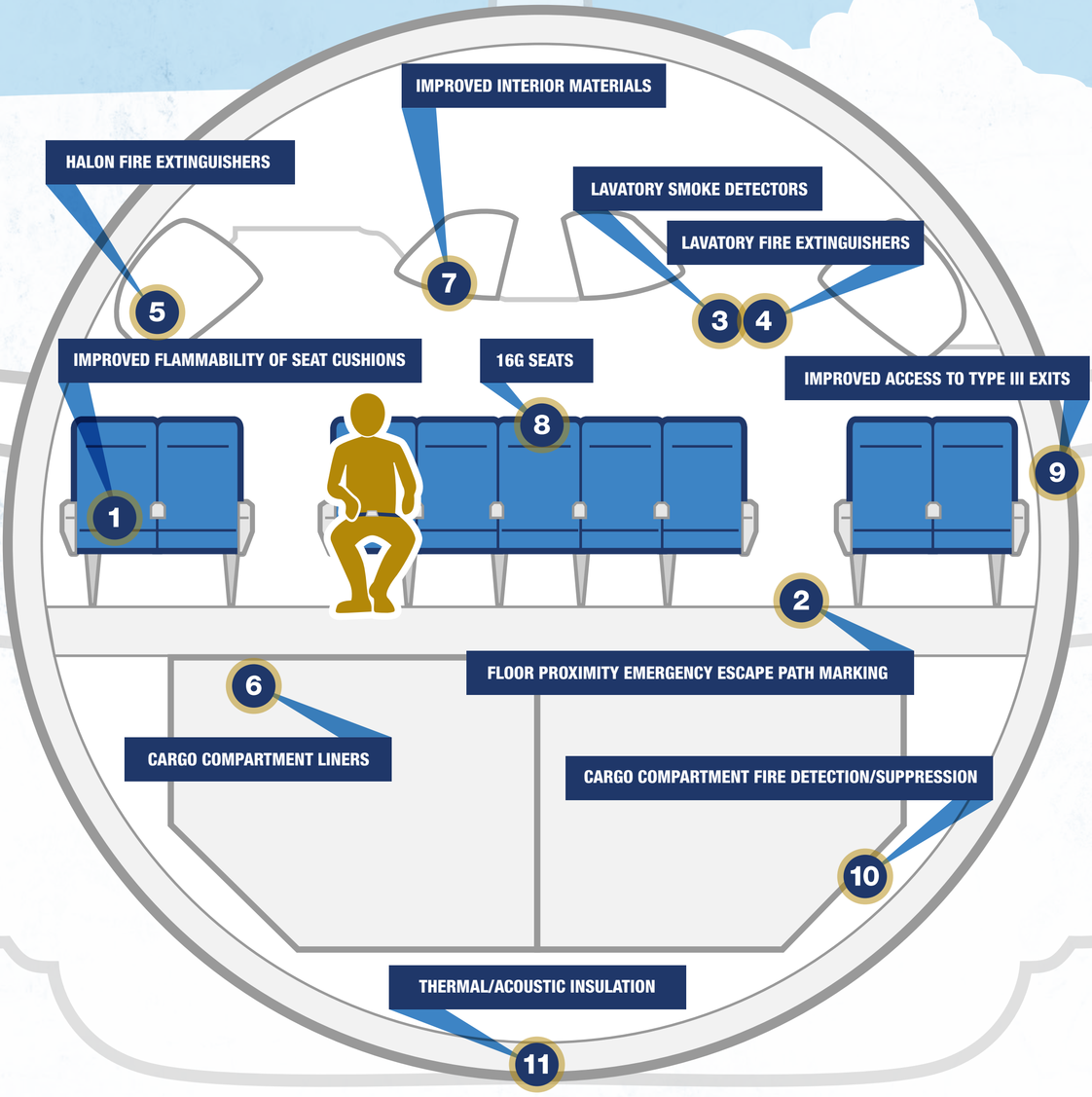
FAA Fact Sheet:
Improvements to Aircraft Survivability

The FAA research and upgrades to aircraft over the years have significantly increased the likelihood of passengers surviving an aviation accident.



1 IMPROVED FLAMMABILITY OF SEAT CUSHIONS:

An October 1984 FAA rule required that cushions installed on passenger and flight attendant seats comply with a significantly more stringent flammability test standard using a 2 gallon per hour kerosene burner. The rule applied to all new transport airplane certification programs. The rule also applied to currently certificated airplane models for airplanes manufactured on or after November 26, 1987. Air carriers replaced 650,000 foam seat cushions on the U.S. fleet. The FAA found that the new material did a better job retarding burning and provided 40 to 60 seconds of additional time for aircraft evacuation when compared to the time available when seats without the improved cushions were installed under the test/research conditions. All existing seats in the U.S. fleet meet the improved standards. The international aviation community adopted the same standards.

2 FLOOR PROXIMITY EMERGENCY ESCAPE PATH MARKING:

By 1986, the U.S. commercial fleet was retrofitted with floor proximity lighting, marking the completion of a two-year compliance schedule. Since smoke rises and can obscure overhead lighting, the FAA determined that floor lighting could improve the evacuation rate by 20 percent under conditions when there is significant smoke in the cabin. The floor proximity marking system aids passengers by marking evacuation paths and identifying exits utilizing illumination sources located close to the floor.

3 LAVATORY SMOKE DETECTORS:

In 1986, the FAA required air carriers to install smoke detectors in lavatories. Air carriers were given 18 months to complete the installation.

4 LAVATORY FIRE EXTINGUISHERS:

In 1987, the FAA required air carriers to install automatic fire extinguishers in the waste paper bin in all aircraft lavatories. Air carriers had two years to comply.

5 HALON FIRE EXTINGUISHERS:

In 1986, portable Halon fire extinguishers were added to all commercial aircraft, following a 12-month compliance time. The FAA requires two Halon extinguishers per aircraft, in addition to other required extinguishers.

6 CARGO COMPARTMENT LINERS:

In 1986, the FAA issued a new test standard using the 2 gallon per hour kerosene burner to improve fire safety in Class C and D cargo and baggage compartments. The rule established burn through resistance fire test criteria for compartment ceiling and wall liners. The existing fleet was required to meet the new standard or two other design standards. This rule change significantly improved the flammability properties of the lining material and has been proven to delay fire in a cargo compartment from breaching the confines of the compartment. Maintaining the integrity of the Class C compartment liner allows the required extinguishing agent more time to extinguish the fire. Subsequent to this rulemaking class D cargo compartments were effectively banned from installation in passenger carrying airplanes.

7 IMPROVED INTERIOR MATERIALS:

In 1985, the FAA developed a new test standard for large surface area panels, e.g., ceilings, walls, galleys, overhead bins and partitions. The intent of the new standard was to delay the onset of a cabin flashover (flash fire) event, giving passengers and crews more time to evacuate the airplane after an accident. The agency required that all commercial aircraft produced after Aug. 20, 1988 have panels that met an intermediate level of heat release and after August 20, 1990, met the final level of reduced heat release. In 1988, the FAA further required that the materials in the panels noted above also comply with a smoke emissions test standard. Although there was no retrofit of the existing fleet, the FAA is requiring that these improved materials be used during major cabin refurbishment. This improvement in cabin material flammability has been demonstrated to delay flashover in the cabin when compared to materials that do not comply with the improved standards. Flashover is the point in time, during a fire, when conditions are generally considered to no longer support life. The amount of additional evacuation time will vary in actual accidents depending on the severity and extent of the fire. In August 2012, the FAA streamlined the flammability testing of many commonly used interior materials.

8 16G SEATS:

In 1988, the FAA issued regulations requiring that all newly developed transport aircraft use "16g" seats. Using a test dummy, these seats undergo dynamic testing and evaluation regarding injury protection. Similar to automobile crash tests, the FAA tests are designed specifically for the aviation environment. Previously, seats were designed and approved to a static 9g standard with no occupant injury criteria. Most transport airplanes were developed before 1988. However, Amendment 121-315, effective October 27, 2005, required that transport category airplanes in part 121 operations, certificated after January 1, 1958 and manufactured on or after October 27, 2009, must comply with the 16g dynamic standard. In 2010, the agency published guidance on the importance of analyzing how interior structures, such as seats, interact with other structures due to critical loads. In July 2012, the FAA issued new criteria for side-facing seats that are equivalent to the occupant protection for standard forward-facing seats.

9 IMPROVED ACCESS TO TYPE III EXITS:

In 1994, the FAA improved the access to Type III exits, by specifying minimum standards for the passageway from the aisle to the exit for airplanes with 60 or more passengers. Type III exits are the non-floor level exit typically located over the wing in thousands of airplanes in air carrier service, e.g., Boeing 727 and 737 and Airbus A320 airplanes). Egress rates through the exits were found to be approximately 14% faster than through the earlier allowed narrower passageways.

10 CARGO COMPARTMENT FIRE DETECTION/SUPPRESSION:

In 1998, the FAA required that all large passenger aircraft have fire detection and suppression systems installed in all cargo compartments by March 19, 2001. This rule affects aircraft currently in service and all newly manufactured aircraft.

11 THERMAL/ACOUSTIC INSULATION:

In May 2000, the agency required that operators of more than 600 aircraft replace insulation blankets covered with metalized polyethyleneraphthalate (MPET) within four years. Replacement materials had to meet a new flame propagation standard that had been developed in 1999. This standard was a modification of an American Society for Testing and Materials (ASTM) test. During the same time period, the FAA also developed another test standard to be used for improving the resistance of the insulation to burn through from an external fire. In 2003, the FAA adopted both test standards into the requirements for new certificated airplane models. The rule also required that previously certificated but newly manufactured airplanes entering the U.S. fleet had to comply as well. The flame propagation requirements went into effect on September 2, 2005. The burn through requirements went into effect on September 2, 2007. The latter date was later extended to September 2, 2009.

FAA cabin research is conducted at the William J. Hughes Technical Center in Atlantic City, N.J. and the Mike Monroney Aeronautical Center in Oklahoma City.

For more information, visit
www.faa.gov

Federal Aviation Administration

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