Airplane Fire Safety Debate Rekindled

Critics charge the FAA is still dragging its feet in requiring stiffer standards

The recent fire aboard an Air Canada flight that claimed 23 lives has once again centered attention on fire safety in aircraft cabins. The disaster has renewed long-standing demands that the Federal Aviation Administration (FAA) create stiffer rules governing fire safety. Critics have charged that the agency has failed to require some simple safety measures, and that it has been slow in getting the airlines to adopt new technologies.

Congressional hearings have been scheduled on the matter on 27 June by the House subcommittee on transportation, aviation and materials chaired by Representative Dan Glickman (D–Kans.). The House subcommittee on investigations and oversight of the Public Works and Transportation Committee will hold similar hearings 12–14 July, chaired by Representative Elliott Levitas (D–Ga.). The Senate Labor and Human Resources Committee is planning to hold hearings in late July on fire safety in general and the hazards of materials such as those used in aircraft cabins.

Levitas said after the Air Canada crash, "The present FAA standards are totally inadequate." The charge is not new.

For two decades, the FAA has come under heavy criticism from Congress and the National Transportation Safety Board for dragging its feet on fire safety and seeking only long-term solutions without addressing more simple, interim measures. Three years ago, attention to the problem peaked when a fire aboard a Lockheed L-1011 in Saudi Arabia resulted in 301 deaths. The fatalities resulted from inhalation of toxic fumes generated by burning cabin materials and fire.

Despite the hounding by legislators, the safety board, and others, the FAA has not issued a single new regulation dealing with fire safety in the past 3 years. To its credit, however, the FAA has developed a more systematic approach to its fire safety research.

James Burnett, chairman of the National Transportation Safety Board, said at House hearings last year the FAA has "an ambitious program" to study fire safety and the board was "very much encouraged by these developments." However, he added, the FAA has "significantly failed to be responsive" to progress in research. "We don't think the FAA has moved as fast as the prevailing technology can permit us to move."

The FAA plays down the significance of fire hazards in aircraft. A senior Washington FAA official, who declined to be named, said that, "The bizarre thing is that aircraft fires are sensational but they don't affect that many lives." But while air travel is a relatively safe mode of travel, fire is tied to a large percentage of airplane accident fatalities. From 1964 to 1977, 39 percent of the 1162 deaths resulting from plane accidents were related to fire, according to FAA statistics.

During the past few years, the FAA's research has become more focused as a result of recommendations by a National Academy of Sciences committee in 1977 and a large panel of aircraft safety experts in 1980, known as the SAFER committee. The agency's research in fire safety has concentrated on three main areas: developing cabin materials that are less toxic and less flammable and that emit less smoke; creating additives for jet fuel that would make it less likely to mist if the fuselage is ruptured during a crash and thus less prone to engulf the plane in flames; and developing mathematical models to understand better the exact nature of an aircraft fire.

So far the results have been few. The "anti-misting fuel" will probably not be ready for commercial use until the end of the decade. Theoretical models will not be developed for at least 3 years, according to Jack Snell, director of the Center for Fire Safety at the National Bureau of Standards. The bureau works with the FAA to develop new fire safety tests.

Without the models, the FAA is likely to be reluctant to push new regulations because it is not yet satisfied what roles smoke, toxicity, and flammability of various cabin materials play in a fire. In 1969, the agency proposed a smoke emission standard, and, in 1974, circulated a toxicity standard. Each time, the proposal was scrubbed after industry objected. The FAA said more study was needed and that it was persuaded that a single rule should incorporate both requirements. Snell says that if the FAA tried to set a smoke and toxicity standard even now, the agency would still be hard pressed to counter industry's arguments.

There have, however, been some gains. Agency scientists recently reported that a new material has been developed that significantly reduces the flammability of airplane seats, a major fire hazard in a cabin. With current airplane equipment, fire leaps quickly from seat to seat because the polyurethane foam cushions are highly flammable. The new material, developed in collaboration with the National Aeronautics and Space Administration (NASA), retards the penetration of heat to the cushion. NASA scientist Richard Tobiason says the fabric, known as Norfab—a combination of a polyamide compound, fiberglass, and

Aftermath of Air Canada's fire

Congress renews scrutiny of FAA after 23 people perished.

aluminum—also releases less toxic fumes and less smoke than conventional fabric. The blocking material does not necessarily prevent a fire from eventually breaking out, but it does slow down the growth of a fire, allowing more time to evacuate. According to the senior FAA official interviewed, the agency may shortly propose a new standard after one more series of tests is completed.

The official said that until recently the agency's research was hampered because its scientists lacked a proper test facility. But 2 years ago, the FAA finally completed a sophisticated fire laboratory in Atlantic City, New Jersey, where researchers can simulate large fire in a C-133 transport aircraft under reproducible conditions.

Critics have pointed out, however, that there are basic improvements in fire safety that could be made right now without awaiting the results of long-term research. The Air Canada DC-9, for example, did not have a smoke detector in the lavatory where the fire broke out—possibly because the motor in the toilet overheated. In 1977, the National Academy of Sciences committee recommended that the agency require smoke detection equipment in unattended places such as the restrooms and cargo bays. The Academy report said, in describing a scenario remarkably similar to the Air Canada accident, that a restroom fire "poses a significant threat" to passengers and the aircraft.

An FAA spokesman, Fred Farrar, said that smoke detectors are not required in restrooms because "in our view, there are plenty of people around who make good smoke detectors. I'm not being facetious." Representative Mario Biaggi (D–N.Y.) introduced legislation after the Air Canada accident that would require commercial airlines to install smoke detectors and automatic fire extinguishing systems in the restrooms.

The FAA also has not yet required aircraft manufacturers to place exit lights near the floor. In 1972, the safety board urged such a regulation based on the obvious fact that smoke rises and obscures the exit lights near the ceiling. Robert Dille, chief of the FAA research center in Oklahoma City, said his group has been looking at the problem and has experimented with lights on armrests and luminescent material on the floor. "It's better to have the lights lower," Dille conceded. But, he said, there is little urgency about the problem at the FAA because the need for floor lighting "is such a rare event."

The FAA has maintained that new standards are largely dependent on advances in technology. But the safety board has said that the agency has been slow to push new rules even when the technology is developed. In 1980, for example, the board said that equipment to protect the vision and breathing of the pilot and crew during a fire was then available. Dille said the agency is still testing various masks and goggles.

Matthew McCormick, a safety board official, noted in an interview that the FAA has failed to require heat-resistant windows that NASA developed in the early 1970's. In a plane crash, the integrity of the windows is especially important in order to keep a fire in the fuselage from entering the cabin. The current acrylic windows now used on planes and considered by the FAA to be the most vulnerable part of an aircraft to a fuel fire collapse in 40 seconds. The NASA windows remain intact for 4 to 6 minutes, an increase that would greatly add precious time to evacuation. The FAA still wants to perform more tests on the NASA windows and has not yet completed a full-cost analysis of the material.

The top FAA official says that criticism of the agency has been unfair. He charged that Congress and the news media have given the public the "false impression that enormous savings of lives could be achieved with improvements." He added, "Aircraft aren't perfect, but they're the safest conveyance known to man."

In addition, he said, "We spend more on fire safety R & D than any other safety program." An examination of the budget figures of the past 3 years reveals that fire research accounts for about half of the total budget allotted for aircraft safety. The total amount of research dollars for fire safety, however, is quite modest: in FY 1981, the FAA spent $6 million; FY 1982, $2 million; and in FY 1983, $6 million. The Reagan Administration proposed this year to phase out the Center for Fire Research at the Bureau of Standards, but Congress is acting to restore the funds.

Burnett of the safety board has taken a somewhat less critical position of the FAA than his predecessor, James King, whom the FAA regarded as a thorn in the flesh. But even Burnett expresses frustration about the aviation agency's slow pace. The FAA has done "a great deal of research," Burnett testified last year. "We think that they are just not using what they already have. Certainly we haven't achieved the final solution yet, but do we have to wait for eternity in order to begin the process of improving?"—**MARJORIE SUN**

More Tales from the Academic Pork Barrel

The University of New Hampshire may soon get a $15 million grant from the Department of Education to build a new space and marine science center. Oregon Health Sciences University has equally ambitious construction plans. It hopes to build a $20.4 million biomedical library and information center, courtesy of the Department of Health and Human Services. What makes these facilities unusual is that proposals to construct them have not been reviewed by the departments that will put up the money, nor have they been approved by the relevant congressional committees. Yet, on 10 June, the Senate voted funds for the projects without debate.

The universities took proposals for the facilities directly to their senators, thus bypassing the lengthy and uncertain review process that is usual for federally funded projects. An amendment providing funds for the two centers was offered to a budget bill on the Senate floor, and it sailed through.

This exercise in pork barrel politics is the latest example of a phenomenon that seems to be occurring with increasing frequency. Last month, Catholic and Columbia universities won approval from the House for funds to construct new research facilities. Their proposals, which similarly bypassed formal review, were championed by key legislators and promoted by a Washington consulting firm, Schlossberg-Cassidy and Associates (*Science*, 3 June, p. 1024).

Officials from the University of New Hampshire talked with their Senator, Warren Rudman (R–N.H.), about 18 months ago, and informed him of the need for a new science facility. According to Len Fisk, the university's director of research, funding for space research on campus has grown by 700 percent in the past 5 years, and that for marine science has risen by 200 percent. Laboratories and classrooms are scattered over the campus, Fisk said, creating a "generally intolerable situation."

Officials from the University of Oregon have also been talking with their Senator, Mark Hatfield (R–Ore.), about the need for a new facility. Their goal is to build a Biomedical Informa-