196461

1000 Columbia Avenue
Linwood, PA 19061-3997
USA

tel (610) 859 3000
(800) 776 3626
fax (800) 355 3626

Symphonex

October 8, 2002

Federal Aviation Administration
Transport Airplane Directorate
Docket Management System
U.S. Department of Transportation
400 Seventh Street, S.W., Room Plaza 401
Washington, D.C. 20590-0001

Re: Docket No. FAA-1999-6411 -54

Dear Sirs:

Symphonex Inc. submits these comments regarding the FAA's amendment of SFAR 88 (the "SFAR Amendment"), announced September 10, 2002. 67 Fed. Reg. 57490 (Sept. 10, 2002). Symphonex is a wholly-owned subsidiary of Foamex International Inc. ("Foamex"), and is engaged in the manufacture of technical foam products for advanced applications. Foamex is a leading producer of high-performance polymers for diverse applications in the industrial, aerospace, defense, electronics and computer industries. Symphonex submits these comments as the manufacturer of Safety Foam, an advanced foam product presently used in advanced military aircraft fuel tanks for flammability reduction and mitigation.

1. The SFAR Amendment Properly Allows Alternative Means of Achieving Equivalent Safety

The SFAR Amendment properly recognizes that because the original May 7, 2001, SFAR was based on the "identical ignition prevention requirements" as are imposed on new planes, the existing SFAR could result in an "unnecessary and inappropriate burden" to develop design changes that might "not result in an improvement in safety" in the existing transport fleet. 67 Fed. Reg. at 57491L.

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In the SFAR Amendment, the FAA recognized that "reduced fuel tank flammability, in combination with prevention of ignition sources, would provide the needed level of safety." *Id.* Thus, the SFAR Amendment achieves the regulatory parity sought by the FAA by providing that existing certificate holders may comply with the SFAR by demonstrating that its fuel tank systems compensate for any variances from the design requirements of §25.981 "by factors that provide an equivalent level of safety." SFAR Amendment, at new § 2(d).

2. Reticulated Polyurethane Foam Achieves The Required "Equivalent Safety Levels"

In adopting the SFAR Amendment, the FAA stated that "[a]t the time of the rulemaking ... the FAA did not have data to support [a requirement of] reduced fuel tank flammability on in-service airplanes." 67 Fed. Reg. at 57491C. This is not strictly correct. In fact, there is extensive historical data supporting the efficacy of fully packed reticulated foam installations.[1] Specific examples of the use of Symphonex's Safety Foam include use by the following:

- The United States Air Force in aircraft such as the F-4, F-5, F-15, and C-130.

- The United States Navy in aircraft such as the F-18.

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1 *E.g.*, Aviation Rulemaking Advisory Committee: Fuel Tank Harmonization Work Group Final Report (July 1998), at 25 (reticulated polyurethane foam is "available for installation inside aircraft fuel tanks to reduce the risks of aircraft hull losses in case of explosions"; the "material has been used effectively on US military aircraft such as ... C-130"); *id.*, at Attachment 6 — Report of Task Group 4: Foam, at 33 ("[t]here is extensive military test and operational experience ... that indicates that a properly installed fully packed reticulated foam installation is 100% effective in preventing overpressure hazards resulting from any internal or external ignition source"). *See also* Advisory Circular No. 25.981-2 (Apr. 18, 2001) (the "U.S. Air Force and other military forces have demonstrated the effectiveness of using appropriate foams to fill the fuel tank and thereby control the pressure rise following an ignition of the fuel tank and thereby control the pressure rise following an ignition.... This method is in use on several types of airplane. The applicant may use such a foam installation to satisfy the requirements of §25.981(c)(2)").

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- United States Army helicopters.
- Race cars, under the authority of the United States Auto Club.
- Other military applications, such as armored vehicles, refueling vehicles, boats, and hovercraft.
- Other nonmilitary applications, such as high-speed watercraft, security limousines and private security vehicles, and filter-spouts in gas containers.

The SFAR Amendment Preamble continues:

> Since the rulemaking, FAA research into nitrogen inerting systems has shown that the practicality of incorporating nitrogen inerting systems into in-service airplanes has significantly improved. Type certificate holders may therefore wish to propose use of reduced fuel tank flammability to mitigate the need to make other more costly changes or implement expensive maintenance actions to prevent certain fuel tank ignition sources.
>
> *Id.*

The SFAR Amendment Preamble improperly and unfairly gives the impression that only nitrogen inerting has been shown practical or effective in reducing fuel tank flammability in an ignition context. The statement is improper because we believe the record is clear that reticulated foam is practical and effective.[2/] Moreover, the statement is unfair because it suggests that the

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2 *See* note 1, above. Indeed, in discussing §25.981's requirement that fuel tank installations be designed to minimize development of flammable vapors, the FAA stated that "if an applicant concludes that such minimization is not advantageous, it may propose means to mitigate the effects of an ignition of fuel vapors in the fuel tanks. For example, such means might include installation of fire suppressing polyurethane foam." [p45]

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FAA has taken a position on which technology should be used when, in fact, the SFAR is a performance based standard.[3/]

In light of the above, and in order to eliminate any potential confusion as to the nature and scope of the SFAR Amendment, Symphonex respectfully submits that the FAA should, upon finalizing the SFAR Amendment, reiterate and clarify the following:

(1) That the SFAR Amendment is technology- and product-neutral and is a performance standard;

(2) That foam has been shown effective in a number of military airplane applications; and

(3) That all proven effective vapor minimization and explosion mitigation technologies are acceptable.

Thereafter, the FAA should let market forces determine which, among the effective systems, will be employed. Symphonex submits that such determination, in turn, should be one that is affected by the additional potential benefits of foam in scenarios involving the limitation or mitigation of explosiveness in an impact context. As discussed in Section 3, *infra*, the benefits of foam in an impact context were not considered during the promulgation of the SFAR or §25.981.

3. Foam May Mitigate Explosion in Impact Situations

Both §25.981 and SFAR 88 were conceived, studied and promulgated before the events of September 11, 2001, and the crash of American Airlines 587, bound for Santo Domingo from JFK Airport, into Rockaway, Queens, New York. Both of those events, one an accident and one a deliberate act using the fuel system of an airplane, highlight a related issue of fuel system safety — the

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3 *E.g.*, 66 Fed. Reg. 23113, 23113 (May 7, 2001) ("this final rule requires a means to minimize flammability or a means to mitigate the effects of ignition. As a performance-based regulation, this allows the use of any effective, approved means, but does not require the use of any one particular means").

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explosiveness of airplane fuel tanks upon impact, whether such impact occurs with fixed objects or the earth.

To date, the FAA's fuel system safety rulemaking proceedings have not addressed the important considerations and potential benefits associated with foam in an impact context. As a result of years of development of foam technology for the purpose of achieving fire and explosion suppression, Symphonex is currently studying the potential benefits of safety foam to assist in dampening or mitigating the effects of fuel tank explosion and fire as a result of an airplane impact, whether such impact is due to terrorism or mechanical failure.

In this and similar rulemakings, the FAA needs to be sensitive to the issue of impact. In evaluating costs and benefits, for example, we believe the FAA should factor into its benefits calculation the lives or property that might be saved through the use of technology such as foam in airplane fuel tanks in an impact scenario. In point of fact, the FAA has just issued a Supplemental notice of proposed rulemaking that proposes to require improved crashworthiness standards for all passenger and flight attendant seats in transport category airplanes. In proposing the new rules, the FAA confirmed that its purpose "is to increase passenger protection and survivability in impact-survivable accidents."[4]

Accordingly, Symphonex respectfully submits that the FAA should undertake a rulemaking with the goal of ensuring that certificate holders are required to mitigate the effects of potential fuel system explosiveness in the context of impact. In addition, Symphonex submits that the FAA should immediately commence its own R&D program, and/or support industry R&D efforts, for the purpose of quantifying the safety benefits of polyurethane foam in

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[4] See "Improved Seats in Air Carrier Transport Category Airplanes", Docket No. FAA-2002-13464; Notice No. 02-17; Supplemental Notice of Proposed Rulemaking, 67 Fed. Reg. 62294, 62294 (October 4, 2002).

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the situations described above. The events of the past year, and the resulting loss of life and property, demand that such action be afforded the highest priority by the FAA.

Respectfully submitted,

Mr. John W. Galbraith
Director, Government Programs
Technology & Development
Symphonex Inc.
1000 Columbia Avenue
Linwood, PA 19061
(610) 859-3137 - Telephone
(484) 214-0397 - Facsimile