HOW IS IT 3M, DUPONT AND OTHERS CAN SIT ON NFPA AND NOT DISCLOSE TOXINS IN EQUIPMENT KNOWING IF THEY DID IT IMPACTS THEIR BOTTOM LINE?

> **F.9.1 Toxicity of Surfactants.** Fire-fighting agents, used responsibly and following Material Safety Data Sheet instructions, pose little toxicity risk to people. However, some toxicity does exist. The toxicity of the surfactants in fire-fighting foams, including the fluorochemical surfactants, is a reason to prevent unnecessary exposure to people and to the environment. It is a reason to contain and treat all

By Diane Cotter

This may not make a whole lot of sense to non fire/military people and the acronyms won't be familiar to non first-responders. But it's an important look into what we in the fire service take for granted. When we see something is marked ***'meets NFPA standards for*** …' (National Fire Protection Agency), we instantly think, "well it has to be safe, it meets NFPA standards!" NFPA will call themselves a neutral organization. That's not for me to decide. But they are the body that oversees every aspect of fire protection. From a sprinkler head, to the drag device on PPE. Everything goes through NFPA committees for review, discussion, public comments, first draft, second draft, reports, technical committees, and finally revisions and publication every for years of the fire service bible. It is extremely tedious and tremendous efforts and hours of research are put in by these committees. You'd have to open up the latest edition of NFPA 11 on FOAM to understand the scope of the work these committees are tasked with. The committees are made up of voting and non voting members. Those members include an array of manufacturers, special experts, scientists, firefighters, and NFPA Staff Liason.

Now, I know at this second I'm gonna be taking many hits from people in NFPA that will find this article outrageous. So be it. This is what I, an outsider, a fire-wife whose husband had career ending cancer, sought answers to.

The question I had was, "how can manufactures that know they are using products that contain a known carcinogen sit on these committees without whispering a word to anyone that they have a secret?"

The answer was they have no legal, or moral obligation to.

In the case of 3M., they began sitting on NFPA 11, the committee for AFFF or aqueous film forming foam, as far back as 1972. They may have been there longer but those records are archived. Along with 3M, was the Navy.

If 3M knew in 1972 that their AFFF was toxic, they said nothing to NFPA about it. And if the military knew, they too said nothing in those years.

So what's the big deal about NFPA?

Because, every purchase order for AFFF for the military, or for most/all municipal and rural fire houses, all 58,000 of them, are stating their AFFF must 'meet NFPA standard for FOAM''.

By 3M and others hiding in NFPA, they literally shape the outcome of their company. They understand that by having their product meet NFPA standards for AFFF, for their military spec AFFF, they have a golden egg. The AFFF that meets NFPA standards becomes the stamp of approval for every airport and fire station in the nation, and beyond. It's not just the USA that goes by the NFPA standard. It's also the standard for many other countries.

And, same with our turnout gear…. DuPont immersed itself in NFPA 1971 for Structural Firefighting PPE. The organization that sets the standard for the flow of purchasing their product on a global platform.

DuPont never once mentioned they had a problem with PFOA. Or that the chemicals used to coat our gear will degrade to form PFOA. Or, that Europe told them they are going to have to remove it by 2020 from turnout gear. They remained silent to the same NFPA committees that determine every aspect of turnout gear. If you're in the fire service you understand how much our manufacturers are involved in our cancer prevention research, programs, teachings, and symposiums. You also understand that in NFPA, the testing of turnout gear examines everthing from the 'particle size down to the micron that can permeate the fabrics in PPE', to the width of reflective tape, to the balance of the helmet. But they never wanted to test the chemical coatings, or for that matter, the chemicals used in the manufacturer of our turnout gear.

They do want to talk a lot about POCs though. Products of combustion.

Manufacturers will not give us the chemical content in PPE information when asked. We were told that information is CBI or 'confidential business information'.

To that end we have had to fund the testing of turnout gear ourselves. The Last Call Foundation Honoring Firefighter Michael Kennedy has already funded over $20,000.xx to test 20 years worth of 'new, never-worn' and some decommissioned gear of the same manufacturer and years.

The problem with all of this, is, we may never know if our cancers were caused from this PFOA. But for those of us who have lost loved ones, lost careers, struggle with insurance, lose insurance, are sued by insurers for getting cancer, fight for legislation only to lose over and over again, it's a real kick in the teeth to know that while CEO's knew of their chemicals causing cancers in lab animals, they were securing billions in contracts in the military and beyond. And sitting across the table with us talking about cancer. Watching us bury our dead at the NFFF memorial every year. Sponsored by some of these same manufacturers.

Here's a look at the last 45 years into NFPA 11 Committee on Foam.

Us Navy Labs present from day 1.

Why is this important? Because there are documents showing the US military knew in the 70's that AFFF was toxic.

1972 NFPA Foam

https://www.nfpa.org/Assets/files/AboutTheCodes/11/1973_TCR-11-11B.pdf

In 1972 they were printing the entire NFPA codes as one 1500 hundred page (approx) publication. FOAM is on page 735 to page 777. No discussion on FF safety.

I see no AFFF manufacturers sitting on this NFPA committee for foam yet.

https://www.nfpa.org/assets/files/AboutTheCodes/11/NFPA_TCR_A1972.pdf

1974 Report of the Foam Committee (still no AFFF manufacturers I recognize).

https://www.nfpa.org/Assets/files/AboutTheCodes/11/1974_TCR-11-11B.pdf

In 1975 3M appears:

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRA-1975-11.pdf

1976:

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRA-1976-11-11A.pdf

(beginning on page 13 of 28 pg pdf): **Part II Standard for High Expansion Foam Systems (Expansion Ratios from 100:1 to 1000:1)**

11 A-8 J HGH EXPANSION FOAM SYSTEMS

I-7 Personnel Safety. 1–7.1 Hazards to Personnel. Tile discharge of large amounts of high expansion foam may inundate personnel, blocking vision, making hearing difficult, and creating some discomfort in brc,~thing. This breathing discomfort will increase with a reduction in expansion ratio of tile foam and also under the effect of sprinkler discharge.

1–7.1.1 Personnel working in a hazmat area and with no responsibility for fire fighting shall be instructed to immediately vacate the area in the event of fire, if possible. **If personnel are unable to vacate and are trapped so that their lives are endangered by smoke or heat, they may enter the foam. Instructions shall be given to move the hand over the nose and mouth to minimize discomfort in breathing within tile foam.** I-7.1.2 Where possible the relative location of foam discharge points to building exits shall he arranged to facilitate evacuation of personnel. I-7.1.3 **To re-enter a foam-filled building, a coarse water spray may be used to cut a path in the foam. Personnel shall not enter the foam. The foam is opaque, and it is impossible to see when one is submerged. It is dangerous to enter a build- • .,~ ………………….. a …… one ………….. 1–7.1.4 Caution. A canister type gas mask shall not be worn in the foam**. The chemicals of the canister will react with the water of the foam and cause suffocation. If emergency reentry is essential, self-contained breathing apparatus shall be used in conjunction with a life line.

1978

3M still there

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRA-1978-11.pdf

Still nothing about toxicity unless I'm missing it completely.

1982 3m, Ansul,

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRA-1978-11.pdf

Page 2 of 30 in this pdf. There is discussion about favoritism being shown to AFFF and there is discussion about the industry referring to all foam as AFFF which others on the committee are in agreement with.

Chapter 4 ~ 4~ Objective: (a) This Chapter is totally biased in favor~ of AFFF and ignores more than 20 years of successful u,.;e of regular foam and compatible ‘dry chemical and 15 years use of fluoroproteion foam and other dry chemicals. (b) Inclusion of this Chapter as describing “Systems” doesn't fit the Standard (nor did it really•fit lIB) because combined agent equipment is generally used as portable. “Recommendation: Either delete the Chapter or completely rewrite to include recognition of other effective agent combinations.

Page 3 has a lot of input from 3M.

1987 Report of Committee on Foam

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRF-1987-11-11A.pdf

Discussion about AFFF vs AFFP among other things.

1993

https://www.nfpa.org/Assets/files/AboutTheCodes/11/TCRF-1993-11-11A.pdf

2002 https://www.nfpa.org/assets/files/AboutTheCodes/11/11-A2002-rop.pdf

https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=11&year=2002

This was the year the 'personal note' came from one of the committee members that called AFFF a death sentence. That story broke in 2017 and called for Congressman Brian Fitzgerald to ask for a "DoD investigation into who knew what and when did they know it.."

https://www.theintell.com/news/20170609/dangers-of-firefighting-foam-discussed-in-2001-document-shows

2004 This the first reference to environmental safety that I found. It is in the Annex…. If it was in the previous Annex's I didn't go looking. There is discussion of 'environmental issues'.. but nothing to warn the first responder using the equipment of how toxic it is/was. **NFPA 11 is not the organization for safety operating instructions. Those are set by the manufacturer. I then asked three colleges who know foam very well, 'who determines if the foam is safe to use?' Is that NFPA?**

All said no… and that UL is the 3rd party that tests the NFPA standards… but still no answer on how a product is determined safe to use… I have since learned that a product can be brought to NFPA to make sure it meets the NFPA 11 requirements. But there is no organization like FDA that stamps approval on the item. Only if the item were later found hazardous would it be looked at more closely.

page 46 of 52

https://www.nfpa.org/assets/files/AboutTheCodes/11/11-F2004-ROP.pdf

Annex F Foam Environmental Issues This annex is not a part of the requirements of this NFPA document but is included for informational purposes only. F.1 Overview. Fire-fighting foams as addressed in this standard serve a vital role in fire protection throughout the world. Their use has proven to be essential for the control of flammable liquid fire threats inherent in airport operations, fuel farms and petroleum processing, highway and rail transportation, marine applications, and industrial facilities. The ability of foam to rapidly extinguish flammable liquid spill fires has undoubtedly saved lives, reduced property loss, and helped minimize the global pollution that can result from the uncontrolled burning of flammable fuels, solvents, and industrial liquids. However, with the ever increasing environmental awareness, recent concern has focused on the potential adverse environmental impact of foam solution discharges.

The primary concerns are fish toxicity, biodegradability, treatability in wastewater treatment plants, and nutrient loading. All of these are of concern when the end-use foam solutions reach natural or domestic water systems. Additionally, the U.S. Environmental Protection Agency (EPA) has highlighted a potential problem with some foam concentrates by placing glycol ethers and ethylene glycol, common solvent constituents in some foam concentrates, on the list of hazardous air pollutants under the 1990 Clean Air Act Amendments. The purpose of this annex is to address the following: (1) Provide foam users with summary information on foam environmental issues (2) Highlight applicable regulatory status (3) Offer guidelines for coping with regulations, and provide suggested sources for additional information (4) Encourage planning for foam discharge scenarios (including prior contact with local wastewater treatment plant operators) It should be emphasized that it is not the intent of this annex to limit or restrict the use of fire-fighting foams. The foam committee believes that the fire safety advantages of using foam are greater than the risks of potential environmental problems. The ultimate goal of this section is to foster use of foam in an environmentally responsible manner so as to minimize risk from its use

F.2 Scope. The information provided in this section covers foams for Class B combustible and flammable liquid fuel fires. Foams for this purpose include protein foam, fluoroprotein foam, film-forming fluoroprotein foam (FFFP), and synthetic foams such as aqueous film-forming foam (AFFF). Some foams contain solvent constituents that can require reporting under federal, state, or local environmental regulations. In general, synthetic foams, such as AFFF, biodegrade more slowly than protein-based foams. Protein-based foams can be more prone to nutrient loading and treatment facility "shock loading" due to their high ammonia nitrogen content and rapid biodegradation, respectively. This section is primarily concerned with the discharge of foam solutions to wastewater treatment facilities and to the environment. The discharge of foam concentrates, while a related subject, is a much less common occurrence. All manufacturers of foam concentrate deal with clean-up and disposal of spilled concentrate in their MSDS sheets and product literature.

F.3 Discharge Scenarios. A discharge of foam water solution is most likely to be the result of one of four scenarios: (1) Manual fire-fighting or fuel-blanketing operations (2) Training (3) Foam equipment system tests (4) Fixed system releases These four scenarios include events occurring at such places as aircraft facilities, fire fighter training facilities, and special hazards facilities (such as flammable/hazardous warehouses, bulk flammable liquid storage facilities, and hazardous waste storage facilities). Each scenario is considered separately in F.3.1 through F.3.4.

F.3.1 Fire-Fighting Operations. Fires occur in many types of locations and under many different circumstances. In some cases it is possible to collect the foam solution used; and in others, such as in marine fire fighting, it is not. These types of incidents would include aircraft rescue and fire-fighting operations, vehicular fires (i.e., cars, boats, train cars), structural fires with hazardous materials, and flammable liquid fires. Foam water solution that has been used in fire-fighting operations will probably be heavily contaminated with the fuel or fuels involved in the fire. It is also likely to have been diluted with water discharged for cooling purposes. In some cases, the foam solution used during fire department operations can be collected. However, it is not always possible to control or contain the foam. This can be a consequence of the location of the incident or the circumstances surrounding it. Event-initiated manual containment measures are the operations usually executed by the responding fire department to contain the flow of foam water solution when conditions and manpower permit. Those operations include the following measures: (1) Blocking sewer drains: this is a common practice used to prevent contaminated foam water solution from entering the sewer system unchecked. It is then diverted to an area suitable for containment. (2) Portable dikes: these are generally used for land-based operations. They can be set up by the fire department personnel during or after extinguishment to collect run-off. (3) Portable booms: these are used for marine-based operations, which are set up to contain foam in a defined area. These generally involve the use of floating booms within a natural body of water

F.3.2 Training. Training is normally conducted under circumstances conducive to the collection of spent foam. Some fire training facilities have had elaborate systems designed and constructed to collect foam solution, separate it from the fuel, treat it, and—in some cases—re-use the treated water. At a minimum, most fire training facilities collect the foam solution for discharge to a wastewater treatment facility. Training can include the use of special training foams or actual fire-fighting foams. Training facility design should include a containment system. The wastewater treatment facility should first be notified and should give permission for the agent to be released at a prescribed rate.

F.3.3 System Tests. Testing primarily involves engineered, fixed foam fireextinguishing systems. Two types of tests are conducted on foam systems: acceptance tests, conducted pursuant to installation of the system; and maintenance tests, usually conducted annually to ensure the operability of the system. These tests can be arranged to pose no hazard to the environment. It is possible to test some systems using water or other nonfoaming, environmentally acceptable liquids in the place of foam concentrates if the authority having jurisdiction permits such substitutions. In the execution of both acceptance and maintenance tests, only a small amount of foam concentrate should be discharged to verify the correct concentration of foam in the foam water solution. Designated foam water test ports can be designed into the piping system so that the discharge of foam water solution can be directed to a controlled location. The controlled location can consist of a portable tank that would be transported to an approved disposal site by a licensed contractor. The remainder of the acceptance test and maintenance test should be conducted using only water.

F.3.4 Fixed System Releases. This type of release is generally uncontrolled, whether the result of a fire incident or a malfunction in the system. The foam solution discharge in this type of scenario can be dealt with by event-initiated operations or by engineered containment systems. Event-initiated operations encompass the same temporary measures that would be taken during fire department operations: portable dikes, floating booms, and so forth. Engineered containment would be based mainly on the location and type of facility, and would consist of holding tanks or areas where the contaminated foam water solution would be collected, treated, and sent to a wastewater treatment facility at a prescribed rate.

F.4 Fixed Systems. Facilities can be divided into those without an engineered containment system and those with an engineered containment system.

F.4.1 Facilities without Engineered Containment. Given the absence of any past requirements to provide containment, many existing facilities simply allow the foam water solution to flow out of the building and evaporate into the atmosphere or percolate into the ground. The choices for containment of foam water solution at such facilities fall into two categories: event-initiated manual containment measures and installation of engineered containment systems. Selection of the appropriate choice is dependent on the location of the facility, the risk to the environment, the risk of an automatic system discharge, the frequency of automatic system discharges, and any applicable rules or regulations. "Event-initiated manual containment measures" will be the most likely course of action for existing facilities without engineered containment systems. This can fall under the responsibility of the responding fire department and include such measures as blocking storm sewers, constructing temporary dikes, and deploying floating booms. The degree of such measures will primarily be dictated by location as well as available resources and manpower." The "installation of engineered containment systems" is a possible choice for existing facilities. Retrofitting an engineered containment system is costly and can adversely affect facility operations. There are special cases, however, that can warrant the design and installation of such systems. Such action is a consideration where an existing facility is immediately adjacent to a natural body of water and has a high frequency of activation.

F.4.2 Facilities with Engineered Containment. Any engineered containment system will usually incorporate an oil/water separator. During normal drainage conditions (i.e., no foam solution runoff), the separator functions to remove any fuel particles from drainage water. However, when foam water solution is flowing the oil/water separator must be bypassed so that the solution is diverted directly to storage tanks. This can be accomplished automatically by the installation of motorized valves set to open the bypass line upon activation of the fixed fire-extinguishing systems at the protected property. The size of the containment system is dependent on the duration of the foam water flow, the flow rate, and the maximum anticipated rainfall in a 24- hour period. Most new containment systems will probably only accommodate individual buildings. However, some containment systems can be designed to accommodate multiple buildings dependent upon the topography of the land and early identification in the overall site planning process.

The specific type of containment system selected will also be dependent upon location, desired capacity, and function of facilities in question. They include earthen retention systems, belowground tanks, open-top inground tanks, and sump and pump designs (i.e., lift stations) piped to aboveground or inground tanks. The earthen retention designs consist of open-top earthen berms, which usually rely upon gravity-fed drainage piping from the protected building. They can simply allow the foam water solution to percolate into the ground or can include an impermeable liner. Those containing an impermeable liner can be connected to a wastewater treatment facility or can be suction pumped out by a licensed contractor. Closed-top, belowground storage tanks can be the least environmentally acceptable design approach. They usually consist of a gravity-fed piping arrangement and can be suction pumped out or piped to a wastewater treatment facility. A potential and often frequent problem associated with this design is the leakage of ground water or unknown liquids into the storage tank. Open-top, belowground storage tanks are generally lined concrete tanks that can rely on gravity-fed drainage piping or a sump and pump arrangement. These can accommodate individual or multiple buildings. They must also accommodate the maximum anticipated rainfall in a 24-hour period. These are usually piped to a wastewater treatment facility. Aboveground tanks incorporate a sump and pump arrangement to closed, aboveground tanks. Such designs usually incorporate the use of one or more submersible or vertical shaft, large capacity pumps. These can accommodate individual or multiple buildings.

F.4.3 New Facilities. The decision to design and install a fixed foam water solution containment system is dependent on the location of the facility, the risk to the environment, possible impairment of facility operations, the design of the fixed foam system (i.e., automatically or manually activated), the ability of the responding fire department to execute event-initiated containment measures, and any pertinent regulations.

AFT New facilities might not warrant the expense and problems associated with containment systems. Where the location of a facility does not endanger ground water or any natural bodies of water, this can be an acceptable choice, provided the fire department has planned emergency manual containment measures. Where conditions warrant the installation of engineered containment systems, there are a number of considerations. They include size of containment, design and type of containment system, and the capability of the containment system to handle individual or multiple buildings. Engineered containment systems can be a recommended protective measure where foam extinguishing systems are installed in facilities that are immediately adjacent to a natural body of water. These systems can also be prudent at new facilities, where site conditions permit, to avoid impairment of facility operations. F.5 Disposal Alternatives. The uncontrolled release of foam solutions to the environment should be avoided. Alternative disposal options are as follows: (1) Discharge to a wastewater treatment plant with or without pretreatment (2) Discharge to the environment after pretreatment (3) Solar evaporation (4) Transportation to a wastewater treatment plant or hazardous waste facility Foam users, as part of their planning process, should make provisions to take the actions necessary to utilize whichever of these alternatives is appropriate for their situation.

Section F.6 describes the actions that can be taken, depending on the disposal alternative that is chosen. F.6 Collection and Pretreatment of Foam Solutions Prior to Disposal. F.6.1 Collection and Containment. The essential first step in employing any of these alternatives is collection of the foam solution. As noted above, facilities that are protected by foam systems normally have systems to collect and hold fuel spills. These systems can also be used to collect and hold foam solution. Training facilities are, in general, designed so that foam solution can be collected and held. Fire fighters responding to fires that are at other locations should attempt, insofar as it is practical, to collect foam solution run-off with temporary dikes or other means. F.6.2 Fuel Separation. Foam solution that has been discharged on a fire and subsequently collected will usually be heavily contaminated with fuel. Since most fuels present their own environmental hazards and will interfere with foam solution pretreatment, an attempt should be made to separate as much fuel as possible from the foam solution. As noted in F.4.2, the tendency of foam solutions to form emulsions with hydrocarbon fuels will interfere with the operation of conventional fuel-water separators. An alternative is to hold the collected foam solution in a pond or lagoon until the emulsion breaks and the fuel can be separated by skimming. This can take from several hours to several days. During this time, agitation should be avoided to prevent the emulsion from reforming. F.6.3 Pretreatment Prior to Discharge. F.6.3.1 Dilution. Foam manufacturers and foam users recommend dilution of foam solution before it enters a wastewater treatment plant. There is a range of opinion on the optimum degree of dilution. It is generally considered that the concentration of foam solution in the plant influent should not exceed 1700 ppm (588 gal of plant influent per gallon of foam solution). This degree of dilution is normally sufficient to prevent shock loading and foaming in the plant. However, each wastewater treatment plant must be considered as a special case, and those planning a discharge of foam solution to a wastewater treatment facility should discuss this subject with the operator of the facility in advance. Diluting waste foam solution 588:1 with water is an impractical task for most facilities, especially when large quantities of foam solution are involved. The recommended procedure is to dilute the foam solution to the maximum amount practical and then meter the diluted solution into the sewer at a rate which, based on the total volume of plant influent, will produce a foam solution concentration of 1700 ppm or less. For example, if the discharge is to be made to a 6 million gal/day treatment plant, foam solution could be discharged at the rate of 7 gpm (6,000,000 gal/day divided by 1440 minutes/day divided by 588 equals 7 gpm). The difficulties of metering such a low rate of discharge can be overcome by first diluting the foam solution by 10:1 or 20:1, permitting discharge rates of 70 or 140 gpm respectively. Dilution should also be considered if the foam solution is to be discharged to the environment in order to minimize its impact. F.6.3.2 Defoamers. The use of defoamers will decrease, but not eliminate, foaming of the foam solution during pumping, dilution, and treatment. The foam manufacturer should be consulted for recommendations as to the choice of effective defoamers for use with a particular foam concentrate. F.6.3.3 Method for Determining the Effective Amount of Antifoam Apparatus.

The effective amount of antifoam is determined by using the following apparatus: (1) Balance—1600 gram capacity minimum—readability 0.2 gram maximum (2) One 2 L beaker or similar container (3) One 1 gal plastic or glass jug with cap (4) Eyedropper (5) Optional—10 ml pipette F.6.3.3.1 Procedure. Proceed with the following instructions to determine the effective amount of antifoam: (1) In the 2 L beaker, weigh out 1 gram (1 ml) of antifoam using an eyedropper or the pipette. (2) Add 999 grams of water. (3) Mix well. (4) Weigh out 1000 grams of the solution to be defoamed and place it in the gallon jug. (5) Add 10 grams (10 ml) of the diluted antifoam to the gallon jug using the eyedropper or pipette, cap it and shake vigorously. (6) If the solution in the jug foams, go back to step 5 and repeat this step until little or no foam is generated by shaking the jug; keep a record of the number of grams (ml) that are required to eliminate the foaming. (7) The number of grams (ml) of diluted antifoam required to eliminate foaming is equal to the number of parts per million (ppm) of the antifoam as supplied that must be added to the solution to be defoamed. (8) Calculate the amount of neat antifoam to be added as follows: Volume of solution to be defoamed = V (U.S. gal) ppm of antifoam required = D Lb of antifoam required = W 8.32 V × D ÷ 1,000,000 = W F.6.3.3.2 Example. 10,000 gal of foam solution require defoaming. The procedure above has determined that 150 ppm of antifoam are needed to defoam this solution 8.32 × 10,000 × 150 ÷ 1,000,000 = 12.48 lb. (9) The amount of antifoam to be added will normally be quite small compared to volume of the solution to be defoamed. The antifoam must be uniformly mixed with the solution to be defoamed. It will aid in the achievement of this objective if the antifoam is diluted as much as is practical with water or the solution to be defoamed prior to addition to the solution containment area. The solution in the containment area must then be agitated to disperse the antifoam uniformly. One method of doing this is to use a fire pump to draft out of the containment area and discharge back into it using a water nozzle set on straight stream. Alternatively, if suitable metering equipment is available, antifoam as supplied or diluted antifoam can be metered into the solution discharge line at the proper concentration

. **F.7 Discharge of Foam Solution to Wastewater Treatment Facilities. Biological treatment of foam solution in a wastewater treatment facility is an acceptable method of disposal. However, foam solutions have the potential to cause plant upsets and other problems if not carefully handled. The reasons for this are explained in F.7.1 through F.7.4.**
F.7.1 Fuel Contamination. Foam solutions have a tendency to emulsify hydrocarbon fuels and some polar fuels that are only slightly soluble in water. Water-soluble polar fuels will mix with foam solutions. The formation of emulsions will upset the operation of fuel/water separators and potentially cause the carryover of fuel into the waste stream. Many fuels are toxic to the bacteria in wastewater treatment plants. F.7.2 Foaming. The active ingredients in foam solutions will cause copious foaming in aeration ponds, even at very low concentrations. Aside from the nuisance value of this foaming, the foaming process tends to suspend activated sludge solids in the foam. These solids can be carried over to the outfall of the plant. Loss of activated sludge solids can also reduce the effectiveness of the wastewater treatment. This could cause water quality problems such as nutrient loading in the waterway to which the outfall is discharged. Because some surfactants in foam solutions are highly resistant to biodegradation, nuisance foaming may occur in the outfall waterway. F.7.3 BOD (Biological Oxygen Demand). Foam solutions have high BODs compared to the normal influent of a wastewater treatment plant.

If large quantities of foam solution are discharged to a wastewater treatment plant, shock loading can occur, causing a plant upset. Before discharging foam solutions to a wastewater treatment plant, the plant operator should be contacted. This should be done as part of the emergency planning process. The plant operator will require, at a minimum, a Material Safety Data Sheet (MSDS) on the foam concentrate, an estimate of the five-day BOD content of the foam solution, an estimate of the total volume of foam solution to be discharged, the time period over which it will be discharged, and, if the foam concentrate is protein-based, an estimate of the ammonia nitrogen content of the foam solution. The foam manufacturer will be able to provide BOD and ammonia nitrogen data for the foam concentrate, from which the values for foam solution can be calculated. The other required information is site-specific and should be developed by the operator of the facility from which the discharge will occur.

F.9.1 Toxicity of Surfactants. Fire-fighting agents, used responsibly and following Material Safety Data Sheet instructions, pose little toxicity risk to people. However, some toxicity does exist. The toxicity of the surfactants in fire-fighting foams, including the fluorochemical surfactants, is a reason to prevent unnecessary exposure to people and to the environment. It is a reason to contain and treat all fire-fighting foam wastes whenever feasible. One should always make plans to contain wastes from training exercises and to treat them following the suppliers' disposal recommendations as well as the requirements of local authorities. Water that foams when shaken due to contamination from fire-fighting foam should not be ingested. Even when foaming is not present, it is prudent to evaluate the likelihood of drinking water supply contamination and to use alternate water sources until one is certain that surfactant concentrations of concern no longer exist. Suppliers of fire-fighting foams should be able to assist in evaluating the hazard and in recommending laboratories that can do appropriate analysis when necessary.

F.7.4 Treatment Facilities. Foam concentrates or solutions can have an adverse effect on microbiologically based oily water treatment facilities. The end user should take due account of this before discharging foam systems during testing or training. F.8 Foam Product Use Reporting. Federal (U.S.), state, and local environmental jurisdictions have certain chemical reporting requirements that apply to chemical constituents within foam concentrates. In addition, there are also requirements that apply to the flammable liquids to which the foams are being applied. For example, according to the U.S. Environmental Protection Agency (EPA), the guidelines in E.8.1 through E.8.4 must be adhered to. F.8.1 Releases of ethylene glycol in excess of 5000 lb are reportable under U.S. EPA Comprehensive Environmental Response Compensation & Liability Act (CERCLA), Sections 102(b) and 103(a). Ethylene glycol is generally used as a freeze-point suppressant in foam concentrates. F.8.2 As of June 12, 1995, the EPA issued a final rule 60 CFR 30926 on several broad categories of chemicals, including the glycol ethers. The EPA has no reportable quantity for any of the glycol ethers. Thus foams containing glycol ethers (butyl carbitol) are not subject to EPA reporting. Consult the foam manufacturers' MSDS to determine if glycol ethers are contained in a particular foam concentrate. F.8.3 The EPA does state that CERCLA liability continues to apply to releases of all compounds within the glycol ether category, even if reporting is not required.

Parties responsible for releases of glycol ethers are liable for the costs associated with cleanup and any natural resource damages resulting from the release. F.8.4 The end user should contact the relevant local regulating authority regarding specific current regulations. F.9 Environmental Properties of Hydrocarbon Surfactants and Fluorochemical Surfactants. Fire-fighting foam agents contain surfactants. Surfactants or surface active agents are compounds that reduce the surface tension of water. They have both a strongly “water-loving” portion and a strongly “water-avoiding” portion. Dish soaps, laundry detergents, and personal health care products—such as shampoos—are common household products that contain hydrocarbon surfactants. Fluorochemical surfactants are similar in composition to hydrocarbon surfactants; however a portion of the hydrogen atoms have been replaced by fluorine atoms. Unlike chlorofluorocarbons (CFCs) and some other volatile fluorocarbons, fluorochemical surfactants are not ozone depleting and are not restricted by the Montreal Protocol or related regulations. Fluorochemical surfactants also have no effect on global warming or climate change. AFFF, Fluoroprotein Foam, and FFFP are foam liquid concentrates that contain fluorochemical surfactants. There are environmental concerns with use of surfactants that should be kept in mind when using these products for extinguishing fires or for fire training. These concerns are as follows: (1) All surfactants have a certain level of toxicity. (2) Surfactants used in fire-fighting foams cause foaming. (3) Surfactants used in fire-fighting foams can be persistent. (This is especially true of the fluorine containing portion of fluorochemical surfactants.) (4) Surfactants can be mobile in the environment. They can move with water in aquatic ecosystems and leach through soil in terrestrial ecosystems. F.9.1 through F.9.5 explain what each of these properties mean and what t

2009 https://www.nfpa.org/assets/files/AboutTheCodes/11/11-F2009-ROP.pdf
2011 https://www.nfpa.org/Assets/files/AboutTheCodes/11/11_FOM-AAA_F2014_FDBallotFinal.pdf

We need to make sure from here on in that if a manufacturer is aware of any toxic chemical used in the manufacting of, or that may degrade to form a toxic chemical, they need to tell us. The case of DuPont / Chemours is exactly the same in the PPE side of the issue. Take a look at the CEO of Chemours. Mark Vergnano. He came up through the ranks in DuPont. He made it to VP of DuPont Personal Protection. Then made his way over to Chemours as CEO.

TOXIC TRIFECTA: PFOS, PFOA,PFNA

YOUR TURNOUT GEAR AND PFOA·SUNDAY, NOVEMBER 11, 201853 Reads

I am deeply troubled thinking of the toxic soup the fire service has been fed for 40 years. While no one said nothing to you, these same companies that profess to have FF Cancer at the core of all they do is the most maniacal thing I’ve ever seen. 3M HID the toxic research from the EPA for 30 YEARS… DuPont/Chemours….. where do I begin… http://www.fluoridealert.org/wp-content/pesticides/effect.pfos.class.timeline.htm

If you are in the fire service, you understand the depths of this great omission. If you are not in the fire service, imagine the tobacco makers preaching lung cancer prevention to it's customers, telling them their cancer is from air pollution or asbestos or anything but their cigarettes. YES it's that obscene. DuPont is in everything FF Cancer related, our research, our FF cancer out-reach, even sponsoring the IAFF's FF Cancer Symposium this year as well .. the list goes on and on..

The testing of samples of 2004 new, and never-worn turnout gear turned up 6 PFAS chemicals. ***The method used by Professor Peaslee could only tell us just the fraction of the potential that was in the samples.. read that again.. just the fraction is all it could tell us. That fraction had over 14,000 times the new PFOA MRL recommended by the 2018 CDC PFAS Toxilogical Profile FOR DRINKING WATER.. we're not even close to talking about textile limits. Albeit the EPA has been 'seeking PFOA comments since 2003'. They are still seeking comments. The testing also showed 279 ug/mL of PFNA or, C9. Again, that's just the 'fraction of the potential' in the samples tested. https://station-pride.com/2018/02/18/fire-gear-laboratory-test-results/***

PFNA concerns me as well, due to the nature of it's effects on the spleen. So, what exactly have we been subjected to? When is the testing going to start, and when can we get answers to what we are wearing?

So, between the AFFF that is used in training and practical incidents (that we just saw the first Prop 65 'reproductive cancer warning' on Viking 3% AFFF, and ., the PFOA/PFNA ., in PPE, what have we been subjected to really?

The list of fire stations with water wells testing elevated due to years of training with AFFF has not even been looked at. And yes we have sounded the alarm. Almost weekly we're emailing EPA, CDC, IAFF, NFPA politicos and high ranking officials.

Nov 10, 2018. 90 days since Attorney #RobertBilott notified CDC/ATSDR that firefighters have earned that spot on the Pease AFB PFAS Concept Plan. Didn't the firefighters on that base drink/shower/cook wash engines, hose down hangars, train with, the water too? We do not have another day to waste waiting for CDC and EPA to do something. They've been wringing their hands and asking for PFOA comments for over a decade, KNOWING YOU ARE WADING IN THIS STUFF.https://www.federalregister.gov/…/proposed-data-collection-…

What about the AFFF the FF's are/were exposed to?

This is horrifying to me. The CDC is managing your FF Cancer Registry, and has omitted you from the PFAS concept plan. Where is the outrage fire service???

https://www.cdc.gov/niosh/firefighters/health.html

While we're at it. The FOX study showed FF's serum higher in PFOA and PFNA….. check out the results again from Professor Peaslee's testing….. Remember, in 2015 we had no idea how much PFOA and PFNA was in our PPE. It wasn't even a blip on the radar.

Biomonitoring in California Firefighters Metals and Perfluorinated Chemicals

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274322/

Perfluorinated chemical multivariate models (Tables (Tables66 to to8)8) identified significantly higher (PFOSA) concentrations in firefighters aged 50 years or older. Monthly or more frequent responses to commercial fires were associated with higher PFHpA concentrations. Those who responded to hazardous materials incidents at least monthly had higher concentrations of 2-(N-methyl-perfluorooctane sulfonamido) (N-MeFOSAA) than those who did not, whereas any hazardous materials response was associated with significantly higher PFNA values. PFNA and PFOA were also significantly higher in firefighters whose turnout gear had not been professionally decontaminated within the last year. Participants who used Class A firefighting foam had significantly higher PFHpA concentrations than those who did not use any class of foam. Conclusions: Perfluorodecanoic acid concentrations were three times higher in this firefighter group than in NHANES adult males. Firefighters may have unidentified sources of occupational exposure to perfluorinated chemicals.

PFNA:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4283221/

https://www.ewg.org/sites/humantoxome/chemicals/chemical.php?chemid=100306

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5204304/ :

PFOS, PFNA, and PFOA Sub-Lethal Exposure to Embryonic Zebrafish Have Different Toxicity Profiles in Terms of Morphometrics, Behavior and Gene Expression

https://www.omicsonline.org/acute-immunotoxic-effects-of-perfluorononanoic-acid-pfna-in-cbl-mice-2161-1459.S4-002.php?aid=14207#8

http://www.healthvermont.gov/sites/default/files/documents/pdf/ENV_DW_PFAS_HealthAdvisory.pdf

Yet still, we can't get you studies for PFAS exposure…. stunning.

Toxological Profile 2018 CDC/ATSDR

https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf

1. **536, ATSDR Tox Profile**

Occupational Exposure:

"Individuals who perform jobs that require frequent contact with perfluoroalkyl-containing products, such as individuals who install and treat carpets or *firefighters*, are expected to have occupational exposure to these substances Still, we're not able to get doctors to write scripts to test our serum levels for pfas. Nor are we able to get any direction from the EPA OR CDC. They continue to run tests.. solicit comments… and they do not reply to emails with ANY plan for the fire service.

Diane Cotter

Your Turnout Gear and PFOA

Rindge, NH

https://medium.com/@dianecotter/how-is-it-3m-dupont-and-others-can-sit-on-nfpa-and-not-disclose-toxins-in-equipment-knowing-if-fead0cb24193?fbclid=IwAR0dXpv94ynqUaRg8STl728XKIBn4hqItHtPhmJRIfGCMDw4efH-LQZzmFM