Australasian Fire and Emergency Service Authorities Council

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Senate Standing Committee on Legal and Constitutional Affairs

Inquiry into use of smoke alarms to prevent smoke and fire related deaths

Submission by the Australasian Fire and Emergency Service Authorities Council (AFAC)

Introduction

The following submission is based on consultation among the Australasian Fire and Emergency Service Authorities Council (AFAC) membership as well as our broader understanding of the context of the inquiry. We would ask the Committee to note that necessarily, our submission is an aggregate of points of view and should not be taken as the position of any single AFAC member. Also, some of our members will have contributed to the inquiry through jurisdictional submissions, and nothing in this letter should be taken as implying that our members do not fully support their jurisdictional submissions where made.

About AFAC

AFAC is the national council and peak industry body for fire, land management and emergency service authorities in Australia and New Zealand, representing 32 member organisations, comprising permanent, part-time personnel and volunteers, totalling 288,000 firefighters and emergency workers.

AFAC engages with members through a collaboration model as well as event facilitation, professional development and influencing regulations and standards. It exists to support the fire and emergency service industry, making communities safer and more resilient. AFAC has no direct 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.

a. The incidence of smoke and fire related injuries and deaths and associated damage to property

The Report on Government Services (RoGS) produced by the Productivity Commission, Chapter 9 reports on the performance of governments in providing emergency management services in the event of fire and out of hospital medical emergency events. AFAC and its member agencies contribute to the development of the report and provide state and territory data for inclusion in Chapter 9. Data covers the period 1983 – 2012.

The 2015 RoGS report shows that nationally in the 2013-14 financial year, fire agencies attended a total of 384,017 emergency incidents, of which 101,867 were fire related. Of those fires incidents, 19,524 involved structure fires, representing a rate of 84 incidents per 100,000 people. 98 deaths were recording during this period, which represents an annual fire death rate of 4.3 deaths per million people. Household and commercial property insurance claims in relation to fire incidents totalled $720.9million, excluding major events.

Residential Structure Fires

The national rate of accidental residential structure fires was 86.9 per 100,000 households in the 2013-14 financial year. It should be noted, the value of asset losses from fire events is now defined as the estimated monetary value of the damage to property and contents caused by the fire and firefighting operations based on insurance claims. Firefighter assessed property losses from structure fires are no longer reported as a measure of value of asset losses from fire incidents.

The installation of smoke alarms/detectors in residential structures is also referred to in RoGS, although nationally consistent data for all jurisdictions is not available. Some jurisdictional surveys indicate that 94.1 per cent, 96.6 per cent and 94.0 per cent of NSW, Queensland and WA households, respectively, had an installed smoke alarm/detector in 2013-14, an increase from 70 to 82 per cent in 2004-05. This does not refer to working smoke alarms.

Fire Related Injury Statistics

In 2012-13 there were 4114 hospital admissions due to fire related injuries, representing a rate of 18.0 per 100,000 people. Fire related injury statistics however, are very difficult to quantify. AFAC research1 identified that 7322 fire injuries occurred in 5762 accidental residential structural fires between 1 July 1999 and 30 June 2006. Data was not available from rural South Australia and was not included in the total number of accidental residential fire fatalities in Australia.

As fire related injuries can be treated in hospital, outpatient clients, doctors' surgeries, or by paramedics at the fire scene, these figures are an underestimate as the majority of studies use hospital admission records only. Therefore, non-admitted fire related injuries are not reported.

The Flinders University Research Findings – Hospitalised injury due to exposure to smoke, fire and flame in the home, Australia 1999 – 20062, states that 5877 people were hospitalised due to injuries sustained in accidental fires in the home between 1 July 1999 and 30 June 2006, resulting in an average length of stay in hospital of seven days. This data is again an underestimate of the true rate of injury as many victims will be treated in emergency rooms or by private medical practitioners, and therefore not recorded as a hospital admission.

b. The immediate and long term effects of such injuries and deaths

The long term effects and costs of smoke and fire related injuries and deaths are not easily expressed and further research should be considered to assist in quantification of the long term effects of these injuries. However in the immediate context we can draw on existing information to

[1] AFAC's Accidental Fire Injuries in Residential Structures: Who's at Risk? July 2009, Page 2
[2] AFAC's Accidental Fire Injuries in Residential Structures: Who's as Risk? July 2009, Page 3

assist this inquiry. There are short and long term costs associated with burn injuries, both financial and social. Data from the Sydney Medical School, University of Sydney, NSW Severe Burn Injury Service has calculated the cost for an average adult burns patient to be AU$71,056.

The notes of the House of Representatives Standing Committee on Health and Ageing's Roundtable Forum on Burns Prevention, held in Canberra on 1 February 2010, provide some indication of these costs and discuss the ongoing nature of burns treatment. The paper highlights that "…treatment of burns is not a one off intervention. Surviving burn injuries involves a lifetime of ongoing treatment and rehabilitation. It stands to reason that this lifelong treatment regimen incurs significant ongoing costs – beyond those of the first presentation and emergency treatment in hospital."

Professor Kimble, on behalf of St John Ambulance Australia told the House of Representatives Standing Committee on Health and Ageing roundtable that the Royal Children's Hospital in Queensland treated 650 new burns patients in 2007, but only 74 of those were admitted to hospital for more than 24 hours. It is estimated that only 11 per cent of burns patients were actually admitted.

Professor Kimble added that if this rate of admission held for all 31 hospitals that treated children with burns in Queensland, then almost 1,500 children would have presented at hospital with new burns in 2007. If these figures reflect a trend across Australia, it supports the assumptions that there is an underreporting of the extent of burn injuries in Australia, as hospital admission figures may significantly underestimate the number of people affected by burn injuries.

Evidence also presented to the House of Representatives Standing Committee on Health and Ageing stated that in the 2007-08 financial year, the cost of burns and burn injury separations was $65 million.

Professor Maitz from the Julian Burton Burns Trust drew the committee's attention to data published by the British Burns Association that states that the true cost of a burn injury is hidden in one-third of the acute hospital cost and two-thirds in rehabilitation and loss of income. If we were to accept that the cost of burns and burn injury separations to be $65 million per year, then that may be one-third of the true cost which could be as high as $195 million per year. Further research to assist in quantification of the long term effects of fire injuries is desirable.

c. How the use, type and installation set-ups of smoke alarms could affect such injuries and deaths

In 2009, the Australian Buildings Codes Board (ABCB) commissioned Victoria University to determine the most appropriate locations for smoke alarms in residential dwellings, considering both detection and occupant notification. The Victoria University released its report in June 2010.

The project experimentally determined the loudness of smoke alarms in five existing residential houses (Class 1a); for each room; with doors open and closed. The houses used were intended to be representative of typical Australian residential dwellings. The report also reviewed fire fatalities that occurred in Victoria between 1998 and 2006 from the CESARE Coronial Database (CCD). The findings concluded that the then existing minimum regulatory requirements for smoke alarms were deficient in providing complete coverage for early detection and notification of fire. The authors also

identified that early detection and notification could only be achieved with interconnected smoke alarms in every room in every house in Australia.

The Victoria University Report identified factors which enable a smoke alarm to effectively alert building occupants to a fire hazard. The main factors included;

- The volume of the smoke alarm signal
- The proximity of the smoke alarm to the occupant at time of alarm activation
- Activity of the occupant at time of alarm activation (awake or asleep)
- The ability for the occupant to perceive and be aroused by the alarm signal, including impairment by, drugs, alcohol or disability.

The authors estimated that smoke alarms in every room, in every dwelling in Australia, would result in 17% to 30% fewer fatalities. This could be increased to 50% fewer fatalities if all alarms were interconnected. Based on these estimations approximately 50 lives could be saved per year. The report did not report on injuries or make an estimate of injury avoidance.

d. What smoke alarms are in use in owner-occupied and rented dwellings and the installation set-ups

Requirements for smoke alarms vary across all States and Territories in Australia. Since 1997 it has been mandatory to install hard wired mains (240V) powered smoke alarms in most new residential properties. These provisions were made under the Building Code of Australia (BCA). From 1 May 2014, all smoke alarms in new residential buildings were required to be interconnected.

The current legislative framework permits the use of either photoelectric or ionisation type smoke alarms. It should be noted that some minor variations were allowed for residential properties in country areas where properties were not connected to the mains power grid.

The BCA does not impose requirements on properties constructed before 1997. Over a period of time, States and Territories have introduced local legislation to require the fitting of smoke alarms to these properties however the legislative provisions vary. There are some cases where mains powered smoke alarms must be fitted in all existing residential buildings prior to their sale or when a new tenancy agreement is signed for rental properties.

In other cases, one or more smoke alarms must be installed and be operational in buildings where people sleep. This requirement to have a working smoke alarm extends to residential properties including, caravans, movable dwellings and temporary accommodation such as safari-style tents. In some cases, ionisation smoke alarms are required to be replaced with photoelectric smoke alarms when their existing alarm ceases to work or when it reaches its 10 year end of service life.

Standard requirements across all States and Territories for new and existing residential properties are desirable and AFAC advocates for this approach.

e. How the provisions of the Australian Building Code relating to smoke alarm type, installation and use can be improved

Regulatory Reform

There is a clear need for regulatory reform in the area of smoke alarms across Australia. Except for the requirement in 2014 to interlink new smoke alarm installations, the requirements under the Building Code of Australia (BCA) have remained essentially unchanged since 1997. AFAC considers this Inquiry provides an opportunity to seek a review of the current BCA and jurisdictional requirements to ensure they meet the safety needs of the community in a consistent and sustainable way.

This could incorporate the below processes:

1. Review and update current legislation and other regulatory instruments to ensure there are consistent and most effective requirements nationally for Type C Photoelectric smoke alarms, the power options (battery/mains/10 year life battery), location of smoke alarms and the alarming arrangements e.g. signal loudness, interlinking, hard of hearing alarms. This is likely to lead to additional requirements for the number, type and connection of smoke alarms installed in residential properties.
2. Introduce common maintenance/testing requirements across Australia.
3. Require the adoption of regulation or an Australian Standard to address smoke alarm tampering. This could include smoke alarms (either connected to mains power or standalone) to be required to have a 10 year lithium battery in a tamperproof sealed chamber to meet Australian Standards (AS) or other regulatory requirements.
4. Consider requirements for manufacturers to date mark the face of smoke alarms with an expiry date.

AFAC advocates that all residential accommodation should be fitted with Photoelectric smoke alarms.

Approvals

Smoke alarm approvals are an area of concern to AFAC. The National Construction Code (NCC) generally requires all new homes to be fitted with a smoke alarm that complies with AS 3786 – 2014 Evidence to support that a particular smoke alarm meets the NCC may be in the form of one or a combination of the following:

- A report issued by a Registered Testing Authority.
- A current Certificate of Conformity or a current Certificate of Accreditation.
- A certificate from a professional engineer or other appropriately qualified person.
- A current certificate issued by a product certification body that has been accredited by the Joint Accreditation System of Australia and New Zealand (JAS-ANZ).
- Any other form of documentary evidence that correctly describes the properties and performance of the smoke alarm and adequately demonstrates its suitability for use in the building.

AFAC is aware of inconsistencies in the approval process and considers that smoke alarms should be treated no differently to portable fire extinguishers and AS 3786 should be listed as a Product Safety Standard by the ACCC for all smoke alarms. AFAC considers that all smoke alarms sold in Australia should comply with the latest edition of AS 3786 and that AS 3786 and Smoke Alarms be a prescribed consumer product safety standard made under the Trade Practices Act 1974.

f. Whether there are any other legislative or regulatory measures which would minimise such injuries and deaths

Smoke alarms are a critical early warning device for occupants to alert them to a fire hazard. They are essential for smouldering fires, which are responsible for a large number of fire fatalities, as sleeping occupants are unaware of the accumulating carbon monoxide and other smoke related toxins. Smoke alarms also provide a warning of flaming fires, which is a time critical scenario. However, once a fire transitions to the flaming stage, it can very quickly progress to flashover, reducing the tenability of the property, and making escape difficult, if not impossible.

Recent research conducted by Fire & Rescue New South Wales (FRNSW) in conjunction with the CSIRO showed how typical home layouts with modern furnishings can progress to flashover in as little as 2-3 minutes. Similar tests conducted in the 1970s resulted in typical flashover times of 10-20 minutes. These findings are of particular concern as the early warning provided by smoke alarms may no longer be a sufficient protection for occupants and can no longer form the cornerstone of public policy for fire safety.

In the USA, the city of Scottsdale, Arizona, USA has mandated sprinklers in all new homes since 1986. A 2003 study evaluating the effectiveness of this policy after 15 years of operation, concluded that civilian fire-related fatalities reduced by a minimum of 50% in buildings with sprinklers. A broader study surveying all U.S. fire departments found that fatality rates dropped by 82% in buildings fitted with sprinklers. Significant reductions in non-fatal injuries were also recorded.

AFAC considers that Residential Sprinklers should also be considered by the committee. Containing or suppressing fires, in residential properties substantially increases the amount of time occupants have to escape harm. If all new houses were to be provided with sprinklers, lives would be saved and injuries reduced. Making progress in this area would rest on three pillars necessary to support a paradigm shift in society's approach to dealing with fire in an environment of water scarcity.

Refinement of Infrastructure Solutions

A substantial amount of work has been done in developing the Australian Standard on home fire sprinkler systems3, capitalising on international experience. An underlying principle driving this work has been affordability. Challenges in effective system design at reasonable cost have been addressed; however, there remain issues on how best to integrate designs with pressure-managed reticulated systems to ensure the performance of sprinklers in fire suppression is not compromised. This requires further research into the engineering aspects of minimum flow and pressure limits, connectivity to water meters and mains, and means of supplementation from on-site tank supplies where these are required under existing building environmental standards.

[3] AS2118.5/2008

Directing Industry Reform

Once the remaining technical obstacles are overcome, the feasibility of widespread implementation from an engineering perspective will have been proven. The next challenge requires industry reform. The housing industry needs to embrace home sprinklers as a standard inclusion for all new dwellings. Increase training and qualifications for the plumbing industry to enable installation and commissioning of residential sprinklers. This will allow fire agencies to refocus their service delivery strategies to invest more in emerging threats such as counter-terrorism and other extreme event consequence management, including natural disasters, storm and bushfire campaigns.

This will require a pilot project involving the installation of home sprinklers into all homes in a new housing development. This serves the twin purposes of providing seed capital to establish what is effectively a new industry, while also providing the base for a longitudinal analysis of system effectiveness.

Economic Analysis

The effective transition to broad-scale implementation in 'green field' developments will likely require regulatory reform to mandate home sprinkler inclusion in conjunction with new reticulated water mains designs. Housing affordability is a critical national concern and so individual home cost neutrality is important. Cost offsets from infrastructure savings are achievable and can balance upfront home sprinkler installation costs. More broadly, the savings to the community in terms of water savings and a safer built environment needs to be quantified to firmly establish the case for national systemic reforms.

The engineering research, pilot implementation scheme and overall economic analysis will establish the long term viability of a major shift in how firefighting services are delivered. This should happen if water pressure management initiatives currently being pursued by water authorities are to proceed smoothly with maximum beneficial effect and not adversely impact on fire authorities' ability to suppress fire. The relationship with an overall improved fire safety outcome for the community is also clear.

A local, preliminary cost benefit analysis has found that mandating sprinklers in all new homes would produce a net benefit of at least $276m over thirty years. This study estimated an installation cost of $1,424 per home for 2016 reducing to $909 in 2045 (in 2015 dollars). The committee is urged to further consider this option for reducing fire injuries and deaths through the introduction of legislative provisions to require sprinklers in new housing developments.

g. Any related matter

Working Smoke Alarms

Smoke alarms are an important life safety device for every residence in Australia. Every year, Australians die in residential fires or are severely injured as a result of fire related burns or smoke inhalation. Many of these deaths and injuries would be prevented if every residential property including caravans, movable dwellings and temporary accommodation including caravans, motor homes and safari-style tents had at least two interconnected photoelectric smoke alarms installed, that are regularly tested.

At-Risk Persons

Older and disabled Australians are vulnerable to home fires, and these persons may benefit from increased service provisions to ensure their fire safety is maintained at a higher level than the minimum required by current legislation. Opportunities arise during care assessments, to ensure working smoke alarms are installed. Community care providers can ensure working smoke alarms are installed and also provide regular testing and maintenance. This may need legislative weight to ensure compliance.

The Community Care Common Standards as set out in the Aged Care Act 1997 (cwlth) should include legislated requirements in relation to smoke alarms for community aged care clients through initial needs assessment processes that are inclusive of the assessment for smoke alarm and the provision of an appropriate smoke alarm to address the client's level of risk. An examination of the feasibility of utilising new technology to link personal alarms to smoke alarms via funded personal alarm services should also be undertaken.

The current funding arrangements for smoke alarms for people who are Deaf or hard of hearing, the future funding arrangements with respect to the roll out of the National Disability Insurance Scheme and current eligibility to ensure it is accessible by people who are unable to hear a standard smoke alarm should also be reviewed.

Emerging Technology

An emerging technology is the use of heat detectors integrated into smoke alarms. These newer multisensory alarms contain two sensor elements – Photoelectric and heat. The single unit provides an improved response to all fire types. This technology should be further investigated as AFAC considers it has the potential to reduce false alarms and at the same time increases the likelihood of early detection. The ABCB along with AFAC could be appropriate bodies to further investigate this new technology and propose amendments to the NCC to require multisensory alarms (Photoelectric smoke alarms combined with heat detectors) for residential properties.

ABCB Regulatory Impact Statements

AFAC is concerned with the rigid process that has to be followed for all changes to the NCC which we believe has led at least in part, to the situation whereby states and territories have introduced local smoke alarm requirements through legislation. This was evidenced when the ABCB released a Regulatory Impact Statement (RIS) Assessment of options for residential smoke alarm provisions in the NCC in October 2012. This RIS provides an analysis and evaluation of the current smoke alarm provisions contained in the NCC against a number of options to improve occupant notification and response times in the event of fire.

Following submissions from AFAC and other interested parties the RIS cost benefit analysis was amended. However, the revised analysis indicated that all options considered presented a significant net cost with low cost benefit ratios.

AFAC did suggest that there are grounds for regulatory change regardless of economic implications. It was suggested that Government has an ethical responsibility to set minimum requirements based on community expectations for safety. Stakeholders from the building industry and most state and

territory governments believed however, that the economic implications on industry were too great to support any regulatory change.

The ABCB later agreed to a requirement for interconnection of smoke alarms in sole occupancy units in Class 1, 2, 3 and 4 buildings where more than one alarm is provided. The ABCB noted that life safety of building occupants, and particularly those in residential buildings (acknowledging the additional risks associated with being asleep), was considered to be of paramount importance. The ABCB was of the view that saving of a life through the interconnection of alarms represented a greater value to the community than that presented in the RIS.

AFAC considers the way RIS's are carried out for these critical life safety considerations should be reviewed.

Maintenance of Smoke Alarms

The NCC does not provide for maintenance activities for fire safety systems, as this is the responsibility of the states and territories. AFAC considers there should be a minimum requirement Australia wide for the maintenance of smoke alarms in all residential accommodation. This should include minimum testing requirements, serviceability, replacement of expired smoke alarms and upgrading to the latest requirements when properties are sold.

Conclusion

If it would assist the Inquiry, 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. If it would be useful to you to discuss this or any other matter related to this submission you should not hesitate to contact AFAC's Chief Executive Officer Stuart Ellis by telephone on 03 9419 2388.

Stuart Ellis, AM
Chief Executive Officer

4 August 2015