

INTERNATIONAL ASSOCIATION OF FIRE FIGHTERS



Statement of

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before the

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EMERGENCY MANAGEMENT

UNITED STATES SENATE

On

THE FEDERAL ROLE IN THE TOXIC PFAS CHEMICAL CRISIS

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Thank you Chairman Paul, Ranking Member Peters, and distinguished members of the Subcommittee. My name is Timothy Putnam and I am Vice-President of the Tidewater Federal Fire Fighters, Local F 25 of the International Association of Fire Fighters (IAFF). I appreciate the opportunity to appear before you today on behalf of the International Association of Fire Fighters, General President Harold A. Schaitberger, and over 315,000 fire fighters and emergency medical personnel who serve this nation as the first line of defense against emergencies and disasters, natural or man-made.

I come before you today to offer my testimony on the federal role in the toxic PFAS chemical crisis. For over twenty-eight years I have been employed by the Department of Defense, first as an active-duty United States Marine where I served as an Aircraft Rescue Fire Fighter. After four years of military service I immediately transitioned to a civilian fire fighter position with the Department of Navy, specifically with the Navy Region Mid-Atlantic Fire and Emergency Services where I currently hold the rank of Lieutenant, assigned to serve at Joint Expeditionary Base Little Creek / Fort Story. As an active fire fighter, I have witnessed and participated in the routine use of Aqueous Film Forming Foam (AFFF) which is now known to contain the toxic chemicals referred to as Per- and Polyfluoroalkyl substances or PFAS.

The primary mission of the fire service is to deliver critical life-saving fire extinguishment as rapidly as possible. This is particularly true when the fire is being fed by vast quantities of flammable liquids in close proximity to people, such as aboard aircraft. To rapidly combat those fires, since the early 1970s, fire fighters have employed AFFF to aid in extinguishing Class B flammable liquid fires. AFFF works by forming a foam and film coating around the liquid, which

acts as a thermal and evaporation barrier to stop the combustion process. Until 2002 production of toxic AFFF included Perfluorooctane Sulfonic Acid (PFOS). PFOS was essentially banned in the United States that year and manufacturers switched to a less toxic formula which does not contain PFOS. However, the less toxic formula isn't without its own hazards. As this formulation breaks down, it forms a harmful substance known as perfluorooctane acid (PFOA). Today, most foam manufacturers have transitioned to the use of short-chain fluorosurfactants known as C6, but AFFF containing PFOA remains in widespread use.

PFOS and PFOA are part of a larger family of chemicals known as PFAS. PFAS is a very stable man-made chemical, sometimes referred to as a "forever chemical," that does not occur naturally in the environment and may take up to a century to completely break down. Produced in large quantities, substances containing PFAS have been widely used for their ability to repel stains, grease, water, and oil. Further, they were used in the manufacturing of coatings and treatments intended for textile materials, carpets, packaging, and cookware. You have undoubtedly heard of them as they are commonly referred to as Teflon and Scotchguard.

Human Exposure to PFAS and the Fire Fighter

Individuals are exposed to PFAS released into the air, water, and soil in areas where they are manufactured, stored, or used. Following the initial release, PFAS can be transported to other areas through windy conditions, movement of groundwater, flooding, or even food production. With their persistence in the environment, concentrations of PFOS and PFOA accumulate in people, wildlife, food sources, soil, and drinking water.

Typically, toxic chemicals enter the body through one of three routes: ingestion, inhalation, or absorption. Most commonly, people are exposed to toxic PFAS through ingesting contaminated food or drinking contaminated water. For some individuals, like fire fighters working with materials containing PFAS such as AFFF, the chemicals are likely to enter the body through inhalation or absorption.

While engaged in operations requiring the use of AFFF, fire fighters are regularly exposed to toxic PFAS. Personally, I have worked with toxic AFFF on a regular and continuous basis throughout my fire fighting career. During my twenty-eight years with the Department of Defense, the majority of my contact with AFFF containing PFAS occurred without the benefit of adequate personal protection equipment (PPE).

ARFF units are the first responder fire fighting vehicles at airports and airfields. Equipped with separate tanks holding large quantities of water and AFFF, airport fire fighting vehicles can place tremendous quantities of extinguishing agent on a fire. Typically, in aircraft-related incidents foam agents are the first line of attack. The effort to extinguish an aircraft fire frequently involves multiple ARFF vehicles working in a choreographed manner attacking the fire from different angles. Each of the attacking apparatus can place 1,500 to 2,000 gallons of the water and AFFF solution per minute on the fire. Some toxic foam becomes aerosolized as the agents are discharged from the vehicle.

During the 1990's the use of fire fighting foam agents at military bases was virtually unchecked. There was an abundant supply kept in the fire station without any limitation on its use or a requirement to protect one's self with PPE. In fact, during the early part of my career,

AFFF was thought to be so safe that I recall using it as a substitute for vehicle soap to wash fire department vehicles. We also used AFFF foam to clean the fire station floors. Of course, the primary use of AFFF foam was to fight fire and to prepare for any potential incidents. Fire fighters were required to train with and ensure the ready availability of such foam. Thus, I performed daily apparatus equipment checks in which I determined the readiness of my assigned ARFF truck. Readiness checks are done by flowing a few gallons of the water and AFFF solution. The newly discharged foam suds were then captured and placed on a visual spectrometer to determine if the proper ratio of AFFF and water are present. We also conducted training exercises involving hands-on fire extinguishment of jet fuel supplied in an open-air burn pit. While training with handlines, fire fighters would wade into the flaming fuel pit to practice the technique of “pushing foam” across the burning jet fuel. Between the apparatus checks and hands-on training, use of and exposure to AFFF was a regular and common occurrence happening six to eight times a month for fire fighters working alternating shifts like me.

In the mid-1990’s, the burn pit at Naval Air Station Oceana used for training was decommissioned and replaced by a stationary aircraft simulator fueled by propane. Different techniques and agents are used to fight gas fires versus liquid fuel fires. Burning propane gas fires are fought with plain water as AFFF foam agents are not normally used for gas fires. The move to the propane fed simulator greatly reduced the frequency of AFFF discharge during training.

As my career progressed, so too did base awareness of the environmental impacts of toxic foam as base officials began limiting the locations where fire fighters were permitted to

release AFFF. In the early days of my career, AFFF was discharged from fire fighting vehicles on the front and rear apron of the fire station or on nearby grassy areas. Since the late 1990's base environmentalists have designated the areas where fire fighters could routinely discharge the foam. The first designated area I recall was both in and near the decommissioned open-air burn pit. After a few years, the designated area was again relocated to a refueling pit. A refueling pit is a recessed concrete pad that is equipped with drains and an oil-water separator. As these transitions occurred, the frequency of foam discharges occurring as part of regular vehicle readiness checks decreased from several times a month to once a week. By the time of my first transfer from Oceana in 2009, AFFF discharges happening as part of apparatus readiness checks dropped off to a monthly basis and now non-emergency AFFF discharges are taking place on a substantially reduced quarterly or a semi-annual basis in very controlled conditions with an effort being made to capture and recover those discharges. Speaking holistically, as more has been learned about the environmental consequences of PFAS release, fire departments have become more cautious in AFFF discharges.

The Health Effects of PFAS on Fire Fighters and the Need for Medical Monitoring

As we have become more aware of the environmental impacts of PFAS, our knowledge of the human impacts continues to evolve. We know that a single exposure to AFFF by fire fighters results in PFAS entering the body. PFAS remains in the human body for years even if there are no additional exposures. The half-life of PFAS ranges from 2-9 years. This long half-life means that the chemicals remaining in the body where they can build up to concentrations that may cause health effects. When fire fighters experience repetitive exposures, it is highly likely that they will maintain a high concentration of PFAS within the

blood and body tissue as compared to non-fire fighters.

There is evidence suggesting that PFAS can cause tumors in lab animals exposed to very high doses, particularly in the liver, reproductive organs, and pancreas. Studies among highly exposed populations have shown a more than insignificant risk of testicular, kidney, bladder, and thyroid cancer related to PFOA and PFOS exposure. The International Agency for Research on Cancer (IARC) classifies PFOA as a Group 2B carcinogen, meaning it is “possibly carcinogenic to humans” based on limited evidence of carcinogenicity in humans and limited evidence in lab animals.

Studies on non-cancer health effects are also limited due to small study populations and inconsistent results. However, research suggests that high exposures to PFAS are associated with developmental effects during pregnancy or breastfeeding, thyroid damage, increases in blood cholesterol levels, and liver damage. PFAS are corrosive and can cause damage to the skin and eyes, including blindness. Unfortunately, I only learned of this through information provided by my union, the International Association of Fire Fighters, and not my employer. I am convinced all fire fighters should receive mandatory annual training on the hazards of toxic foams.

Regulating PFAS and Approving Safer AFFF Formulas

In 2000, the United States Environmental Protection Agency (EPA) and 3M, the primary manufacturer of PFAS, agreed to a voluntary phase-out of production of AFFF containing PFOS, which was completed in 2002. AFFF containing the more harmful PFOS is no longer made in the U.S.

In 2006, the EPA and the eight major companies that manufacture PFOA launched the 2010/15 PFOA Stewardship Program, in which companies agreed to reduce emissions of PFOA by 95% by 2010 and phase out production by 2015. These voluntary phase-outs did not affect existing AFFF products containing PFAS.

Despite these voluntary efforts, AFFF containing PFOS may still be in use or in stockpiles stored in fire stations and warehouses for many years to come. With a twenty-five-year shelf life, AFFF containing PFOS will be around for another decade or possibly two, and will continue to remain aboard ARFF apparatus despite health concerns.

A suitable substitute for PFAS in fire fighting foams not only has to meet health and environmental standards, but it also must be effective at extinguishing Class B flammable liquid fires. The AFFF used in the U.S. military and in most civilian applications must meet specific requirements for surface tension established in Military Specification MIL-F-24385F to ensure its effectiveness against a wide variety of flammable liquid threats.

The EPA has engaged in reviews of safer substitutes for PFAS AFFF as part of the 2010/15 PFOA Stewardship Program and the New Chemical Program. One suitable substitute is an AFFF that contains certain fluorocarbon surfactants with fewer than six carbons (also referred to as C₆ or fluorotelomer foam) made through telomerization. These foams do not form PFOA when they degrade and are generally less toxic and less persistent in the environment compared to the longer chain PFOA, although they are likely to contain trace amounts of PFOA as a byproduct of manufacturing.

Another option is to develop an effective AFFF that is free of fluorocarbon surfactants altogether, which eliminates the environmental and health hazards associated with PFAS. A

number of these foams are currently on the market. While available for commercial and civilian uses, such foams may not meet the more stringent U.S. military performance standards.

Moving Forward Without Toxic Foam

Despite important advances limiting human and environmental exposure to PFOS and PFOA, we remain concerned that fire fighters continue to be exposed to these toxins in legacy foams still in use or in stockpiles. As a result, fire fighters are continually regularly exposed to foam containing PFAS and at risk for potential health impacts. As we learn more about the potential health impacts of fluorinated chemicals, we must take steps to reduce fire fighters' exposure and protect their health.

Washington State is leading the way in these efforts. In March, Governor Inslee signed legislation banning PFAS in Class B firefighting foam designed for flammable liquid fires and firefighting personal protective equipment. Steps are also being taken at the federal level. The recently negotiated FAA Reauthorization Act contains language championed by Senator Peters permitting airports to use non-fluorinated fire fighting foams. We support this language and are pleased airports will now have the ability to transition away from toxic foams.

We know PFAS presents a health risk to workers, such as fire fighters, who are exposed on a regular basis and thus we seek to ultimately discontinue the use of PFAS foams. In recent years, driven by the European and US reforms, fluorine-free foam technology has advanced to counter concerns raised with PFOS and PFOA fluorinated foams. Fluorine-free foams are now available in the international market.

Fluorine-free foams continue to gain wide acceptance in Europe and Australia where the use of Mil-Spec AFFF isn't required. Several European locations having transitioned to the new formulations have reported acceptable firefighting experiences with fluorine-free UL approved foams. In 2015 an engine fire occurred on a British Airways aircraft located at London's Heathrow International Airport. The fire was successfully extinguished using a fluorine-free foam. Following the incident, officials were not only pleased by the performance of the fluorine-free foam, but also recognized the fluorine-free foam came with the benefit of an absence of known health hazards, zero clean-up cost and no environmental damage. The IAFF supports the use of non-toxic foam formulations.

In the interim, we must acknowledge that fire fighters have been, and will continue to be, exposed to toxic PFAS. In addition to exposures from foam and as a by-product of combustion of consumer goods manufactured with PFAS, such as upholstery, in the past, PFOA was a chemical building block or by-product created within the manufacture of water repellent treatment and moisture barriers for turnout gear. Major U.S. manufacturers have assured IAFF that PFOA is no longer present within the moisture barrier of turnout gear or in the barrier treatments of used on turnout gear, but the toxin may be present in legacy gear. To better protect fire fighter health, we support discontinuing the use of legacy foams and turnout gear containing PFOA.

Few scientific studies of PFAS examine fire fighters. Those that have are of little statistical significance due to the limited size of the test group. We believe more studies on fire fighters' exposures and health impacts must occur. Additionally, we believe all fire fighters must receive annual physicals which include blood testing to determine the level of PFAS in the

fire fighter's bloodstream. Such information will allow fire fighters and their doctors to take active steps to better protect their health and treat any potential health impacts which may have already occurred.

Conclusion

On behalf of the International Association of Fire Fighters, I appreciate the opportunity to testify on the federal role in the toxic PFAS chemical crisis. As a nation, we have made significant positive progress in recognizing the emerging threat to human health caused by PFAS exposure. It is crucial that as we move forward, we take immediate steps to limit the fire fighter exposure to the toxic formulations of AFFF. To the extent that I or the IAFF can assist the Subcommittee in these efforts, I am happy to offer our expertise and pledge to work closely with you and your staffs.

Again, I'd like to thank the Subcommittee for the opportunity to testify today and am happy to answer any questions you may have.