PUBLIC SAFETY

# Give Air Safety Measures

**The strength of the human body is an important factor in airplane crash-survival, a factor design engineers must consider in improving air travel safety.**

➤ A HUMAN BEING can survive plane crashes that would completely demolish present airplane fuselage structures, it was found in studies conducted by Aviation Crash Injury Research of Cornell University, Flushing, N. Y.

The human body is remarkably strong and resistant to high stresses, and can easily withstand loads of 100 to 150 times the force of gravity while lying prone, the studies indicated.

There is a growing understanding among design engineers that airplane seats, passenger tie-downs and other equipment used near passengers must be made stronger in order to protect the occupants.

In most survivable airplane crashes, there are three main reasons why persons are needlessly injured or killed. Their seat belts or seats tear loose, making them "human missiles." Poorly fastened equipment, such as fire extinguishers, rips from walls and become missiles. The fuselage crushes inward on passengers.

Four safety measures were proposed to help passengers survive plane crashes. These four proposals are:

1. Strengthening hull and floor structures to prevent crushing of passengers and to absorb the shock under survivable crash conditions, that is, when the airspeed is about 170 m.p.h. at a somewhat flat impact angle.

2. There should be strong, effective passenger tie-down to prevent occupants becoming missiles. These tie-down designs will include seat-belts, seats and their anchorages to floor and fuselage structures.

3. The passenger area must be "de-lethalized," designed so that pieces of the structure or other articles near the passengers will not inflict serious injury when struck by the occupants.

4. The passenger area should be designed so that no potential missiles could break loose to strike passengers.

## Can Prevent Crash Fires

➤ CRASH FIRES in turbojet airplanes can be prevented, four scientists of the National Advisory Committee for Aeronautics have found.

Three actions taken simultaneously immediately after the crash will keep the fires from breaking out. The actions are to shut off the fuel flow to the engine, spray water on those surfaces hot enough to start fires and disconnect the airplane's electrical system at the battery and generator.

I. Irving Pinkel, Solomon Weiss, G. Merritt Preston and Gerard J. Pesman of the NACA's Lewis Flight Propulsion Laboratory, Cleveland, Ohio, crashed eight airplanes in their studies of the origin and prevention of crash fires in turbojet aircraft. The six protected by the three-part "inerting" system did not catch on fire, but the two others crashed without protection caught fire. The full-scale tests were made following experiments on the engine only.

The NACA has probed into the origin of crash fires for several years and recently expanded its research into the turbojet field. The elements introduced by jets include the engine and fuel, increased fuel quantity and differences in fuel location.

The tendency for a jet engine to continue to rotate after a crash makes it probable crash-spilled fuel may be sucked into the engine, then ignited explosively there. This ignition may occur on the hot metal of the engine interior even after the jet flame is extinguished and the engine coasting to rest.

Gas flow through the engine is too fast for igniting the fuel on hot metal in contact with the main gas stream, but burning does occur on the hot surfaces away from the main gas stream.

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