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### AOG Exhibition, Perth Australia

We have a good response to our exhibit at AOG last month. We exhibited our most advanced remote-controlled monitors, including our new 65mm Class 1 Zone 1 hazardous area monitor, and our 100mm turbine proportioner.



Our jetty monitors have also just been featured in the March issue of the Oil & Gas AustralAsia magazine.

### A PFAS Free World

Orion is actively supporting the move to fluorine free fire-fighting foams by developing the technologies to do this safely and effectively. Changing foam concentrate technologies is full of pitfalls and we can help avoid them. Rod Rutledge of Caltex has a very appropriate phrase he uses, "regret spend". There are many opportunities for regret spend when changing to fluorine free foams.

In the mid 1990's we went through the Halon change out and customers were offered supposedly drop in replacements which led to a lot of regret spend. Predictably, the same types of problems are found in Queensland today as they move to fluorine free technologies.

Orion manufactures proportioners and foam equipment to work with all available F3 foams to ensure new F3 systems work as well as possible, and minimise regret spend.

We are often asked to offer a fluorine free replacement foam 'that provides the same level of fire protection as our current foam'. We can't honestly satisfy these customers since there are no such fluorine free foams. There are some applications where fluorine free foams can provide a reasonable replacement but there are others where the F3 technologies are unproven or definitely unsuitable. When you have no choice but to change your foam it can become a risk trade-off for the end user - increased fire risk for reduced environmental risk.

Even if choosing a fluorine free foam was easy, the change out is not simple, as our next section demonstrates.

### Changing out to F3 Foam

The Queensland Government Operational Policy for Environmental Management of Firefighting Foam is not entirely clear on what defines a fluorine free foam. Section 6.1 starts "Although non-persistent (including fluorine-free) foams may not contain highly persistent organic compounds such as PFCs, ....". Unfortunately, this is an impractical definition as there is no practical way to ensure zero content. Any practical test method has a minimum detectable amount. Also, all the world's oceans and many rivers are contaminated with PFAS making it impractical to make foam concentrates that are completely PFAS free, it is in the water. A proper definition would have set a reasonable detectable limit.

Table 6.2.4-A of the policy sets allowable limits for emission into the environment that might be relevant to determining what might be allowed. This is 1 µg/kg of PFAS. Which would seem to be the allowable limit of PFAS contamination in F3 foams.

This has major implications for changing out your existing foam concentrates. In a conventional 3% AFFF there could be about 5,000 mg/kg of PFAS, and much more if it is an old 3M foam. Simple maths suggests that the residual foam in a foam system must be less than 1/5,000,000 of the starting amount of old foam to comply with the 1 µg/kg limit. For a 1000 litre foam system (including pipework, valves and pumps, not just the tank), if just 0.2ml of foam concentrate is left after cleaning the system it may be sufficient to render the new F3 foam non-compliant.

Recently we organised some TOP Assays for a customer and they included their new F3 foam that had recently been pumped into their newly cleaned foam tank (cleaned by repeated flushing with water we are told). The TOP Assay identified over 2,000 µg/kg of PFAS in the new 'fluorine free foam' now in their tank, most likely making it non-compliant.

On the topic of TOP Assay testing, people seem to be using the TOP Assay to prove a foam is 'fluorine free'. This test is not sufficiently sensitive for this purpose (for Queensland at least). The detectable limits for different PFAS compounds in the TOP Assay range from 20 µg/kg to 100 µg/kg, nowhere near sufficiently sensitive to measure the 1 µg/kg required maximum. The TOP Assay tests for only a few (20) possible PFAS compounds and, from our experience, might fail to detect around 50% of the PFAS in older foam concentrates. Testing at the 1 µg/kg level could be a challenge.

In order to meet a 1 µg/kg limit for PFAS after replacing the old foam, the only practical way would seem to be replacing all equipment that is in contact with the foam concentrate (tank, pumps, valves & piping etc).

To us this seems like a huge economic impost, and we hope that policy makers in other jurisdictions will think this process through carefully.

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Any questions about this email or other Orion products and services?

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