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Radio New Zealand News

By email: Phil.pennington@radionz.co.nz

Dear Phil

Class B Firefighting Foam

I refer to your email dated 5 February 2018 regarding Class B foam use by Fire and Emergency New Zealand. In your email you asked a number of clarification questions. In response to your written questions we have prepared the response below:

Fire and Emergency New Zealand uses two types of foams to fight fires: Class A foam and Class B foam.

Most of the foam used by Fire and Emergency New Zealand is Class A, which is used for vegetation and house fires. This makes up around 95% of the total amount of foam used and is similar to a detergent. It does not contain fluorinated compounds.

Class B foam represents a very small proportion of the materials Fire and Emergency New Zealand uses at the incidents it attends. It is mainly used to fight liquid fuel fires, which can't be effectively extinguished with water or Class A foam types. On average Class B foam is used at 33 incidents a year, out of the roughly 80,000 incidents Fire and Emergency NZ attends annually.

Fire and Emergency New Zealand is taking prudent steps to manage its use of Class B foam, but it is important to balance this with the risk that liquid fuel fires can pose to life and property. All fires can have environmental impacts irrespective of whether foam is used or not, and it is important that Fire and Emergency New Zealand equips its firefighters with tools and materials that are effective against the range of incidents we attend. A research report by ESR was funded by Fire and Emergency New Zealand out of its research fund to proactively understand the environmental impacts of Class B foam. This has provided us with confidence that the Class B foams currently in use do not contain PFOS or PFOA.

There are fluorine-free Class B foams available but currently they do not provide the same level of firefighting performance and operational effectiveness, which has implications for firefighter safety, asset protection and environmental impact. Further, it is not as simple as substituting fluorine-free foam concentrates for existing Class B foam because they are significantly higher in viscosity. This means that the methods and equipment used to pump Class B foam would also need to be changed. The issue of Class B foam is not unique to New Zealand and we are working closely with our international partners to keep up to date with developments and testing of

fluorine-free foams, particularly the Australasian Fire and Emergency Service Authorities Council (AFAC).

Against that background, our answers to your specific questions are:

1. The NZFS study shows 12 types of Class B foam in use in 2016 (p15). It shows 8,500 litres used in 6 yrs but does not say how much of each type was used. Please detail.

Fire and Emergency New Zealand information on Class B foam use is derived from incident records. The Fire and Emergency New Zealand incident management system requires that equipment and materials used at an incident be recorded in our incident reporting. Reporting does not go the level of specifying the brand of foam used, so we do not have sufficient data to provide this breakdown.

2. Please detail the quantities in storage of Class B fluorine-based foams

Class B foam concentrate is usually stored in 20-25 litre containers and most fire appliances will carry 2 foam containers and proportioners (mixing equipment). Fire and Emergency New Zealand has nearly 700 appliances across the country carrying foam, and there are some additional stocks held at fire stations.

Fire and Emergency New Zealand also has two dedicated foam appliances with small foam tanks and in-built pumps. One is currently using Solberg RF (fluorine-free) foam.

3. The Class B foams include fluorotelomer compounds with 30-60% less fluorine than PFOS-based products (p10). The study says these compounds degrade to PFOA. Given that, is it accurate for RNZ to report that “even though PFOA has been banned since 2006, New Zealand firefighters use foams that degrade into PFOA eventually”?

Fire and Emergency New Zealand does not agree that the study finds that the fluorinated compounds in Class B foams will eventually degrade into PFOA. There are a high number of variables affecting what happens to those compounds once the foam is released into the environment and if/how they will break down. The issue Fire and Emergency New Zealand is dealing with is that the compounds are highly stable and therefore persistent in the environment.

Fire and Emergency New Zealand is however, taking a conservative approach to the use of Class B foam. The research and report from ESR was undertaken through Fire and Emergency New Zealand’s research fund to proactively understand the environmental impacts of the Class B foam used by Fire and Emergency New Zealand. Once the report was received from ESR a moratorium was placed on the purchase of new Class B foam stocks and its use in non-emergency situations. The ESR analysis tested the five most commonly used Class B foams within Fire and Emergency New Zealand and found they did not contain PFOS or PFOA. Fire and Emergency New Zealand issued a national direction that only these foams could continue to be used, with other foams withdrawn from service.

4. The Class B foams in use include some – Alcolac, Kerr A836 and Angus FP70 - with high scores for negative environmental impact (p27). How much of each of these 3 was used 2011-2016?

As noted above in response to your first question, Fire and Emergency New Zealand doesn’t have a breakdown of foam use by individual brand/product.

5. Why is NZFS using these when Solberg RF scores much lower for impact?

Fluorine-free foams are still a developing product and, as yet, Fire and Emergency New Zealand has not been satisfied that there is a fluorine-free foam that will effectively combat the range of liquid fuel fires it attends. Fire and Emergency New Zealand may be called on to attend fires involving fuel tankers, other motor accidents where fuel may be spilled, as well as fires involving other flammable liquids and solvents (some of which mix with water), such as ethanol. The Class B foam carried on Fire and Emergency New Zealand appliances needs to be effective against all these different fuel fires.

In addition, the high viscosity of current fluorine-free foam concentrates available would require a significant change to both equipment and operational practices as it cannot be pumped using existing methods or equipment.

These problems are not unique to New Zealand. Fire and Emergency New Zealand is working with international partners, including AFAC, to explore and test new fluorine-free foams that are emerging in the market.

Fire and Emergency New Zealand has been using Solberg RF on a foam tender but to date there has been limited opportunity to assess its performance in actual fire incidents. Fire and Emergency New Zealand is carefully balancing the risk to life and property with the available methods and materials to put them out. Environmental performance has to be balanced against firefighting performance. For example, if a greater volume of fluorine-free foam is required to achieve the same effect then there will be higher volumes of contaminated firewater causing higher environmental impact and risks to safety.

6. Why is NZFS still using fluorine-based foams at all, given it also uses some fluorine-free foams?

As noted above, the effectiveness of fluorine-free foams is still unproven on the range of emergency situations attended by Fire and Emergency New Zealand. It is also necessary to recognise that firefighting foams are not homogenous: different foams are used to extinguish different types of burning fuels and suppress flammable vapours to prevent ignition, and products that are effective in one application may be of limited use in another. While investigations into the use of fluorine-free foams has occurred in the past and is ongoing, Fire and Emergency New Zealand has not changed over to new products yet due to concerns about performance and other operational considerations outlined above.

Fire and Emergency New Zealand personnel attended a conference last week in Australia on the future of firefighting foam at which the performance of fluorine-free and fluorinated foams was discussed. There remains a significant divergence of views across the sector (foam and equipment suppliers, foam users and regulators) regarding the current performance of fluorine-free foams. It is recognised that the performance of fluorine-free foams is continuing to improve as manufacturers develop and refine their products. However, the clear message was that it is not a simple matter of substituting new foam concentrate into existing systems - the solutions are much more complex than that.

7. What is the cost (per relevant unit) of comparatively effective fluorine-based v fluorine-free foams?

Cost is not a primary consideration in Fire and Emergency New Zealand's selection of foams and fluorine-free foams are not significantly more expensive than fluorine-based ones. You may like to consider contacting foam suppliers directly for this information.

8. Quantities of Class B foam used in any form of training 2011-17 year?

As noted Fire and Emergency New Zealand has not used any Class B foam in training since June 2017 and its use had been quite limited prior to that. We do not have records of foam training volumes, however any use of Class B foam for training in this period is likely to have been in facilities with full containment of the run-off.

We have noted you requested a recorded interview with Fire and Emergency New Zealand about Class B foam. Please feel free to get in touch with our media team once you have had the opportunity to review our responses and they will assist.

Yours sincerely



Leigh Deuchars
Director, Office of the Chief Executive