

Alastair Paton

Submission No.206

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TO: Committee Secretary  
Select Committee on the Recent Australian Bushfires  
Parliament House, CANBERRA ACT 2600  
Via E-mail [bushfires.reps@aph.gov.au](mailto:bushfires.reps@aph.gov.au)

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Dear Committee Secretary,

### **RESIDENTIAL FIRE SUPPRESSION SYSTEMS**

Please accept this submission for the inquiry into the recent Australian bushfires which, as an individual, I authorise for publication. I have no monetary interests associated with this topic.

#### **Summary of Main Points**

- This submission relates to multiple committee Terms of Reference (including e., f and i);
- A new active measure - "Residential Fire Suppression System" - has been prototyped but a total lack of Commonwealth and State regulatory guidance for such systems is making it very difficult for relevant authorities to progress - let alone discuss - the concept (*Reference: Michael Ockwell, ACT Department of Justice and Community Safety*);
- Two system prototypes (which provide an insight into the method of operation of such systems) are available here in Canberra for on-site inspection;
- The ACT Emergency Services Fire Safety Officer has conducted a preliminary on-site inspection of the first prototype and is keen to progress the initiative with a media campaign prior to the 2003/04 bushfire season (*Reference: Mick Collins, ACT Fire Brigade*);
- Recommendation that CSIRO be tasked and funded to evaluate effectiveness of such systems to provide clear detailed guidance for any Government sponsored media campaign; and
- Request that the Commonwealth task CSIRO as a matter of priority to maximize the time available for CSIRO to conduct the necessary research on which to base their guidance.

## **Terms of Reference**

Relevant Terms of Reference for the committee include:

- an alternative active bushfire mitigation approach needing immediate research (Ref: Terms of Reference E);
- the appropriateness of existing planning and building codes, particularly with respect to urban design and land use planning, in protecting life and property from bushfires (Ref: Terms of Reference F); and
- liability, insurance coverage and related matters (Ref: Terms of Reference I).

## **Background**

During the recent bushfires in Canberra I designed and prototyped a very cheap active fire suppression system that can be implemented by property owners (at insignificant cost) to reduce the impact of bushfires on life and property. The system is based on simple poly-tube (black plastic garden watering system pipe) laid in gutter around perimeter of roof (to form a manifold) with jet sprays on every 2m (or so) creating a water spray to wet and cool surfaces.

Pipes can be run from the manifold to elsewhere on the house (such as roof, pergolas and windows) to improve coverage for the particular house. Noting wind dispersal is an extremely critical issue, the sprays can be directed close to entry points of concern. Fixing options such as clamping to barge board, clipping to gutter, etc. can be used and the size of jet spray heads can be varied to provide a spread of droplet size to give the required breadth of effect for the particular house being protected.

I thought of the concept whilst preparing to defend my home on Saturday 18 January 2003 and the next day I built, installed and turned on the prototype. From this system I observed that after a few minutes of operation at half pressure, combustible surfaces within with a few meters of the house were wet, whereas at full tap pressure a fog was generated to acted as a water blanket to protect the house from radiant heat.

With fires still alight and Belconnen under threat I took a video of the system and showed it at my civilian place of work, Codarra Advanced Systems. This video prompted the Managing Director (Mr Warren Williams) to dispatch two young engineers to install a similar system on his daughter's house in Belconnen, which they did for under \$100 parts and a couple of hours work.

Given the extremely low material cost, low system water usage and ease at which the sprays can be adapted for specific risks for each particular house, I tried to get the attention of relevant authorities. My desire was to get the message out to other home owners still under the threat of fire so they could be given the opportunity of considering such systems as an option for protecting their properties.

I was at a loss to which Government area was responsible so I approached many of the fire and emergency services personnel who were mobilised here in Canberra during the crisis period, encountering great determination and professionalism within every single person I met.

They directed me to Mr. Mick Collins, ACT Emergency Services Fire Safety Officer who requested that I get the attention of the media. I tried that with multiple attempts, including a media release and even directly approaching a radio station announcer, all to no avail.

In parallel I was fortunate to be introduced to Mr John Stanhope, ACT Chief Minister, who was most supportive and asked that I work with Mr. Michael Ockwell Executive, Director, Corporate Services, ACT Department of Justice and Community Safety.

Michael referred me to BEPCON, Building Electrical and Plumbing Control, ACT Department of Urban Services, and given my past unsuccessful attempts in this area I asked Michael for a name in BEPCON who I could approach.

Michael reported to me that he had made contact with BEPCON, and that BEPCON indicated that as it is mainly concerned with 'minimum' building standards, and would regard this innovation as an enhancement to be undertaken at the home owner's discretion, it would be an inappropriate agency to pursue the matter.

I ended up resorting to documenting the system and passing electronic copies out to friends via the internet with the request that they pass it on to anyone else they know who may be interested.

Once the crisis had abated, Mick Collins visited my house in April 2003 and conducted a preliminary on-site inspection of the prototype system I had installed.

He was interested in the concept, suggested some system improvements and expressed the same desire for media coverage.

He also was keen to improve community awareness through organized groups.

I was not aware of any such groups in Canberra but later became aware of "Community Fireguard" <http://www.cfa.vic.gov.au/cfgindex.htm> which is all about small groups of local residents who - with the help of a Country Fire Authority (CFA) of Victoria facilitator - work together to deal with their local bushfire threat.

Mick and I agreed to re-meet in September 2003 to start some detailed planning for a media release on 1 November 2003.

However, my experiences with Navy fire fighting training and working in submarine safety taught me the need for regulations. I was also fortunate to learn the valuable effect of water spray on fire noting "Waterfog is the approved fixed, fire fighting and weapon cooling system for submarine weapon stowage compartments" (text obtained by a past superior, Captain Peter Hugonnet, AM RAN (rtd.) based on UK Royal Navy training material).

Since the crisis I have attempted to obtain regulatory guidance on the application of water spray in the Residential Fire Suppression System configuration.

### **Regulatory Guidance**

Via the internet I approached the US American Fire Sprinkler Association with the concept and J. Scott Mitchell, a Professional Engineer and member of the NFPA Committee on Automatic Sprinklers, responded.

They were interested in the concept but unable to put a finger on anything explicitly regarding residential exposure protection. NFPA 13 - Installation of Sprinkler Systems – gives some design criteria for exposure protection systems and also references NFPA 80A - recommended practice on exposure protection. But these were primarily developed for commercial properties where buildings are erected in close proximity to other properties. Not for residential exposure or bush land interface.

Scott had contacted NFPA and suggested I contact their Wildland Fire group at NFPA - [www.firewise.org](http://www.firewise.org) . This group handles all the standards for landscaping and protection of homes and

buildings from wild fires and I was given the name Jim Smalley, NFPA - [www.nfpa.org](http://www.nfpa.org) - as a point of contact.

I haven't contacted NFPA yet for closer to home I found "Planning for Bushfire Protection - A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners", NSW Rural Fire Service, 2001, ISBN 0 9585987 8 9. This is a superb reference for bushfire protection and includes the following excerpt:

**“6.4.4 Sprinkler Systems**

The NSW Rural Fire Service (RFS) does not currently advocate the inclusion of sprinkler systems in construction standards due to the limited research available to substantiate the effectiveness of these systems as protection during a severe bushfire event.”

The NSW RFS engaged CSIRO to develop a model which related hazard parameters to various building components under various modes of bushfire attack. From this CSIRO has developed a robust assessment framework which offers practical options for combinations of distance and construction standard (CSIRO, 2000).

Following the recent Linton Coronial Inquiry CSIRO have worked with the NSW Rural Fire Service and Country Fire Authority of Victoria to develop and release (within 12 months) a protection system using water spray for rural fire fighting vehicles to protect crews when caught in bushfire burn-overs (POC: Anne Lawrence, Marketing and Communications Manager, CSIRO Forestry and Forest Products, Tel (03) 9545 2225, Mob 0419 696 184, E-mail [anne.lawrence@csiro.au](mailto:anne.lawrence@csiro.au)).

Following this line I then contacted the CSIRO Bushfire Research Leader (POC: Justin Leonard, Project Leader, Bushfire Research for CSIRO Manufacturing and Infrastructure Technology, Tel (03) 9252 6353, Mob 0419 314 968, E-mail [justin.leonard@csiro.au](mailto:justin.leonard@csiro.au)) who runs the fire vehicle spray protection system project and also heads the People and Property Protection Project in the Bushfire CRC (which begins July 2003 and has education as part of its charter).

Justin expressed interest in the concept of a \$100 active defence water spray fire suppression system and said that we need to increase our understanding on how such systems work before standards - such as AS-3559 - can even consider amendment, let alone actually be amended.

Issues such as site specifics, vulnerabilities, prevailing wind conditions, pre-wetting, water pressure loss, power loss, etc. all need to be considered with all available defence options, be passive or active, to provide a balanced approach that reduces the fire risk for the specific dwelling.

Ideally, a robust hazard assessment for habitable building development must quantify, for different vegetation types, the parameters of fire attack (embers, radiant heat, flame contact and smoke) that damage or destroy houses. This system must relate these parameters to threshold values of vulnerable components of houses (CSIRO, 2000).

Justin was aware of metal pipe higher water volume systems being installed in Victoria for \$5,000 (or so) which aligns with fire fighters from NSW Rural Fire Service here in Canberra January 2003 who reported other similar systems in the Blue Mountains Rural Urban Interface. To date I have been unable to obtain any specifics on such systems but I am most interested if any such properties have used their systems 'in anger'.

**Recommendation to Committee:** CSIRO be tasked and funded to evaluate such active defence water spray Residential Fire Suppression Systems with the aim of providing Government endorsed guidance in the upcoming media campaign targeted at homeowners preparing for upcoming fire seasons.

I believe additional funding is required to increase CSIRO resources as the demand of fitting multiple fire vehicle protection systems will already be drawing upon CSIRO's limited resources.

## **Request for Urgency**

We are still in a nasty drought (Canberra currently at Level 2 water restrictions) that results in rural urban interfaces being even more vulnerable to fire.

I feel that active low cost water spray systems with low water usage should receive proper review by CSIRO for inclusion in the media campaign, noting the need for careful message management as water preservation is key to any media message in times of drought.

For the media campaign to be of real value to the home owner wishing to protect their property, the campaign is going to need detail that provides specific guidance in a balanced and common sense approach that tells home owners what level of protection is afforded by what measures.

However, such specific detail currently doesn't exist for water spray systems and it will take time and resources to obtain. CSIRO is on the critical path for researching this specific detail so I request that a priority be given to the above recommendation to committee (should it be adopted).

## **Insurance**

The insurance industry may consider relaxing their premiums for a property in a designated fire prone area should the property have endorsed fire suppression measures in place, including active spray systems. However, an endorsed minimum standard of performance for active spray systems is required for the insurer and home owner to have assurance so the premiums can be relaxed.

## **Conclusion**

With the current drought I am concerned for bush fire prone houses in the 2003/04 fire season and I feel that active low cost water spray systems with low water usage - if installed properly - have potential to reduce further property damage caused by bush fire.

Such systems are new and need to be evaluated by CSIRO so clear and detailed direction can be promulgated - via a Government sponsored media campaign - for effective installation at each home.

This is the second year in a row that Curtin has been burnt by bush fire and I have been lucky on both occasions. However, I fear that before this drought breaks other Australians won't be so lucky.

I ask that we do something to prepare - whilst we have time - and I see the House Select Committee on the recent Australian bushfires as our best hope.

Yours Sincerely,

Alastair Paton  
Senior Member, Institution of Engineers, Australia (Mechanical Engineering)  
Lieutenant Commander, Royal Australian Naval Reserve (Active)  
Principal Consultant, Codarra Advanced Systems