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**AIR LINE PILOTS ASSOCIATION, INTERNATIONAL**

535 HERNDON PARKWAY □ P.O. BOX 1169 □ HERNDON, VIRGINIA 20172-1169 □ 703-689-2270  
888-FLY ALPA (888-359-2572) □ FAX 703-689-4370

September 29, 2004

Robert A. McGuire  
Associate Administrator for Hazardous Materials Safety, DHM-1  
U.S. Department of Transportation  
Research and Special Programs Administration  
Office of Hazardous Materials Safety  
400 7th St., S.W.  
Washington, DC 20590

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U.S. DEPARTMENT OF TRANSPORTATION

Subject: Lithium Battery Shipments Transported via the Air Mode

Dear Mr. McGuire:

The Air Line Pilots Association, International (ALPA), representing the safety interests of 64,000 professional airline pilots flying for 43 airlines in the United States and Canada, is greatly concerned that packaging standards currently in place for lithium battery shipments do not adequately protect the aircraft and its occupants from the potential fire hazard posed by these shipments.

On April 28, 1999, a fire occurred at a cargo facility at Los Angeles International Airport after a pallet of lithium batteries was damaged during unloading. The fire erupted approximately 3 hours and 40 minutes after the pallet was damaged, and quickly spread to an adjoining pallet of undamaged batteries. Because of a special provision in place at the time of the fire, the batteries were permitted to be shipped without being identified as hazardous material requiring appropriate identification, marking, labeling, and testing. In response to this incident and the subsequent National Transportation Safety Board (NTSB) report, the Research and Special Programs Administration (RSPA) issued rulemaking, which substantively addressed the deficiencies in the identification, marking, labeling, and testing of lithium batteries shipped in bulk, as well as increasing packaging standards to prevent the short-circuiting of batteries. Unfortunately, this rulemaking did not address the susceptibility of an undamaged lithium battery shipment to fire, or the severity of such a fire. This was evidenced by the ease in which the fire in Los Angeles spread to the adjoining undamaged pallet of batteries, and the difficulty the fire department had in extinguishing the fire.

This was also a principle finding of the June 2004 Federal Aviation Administration (FAA) Technical Center report, DOT/FAA/AR-04/26, entitled "Flammability Assessment of Bulk-Packed, Nonrechargeable Lithium Primary Batteries in Transport Category Aircraft." This study

was conducted in response to NTSB Recommendation A-99-85<sup>1</sup>, issued November 16, 1999, which recommended the FAA and RSPA evaluate the fire hazards posed by lithium batteries in an air transportation environment and the involvement of packages containing large quantities of tightly packed batteries in a cargo compartment fire. Among the troubling conclusions included in this report, the FAA found that a relatively small fire source was required to start the batteries on fire; that once a fire was initiated it quickly spread to the remainder of the batteries until all batteries were involved in the fire; that the temperature in the testing compartment could rise to 1,400°F (above the melting point of aluminum); and that the batteries burned in an explosive manner, including a pressure pulse sufficient to cause the failure of a cargo compartment. Perhaps the most troubling finding was that the Halon 1301 suppressant currently used in aircraft cargo compartments was completely ineffective in suppressing a lithium battery fire, even if discharged immediately after initiation of the fire, and that the heat from a suppressed cargo fire was sufficient to ignite a bulk shipment of lithium batteries.

The risk associated with bulk shipments of lithium batteries is fairly unique within the dangerous goods transportation system, in that nothing other than an improperly packaged or damaged shipment of batteries is required to initiate a fire. For flammable liquids, an ignition source is still required once a package has failed and the shipment has leaked. Once a shipment of lithium batteries has been damaged, there is a significant likelihood that the batteries will initiate and catch fire, overcoming the on-board fire suppression capabilities and likely causing the loss of the aircraft and all aboard. As such, bulk shipments of lithium batteries represent a similar risk as charged oxygen generators and should be governed by similar regulations.

In fact, in the notice of proposed rulemaking Docket HM-224B currently open for comment, RSPA proposes packaging standards for oxygen cylinders which would require the packaging for the cylinders to withstand a 400°F temperature for 3 hours. This is roughly equivalent to the temperature of a suppressed cargo fire during an ETOPS (Extended Twin Engine Operations Performance Specification) diversion. Yet the current packaging standards for lithium batteries offer no protection against a suppressed cargo fire, while the severity of a lithium battery fire would far exceed that of a fire fed by an oxygen cylinder.

The Air Line Pilots Association, International urges RSPA to develop packaging standards for lithium batteries similar to those in place for other commodities, which in the event of a fire, including a suppressed cargo fire, would result in the loss of the airplane. The packaging should not only be sufficient to protect the batteries from damage and short-circuiting, but also should be adequate to protect the batteries from self-ignition if exposed to the heat from a suppressed or

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<sup>1</sup> The National Transportation Safety Board recommends that the Federal Aviation Administration: With the Research and Special Programs Administration, evaluate the fire hazards posed by lithium batteries in an air transportation environment and require that appropriate safety measures be taken to protect aircraft and occupants. The evaluation should consider the testing requirements for lithium batteries in the United Nations document *Transport of Dangerous Goods Manual of Tests and Criteria*, the involvement of packages containing large quantities of tightly packed batteries in a cargo compartment fire, and the possible exposure of batteries to rough handling in an air transportation environment, including being crushed or abraded open. (A-99-85) November 16, 1999.

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unsuppressed cargo fire. Additionally, in light of the FAA testing of a single lithium-ion computer battery, we request that further testing of lithium-ion batteries and batteries in equipment be accomplished.

The severity of this issue requires immediate attention, and we look forward to your response. If these criteria cannot be met, bulk shipments of lithium batteries should be forbidden from both passenger and cargo-only aircraft until adequate packaging standards are in place. This is consistent and more restrictive than the NTSB Recommendation<sup>2</sup> A-99-81 to the RSPA to prohibit lithium batteries from being carried on board passenger-carrying aircraft.

Thank you for the opportunity to provide comment. We are available to discuss this matter further. Please contact Mark Rogers, Director of ALPA's Dangerous Goods Programs, directly at mark.rogers@ALPA.org or via Rick Kessel, ALPA Engineering and Air Safety Department staff at 703/689-4202; rick.kesselr@ALPA.org.

Sincerely,



John Cox  
Executive Air Safety Chairman

JMC/kr

cc: The Honorable Ellen Engleman Conners  
National Transportation Safety Board  
490 L'Enfant Plaza, S.W.  
Washington, DC 20594-0003

William Wilkening, Jr.  
Director, Office of Hazardous Materials, ADG-1  
Federal Aviation Administration  
800 Independence Avenue, S.W.  
Washington, DC 20591

Bob Richard  
International Standards Coordinator, DHM-5  
Research and Special Programs Administration, DOT  
Office of Hazardous Materials Safety  
400 7th St., S.W.  
Washington, DC 20590

Edward T. Mazzullo  
Director, Office of Hazardous Materials Standards, DHM-10  
(same address as Bob Richard)

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<sup>2</sup> The NTSB recommends that the Research and Special Programs Administration: Pending completion of your evaluation of the fire hazards posed by lithium batteries in an air transportation environment, prohibit the transportation of lithium batteries on passenger-carrying aircraft. (A-99-81) November 16, 1999.