

AR 226 - 1113

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15 July 2002

Charles M. Auer, Director
Chemical Control Division
US EPA - OPPTS
Washington, DC 20460

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Ref. EPA-SNUR

Dear Mr. Auer:

Thank you for your letter of 2 July 2002 and the helpful information.

I have been in contact with NIOSH and learned there is a stakeholder organization "THE FIRE SERVICE JOINT MANAGEMENT WELLNESS - FITNESS INITIATIVE." I sent them selected information from my files and directed them to the EPA web site for more current information on the subject. While I followed-up with several phone calls to Mr. Richard M. Duffy, Assistant to the General President, I have no response yet from that organization. I will send them a copy of your 2 July 2002 letter to me because such information should be helpful to their program. (ref. Enc. 1)

I have also been in contact with some Department of Defense activities, but have no response on any program to detect and prevent such unnecessary risks that may effect the safety, health and long term quality of life for DOD fire fighters and other personnel exposed to Mil Spec (Mil-F-24385F) AFFF (a PFOS compound). This Primary Fire Fighting Agent has been used by the DOD for over 40 years.

I was surprised to learn there are some within the fire fighting community who seem reluctant to welcome medical monitoring that might intrude and/or relate to the habits of their members. So, trying to protect personnel against such unnecessary risks of PFOS compound exposure may be a hard sell. But that should not keep concerned leaders from making the necessary efforts to protect the safety, health and long term quality of life for the fire fighting community and the Marine Ecosystem.

Since I don't have a medical background, I appreciate your corrections and clarification to my interpretation of the: EPA-TOX/2000 18 Oct 2000/to 2675; C. HEALTH EFFECTS (Pg. 62326) of EPA-40CFR-721 OPPTS-50639; FRL-6745-5 RIN 2070-AD43 document. (Enc. 2)

I commend the EPA for its continuing investigation of fluorinated compounds, including other PERFLUOROALKYL SULFONATES PERFLUOROOCTANOIC ACID and its SALTS, and the FLUORINATED TELOMERS. Should the investigation lead to rules limiting the use of this class of compounds in fire fighting agents the Industry is well prepared to deal with such an event.

I have over 30 years of experience in the business of fire protection and can assure you there are several Commercial-Off-The-Shelf (COTS) solutions from the Industry that would eliminate

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the Environmental, Safety and Occupational Health risks now attributed to AFFF type fire fighting agents. Some of these proven COTS technologies would also provide a significant increase in fire fighting extinguishing performance capability that would benefit the general public, homeland security efforts and the Department of Defense needs to meet the 21st Century mission requirements.

Dealing with the ESOH issues regarding this class of compounds provides the industry an opportunity to make a breakthrough increase in fire fighting capability. It would also result in very affordable fire protection platforms/systems for most, if not all, current AFFF applications. If you know of any stakeholders that would provide the leadership and resources to promote environmentally sound, improved fire fighting performance standards, I would greatly appreciate knowing of such contacts. I would follow-up with those people/organizations to help move the effort forward.

I would like to take this opportunity to thank you for your efforts to be helpful and wish you continued success at EPA.

Very truly yours,



J.D. Dunne
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cc: Dr. Kenneth Moritsugu
Mr. Richard M. Duffy

10 May 2002

Richard M. Duffy
Director OH&S
International Association of Fire Fighters, AFL-CIO, CLC
Department of Occupational Health & Safety
1750 New York Ave, NW
Washington, DC 20006
Fax: 202-737-8418

Subject: EPA Recommended Medical Monitoring of Fire Fighters For Effect of PFOS Exposure (ARFF agents)

Gentlemen:

I was advised that your organization is actively involved in efforts to eliminate unnecessary occupational health and safety risks for fire fighters.

One of the latest identified occupational health and safety risk for fire fighters is exposure to PFOS Compounds (the major component of Mil-Spec MIL F24385F, a primary ARFF fire fighting agent for ARFF applications).

Enclosed is selected information that will enable you to access more detailed information for you continued efforts to protect the fire fighting community. In this particular application (ARFF) all people in the area are effected, even after the fire is out and the clean-up efforts commence. It is likely that the information being gathered by the EPA for the SNUR will also lead to regulations for other compounds in this class (used in commercial formulations).

The current data clearly confirms the need for the EPA suggested Medical Monitoring to protect the long-term quality of life for the fire fighters.

I also believe the 3M decision to terminate production should provide the impetus for the industry to now consider Operational Requirements as the basis to select alternative commercial-off-the-shelf (COTS) solutions that eliminate the Environmental, Safety and Occupational Health risks to fire fighters and improve extinguishing capability. I am looking for an organization/activity that has the leadership and resources to address such a Performance Based approach. The Status Quo approach will not meet 21st Century requirements of DOD and/or Homeland Security.

Unfortunately, I don't see much industry/government efforts to solve the problem. These stakeholders seem content to study the issues with emphasis on matching the physical and chemical properties of ARFF. But, that's how we got here in the first place (and it didn't work for halons). In fact, most people are surprised to learn that the original Navy report (NRL Report 6057) never recommended ARFF as a fire extinguishing agent.

I have 30 years experience within the fire protection industry and a unique OUTREACH NETWORK of experienced professionals working to improve real life fire fighting extinguishing Performance Standards within the industry. If we can ever be of help to your efforts, please give me a call. We will give our very best effort to help provide improved capability while eliminating Environmental, Safety and Occupational Health risks for the fire fighting community.

If this subject is not the responsibility of your organization, I would appreciate your recommendations for appropriate contacts. I'll follow-up any lead you provide.

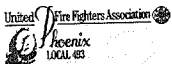
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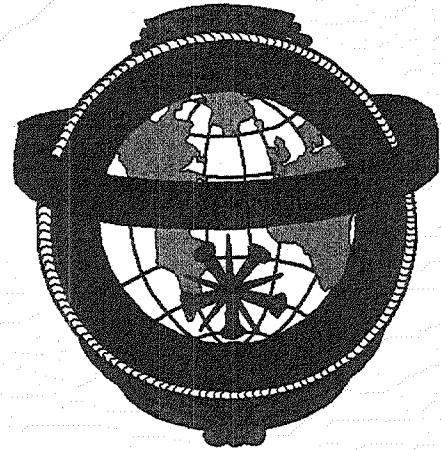
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The Fire Service Joint Labor Management Wellness-Fitness Initiative

Second Edition



Local 2898



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International Standard Book Number: 0-942920-36-8

Mission Statement

Every fire department in cooperation with its local IAFF affiliate must develop an overall wellness/fitness system to maintain uniformed personnel physical and mental capabilities. While such a program may be mandatory, agreement to initiate it must be mutual between the administration and its members represented by the local union. Any program of physical fitness must be positive and not punitive in design; require mandatory participation by all uniformed personnel in the department once implemented; allow for age, gender, and position in the department; allow for on-duty-time participation utilizing facilities and equipment provided or arranged by the department; provide for rehabilitation and remedial support for those in need; contain training and education components, and, be reasonable and equitable to all participants. The program must address the following key points.

- Confidentiality of behavioral, medical, and fitness evaluations
- Physical fitness and wellness programs that are educational and rehabilitative, and not punitive
- Performance testing that promotes progressive wellness improvement
- Commitment by labor and management to a positive individualized fitness/wellness program
- Develop a holistic wellness approach that includes:
 - Medical evaluation
 - Fitness
 - Rehabilitation
 - Behavioral health
- The program should be long term, and, where possible, be made available to retirees.

The Fire Service Joint Labor Management Wellness-Fitness Initiative Task Force

Facilitator

Harold A. Schaitberger, IAFF Executive Assistant to the General President

International Association of Fire Fighters

Alfred K. Whitehead, General President

Richard M. Duffy, Director of Occupational Health and Safety

International Association of Fire Chiefs

Luther Fincher, Fire Chief

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Fairfax County, Virginia Fire and Rescue Department

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City of New York, New York Fire Department

Tom Von Essen, Fire Commissioner

Kevin Gallagher, President, IAFF Local 94

Peter Gorman, President, IAFF Local 854

Phoenix, Arizona Fire Department

Alan Brunacini, Fire Chief

Billy Shields, President, IAFF Local 493

Seattle, Washington Fire Department

James Sewell, Fire Chief

Charles Hawkins, President, IAFF Local 27

The following former Task Force Members participated during the development and revision of the Initiative:

International Association of Fire Chiefs

Richard "Smokey" Dyer, Past President

Richard Marinucci, Past President

R. David Paulison, Past President

Austin, Texas Fire Department

Robin Paulsgrove, Past Fire Chief

Mike Marks, Past President, IAFF Local 975

Doug Fowler, Past President, IAFF Local 975

Calgary, Alberta Fire Department

Jack Ross, Past Fire Chief

Murray Castle, Past Acting Fire Chief

Fairfax County, Virginia Fire and Rescue Department

Glenn Gaines, Past Fire Chief

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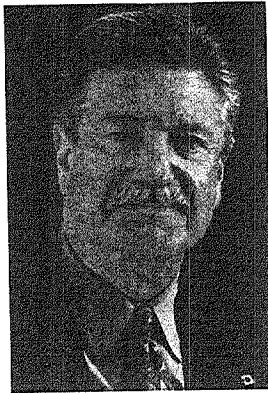
Pat Cantelme, Past President, IAFF Local 493

Seattle, Washington Fire Department

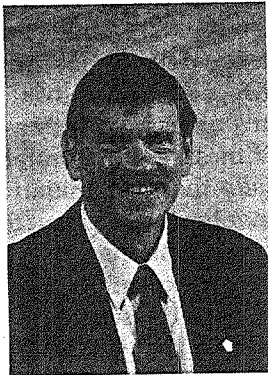
Paul Harvey, Past President, IAFF Local 27

Michael Milam, Past President, IAFF Local 27

Foreword



Harold A. Schaitberger
General President
IAFF



Michael Brown
President
ICHIEFS

The International Association of Fire Fighters and the International Association of Fire Chiefs have joined together in an unprecedented endeavor. We have gathered together some of North America's finest fire departments to build a stronger fire service by strengthening our foundation—the fire fighter and EMS responder. Meeting the challenges of tomorrow's fire service requires that we keep our uniformed personnel fit today.

The *Fire Service Joint Labor Management Wellness-Fitness Initiative* has been an exciting challenge for all of us involved in this positive process for the fire service. In this document and throughout the process of its development, we have addressed the needs of the total individual in a program to build and maintain fit uniformed personnel. Fitness—physical, mental, and emotional—requires an effective wellness program available to recruits, incumbents, and retirees. Components of the Wellness-Fitness Initiative include medical evaluation, fitness, injury/fitness/medical rehabilitation, behavioral health, and data collection.

It is no secret that, historically, the fire service has known more about their apparatus and equipment than the uniformed personnel who provide emergency services and use such equipment. Fire fighters and EMS responders respond to emergency incidents that require extreme physical output and often result in adverse physiological and psychological outcomes. These adverse outcomes, over time, can and do effect the overall wellness of the fire fighting and emergency response system. Often, past attempts to address personnel fitness have been piecemeal, such as the recent trends to unilaterally implement timed, task-based performance tests. Such piecemeal approaches have failed to produce universally acceptable and productive results.

Fire chiefs and IAFF local union presidents participating in the Fire Service Joint Labor Management Wellness-Fitness Initiative have contributed to developing an overall wellness/fitness system with a holistic, positive, rehabilitating and educational focus. All participants have committed themselves to overcoming the historic fire service punitive approaches to physical fitness and wellness issues. They have committed to moving beyond negative timed, task-based performance testing to progressive wellness improvement. And, most importantly, all labor and management representatives jointly have committed themselves to the implementation of an individualized wellness/fitness program based on the recommendations in this document.

The ultimate goal of the comprehensive *Fire Service Joint Labor Management Wellness-Fitness Initiative* is to improve the quality of life of all uniformed personnel. The project seeks to demonstrate the value of investing wellness resources over time to maintain fit, healthy, and capable fire fighters and EMS responders throughout their career. An effective program should realize significant cost savings in lost work time, workers compensation, and disability. In addition, through data collection and analysis, participating departments will create an invaluable database suitable for comparisons throughout the fire service.

This comprehensive project on physical fitness and wellness issues involved the creation of a network of geographically diverse fire departments with excellent union/management relations. Each selected fire department was represented by the fire chief and the IAFF local union president, with invitations extended to the departments' technical experts. As participants, fire department and IAFF local union officials detailed their physical fitness programs and needs, assisted in the creation of a practical fire service program, and committed to share new knowledge with the consortium. The IAFF has facilitated this effort and provided resources needed to complete this project. The ICHIEFS, as an organization, participated in all phases of this Wellness-Fitness Initiative.

Three task force meetings and three separate technical committee meetings were held as part of this Initiative. The task force, consisting of the department chiefs and IAFF local union presidents, directed the content of the document. Each department was represented on the technical committee by exercise physiologists, fitness coordinators, department physicians, behavioral health professionals, and information management personnel. Expert advisors were utilized throughout the process to assist with meeting proceedings. Finally, the IAFF Health and Safety Department coordinated the work of the task force and technical committees.

The Fire Service Joint Labor Management Wellness-Fitness Initiative is a complete physical fitness and wellness program package. The developed program includes a manual, video, and data collection protocol.

The process supporting the creation of this Initiative is truly unprecedented within the fire service. Within seven months, we gathered together over 80 talented and knowledgeable people for six meetings, supported by each fire department's and IAFF local union's funds, to conceive, develop, and approve of all aspects of this program. Additionally, those ten departments and IAFF local unions involved have committed themselves to not only serve as regional wellness/fitness resource centers, but most importantly, formally committed to adopting *fully* the total Initiative program. We recognize and applaud the efforts of everyone involved throughout the development of this Initiative. We have committed both our organizations, the IAFF and the ICHIEFS, to support the development and full implementation of the Initiative throughout the United States' and Canada's professional fire service.

Since the initial distribution of this manual, the IAFF, the ICHIEFS, the Task Force, and technical committee members have continued to address each of the Initiative's components. The second revision of this manual reflects our commitment to keep this project current.

meter cubed per mole), respectively. The vapor pressure and water solubility values were obtained from Table 4, p.16 of the March 1, 2000, white paper by 3M, Sulfonated Perfluorochemicals in the Environment: Sources, Dispersion, Fate and Effects (Ref. 1). These Henry's Law values suggest that volatilization from water to air is not very likely. According to 3M, testing is planned and/or underway for the environmental properties, fate, and transport of PFOS (Ref. 1). With more complete data, EPA would be able to make more definitive assessments. With the present data, the Agency can only speculate on environmental transport and partitioning of PFOS, although current information suggests strongly that it is persistent and may bioaccumulate.

C. Health Effects

The Agency's hazard analysis for PFOS is a review of health hazard and biomonitoring data (Ref. 8). Toxicology studies show that PFOS is well absorbed

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orally and distributes primarily in the serum and liver. PFOS can also be formed as a metabolite of other perfluorinated sulfonates. It does not appear to be further metabolized. Elimination from the body is slow and occurs via both urine and feces. Serum PFOS levels in three retired male 3M chemical workers have been followed for 51/2 years and suggest a mean elimination half-life ($t_{1/2}$) of 1,428 days (approximately 4 years). Based on the pharmacokinetic data obtained from a 28-day oral study in male and female monkeys, a volume of distribution (V_d) of 0.19 L/kilogram (kg) was reported; no sex differences in the pharmacokinetic parameters were noted.

PFOS has shown moderate acute toxicity by the oral route with a rat LD50 of 251 mg/kg. A 1-hour LC50 of 5.2 mg/L in rats has been reported. PFOS was found to be mildly irritating to the eyes and non-irritating to the skin of rabbits. PFOS was negative in mutagenicity studies in five strains of salmonella and did not induce micronuclei in an in vivo mouse bone marrow micronucleus assay.

Numerous repeat-dose oral toxicity studies on PFOS have been conducted in rats and primates. Adverse signs of toxicity observed in rat studies included increases in liver enzymes, hepatic vacuolization and hepatocellular hypertrophy, gastrointestinal effects, hematological abnormalities, weight loss, convulsions, and death. These effects were reported at doses of 2 mg/kg/day and above. Adverse signs of toxicity observed in Rhesus monkey studies included anorexia, emesis, diarrhea, hypoactivity, prostration, convulsions, atrophy of the salivary glands and the pancreas, marked decreases in serum cholesterol, and lipid depletion in the adrenals. The dose range for these effects was reported between 1.5-300 mg/kg/day. No monkeys survived beyond 3 weeks into treatment at 10 mg/kg/day, or beyond 7 weeks into treatment at doses as low as 4.5 mg/kg/day. At doses as low as 0.75 mg/kg/day, Cynomolgus monkeys exhibited low food consumption, excessive salivation, labored breathing, hypoactivity, ataxia, hepatic vacuolization and hepatocellular hypertrophy, significant reductions in serum cholesterol levels, and death.

Postnatal deaths and other developmental effects were reported at low doses in offspring in a 2-generation reproductive toxicity study in rats. At the two highest doses of 1.6 and 3.2 mg/kg/day, pup survival in the first generation was significantly decreased. All first generation offspring (F1 pups) at the highest dose died within a day after birth while close to 30% of the F1 pups in the 1.6 mg/kg/day dose

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group died within 4 days after birth. As a result of the pup mortality in the two top dose groups, only the two lowest dose groups, 0.1 and 0.4 mg/kg/day, were continued into the second generation. The no observed adverse effect level (NOAEL) and lowest observed adverse effect level (LOAEL) for the second generation offspring (F2 pups) were 0.1 mg/kg/day and 0.4 mg/kg/day, respectively, based on reductions in pup body weight. Reversible delays in reflex and physical development were also observed in this study, raising concerns about the potential for developmental neurotoxicity following exposure to PFOS.

Developmental effects were also reported in prenatal developmental toxicity studies in the rat and rabbit, although at slightly higher dose levels. Signs of developmental toxicity were evident at doses of 5 mg/kg/day and above in rats administered PFOS during gestation. Significant decreases in fetal body weight and significant increases in external and visceral anomalies, delayed ossification, and skeletal variations were observed. Abnormalities of the lens of the eye were also reported at doses as low as 1 mg/kg/day in one rat prenatal developmental study, but could not be repeated in a second study of similar design. At doses of 2.5 mg/kg/day and above, significant reductions in fetal-body weight and significant increases in delayed ossification were observed in rabbits administered PFOS during gestation.

In human blood samples, PFOS has been detected in the serum of occupational and general populations in the parts per million (ppm) to parts per billion (ppb) range. In the United States, recent blood serum levels of PFOS in manufacturing employees have been as high as 12.83 ppm, while in the general population, serum collected from blood banks and commercial sources have indicated mean PFOS levels of 30-44 ppb. Levels in a very small sample of children yielded even higher results, with a mean level of 54 ppb.

Sampling of several wildlife species from a variety of sites across the United States has shown widespread distribution of PFOS. In recent analyses, PFOS was detected in the ppb range in the plasma of several species of eagles, wild birds, and fish. Endogenous levels of PFOS have also been detected in the ppb range in the livers of unexposed rats used in toxicity studies, presumably through a dietary source (fishmeal).

Although the PFOS levels detected in the blood of the general population are low, this widespread presence, combined with the persistence, the bioaccumulative potential, and the reproductive and subchronic toxicity of the chemical, raises concerns for potential adverse effects on people and wildlife over time should the chemical substances continue to be produced, released, and accumulated in the environment.

D. Exposure Data

As indicated in Unit IV.C., PFOS has been detected at low levels in the blood of humans and wildlife throughout the United States, providing clear evidence of widespread exposure to the chemical. PFOS has been in commercial use since the 1950's, predominantly in soil and stain-resistant coating products on fabrics, carpets, and leather, and in grease and oil resistant coatings on paper products, including food contact papers. Other uses leading to environmental releases include fire fighting foams. The various surface treatment uses constitute the largest volume of PFOS production and are believed to present the greatest potential for widespread human and environmental exposure to PFOS. Studies are underway to determine the routes of exposure which have led to the detection of PFOS in human and animal blood. There are several potential pathways that may account for the widespread exposure