United States. Federal Aviation Administration.
Safety Review Task Force.

REPORT OF THE SAFETY REVIEW TASK FORCE ON FEDERAL AVIATION ADMINISTRATION FLIGHT STANDARDS SAFETY PROGRAM

August 1985

Executive Summary

Introduction. Rapid, significant changes in the transportation environment resulting from accommodation of vastly accelerated technological advances and economic deregulation have brought about concern that the new environment created by these changes might result in a reduction in industry safety. A safety review was directed by the Secretary of Transportation, to encompass all modes within the Department to determine if safety concerns were valid and to ensure that safety would not be compromised. In order to accomplish this review, the Secretary established the Safety Review Task Force to analyze the status of safety programs in the Department of Transportation. This report reflects the results of the efforts of that Task Force with respect to a review of the Federal Aviation Administration's Flight Standards Safety Program.

The methodology employed by the Task Force included field observation of the FAA during the National Air Transportation Inspection (NATI), interviews with FAA personnel, interviews with National Transportation Safety Board (NTSB) personnel, interviews with representatives of other relevant government agencies, and meetings with representatives of the aviation industry and public interest groups. Additionally, the Task Force reviewed and analyzed large quantities of documents and materials available dealing with civil aviation and Federal Aviation Administration's Flight Standards Safety Program.

Both the NATI and the Task Force review indicate that the air carrier industry is adapting well to the environment created by rapidly accelerating technological changes and fewer competitive restraints. Both the NATI and the Task Force review also indicate that no diminution of safety has occurred during that same period. In fact, accident rates for the period 1980-1984 are substantially lower than for the period 1975-1979. The rate for scheduled large air carriers is down one-third and commuter airlines down one-half. This pattern holds for both total accident rates and fatal accident rates.

The issue now under review, however, is whether or not the FAA itself has and can keep pace with the industry and the environment. As a result of the NATI Program, the FAA has acknowledged that a gap exists between the actual air carrier operational environment and FAA regulatory requirements. The FAA continues to review the results of the NATI, which has formed the basis for an in-depth study of its air carrier inspection programs. The General Aviation Safety Audit currently in progress is providing an information base which the FAA will use to examine its activities in the general aviation area as well.

Throughout its review, the Task Force was continually impressed with the dedication and professionalism of FAA employees in carrying out their responsibilities. However, this report focuses on areas where there is general agreement that problems do exist and where improvements should be made. The identified problem areas are: (1) difficulty in formulating and carrying out actions in a timely manner; (2) lack of uniformity in the interpretation and implementation of regulations and policies; (3) lack of effective communication within the organization, with the aviation community and with the public; and (4) a degree of autonomy at regional offices and in some offices within headquarters sufficient to inhibit the accomplishment of program objectives.

Management/Safety Issue 1: Timeliness. Of the issues and concerns discussed in this report, the Task Force agrees that the area most in need of improvement is that of timeliness in identifying and responding to safety issues. Repeatedly, in meetings, observations, and reports, timeliness surfaced as a problem and appeared to cause the most frustration. While some delay is inherent in the system, especially in those areas requiring rulemaking, continuing or repeated delay without adequate controls and justification can adversely affect safety.

Several examples illustrative of the timeliness issue are discussed at length in the report. The two examples considered most illustrative involve the issue of the installation of shoulder harnesses in small general aviation aircraft and the issue of private pilot certification and training. Since 1969 FAA has acknowledged the utility of shoulder harnesses in protecting occupants of small aircraft from serious injury. Not until 1977, however, did FAA issue a rule requiring installation of shoulder harnesses, and then only for front seats of small planes manufactured after 1978. Despite repeated recommendations from NTSB since 1977 that FAA require installation of harnesses for passenger seats, FAA made little progress until Admiral Engen became FAA Administrator. A notice of proposed rulemaking for the installation of shoulder harnesses in newly manufactured normal, utility, and acrobatic category airplanes was published. The comment period closed June 20, 1985. The rule is expected to be issued by the end of 1985.

With respect to the issue of pilot training and certification, the National Association of Flight Instructors (NAFI) submitted a petition with regard to this issue in February 1982. That petition recommends numerous changes to Federal Aviation Regulations governing the certification of pilots and flight instructors. Those recommendations include creating a restricted category of pilot certification for "recreational" pilots, establishing annual training and flight review for pilots with less than 400 hours, eliminating home-study programs as "acceptable ground training" for certification, and instituting a minimum age of 14 for student recreational pilots. A routine comment period was observed (March-June 1982) and the petition was allowed to lie dormant until late 1984. A notice of proposed rulemaking in response to the petition was published in June 1985. While the delay incurred with respect to the NAFI petition is not as significant as the delay in the shoulder harness rulemaking, the perception of delay and failure to respond may have been greater because a petition is involved and because the issues raised by the petition are of importance to the general aviation community.

Although in both of these examples there has been recent action by FAA, the action may be attributable to the extraordinary emphasis on safety initiatives by the Secretary, as well as to management initiatives implemented by Administrator Engen since his arrival at FAA.

As a result of its review of the Federal Aviation Administration with respect to the issue of timeliness, the Task Force submits the following recommendations:

a. That the FAA adhere more strictly to a specific timetable for each significant safety rulemaking activity and, further, that such timetable require written approval by the Administrator for any time extensions or exceptions; further, that notice of such timetables, waivers, exceptions, etc., be provided to OST.

b. That action plans and completion dates be prepared for all currently pending significant safety rulemaking activities.
c. That the FAA impose reasonable time limits for taking action in response to all NTSB aviation safety recommendations and that any extension or exception to such time limits be granted only upon written approval by the Administrator with notice to NTSB and, further, that no NTSB aviation safety recommendation remain open for more than one year, without written explanation, update, and Administrator concurrence.
d. That OST impose reasonable time limits upon all OST reviews of safety rulemaking documents, with extensions or exceptions to be granted only upon written approval by the General Counsel with notice to the FAA.

Management/Safety Issue 2: Uniform Interpretation of Regulations and Policies. Lack of uniformity in the implementation of FAA safety programs was brought to the attention of the Task Force during the course of meetings with representatives of industry organizations and consumer safety organizations. The Task Force is not the first entity to address this issue.

Industry/consumer comments in the area of uniform interpretation of regulations and policies revealed a perception that FAA headquarters lacks a broad, national view of the agency's mission and programs and appears, at times, divorced, both geographically and programmatically from the field offices. Several industry spokesmen expressed the opinion that while FAA regulations may be clear, there is a lack of consistency in interpretation and application. The NATI Program seemed to confirm some of the industry perceptions. The NATI report points out that "The decentralized solution to what may be potentially broad-based problems has led to a lack of standardization in the application of policy. The NATI participants...observed a number of instances of nonstandard application of policies and practices."

Administrator Engen is already taking steps to improve consistency and accuracy in agency programs, ranging from uniform application of air traffic rules to stronger and clear national program guidance for the flight standards safety program. Early findings from the FAA's Safety Activity Functional Evaluation verify the need for greater attention at the headquarters level to the dissemination of accurate and current interpretations of agency regulations and directives.

As a result of its review of the Federal Aviation Administration with respect to the issue of uniform interpretation of regulations and policies, the Task Force submits the following recommendations:

a. That, to improve uniformity among regions, the FAA expedite the review of regional interpretations and implementation of FAA regulations and policies, to include public hearings or meetings with industry and public interest representatives on the subject of regional variation in interpretation and implementation of regulations and policies.
b. That the FAA establish procedures to achieve more uniform interpretation and application of its inspection and certification requirements.

Management/Safety Issue 3: Internal and External Communication. During the course of its review, the Task Force has become convinced that there is a need for FAA to improve its internal processes for information exchange and, further, to improve processes for disseminating information to the industry and the general public.

Task Force observations during the conduct of the NATI Program as well as the NATI Program itself revealed a lack of internal FAA communication with respect to inspection results. This was especially evident in those cases where an air carrier's certificate is held in one region, but the carrier conducts a large segment of its operations in other regions. In those cases, except during the NATI Program, inspection results were not regularly transmitted between regions.

Industry/consumer comments in this area reflected frustration with FAA's failure to communicate with petitioners for rulemaking. Also raised as a concern was FAA communication and information exchange with other agencies and organizations such as NASA, the Department of Defense, universities and other centers of aviation research. The concern here was not directed to the quantity of exchange of information, but more to the utilization of this information by FAA.

As a result of its review of the Federal Aviation Administration with respect to the issue of internal and external communication gaps, the Task Force submits the following recommendations:

a. That the FAA provide for acquisition of regional data on a timely basis at headquarters and for coordination of data requests among offices within headquarters.
b. That the FAA review its public affairs/public relations policies and improve public as well as industry awareness of FAA's functions, information, and resources.
c. That the FAA review its relations with other departments and agencies, strive to develop closer working relationships and information exchanges with them, and instill a more positive attitude toward utilization of research and technology from other organizations and agencies to improve aviation safety.

Management/Safety Issue 4: Regional Autonomy. During the course of its review, the Task Force was continually reminded, either by experience or by comments from individuals and organizations within the aviation community, of the role decentralization has played in FAA's ability to effectively carry out its responsibilities. Decentralization, as a management technique, is felt to be generally acceptable. However, decentralization has resulted in a degree of regional autonomy that has been largely responsible for some of the concerns previously discussed in this report. Considerable frustration was expressed by industry and consumer organizations with the perception that they were being required to deal with "ten little FAAs" (the headquarters and the nine regional offices).

Here again, the NATI Program provided an excellent opportunity for the FAA to observe its own operations and to begin to evaluate the effect of regional autonomy on the Flight Standards Safety Program. The Safety Activity Functional Evaluation (Project SAFE), a long-term study being conducted by the FAA, using the NATI data as a base, should provide considerable insight into this area. One question raised by NATI that warrants further attention is whether FAA should require more mobility among inspectors as they advance, rather than permitting them to remain in the same region and even assigning them to the same carrier(s) for extended periods.

As a result of its review of the Federal Aviation Administration with respect to the issue of regional autonomy, the Task Force submits the following recommendations:

a. That the FAA expedite the completion of Project SAFE, and implement findings from that study.
b. That the FAA Administrator continue his efforts to provide clear direction from headquarters, especially with respect to more uniform interpretation and application of inspection requirements.
c. That the FAA take steps to provide increased mobility for inspector personnel.
d. That the FAA fully implement the geographic area responsibility concept, ensuring adequate communication among regions and district offices and appropriate follow-up of inspection results.

General Aviation Safety Issues: In reviewing FAA's oversight of general aviation (GA) safety, the Task Force singled out seven subject areas which have been the focus of recommendations for improvement by NTSB, GAO, and other organizations with an interest in aviation safety. Six of these GA subject areas are related to pilot training and certification: pilot judgment training, flight instructor responsibilities, recreational pilot certification, the biennial flight review requirement, pilot competency training for more sophisticated aircraft, and FAA's Accident Prevention Program. The other GA subject singled out for attention is that of crashworthiness standards for GA aircraft.

Pilot training and certification is probably the most important element in GA safety, as illustrated by the fact that, according to FAA statistics, pilot error is a factor in 83% of general aviation accidents. Part 61 of the Federal Aviation Regulations contains FAA standards and requirements for pilot training and certification. To be certified, a pilot candidate must pass a written examination and flight test. Also, to assure that pilots remain competent to fly safely, FAA requires that a pilot obtain a competency endorsement within the previous two years from an authorized examiner, based on a proficiency check -- the biennial flight review (BFR).

In 1982, a joint FAA-industry panel formed by the National Association of Flight Instructors (NAFI) proposed a significant revision of pilot training and certification requirements and a petition for rulemaking to that effect was published in the Federal Register in March of 1982. The proposal was dormant until late 1984 when the FAA Administrator ordered a rulemaking to be developed. An NPRM on pilot training and certification has recently been issued. The NPRM addresses, fully or in part, four of the six pilot issues discussed below.

General Aviation Safety Issue 1 -- Pilot Judgment Training: Knowledge, skill, and judgment have traditionally been regarded as the three critical faculties that a good pilot must posses. Knowledge and skill elements are explicitly included in pilot training and in tests necessary for pilot certification, but judgment has generally been deemed to be innate or something to be acquired through experience. Yet an FAA-sponsored study in 1976 concluded that 52% of all fatal U.S. general aviation accidents during a five year period were related to poor flying judgment of the pilot.

For the past eight years FAA has been researching whether and how pilot judgment might be taught and evaluated. Evaluations of judgment training experiments in the U.S. and Canada indicate that judgment training improves pilot decisionmaking. The results have been promising enough to interest the General Aviation Manufacturers Association (GAMA). GAMA has offered financial and technical assistance to FAA in preparing judgment training teaching materials. Also, the Aircraft Owners and Pilots Association has been cooperating fully with a current FAA program in which judgment training materials have been made available to pilot training schools at ten airports in the Eastern Region.

FAA's NPRM on pilot training and certification does not address the subject of pilot judgment training. FAA staff in the Office of Aviation Medicine are continuing to evaluate the effectiveness of judgment training and to review methods of introducing it into pilot training by certificated flight instructors.

General Aviation Safety Issue 2 -- Flight Instructor Responsibilities: As a result of concern about flight instruction, a panel of general aviation representatives, known as the General Aviation Safety Panel (GASP), has recommended expanded course content for flight instruction. GASP also suggested that, in order to hold flight instructors more accountable for their training and encourage instructors to maintain high standards, FAA establish a procedure to identify the instructor of pilots involved in accidents and analyze the data for patterns of potential instruction deficiencies.

In the pilot certification NPRM, FAA proposes new and more specific private pilot training requirements and certification standards for use by flight instructors and examiners. The objective of the proposed changes is to assure pilot proficiency, especially in basic flight operations. With respect to the GASP recommendation on instructor accountability, FAA has indicated that it is using its computerized Aviation Safety Analysis System to correlate unfavorable pilot reports with each pilot's instructor.

General Aviation Safety Issue 3 -- Recreational Pilot Certification: One of the recommendations contained in the National Association of Flight Instructors petition described above was that FAA revise Part 61 to create a new pilot category termed "recreational." Pilots in this new category would not have to receive the more sophisticated communications and navigational training now required for all entry level private pilots, and, as a result, their certificates would have operational limitations, including daytime-only flying, distance limitations, and prohibitions on flying in and out of controlled airports.

FAA has included a proposal to this effect in the NPRM on pilot certification and training. FAA supports the establishment of this new pilot category although it recognizes that there are legitimate safety questions which must be addressed since the rule would require less training for initial private pilot certification and it would result in an increased number of aircraft without sophisticated communications and navigation equipment in the airspace. FAA believes that, because this new category would be established in combination with operating restrictions and with improved training, certification, and flight review requirements, there would be no reduction in safety. Comments on these issues are being sought and will be carefully analyzed before any decision is made on this proposal.

General Aviation Safety Issue 4 -- Biennial Flight Review: Under FAA regulations, a pilot acting as pilot in command of an aircraft must, within the preceding two years, have satisfactorily completed a flight proficiency check and had his log book endorsed to that effect by an authorized examiner. However, the scope and content of this biennial flight review (BFR) is left to the examiner's discretion.

At various times over the past eight years, the BFR regulation has been criticized as too vague, discretionary, and ineffective. NTSB, GAO, the General Aviation Safety Panel (consisting of GA industry representatives), and the National Association of Flight Instructors have separately made recommendations to make the BFR requirement more stringent.

In the pilot certification NPRM, FAA proposes to supplement its current BFR regulation with the following requirements: (a) all recreational and private pilots would be required to receive two hours of training annually; (b) non-instrument-rated private and recreational pilots with less than 400 hours flight time would be required to comply with the current BFR requirement on an annual rather than biennium basis; (c) private and recreational pilots who have less than 400 hours flight time and who have not flown as pilot in command within the previous 180 days would be required to receive flight instruction and log book competency endorsement from an authorized flight instructor. These review and instruction requirements could be satisfied simultaneously, so that the flight review requirements could be met at the same time that the annual two-hour training occurs.

General Aviation Safety Issue 5 -- Pilot Competency Training for More Sophisticated Aircraft: A pilot's certificate specifies the aircraft categories, classes, and types for which he is authorized to act as pilot-in-command. Currently, however, a private pilot may be certificated to operate a wide range of high-performance airplanes based on instruction in only one make and model of airplane at the lowest end of the high-performance continuum. In recent years, the technological complexity of high performance GA aircraft has increased, resulting in increased hazards associated with GA pilots operating an aircraft for which they have FAA authority but lack familiarity.

In 1979 and in 1982, the NTSB expressed concern about GA accidents involving multi-engine and high-performance aircraft and recommended changes in FAA's training and flight review requirements for such aircraft. NTSB's more recent recommendations called for FAA to impose new flight review requirements for multi-engine and turbojet aircraft, review/revise the agency's type-rating criteria, and require manufacturers to provide training guides for pilot transition into new aircraft makes and models.

In response to NTSB's recommendations, FAA indicated that a special flight standardization board was created, comprised of FAA specialists and manufacturers' representatives, to review what changes, if any, were warranted. The board completed its work and issued a report to FAA containing its conclusions. FAA has not yet followed through with analysis and policy decisions based on the board's report; however, FAA indicates that many of NTSB's specific recommendations have been satisfied by a variety of changes that have occurred in the meantime.

General Aviation Safety Issue 6 -- GA Aircraft Crashworthiness: As early as 1970, NTSB began making the first of scores of NTSB recommendations to FAA, based on NTSB accident investigations, to require improvements in the crashworthiness of small aircraft, including requirements for internal equipment such as shoulder harnesses and strengthened seats. During this time FAA has conducted extensive research on aircraft crashworthiness in order to determine what changes in aircraft design would be appropriate.

Recent signs of progress are evident in FAA's issuance of an NPRM that would require manufacturers to install shoulder harnesses for passenger seats of newly manufactured small aircraft (FAA required manufacturers to install shoulder harnesses for front seats of small aircraft in 1977). A final rule is expected to be issued by the end of 1985.

FAA has also been considering other crashworthiness standards for GA aircraft. An NPRM on dynamic testing criteria for seats, doors, and emergency exits was received by OST in June 1985 and was returned to FAA for further work.

General Aviation Safety Issue 7 -- FAA's Accident Prevention Program: FAA began this program in 1971 in order to reduce the GA accident rate by improving private pilot aeronautical skills, knowledge, and safety attitude. The primary activity of the program, which relies on industry and volunteer participants, is sponsorship of joint FAA/industry pilot safety meetings.

In 1981, GAO and the Western Region Inspector General separately evaluated the program and recommended improvements. GAO recommended that district offices identify specific safety problems and how they could be resolved, collect data to target certain groups, and appoint counselors at locations with particular needs. The Western Region IG was more critical than GAO and cited deficiencies in program planning and direction and lack of an adequate organization of counselors. FAA's responses to GAO and the IG indicate agreement and follow-up on the recommendations.

General Aviation Safety Recommendations: As a result of the preceding review of general aviation safety issues and FAA initiatives, the Task Force submits the following recommendations:

a. That FAA expedite completion of its ongoing General Aviation Safety Audit, evaluate results of portions of the Audit already completed, and identify appropriate steps to implement whatever changes are indicated by those results.

b. That the FAA and OST cooperate to expedite issuance of Final Rules or other appropriate follow-up to NPRM's on:

(1) recreational and private pilot certification and training; and
(2) shoulder harnesses.

c. That the FAA take appropriate follow-up action to the NTSB recommendations and the report of the special flight standardization board with respect to training requirements for GA pilots operating more sophisticated aircraft.

I. Overview

Rapid, significant changes in the transportation environment resulting from accommodation of vastly accelerated technological advances and economic deregulation have brought about concern that the new environment created by these changes might result in a reduction in industry safety. The Safety Review ordered by the Secretary of Transportation, encompassing all modes within the Department, is to determine if such concerns are valid and ensure safety is not compromised. In order to accomplish this review, the Secretary established the Safety Review Task Force to analyze the status of safety programs in DOT. The scope of the modal reviews include, but are not limited to, the areas of:

-- licensing and certification
-- registration
-- operations
-- inspection
-- enforcement
-- emergency response
-- testing and education
-- research

Aviation is the first mode to be reviewed.

A. Scope of the Aviation Review

Air transportation has grown rapidly in significance in the U.S. In spite of the growth, accident rates for the period of 1980-1984 are substantially lower than for the period 1975-1979. The accident rate for scheduled airlines is down one-third and for commuter airlines down one-half. This pattern holds true for both total accident rates and fatal accident rates. Furthermore, in 1984, U.S. airlines achieved a record low total accident rate and the second lowest fatal accident rate. Commuters experienced record lows in 1983, with only a slightly higher total accident rate in 1984 and the third lowest fatal accident rate in a decade.

However, because of the changes occurring in the air carrier industry, the Task Force felt that a "snap shot" of the industry's safety compliance and FAA's inspection and reporting procedures was needed. Therefore, the Secretary directed the Federal Aviation Administration (FAA) to conduct an inspection of all scheduled U.S. air carriers, including commuter carriers which have experienced tremendous growth since 1978. The National Air Transportation Inspection (NATI) program began in early March 1984 and continued through May 1984.

At the same time, the Secretary's Task Force analyzed the effectiveness with which the FAA accomplishes DOT's statutory mandate to ensure civil aviation safety through its Flight Standards Safety Program. This review was focused on safety in commercial passenger-carrying operations in scheduled service and on safety in general aviation operations. As a safety issue emerged, the Task Force attempted to identify FAA's responsibility in that area and determine how that responsibility was defined in the statutes, regulations, policies, and programs applicable to that issue.

The methodology employed by the Task Force included field observation of the FAA during the NATI program; interviews with personnel in the FAA, National Transportation Safety Board (NTSB), and other relevant government agencies; meetings with representatives of the aviation industry and public interest groups; and analysis of available documents concerning civil aviation and FAA programs.

Throughout its work, the Task Force was continually impressed with the dedication and professionalism of FAA employees in carrying out their responsibilities. During the course of meetings with representatives of the aviation industry and with public interest groups, it became clear that, while there was general recognition of the aviation industry's outstanding safety record and the FAA's role in achieving that record, coupled with considerable respect for the aviation expertise within the FAA, there was general agreement that improvement was needed in several areas. There was also general agreement that improvements in these areas would increase the effectiveness of FAA in ensuring aviation safety.

The Task Force has identified four areas where there is general agreement that problems exist and improvements should be made. The same problem areas exist in other large public and private sector organizations, which, like the FAA, are widely decentralized, have multiple functions, and must deal with budgetary and manpower restrictions. The identified problem areas are:

- o Difficulty in formulating and carrying out actions in a timely manner;
- o Lack of uniformity in the interpretation and implementation of regulations and policies;
- o Lack of effective communication within the organization, with the aviation community and with the public; and
- o A degree of autonomy at regional offices and in some offices within headquarters sufficient to inhibit the accomplishment of program objectives.

Section II of this report addresses each problem area and recommends solutions for the Secretary's consideration. Where appropriate, information regarding the following is included: (1) field observation; (2) comments from industry and consumer groups; (3) results of the NATI program; and (4) related agencywide issues. Section III contains the Task Force analysis of general aviation safety issues and recommendations.

B. Profile of U.S. Civil Aviation

The Task Force focused on two areas of aviation operations: (1) air carriers, comprised of two segments: (a) large air carriers, whose primary operations are in domestic scheduled passenger service between medium and large air traffic hubs; and (b) commuter air carriers, who operate aircraft for common carriage with passenger capacities of more than 30 and who perform at least five scheduled round trips weekly between two or more points; and (2) general aviation pilots using owned or leased aircraft, including air taxis.

1. Air Carriers

Until recently, air carrier routes, rates, and other operational aspects were regulated by the Civil Aeronautics Board (CAB). That agency issued certificates authorizing scheduled service on specific routes and certain nonscheduled operations. In this way, competition was controlled and certificate holders were granted route protection. Enactment of the Airline Deregulation Act of 1978 (P.L. 95-504) increased the freedom of air carriers to acquire new routes, terminate existing routes, and set fares. One result of the Act was the evolution of interlining or "hub and spoke" systems, in which large carriers provide long-haul service to hub cities, and regional/commuter carriers bring passengers to and from small and medium cities to hub locations where connections can be made with large carrier flights. As a result, the number of "spokes"--commuter carriers--has doubled since 1978, with approximately 300 such carriers now in commercial service.

Historically, regional carriers have been categorized in the general aviation segment. However, the dramatic expansion--both in number and importance--of this class of carriers since the Airline Deregulation Act, as well as the type of aircraft used by the commuter industry, makes it more logical to consider their operations and safety programs along with large air carriers. This was the approach used in the NATI program and continued in this report, unless otherwise noted.

While supporters of deregulation expressed great confidence that it would in no way reduce safety, there was some concern that the increasingly competitive environment and the operational and economic pressures brought about by that environment might diminish carriers' compliance with air safety regulations. Cognizant of this possibility, the Congress required that the Secretary of Transportation annually report on the effect of the Airline Deregulation Act on aviation safety. In each edition of "The Effect of the Airline Deregulation Act on the Level of Air Safety" the Secretary has stated, "In this, nor in any of the preceding reports has any adverse correlation been established between aviation safety and the deregulated industry environment." The continued improvement in the air carrier safety record during calendar years 1979-1984 affirms this statement.

2. General Aviation

In many respects, safety issues in this segment differ markedly from those in air carrier operations. Accidents and fatalities among licensed general aviation pilots are higher than in commercial air carrier operations, reflecting the generally shorter distance, higher frequency, and higher accident potential of general aviation flights. Nearly 20 percent of general aviation accidents occur during takeoff and 43 percent during landing. This makes occupant protection, cabin integrity and pilot competence vital safety issues since improvements in these areas could turn many now-fatal accidents into survivable crashes. In addition to pilot error and equipment faults, general aviation accidents can result from weather hazards and currency and appropriateness of aeronautical training. The General Aviation Safety Audit (GASA) ordered by the Secretary in June of 1984, is taking a closer look at some of the issues discussed above. It is a "white glove inspection" tailored to the characteristics of general aviation. The Audit includes study of: certificated non-air carrier operators of large aircraft (Segment I), aircraft subject to FAA noise regulations (Segment II), pilot schools and instructors, repair facilities, and certain mechanics (Segment III), on-demand air taxis (Segment IV), and other non-air carrier operators of large aircraft who have been granted deviations from parts of the certificate rules (Segment V). The Audit is being conducted over a period of approximately 18 months, beginning with the first phase on July 22, 1984. Field inspections have been completed for the first four segments, although Segment II operators will be subject to continued inspections through CY 1985. An interim report on each segment will be issued, with a final report scheduled in early 1986.

C. FAA Safety Mission and Organization

The Federal Aviation Act of 1958 (P.L. 85-726), as amended, directs the Secretary to promote the development of air commerce and ensure its safety. On October 15, 1966, P.L. 89-670, 3(e), 6(c)(1), 80 Stat. 932, 937, which appears as 49 USC Section 1652(e), 1655(c)(1), transferred all functions, powers and duties of the Federal Aviation Agency and of the Administrator to the Secretary of Transportation and established a Federal Aviation Administration in the Department of Transportation.

In the area of aviation safety, Congress was explicit when it set forth the powers and duties of the Secretary of Transportation. Section 1421 of Title 49 of the United States Code states:

> The Secretary of Transportation is empowered and it shall be his duty to promote safety of flight of civil aircraft in air commerce by prescribing and revising from time to time:
> (1) Such minimum standards governing the design, materials, workmanship, construction, and performance of aircraft, aircraft engines, and propellers as may be required in the interest of safety;

(2) Such minimum standards governing appliances as may be required in the interest of safety;
(3) Reasonable rules and regulations and minimum standards governing, in the interest of safety, (A) the inspection, servicing, and overhaul of aircraft, aircraft engines, propellers, and appliances; (B) the equipment and facilities for such inspection, servicing, and overhaul; and (C) in the discretion of the Secretary, the periods for, and the manner in, which such inspection, servicing, and overhaul shall be made, including provision for examinations and reports by properly qualified private persons whose examinations or reports the Secretary may accept in lieu of those made by its officers and employees;
(4) Reasonable rules and regulations governing the reserve supply of aircraft, aircraft engines, propellers, appliances, and aircraft fuel and oil, required in the interest of safety, including the reserve supply of aircraft fuel and oil which shall be carried in flight;
(5) Reasonable rules and regulations governing, in the interest of safety, the maximum hours or periods of service of airmen, and other employees, of air carriers; and
(6) Such reasonable rules and regulations, or minimum standards, governing other practices, methods, and procedure, as the Secretary may find necessary to provide adequately for national security and safety in air commerce.

The Secretary of Transportation's authority includes specific areas of safety concern in paragraphs (1) through (5) and a catch-all safety provision in paragraph (6). It is clear that Congress meant the Secretary's duties to span the myriad of topics within the category of air safety. The Secretary has delegated these responsibilities to the Federal Aviation Administrator.

In its publication "FAA Statistical Handbook, Calendar Year 1983," FAA describes its responsibilities as it has in previous reports:

> "...the fostering of the development and safety of American aviation. More specifically, the FAA is responsible for developing the major policies necessary to guide the long-range growth of civil aviation; modernizing the air traffic control system; establishing in a single authority the essential management functions necessary to support the common needs of civil and military operations; providing for the most effective and efficient use of the airspace over the United States; and for the rulemaking responsibilities relative to these functions."

FAA executes its responsibilities through Washington, D.C., headquarters, which conducts agencywide program planning, direction, control, evaluation, and central operations activities; and nine regional offices which direct operations in specific geographic areas.

Four regions have been designated as "lead" areas, denoting primary rule-making or certification responsibility for certain aircraft or systems. Lead regions are designated where an aviation manufacturing segment is clustered:

Region	Segment
Northwest	Large Commercial Aircraft
Central	General Aviation Aircraft
Southwest	Helicopters
Northeast	Engine and Propulsion Systems

FAA implements its statutory mandate through its regulations, policies, and programs. To again quote from the FAA Statistical Handbook:

> "...it [FAA] prescribes and administers rules and regulations concerning airmen competency, aircraft airworthiness, and air traffic control. It promotes safety through certification of airmen, aircraft, and flight aircraft maintenance schools. It reviews the design, structure, and performance of new aircraft to insure safety of the flying public."

D. Aviation Safety Regulation

In the NATI report, the FAA acknowledges that aviation safety regulations do not always adequately reflect air carrier operations in the new environment. The following examples culled from the report are illustrative.

1. Air carriers now frequently contract for training, maintenance and operational support, formerly available within the organization. Current regulations may not adequately reflect the oversight and responsibility of each party.

2. The increased importance of marketing and finance, caused by competition, can affect management/safety decisions.

3. Certain longstanding regulations, such as minimum equipment requirements, were shown to be problem areas for a number of carriers and appear to require clarification for both FAA inspectors and air carriers.

This acknowledgment by FAA of a gap between the actual air carrier operational environment and FAA regulatory requirements is particularly significant when examined in light of statements addressing the same basic question contained in each of the annual reports to Congress on "The Effect of the Airline Deregulation Act on the Level of Air Safety" covering operating years 1979-1983. In those reports, it is stated that:

- No significant changes or proposals for changes in operating practices were submitted by carriers as a result of the deregulation act;
- FAA has not identified a need for significant changes to air carrier operating practices due to deregulation.

Although the Act has been in effect for over 6 years, the air carriers have not requested FAA approval for any significant changes to their procedures which can be attributed to deregulation. The operation and maintenance of aircraft, regardless of the number of aircraft and frequency of operation, is still accomplished in accordance with practices and procedures approved prior to deregulation.

The NATI, discussions with air carrier industry representatives and recent efforts on the part of the FAA Administrator to address issues such as the air traffic system in a cooperative effort with the private sector indicate both a recognition of the disparity between operational practice and administrative requirements as well as an effort to attempt to reduce or eliminate that disparity. It would appear, also, from the examples cited above from the NATI report and the annual safety reports to Congress that, in the air carrier area, the FAA has relied largely upon the industry to trigger reviews of regulatory procedures and requirements.

It appears clear that, in today's rapidly changing environment, the FAA, in order to maintain its role in assuring aviation safety, must become much more active in reviewing and recommending modifications to regulatory requirements.

II. Management/Safety Issues

A. Timeliness of FAA Actions

Of the issues and concerns discussed in this report, the Task Force agrees that the area most in need of improvement is that of timeliness in identifying and responding to safety issues. Repeatedly, in meetings, observations, and reports, timeliness surfaced as a problem and appeared to cause the most frustration. While some delay is inherent in the system, especially in those areas requiring rulemaking, continuing or repeated delay without adequate controls and justification can adversely affect safety.

An issue illustrative of this is that of the installation of shoulder harnesses in small aircraft. Since 1969, Part 23 of the Federal Aviation Regulations has recognized the utility of the shoulder harness in preventing serious injury. However, shoulder harnesses were initially identified as one of three possible additions to the seatbelt that could be utilized to protect the occupants of small airplanes from injuries. The other two were elimination of injurious objects within striking radius of the head and energy absorbing rest(s) that would support the arms, shoulder, head, and spine. (See 23 FAR Section 23.785 as adopted on August 1, 1969.) In 1973, the FAA issued a notice proposing further amendments to Parts 23 and 91 of the Federal Aviation Regulations that would require shoulder harnesses for all occupants of newly certificated airplanes, shoulder harnesses for all occupants of airplanes manufactured one year after the effective date of the proposed amendment, and shoulder harnesses for all airplanes in service with structural provisions for the attachment of such shoulder harnesses within one year after the effective date of the amendment. The rules as published on June 9, 1977, required the installation of shoulder harnesses only for the front seats of all small airplanes certificated or manufactured after July 18, 1978. During this same period of time, the National Transportation Safety Board expressed concern that the new rule would not address the issue of passenger safety in small airplanes and would be limited to a requirement for shoulder harnesses in the front seats. In fact, that is what the rule, as adopted, did require.

Following FAA's issuance of the rule in June of 1977, the NTSB began a review of the FAA's actions and, in December 1980, forwarded safety recommendations to the FAA Administrator that would require the installation of shoulder harnesses at all positions in those aircraft manufactured with attachment points (hard points) for harnesses by not later than December 31, 1985. Furthermore, the NTSB recommended that the FAA, in coordination with airframe manufacturers, develop, publish, and provide approved installation instructions for shoulder harnesses at each seat location in general aviation aircraft where shoulder harness attachment points were not provided as standard equipment. The NTSB then recommended that all general aviation aircraft having FAA approved harness installation instructions be fitted with shoulder harnesses at each seat location not later than December 31, 1985. Those recommendations were taken under advisement by the FAA in 1980, in connection with an on-going regulatory project to assess the economic impact of the various occupant protection options.

In support of that regulatory project, FAA made a study of 47 accidents, 23 of which involved occupants in passenger seats in small aircraft. The 47 accidents involved 136 persons. Eighty-seven (87) of the 136 were occupying a pilot or co-pilot seat. It was estimated that 42 of the 49 passengers occupying passenger seats would have suffered less serious injury had shoulder harnesses been available and used.

An abbreviated chronology of FAA responses to NTSB on this subject is set forth below.

NTSB Recommendation:

12/77 amend regulations to require shoulder harnesses for all seats (newly manufactured and existing) as proposed in 1973 NPRM

FAA Response:

12/78 was considered in '73, found not supportable; no new evidence to support

2/79 retrofit not appropriate, preferred delethalization; now will reconsider decision; analyze, consider options

9/79 conducting regional survey; will advise

3/80 survey completed, proceeding with regulatory analysis; updating report; will determine course of action

4/81 studying feasibility of requiring shoulder harnesses under existing regulatory project; proposed TSO with design requirements; will advise

3/83 cost-benefit analysis completed; will evaluate options

Since 1969, there has been a clear recognition that the installation and use of shoulder harnesses will enhance the safety of small aircraft. However, until recently, no requirement for the installation of such shoulder harnesses in rear seats was forthcoming.

As part of its current crashworthiness research and analysis, NTSB has estimated the benefits of the installation and use of shoulder harnesses by all occupants of small aircraft. The results, described in NTSB's forthcoming report "General Aviation Crashworthiness, Phase II," indicate that shoulder harnesses would reduce fatalities by 20% and serious injuries by 83%.

During the past year, the General Aviation Manufacturers Association (GAMA) expressed an intention to voluntarily install shoulder harnesses at all positions beginning with aircraft manufactured after December 31, 1984. Additionally, since the appointment of Admiral Engen as the Federal Aviation Administrator, work has progressed at a rapid pace on the production of a rule regarding shoulder harnesses. The notice of proposed rulemaking for the installation of shoulder harnesses in normal, utility, and acrobatic category airplanes was circulated in OST in October 1984 and a revised version was again circulated on December 3, 1984. The NPRM was subsequently published and the comment period closed on June 10, 1985. A Final Rule is anticipated by late 1985.

While it is recognized that there is no requirement that the FAA comply with any or all recommendations made by the National Transportation Safety Board, there is a responsibility on the part of FAA to respond and to follow-up as indicated in the response. In an effort to further assess the timeliness issue, an analysis was made of the status of FAA responses to NTSB recommendations.

The Task Force analyzed FAA's responses to 1706 NTSB aviation safety recommendations issued since July 1968. As a brief background, when NTSB adopts and issues safety recommendations, generally as the result of its accident investigations, copies are sent to appropriate agencies who respond, indicating a plan or program which, when implemented, would satisfy the intent of the recommendation. NTSB evaluates the response and assigns the recommendation to one of the following categories:

Open safety recommendations: NTSB awaiting the addressee's follow-up action.
- Open, acceptable: addressee's plan would satisfy intent; NTSB monitors progress.
- Open, acceptable alternate action - addressee's alternative plan meets recommendation objective and Board concurs.
- Open unacceptable action - addressee disagrees with the need or merit of the safety recommendation; NTSB may formally attempt to clarify or reemphasize need for action.

Closed safety recommendations: A formal Board action, determined when follow-up action no longer required.
- Closed, acceptable action - addressee action fulfills recommendation objective.
- Closed acceptable alternative action - addressee responds with alternative plan, Board concurs.
- Closed, unacceptable action - addressee's response negative, Board considers response as final, or further correspondence useless.
- Closed, no longer applicable - changed circumstances, follow-up no longer warranted, or recommendation too old to be effective.
- Closed, reçonsidered - addressee rejects recommendation, supporting rejection with a rationale in which NTSB concurs.

Nearly 200 of the responses analyzed are in the categories "Open Acceptable Action" or "Open Acceptable Alternate Action." In some cases there is no appearance of progress toward completion of action on these recommendations.

The Department's Office of the Inspector General recently completed an audit of FAA's implementation of NTSB aviation safety recommendations. According to NTSB records examined by OIG, 62 recommendations issued to FAA during 1970-1978 remained open as of August 1983 even though FAA agreed to take corrective action. The audit disclosed a need for FAA "to improve their management of...recommendations...to achieve more timely corrective actions." The auditors also found that during that same period (1970-1983), NTSB had to repeat several recommendations after similar aviation accidents occurred because FAA had not completed their proposed corrective action. In response, FAA concurred with the findings and recommendations of the OIG and reported the actions it intended to take.

Rulemaking is an area in which timeliness is both a real and perceived problem. For example, general aviation crashworthiness has been the subject of at least 31 NTSB recommendations over a 14-year period. Nineteen of these recommendations remain open; of these, 14 require regulatory action, and 5 do not. In connection with rulemaking and timeliness, the FAA validly contends that action by OST and OMB is responsible for some of the delays.

A discussion of FAA's inaction on some safety issues was presented in the GAO study "How to Improve the Federal Aviation Agency's Ability to Deal with Safety Hazards" (1980). GAO found that FAA had not been timely or effective in dealing with some safety hazards because there was no planning process for addressing safety issues. Without this process, the study states, management lacks a frame of reference for planning, approving, implementing, and evaluating specific safety projects.

FAA's response to this statement acknowledged the need for a comprehensive planning process and indicated such a process was being developed. The first 10-year "Aviation Standards Plan" was issued in June 1982. It "defines the component elements of the National Aviation System; quantifies the requirements necessary to meet future demands on that system; and responds to overall policy objectives for a safe, efficient, and environmentally sound aviation system." In 1983 the focus was narrowed to identify resources, major programs, objectives and plans on a yearly basis. The most recent version was issued in March 1984. GAO monitored implementation of this recommendation and in June 1984 indicated that these actions were responsive to the recommendation.

While recent developments reflect progress in the area addressed by the 1980 GAO study, it continues to appear that FAA has not adopted an efficient, effective system for responding to external initiatives such as industry/public rulemaking petitions and NTSB recommendations. These initiatives comprise a large portion of agency activities and may require policy decisions by FAA, but the agency often is slow in responding.

An example is the rulemaking petition submitted by the National Association of Flight Instructors (NAFI) to FAA in February 1982. The proposal recommends numerous changes to Part 61 of the Federal Aviation Regulations which contains the requirements for certification of pilots and flight instructors. The petition includes recommendations to create a restricted category for "recreational" pilots, to establish annual training and flight review for pilots with less than 400 hours, to eliminate home study programs as "acceptable ground training" for certification, and to set a minimum age of 14 for student recreational pilots. Except for the routine comment period (March-June 1982) and status reports to the petitioners, the proposal was dormant until late 1984. At that time, the FAA Administrator directed that this rulemaking be expedited, and an NPRM was issued on June 25, 1985.

Another example of rulemaking delay is the issue of fire retardant materials in commercial aircraft interiors. This has been an issue in commercial aviation since the late 1940s. FAA last updated the cabin materials flammability standard in 1972. The agency did not complete rulemaking proposals, begun in the mid-1970s, pertaining to standards for toxicity and smoke emission. FAA's rationale was that further research and development was needed to understand the interrelationship of flammability, smoke, and toxicity. Several members of Congress have expressed frustration over the length of time rulemaking to improve cabin safety has taken. In July and August 1984, the Aviation Subcommittee of the House Public Works and Transportation Committee held hearings on legislation which had been introduced to set statutory deadlines on FAA's cabin safety rulemaking. A rulemaking timetable was proposed at the hearings and reiterated by Subcommittee Chairman Norman Mineta and Ranking Minority Member John Paul Hammerschmidt in a letter to the FAA Administrator on September 17, 1984. As requested in that letter, FAA continues to submit monthly progress reports to the Subcommittee.

Since the hearings last year, FAA has issued three final rules and has a number of other safety regulatory actions underway. In a letter to Secretary Dole and Administrator Engen on August 1, 1985, Congressmen Mineta and Hammerschmidt expressed their support for the three final rules issued since October 1984 and urged that the compliance dates be strictly enforced.

STATUS OF REGULATIONS ON CABIN SAFETY

I. <u>Final Rules Issued:</u>

Fire-Blocking Layer on Aircraft Seats and Cushions	Final Rule issued 10/23/84
Cabin Emergency Lighting (Floor Proximity Lighting)	Final Rule issued 10/22/84
Airplane Cabin Fire Protection (Fire Extinguishers and Smoke Detectors)	Final Rule issued 3/26/85

II. NPRM's Issued:

Class D Cargo Compartments/Improved Liners	NPRM issued 8/8/84 OST awaiting Final Rule
Upgraded Medical Kits	NPRM published 3/14/85 Comment period closed 7/12/85 OST awaiting Final Rule
Cabin Materials Flammability Standard	NPRM issued 4/11/85 Comments due 7/15/85 Comment period reopened on 8/1/85 for 45 days.

III. NPRM's in Preparation:

Protective Breathing Equipment and Crew Training Requirements	NPRM returned to OST 8/7/85, reflecting major changes made pursuant to Secretarial instruction.
Dynamic Testing Criteria for Seats, Doors, and Emergency Exits	NPRM was submitted to OST on 6/14/85 and was returned to FAA with comments.
Improved Flight-Cabin Crew Emergency Communication	OST awaiting proposed NPRM
Fire Protection System with Total Flood Concept	OST awaiting proposed NPRM
Evacuation of Smoke from Cabin	OST awaiting proposed NPRM

IV. NPRM's Under Consideration

Anti-Misting Kerosene	Action deferred to mid-1985
Crash-Resistant Fuel Systems	ANPRM issued 3/5/85 Comment period closed 7/5/85

(1) Industry/consumer comments. The frequency and similarity of opinions among consumer and industry groups make it clear that there is a perception that the timeliness problem is pervasive at FAA. Among the comments heard most often were that FAA doesn't respond to proposals; that it "sits on" what it doesn't like; that its rulemaking process has no valid structure, guidelines or timetable; and that scheduled or recurring reviews are very frequently postponed. The Task Force found little evidence to rebut these allegations. This may be as indicative of a public relations/communications problem as it is of a timeliness problem. Several air carrier employee associations and public representatives strongly implied that if a proposal involved a significant cost to air carriers or aircraft manufacturers, FAA would not move forward swiftly. This has not been substantiated, but does clearly represent a perception on the part of that segment of the aviation community.

(2) Recommendations:

a. That the FAA adhere more strictly to a specific timetable for each significant safety rulemaking activity and, further, that such timetable require written approval by the Administrator for any time extensions or exceptions; further, that notice of such timetables, waivers, exceptions, etc., be provided to OST.
b. That action plans and completion dates be prepared for all currently pending significant safety rulemaking activities.
c. That FAA impose reasonable time limits for taking action in response to all NTSB aviation safety recommendations and that any extension or exception to such time limits be granted only upon written approval by the Administrator with notice to NTSB and, further, that no NTSB aviation safety recommendation remain open for more than one year, without written explanation, update, and Administrator concurrence.
d. That OST impose reasonable time limits upon all OST reviews of safety rulemaking documents, with extensions or exceptions to be granted only upon written approval by the General Counsel with notice to the FAA.

B. Uniform Interpretation of Regulations and Policies

Lack of uniformity in the implementation of FAA's Flight Standards Safety Program was brought to the attention of the Task Force during the course of meetings with representatives of industry organizations and consumer safety organizations. This issue has also been discussed in several other reports on FAA programs.

(1) Industry/consumer comments. During the course of the aviation group meetings, representatives of the various groups revealed a perception that FAA headquarters lacks a broad, national view of the agency's mission and programs and appears, at times, divorced, both geographically and programmatically, from the field offices. These private sector organizations feel an absence of national coordination and standardized interpretations of regulations and policies.

There were numerous comments at all the group meetings concerning adequacy and clarity of FAA regulations. Some industry spokesmen felt that FAA regulations are clear but that there is a lack of consistency in interpretation and application. Two factors which make complete uniformity difficult for FAA are varying regional priorities and the problems inherent in a large organization.

(2) NATI report. Perceptions of a lack of uniformity among FAA personnel as well as differences between FAA and carriers were confirmed during the nationwide carrier inspection. The report points out, for example, that

"The decentralized solution to what may be potentially broad-based problems has led to a lack of standardization in the application of policy. The NATI participants...observed a number of instances of non-standard application of policies and practices."

The structure of the NATI effort brought together personnel occupying identical positions in different geographical areas. As a result, FAA found that its regions use different approaches in policy implementation, carrier compliance, and other areas. The agency attributes these differences to several factors, e.g., its decentralized field organizations, rapid changes in the air carrier environment, or local problems which should be solved expeditiously--implicitly on site. The need for uniformity or consistency is also evident in the increasing practice of contracting for training of pilots, flight attendants, and maintenance crews. It has been the practice that carriers provide training with FAA approval of the curricula. The contract system results in a situation in which service personnel trained by another carrier may not be adequately trained and familiarized with the operations of the parent carrier. This is an area with considerable potential safety impact. It is possible for FAA to provide more stringent guidelines and oversight to develop more standardized training programs for service personnel. The creation of such training programs could be delegated to selected carriers in much the same manner as airframe design testing has been delegated to manufacturers and aircraft maintenance and pilot certification has been delegated to airlines. However, FAA would have to exercise close oversight or supervision at the outset to insure that quality, uniform training is provided.

Administrator Engen is taking steps to improve consistency and accuracy throughout the agency, ranging from uniform application of air traffic rules to ensuring full reporting to headquarters of near midair collisions and providing national program guidance on safety programs. Some of the early findings from Project SAFE also verify the need for greater attention to the dissemination of accurate and current interpretations of agency rules and directives.

(3) Recommendations:

a. That, to improve uniformity among regions, FAA expedite the review of regional interpretations and implementation of FAA regulations and policies to include public hearings or meetings with industry and public interest representatives on the subject of regional variation in interpretation and implementation of regulations and policies.
b. That the FAA establish procedures to achieve more uniform interpretation and application of its inspection and certification requirements.

C. Internal and External Communication

During the course of its review, the Task Force has become convinced that there is a need for FAA to improve its internal processes for information exchange and, further to improve processes for disseminating information to the industry and the public.

(1) Industry/consumer comments. Participants at group meetings frequently mentioned difficulties in obtaining information from FAA. For example, instances were cited wherein petitions for rulemaking filed with the FAA did not elicit either a response or an acknowledgment of receipt. Failure to communicate with petitioners increases the frustration of both industry and public interest groups in dealing with the FAA and enhances the perception that the FAA is either poorly managed or intentionally non-communicative.

Another area of concern raised during the course of discussions with industry representatives and groups dealt with FAA communication and information exchange with other agencies and organizations such as NASA, the Department of Defense, universities, and other centers of aviation research. It was acknowledged that there was, on the surface, considerable exchange of information between these agencies. However, the concern expressed dealt more with the utilization of information and resources from other sources in addressing aviation safety problems. A recent example of interagency cooperation is the FAA/NASA joint crash project in California. However, a considerable amount of aviation research and testing is conducted by organizations other than FAA and the perception, on the part of some members of the industry, is that FAA does not make adequate use of the information and resources that are available. While this failure to utilize or rely upon the work of other agencies and organizations is not an across-the-board, pervasive issue, it does exist and some effort should be made to improve in that area.

Additional examples of both internal and external communications problems from the standpoint of industry and consumer groups are: (1) a labor union representative, during the course of one of the group meetings, stated that his members complain that they never see the FAA inspectors, but rather, the inspectors deal only with management; (2) a 1984 NTSB high altitude involvement study ("Air Canada Flight 965, Lockheed L-1011, C-FTNJ, Near Charleston, South Carolina, November 24, 1983"), the results of which were presented by NTSB Chairman Burnett to the Public Works and Transportation Subcommittee on Investigations and Oversight on June 7, 1983, found that over 100 commercial pilots using routes over a dangerous storm area were not aware that FAA's high altitude weather information service (HIWAS) was available and that the service was explained in the FAA's Airman's Information Manual. These two examples are primarily illustrative of the range of communications issues which exist in connection with the FAA. The Task Force is aware that the current Administrator is addressing the issues of internal and external communication.

(2) NATI report - Increased and improved communication is repeatedly emphasized as a need both within the organization and with the air carriers. During the course of NATI, FAA found the information in its Air Operator Data System, which has been a major source of internal information had "a large number of errors...." The agency intends to rectify this problem with its new comprehensive data system, the Aviation Safety Analysis System (ASAS), which is being phased into headquarters and regional offices. This system will allow FAA to upgrade reporting, information exchange and early warning of potential safety problems. It

will also be an important source of information for program and personnel management. FAA's position is that progress is being made toward transitioning into ASAS, but that it is a slow process due to the requirement to educate personnel in the use of the system and to "deprogram" them of old communications habits.

Another problem within FAA is the lack of consistent and accurate data, especially in the area of controller and inspector staffing. It is recognized that staffing levels are constantly changing, but in its information gathering, the Task Force encountered instances of several offices reporting different historical data, as well as inconsistent current status information. The FAA could improve its image by expediting information retrieval and making certain that frequently requested data is accurate and easily obtainable. Administrator Engen has already taken steps to improve air traffic controller data and to make it available through a monthly status report. Responding to a similar problem, he has also tightened up procedures to ensure full and accurate reporting to headquarters of regional data on near midair collisions.

(3) Recommendations:

a. That FAA provide for acquisition of regional data on a timely basis at headquarters and for coordination of data requests among offices within headquarters.
b. That FAA review its public affairs/public relations policies and improve public as well as industry awareness of FAA's functions, information, and resources.
c. That FAA review its relations with other departments and agencies, strive to develop closer working relationships and information exchanges with them, and instill a more positive attitude toward utilization of research and technology from other organizations and agencies to improve aviation safety.

D. Regional Autonomy

During the course of its review, the Task Force was continually reminded either by experience or by comments from individuals and organizations within the aviation community of the role that decentralization has played in FAA's ability to effectively carry out its responsibilities. Decentralization, as a management technique, is felt to be generally acceptable. However, decentralization has resulted in a degree of regional autonomy that has been largely responsible for some of the concerns already discussed.

(1) Industry/consumer comments. During the course of meetings with organizations and groups, two terms were heard repeatedly--"fiefdoms" and "10 little FAAs." At the same time, there was no indication of a desire on the part of these individuals or groups to concentrate all management authority and discretion in the Washington headquarters. What became clear from the comments was the perception, and to a lesser degree, the fact that there was a need to provide more guidance and direction from the headquarters to the field. The FAA Administrator is aware of these concerns and is initiating steps to address them.

(2) NATI Report - The NATI increased awareness within FAA that a significant gap exists in routine communication between regions and offices with respect to inspection results. This significant gap may also be indicative of additional organizational problems. A letter from the FAA Administrator to Congressman Mineta in January 1985 points out that non-standard application of FAA policy has resulted, in part, from decentralization.

It is clear from reviewing the NATI report that inspectors in one region are generally inspecting the aircraft of only those carriers whose certificates are held in that region or at that facility. A recent DOT Inspector General audit also identified numerous instances where required inspections were not performed on air taxi operators' aircraft, operations, and facilities at airports outside the geographical areas of the certificating district offices. The IG Report said this occurred primarily because of the low priority given to the geographic area responsibility concept by FAA district offices. The IG noted the need for improvements in communicating and coordinating between the district offices to ensure the inspections are accomplished and recommended that FAA headquarters look at the potential national implications of failure to fully implement the concept as provided in FAA Order 8000.49, "District Office Geographic Area Responsibility Concept" (dated July 27, 1981).

A situation arising during a Task Force visit to an FAA field office is illustrative of another type of problem that can result from regional autonomy. The director of the field office could not adequately explain why many carriers whose certificates were held in that region had been cited for fewer deficiencies when inspected at airports in that region than were discovered when those carriers were inspected by another region during the NATI. During the NATI, an effort was made to establish uniform criteria for all inspections. Thus, the problem may be one of emphasis, rather than non-standard interpretation or application of criteria. However, this situation also raises the question of the extent to which FAA should require more career mobility for inspectors, rather than permitting them to remain in the same region and even assigning them to the same carrier(s) for extended periods. The potential negative aspects of extreme familiarity with particular air carriers should be weighed against the positive aspects to ensure that national policy and standards are always carried out.

It is felt that the NATI also increased FAA awareness of internal communication difficulties in the inspection area. The improvement of internal communication and the effectiveness of the current inspection system is being examined in the context of the aviation Safety Activity Functional Evaluation (Project SAFE), a long term study by the FAA. The preliminary findings of this study were recently circulated by FAA.

The FAA Administrator is cognizant of the overall effect and impact of regional autonomy and is currently attempting to restore control and authority at the headquarters level to the degree necessary to assure consistency of interpretation and application.

(3) Recommendations:

a. That FAA expedite the completion of Project SAFE, and implement findings from that study.
b. That the FAA Administrator continue his efforts to provide clear direction from the headquarters to the regions, especially with respect to more uniform interpretation and application of inspection requirements.
c. That the FAA take steps to provide increased mobility for inspector personnel.
d. That the FAA fully implement the geographic area responsibility concept, ensuring adequate communication among regions and district offices and appropriate follow-up of inspection results.

III. General Aviation Safety Issues

A. Overview

According to FAA statistics, pilot error is a factor in 83 percent of general aviation accidents. Most of these errors occur in three categories--take-off and landing related accidents (50-60%); weather related errors (10-15%); and mid-air collisions (5%). An FAA brochure, titled, "The Accident Prevention Program, Your Key to Safe Flight," states that a high percentage of these accidents are the result of one or a combination of the following factors:

- lack of basic knowledge and skills of airmen,
- complacent attitude toward safety,
- flight hazards associated with the aviation environment.

Regulations pertaining to pilot training and certification are contained in Part 61 of the Federal Aviation Regulations. Training is geared to provide ground and flight instruction for competence in visual navigation, weather conditions, and aircraft operations. Pilot candidates must pass a written examination and flight test given by an FAA authorized examiner and then are licensed (certified). Following the initial certification rating a pilot may acquire additional ratings for more complex aircraft types. However, basic operating certificates have no expiration date.

At present, flight instructors can use either the Flight Test Guide issued in 1973 and contained in FAA Advisory Circular 61-54A, or the new Private Pilot Practical Test Standards (FAA-S-8081-1), issued by FAA's Aviation Standards Branch in the Oklahoma National Field Office.

The option of using either procedure ceases on September 1, 1985, when the new standards replace AC-61-54A. The major contrasts in private pilot certification between these procedures are:

-- The Flight Test Guide includes ten maneuvers (for example, cross-country flying competence, night navigation, etc.). Under this procedure a student would be tested in three or four of these areas, but not all, to prove competence in this segment of the certification process. Under the new standards every pilot-to-be is tested on every maneuver.

-- The new standards require that a pilot seeking to upgrade his certificate from a single-engine instrument rating to the multi-engine instrument category redemonstrate competence with instruments in order to advance to the desired category.

As noted earlier, a significant revision of pilot training and certification requirements has been proposed to FAA by a joint FAA-industry panel formed by the National Association of Flight Instructors. The revisions were submitted to FAA by NAFI as a petition for rulemaking, which was published in the Federal Register of March 15, 1982. The proposal was dormant until late 1984 when the FAA administrator ordered it to be moved through the rulemaking process. An NPRM was drafted by FAA encompassing the panel's proposals and, also, containing other revisions desired by FAA. The NPRM was circulated, revised as a result of comments within the Office of the Secretary, and issued on June 25, 1985. The amendments in the pilot certification NPRM would create a new recreational pilot category requiring less training and skill, but, correspondingly, limit the operating privileges of such pilots; expand the concept of training to standards, which is already offered as an alternate instruction method; and revise and upgrade requirements for post-certification competency training and reviews. The remainder of this section on general aviation issues discusses the separate elements of the pilot certification NPRM, as well as other general aviation issues.

B. Pilot Judgment Training

The high percentage of private pilot accidents attributed to "pilot error" has given rise to a concern that, often, pilots do not correctly assess the limitations of their own capabilities and the capabilities of their aircraft. Research has been conducted in the U.S. and in Canada to determine the efficacy of incorporating judgment training or pilot decisionmaking into pilot instruction. Some commercial carriers have developed programs in cockpit resource management--including pilot decisionmaking--in order to improve pilot judgment. The preliminary research has demonstrated that aeronautical decisionmaking training can be successfully incorporated into instruction programs for private pilots and that such training can lead to a reduction in the number of judgment related pilot errors. This information offers a potential opportunity to improve pilot training.

FAA has been involved in judgment training research since 1976. In 1984 FAA's Office of Aviation Medicine together with the General Aviation Manufacturers' Association, the Aircraft Owners and Pilot Association, and Transport Canada conducted a demonstration project in FAA's Eastern Region to assess which decisionmaking skills could be taught to student pilots. Although testing and evaluation of the project has not been completed as yet, the FAA project manager indicates that 60-70% of the students and instructors who have responded to evaluation questions thus far feel decisionmaking training improves pilot judgment.

Judgment or decisionmaking training does have support within the industry. AOPA has cooperated fully in the demonstration project in the Eastern Region although that organization does not fully support increased licensing and certification requirements. GAMA has been working informally with the FAA and sponsored a seminar earlier this year to prepare a specific curriculum of decision-based instruction. The results of that seminar are to be presented to the FAA Administrator.

While FAA's pilot certification NPRM begins to address some of the issues in pilot training, it does not address judgment training. FAA staff in the Office of Aviation Medicine are continuing to evaluate the effectiveness of judgment training and to review methods of introducing it into pilot training by certificated flight instructors.

C. Safety Responsibility of Certificated Flight Instructors

Based on concerns about flight instructor training, the General Aviation Safety Panel, recommended that flight instructor training be revised to include courses on human factors and on interpretation of the Federal Aviation Regulations. The panel also suggested that certificated flight instructors be held more accountable by identifying the CFI of pilots involved in accidents. The panel's rationale for this proposal is that this procedure would encourage CFI's to maintain high standards and also provide data from which the FAA could identify favorable and unfavorable patterns of instruction.

FAA reviewed requirements for flight instructor certification and is approaching the accountability issue by using ASAS to screen pilot histories and correlate unfavorable reports with each pilot's instructor and examiner. FAA has indicated it is developing a demonstration project which, if successful, can be replicated nationwide.

D. Recreational Pilot Certificate

One of the elements giving rise to the pilot certification NPRM discussed previously was the proposal of the NAFI panel to revise portions of Part 61 to create a new pilot category termed "recreational."

The prerequisites for licensing in this category would emphasize basic flying skills and techniques and would deemphasize the more sophisticated types of training such as sophisticated communications and navigational training now required for all entry level private pilots. The basis for this would be that the pilots holding "recreational" certificates would have strict operational limitations placed upon them. These limitations would include daytime only flying and strict distance limitations from the home airfield as well as a requirement that flying be done only in and out of uncontrolled airports. Those seeking private pilot certification who fall within this category would benefit from the proposal in that they would receive training which emphasizes the basic skills and would not be required to undergo training which, at that level and for that purpose, is of limited or no value.

An essential element of the proposed rulemaking for the recreational pilot's certification is the presumption that those who obtain such certification will abide by the rules surrounding such certification. This presumption, of course, goes with any restrictive rulemaking. FAA supports the establishment of this new pilot category although it recognizes that here are legitimate safety questions which must be addressed since the rule would require less training for initial private pilot certification and would result in an increased number of aircraft without sophisticated communications and navigational equipment in the airspace. Both the FAA and NAFI are of the opinion that a substantial portion of the purely private pilot population already falls within this category and that, while the creation of the category may result in an increase in the number of pilot certifications, the

restrictions placed on it would not result in increased traffic in controlled airspace. The various viewpoints on this particular aspect will be addressed during the comment period on the NPRM.

E. Biennial Flight Review

FAA implemented the biennial flight review (BFR) program in 1974 to insure that pilots remain competent to fly safely. According to FAR 61.57, a pilot cannot legally act as "pilot in command" unless he has demonstrated that he possesses the knowledge and skills to fly safely. Authority to conduct a biennial flight review has been delegated by FAA to certificated flight instructors and designated examiners. The content of the review is not specified in the regulation. In fact, the BFR is a proficiency check, not a test, consisting of a review of operating and flight rules and review of maneuvers and procedures which, in the discretion of the authorized examiner, demonstrate the pilot's competence. After satisfactory completion of the review, the examiner endorses the pilot's log book.

The GAO, NTSB, GASP, and NAFI have commented on the BFR's:

GAO: The BFR requirement was assessed in two studies. The first, "Improved Controls Needed Over Private Pilot Licensing" (February 26, 1976) concluded that "FAA does not have an effective system for determining whether private pilot flight tests and biennial flight reviews comply with agency standards." The major findings relating to the BFR are:

- "guidance on the conduct of flight rules has been inadequate, and instructors and examiners conducting the reviews have widely varying opinions on what procedures, maneuvers and other matters should be reviewed."
- "FAA does not monitor flight reviews or know which pilots have taken the required flight review; it is not making any appreciable effort to enforce the requirement." (all quotes from p. ii of GAO's report)

The GAO concluded "that FAA has not adequately defined the content or performance standards of an acceptable biennial flight review, has not obtained information on the procedures, maneuvers and other matters covered in the review, and has not kept information on pilots' compliance with the flight review requirement." (p. 16 of GAO report)

The Department's response to these findings indicated:

- agreement that additional guidelines were needed to strengthen BFR's; that standardized guidelines had been developed in cooperation with the aviation industry; and that an advisory circular concerning them would be issued. (A circular was issued February 11, 1976 (Number 60-12) informing all FAA certificated pilots and flight instructors of the availability of the BFR guidelines and provided the name and address of six associations plus one university where the guidelines could be obtained.)

- its procedures were adequate for enforcing the-BFR's and that obtaining information on which pilots have and should have received the reviews would not be practical; and
- it did not agree that information on the content of flight tests and biennial reviews and the examiners and instructors' appraisals of pilots performance should be obtained and used as a basis for evaluating the quality of flight test and biennial reviews.

Five years later the GAO's report "The Federal Aviation Administration Can Improve the Operation of Its General Aviation District Offices" (June 29, 1981) stated that many FAA and industry officials believed that the voluntary guidelines and the regulations regarding the BFR were still too vague and discretionary (p. 26).

GAO also refers to an "industry/FAA workshop conducted in January 1981" on the inadequacies of the BFR guidelines. (Although the GAO '81 report does not specifically name the workshop purpose or conclusions, the panel may have been the one formed by NAFI which developed the pilot certification petition.) GAO states that this panel concluded that the BFR is too vague and discretionary and the panel recommended "a regulation change that would specify minimum aeronautical knowledge and subjects to be covered in the review, appropriate to the grade of pilot license held by the individual" (p. 26 of GAO '81 report).

The major recommendation regarding the BFR in the GAO '81 study proposed amending "Federal Aviation Regulations to specify minimal subject matter to be required in each biennial flight review, appropriate to the type of pilot license and ratings to be used" (p. 29). This was similar to the aforementioned recommendation of the unnamed industry workshop. The Department's response indicated it did not agree. Instead, the reply reiterated that the BFR "was designed to achieve a proficiency objective and reduce accidents" and referenced data appearing in the GAO '81 report which indicated a steady improvement in the general aviation accident record during 1972-1976 (p. 5 of attachment to DOT's letter to the Office of Management and Budget, dated September 4, 1981, replying to GAO's final report on the GAO '81 study).

In addition, the letter indicated with regard to the BFR and two other programs evaluated in the same study--examiner surveillance and aircraft rental--that an extensive review of these programs had been made (although who performed the review is not indicated). FAA states, also:

- "In each instance it was determined that adequate management procedures and safeguards are in place to ensure appropriate control;" and, further;
- the level of effort was in balance with the desired results, alluding to the declining numbers of accidents and fatalities cited in the GAO '81 report;
- that additional manpower would not result in a proportionate increase in safety in that program, but would reduce emphasis in higher priority safety programs (no evidence was given of a cost/benefit or any other structured analysis which led to these conclusions).

NTSB: This GAO '81 report also refers to NTSB's views, as follows:

- The broad and non-specific language of the BFR regulation led to wide interpretation by those giving the review, with the result that the reviews were ineffective. The voluntary industry guidelines added nothing to what was already in the regulation.
- Since a pilot can take the review in any aircraft for which he has a rating, the review requirement could be satisfied in a basic model aircraft which would not be an adequate determinant of the pilot's competency in any more complex models which he could legally operate.

At that time, FAA told NTSB that the Board's recommendation to amend the aviation regulations to require multi-engine rated pilots to demonstrate competency during the flight review would be considered in FAA's planned review of applicable regulations. (The multiengine competency issue is discussed in section F of this chapter.)

GASP: As a result of comparing data on regular, structured training for pilots and accident rates, the GASP unanimously recommended that FAA endorse a program of yearly recurrent training for general aviation pilots. The majority opinion recommended that in lieu of the BFR at least two hours of dual training each year be required as a prerequisite for pilots to carry passengers or act as pilot in command. Specific areas identified for this training were:

- Emergency procedures dealing with system failures;
- Aircraft performance and the influence of configuration, loading, emergency situations and atmospheric conditions; and
- Flight planning and enroute decisionmaking.

Others in the panel proposed that the FAA allow pilots to choose either two hours of yearly training including ground school or the BFR.

NAFI: The pilot certification NPRM discusses the content of some portions of the NAFI petition. FAA's synopsis of the NAFI position on post-certification training status is as follows:

- an annual flight review for low-time pilots (those with less than 400 hours flight time); and
- instruction and logbook endorsement for low-time pilots who have not acted as pilot-in-command within the preceding 180 days.

FAA proposal: FAA's NPRM on pilot certification is a composite of the GASP and NAFI proposals, as follows:

GASP: require at least 2 hours annual training for all pilots in lieu of the BFR; or choice of of training or BFR.	FAA: require 1 hour ground, 1 hour flight instruction for recreational and private pilots; not a competency rating (pilot could not fail); instructor gives logbook endorsement; does not necessarily satisfy review requirement.
NAFI: require annual flight review for low-time pilots (less than 400 hours)	FAA: require same procedures as in current BFR on annual basis for low-time private or recreational pilots (less than 400 hours).
NAFI: recency of flight as pilot in command: low-time pilots who have not flown as pilot in command within preceding 180 days must obtain instruction and logbook competency endorsement before flying.	FAA: low-time pilots who have not flown as pilot in command within previous 180 days would have to receive flight instruction and logbook competency endorsement from an authorized flight instructor.

The NPRM provides that all the review and instruction requirements could be combined, at the discretion of the instructor. For example, if during the recreational or private pilot's annual 2-hour training, the flight instructor determines that the biennial or proposed annual flight review requirements have also been satisfied, the instructor could so endorse the pilot's logbook. Likewise, if the instructor conducting the proposed annual flight review determines that the recency requirements for instruction for pilots who have not flown as pilot in command within 180 days have also been met, the instructor could so endorse the pilot's logbook. Thus, review and instruction could be conducted simultaneously, and several requirements could be met at once at the discretion of the flight instructor.

F. Competency Testing for Pilots Moving to More Sophisticated Aircraft

The qualifications required to act as pilot in command of an aircraft are contained in Part 61 of the Federal Aviation Regulations. In order to act as a pilot, a person must be certified (licensed) by the FAA or a designated examiner and obtain logbook endorsement, attesting to the pilot's competency for the aircraft categories for which he is rated. At present, the regulations do not require a separate endorsement for each make and model of aircraft in a specific category. Thus, it is possible for a pilot to move from simple to more complex aircraft--which require a higher degree of skill--without undergoing competency testing by an authorized examiner.

The dichotomy between training and flight review requirements on the one hand, and the complexity of piloting high performance aircraft on the other, has been a concern of the NTSB. The Board conducted a special study and, in December 1979, issued the report, "Light Twin-Engine Aircraft Accidents Following Engine Failures, 1972-1976." The study focused on pilot proficiency, and among the recommendations to FAA were the following proposals regarding check rides:

- amend 14 CFR Part 61.57 to require that to act as pilot in command of a multi-engine aircraft a person must have successfully completed, within the last 24 months, a flight review in a multi-engine aircraft (Recommendation Number A-79-96); and
- amend 14 CFR Part 61.57 to require that during the multi-engine flight review the pilot demonstrate the maneuvers required for a multi-engine proficiency check in accordance with the flight test guide, especially those related to power loss (Recommendation Number A-79-97).

FAA's response to both recommendations dated March 28, 1980, stated that the agency was conducting an internal review of Part 61 to identify areas of potential revision and that NTSB's recommendations would be considered. No further response or update exists. NTSB holds these two recommendations in the open, acceptable action category.

Since then the technological complexity of high performance general aviation aircraft has increased. In addition, performance and handling features vary by manufacturers and, further, different models produced by the same manufacturer can have different equipment. Such factors have raised the actual and potential hazards associated with operating an unfamiliar aircraft. NTSB again was drawn to this issue of pilot training, as the result of investigations of three crashes occurring in 1980 and 1981, each involving small, high performance jet aircraft. The Board concluded that inadequate pilot training appeared to be a cause or factor in each of those accidents. NTSB also indicates that the availability and demand for such airplanes will increase, making it presumable that similar accidents will also increase unless preventive measures are implemented. On September 27, 1982, the Board issued 19 recommendations in this area. Six were directed to FAA, and the others to manufacturers of general aviation jets and users. In four recommendations, the Board called upon the FAA to change the manner in which training guides were developed, for general aviation jets to:

- require that manufacturers provide for the initial certification of a new general aviation turbojet aircraft, a training guide for pilot transition into that aircraft, encompassing the entire flight envelope in which the plane is intended to operate, including handling characteristics and performance elements, including the hazards of exceeding the flight envelope, with such guide approved by FAA for use in pilot training or examination (A-82-123);
- require that manufacturers provide similar training guides for currently certificated turbojets (A-82-124);
- review or revise, as necessary, its criteria for type rating of successive models of an original aircraft design to determine if differences are sufficient to warrant appropriate modifications to those criteria (A-82-125); and
- require that type-rating flight checks in turbojets include actual attitude and speed ranges compatible with the specific flight envelope of the airplane (A-82-129).

FAA's response to the NTSB on December 15, 1982, stated that a special flight standardization board (FSB) would be created to review what, if any, changes in training were warranted. Flight standardization board review has been developed by FAA as a means to ascertain what training and similar

requirements are appropriate for all aircraft to be certificated (except aircraft weighing less than 12,500 pounds). The boards are comprised of FAA technical specialists and manufacturers' representatives. A board can also be convened to review training, if a problem is apparent. The FSB convened in response to NTSB's 1982 recommendations has completed its work and issued a report to FAA containing its conclusions. According to staff of FAA's General Aviation and Commercial Division in the Office of Flight Operations (AFO-800), which is directing the response to the above Board recommendations, many of the concerns raised in the NTSB's 1982 recommendations have been resolved and a full response to the NTSB is pending.

G. General Aviation Crashworthiness 1/

Regulations regarding crashworthiness for the general aviation fleet include design standards in FAR 21 and operating rules which are in FAR 91. The need for greater occupant protection in small aircraft has been the subject of much research and discussion. One of the main problems is in establishing human impact injury criteria. This is partly due to difficulties in measuring such impact in test cases, and partly due to the fact that individuals have vastly different crash tolerance levels. As early as 1970 the NTSB began making what now amounts to scores of recommendations to FAA, based on accident investigations, to require improvements in the crashworthiness of small aircraft and to require internal equipment, such as shoulder harnesses, strengthened seats, and limitation of protruding objects in cabin interiors.

FAA has conducted extensive research on crashworthiness. One study reported in 1971 indicated that most general aviation aircraft disintegrate at force levels of 10g and above making restraint equipment for crash survival of dubious value for such crashes. However, two other findings of that study were:

- failure of seatbelts and seats in even moderate decelerations occurs because the equipment is inadequately attached to cabin structure.
- use of properly designed and installed shoulder harnesses would help prevent impact of the head and upper torso.

A 1973 FAA report compared the levels of crash protection provided by seatbelt alone, seatbelt/shoulder harness, and seatbelt/airbag restraint systems. The seatbelt/airbag and the seatbelt/shoulder harness system was deemed most desirable.

In 1973 the FAA and NASA began a general aviation crash test program to obtain information with which to predict structural collapse and to improve designs for seats, occupant restraint devices and cabin interiors. Twelve reports were produced through 1979. The effort, known as project KRASH, included the development of a computerized method for analyzing general aviation aircraft under probable accident conditions. The project results were intended to be useful to aircraft designers in the development of improved crashworthiness and were used experimentally by at least one major aircraft manufacturer.

1/ As used here, crashworthiness refers to fire retardants, crash kinematics, energy absorbing seats and shoulder harnesses and the effectiveness with which such equipment withstands the gravitational forces occurring in crashes.

A 1978 FAA report estimated that a 17 percent improvement in survivability could be attained if seat design load factors set forth in FAR 23 were increased. Seat strength requirements are specified in this regulation, but there is no standard specified for downward inertia forces generated during crash conditions in airplanes which do not have retractable landing gear. Since manufacturers need not exceed the requirements of applicable regulations, design for downward forces is not required.

At present, FAA is considering several rulemakings which could improve crashworthiness elements. One of these is the product of a joint NTSB/industry effort. A crashworthiness task force group comprised of industry (from the GASP), NASA, NTSB, and FAA has established crash design standards for seat and restraint systems for new general aviation aircraft designs. The group has presented its findings to FAA, to be considered in the FAA's forthcoming FAR 23 design review, and also to be reviewed as a separate element. On September 21, 1984, FAA published a draft advisory circular (AC) regarding its intent to issue rules to require designers of future civil aircraft to increase occupant protection. The AC, entitled, "Draft Advisory Circular on Human Exposure to Impact; Preview of Crash Dynamics Program," would apply to both commercial and private aircraft. An NPRM on shoulder harnesses was published by FAA and the comment period closed on June 20, 1985. FAA expects to issue a Final Rule by the end of 1985. FAA also sent an NPRM on dynamic testing criteria for seats, doors, and emergency exits to OST for review in June 1985.

H. Accident Prevention Program

FAA began this program in 1971 in order to reduce the general aviation accident rate by improving private pilot aeronautical knowledge, aeronautical skills and attitude toward safety. The program relies on industry and volunteer participants and is coordinated by FAA in district and regional offices. The primary activity of the program is sponsoring joint FAA/industry pilot safety meetings. The program also involves pilot proficiency activities and refresher clinics; obtaining and following up on safety suggestions submitted by the aviation community; counseling airmen; and assisting flying clubs and other aviation groups in establishing accident prevention programs.

The proficiency award program, called "Wings," began in 1977 as an effort to deal with a rising number of general aviation accidents attributable to pilot error. The program offers continuing training which private pilots can voluntarily attend. For example, the program offers instruction geared to the required biennial flight review.

According to the program manager, participants in the "Wings" program have an outstanding safety record. Only 81 accidents with a total of 10 fatalities have occurred among the group of 45,000 airmen who have participated in the program since July 1979. It could be argued that program participants are more highly motivated and safety conscious. Yet, the enhanced proficiency and safety awareness resulting from participation also appear to be factors contributing to the comparatively low instance of accidents among "Wings" program participants. After reviewing the accident prevention program at

district offices in 1981, the GAO concluded that the program is a good idea but that it could be made even more effective. GAO recommended that district offices identify specific safety problems and how they will be resolved in their accident prevention plans; collect data on safety meeting participants to plan future meetings and target groups; appoint counselors at locations in need; and follow-up on reports. FAA generally agreed with the recommendations, stating that some of these objectives were already in the program.

Later in 1981 the Western Region Inspector General included the Accident Prevention Program in an audit of FAA's Western-Pacific Region. The auditors concluded that substantial improvements were needed in the program to make it effective. Areas of particular concern were program planning and direction and lack of an adequate organization of counselors. In its initial response FAA indicated general agreement with these findings and recommendations and indicated its plans to address these concerns. FAA formally responded to the report on February 4, 1982, within the standard 90-day period, stating that all the procedures outlined in its initial response were implemented and the recommendations of the Inspector General were put into effect. The Inspector General determined FAA's response appropriate and has not taken any further follow-up action. The Office of the Inspector General in the Western Region tentatively plans to review both enforcement and the accident prevention programs in FY 1986.

General Aviation Safety Recommendations: As a result of the review of general aviation safety issues and FAA initiatives, the Task Force submits the following recommendations:

a. That FAA expedite completion of its ongoing General Aviation Safety Audit, evaluate results of portions of the Audit already completed, and identify appropriate steps to implement whatever changes are indicated by those results.

b. That the FAA and OST cooperate to expedite issuance of Final Rules or other appropriate follow-up for NPRMs on:

(1) recreational and private pilot certification and training; and

(2) shoulder harnesses.

c. That the FAA take appropriate follow-up action to the NTSB recommendations and the report of the special flight standardization boar with respect to training requirements for GA pilots operating more sophisticated aircraft.

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