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Submission on amendments to HSNO Firefighting Chemicals Group Standard 2017

Structure of this submission

This submission presents Fire and Emergency New Zealand's comments on the proposed amendments to the HSNO Group Standard. The structure is based largely on the questions raised in the discussion document, with additional information and comment included where appropriate.

About Fire and Emergency New Zealand

The Fire and Emergency New Zealand Act 2017 (Act) combined urban and rural fire services into a single, integrated fire and emergency services organisation – Fire and Emergency New Zealand – with a mandate to provide a wide range of services for communities.

The Act provides the framework under which we operate and sets out our principal objectives, and both our main and additional functions.

Principal objectives

The principal objectives of Fire and Emergency are:

- Reducing the incidence of unwanted fires and the associated risk to life and property; and
- In relation to our functions under sections 11 and 12 of the Act, protecting and preserving life, and preventing or limiting injury, damage to property, land and the environment.

Main functions

The main functions of Fire and Emergency under section 11 of the Act are to:

- promote fire safety including guidance on the safe use of fire as a land management tool
- provide fire prevention, response and suppression services
- stabilise or render safe incidents that involve hazardous substances

- provide for the safety of persons and property endangered by incidents involving hazardous substances
- rescue persons who are trapped as a result of transport accidents or other incidents
- provide urban search and rescue services
- efficiently administer the Act.

Additional functions

Under section 12, we may carry out additional functions if we have capability and capacity to do so, and provided this does not affect our ability to carry out our main functions. These additional functions are:

- responding to medical emergencies
- responding to maritime incidents
- performing rescues, including high angle line rescues, rescues from collapsed buildings, rescues from confined spaces, rescues from unrespirable and explosive atmospheres, swift water rescues, and animal rescues
- providing assistance at transport accidents (e.g. crash scene cordoning and traffic control)
- responding to severe weather-related events, natural hazard events, and disasters
- responding to incidents in which a substance other than a hazardous substance presents a risk to people, property, or the environment
- promoting safe handling, labelling, signage, storage, and transportation of hazardous substances
- responding to any other situation, if Fire and Emergency has the capability to assist.

Key points

The key points of our submission are summarised below.

- Fire and Emergency's current Class B foams comply with the 2017 standard (i.e. contain no PFOS or PFOA) but do contain other PFAS which are currently not regulated in New Zealand.
- We have publicly signalled our intention as an organisation to transition to fluorine-free foams, but this process will require significant time and resourcing.
- While we support the future mandating of fluorine-free foam, the timeframe for phasing out PFAS foams as it would apply to Fire and Emergency's operations is uncertain in the proposal. We seek clarification from the EPA on their intent to enable us to fully understand the implications and plan accordingly.
- We need to maintain an effective foam capability that meets our operational requirements. Due to the scale and complexity of our operations and infrastructure, we cannot achieve this transition in a short timeframe and wish to engage with the EPA to establish a transition process and timetable that is realistic and achievable.
- We fully support the proposed immediate ban on use of PFAS foams for training and for testing of equipment; this has been Fire and Emergency policy since mid-2017.

Other observations about the scope and drafting of the standard, and how compliance will be determined and enforced, are also provided.

What is the reason for making a submission?

Fire and Emergency New Zealand uses a range of fire fighting chemicals in its response operations. These include:

- long term retardants for wildfire response
- class A fire fighting foams for fires involving vegetation and combustible materials such as timber and tyres
- class B fire fighting foams for vapour suppression and firefighting in relation to flammable liquids (including water miscible liquids such as methanol and ethanol)
- high expansion foams for suppressing fire in enclosed spaces such as ships' holds and ducting/tunnels.

Our use of fire fighting chemicals including foams is critical for ensuring we can consistently and reliably continue providing emergency services to the New Zealand public and ensure the safety of our firefighters when doing so.

Changes to the HSNO Group Standard will have an impact on our activities and operations, not just in relation to Class B foams containing PFAS (per- and poly fluoroalkyl substances). We consider that the standard needs to properly regulate all types of fire fighting chemicals including emerging future products e.g. retardants and gels. To this end, we consider that the focus of the standard should be on minimising the potential impact of all fire fighting chemicals on people and the environment rather than narrowly focussed on PFAS in Class B foams, while still enabling their effective use for the protection of life and property.

The standard also needs to cover the contents of high-performance dry powder extinguishers designed for flammable liquid fires such as Purple K and Monnex.

Do you wish to speak in a hearing?

Yes, Fire and Emergency wishes to speak at a hearing.

What is your preferred outcome in this consultation?

As a user of fire fighting chemicals, our preferred outcomes are as follows:

- A standard that is fit for purpose and manages the hazards and potential impacts of all fire fighting chemicals, both present and future products, recognising that fire fighting and fire suppression products continue to advance as the technology develops.
- Assurance that the revised standard provides a robust and enforceable regime for the full range of fire fighting chemicals (not just Class B foams) to protect users of these products as well as the public.
- A greater focus not just on specific constituents of fire fighting chemicals but on the end objective – minimising the potential impacts on people and the environment – through an emphasis on both acute impacts and persistence.
- Certainty about the standards that will be imposed and their implications for the long-term use of fire fighting chemicals, given – particularly in the case of Class B firefighting foams – the infrequency of their use, the long shelf life and the not insignificant cost of the products.
- A phased, managed withdrawal of fire fighting chemicals that contain PFAS, that is:

- based on scientific evidence and robust rationale
- practically achievable by users of these chemicals
- reflective of the actual risks that their use presents.

- A pro-active approach by the EPA to assessing products subject to this standard and ensuring compliance.
- Assurance that this regulation will not inadvertently create future problems arising from potentially harmful constituents in fluorine-free foams used as substitutes for PFAS.
- Options for disposal that set clear expectations about what is required, are practical and affordable, and will not encourage irresponsible practice.

Overview and background to Fire and Emergency's use of fire fighting foams

Foam use

Class A foams make up the bulk of the fire fighting foam that we use (estimates at around 95% by volume). These are essentially wetting agents (detergents) and do not contain PFAS. The majority of our appliances have a built-in Class A foam tank and proportioning system.

Fire and Emergency uses Class B foams for fighting fires involving flammable liquids such as fuels and crude oil. Some flammable liquids such as methanol, ethanol and acetone can mix with water, so an alcohol resistant foam is required for fires involving these substances. Class B foam is also used for vapour suppression to prevent ignition of flammable spills.

We currently use a range of commercial Class B foam products. The main ones are Alcoseal, Tridol, FP70, Ansulite and Croda A836. We are compliant with all existing regulations. These products all contain some level of PFAS, but do not contain PFOS or PFOA above the levels of reporting (LOR).

These products cover the following foam categories:

- AFFFs (aqueous film forming foams)
- AR-AFFFs (alcohol-resistant aqueous film forming foams)
- FPs (fluoroprotein foams)
- FFFPs (film forming fluoroprotein foams).

We also use:

- Fluorine-free foams – small quantities only
- High expansion foams – understood to be fluorine-free.

We use predominantly portable foam-making equipment for Class B foam. Unlike airports, the oil industry, and our emergency response counterparts in Australia, we use external induction devices for proportioning almost exclusively, rather than pressurised or pumped systems. The fire truck provides water to an in-line inductor drawing from a 20-litre drum or a 1000-litre IBC, with foam solution applied through a hose and foam nozzle. Alternatively, we use self-inducting nozzles (the foam nozzle is supplied with water and draws directly from the foam source). We have two operational foam tenders in service, with on-board foam tanks and pumping proportioning systems. One of these uses fluorine free foam.

We have over 600 trucks in our fleet and a large proportion of these carry a supply of Class B foam in drums and portable foam making equipment.

In 2017/18 and 2018/19, our records indicate that we used Class B foams in incident response on average on less than 50 occasions per year, with around 1700 litres of foam concentrate used in 2017/18 and 1000 litres in 2018/19. In reality, given limitations in the data, we believe the average number of incidents was closer to 25 to 30 per year and the volumes of foam used were correspondingly lower.

We have not used Class B foam for training and non-emergency use since at least mid-2017. The use of Class B foams by Fire and Emergency in training has been very limited for a number of years. This is due to concerns about environmental impacts from runoff, the high cost of the foam itself, and the availability of suitable sites and opportunities to conduct training.

We currently have around 31,000 litres of Class B fire fighting foam in circulation, spread across hundreds of locations and fire appliances throughout New Zealand. These are Fire and Emergency 'approved foams' that have been tested and confirmed as PFOS and PFOA-free though they do contain other PFAS.

We do not use any portable foam extinguishers.

Fluorine-free foam

We are committed to transitioning to fluorine-free foam and have already taken steps towards this. We are keeping abreast of developments internationally in fluorine-free technology and firefighting performance and this will inform our future selection of Class B foam products.

At this stage we do not intend to purchase or acquire any more fluorinated foams. We have issued a request for information to suppliers for fluorine-free products. This is the first step in a multi-stage evaluation and procurement process to enable us to transition to fluorine-free foams.

Our future strategy for use of Class B foam is part of a wider National Flammable Liquids Incident Readiness and Response Strategy. We are still defining our foam capability requirements e.g. what are the risks we need to manage, where do we need to use Class B foam, what foam products do we need, how do we use them, how much and where should they be deployed? Unlike the oil and chemical or aviation sectors, minimum foam requirements for Emergency Services are not prescribed under regulation.

We currently have a small quantity of Solberg fluorine-free foam. As noted, we also use high-expansion foam (Expandol) for situations where it is necessary to flood internal spaces such as the holds of ships; this foam is understood to be fluorine-free.

Our actions on foams containing PFAS

We have taken a proactive and conservative approach to the use of Class B foam in relation to concerns about PFAS contamination and potential effects, as follows:

- Fire and Emergency funded a research report by ESR in 2016/17. The study considered the environmental impacts of our use of Class B foam. This work included testing the foam concentrates that made up the bulk of our foam stock. None contained PFOS or PFOA above the Level of Reporting.
- In June 2017, a moratorium was placed on the purchase of new Class B foam. Previously Class B foam had been purchased by individual regions, but since then this has been managed at a

national level. We also stopped using it in non-emergency situations such as training, and stopped accepting any gifts or donations of foam from other parties.

- Where we had used it for training in recent years, it has been in contained, purpose-built training facilities such as at Mardsen Point Refinery.
- In December 2017, we withdrew all Class B foam brands from service that had not been tested and confirmed as PFOS- and PFOA-free (our 'approved' foams).
- In early 2018, we audited all our urban and rural stations. We removed and quarantined any Class B foam stocks in stations or on appliances that were not tested brands, or were older than 2006 or that we could not identify.
- At the same time, we bought some additional stocks of new foam to cover the shortfall for the short term. This product, Ansulite C6 A336 LRV, is an alcohol-resistant AFFF (aqueous film-forming foam) product that had been previously tested and contains no PFOS or PFOA.
- The quarantined foam concentrate (approximately 60,000 litres) removed from service in 2018 has now been collected, re-packaged and securely stored ready for disposal. It will be exported for destruction in the next few months.

Our PFAS site investigations

We are actively investigating our sites around New Zealand for potential PFAS contamination from past use of foam in training activity.

We have been working through a structured programme of assessing all our 667 operational sites around New Zealand to identify locations where there is potential for PFAS contamination from past use of Class B foam, and to prioritise sites for investigation. This process has three steps:

- Identification (including an initial desktop assessment)
- Preliminary Site Investigation
- Detailed Site Investigation.

This work is being carried out by an independent environmental consultancy.

Eight sites were selected to undergo a Preliminary Site Investigation. So far, three sites have been identified for a Detailed Site Investigation and we have concluded investigations for a further two sites.

General observations on the EPA's discussion document and the draft standard

Having reviewed the consultation documents, we wish to make the following observations:

- The general objective of the draft standard is not clear – whether it is to mandate PFAS-free or fluorine-free fire fighting chemicals. These are not necessarily the same. While the focus of the standard is on PFAS foams, Part 3 clause 8 requires declaration of fluorine content not PFAS content.
- Similarly, as mentioned earlier, we consider that the focus of the standard should be on fire fighting chemicals as per its title. 'Firefighting chemical' has a broad definition in Schedule 3

and, as previously noted, we use a range of such chemicals in our operations, not just PFAS foams.

- The discussion document appears to focus on AFFFs to the exclusion of other types of fluorinated foams (FP, FFFP, etc) and, in effect, considers all such foams to be similar.
- It is unclear whether the EPA is taking any steps to regulate PFAS in other products in New Zealand as fire fighting foams are not the only source of PFAS in the environment.
- The discussion document does not talk about the available analytical methods for PFAS, or what methods might be used to demonstrate compliance with the standard e.g. determining PFAS or fluorine content. Consequently, it does not address the significant limitations of the analytical methods available or the difficulties this creates for users.
- In relation to the above point, the standard refers to 'PFOA-related compounds' without any reference to how these might be determined to be present or not.
- The standard does not appear to provide any standards for the disposal of fluorine free foam, foam solution or foam contaminated fire water runoff, only PFAS foam and foam waste. The implication is that fluorine free products are benign which is not strictly the case.
- There do not appear to be any timeframes given for the disposal of firefighting foams containing PFAS, once withdrawn from use.
- We understand that during the investigation into PFOS in firefighting foam, the EPA would have amassed a considerable amount of analytical data about the constituents of a wide range of foam products of different ages. The discussion document provides very limited information on the prevalence and characterisation of PFAS (other than PFOS) to support the case for fluorine-free foams. Such information would also give the users of foams a better understanding of the nature of the products they use and the implications of the standard.

The proposals raise the following issues which we would like to discuss in more detail with the EPA.

- Fire and Emergency supports the prohibition on the use of PFAS foams for training. Fire and Emergency has had a moratorium on training with Class B foams (except fluorine-free) since June 2017. The historical contamination of soils, groundwater and surface water from foam use in New Zealand and Australia has been almost exclusively from training activity which by its nature has involved long term, repeated application in very specific geographical locations. Prohibition of training activity will have a major impact on reducing contamination of the environment and potential exposure for people to PFAS.
- Several 'training foam' products are available for use as substitutes for PFAS foams in physical application exercises (including with live fire in some cases), though disposal of any foamy waste still presents challenges.
- Similarly, Fire and Emergency supports the prohibition on testing of equipment and systems using PFAS foam unless all foam, run-off and contaminated water can be contained and disposed of.
- Fire and Emergency seeks clarity on the timeframes for transitioning to fluorine free foams as proposed in the standard and the implications for our operations. As noted above, Fire and

Emergency has two operational foam tenders in its fleet of some 600 vehicles, featuring a foam tank and proportioning system which can deliver Class B foam solution to a nozzle and aeration device. The remainder of the fleet do not have foam 'systems' as such – instead the truck provides a source of water to an external (in-line) inductor which draws foam from a drum or large container and discharges foam solution to a nozzle. In many situations, we use self-inducting foam branches instead of in-line inductors.

- It is unclear whether these uses fall under the definition of 'systems' thereby providing a minimum 2-year transition time. The discussion document does not provide any explanation in this regard. Informal advice from the EPA recently has been that, depending on interpretation of the Stockholm requirements in relation to POPs, all PFAS foam stock in drums or IBCs could be subject to the new standard when it comes into force which is expected to be around September 2020, though there may be some scope in the standard for specific exceptions.
- Withdrawal of all our current PFAS foams cannot be achieved in this timeframe. A significant investment in time, cost and organisation resource is required to implement this change. The safety of our firefighters and the public could be compromised if we are forced into hasty decisions on future foam selection, deployment and equipment. There is also a risk of making poor or less than optimal decisions if our foam strategy (see previous reference) is pre-empted by the implementation timeframes for fluorine free foams indicated. Fire and Emergency wishes to discuss this in detail with the EPA with a view to agreeing some realistic timeframes for the transition.
- The discussion document describes four broad categories of Class B foams. Under "legacy fluorotelomer", it notes that these can contain some long chain PFAS (C8s) and also "PFOA related compounds" recently added as a POP to the Stockholm Convention. As noted previously, Fire and Emergency holds a wide range of foam products of different types and brands and a range of ages from 2006 to 2018. We would welcome discussion with the EPA as to how we might identify which, if any, of these meet the Stockholm POP criteria for "PFOA-related compounds".
- In relation to Schedule 2, clause 3, it could be argued that where an incident response requires Fire and Emergency to apply foam into a contained area such as a tank bund, rather than an unconfined space (and this might be for the purposes of vapour control from an unignited spill, not just a fire scenario) then the provisions of this clause should also apply. Again, the requirement for containment, and what that means in practice, is confusing.
- By the very nature of our emergency response operations, we will invariably be applying other parties' foam stocks on a site at the initial stage of response (as part of operating their mandated firefighting systems), or potentially using third party stocks brought in from elsewhere to supplement the site owner's or our own foam. This mode of foam 'use' will generally be different to that for other foam users (e.g. airport emergency services or industry) and so creates uncertainty about the interpretation of the terms 'use' and 'user' in the standard, and the implications and associated liabilities, particularly during the transition phase.

Transition to fluorine-free foams

The process for Fire and Emergency to transition from its current PFAS foams to fluorine free foams involves a number of steps. As noted previously, we operate from over 600 locations with a

similar number of appliances. Foam stocks are not held centrally so any transition is a significant and complex undertaking. The key steps in the process are as follows:

1. Complete an initial request for information (RFI) to assess what fluorine free products are currently available in the market (this has been started).
2. Develop a national foam capability statement as a basis for procurement (see also earlier comments regarding the development of a National Flammable Liquids Incident Readiness and Response Strategy).
3. Issue tender documents and assess responses.
4. Develop a short list of products for evaluation and testing.
5. Develop and carry out a testing programme on short listed products.
6. Confirm new equipment requirements and develop a deployment programme for roll out. This will include determining priorities for replacement and phasing of foam change out across the country.
7. Develop training courses and materials and roll out training programmes.
8. Commence deployment of replacement foam and collection of existing product.

It is noted that step 6 assumes that a suitable foam product(s) can be found that does not require a major reconfiguration of our equipment or a significant change in the way that we would currently use foam.

Do you consider there are any applications for which fluorine-free foams are not suitable or do not have relevant approvals?

We recognise that there has been significant development of fluorine-free Class B foams in recent years and that the range of commercial products available continues to expand.

We also acknowledge that significant large scale bund and tank fire testing has been undertaken with such foams (which is continuing) and their fire fighting performance compared to traditional AFFFs has improved. Our understanding of such trials is that generally for smaller shallow pool fires, some of the fluorine-free foams tested appear to perform comparably to AFFFs but that for large tank surface fires, they generally do not perform as well. Also as with any foam product, performance will also depend on the type of fuel, and how it is applied, so can be quite variable.

Unfortunately, due to the commercial nature of the organisations undertaking these large scale tests and confidentiality considerations, this testing does not provide users such as ourselves with much useful information about the performance of individual products at scale, and we remain reliant on suppliers' documentation in making decisions about product selection.

We further observe that there continue to be conflicting claims about fluorine-free foams vs. PFAS foams. There are strongly held views on both sides and with incomplete and sometimes misleading information being promulgated by opposing parties, foam users are left confused. Despite the claims, there seems to be very few reliable and objectively documented cases of significant fire incidents where fluorine-free foams were used successfully 'in anger' to support claims of their satisfactory performance. However, there are also many factors involved in the successful control of a large fire which can obscure the effectiveness of a particular foam product or firefighting tactic.

Fire and Emergency's use of Class B fire fighting foams is very infrequent, and the situations we would normally be dealing are the not the same as those of, for example, the aviation industry, the oil industry or the military. Mostly in Class B fires that we encounter, rapid control and extinguishment of fire for protection of life will not be the primary objective (unlike in an aircraft

or ship). Similarly, with large flammable liquids storage facilities, the initial attack and control will be largely reliant on (mandated) fixed firefighting systems (foam pourers on tanks, foam deluges in loading bays, cooling water deluges on exposed tanks) prior to Fire and Emergency taking control of the incident. Therefore the objectives, priorities and tactics, and consequently the type of foam and the way it is likely to be used by Fire and Emergency will be different.

We note the recommendation from the Stockholm Conference of Parties in relation to considering fluorine-free foams rather than C6 foams for the future. Given the wording of the recommendation[1], we do not consider that the position adopted by the EPA i.e. a rapid phase out of all PFAS foams for dispersive use, including C6s, is substantially supported by this recommendation or that a sufficient case has been made. Most other jurisdictions (South Australia excepted) have transitioned to fluorine-free foams in stages and we therefore consider, given the actual level of risk presented (exposure, frequency of use, uncertainty of the science) that a staged approach to C6 is also warranted in New Zealand.

What do you think of the practicality of these cleaning requirements in terms of the resources and costs involved?

To date, Fire and Emergency has cleaned only one of its fire appliances. This was an old foam tender which was no longer in active service and had not been used for foam application for many years. The foam in the tender's tank was removed, and all the on-board pipework, proportioning equipment, foam nozzles and hoses cleaned. The wash water was filtered before discharge to trade waste, and the filter medium and foam will be disposed of by incineration. In addition, the whole process was verified and documented by a third party. The total cost of this exercise was close to $100,000 for a single vehicle that has reached the end of its working life.

If this proposal is accepted into the standard, then Fire and Emergency will need to repeat the exercise on at least two further appliances. The different configuration of vehicles does not lend itself to economies of scale. In fairness to users of foam, it is strongly suggested that the EPA provides guidance (at least in draft) on what is considered to be 'as far as is reasonably practicable' as part of this proposal so that we have something concrete to comment on.

The guidance on cleaning requirements should be supported by a robust risk analysis so as to ensure that decontamination end-points (residual PFAS levels in wash water streams) are realistic and practical, and flushing processes are efficient and avoid creation of unnecessary waste.

What do you think of the practicality of these disposal provisions in terms of the resources and costs involved?

Fire and Emergency has removed around 60,000 litres of 'old' and 'unapproved' Class B foam from service and quarantined it for disposal. This has now been collected and consolidated by an approved waste management specialist and is due to be exported for destruction by incineration. The approximate cost of this exercise will be around $650,000. We have a further 30,000 litres of

[1] Stockholm Convention Conference of Parties UNEP/POPS/COP.9/30 SC-9/13 Actions related to PFOA, it salts and PFOA-related compounds
"*The Conference of the Parties… (3) also encourages Parties and others to use alternatives to PFOA, its salts and PFOA-related compounds, where available, feasible and efficient, while considering that fluorine-based fire fighting foams could have negative environmental, human health and socioeconomic impacts due to their persistency and mobility."*

'approved' PFAS foam which under this proposal will also need to be withdrawn from service and destroyed in accordance with the standard at a further cost of around $300,000.

It is noted that the disposal cost for PFAS foam concentrate is based on a gross weight which includes all packaging and associated waste material. Given that our stock of foam is almost all in 20 or 25-litre plastic drums this adds a significant weight for disposal by incineration (around 12%) in addition to the actual foam itself.

This is a significant cost for this organisation. It is acknowledged, however, that the initial quarantined volume is a reflection of the historical management of foam stocks and so has been a necessary step.

Other organisations will be facing similar scale of cost. We understand that there is a significant volume of PFAS foam remaining in circulation nationally. The disposal of this foam and cleaning of systems required by the standard over the coming years will significantly stretch the existing capacity in New Zealand for PFAS decontamination, waste management and disposal, as well as the analytical services necessary to support this activity.

The EPA has facilitated the destruction of 'old' foam through the issue of export certificates for POPs waste under the HSNO Act. However, unlike previous situations such as the banning of PCBs in New Zealand where a free collection and disposal service was established, there has been no central government initiatives or support for a national collection scheme to assist users, or exploration of possible disposal options in New Zealand.

In summary, the disposal provisions are impractical and expensive but there have been no alternatives available. The lack of pro-active central government support or leadership for foam users to address the problem has been somewhat disappointing.

Finally, clause 4, in Schedule 1, Part 1 of the standard refers to the Hazardous Substances (Disposal) Notice 2017. We understand that this Notice is currently being reviewed and updated. It would be helpful to foam users to know what specific provisions in that Notice apply to disposal of foam concentrates, solutions and wastes and what changes are proposed to the Notice in the light of this standard, rather than having the issue of disposal dealt in a piecemeal fashion.

Certification of fluorine content

We question the effectiveness of this requirement as currently proposed. Firstly, despite the common use of the term 'fluorine-free' the presence of fluorine in foam is not the issue. The issue is the presence of persistent compounds, specifically persistent compounds containing fluorine such as PFAS.

Secondly, any such stipulation would need to specify a recognised analytical standard and a threshold (the threshold for a POP is 10ppm) to be enforceable, and for it to provide any meaningful assistance to foam users in making procurement decisions.

Discharges in emergency situations

Would your business be able to contain all foam wastes?

No.

If not, is this due to cost or practical difficulties?

This is largely due to practical considerations rather than cost, given we are applying foam in emergency situations and every situation is different. Containment of foam solution and foam-contaminated firewater will not always be practical or easily achieved especially outside fixed installations, such as a road tanker incident.

As noted previously, there is also uncertainty as to what situations would fit within "containment" for the purposes of the proposal.

Fire and Emergency strongly supports the position that emergency releases are tolerable provided that all reasonable and practicable steps are taken to minimise environmental harm. This is consistent with longstanding Fire and Emergency operational practice where all reasonable and practicable steps are taken to minimise the impact of contaminated firewater and runoff from an incident. Despite best endeavours this is not always achievable and the standard recognises this. In addition, it is noted that foam in firewater runoff is only one of many possible and problematic contaminants that we encounter so containment is always a consideration at any incident.

Do you have any concerns about fluorine-free foams potentially containing other persistent, toxic or bio-accumulative compounds?

Yes, we have significant concerns due to the following factors:

- As fire fighting foams are used infrequently in incidents, foam stocks may be stored for many years. Foam concentrates are also expensive so unnecessary use is discouraged and stocks will age. Fire and Emergency's own quarantined foam stock and the extent of the historical issues uncovered throughout New Zealand by the EPA in its PFOS investigations serves to reinforce this point.
- During the period between purchase and use, it is highly possible that new information on ingredients currently used as acceptable alternatives to PFAS may emerge, leading to future concerns about environmental impact, persistence or health concerns. The current standard should be sufficiently comprehensive to exclude likely foam constituents that could become problematic in the short to mid-term, so avoiding a repeat of the PFAS narrative in foam.
- As an end user, organisations such as Fire and Emergency have little information about the constituents of fire fighting chemicals, which are generally proprietary formulations. The present HSNO regime allows self-classification which has contributed at least in part to the current PFAS issues. A hands off approach by the EPA and its predecessor ERMA has exacerbated this, as has the HSNO classification scheme which does not address the issue of persistence particularly well. Users of such products are very exposed to the potential for another PFAS-type issue in 10 years' time.

By way of example, Fire and Emergency uses a long term fire retardant product for wildfire operations. The supplier's 'HSNO-compliant' SDS states that the product is not hazardous under HSNO and so has no HSNO classification, and therefore it is not subject to this standard. Given the manufacturer's stated health and safety precautions and recommended PPE, and the recommendation to keep it out of waterways during applications, we find it somewhat surprising that the product does not trigger any HSNO thresholds at all. For many of the classification categories listed in the standard, the SDS merely states "no information". The 'HSNO-compliant' SDS is missing critical information on constituents and ecotoxicity that is found in the United States' SDS for the same product.

Given the scale and impact of the historical issues created by the presence of PFOS and PFOA in foam products, the requirement in the standard for a formal determination by the EPA based on a full constituents listing would give greater assurance to users of such products.

Which option for addressing these concerns do you prefer and why?

Option 1 does not provide a sufficient level of assurance to either users or the public as to what is in these products, and risks a repeat of the PFOS issue in New Zealand. Adjustment of the HSNO classifications will not adequately address persistence issues which are picked up in the HSNO thresholds. Much of the concerns about PFAS currently are based on uncertainties and probabilities rather than clear evidence of effects and so do not trigger HSNO thresholds.

We consider that Option 2 is insufficient and that the EPA should be required to carry out a determination on all products to be imported or manufactured including those currently being sold, not just receive the information from the importer. Only this way can user and public confidence in the use of firefighting chemicals be re-established.

Past experience with PFAS foams has been that manufacturers' formulations have changed over time. The effect of this is that a product may have different constituents to the product of the same name that was originally approved under HSNO in the past. In the case of the PFAS content this has significant implications. The compliance process needs to provide for ongoing assurance of products under HSNO as their formulations change, not just when the product is first imported or manufactured.

Fire and Emergency is currently in the market for foams for the future as well as other fire fighting chemicals. We would like to be able to specify a requirement that any product we purchase be conditional on a determination from the EPA and confirmation of compliance with the standard. This needs the EPA's support as the regulator through Option 2 to make it work.

Do you agree with phasing out C6 AFFF at the same timeframe as C8 AFFF?

We do not agree with phasing out C6 AFFF in the same timeframe as C8 AFFF.

Which is your preferred option?

We would prefer to see a phased approach to the withdrawal of PFAS foams that aligns with the requirements of the Stockholm Convention.

Firstly, withdrawal of any foams that contain PFOA or PFOA-related substances in line with Stockholm obligations. This would require EPA input and assistance to identify which of our current products fall into this category, as we are currently unable to establish this.

Secondly, the progressive withdrawal of older foams that may be classed as C8s. It is understood that not all 'so-called C8s' will necessarily contain PFOA-related substances.

Thirdly, that the 'dispersive use' of C6s be extended for a period of at least five years. We may well be able to achieve complete phase out of C6 foams in a shorter timeframe, but this allows some flexibility for the organisation to fully transition.

What are your reasons?

Firstly, we suggest that the terms C6 and C8 are problematic as they are general descriptors rather than precise quantifiable categories. This means it is not possible to establish what a 'pure C6'

foam is. From our own analysis, we know that our C6 product does not contain PFOS, PFOA or PFHxS above the POP thresholds. A similar issue arises with 'PFOA and PFOA-related compounds' and in the future with 'PFHxS and PFHxS-related compounds' as the current analytical tools cannot provide the necessary assurances that a product does or does not contain these. So, while the Stockholm Convention may set such a standard for PFOA and PFOA-related compounds, it is not clear how compliance (or non-compliance) can be conclusively demonstrated in practice.

That issue aside, as stated previously, the Conference of Parties recommendation is a very 'soft' one and we consider there is a significant leap from the sentiment expressed therein to the proposal by the EPA to ban all PFAS foams including C6s in two years. The robustness of some of the information presented to the Conference by certain organisations has been challenged, and we understand the evidence against C6 foams and the questions about its fire fighting performance are not that clear cut, as previously commented on.

We would prefer to see a longer timeframe for the prohibition of C6, so we can transition across our entire operation.

In early 2018, Fire and Emergency purchased additional stocks (around 8,500 litres) of C6 foams at a cost of $110,000. This product currently makes up about 25% of our current holdings of around 31,000 litres. We will ultimately incur costs of a further $100,000 or more to dispose of this new product.

We did not purchase a fluorine free foam at that time as we did not have sufficient confidence in the then available products to proportion satisfactorily in our equipment. Unlike airports, the oil industry, and our emergency response counterparts in Australia, we use external induction devices for proportioning almost exclusively, rather than pressurised or pumped systems. The performance of our foam making equipment is significantly affected by viscous, non-newtonian foam concentrates which fluorine-free products invariably are. This issue is exacerbated with alcohol resistant foams which use different formulations and are usually more viscous again – these are generally not used by airports or the oil industry. Further, experience has shown there may be issues of materials compatibility to address with fluorine free foams.

We also have around 4,400 litres of fluoroprotein foam (Angus FP70), which is all less than eight years old. We have no reliable information on the types of PFAS used in the formulation of this product, other than our understanding that it is not an aqueous film-forming foam.

As noted above, we are currently researching fluorine free foam products as part of future procurement, and part of this work will be assessment of product performance in our equipment.

As an organisation, we operate over 600 fire stations across New Zealand with some 600 fire trucks. A phase-out of current PFAS foams in a short timeframe is a significant logistical task, aside from the difficulties of identifying a suitable replacement product and equipment to match. Hence, our preference for a longer timeframe. Given our very low frequency of Class B foam use, and that training activity with Class B no longer occurs, we consider that this does not present a significant risk. The nature of Class B foam is that while we must maintain readiness and a certain level of capability; in all likelihood, we will probably never use a significant quantity. The major sources of historical contamination have been identified and curtailed.

Can you estimate the cost to your business of phasing out C6 AFFF?

As noted above, we have incurred a cost of over $100,000 in the recent purchase of C6 foam. An additional cost of $100,000 is expected to dispose of it.

Replacement cost for all our current stock of foam (based on maintaining a similar national stock level) is approximately $500,000, with potential for a similar cost for replacement of equipment that will work with new fluorine-free foam.

In addition to the above, there may be a significant re-equipment cost to transition to a fluorine free foam across all our operations. This has not been assessed in any detail as yet.

Do you have any other comments to make about the proposed amendments?

As previously noted, we consider that the broad focus of the standard should be on both acute effects and persistence of all fire fighting chemicals, in line with the approach in Queensland and not solely on PFAS. There should be an explicit recognition that all fire fighting foams will have some environmental impact.

The proposal goes a long way in outlawing the use of PFAS foams in training which has become the status quo in New Zealand within the last two years. This, in effect, has curtailed the major source of historical and ongoing contamination and so a phased approach to the withdrawal of PFAS foams does not present a large risk.

Do you have any comments about the workability of the draft amendments shown in the revised Group Standard in the Appendix? Please include the relevant clause and sub-clause number providing any feedback?

The drafting of the standard follows a set format adopted for all the HSNO group standards. It contains extensive cross-referencing both within the standard and to external documents.

Along with Fire and Emergency, there are a number of other parties who will be required to comply with the standard. It is important that all parties are able to clearly understand what their obligations are for any new requirements. We suggest a focus on greater clarity and simplicity in the drafting of the revised standard.

Some specific issues are noted below:

- What does “discharge to the environment” mean (Part 3, clause 9 and Schedule 2, clause 4)? This should be more explicit e.g. discharge to land, discharge to surface water etc. Is the act of directing a stream of foam through the air onto a fire a “discharge to the environment”?
- The definition of PFOA-related compounds in Schedule 3 is not consistent with that in the Stockholm Convention.
- Similarly, the definition of PFAS in Schedule 2 does not appear to be one in common usage.
- The definition of firefighting chemical in Schedule 3 specifically includes fire retardants “that are mixed with water and applied to unburnt vegetation so that combustion is not supported”. However, the definition of firefighting foam includes a substance “intended for use to prevent ….. fires”. This may lead to questions of interpretation so it is suggested that the definition of foam specifically exclude fire retardants.

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