprises the head of its 36 member agencies and by its seven elected directors who form the Board. The directors have all of the responsibilities ascribed to directors under the Australian Corporations Act.
4. AFAC's vision as documented in 2007 is "*Fire and Emergency Services strengthened through sharing, collaboration and innovation.*" It has 5 strategic goals in support of that vision:

Leadership and Advocacy

Consistent and effective approach to the delivery of services

The collective experience and knowledge across the sector is captured and shared

A fire and emergency sector with capability and capacity

The value of AFAC is realised throughout the membership.

5. Within Australia, the responsibility for the delivery of fire and emergency services rests with the states and territories. Within this responsibility, there are numerous matters that are of common interest to the agencies and increasingly, matters that benefit from a national perspective.
6. The purpose of AFAC is for its members to share information and resources to enable efficiencies and learnings and to collaborate on issues where a collective effort will achieve a better outcome. AFAC has no role in the delivery of services to the community e.g. the implementation of education programs or giving advice. It also has no role in representing its members in industrial matters.

### **AFAC's involvement in flood management issues**

7. State and Territory Emergency Services (S/TES) across Australia are the lead control agency for incidents involving flooding and storm damage. As such, they have accumulated a fund of knowledge in flood management and flood response through their experience gained over the years in controlling major flood incidents in Australia. Many S/TES employ staff whose role encompasses work on research in flood management and emergency response, and contribution to development of best practice in the area.
  
8. AFAC members, both fire services and S/TES, have a direct role in emergency response to flood incidents. S/TES also have a role in advancing community preparedness for flood events: whether through community education, or by contributing to the development of publications such as the Australian Government's Australian Emergency Manuals series.
  
9. AFAC advances submissions to this Commission of Inquiry based on subject-matter areas that consistently raise issues for AFAC members, namely Flood intelligence and warning systems and Land use planning. AFAC submits that the observations below on these subjects are of relevance to the Commission's terms of reference at paragraphs 2(a), (c) and (g) of the Order in Council appointing the Commission.
  
10. This submission will make reference at a number of places to the Australian Emergency Manuals Series, published by the Australian Government, and abbreviated hereafter as 'AEMs'. In 2009 new editions of four relevant AEMs were published: Flood Preparedness (Manual 20), Flood Warning (Manual 21), Flood Response (Manual 22) and Emergency Management Planning for Floods Affected by Dams (Manual 23). The review of the flood AEMs was in part funded by AFAC, and staff of a number of AFAC member agencies were involved in the review of the original AEMs and drafting of the updated versions that were published in 2009.
  
11. In addition, AEM 19 (Managing the Floodplain) has very recently been reviewed and is expected to be released in a new edition in 2011.

12. The AEMs are intended, as noted in their forewords, to provide broad guidance on all the important aspects of and best practice in flood preparedness, warning, response and floods affected by dams.

## **Flood intelligence and warning systems**

Relates to terms of reference

(a): the preparation and planning by federal, state and local governments; emergency services and the community for the 2010/2011 floods in Queensland, and

(c): all aspects of the response to the 2010/2011 flood events, particularly measures taken to inform the community and measures to protect life and private and public property

### **Flood intelligence: a crucial aspect of planning for floods<sup>1</sup>**

13. At its core, flood intelligence is about the relationship between flood severity and flood consequence — that is, the effects of flooding of different levels on communities<sup>2</sup>. The objective of the flood intelligence system is to determine (from predicted flood heights and an understanding of community needs and characteristics) the likely impacts of flooding, what actions will need to be taken by response agencies and the community and what information and advice should be provided to community members.<sup>3</sup> Flood intelligence complements the warnings issued by the Bureau of Meteorology by advising communities of what effects the flood is likely to have on them and what they should do to protect themselves and their property.
14. Flood intelligence is the product of a process of collecting, collating and assessing information to assist in the determination of the extent and likely effects of a flood upon a community. In this context, information is raw, un-evaluated data of every description, including that derived from observations (historical and real-time), reports, rumour, imagery and other sources which, when processed, may produce intelligence. Flood information can be collected and assessed for its intelligence value before, during and after flood events, and used to guide anticipated responses in the planning context and in the operational moment.
15. Timely intelligence allows incident controllers and planners to: define the operational problem and assess needs; plan operations and effectively deploy resources; alert

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<sup>1</sup> The management of Flood Intelligence is explained in the NSW SES Intelligence Manual, September 2007

<sup>2</sup> For this definition and his contribution to the following eight paragraphs, AFAC is indebted to Dr Chas Keys, former Deputy Director General of the NSW SES.

<sup>3</sup> See also, EMA Australian Emergency Manuals Series, Manual 20, Flood Preparedness, Chapter 2

higher headquarters and supporting agencies that assistance is required; and most importantly, to advise the community through effective warning messages that describe the likely threat and its consequences.<sup>4</sup>

16. Flood intelligence illuminates the concept of flood risk. In doing so it provides assistance to flood responders who have to make operational decisions (for example about the deployment of sandbags, ambulances or personnel or the evacuation of communities), and it provides a means of indicating in advance to community members what a coming flood will mean to them and how they should react. It is the basis for planning for floods in the context of the development of warning, information provision, property protection, resupply, rescue and evacuation strategies.
17. Flood intelligence is vital to effective flood management. Without it, flood responders are inevitably 'flying blind' and reacting to the effects of floods only after they have manifested themselves. Alternatively, responders under-react or are forced into over-reaction because they cannot know what a flood will do until it has done it. In such cases inefficiencies arise, either in terms of avoidable damage being sustained or potentially costly or unnecessary operational activities being undertaken.
18. Most flood intelligence records indicate the effects of flooding in an area at specified heights measured at a stream gauge to which people in the area refer. Thus the flood levels at which, for example, farmland in an area begins to be inundated or roads next to the river are covered with floodwater and must be closed may be identified. Heights at which dwellings, shops, industrial premises and institutional buildings (such as schools, hospitals, nursing homes and jails) take in water can be identified, as can the design heights of protective levees. Flood intelligence, properly recorded, helps flood managers to know the conditions under which properties or communities become isolated and the consequences of inundation in terms of such things as the numbers of people who might need to evacuate to safety.
19. Flood intelligence also has an important role to play in identifying the effects of flooding on critical infrastructure. Infrastructure such as water and electricity distribution networks may be vulnerable to flooding at particular levels, and flood intelligence allows for some advance notice of these impacts to be given so as to permit either attempts at defence/mitigation (such as sandbagging, pumping or temporary levees), or notification

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<sup>4</sup> EMA Australian Emergency Manuals Series, Manual 21, Flood Warning, highlights this critical link

to the community of the imminent loss of services. Equally, the effect of flooding on evacuation routes is a critical factor in flood response, and flood intelligence allows agencies responsible for issuing warnings and conducting evacuations to direct the community as to appropriate evacuation routes, and avoid becoming affected by flood waters in the course of an evacuation.

20. There are many sources of flood intelligence. The most common (and usually the most detailed and reliable) are flood studies (which incorporate hydrological analyses and seek to describe flood regimes), floodplain management studies and coastal zone management studies (both of which typically contain information on the human impacts of flooding and may incorporate material of value in developing evacuation strategies). These are usually available from councils, catchment management authorities and/or state and territory governments, along with levee studies and other flood mitigation design studies, and will often record a range of probable effects of extreme floods greater in scale than have been seen in an area.
21. Operational records maintained by lead flood agencies often record flood effects up to the levels reached by floods. Newspaper accounts of floods are often useful in recording the impacts of specific floods (the stage and peak heights of which can usually be ascertained from flood studies), and post-flood reconnaissance can be useful if conducted soon after a flood by people who understand what sorts of information is required for flood intelligence records. Similarly anecdotal evidence of community experiences, gathered from people who have experienced flooding in an area, can be valuable. Dam-break studies, conducted on behalf of dam owners, provide information on the nature of the usually very severe floods caused by dam failures.
22. AFAC's view is that the establishment and maintenance of effective flood intelligence systems is vital to the provision of appropriate flood warnings to the community, as well as to the planning and execution of effective flood operations. This does not come without cost. However, without the information and analysis on which flood intelligence is based, supported by a system allowing for easy retrieval in a user-friendly format, it is extremely challenging to provide meaningful warnings to the community about the likelihood of a flood impacting them, and the practical consequences for them if it does.
23. AFAC accordingly submits that in considering issues of preparedness and planning for flood events, the Commission should consider the nature and extent of available flood



intelligence systems, and the desirability of comprehensive flood intelligence systems being established – and funded – in support of the work of flood agencies.

### **Community warnings – an element of emergency response<sup>5</sup>**

24. There are significant parallels to be drawn between the importance of community warnings in a bushfire environment, as examined for example by the Victorian Bushfires Royal Commission of 2009-2010, and community warnings in the flood context.
  
25. Although much of the focus in the years prior to 2011 was on bushfire issues, it is worth bearing in mind that historically, flood has been more significant to the Australian community in terms of life lost and property destroyed than bushfire.<sup>6</sup> The importance of having effective warning systems is therefore at least as important for flood as for bushfire.
  
26. Flood warning systems of one sort or another have been operative in Australia since the 1960s, when the Bureau of Meteorology started developing flood warning systems nationally. AEM 21 on flood warning (referred to above) gives further background information on flood warnings in Australia.
  
27. Effective warnings save life and property. Papers by Smith and Gissing on the Taminda flood event (Bureau of Infrastructure, Transport and Regional Economics, 2001) and Gissing on Flood Action Plans (Australian Journal of Emergency Management, 2003) argue that in a well-prepared riverine flood environment, up to 80% of direct flood damage losses can be prevented by timely and accurate warnings.
  
28. AEM 21 discusses the design and implementation of flood warning systems in some detail. It promotes the approach of the Total Flood Warning System, which means that to be effective, a flood warning system must have a number of integrated components. These are
  - a. Monitoring of rainfall and river flows that may lead to flooding
  - b. Prediction of flood severity and time of onset
  - c. Interpretation of that prediction to determine the likely impacts of the flood on the community by reference to flood intelligence

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<sup>5</sup> EMA Australian Emergency Manuals Series, Manual 21, Flood Warning, covers flood warning in detail

<sup>6</sup> Gentle, Kierce and Nitz (Bureau of Transport Economics), *The Economic Costs of Natural Disasters*, AJEM Winter 2001

- d. Construction of warning messages describing what is happening, what will happen, the likely impacts, and what actions should be taken
- e. Dissemination of warning messages
- f. Response by agencies and the community to the warnings
- g. After event review.

The Total Flood Warning System is consistent with the National Warning Protocol adopted in 2009 by the National Emergency Management Committee of COAG.

29. A critical element of flood warning systems is the network of water level gauges (river gauges) upon which the prediction of flood heights and the warnings to the community is based. It has been noted earlier in this submission that flood intelligence links the predicted height of a flood with the consequences on communities. It follows that flood gauges must exist for this height/consequence relationship to be established. The flood warnings to a community typically refer to the predicted flood height on a key reference gauge.<sup>7</sup> Many water level gauges are installed for water resource monitoring and not for flood warning. The use of gauges for flood warning is often a secondary, albeit important purpose.
30. An issue which AFAC wishes to highlight is that gauges are critical to flood warning and can be vulnerable to inadequate maintenance (for flood warning purposes) or even the risk of removal when they no longer meet the business objective of the owners. A water resource entity may only require 50% reliability for a gauge to be effective for their needs. In contrast, flood warning in a critical location may require a gauge to operate reliably 24 hours per day every day of the year. For this reason, we submit that it is important that jurisdictions have arrangements in place for the maintenance of an adequate network of flood gauges to nationally agreed standards.
31. There is a strong similarity between other factors relating to flood warnings and those relating to warnings in the bushfire environment. These include:
- a. The requirement for a strong relationship between responsible agencies and the broadcast media to ensure widespread dissemination of warnings
  - b. The language of warnings needing to be concise, but at the same time informative both as to the impact of the predicted event and as to what the recipient of the warning should do

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<sup>7</sup> See AEM 21, The elements of flood prediction at p.17

- c. The need to be aware of societal developments in the sharing of information about natural hazard events, particularly in social media. Social media played a prominent part in the flood events of 2011: for example Facebook pages set up for events such as the Wagga Wagga, Rochester and Koo Wee Rup flooding events, and the use of social media by Queensland police in relation to the flooding events and Cyclone Yasi there.
32. Of particular significance is the issue of how warnings and community education and awareness interface.<sup>8</sup> This topic, too, is familiar from the fire environment. It is of fundamental importance that when members of the community receive a warning, they have some prior knowledge of what the warning relates to and how they should react to it. This is illustrated by research that shows that the majority of people who died or were injured in floods prior to 2011 became casualties whilst walking, riding or driving through, or playing in floodwater.<sup>9</sup> Similar casualties are known to have occurred in the 2010-2011 flood events as well. This is despite the standard warning issued by State and Territory Emergency Services for flood events containing advice not to walk ride or drive through, or play in flood waters.
33. AFAC and S/TES have recently been active in promoting community awareness, through the SES Natural Hazards Children's Awareness and Education Program launched in November 2010. The program was funded through the Federal Attorney-General's Department (AGD) 2010 – 2011 National Emergency Management Program, and consisted of a 10 x 30 second national television advertising campaign featuring Ettamogah Entertainment's 'L'il Larrikins' characters, a national PR launch, and integration into school and local community programs by the SES.<sup>10</sup>
34. S/TES nationally seek to build awareness of flood risks within the community and to collaborate and partner with the community in preparing for them, ultimately strengthening the resilience of communities. The S/TES FloodSafe community education program includes:

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<sup>8</sup> Gissing, Keys and Opper, Towards resilience against flood risks (paper presented at 50<sup>th</sup> annual conference of the Floodplain Management Authorities of NSW, 2010)

<sup>9</sup> Haynes, K., Coates, L., Leigh, R., Handmer, J., Whittaker, J., Gissing, A., Mcaneney, J. Opper, S., (2009) *Shelter-in-place' vs. evacuation in flash floods*, Environmental Hazards.

Vol 8, Coates, Lucinda, 1999. Flood fatalities in Australia, 1788–1996. Australian Geographer; vol. 30, no. 3

<sup>10</sup> The advertisements can be watched here:

[http://knowledgeweb.afac.com.au/video/safety/ses\\_natural\\_hazards\\_safety\\_program](http://knowledgeweb.afac.com.au/video/safety/ses_natural_hazards_safety_program)

- a. provision of information about risks and how community members can mitigate and manage the impacts of floods
- b. facilitation of community participation through consulting, involving and collaborating with the community as a two way process to empower them to be more prepared, act safely and to have a sense of ownership of emergency plans and decisions.

35. Community education of this nature is essential to ensure communities are aware of their risks and ready to respond to flood warnings when they are issued. It is of increased importance in flash flood environments as often little to no official warning is possible and people need to be educated as to how to appropriately respond to environmental warning signals such as heavy rain and stream rises. Community education is an ongoing process and must be continually reviewed and repeated to ensure that community awareness and preparedness is maintained.

36. In 2009 AFAC prepared a discussion paper entitled 'A national systems approach to community warnings'<sup>11</sup> which considered the issue of the interconnectedness between warnings and community preparedness, which described a model and an approach to resolve the issue of implementing a system for the consistent management of community warnings. A draft of that paper was before the Victorian Bushfires Royal Commission and was referenced in its interim report<sup>12</sup>: a copy is annexed to this submission.

37. It is a leading feature of the AFAC position on Bushfire and Community Safety that managing risk and reducing loss is a shared responsibility between government, communities and individuals; and that people should make their own decisions and preparations for how they will respond to the threat. AFAC submits that the same is true for flood events. Warnings would then be received in the context of a community that has planned for the flood threat and how to respond to it.<sup>13</sup> This is consistent with the Council of Australian Governments' National Disaster Resilience Strategy, which includes steps to improve community understanding of the risks of natural disasters, educating people of these risks, and improving the methods of communicating urgent

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<sup>11</sup> [http://knowledgeweb.afac.com.au/ppg/documents/Comm\\_Warnings\\_Discussion\\_Paper\\_Edition1.0\\_FINAL.pdf](http://knowledgeweb.afac.com.au/ppg/documents/Comm_Warnings_Discussion_Paper_Edition1.0_FINAL.pdf) retrieved 23 March 2011

<sup>12</sup> First interim report of the Victorian Bushfires Royal Commission, August 2009, p127

<sup>13</sup> Pfister N. (2001) Community response to flood warnings: the case of an evacuation from Grafton, March 2001, provides a good description of the issues with warning where there was a lack of community understanding

messages to communities so they can make informed decisions about their options when faced with natural disasters.<sup>14</sup>

38. Community decisions on how to react to warnings need to be based on flood intelligence, and it is necessary to find a way to link flood intelligence – which will predict the impact a flood event will have on a community – to warnings – which will tell the community that the flood event is coming. Later on in this submission, we discuss how evacuation is the primary community response to a threatened flood event. Communities need to have access to locally based evacuation plans, developed with community input and support, which will enable them to react appropriately to warnings they receive.
  
39. We emphasise that this is not a form of ‘transferring blame to the victim’ or abdication of responsibility by response agencies. The AFAC position on Bushfire and Community Safety (September 2010) specifies that agencies should engage with at-risk communities, and seek to influence their preparedness. This is as true for flood as for fire. As with flood intelligence, this needs to be adequately resourced and funded to be effective.
  
40. AFAC accordingly submits that
  - a. Effective flood warning produces better community outcomes
  - b. Reliable, well-maintained flood gauges are necessary for good quality flood warnings, and these should be funded adequately and managed to consistent national standards
  - c. Community engagement, including input to locally based evacuation plans, is central to effective flood warning
  - d. Decisions need to be made about who will be responsible for and deliver that community engagement
  - e. The agency/ies that are nominated to do so must be adequately funded to discharge that responsibility.

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<sup>14</sup> National Strategy for Disaster Resilience, Council of Australian Governments, adopted 13 Feb 2011, [http://www.coag.gov.au/coag\\_meeting\\_outcomes/2011-02-13/docs/national\\_strategy\\_disaster\\_resilience.pdf](http://www.coag.gov.au/coag_meeting_outcomes/2011-02-13/docs/national_strategy_disaster_resilience.pdf) retrieved 28 March 2011

41. The experience of AFAC member agencies with bushfire emergencies over time, and with the more recent flood emergencies in Australia over the past 12 months, leads us to submit that community engagement by emergency services should be as broad based as possible and should take account of the various hazards that may affect the community. Whereas messages will always need to be targeted for communities depending on the particular risks that they face, opportunities should be taken to adopt a 'multi-hazard' approach to messages about warnings, planning and so forth where this is possible.

### **Flash flooding and warnings**

42. When discussing warnings there is an important distinction to be made between riverine flooding and flash flooding. The Bureau of Meteorology defines a flash flood environment as one where flood onset takes place within 6 hours or less of the flood-producing rainfall. Typically, flash floods are characterised by more rapid rates of rise and higher water velocity than riverine flooding. These are both factors that contribute to the potential lethality of flood events.
43. Given adequate flood intelligence systems, warnings of riverine flooding can be given many hours or even some days in advance, and can describe with a reasonable level of accuracy what the impact of the flood event is going to be, allowing the community the opportunity to react based on prior planning, or at least on some pre knowledge of what is going to happen. In contrast, the challenge with flash flood events is that by definition they are far less predictable in terms of location, timing and magnitude.
44. The meteorological and hydrological aspects of flash flooding are more within the province of other agencies such as the Bureau of Meteorology to comment on. From the point of view of AFAC member agencies, any development that can, in a cost-effective manner, provide any additional advance notice of flash flooding (whether by topographical analysis to identify prone areas, advances in meteorological techniques to monitor rainfall events, or otherwise) would be valuable. AFAC would support any initiative to further develop infrastructure such as rainfall radar that would support near-real time flash flood warning capability.
45. Additional factors and challenges relating to flash flooding from AFAC members' perspective are

- a. It is rarely possible to give accurate information about the magnitude of a threatened flash flood in a warning
- b. Communities need to be educated that warnings of flash flooding may not come at all, or may come with very little lead time before the event
- c. Communities need to be engaged in advance to understand how to react in a flash flood
- d. Warning messages need to be as locally specific as possible
- e. Not all community members may receive a warning
- f. Community members need to be engaged to understand the impact that a flash flood will have, and the risks to life associated with fast-moving floodwaters.

46. There is also evidence from the Newcastle flash flooding events of 2007 that members of the community there simply did not understand the warnings that were issued or how to react to them.<sup>15</sup> If community behaviour and reaction to warnings is not appropriate to the threat, then the effectiveness of warnings is diminished.

47. In summary, AFAC submits in relation to flash flooding and warnings that

- a. Any infrastructure or meteorological initiatives that might increase the lead time for flash flooding warnings should be supported
- b. Community education to foster an understanding of flash flooding risk *before the event*, and increase awareness as to how to react, is critical and should be considered a priority for community engagement funding.

## Land use planning

Relates to term of reference (g): all aspects of land use planning through local and regional planning systems to minimise infrastructure and property impacts from floods

48. AFAC's submissions are based on the broad proposition that emergency response is not an adequate risk treatment option for urban development in high risk flood areas.

49. To expand on that proposition, we submit that land use planners cannot afford to, and should not be allowed to, discount the risk of flood events occurring on the basis of an assumption that emergency management agencies will 'deal with' the residual problems that land planning finds too difficult to resolve. The reasons are to an extent self-evident. Emergency managers cannot prevent floods occurring. In theory a fire can be

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<sup>15</sup> Molino Stewart, 2007, Maitland and Newcastle Flood Warning Evacuation Report

extinguished, even if in practice it is imprudent to count on that possibility. However a flood, once the requisite amount of water has entered the river catchment, will happen.

50. That flood will inevitably have an impact on the communities affected, which the best-run emergency response operation cannot prevent. The balance between making land available for development, and avoiding natural disaster, is one to be struck by society through its elected representatives and is not a matter for emergency services. However, insofar as decisions are made to permit land to be developed which might be prone to a flood risk, AFAC submits that the following factors should be taken into account from an emergency planning and management perspective.
51. In relation to the risk, land use planning and emergency planning decisions should be made on the basis of the impact of hazards on communities, across the full range of hazard severity. Historically, land use planning has often focused on planning for single design floods such as the 1:100 Annual Exceedance Probability flood (1:100AEP). This is often misleadingly referred to as the '1 in 100 year flood' – misleadingly, because the 1:100AEP has as a matter of probability one chance in 100 of happening *in any given year*, and there is nothing to stop it happening in consecutive years, or several times in a decade.
52. The problem with using the 1:100AEP as a datum point for land use planning is that it ignores the real probability of larger floods occurring. Communities may also be misled in their understanding and acceptance of flood risk, particularly by the use of phrases such as '1 in 100 year flood'. AFAC agencies will be directly responsible for managing emergencies that may exceed the 1:100AEP, and AFAC submits that land use planning outcomes should be required to consider the consequences of all probable floods including worst case scenarios, not just one, arbitrarily selected level.
53. That is not to say, and AFAC is not submitting, that development cannot be allowed anywhere that there is a probability of flood occurring. That is, as stated above, a matter for governments and communities to decide. However, where development is being contemplated in potentially flood prone areas, consideration needs to be given at that stage to how flood emergencies are to be managed.
54. The AEM series includes a Managing the Floodplain manual (manual 19) that is currently under revision and due for release in a new edition in 2011. We submit that



authorities having a role in land use planning which may involve the floodplain should have regard to the best practice reflected in that Manual.<sup>16</sup>

55. Evacuation is the primary option for the protection of life during flood events. To that extent, rescue may be viewed as being evidence of a failed evacuation. Rescue cannot be assumed to be available if a flood event occurs: in the same way that fire agencies will not guarantee that a fire appliance will attend all calls for assistance in bushfire emergency, flood control agencies may have insufficient resource to despatch rescuers to every request for assistance during a widespread flood emergency. All development in potentially flood-prone areas should therefore in our submission be planned first and foremost in terms of evacuation capability.
56. NSW SES has developed flood evacuation modelling that is being adopted both nationally and internationally. This looks at issues such as evacuation lead times, evacuation routes (capacity and proneness to flooding) and infrastructure, and has been used in NSW to design flood evacuation plans and infrastructure for populations of up to 60 000.<sup>17</sup>
57. In our submission, initiatives of this sort should be applied to land use planning across the country. Emergency management agencies should have a direct involvement in land use planning and major development, with a focus on life safety and emergency management issues. This should be at a strategic (zoning; major/high vulnerability development), not an individual dwelling level.
58. AFAC submits that it is important for emergency management agencies, such as the State and Territory Emergency Services, to be directly involved in the process, because it is in those agencies that expertise in relation to emergency management and response activities is to be found. Emergency management agencies are in the best position to comment on whether particular land use or development proposals have negative implications from an emergency management point of view, and are best able to advise on how to address any problems that become apparent. Because emergency management agencies are focused on the risk from flood and the ways in which that

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<sup>16</sup> The NSW Floodplain Development Manual 2006 sets out how land use planning and emergency management could be better integrated

<sup>17</sup> Stephen Opper ESM, Peter Cinque OAM and Belinda Davies *Timeline modelling of flood evacuation operations* Procedia Engineering Volume 3, 2010. Presented to the First International Conference on Evacuation Modelling and Management, The Haag, The Netherlands, 2009

risk may be addressed, they are best placed to bring that focus to wider debates about land use planning in a locality.

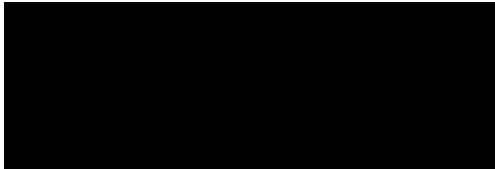
59. The adoption of this practice necessarily has resource and funding implications for agencies and government. AFAC submits that the provision of the additional resource required has the potential to pay dividends in terms of life safety and improved outcomes in emergency events, because emergency management will have been built into planning decisions rather than just being an afterthought.

## **Conclusion**

60. AFAC's interest in the outcome of this Commission of Inquiry is to optimise future conditions for AFAC members to manage flood emergencies as they arise. To that end, our submissions focus on those areas which have the potential to improve both community safety and flood response operations. Without detracting from the specific submissions made in the body of this document, we summarise as follows:

- a. Well-developed flood intelligence systems are key to both community safety and operational outcomes, and should be a funding priority for government.
- b. Warnings are a critical part of flood emergency management. The approach to emergency warnings by government should be multi-hazard wherever possible.
- c. Community engagement is crucial to the effectiveness of warnings and funding for community engagement and education is a key part of any flood emergency management strategy.
- d. Land use planning should take into account all probable floods. It is misleading and potentially dangerous to focus on a single flood planning level such as the 1:100AEP flood.
- e. All development in flood-prone areas should be based on evacuation capability assessment.

61. If it would assist the Commission, AFAC is able to nominate witnesses who would be able to give more detailed evidence, supported by their expert knowledge in the field, on any of the above matters.



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Naomi Brown, Chief Executive Officer, Australasian Fire and Emergency Service Authorities Council

## List of AFAC members

AirServices Australia  
Australian Capital Territory Emergency Services Agency  
ACT Parks and Conservation Service  
ACT State Emergency Service  
Attorney General's Department National Security Capability Division  
Bushfires NT  
Country Fire Authority, Victoria  
Country Fire Service, South Australia  
Department of Community Safety Queensland Government - Queensland Fire and Rescue Service  
Department of Environment Climate Change and Water, NSW  
Department of Environment & Conservation, Western Australia  
Department for Environment & Natural Resources, SA  
Department of Environment and Resource Management, QLD  
Department of Sustainability & Environment, Victoria  
Emergency Management Queensland - State Emergency Service  
FESA State Emergency Service - Western Australia  
Fire & Emergency Services Authority of Western Australia  
Forests New South Wales  
Forestry Plantations - Queensland  
Forestry South Australia  
Forestry Tasmania  
Metropolitan Fire and Emergency Services Board, Melbourne  
New South Wales State Emergency Service  
Fire and Rescue New South Wales  
New South Wales Rural Fire Service  
New Zealand Fire Service  
New Zealand National Rural Fire Authority  
Northern Territory Emergency Service  
Northern Territory Fire and Rescue Service  
Parks Victoria  
Parks & Wildlife Service, Tasmania  
South Australian Metropolitan Fire Service  
South Australian State Emergency Service  
Tasmania Fire Service  
Tasmania State Emergency Service  
Victoria State Emergency Service