International Systems Fire Protection Working Group

Active Fire Protection in Hidden Areas

FAA Technical Center

NTSB review of crew actions during inflight fires has resulted in a series of recommendations calling for improved crew training and modification of cabin interiors to improve access to fires burning behind panels.

Incidents Included:

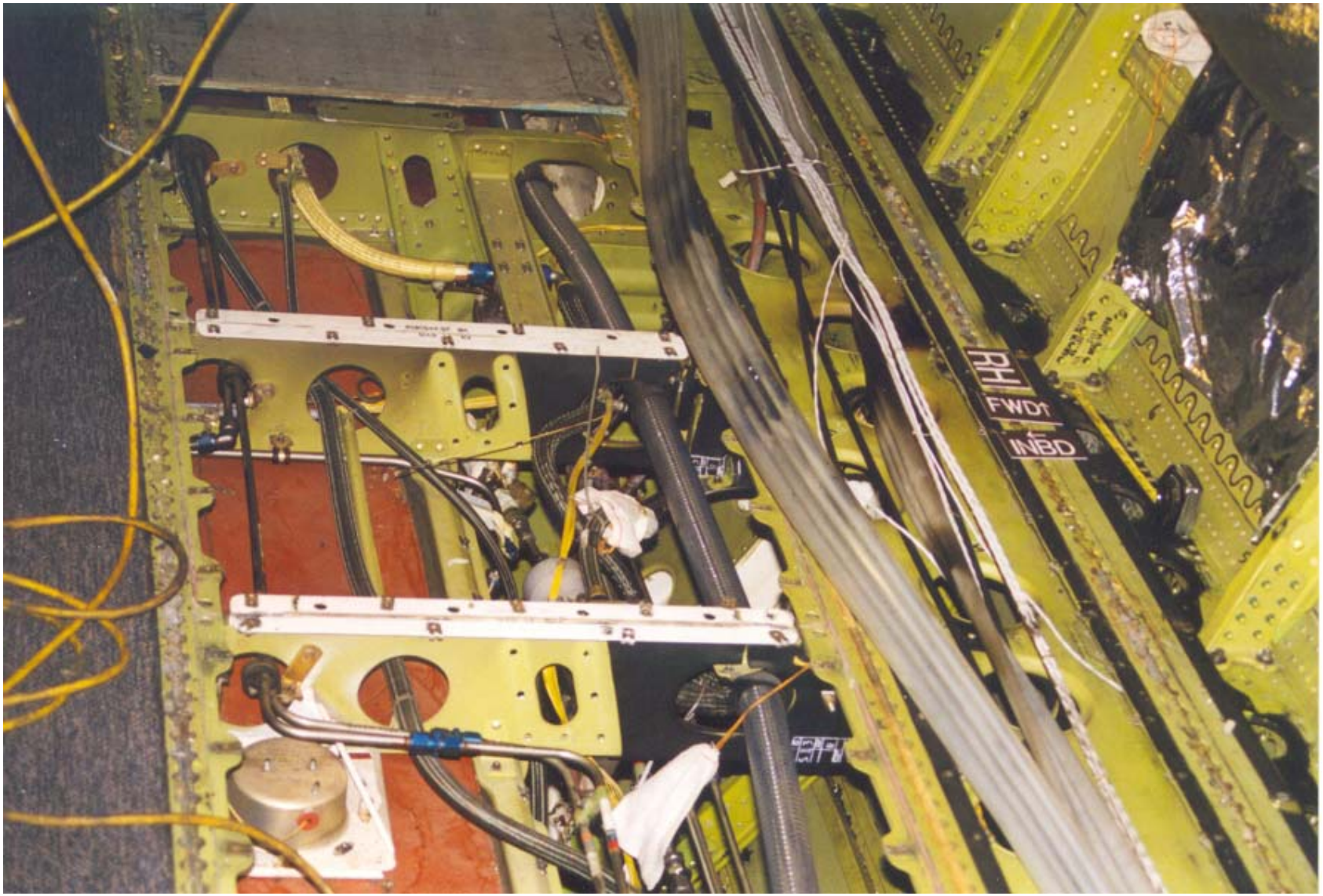
Delta Flight 2030, MD-88, emergency landing at Cincinnati, Sept 17, 1999
Flight attendant discharged halon extinguisher into return grills to extinguish fire.

AirTran Flight 913, DC-9-32, emergency landing at Greensboro Aug 8, 2000
Electrical fire in cockpit bulkhead, no attempt made by flight attendants to extinguish fire.

American Flight 1683, MD-80, emergency landing at Dulles Nov 29, 2000
Lightening strike induced arcing above cabin ceiling. Halon extinguisher discharged into access hole cut with pocketknife, extinguishing fire.

Air Canada Flight 797, DC-9, emergency landing at Cincinnati June 2, 1983
Fire in aft lavatory behind sidewall, eventually destroyed aircraft, 23 fatalities.

Fire in Hidden Area Below Cabin Floor (Cheek)



Fire in Hidden Area Outboard of Cargo Compartment (Cheek)

Fire in Bulkhead, Spread to Area Above Cabin Ceiling (Overhead)

Fire in Bulkhead, Spread to Area Above Cabin Ceiling (Overhead)

Fire in Bulkhead, Spread to Area Above Cabin Ceiling (Overhead)

Fire in Cheek Area, Spread to Area Above Cargo Compartment

Fire in Cheek Area, Spread to Area Above Cargo Compartment

Fire in Cheek Area, Spread to Area Above Cargo Compartment

Fire in Cheek Area, Spread to Area Above Cargo Compartment

Fire in Hidden Area Above Cabin Ceiling (Overhead)

Fire in Hidden Area Above Cabin Ceiling (Overhead)

Fire in Hidden Area Below Cabin Floor (Cheek)

New Recommendations for 2002

(A-01-83) Issue Advisory Circular (AC) that describes the need for crewmembers to take immediate and aggressive action in response to signs of an inflight fire.

(A-01-84) Require principal operations inspectors to ensure that the contents of the advisory circular are incorporated into crewmember training programs.

(A-01-85) Amend Part 121.417 to require participation in firefighting drills that involve actual or simulated fires during crewmember recurrent training and to require that those drills include realistic scenarios on recognizing potential fire situations, locating the origin of the fire, and fighting hidden fires.

(A-01-86) Develop and require implementation of procedures or airplane modifications that will provide the most effective means for crewmembers to gain access to areas behind interior panels for the purpose of applying extinguishing agent to hidden fires. As part of this effort, the FAA should evaluate the feasibility of equipping interior panels of new and existing planes with ports, access panels, or some other means to apply extinguishing agent behind interior panels.

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Phase I Characterization of Hidden Areas

E&E Bay, Cabin Overhead Space, and Cheek Areas

-Determine typical ventilation rates and patterns in these areas

Information from manufacturers!!!

Actual measurements from aircraft

-Determine types of materials used in these areas

-Determine types of systems used in these areas

-Determine existence of irregular geometries

-Predict types of fires that could occur

Phase II Development of Suitable Test Rig(s)

EE Bay, Overhead, Cheek Area

Phase III Development and Characterization of Fire Test Scenarios

Ignition Sources, Fire Growth, Hazard Spread

Phase IV Development/Testing of Various Fire Detection/Suppression/Extinguish Systems/Technologies

Smoke, Thermal, Gas Analysis, Optical, or Visual Detection? Combination?

State-of-the-Art Detection Useful?

Adaptation of Existing Extinguishment Capabilities (handheld, cargo)

Phase V Formulation of Certification Criteria for Suppression Systems