

# NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

ISSUED: August 26, 1981

Forwarded to:

Honorable J. Lynn Helms  
Administrator  
Federal Aviation Administration  
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-81-93

On September 2, 1980, an Israel Aircraft Industries Model 1124 experienced a cabin fire while cruising at 35,000 feet near Iowa City, Iowa. Most of the pilot's instruments failed; the pilot's instrument lights went out; the computer for the left engine fuel control became inoperative; and control of several other systems was lost. Warning lights did not come on, and no circuit breaker opened. The fire was extinguished but reignited twice during the descent and landing. Because fuel could not be dumped, an overweight (21,000 pounds) night, emergency landing was accomplished. Landing flaps and thrust reversing were unavailable, the antiskid was inoperative, and because heavy braking was used, the brakes caught fire and subsequently failed. As a result, the aircraft overran the runway and stopped beyond the end where the passengers and crew disembarked. The fire department extinguished the fire. There were no injuries; however, the aircraft was substantially damaged.

The Safety Board's investigation disclosed that a wire bundle located behind a coffeemaker chafed and shorted to the rear of the coffeemaker container case. As a result, the bundle burned through and separated. The wire bundle contained communication and accessory distribution wiring to the cockpit from the remote-control circuit breaker panel located in the aft luggage compartment. The remote-control circuit breaker (100 amp) used to protect the accessory and communications bus did not open. The remote-control circuit breaker is designed to provide protection through a thermal sensor which opens a 0.5-amp circuit breaker in the cockpit. Both the 0.5-amp circuit breaker and the remote-control circuit breaker were tested, and they functioned properly.

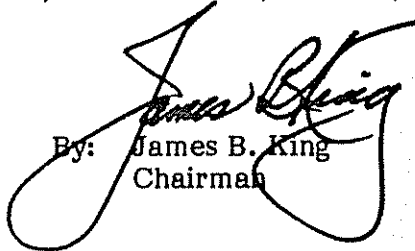
On September 3, 1980, the manufacturer took action to reroute the wire bundle so that it could not contact the coffeemaker. The Federal Aviation Administration subsequently issued Airworthiness Directive (AD) 80-19-15 to remove the potential of chafing. However, the AD did not require any modification of the circuit protection.

As required in 14 CFR 25.1357, Circuit Protective Devices, automatic protective devices must be used to minimize distress to the electrical system and hazard to the airplane in the event of wiring faults or serious malfunction of the system or connected equipment. With regard to this incident, the Safety Board believes that the aircraft's automatic electrical circuit protection should have prevented the overheating and fire that destroyed important electrical wiring. Further, we believe that the provisions of 14 CFR 25.1357 were not satisfied in that the installed automatic protection device did not open the circuits it was designed to protect.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Evaluate the adequacy of the electrical system fault protection devices on Israel Aircraft Industries 1124 aircraft to ensure that the protective devices will minimize hazards to the aircraft when short circuits occur.  
(Class II, Priority Action) (A-81-93)

KING, Chairman, McADAMS, and GOLDMAN, Members, concurred in this recommendation. DRIVER, Vice Chairman, and BURSLEY, Member, did not participate.

  
By: James B. King  
Chairman