

FIRE MITIGATION STRATEGIES FOR AIRCRAFT

BY CAPTAIN BOB BROWN

Aviation has a remarkable safety record, but there is a growing threat that urgently must be addressed: The number of fires while transporting lithium batteries on aircraft is increasing at an alarming rate. You may be surprised to learn that in 2018, an average of one lithium battery fire occurred onboard an aircraft every week. This presentation provides a pilot's perspective on the threat, explains the risk, and addresses current and future mitigation strategies to make aviation safer.

Efforts are underway to mitigate the threat. Many cargo airlines are installing quick-donning, full-face oxygen masks for pilots that provide significant protection from smoke and fumes. In addition, several cargo airlines have installed vision assurance systems that allow a pilot to safely fly in a smoke-filled environment. Several express-package airlines have adopted the use of fire blankets for pallets and fire-resistant containers for transporting batteries. In the passenger airline world, airlines are beginning to voluntarily equip their aircraft with fire containment bags.

Another effort involves certification of fire detection and suppression systems to be placed in individual fire-resistant containers. This type of system has applications in both the passenger and cargo airline world and would be particularly useful when transporting undeclared hazardous materials. New packaging standards under development by SAE involve engineering a box to the point where it could contain a fire from a lithium battery inside the package.

Finally, the most important effort promotes a third-party validation process for newly manufactured batteries being transported to the retail industry. This would involve identifying the true risk of a battery through science by testing the battery to the point of failure. Testing is crucial to understanding the power and unpredictability of lithium batteries overheating and going into full thermal runaway.

The threat of a lithium battery fire on an aircraft is real. Those who work in the aviation industry are deeply concerned. While some mitigation strategies are underway, additional engineering and research are needed to counteract the threat.

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