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REPORT BY THE

Comptroller General

OF THE UNITED STATES

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How To Improve The Federal Aviation Administration's Ability To Deal With Safety Hazards

Though aviation's safety record is admirable, there is a great deal of concern both inside and outside the industry about the Federal Aviation Administration's effectiveness. What, if anything, is FAA doing wrong and what can it do to improve its performance?

FAA has not been effective or timely in developing systems to identify safety hazards. Also, because it has no overall planning process, FAA's actions in dealing with individual safety problems are perceived to be reactive instead of anticipatory. The agency has not adequately marshalled its forces to deal with safety problems quickly and effectively.

FAA has taken some steps that may improve its performance. GAO is recommending specific procedures, processes, and controls that should make FAA able to respond more quickly and effectively to aviation hazards.

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

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The Honorable Harold T. Johnson
Chairman, Committee on Public Works
and Transportation
House of Representatives

The Honorable Elliott H. Levitas
House Of Representatives

As requested in your letters of October 23, 1978, and November 17, 1978, this report discusses the Federal Aviation Administration's management of aviation safety. We found that while the agency has taken some steps to deal with safety problems, it should do more to respond quickly and effectively.

The Department of Transportation, in its comments on our draft report, concurred with many of our observations but did not clearly address or did not address at all most of the specific conclusions and recommendations presented in the report.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

Comptroller General
of the United States

COMPTROLLER GENERAL'S REPORT TO THE CHAIRMAN, HOUSE COMMITTEE ON PUBLIC WORKS AND TRANSPORTATION, AND THE HONORABLE ELLIOTT H. LEVITAS HOUSE OF REPRESENTATIVES

HOW TO IMPROVE THE FEDERAL AVIATION ADMINISTRATION'S ABILITY TO DEAL WITH SAFETY HAZARDS

D I G E S T

Aviation, compared with other transportation modes, has a good safety record. However, the Federal Aviation Administration (FAA) has not been timely or effective in dealing with some safety hazards (safety problem areas such as midair collisions, fuel fires or explosions, and lack of child restraint devices). FAA does not have

--effective systems for identifying safety hazards,

--a comprehensive planning process to address safety issues,

--an adequate system for planning and approving individual safety programs,

--a proper system of controls to govern the implementation phase of safety projects, or

--sufficient evaluation of safety programs and projects.

IDENTIFICATION OF SAFETY HAZARDS

FAA has not been effective or timely in developing systems to identify safety hazards because it has not

--recognized the importance of hazard identification systems,

--emphasized information gathering and analysis, or

--undertaken long-term planning for comprehensive identification systems.

Organizational problems have also hampered FAA's effectiveness. For example, no single individual or office has been responsible for hazard identification, and organizational conflicts have existed between FAA and the National Transportation Safety Board. FAA has recognized its shortcomings and has recently moved to correct them. One way was through an overall study of safety information analysis.

To better understand how to identify hazards caused by human behavior, FAA conducts human factors research. However, people inside and outside FAA question whether the agency pays enough attention to this kind of research. Whether or not such perceptions are accurate, an agencywide approach to this area is warranted. (See p. 5.)

COMPREHENSIVE PLANNING PROCESS

FAA does not have a comprehensive planning process for addressing aviation safety issues. Without this process, management lacks a frame of reference for planning, approving, implementing, and evaluating specific safety projects. Moreover, top management's lack of emphasis on the importance of planning has contributed to untimely or ineffective approaches for addressing some safety hazards. (See. p. 18.)

PLANNING OF INDIVIDUAL SAFETY PROJECTS

Once FAA has identified its overall safety priorities, it must have a procedure for making sure that plans for safety projects are prepared, reviewed, and approved. To date, however, such a procedure has either been incomplete or nonexistent. As a result, FAA has not always been able to address specific safety problems quickly and effectively. Difficulties regarding priorities, requirements, cost-benefit analyses, interim corrective actions, internal coordination, staffing-workload analyses, and accountability have contributed to this problem. (See p. 30.)

For example, FAA began a high priority project in October 1973 to develop criteria for approving child restraint devices for aircraft use. Priority on this project was later downgraded, and in May 1978 the project was canceled. However, a December 1978 air carrier accident in Portland, Oregon, in which two infants died, again demonstrated the need for child restraint devices, and FAA established another high priority project concerning child restraint devices. (See p. 31.)

Between 1970 and 1978 FAA developed standards for more energy-absorbing aircraft seats. FAA officials told GAO that the new standards would not be used, however, because there was no evidence that existing standards were inadequate. FAA's decision to develop new standards, followed by its decision not to use them, were not based on an estimate of the associated costs and benefits. (See p. 37.)

FAA's past efforts to deal with midair collisions have been hampered by a lack of internal coordination and disagreements over policy, approach, timing, and direction. FAA developed a coordinated agencywide plan to address this hazard after the September 1978 San Diego midair collision. (See p. 40.)

CONTROLS OVER IMPLEMENTATION PHASE OF SAFETY PROJECTS

FAA management needs a system of controls to govern the implementation phase of safety projects. The difficulties discussed so far have directly affected the timeliness and effectiveness of FAA's safety projects and should be documented in project files. Frequently, they have not been documented. Also, safety projects have not always been adequately monitored. FAA has no agencywide requirement for recording actual time charged on safety project work. As a result, FAA has not had adequate controls to monitor the progress and performance of safety projects. (See p. 53.)

EVALUATION SYSTEM

Evaluation has received varying commitment during FAA's history. In recent years, however, it has received little priority and has diminished in use.

Though assigned major evaluative functions, the Office of Aviation Safety and the Program Review Staff, Office of the Associate Administrator for Administration, have either not carried them out or, in GAO's opinion, did not provide for appropriate independence in performing such functions. Further, FAA has not always evaluated the effectiveness of nonregulatory actions that addressed safety problems and does not require that such evaluations be made. (See p. 60.)

RECOMMENDATIONS

GAO makes a number of recommendations to the Secretary of Transportation that, if implemented, should make FAA able to respond more quickly and effectively to aviation problem areas. These recommendations appear on pages 16, 28, 51, 58, and 65 of this report.

AGENCY COMMENTS

The Department of Transportation concurred with many of GAO's observations but did not clearly address, or did not address at all, most of GAO's specific conclusions and recommendations. The Department believes that recent actions taken within FAA will accomplish the same results as GAO's recommendations. These actions include changes to the organizational structure under an Associate Administrator for Aviation Standards, including the establishment of a safety-oriented organizational component, and changes to the regulatory process.

GAO believes that these actions and others FAA plans to take have the potential for improving FAA's operations. However, GAO recommends many more specific improvements to FAA procedures, processes, and controls

that should make it able to respond more quickly and effectively to aviation safety hazards from the time a problem is identified to the time a proper solution is put into effect.

Contents

ABBREVIATIONS

DOT	Department of Transportation
FAA	Federal Aviation Administration
GAO	General Accounting Office
NTSB	National Transportation Safety Board

CHAPTER 1

INTRODUCTION

At the request of the Chairman of the House Committee on Public Works and Transportation and Congressman Elliott H. Levitas, we reviewed the Federal Aviation Administration's (FAA's) efforts to set priorities and develop timely solutions to safety hazards (safety problem areas such as midair collisions, fuel fires or explosions, and inflight turbulence). We examined FAA's efforts to (1) identify safety hazards, (2) assign priorities, (3) develop action plans, (4) implement plans, (5) monitor implementation of the plans, and (6) evaluate the effectiveness of its safety projects. We assessed the adequacy of FAA's management controls over its efforts to reduce or eliminate safety hazards but not the technical sufficiency or reasonableness of its solutions.

RESPONSIBILITIES

FAA is responsible, under the Federal Aviation Act of 1958, as amended (49 U.S.C. 1421), for ensuring the safe and efficient use of the Nation's airspace and fostering civil aeronautics and air commerce.

To meet these responsibilities, FAA conducts the following basic programs.

--Regulates air commerce to ensure safety through the development, promulgation, and administration of safety and medical standards, rules, and regulations which govern airmen, aircraft, aeronautical operations, and related ground support activities. It oversees aeronautical activities to assure that regulations are followed, determines necessary changes in regulations, and processes charges against those who violate Federal Aviation Regulations.

--Provides for air traffic safety and efficiency by providing air navigation services for en route navigation, access to the airway system, and guidance in the approach and landing phase of flight; air traffic services to assure separation of flights in the en route and terminal areas; and furnishing preflight and in-flight assistance to pilots.

--Assists in developing of public airports by making grants-in-aid to localities for airport planning and construction.

--Operates and maintains Washington National and Dulles International Airports, which serve the Washington metropolitan area.

--Carries out other activities designed to facilitate and promote the development of safe and efficient air commerce.

FAA understandably attaches great importance to its safety-related programs, which include a wide-ranging engineering and development program and a systems acquisition process. But perhaps FAA's most effective safety endeavor is its rulemaking and enforcement authority provided by the Federal Aviation Act of 1958, as amended. Following issuance of notices (and advance notices) of proposed rulemaking for public comment and appropriate public hearings, FAA can publish new aviation safety rules, directives, and requirements capable of handling almost any aviation safety problem that can be dealt with by regulatory action. On safety matters requiring immediate attention, FAA can waive public comment on proposed rules.

SAFETY POLICY

The Department of Transportation (DOT) is strongly committed to air safety. DOT Order 5800.2 dated September 17, 1973, states:

> "It is the policy of the Department of Transportation to provide the highest practicable level of safety for people, property and the environment associated with or exposed to the nation's transportation systems. The Department of Transportation recognizes safety as a primary management responsibility and as a major factor in its decisionmaking process. Its safety programs will stress accident prevention through identification, reduction and control of hazards, and emphasize integrated efforts directed at preventing, reducing and controlling accidents caused by human, equipment or operational factors."

FAA, in its March 1972 report "The National Aviation System Policy Summary," described its policy for ensuring safety as follows:

> "Safety is a major responsibility and goal of the FAA. Accordingly, the agency will continue

to place major emphasis on air safety problems. The agency will assume the initiative not only in attempting to identify unsafe conditions, but also in seeking to implement improvements or corrections before actual incidents occur. In developing safety standards for the various kinds of operations conducted by the aviation community, the agency will take into account both the private rights and public obligations of each segment. These considerations are primary determinants in establishing the level of safety required in the public interest, a level which must represent proper balance between the efficiency and safety of air transportation."

These documents were current as of September 30, 1979.

SAFETY RECORD

Aviation, in comparison with other transportation modes, has a good safety record, especially air carriers which are expected to provide the highest possible degree of safety. The following chart shows statistics released by the National Transportation Safety Board (NTSB) 1/ on transportation fatalities from 1973 to 1978.

Transportation Fatalities

	1973	1974	1975	1976	1977	1978 (note a)
Highway	54,615	44,950	44,690	45,523	47,876	50,145
Grade crossings	1,185	1,250	910	1,174	1,001	1,064
Railroad (note b)	777	582	564	590	644	632
Marine	2,074	1,854	1,860	1,533	1,528	1,500
Aviation						
General	1,412	1,290	1,324	1,341	1,395	1,548
Air carrier	227	467	124	45	654	161
Pipeline	70	34	30	82	43	33
Total	60,360	50,427	49,502	50,288	53,141	55,083

a/Based on preliminary statistics released on May 12, 1979.

b/Figures include rapid rail transit.

1/NTSB is an independent Federal agency that investigates transportation accidents and determines their probable cause.

While the aviation safety record is good, there is a great deal of concern both within and outside the aviation industry about FAA's management. What, if anything, is FAA doing wrong and what can it do to improve its performance?

ORGANIZATION

FAA is organized into three major components--FAA headquarters in Washington, D.C.; 12 regional offices located in the United States and overseas; and numerous field offices located in the United States and overseas. On September 30, 1979, FAA had over 55,000 full-time employees and for fiscal year 1979 spent about $3 billion for its various programs.

FAA has undergone numerous organizational changes in the past 2 years. (See app. I for charts of FAA's organization as it existed in 1977 and at September 30, 1979.)

On November 2, 1978, a major change in the way FAA prosecutes its safety work occurred with the creation of a new position, the Associate Administrator for Aviation Standards. The Office of Aviation Safety, the Civil Aviation Security Service, and the Flight Standards Service 1/ were placed under the executive direction of the new Associate Administrator. Additional changes were made to this new organization on December 21, 1978, and July 10, 1979. As a result, there are now four offices--Aviation Safety, Civil Aviation Security, Flight Operations, and Airworthiness--reporting to the Associate Administrator for Aviation Standards.

1/The Flight Standards Service was responsible for assuring aircraft airworthiness, airman competence, and the adequacy of flight procedures and air operations. Effective with a reorganization of July 10, 1979, the Flight Standards Service ceased to exist. Its responsibilities were transferred to the Office of Airworthiness, Office of Aviation Safety, and Office of Flight Operations under the Associate Administrator for Aviation Standards. However, for the purposes of this report, we continue to use the Flight Standards Service designation because this organizational component was responsible for many of the areas we examined.

CHAPTER 2

NEED FOR GREATER EMPHASIS ON IDENTIFICATION OF SAFETY HAZARDS

FAA has not been effective or timely in developing systems to identify safety hazards. Years have elapsed and known problems have persisted. There are many reasons why FAA has not moved quickly; for one, it has not recognized the importance of hazard identification systems. Neither has it emphasized information gathering and analysis nor undertaken long-term planning for comprehensive identification systems. Also, FAA has had organizational problems; for example, no single individual or office has been responsible for hazard identification. Other problems are organizational conflicts within FAA and between FAA and NTSB. FAA has recognized its shortcomings and has been moving to correct them, but we believe that certain steps are needed to make sure that changes are made.

The last unexplored frontier of aviation safety is the role played by human beings. To better understand how to identify hazards related to human factors, FAA does human factors research. However, many people inside and outside FAA question whether FAA pays enough attention to this kind of research. Whether or not these perceptions are accurate, an agencywide approach to this area is warranted.

HAZARD IDENTIFICATION EFFORTS NOT EFFECTIVE OR TIMELY

FAA's main mission is to promote aviation safety. Since the first step in eliminating safety hazards is to recognize them, FAA collects and analyzes an abundance of information on aviation. However, although FAA's hazard identification efforts have been numerous and varied, they have been hindered by insufficient information gathering, limited analysis that has not fully employed state of the art capabilities, and an inadequately planned and coordinated agency approach. Further, FAA has not addressed known weaknesses in its hazard identification efforts in the most timely manner.

Although in this report we do not deal with all of FAA's hazard identification efforts, some of its more far-reaching and critical efforts are discussed. These include accident and incident (near accident) reports, the Service Difficulty Program, a proposed comprehensive Flight Standards Service system, and systems that address the human element in aviation.

Accident and incident information

An example of ineffective and untimely FAA action concerns the accident and incident data system. Records for the system are compiled by investigators of aircraft accidents and incidents and are useful in identifying hazards. However, these records could be used better and this has been known within FAA since 1975.

An August 1979 FAA report, confirming previous studies, found underused and ineffective accident and incident data systems. The report criticized FAA's incident reporting system for not collecting as much information as it should. It pointed out that, as in 1975, the term "incident" needed to be better defined. It also concluded that FAA's accident data system did not use adequate trend analysis (looking for patterns in accidents or incidents) or other statistical techniques commensurate with the state of the art. Most FAA field personnel responding to a questionnaire used in the FAA study favored using the computer more to detect problem trends and to "red flag" problems after they occurred a certain number of times.

The FAA report also proposed eliminating redundancy between the FAA and NTSB accident and incident data bases by having FAA formally approach NTSB about establishing a common data base. Similar suggestions were made in 1975 and 1976, but attempts to act on them were unsuccessful, according to FAA and NTSB officials, because of differing agency missions, organizational conflict, and the agencies' maintaining parochial interests. Many FAA officials favor a common data base, and NTSB officials have expressed a willingness to accommodate FAA needs in other ways.

Service Difficulty Program

Another area where problems have been discussed within FAA for a long time has been the Service Difficulty Program. This program, which primarily records data about broken aircraft parts, is FAA's most important source of information on the airworthiness and reliability of aircraft. Its purpose is to collect and analyze data on malfunctions and defects so they can be corrected. Many sources, including air carriers, air taxis, manufacturers, and aircraft repair stations, are required to report their service

difficulties to FAA. However, FAA officials knowledgeable about the Service Difficulty Program estimated that, because reporting for general aviation was largely voluntary, only 10 percent of the service difficulty information--collected to detect problems earlier--was coming to FAA's attention. Accordingly, FAA may not be aware of the volume or seriousness of particular difficulties.

The regulations covering what should be reported as an air carrier service difficulty have not changed significantly since the late 1960s, although improvements have been suggested since then. A 1973 attempt to streamline and update service difficulty reporting requirements was terminated in 1975 because the regulations were becoming lengthier and more complex. A project authorized in 1976 to expand and modernize the rules failed in March 1979 to become a regulatory project because the Flight Standards Service had a backlog of other items and would only approve projects for "safety-of-flight" items. However, this project was reactivated in August 1979, after the May 1979 DC-10 accident at Chicago, Illinois, raised questions about problems with aircraft components and resulted in widespread interest in service difficulty problems. A decision on whether to approve this project was still pending in September 1979.

Internal FAA staff recommendations for improving the Service Difficulty Program abound. They include studying the extension of reporting requirements to all persons in the aviation industry; requiring manufacturers and operators to keep service difficulty data and give FAA access to it; mandating that malfunctions be reported every time they occur; establishing a requirement that warranty and parts replacement data be reported; and requiring the reporting of items such as incidents during taxiing or landing, tire and wheel failures, all major engine repairs, and deficiencies in emergency equipment such as evacuation slides.

Proposed comprehensive Flight Standards Service system

FAA continues to have weaknesses, which were identified 4 years ago, in its overall methods of hazard identification and analysis. Two studies--a 1975 Flight Standards Service staff study and a 1976 Mitre Corporation report--identified fundamental problems with Flight Standards' systems. They proposed an integrated information and analysis system that would include accident, incident, and service difficulty systems, as well as many others. The significance of the reports' findings was magnified by the possibility that any

overall system could be expanded to encompass the activities of the entire agency.

The 1975 and 1976 studies noted that Flight Standards' many data systems were developed without an overall plan, resources were applied in a redundant and fragmented way, and the existing systems for identifying problems were inadequate. The 1975 study found inadequate trend analysis, and the 1976 Mitre Corporation report concluded that to a great extent stored data was not analyzed. Mitre recommended emphasizing the red-flagging of problem areas, an approach contrary to Flight Standards' traditional use of information for postproblem analysis or one-of-a-kind answers.

These same problems and others that had been noted years earlier still existed in FAA during our review. The problems included many safety information systems with no overall plan, duplication and fragmentation of effort, problems not addressed, computer output being described merely as dumps of the data base, and various data bases containing associated data that is not easily consolidated. There was also evidence that available information, designed for specific purposes, was hard to analyze to support decisionmaking and consequently was not used to its maximum extent. In addition, the Flight Standards Service was still said by people inside and outside FAA to have limited statistical capability for, and to place little emphasis on, systematically analyzing past and future trends. Such shortcomings may result in problems not being noted as quickly as possible and FAA not being able to reply to outside recommendations or events from a base of knowledge.

Information about human factors

FAA's information about human factors includes data on pilot and controller error and the ability of humans to survive crashes. Although air safety has improved steadily since World War II, about 60 percent of air carrier accidents and about 80 percent of general aviation accidents still involve human error. To date, FAA has not collected enough information about human factors to address the underlying causes of human error and injury, although it is now striving to improve its data bases in this area. Data to which FAA has access includes the NTSB accident data base; medical data collected during accident investigations (including pilot medical conditions, factors that may predispose a pilot to an accident, and crash injury details); the system error reports dealing with controller error;

and the Aviation Safety Reporting System, which a group studying the system called possibly the most important step toward solving operational and human factors problems.

A 1978 FAA staff paper criticized NTSB's data base and said that it was essential to identify what information about human factors should be obtained during accident investigations. Until causes were further defined, it noted, there could be no effective safety programs aimed at the root causes of accidents related to human factors. NTSB staff admitted the existence of such problems and acknowledged that FAA could not do much until the data gathering approach was better defined. NTSB was studying the situation in September 1979 and told us that neither FAA nor NTSB knew what information should be collected.

The 1979 FAA report mentioned earlier noted that the existing data system gathered little specific crash or injury information and that more information about human factors needed to be collected. FAA's Office of Aviation Medicine, though feeling the situation was not likely to improve, suggested an idealized system for collecting data in areas ranging from restraint systems to crash, fire, and rescue services to psychological and behavioral background information. Also, FAA field personnel suggested ways of determining the degree of pilot error.

FAA believed that working toward a common NTSB/FAA data base would improve both the collection and use of human factors information. However, recommendations for uniform systems for collecting crash data made in our October 15, 1974, report to DOT and NTSB and in a 1976 Office of Aviation Safety survey of air carrier cabin safety were apparently ignored.

FAA's Office of Aviation Medicine has been aware of problems with data about human factors and has begun addressing them. A 1977 study showed that the Aviation Medicine Program in general aviation accident investigations was not effective in either acquiring or applying human factors information. According to FAA officials, even though FAA's Medical Accident Data System was established 7 years earlier, as of September 1979 it had not been able to adequately analyze system data because of problems in getting computerized access to it. Therefore, its usefulness in identifying medical contributions to accidents had not been established. Revisions to the Medical Accident Data System to provide for better access were being planned during our review, and a new form for collecting medical data from accidents went into effect in January 1979. Data from the new form was not expected to be computerized, however, until early 1980.

FAA was also taking action to correct weaknesses in the system error program, which collects information on controller and other errors. In December 1977 the Mitre Corporation issued a report to help identify the human reasons for aircraft approaching each other too closely. One of the report's conclusions was that the system error program should have more compelling data on actual causes and corrective actions. During our review FAA was revising the system error reporting form and procedures and expected to have them tested in early 1980.

Many aviation interest groups and others felt the analytical potential of another information source--the Aviation Safety Reporting System--was jeopardized by a 1979 FAA action that has since been modified. The program, as established, allowed pilots and controllers to report aviation safety problems and receive immunity from FAA sanctions with respect to the reported case, even if aviation regulations were violated. The immunity provisions were designed to ensure an unrestricted flow of information.

The future of the system was thrown into doubt when the FAA Administrator decided that immunity was too detrimental to aviation safety enforcement and outweighed the system's potential informational benefits. Aviation interest groups and others argued that changing the program would jeopardize the filing of future safety hazard reports and diminish the system's usefulness before it was given a chance to show hazard trends. FAA contended that information submission would not be curtailed too greatly and that the usefulness of additional repetitive information for trend analysis was minimal.

After the disagreements were aired, FAA changed its position to allow an individual immunity one time, providing certain conditions were met including the timely filing of of a report with the Aviation Safety Reporting System.

QUESTIONS RAISED ABOUT HUMAN FACTORS RESEARCH

One means FAA uses to identify safety hazards related to the human element in aviation is by sponsoring research on "human factors," a term which has no set definition and means different things to different people. Human factors research is not new, and in FAA it extends from human engineering in systems design to studies of human characteristics. FAA had no summary of dollars spent or needed for human factors research, and the information needed for us to compile a summary was not readily available.

A 1978 FAA report has noted that human factors is the last unexplored frontier in aviation safety. In that light, individuals inside and outside FAA believed FAA's efforts concerning human factors have been less than adequate, and both an internal and an external report have said that few FAA safety programs are even indirectly related to human error. The external sources included a panel of 260 independent aviation experts, an FAA contractor, NTSB staff, and private interest groups. However, others believed FAA's human factors work has been appropriate. One high level FAA official believed any shortfall in FAA's human factors research resulted from a shortage of good ideas, not of financial commitment.

A similar difference of opinion existed on the question of whether FAA's human factors research was properly coordinated. Seven FAA organizational units have been involved in studying human factors. Some FAA officials believed informal communication networks and certain "umbrella" projects were sufficient coordination; other officials disagreed.

Suggestions by FAA officials and others to improve coordination included defining human factors for FAA, developing a human factors research plan, providing a single human factors contact for top management and an FAA human factors spokesman, and writing an FAA position statement on human factors. Such measures, proponents argue, would enable FAA to deal with outside critics more effectively than it can now and would help FAA better lay out the requirements for future human factors work and the dollars needed to meet requirements. Further, they would provide more assurance that human factors were considered in all FAA work and received proper top management attention.

FACTORS CITED FOR HAZARD IDENTIFICATION INADEQUACIES

FAA officials believed the problems with hazard identification data gathering and analysis could be attributed to slowness by FAA in recognizing the importance of hazard identification systems and in supporting new techniques. Further, FAA had not undertaken long-term system planning or established a focal point in the agency for this area.

FAA has not recognized the importance of hazard identification systems

Although the exact causes of FAA's slowness in striving for more effective information systems were elusive, one reason, according to FAA officials, was its failure to recognize the importance of hazard identification systems. The systems concept reported on in 1975 and 1976 never received top level

Flight Standards Service support. Criticisms raised about the systems concept and described to us included charges within FAA of "empire building," questions as to the benefit to be derived from dismantling existing systems to establish a new nationwide system, and disagreement with attempts to design new systems rather than addressing weaknesses with existing systems. FAA officials and a Mitre Corporation official knowledgeable of FAA told us that another reason the concept has not been supported was that FAA staff has been operationally oriented but not necessarily analytically oriented and consequently did not recognize the importance of information analysis.

Officials in three units responsible for analyzing safety information--the Flight Standards Service Safety Analysis Staff (transferred to the Office of Aviation Safety in 1979), the Flight Standards Service Safety Data Branch, and the Office of Aviation Safety before it was reorganized--told us they did not have enough staff to conduct the proper amount of analysis. The current director of the Office of Aviation Safety, which in 1979 was given greater safety analysis responsibilities, did not know why FAA was late in addressing hazard identification problems but said a possible reason was a lack of identification with the systems concept and the potential it offered.

Long-term planning not undertaken

In 1976 FAA began to develop a plan to deal with the long-recognized need to relate its many safety information sources and analyze information for trends and potential problems. By August 1977 FAA components had not agreed on a master plan to govern this area. In October 1977 it was concluded that an overall safety information project was too broad to be manageable. As an alternative to developing a master plan, the agency split out several elements of the overall project as separate projects. No master plan existed as of September 1979.

Our report "Strong Centralized Management Needed in Computer-Based Information Systems," dated May 22, 1978, made recommendations for improving FAA's information systems planning. The report noted that at FAA headquarters there was little formal long-range planning of management information systems. Fragments of a plan, which primarily addressed current and projected computer system projects, existed instead. The same was true of FAA's safety information system in September 1979.

Focal point not established

No single FAA unit has had total responsibility for safety information consolidation and analysis. The mission statements of both the Safety Analysis Staff and the Safety Data Branch in the Flight Standards Service focused heavily on data analysis. The Office of Aviation Safety was also charged with reviewing and analyzing safety information. Officials in various FAA organizational components expressed concern to us about the unclear organizational roles of the offices involved in safety analysis. An example of information that is not consolidated is the system error report being received by the Air Traffic Service and related near midair collision data being gathered by the Flight Standards Service.

Various FAA officials have suggested to us that an agency focal point for hazard identification be established. Such a focal point could alleviate overlapping or unclear responsibilities between offices and prevent situations such as one organizational component undertaking an analysis effort without another component even knowing about it.

A December 1978 FAA consultant's report on safety analysis in rulemaking lends credence to the idea of such a focal point. According to the report, the effective use of safety data depends heavily on systematically and efficiently assembling all the information on a specific project. FAA's traditional approach, however, was less formal and relied on industry data and on individuals who recalled events, studies, or reports. The consultant's report suggested that instead FAA should move toward a system for identifying relevant data, statistical and otherwise, to include informational sources outside FAA such as the Aviation Safety Reporting System.

RECENT FAA ACTIONS TO IMPROVE HAZARD IDENTIFICATION AND ANALYSIS

Many recent actions show that FAA has recognized deficiencies in its hazard identification and analysis. Since late 1978 FAA has made changes that indicate an improved management commitment in this area. In November 1978, for example, the Office of the Associate Administrator for Aviation Standards was created, encompassing both the Office of Aviation Safety and the Flight Standards Service. On March 2, 1979, the Office of Aviation Safety committed the agency to a new safety analysis project based on a 1978 study of safety analysis in rulemaking.

The new safety analysis study, to cost an estimated $2.3 to $5 million over at least 3 years, is being managed by DOT's Transportation Systems Center which was doing similar work for the Federal Railroad Administration. The Center is scheduled to report an interim analysis of requirements to FAA in September 1980, with a final report scheduled for September 1981. A Center official estimated that any resulting system implementation could take until 1984.

The project was originally planned, in part, to develop long-term methods and systems to better use data bases and analytical techniques to support regulatory activity. In late April 1979, FAA established a task force made up of representatives from all appropriate FAA organizations to develop an overall plan for aviation safety information systems. By June 1979 work had begun on increasing the scope of the long-term study. In order to accomplish the main goal of the effort--improving FAA's analytical capabilities--FAA had to have better information. Consequently, the study's expanded tasks included determining FAA's real safety information requirements, critiquing existing systems, and designing a comprehensive safety information system. This system would collect, process, and disseminate safety-related information for use in licensing, regulating, inspecting, monitoring, and controlling the civil aviation industry and the National Aviation System. In this way, according to the study's work description, the manufacture, operation, and maintenance of aircraft, as well as the rating and certification of airmen, could be sensibly managed. The description noted that the June 1979 DC-10 groundings and the growth of the air taxi/commuter and general aviation industry were strong forces to increase the role of existing safety information systems.

When the Flight Standards Service was abolished in July 1979, the functions of its Safety Analysis Staff were transferred to the Office of Aviation Safety. The mission statement for safety analysis was rewritten, and the Office of Aviation Safety was strengthened. Because of these revisions and because it is sponsoring the wide-ranging Transportation Systems Center effort, the Office of Aviation Safety will, among other duties, now serve more as FAA's focal point for hazard identification and analysis.

The Federal Air Surgeon, in charge of the Office of Aviation Medicine, advised us that a new order, in draft form as of September 1979, would improve FAA's coordination

of human factors research. According to him, the order would provide for keeping an inventory of all human factors work occurring within the agency. It would guard against one office starting a project without consulting another office. The Director of the Office of Aviation Safety also would like his office to serve as a human factors focal point in the future.

CONCLUSIONS

The first step in eliminating safety hazards is to recognize them, but FAA has not given systems for identifying and analyzing hazards enough attention. As a result, development of systems has been slow, and existing systems have not been as effective as they could be. Weaknesses were noted and improvements suggested up to 4 years ago, and for the Service Difficulty Program as long ago as the 1960s; however, many shortcomings still existed during our review. Because sufficient information was not collected and better analysis was not done, FAA may not be identifying, and therefore not correcting, potential safety problems as early as possible.

This situation may be due to past FAA officials' not recognizing the importance of hazard identification and analysis. As a result no long-range plan to integrate various systems was endorsed, and no focal point for collecting and analyzing information was established. Also, organizational conflict has existed within FAA and between FAA and NTSB. FAA and NTSB were left with redundant accident and incident data bases.

A new climate, however, appeared to exist in FAA. A long-term attempt to integrate FAA's safety data systems and to upgrade its statistical capability was underway as of September 1979. The Office of Aviation Safety was assigned responsibility to play a central role in hazard identification and analysis, and human factors data were to be improved. Though agreeing with the general direction of these efforts, we have some reservations about FAA's ability to see the effort through to a successful conclusion based on FAA's past performance in effecting needed changes. Because hazard identification and analysis are central to the performance of FAA's safety mission, and because of the cost and amount of time needed to improve FAA's systems, the current efforts cannot be allowed to go the way of past attempts. In short, FAA must ensure that identified weaknesses are not allowed to continue.

FAA's commitment to and coordination of human factors research were perceived by some individuals inside and

outside FAA as needing enhancement. FAA has no agencywide human factors spokesman, statement of position, definition, long-range plan, or summary of dollars spent or needed. Management tools like these could bring increased attention to human factors, said to be the last unexplored frontier in aviation safety. This in turn could lead to more FAA safety programs that deal directly with human factors and assure that human factors are appropriately considered in all FAA work. Accordingly, any agency actions toward greater human factors coordination should consider including these elements.

RECOMMENDATIONS

We recommend that the Secretary of Transportation direct the FAA Administrator to:

- --Prepare a comprehensive long-range plan (1) to improve FAA's identification of safety hazards and (2) laying out the problems to be solved, the integration of various systems to solve them, and milestones for arriving at solutions.

- --Monitor the progress of the overall safety information effort at the highest management levels within FAA and periodically report progress to the Secretary of Transportation.

- --Adhere to milestones for plan implementation.

- --Explore all means for obtaining a common FAA/NTSB approach to accident information.

- --Achieve better coordination of human factors research by establishing an agencywide human factors spokesman and preparing a comprehensive statement of position on human factors, an FAA human factors definition, an agency long-range plan, and a summary of dollars spent or needed on human factors research.

AGENCY COMMENTS

In commenting on our draft report, DOT maintained that ongoing efforts were addressing the issues covered in our recommendations. Specifically, long-range planning, achievement of program objectives, and effective progress monitoring were integral elements of the FAA/Transportation Systems Center project to develop ways of better using data base information and predictive analysis. In addition, DOT feels that since the Office of the Secretary of Transportation and FAA will have equal

access to the system the Transportation Systems Center is developing, thereby providing management awareness of overall safety improvement efforts, the reporting requirement we recommend is satisfied.

DOT also cited the FAA Administrator's awareness of the possible benefits of sharing FAA and NTSB accident information and stated that as part of the FAA/Transportation Systems Center effort, an FAA/NTSB group will report on these possibilities.

DOT acknowledged the need to better coordinate, define, and plan human factors research and pointed out that human factors has been identified as a special program under the Office of the Associate Administrator for Aviation Standards.

We appreciate that FAA is working on the areas that need improvement; however, the improvements have not yet been made. It should be kept in mind that a Mitre Corporation report proposed an integrated information and analysis system back in 1976, and that suggestions for more closely relating FAA and NTSB accident data bases date back to 1975. Also, even though the Office of the Secretary may have access to the systems being developed, the formal development agreement is between FAA and the Transportation Systems Center.

To reiterate our earlier conclusions, the current efforts cannot be allowed to go the way of past attempts. FAA must see that identified weaknesses are not allowed to continue. We believe that our recommendations, if implemented, would aid in assuring that the needed changes are made.

CHAPTER 3

NEED FOR COMPREHENSIVE PLANNING PROCESS TO ADDRESS AVIATION SAFETY

FAA managers do not have a comprehensive planning process for addressing the safety issues facing aviation. As a result, FAA actions in dealing with individual safety problems have been or have been perceived to be reactive and ad hoc instead of anticipatory and preventive. Further, without a comprehensive planning process, management lacks a frame of reference for planning and approving specific safety efforts, implementing individual safety project plans, and evaluating safety project efforts. Moreover, top management's lack of emphasis on the importance of planning has contributed, among other things, to untimely or ineffective approaches for solving or reducing some safety hazards. Examples of these untimely or ineffective actions are provided in chapter 4.

NEED TO ESTABLISH A COMPREHENSIVE PLANNING PROCESS

An effective planning process should be FAA's basic tool for guiding the expenditure of its resources in conformance with its safety goals and priorities. This process would include a number of steps: defining safety goals and objectives in relation to FAA's mission; setting and implementing priorities to achieve these goals and objectives; and measuring the results through organized, systematic feedback. Without setting goals, objectives, or priorities, FAA's management cannot be sure that the organization performs as management desires.

Key elements of planning missing

Because FAA's process for planning and dealing with safety issues was not comprehensive, there was a good deal of ambiguity within the agency itself about what FAA was doing and where it was going. Moreover, top management's failure to emphasize the importance of planning appeared to be the major reason why an effective process did not exist as of September 30, 1979. Numerous FAA officials expressed concern over this ineffective planning and believed a more systematic and objective means was needed to identify the more important safety problems facing aviation.

Planning provides a framework for decisionmaking and assures that efforts are coordinated toward common objectives. It also helps assure effective, efficient programs

and policies through the measurement of performance and analysis of results.

A comprehensive planning process involves several steps.

--Defining the organization's mission. An organization needs to define what its business is and should be. This involves developing alternative definitions, thinking them through carefully, and working out conflicts between different definitions until the organization arrives at a clear purpose.

--Setting clear, specific goals and objectives. These are derived from the organization's mission and should guide not only overall agency policy initiatives but also the activities of each organizational unit.

--Setting priorities for achieving goals and objectives. Because of limited resources, agencies will always have to conserve their strength and concentrate on what is important. Without priorities, the staff will scatter its efforts over a broad range of activities, and much of that effort may be wasted.

--Implementing the plan. Priorities, once established, must be translated into action. This involves setting standards of accomplishment and deadlines for each task and making someone accountable for results.

--Getting feedback on the organization's efforts. An organization must determine if it is meeting its objectives; therefore, it should measure its performance and identify those objectives which have been achieved or have been proven unattainable.

FAA's planning process lacked these elements. The consequences of poor planning were recently illustrated in a DOT evaluation report of FAA's major engineering and development (E&D) programs. For example, the April 1979 report, in discussing the engineering and development management process, concluded in part:

> "There appears to have been a tendency in FAA to establish an E&D program by looking for opportunities to make improvements which relate to FAA functions, rather than responding to critical needs which are prioritized by mission analysis guided by top level policy. * * * It is considered essential to develop a more systematic and coordinated approach to planning."

We believe it is important that planning be explicitly undertaken if FAA is to do more than attempt to react to its changing environment.

Safety goals, objectives, and priorities either outdated or nonexistent

FAA's missions are defined in various statutes, executive directives, and national transportation policy statements. These missions should be translated into safety goals and objectives and, ultimately, agency safety priorities. However, FAA's attempts to do this have been unsuccessful, leaving the agency with statements of its safety goals, objectives, and priorities which are not current and need to be updated.

FAA has formally expressed its policy in Order 1000.1 "Policy Statement of the Federal Aviation Agency," dated April 1965. Applicability of this policy to the various programs and activities is provided by Order 1000.27, appendix 1, "National Aviation System Policy Summary," dated March 1972 and revised in November 1973. Both orders were still listed as current FAA directives and had not been updated since they were issued. FAA officials told us that these policy documents have needed updating for some time but FAA has been hesitant to do so. Reasons for this reluctance, as cited by one official, included the agency's failure to develop a process for determining and documenting policy and a lack of agreement within FAA about what the policy should be. A high level regional office official believed the issuance of an overall policy statement should be a high priority area for any new Administrator.

Since these policy statements were issued, FAA has made some attempts to define safety goals, objectives, and priorities. Each effort, however, was shortlived or failed. For example, in February 1975 the FAA Administrator determined that, if FAA were to continue to carry out its mission effectively, "* * * we must all have a clear and common understanding of the public purpose we serve." He therefore developed 10 goals, each with one or more objectives, to establish the major directions in which the agency should be moving for the foreseeable future. However, since this Administrator's resignation on March 31, 1975, FAA has not attempted to measure its achievement in reaching these goals or objectives nor has it officially adopted any new ones.

In the fall of 1975 FAA established a list of its 10 top priorities. However, as with the listing of 10 goals discussed previously, this undertaking was shortlived and unsuccessful. In late 1976 there was another attempt by

FAA's Office of Management Systems to define FAA's goals and priorities. In a December 21, 1976, memorandum on this subject to the heads of offices and services and regional and center directors, the Director, Office of Management Systems, stated:

> "In the past, we expended considerable effort developing goals and objectives with related measurement systems which reflected the 'performance' of the environment rather than our own. Consequently, many FAA managers found it difficult to relate their work to the broadly stated FAA goals and objectives. Accordingly, we have been directed to develop a program which relates priority issues to the agency's mission and goals."

The only formally adopted document resulting from this effort was the following statement of FAA missions and goals dated in August 1977.

FAA Missions and Goals

Missions	Goals
Promote safety	Reduce aircraft accidents/ incidents Reduce aviation security incidents Reduce airport-related accidents
Promote air commerce and civil aviation at home and abroad	Improve FAA's responsiveness to the aviation needs of the public Sustain U.S. aviation leadership and commitments worldwide Increase the public's understanding and support of aviation Stimulate State and local government participation in aviation
Ensure efficient utilization of airspace	Increase the productivity of the National Aviation System Increase efficiency in the use of energy
Fulfill national defense requirements	Support Department of Defense Support national disaster plans

Administer programs effectively and economically	Increase participation of minorities and women in aviation activities Optimize aviation's positive contribution to the environment Sustain program effectiveness while minimizing cost

We believe that although it was a step in the right direction, this list was much too broad to be useful in communicating what FAA was doing and where it was going. FAA must still define the objectives which will accomplish the overall goals and the priorities which will address those objectives.

As part of its overall effort to formalize FAA's goals and priorities, the Office of Management Systems drafted Order 1300, "FAA Goals and Priorities," in June 1977 which provided the following definitions for goals and priorities.

> "Goals give purpose, scope, and direction to planning. They form the focal point for coordinating and shaping the resources and activities of the FAA."
>
> "Priorities are major goal-related activities of a definable nature which have been officially designated by FAA management to be important and worthy of special consideration and which take precedence over efforts not similarly classified or identified."

When this order was circulated for comment, both the Office of Aviation System Plans and the Office of Budget would not concur with it. The major reason given by the Office of Aviation System Plans was that before completing a planning process overview paper, it was not appropriate to formalize a procedure which might be modified. The Office of Budget believed the proposed order would create confusion within the agency about the process by which goals and objectives were identified and published. It reasoned that the then recently instituted zero base budgeting procedure required the agency's goals and objectives to be identified by decision unit and appropriation 1 year prior to the time schedule stated in the proposed order. The Office of Budget limited its comments to goals and objectives; there was no mention of priorities.

We disagree that zero base budgeting is sufficient for communicating FAA's safety priorities. It is much too broad to show the extent of the commitment FAA is making toward

specific safety hazards. Zero base budgeting focuses on broad programs by funding/appropriation source. It is not oriented to defining and setting priorities about problems facing aviation. Two Associate Administrators agreed with our opinions regarding zero base budgeting. One of them noted that zero base budgeting does not show the significance of specific safety items that affect more than one appropriation or funding source or that cross organizational lines.

We believe the following example illustrates this point. In its fiscal year 1980 budget, FAA identified four broad mission priorities--safety, capacity, productivity, and energy. Under safety, nine items were listed:

--Establish and enforce safety rules, regulations, and procedures to prevent accidents.

--Assure the separation of air traffic to prevent accidents.

--Establish safety standards for airports and assure their compliance.

--Continuously inspect and check the airway navigation and surveillance systems to assure their operation and accuracy.

--Assure the safety and security of airway and airport users and property.

--Establish medical standards for airmen and air traffic controllers and assure their compliance.

--Operate and maintain Washington National and Dulles International Airports within the Federal safety standards, rules, and regulations.

--Provide the necessary research, engineering, and development to continuously support and improve upon the safety of the airway and airport system.

--Provide the necessary facilities and equipment capital investment to support and improve upon the safety of the airway and airport system.

Although these are laudable mission priorities, each FAA office was allowed to decide what the safety issues and problems were, their relative importance, and where they could be incorporated into the budget process. By leaving these choices to the discretion of a number of FAA offices during

a budget process having a 2-year leadtime, we believe the chances of fragmented, uncoordinated, untimely, or differing approaches are greatly increased. The reduction of safety hazards should not be left to chance. The integration of safety issues and problems into a comprehensive planning process could aid FAA in effectively channeling its resources to the more pressing safety areas.

Past planning problems

In July 1977 FAA's Office of Aviation System Plans was directed by the Executive Committee--the highest level of review on all matters of agency policy and other critical issues which may affect the agency's operation or external relations--to study FAA's planning process and determine how it could be improved. This study focused on FAA's application of the processes described in FAA Order 1800.13A "FAA Planning and Resource Allocation" dated March 21, 1977. In an August 22, 1977, planning process overview paper, the Office of Aviation System Plans stated that the process was designed to improve the decisionmaking used to allocate resources and required the agency to translate its broad missions into specific programs which contribute to the accomplishment of that mission. Furthermore, the process was an iterative one that comprised the basic priority-setting mechanism of FAA. The results of each successive step of the process were designed to feed back to the previous steps so that their impact could be assessed.

In summarizing its conclusions on how this order was used, the Office of Aviation System Plans stated that FAA had not utilized the processes which the order described; that there was a lack of agency commitment and participation in the processes; that authorities and responsibilities were not clearly defined, nor were key decision points; and that the elements within the order had been developed in a piecemeal basis over time and had not been assessed in total by top management. Furthermore, the paper concluded that "planning," as documented in FAA Order 1800.13A, was but one element in a set of integrated activities leading from FAA's mission including (1) formulation of goals, objectives, and policy, (2) preparation of forecasts, (3) planning, (4) budgeting, (5) program accomplishment, and (6) evaluation. It added that FAA was not in fact operating within the framework of Order 1800.13A. For example:

--Agency goals and objectives were not clearly documented nor was there a process for their development.

--Development of plans and programs was accomplished without a clear, common understanding of the appropriate direction and priorities.

--The relationship of the 10-year plan to other elements was unclear.

--The procedures, input, and outputs for most of the system elements were insufficiently defined.

--There was no integrated, overall evaluation of program progress toward accomplishment of agency mission.

This paper was never presented to the Executive Committee, which was officially terminated on August 31, 1977. We were unable to determine what use was actually made of this document. Therefore, we presented these same conclusions to top management officials in various organizational components to determine (1) their validity in August 1977 when the overview paper was prepared and (2) whether events had changed in the intervening 2 years. These officials informed us in August and September 1979 that the conclusions were valid in 1977 and remained valid 2 years later. They believed planning was a shortcoming in FAA and that there was a need for a systematic planning process. As one official stated, there was a definite need for planning, but there was not enough time to do it.

NEED FOR TOP MANAGEMENT'S COMMITMENT TO PLANNING

Through top management's examination of the safety goals, objectives, and policies of the agency, FAA can begin determining the safety issues and problems facing aviation. This determination can provide the foundation for future actions to solve specific safety hazards. We believe top management can systematically identify the most pressing, urgent, or serious safety problems through a comprehensive planning process. Previously, FAA established management processes to effectively deal with such agencywide issues.

Similar issues addressed by top management

In the past, FAA has recognized the need for more formalized plans and agencywide commitment to address similar management issues. Its establishment of a formalized system acquisition management process is one example. This process was developed to address many past criticisms related to FAA's acquisition activities. These criticisms focused on requirements definition, preparation of specifications, management of the procurement process, and monitoring and controlling programs. There are many parallels between the system acquisition management process and the changes we believe are needed to provide more timely and effective solutions to safety hazards. For example, the system acquisition management process, as designed, provided for the following:

--The focal point for managing and monitoring the flow of the system acquisition management process is the System Requirements Group, a high level group of representatives of each Associate Administrator, and the Director for Flight Standards, chaired by the Deputy Associate Administrator for Administration. This multidisciplinary group reports to the Administrator and is responsible for the orderly flow of the process through all phases and focusing top management attention upon the critical issues related to major system acquisitions.

--The system acquisition process establishes a management procedure for identifying potential requirements, processing the requirements to determine their validity, and developing and implementing new systems to fulfill valid requirements.

--The system acquisition management process identifies the office of primary interest as the office or service having principal responsibility for the end product(s) of a major system acquisition.

--The role of the program manager in the system acquisition management process is one of accountability. He or she is responsible for overall program management of the development and implementation phases of the system acquisition management process. The program manager assignments are documented in written charters which spell out resource guidance, schedules, and goals and define authority and accountability. The charters also prescribe how acquisitions are to be managed and what authority relationships exist. The charters enable management to measure progress against plans and objectives.

FAA has recognized that management decisionmaking can be made more timely and effective when an agencywide process exists to concentrate efforts on common objectives. We did not examine the implementation of the system acquisition management process, but we identify strongly with the management and control implied by the process. Similar management and control is needed when FAA addresses safety programs and issues. The development of an agencywide process to manage and control safety project efforts needs to command the same type of recognition that FAA has given the system acquisition management process.

Need for safety advisory group

FAA needs to systematically identify the most pressing, urgent, or serious safety issues and problems and establish them as the agency's overall safety priorities. The key to this process is top management's commitment and involvement in it. The establishment of a top management group, which might be called the Administrator's Safety Advisory Group, is necessary to act as an agencywide filtering mechanism to identify what are FAA's overall safety priorities. This Group should be comprised of key FAA management officials and be responsible for setting priorities among safety problems and issues by determining (1) their conformance with FAA's established safety goals, objectives, and policies and (2) the degree of urgency for finding appropriate solutions.

This initial action by the Group would enable FAA to identify the 20, 50, or 100 most pressing safety problems or issues confronting aviation. Then, through the collective judgment of these top management officials, the significance of the problems and issues could be compared with each other and a determination made regarding relative priorities. Recognizing that ranking the 20, 50, or 100 safety problems or issues will be difficult, the Group should strive to categorize the problems or issues into three levels of priority: (1) essential, (2) highly desirable, and (3) desirable. The final result of the Group's deliberations would be a listing of FAA's broad safety priorities. The list would probably include such safety problems and issues as midair collisions and cabin safety.

Establishing the Administrator's Safety Advisory Group and ranking broad safety issues and problems facing aviation will require a large commitment from FAA personnel. We believe this commitment is needed to focus appropriate agencywide attention on the broad safety issues and problems. By identifying the overall safety priorities, each FAA office, component, and employee knows where agency resources will be directed. It eliminates the problem of individual offices or components pursuing less significant safety items. However, on the other hand, it provides the needed mechanism to identify significant safety issues or problems from anywhere within the agency. It is the lack of an agencywide focal point for resolution of safety issues and problems which has diluted some of FAA's safety efforts in the past.

We believe the collective judgment provided by the Administrator's Safety Advisory Group can act as a catalyst

to create an agencywide awareness of the safety issues and problems and facilitate decisionmaking to discover and implement timely and effective safety project plans which address the various elements of the broad safety issues and problems. The lack of this decisionmaking and commitment from management has led to many problems on individual safety projects. These specific problem areas and the needed corrective actions are discussed in the following chapters.

CONCLUSIONS

FAA has not established a comprehensive planning process--a basic element of management--within which it defines organizational objectives, policies, and priorities in relation to its safety mission. Without such a process, management lacks a frame of reference for planning and approving specific agency efforts, implementing individual safety project plans, and evaluating safety project efforts. As a result, FAA's actions to deal effectively with safety issues have often been either reactive or perceived to be reactive as opposed to being anticipatory and preventive.

RECOMMENDATIONS

We recommend that the Secretary of Transportation direct the FAA Administrator to establish (1) a comprehensive planning process which defines organizational goals, objectives, policies and priorities to guide the overall safety mission and provides a frame of reference for planning and approving specific safety efforts, implementing individual safety project plans, and evaluating safety projects and (2) a top management group, which might be called the Administrator's Safety Advisory Group, to identify overall safety priorities.

AGENCY COMMENTS

In commenting on our draft report, DOT acknowledged the need to establish a comprehensive planning process and indicated that corrective action was taking place. DOT stated that FAA was actively engaged in establishing a comprehensive planning process to address safety issues facing aviation and that the organizational mission and definition of specific goals and objectives have already been accomplished. Further, the remaining stages--priorities, implementation, and feedback for safety and safety-related efforts--would be included. We are pleased that corrective action has been initiated. We believe that this comprehensive planning process, if carried out properly, will aid FAA management in assuring that its organization is performing as its desires.

DOT disagreed with our recommendation on the need to establish a top management group to identify overall safety priorities. DOT believes that the comprehensive planning process will result in more effective planning. However, it also believes that "* * * with this more effective planning, there is no need to establish a Safety Advisory Group."

While agreeing with DOT's conclusions that more effective planning should result from the comprehensive planning process, we believe that a need still exists for a top management group to identify FAA's overall safety priorities. A top management group can provide collective judgment on the significance of the safety problems or issues and act as the agencywide focal point for identifying overall safety priorities. It can also act as a catalyst to create an agencywide awareness of the safety issues and problems and facilitate decisionmaking to discover and implement timely and effective safety project plans. This agencywide awareness of the safety issues and problems was missing at FAA. We therefore continue to believe that a top management group is needed to identify overall safety priorities.

CHAPTER 4

NEED FOR BETTER PLANNING TO ASSURE MORE TIMELY AND EFFECTIVE SAFETY ACTIONS

Once FAA has identified its overall safety priorities, it must put additional mechanisms in place which would assure the preparation, review, and approval of formalized safety project plans for safety projects. Up to the present time, however, these mechanisms have either been incomplete or nonexistent at FAA. As a result, the agency has often been unable to address specific safety problem areas quickly and effectively.

MAJOR PROBLEM AREAS AFFECTING THE TIMELINESS AND EFFECTIVENESS OF ADDRESSING SAFETY EFFORTS

We examined 16 specific safety hazard areas. We also had discussions with numerous FAA officials concerning broad safety issues and management controls. Our work revealed seven major problem areas affecting FAA's ability to take quick and effective action against safety hazards. These problems were:

--Priorities not assigned agencywide and not consistent.

--Requirements not specifically defined.

--Costs and benefits not considered at the earliest stages.

--Interim corrective actions not aggressively explored.

--Coordination not assured.

--Staffing implications not properly addressed.

--Accountability not adequately established.

Each of these problem areas did not affect the timeliness and effectiveness of all the actions FAA took on all of the safety hazards we examined. However, the majority were affected, to varying degrees, by them. In the following sections, we discuss each of the problem areas together with some examples of the problems uncovered on specific hazards. Each section concludes with the views of various FAA officials on the problem areas.

Priorities not assigned agencywide and not consistent

FAA had no agencywide system of priorities for safety problems. Even when separate offices attached priorities to individual efforts, over time priorities were sometimes changed. Also, among FAA organizational components the levels of effort and commitment varied. As a result, the most appropriate and timely actions to address safety hazards may not have been taken. We believe that assigning priority designations to safety projects would show management's degree of commitment to solving the problem and would guide prompt and appropriate actions from all organizational components. Furthermore, it would enable the agency as a whole to provide a comprehensive and consistent level of commitment to the solution process. The following examples illustrate the problem.

--Child restraint system. Because of incidents during turbulence, hard landings, and sudden stoppage of aircraft where unsecured infants (under 2 years of age) were injured, in October 1973 the Flight Standards Service authorized a high priority project to amend the Federal Aviation Regulations and allow the use of an FAA-approved restraint device. Research on this device began the following year. However, in October 1977 the project was canceled because it had failed to establish specific standards for infant restraint devices.

In December 1977 another project was authorized to establish these standards. Although this second effort was able to develop standards, the project was canceled in May 1978 because the Flight Standards Service's Safety Regulations Division wanted to concentrate on higher priority work. However, a December 1978 air carrier accident at Portland, Oregon, in which two infants were killed, once again pointed up the need for a child restraint device.

On January 5, 1979, the FAA Administrator established an agencywide task force to assess this problem. Subsequently, the Associate Administrator for Aviation Standards gave the work on child restraint a high priority. As of July 1979, another project having objectives similar to the one started in October 1973 was in progress.

--Midair collision. Although various FAA components have directed a great deal of effort to reducing midair collisions, it was difficult for us to determine

historically how important each component viewed this hazard relative to others or what priority FAA as a whole attached to this work. For example, Flight Standards officials, including some former officials, told us that in the past they considered midair collision work as relatively low priority. FAA research and development officials, however, told us that historically they viewed this work as high priority. These two FAA offices must work very closely with each other to keep research work focused and on schedule and to effect ultimate corrective actions through additional regulation or other means. FAA officials told us that past disagreements or unresolved issues between these two organizations may have prevented or slowed implementation of proposals designed to reduce the midair collision hazard. We also noted that since the 1978 San Diego midair collision, there appeared to be a general agreement within FAA that midair collision work was high priority.

--Wind shear. Several air carrier accidents between 1975 and 1976 were attributed to wind shear 1/. FAA's response to these included research into ground-based wind shear detectors, airborne wind shear detectors, and improved wind shear forecasting techniques. FAA has been successful in developing and is now implementing ground-based wind shear detectors. Improvements have also been made in wind shear forecasting. FAA has been less timely in its efforts to develop and require the use of airborne wind shear detectors installed on aircraft. Airborne detectors are thought to be necessary because not all airports will have ground-based equipment, and both ground-based detection equipment and wind shear forecasting have performance limitations.

In July 1977, FAA's Flight Standards' plans called for issuing a notice of proposed rulemaking within 6 months which would require the use of airborne detectors. The former Flight Standards project officer for wind shear told us that the ranking of this high priority project shifted when the Director of Flight Standards retired. He said there was little support for the project after that time, and it was even dropped as an active project for several months.

1/A change in wind direction and/or speed in a very short distance in the atmosphere.

In place of a notice of proposed rulemaking, an advance notice of proposed rulemaking was published almost 2 years later in May 1979. As of September 1979, FAA was considering the need for a notice of proposed rulemaking.

FAA officials acknowledged that the agency did not have a list of its safety issue priorities nor did it have a process for developing one. They also agreed that commitments to the same safety issue/subject have differed among FAA offices. Further, shifting commitments agencywide or within the same organizational component in some instances resulted in regulatory actions being delayed. FAA officials believed an agencywide listing of priorities would be beneficial in focusing FAA's attention on the more important issues. The former Director, Office of Aviation Safety, told us that FAA would be in a better position to justify its actions if priorities were established systematically. Another former FAA official believed a list of FAA's safety priorities was definitely needed to inform personnel about what was important.

Requirements not specifically defined

In some instances, FAA has failed to establish at the earliest possible time clear, specific requirements for its research and rulemaking efforts. Many requirements have been determined at much later phases in the solution process and resulted in either untimely or unusable efforts. We believe that when research and development or rulemaking is an integral part of the solution process, the establishment of specific, detailed requirements at the earliest possible time can focus efforts on the most feasible research areas and/or on data needed to support rulemaking actions. This is needed to alleviate problems of research products being untimely or unusable and rulemaking actions lacking adequate support. The following examples illustrate the problem.

--Frangible runway approach light towers. In September 1970 the Flight Standards Service requested, with few stated specific requirements, that the Systems Research and Development Service 1/ initiate work to improve frangibility (breakability) requirements for runway approach light towers. In November 1970 the Systems Research and Development Service asked Flight Standards to provide more guidance on specific

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1/Responsible for FAA research, engineering, and development programs to improve the National Aviation System.

requirements such as degree of frangibility, maximum cost, and other factors. It was 1972 before Flight Standards decided that a tower should be frangible enough so as not to damage the nose gear of a Beech 99 aircraft. A Flight Standards Service official told us that this definition was a problem then and in 1979 because it had never been precisely determined. Another Flight Standards official believed that if more specific requirements had been established earlier, FAA's actions could have been more timely. It was 1975 before FAA began to install frangible towers.

--Stalls of general aviation aircraft. One way FAA has addressed this hazard has been with research projects involving aircraft design, stall 1/ warning systems, and pilot training. We examined the pilot training efforts in detail. Research in this area began as a result of a 1974 meeting between officials of the Flight Standards Service and Systems Research and Development Service. At this meeting, concern was raised about the pilot's airspeed control (an aircraft can stall when proper airspeed is not maintained), but, according to an FAA official, nothing more specific such as what research methodology or end products were required was discussed. Further, there was no mention of possible rulemaking actions or what data would be needed to support such actions.

The Systems Research and Development Service project manager told us that Flight Standards wanted something but did not know specifically what. Believing that a stall training syllabus was warranted, he started a project to develop it for use in pilot training. The final report discussing the results of this effort was issued in September 1976. Flight Standards took little action on this report until February 1979, when it distributed the training syllabus to flight instructor clinics for their voluntary use. This was done in response to a July 1978 NTSB recommendation which cited FAA's lack of action and called for implementing the results of research through distribution and regulation.

1/The flight maneuver or condition in which the air passing over and under the wings stops providing sufficient lift to hold the altitude of the aircraft.

Referring to this study and several other research efforts involving aircraft stalls, FAA told NTSB in December 1978 that the results, while containing much useful information, were not sufficiently definitive to warrant regulatory action at that time. We believe one reason these efforts did not produce more useful results was the failure to establish specific requirements when the projects were initiated.

--Fuel fires or explosions. FAA has looked at numerous methods for preventing in-flight and postcrash fuel fires or explosions. Nitrogen inerting (nitrogen gas fed into fuel tanks to replace oxygen as fuel is consumed) has been one explosion prevention method studied since the 1960s. In September 1971 Flight Standards asked the Systems Research and Development Service to study the feasibility of using onboard-generated nitrogen (generated on board the aircraft using a gas generator), a process claimed effective by one manufacturer. The concept proved feasible and FAA contracted for development of a prototype in June 1975. In December 1977 the Systems Research and Development Service forwarded its final research report to Flight Standards with a cover letter which stated, "If an explosive hazard exists, the results of the enclosed report should provide the basis for a notice of proposed rulemaking."

A Flight Standards official told us that Flight Standards did not agree that the research report constituted adequate support for proposing a rule to require the use of such devices. However, we noted that no statement of requirements had been prepared which showed exactly what support was necessary to justify a rulemaking proposal. A Flight Standards official told us that a decision on rulemaking has been delayed until the U.S. Air Force completes flight tests in 1981 on the full-scale system developed by FAA. He added, however, that the Air Force may now only be going to simulate the tests rather than conduct actual flight tests. He was not sure if simulations would constitute adequate justification to support a rulemaking proposal. The same official said FAA should, if possible, do more early on to identify what specific support is needed for FAA rulemaking efforts.

FAA officials informed us that requirements definition was a problem within FAA. They believed a need existed for a more objective and systematic process to define requirements. A service director cited FAA's development of a system acquisition management process as an attempt to better

define requirements. This process established the methods to manage and monitor system acquisitions by emphasizing requirements definition, planning, and monitoring activities. Other officials stated there was a reluctance to set requirements early in an effort because of the difficulty in determining where the development of an idea would lead. Requirements, according to one official, tend to be ill defined until the latter stages of the solution process.

Costs and benefits not considered at the earliest stages

FAA has generally waited until the latter stages of the solution process to quantify costs and benefits. This has resulted in safety projects being initiated without FAA knowing whether the costs and benefits justified the project. We believe earlier consideration of the costs and benefits of addressing safety hazards can facilitate decisionmaking about whether and what solutions should be pursued. It can also provide an initial estimate of the significance of the problem and costs of solution(s). The following examples illustrate the problem.

--Servicing of aircraft oxygen systems. Based on a 1970 fire, which occurred on the ground while an aircraft's oxygen system was being refilled, NTSB recommended that FAA prohibit oxygen system servicing with passengers on board the aircraft. In 1974 FAA issued a notice of proposed rulemaking to prohibit, except in certain circumstances, the servicing of oxygen systems with passengers on board the aircraft. In this notice, FAA cited a lack of uniformity among aircraft operators in responding to recommendations made in manufacturers' service bulletins concerning oxygen servicing and stated that regulatory action was necessary. Many aircraft operators objected to all or part of the notice. As a result, it was modified and a supplemental notice was issued in December 1976 which permitted employees and even passengers to remain on board the aircraft during oxygen servicing under certain circumstances and conditions.

In October 1977 FAA withdrew the notice from further consideration citing (1) industry objections related to industry hardship and passenger inconvenience, (2) satisfactory servicing history since 1972, (3) improved equipment in use, and (4) the fact that aircraft operations already required attendants on board the aircraft during oxygen servicing with passengers on board. Despite these factors, an NTSB official told us that there was still a danger of an oxygen-fed fire occurring. He believed that

procedures were subject to change by the industry without an FAA rule.

An FAA official told us that one common element in past oxygen fires has been a piece of dirt, sand, or grease in the oxygen system which caused the fire. He said that although much has been done to make the system safe, there could be another fire if someone was careless. Even though FAA's policy called for cost analyses of proposed actions, we found no evidence that FAA ever analyzed the cost of industry complying either with precautions recommended by NTSB or with what evolved as FAA's proposed regulation.

--Midair collision. Although through fiscal year 1978, FAA had spent approximately $32 million on efforts to develop an airborne collision avoidance device, there was no evidence that the cost and benefits of such a device were ever estimated. An April 1979 DOT evaluation report found that questions still remained unanswered on technical limitations, cost, timing, and how much safety would be improved by airborne and ground-based elements of FAA's Aircraft Separation Assurance Program. The development of a collision avoidance device has been one element of this program. The DOT evaluation report recommended cost-benefit analyses be conducted to broaden the basis for decisionmaking.

--Aircraft seat strength. Existing seat strength standards date back to the 1950s. In 1970 FAA initiated research to develop stronger, more energy-absorbing aircraft seats and a proposed standard was developed by October 1978; however, FAA failed to use the new standard. FAA officials told us that there was no evidence that the current regulations were inadequate. We noted that this determination was not based on an analysis of both the costs and benefits of increasing seat strength standards.

FAA has not collected enough data to determine the number of injuries or fatalities that have been caused by seat failures. In addition, FAA and NTSB have often disagreed over whether in specific accidents lives could have been saved by stronger seats. Some cost information on increasing seat strength has been solicited from industry sources, but at least one FAA engineer believed the data supplied was technically unfounded. We believe that, without at least an estimate of the costs and benefits, FAA is in a weak position to make sound decisions

on starting research or using the results of such research.

FAA officials expressed varying opinions as to when cost-benefit analyses should be performed. Generally, cost-benefit analyses were conducted at the end of the solution process. One division director believed FAA would be criticized if it attempted to use cost-benefit analyses to justify whether or not to work on safety projects. This same official did admit, however, that cost-benefit analyses should be performed earlier than they have been.

The idea that cost-benefit analyses would aid decisionmaking has been expressed in FAA policy since at least 1965. For example, the April 1965 "Policy Statement of the Federal Aviation Agency" included the following comments on such analyses.

> "It is clear that a price must be paid for many safety improvements, either in terms of dollars or system efficiency. Therefore, in carrying out its responsibility to promote air safety, the Agency will judge each proposed safety improvement in light of the price to be paid for it."
>
> "Cost/benefit analysis can be a useful tool to management if it is made an integral part of the Agency's planning process. It is properly applied during rather than after the formulation of projects. The role of cost/benefit analysis is that of an aid to decision-making, not a substitute for it. All decision-making involving the allocation of funds becomes ultimately an exercise in judgment. Decision-making will be improved to the extent that information on the consequences of a decision, and on alternative courses of action, is available. Cost/benefit analysis can be used to determine the economic quality of proposed projects, but not all decisions can or should be made solely on an economic basis. No amount of quantitative analysis, including cost/benefit analysis, can supplant the exercise of administrative judgment."

As evidenced by these and other statements, cost-benefit analysis has long been recognized by FAA as a useful tool to aid decisionmaking. When such analysis can be conducted depends on a number of factors such as the extent of available data and when the nature of the solution(s) is known. However, we believe greater use of this concept is necessary at the earliest possible stages of the solution process.

Interim corrective actions not aggressively explored

FAA has not always aggressively explored interim corrective actions. As a result, its use of available interim actions has at times been either untimely or inadequate. We believe that timely adoption of interim corrective actions can frequently provide a measure of protection against safety hazards. The following examples illustrate the problem.

--Frangible runway approach light towers. FAA initiated research on a frangible runway approach light tower in 1970. In October 1971 the Flight Standards Service recommended that an existing frangible approach light tower be used until a new tower could be developed by FAA's Systems Research and Development Service. It added that existing Canadian and European frangible towers had been used successfully for years. FAA did not adopt this recommendation because it believed a better frangible tower should be developed. Because a usable tower had not been developed by 1973, FAA decided to adopt the European-designed tower and started requiring its use in 1975.

--Cabin material fire safety. One interim measure that FAA has studied is a simple bag-shaped hood that would protect passengers from incapacitating smoke and toxic fumes during an emergency evacuation. In January 1969 FAA issued a notice of proposed rulemaking to require the use of such devices by air carriers. The notice indicated that smoke hoods had been developed and successfully tested. FAA stated in this notice that though there could be an increase in passenger evacuation time, the time would still remain within the prescribed standards.

Industry and others responding to the notice raised questions about the thoroughness of FAA's tests and cited other tests which seemed to contradict FAA's. FAA withdrew the notice in August 1970 stating that smoke hoods might delay emergency evacuation to an unacceptable degree. FAA conducted no additional tests to support this apparent reversal of position. An FAA Associate Administrator indicated in a memorandum, however, that even though the notice was being withdrawn, the agency should continue to diligently pursue the potential of smoke hoods.

FAA has made no such efforts. We noted that FAA's Federal Air Surgeon stated in 1976 congressional testimony that he supported a reexamination of smoke

hoods because FAA's research into other methods of fire, smoke, and toxic fumes protection had failed to produce improvements. He voiced a similar opinion to us in September 1979. We could find no documented rationale for FAA's failure to explore this possibility further.

--Child restraint system. FAA has conducted research on infant/child restraint since the early 1960s. However, as of September 1979 FAA's efforts had failed to produce new requirements. Efforts had centered on developing standards and testing procedures to be used in manufacturing child restraints for use on aircraft. FAA officials told us that allowing use of National Highway Transportation Safety Administration-approved car seats as an interim measure was not possible because (1) these seats had not been tested for aircraft use and (2) they could cause injury to other passengers during evacuation.

A September 1972 FAA research progress report, however, stated that when properly used, two types of auto seats would provide improved crash protection for children sitting in aircraft. The report suggested that the seats be used only at window locations so as not to restrict other passenger evacuation. This effort was similar to FAA's latest approach, which was to use updated National Highway Transportation Safety Administration car seat standards with modest additional FAA requirements. It would appear then that FAA may have been able to be more timely with at least an interim solution to this problem had it pursued the 1972 research effort more diligently.

FAA officials agreed that in the past there have been problems of not fully considering interim corrective actions. A division director explained that these considerations become judgment decisions. Other officials told us that there was pressure not to pursue interim solutions because of the economics of implementing both the interim and ultimate solutions. The tendency has been to pursue ultimate solutions, especially when research and development was involved. One service director stated that research and development problems of freezing the state of the art and deciding when a solution was sufficiently developed have also contributed to the problem.

Coordination not assured

In some instances, FAA has failed to adequately stress the need for proper coordination of its safety projects and to document its coordination efforts. As a result, some efforts aimed at solving safety hazards have either lacked proper direction or been untimely. The following examples illustrate the problem.

--Midair collision. No coordinated agencywide plan for the midair collision threat was issued by FAA until December 1978--3 months after the San Diego, California, midair collision. Prior to developing this plan, FAA had various efforts underway that addressed the problem of midair collision. We believe that the value of these efforts, however, was diminished by the lack of effective coordination between FAA offices and disagreements over policy, approach, timing, and direction. In commenting on a portion of the December 1978 plan, the FAA Administrator stated:

> "The true relevance of the San Diego accident to our current proposals is that the accident caused us to focus systemwide on the general threat of midair collisions * * *."

--Stalls of general aviation aircraft. Coordination between Flight Standards and the Systems Research and Development Service on the pilot stall training research work has been very poor. For example:

  --The project was based on one meeting where general solutions were discussed.

  --The Systems Research and Development Service project manager said he determined the direction, scope, and product to be obtained. He said Flight Standards did not review the contractor's work statement.

  --The project manager also said he had sent a draft of the final report on the stall training research to Flight Standards, followed by the final report dated September 1976. A Flight Standards official said Flight Standards was not aware of the report until sometime later. Little action was taken to use the product until after an NTSB recommendation was made to use the results of the research.

The need for better coordination in FAA was an issue identified to us by many FAA officials. These officials cited projects internally generated by FAA's engineering and development components as the principal area where coordination had not occurred. According to the officials, these components performed work with little or no input from the operating offices/elements and then tried to force the end products upon the operating components. A Flight Standards official told us that many times in the past research and development reports have been received that contained a great deal of data but were insufficient in terms of being able to support regulatory action. He attributed this problem to the lack of a coordination mechanism to resolve differences before work progressed very far. He added, however, that the recent creation of the Office of the Associate Administrator for Aviation Standards will provide much more attention to research and development coordination. A division director stated that coordination was one of the weakest links in the organization.

A recent example of this failure to coordinate surfaced on an FAA contract award. On June 22, 1979, FAA awarded a $525,491, 3-year contract to develop or revise training procedures so as to reduce the number of weather-related accidents among general aviation pilots. Although the program was sponsored by FAA's Office of Systems Engineering Management, there was little communication or coordination with the Flight Standards Service, which would be responsible for implementing any results. The Flight Standards Service's research and development coordinator told us that the first time he became aware of this effort was when the award announcement appeared in an FAA newsletter. Upon checking with another Flight Standards official, he discovered that Flight Standards had orally recommended that the work not be done since it was believed that the project would not result in anything new. Therefore, he decided that a meeting between all affected parties was needed to coordinate this effort.

Staffing implications not properly addressed

Staffing issues, chiefly related to competing work responsibilities, affected FAA's process for resolving safety hazards and, in some instances, slowed down rulemaking actions. We believe staff availability and commitment can influence agency efforts to solve safety hazards. When staff are assigned to a safety project and allowed to fully pursue a solution, the chances of success and timely implementation of the solution are enhanced.

Competing work responsibilities

FAA has not adequately assessed the impact of assigning nonsafety work to personnel working on safety projects. As a result, some safety projects have taken longer than they should have.

A management study of the Flight Standards Service's rulemaking procedures was conducted by the Office of Management Systems in 1974. This study concluded that "* * * division regulatory specialists spend too little time in pursuit of their approved project workload, to the extent that project development is seriously impaired." Also, "* * * regulatory specialists are simply not giving sufficient time in the conduct of rules project development." The report referred to a project officer who said that for 6 months priority workload of a nonregulatory nature prevented him from making minor changes to a safety project report.

Our review of specific hazards and interviews with FAA's management confirmed that these conditions continue to exist. A study completed in July 1979 by the Flight Standards Service also pointed out similar conditions. This study required individuals in the various organizational components of Flight Standards to identify work activities that were or should have been accomplished in fiscal year 1978 and those to be accomplished in fiscal year 1979. The results of this effort indicated that Flight Standards had insufficient staff to conduct mission functions. Also, results indicated safety project work was affected both by the total staff commitment to do this work as well as by competing work responsibilities.

This problem was further evidenced in July 1979 when the Acting Director, Flight Standards Service, requested his division/staff chiefs to outline how recent Washington staffing reductions had affected programs to date and to assess the consequences of further reductions. The following examples show the concerns raised by the various staff at that time:

--"Since our staffing has been reduced, many of our major programs have been affected as we are barely able to keep up with the day-to-day work such as answering congressionals, correspondence, and high priority work items."

--"The general problem created by these reductions is that managers and staff specialists are now able only to react to immediate situations. This leaves

very little time for planning, analyzation, and objective long-term program guidance. Any further reductions can only worsen the situation."

--"The attached listing of target date slippages shows at a glance the effect of insufficient staffing on current projects. You will note that delays of as much as 15 months exist presently. Additional reductions will simply increase the delays."

FAA officials informed us that staff availability and other work responsibilities have affected the progress of safety projects. Examples included processing petitions for rulemaking and exemptions from existing rules, answering correspondence with mail controls, answering congressional inquiries, and handling Freedom of Information Act requests. A June 1978 analysis of staffing and workload in one Flight Standards Service division showed that routine activities (often referred to as demand work, unprogrammed work, etc.) used from 50 to 80 percent of its staff resources. One office director expressed concern over FAA's policy of processing exemptions within 120 days while having no such policy for safety projects. A division director stated that the impact of other work responsibilities results in not being able to work on all safety projects that should be worked. To him, it has become a case of deciding what "must" be done. Safety projects also suffer because of other pressures, including staff availability. Many FAA officials told us that workload has increased while staffing has been reduced. They believed that this has resulted in (1) FAA being unable to pursue some safety work due to other responsibilities, and (2) a loss of timeliness and quality on work that was being performed.

Untimely rulemaking process

FAA's rulemaking process has been very slow--sometimes years have gone by before a new rule/change was adopted or rulemaking proposals were withdrawn. Although some of the delays and processes were necessary and unavoidable, extensive reviews and lack of staff have contributed to the problem. We believe new rules or changes to existing rules can be an effective means to address safety hazards. However, when this solution is being pursued, it must be performed in a timely manner.

FAA's Office of Management Systems, in a 1974 study of the Flight Standards Service's rulemaking process, concluded that the Office of the Chief Counsel was partly responsible for delaying completion of rulemaking efforts and indicated that the Office would have to double its staff of 21 full-time

regulatory attorneys to keep pace with the existing workload. The Office's staffing and workload have both changed since 1974. In July 1979 it had 13 full-time regulatory attorneys. During this 5-year period (1974-78), the number of exemptions increased from 859 to 1,080, and the number of notices (and advance notices) of proposed rulemaking issued or withdrawn decreased from 50 to 31. Many factors, including the complexity and variance of time commitment involved in processing exemptions and notices (advance notices) of proposed rulemaking, preclude making a meaningful workload/staffing analysis using only statistical data; but it is a starting point. However, in view of the problems identified in the 1974 management study and since the timeliness of the Office of the Chief Counsel's work was pointed out to us as a problem that varied over time, any workload/staffing analysis for safety project work should include this organizational component.

FAA officials attributed the lack of timely action on some regulatory matters to delays caused by the Office of the Chief Counsel and by FAA's broad reviews of the Federal Aviation Regulations. One division director cited long periods of time elapsing before the Office of the Chief Counsel took action on a proposed rule. An Associate Administrator told us that the Office of the Chief Counsel encroached too much on the technical side of issues. In his opinion, the Office was slow in conducting its work but he did not know why this was the case. Another FAA official told us that some regulatory projects were delayed by FAA's attempts to review broad sections of the Federal Aviation Regulations.

For example, regulatory action on two safety issues we reviewed--crew rest and in-flight turbulence--were delayed for years as a result of FAA's implementation of its operations review. In February 1975 FAA announced a broad review, referred to as the operations review, of the Federal Aviation Regulations relating to the environment in which airmen, air agencies, and aircraft operate. Included in the review were proposals for improving the regulations relating to crew member flight and duty time limitations, and additional requirements for passenger seat belt signs and seat belt use. Flight time limitations had not been changed for over 30 years, and FAA believed there was a need to simplify existing rules and determine whether they were too restrictive or ineffective from the standpoint of fatigue. In-flight turbulence had accounted for many injuries, which resulted in proposals for stronger seat belt use requirements.

The entire operations review program, a review of regulations to be accomplished every 2 years, contained 1,665 proposed changes to the regulations. After a public conference on the proposals, FAA determined that 902 of the proposals warranted further consideration. Final action on each of these proposals was to be taken by February 1977. However, final action on only 318, or 35 percent, of the proposals had been taken by that date. As of September 1979, final action had not been taken on either the crew rest or in-flight turbulence proposals. FAA officials told us that one of the major reasons for the delay was that adequate staff was not assigned to the effort.

The FAA Administrator, recognizing some of the shortcomings of the rulemaking process, announced on September 14, 1979, major revisions to FAA regulatory procedures. The objectives of these revisions were to:

--Update and streamline the rulemaking process while formally implementing the Executive order and departmental directive governing regulatory actions.

--Eliminate unnecessary levels of review.

--Eliminate unnecessary paperwork.

--Accommodate the use of the team concept for formulating and executing rules projects.

--Revise and revitalize the procedures for establishing priorities for regulatory projects.

It was too early for us to assess FAA's use of these new procedures.

Accountability not adequately established

Accountability has been and continues to be a problem area at FAA. Basic to sound management practice and control is the idea that individuals should be held accountable for results.

Though the individual services and offices normally assign safety project managers, generally FAA has not been assigning individual focal points on projects requiring input from multiple services or offices. That means that projects can be delayed because no one individual has overall accountability for keeping a project on schedule. That together with the fact that FAA has not had the appropriate planning, processes, and procedures has affected the agency's

ability to address safety problems in the most timely and effective manner. The lack of adequate controls leaves management without all the information it needs to make good judgments about individual accountability.

For example, the lack of specific, detailed plans to guide safety projects and the shortcomings in project file documentation have not enhanced management's ability to hold individuals accountable. Also, the absence of such management controls allowed individual safety projects, as discussed above, to be conducted without consistent agencywide priorities, clear requirements, adequate internal coordination, and clear staffing-workload commitments. Individual accountability for project delays and other project problems was often unclear on the specific hazard areas we examined.

Further, many FAA officials were of the opinion that the lack of accountability for safety projects is a continuing problem area. A division director told us that the problem was most apparent in the early phases of the solution process. One service director believed accountability in many instances could not be pinpointed. Another official cited problems of multiple tasks and responsibilities as affecting accountability for safety projects. They also stated that the problem persisted because of adversary relationships among FAA offices. These relationships resulted in a great deal of "finger pointing" as to why problems remain unsolved.

We believe FAA needs to do more to assure accountability throughout the entire solution process. This includes establishing accountability from the time a safety hazard is identified until the time FAA implements a solution.

BETTER PLANNING NEEDED TO GUIDE TIMELY AND EFFECTIVE SOLUTIONS TO SAFETY EFFORTS

As evidenced by the problems discussed throughout this chapter, FAA needs a logical, systematic basis for guiding its efforts to solve safety hazards. We believe that individual safety project plans can provide the necessary framework to accomplish this task. Plans within FAA to guide timely and effective solutions to specific safety hazards have failed to show the totality of the solution process as it affects FAA on an agencywide basis. To eliminate this problem, individual safety project plans that are specific and detailed and reflect commitments agreed to by each involved organizational component should be reviewed and approved at the Associate Administrator level. Where

agreement on requirements, resource commitment, etc., cannot be effected at the Associate Administrator level and on broad efforts involving more than two organizational components, a top management group, such as our recommended Administrator's Safety Advisory Group, should be the principal body for reviewing and approving specific and detailed safety project plans.

Plans that have existed within FAA only addressed portions of the solution process. For example, FAA's research and development components have formulated program plans, which are engineering and development management guidance documents, to support management decisionmaking. These plans are fairly detailed and describe problems, objectives, critical issues, alternative solutions, technical approaches, schedules, products, milestones, interfacing programs, support organizations, resource and funding requirements, decision points, charts, and tables as they relate to research and development.

On the other hand, FAA's Flight Standards Service had a less formalized and less structured planning process. Its plan consisted only of a two-page project authorization document which, according to agency instructions, should provide sufficient detail to explain the origin and purpose of the project. Also, the agency instructions provide that this document should define the points at which the project begins and ends, the final product expected, and whether the project will be considered complete when the product is released by the project officer, when approved by the division chief, or when some subsequent approval is received. Further, the document should identify any changes in regulations or directives that may be required, the component tasks involved, and timetables to accomplish the tasks.

We believe that both of these "plans" are inadequate for agencywide solutions to safety hazards. They attempt to describe parts of the solution process but do not show how the entire solution is to be accomplished, by whom, and when. They fail to identify what specific products are required from each participating FAA office to support FAA's taking action. It is this total action plan that has been missing in FAA.

The FAA Administrator recognized this problem on April 26, 1979, during testimony he provided before a congressional subcommittee investigating FAA's actions concerning cabin safety. At this hearing, he stated:

"There are many facets to cabin safety and we have worked to address them all with varying degrees of success. To an extent, I think the fact that some of our efforts did not result in timely success can be attributed to the way we approached the subject of cabin safety for, in reviewing our many efforts to improve cabin safety, and in assessing the status of these efforts, it became clear to me that our programs to improve cabin safety were splintered. While all pursued the same goal of improving safety, there was lacking a cohesiveness of effort; a central focal point, if you will, to bring together the varied work efforts and to comprehensively deal with the problem."

Examples such as these show that some well-intentioned actions have resulted in fragmented, uncoordinated, and therefore untimely and ineffective approaches to safety problems. Many of the problems we found related to the lack of formal plans and agencywide commitment to the solution process.

Formal plans show how the solution process is to be accomplished. If they are comprehensive, clear, and well documented, implementation can be performed in a timely and effective manner. We believe that formal plans should answer the basic questions of who, what, where, when, and how on an agencywide basis as they relate to individual safety projects. To answer these questions, a formal plan should describe in specific and adequate detail at least the following:

--Problem--What is it?

--Safety contribution--How does it relate to FAA's safety goals, objectives, and priorities?

--Objectives--What will be accomplished?

--Requirements--How will the objectives be accomplished and what is needed to justify final agency resolution of the problem?

--Alternative solutions--What are they and which is best?

--Interim corrective actions--What are they and should they be pursued?

--Costs and benefits--What are the costs and benefits to the public, industry, and FAA?

--Coordination--Who is an integral element of the solution team?

--Resources--What are the staffing and financial resources needed?

--Milestones--When will specific elements of the plan be implemented?

--Results desired--Where, when, and how will the end product be used?

--Responsible official--Who is responsible and accountable for the solution process?

--Priority--What is top management's commitment to solve the problem?

Formal plans for individual safety projects, which include the elements described above, should be reviewed and approved at the Associate Administrator level. When agreement on requirements, resource commitment, etc., between organizational components cannot be effected at the Associate Administrator level and on broad efforts involving more than two organizational components, a top management group, such as our recommended Administrator's Safety Advisory Group, should be the principal body for reviewing and approving specific and detailed safety project plans. Plans, as approved, provide a mechanism to evaluate performance against expected results, thereby assuring accountability within the solution process.

CONCLUSIONS

Logical, systematic planning to solve safety problems in the most timely and effective manner has been missing at FAA. Therefore, the problems we found of (1) priorities not assigned agencywide and not consistent, (2) requirements not specifically defined, (3) costs and benefits not considered at the earliest stages, (4) interim corrective actions not aggressively explored, (5) coordination not assured, (6) staffing implications not properly addressed, and (7) accountability not adequately established will continue to hamper FAA's safety project efforts. Top management officials have sometimes failed to exercise appropriate review and approval authority on individual safety project plans. This has resulted in fragmented, ineffective, and unstructured approaches to the solution process. The lack of

formalized, agencywide planning documents showing the totality of the solution process for specific safety projects was a large factor contributing to the problems we found.

RECOMMENDATIONS

We recommend that the Secretary of Transportation direct the FAA Administrator to:

--Develop formal safety project plans showing how the total agencywide solution is to be accomplished. Elements of the formal plan should include a specific and detailed description of at least the following:

  --Problem.

  --Safety contribution.

  --Objectives.

  --Requirements.

  --Alternative solutions.

  --Interim corrective actions.

  --Costs and benefits.

  --Coordination.

  --Resources.

  --Milestones.

  --Results desired.

  --Responsible official.

  --Priority.

--Require that formal plans for individual safety projects be reviewed and approved at the Associate Administrator level. Where agreement on requirement, resource commitment, etc., between organizational components cannot be effected at the Associate Administrator's level or on broad efforts involving more than two organizational components, a top management group, such as our recommended Administrator's Safety Advisory Group, should be the principal body for reviewing and approving specific and detailed safety project plans.

AGENCY COMMENTS

DOT, in commenting on our draft report, apparently agrees that an adequate system for planning individual safety efforts has not existed in the past. DOT stated, however, that recent action has corrected the problem areas we identified. For example, DOT said that FAA's Office of Aviation Safety's Special Programs Division has been assigned the responsibility for identifying functional areas that require attention, establishing priorities agencywide, and describing the necessity for the effort. DOT also said specific program plans would be developed which will include early estimates of cost and benefits, potential interim actions, necessary coordination, resource requirememnts, and accountability. DOT further indicated that the Program Management Staff under the new Associate Administrator of Aviation Standards would be responsible for a similar process for activities not warranting emphasis by the Special Programs Division.

We are pleased that FAA has recognized the need for safety project plans and that action along the lines of our recommendation is being taken. We reemphasize, however, that specific project plans should show how the total agencywide solution is to be accomplished and that such plans should contain the specific elements we recommended.

In addressing our recommendation on the review and approval of safety projects plans, DOT states that the new system developed within FAA ensures that large individual safety projects are reviewed and approved at the Associate Administrator level and that full coordination between independent organizational elements is assured. DOT, however, does not share our view that an Administrator's Safety Advisory Group is needed to review and approve actions by multiple organizational components.

We are not convinced that individual or even primary Associate Administrator review and approval of safety project plans will assure adequate resource commitments and coordination when input from other independent organizational elements is required. We continue to believe that in such cases our recommended Administrator's Safety Advisory Group would serve to facilitate, at the outset, commitment from all applicable organizational components for broad based safety project work. A continuing responsibility of the Advisory Group would be to assure that commitments, once made, are honored.

CHAPTER 5

NEED FOR A SYSTEM OF CONTROLS TO GOVERN THE IMPLEMENTATION PHASE OF SAFETY PROJECTS

FAA management needs a system of controls to govern the implementation phase of safety projects. These controls should assist FAA in conducting its safety work in a more timely and effective manner and should help ensure that commitments on individual safety efforts are met.

The factors discussed earlier--priorities, requirements, cost-benefit analyses, interim corrective actions, internal coordination, staffing-workload analyses, and accountability--directly affect the timeliness and effectiveness of FAA's safety efforts and should be documented in project files. However, frequently they have not been. Also, safety projects have not always been monitored. Further, FAA has no agency-wide requirement for recording actual time charged on safety project work in project files. As a result, FAA has not had adequate control mechanisms for monitoring the progress and performance of safety projects.

NEED FOR IMPROVED AND MORE CONSISTENT DOCUMENTATION OF DECISIONMAKING

Important information about FAA's safety projects has not been adequately or consistently documented. By documenting results of decisionmaking, management can assure itself that events and the circumstances surrounding them are accurately recorded and understood by all affected parties. Documentation facilitates coordination and communication because it is in written form. Without it, the reconstruction of past events or agreements relies completely on the memory of key participants that may or may not be available. Lack of documentation, especially in an environment with a relatively high rate of staff turnover, makes it very difficult for new staff to be fully productive.

The need for improved control over programs/projects was recognized in November 1975 by FAA's Executive Secretariat, a staff at the Administrator level. The Director, Executive Secretariat, in a memorandum concerning agency priority items stated that "* * * to measure progress on these priority items, a continuing flow of information on the status of these programs/projects is necessary."

However, the kind of information recognized as needed by the Executive Secretariat was often incomplete or lacking on the safety issue areas we examined.

FAA officials agreed that project file documentation and staff turnover have been problems. Files that should have contained all necessary and appropriate data on safety project efforts all too often did not. An Associate Administrator told us that FAA must be in a position to know, by looking through its project files, why it is trying to solve a particular hazard, what alternatives have been considered, and what justifies the current course of action. He added that one would be hard pressed to find this type of documentation in the files today.

A June 1978 evaluation of the project controls used by one division of the Flight Standards Service further illustrates the documentation problem. The evaluation report stated, in part:

> "* * * these projects should be maintained in such a manner that anyone with a 'need to know' should be able to review a project report at a central point and immediately know where the Division stands on a particular program. As the system operates now, it appears in some cases we can only hope that the individual Project Officer is readily available for consultation."

We found that this problem continued to exist at FAA. The lack of documentation also impeded our work and affected the scope of our review because in many instances we had to rely on interviews with agency officials rather than agency records. Also, had project files been adequately documented, FAA officials would have had a documented source to reference when responding to our detailed questions.

A management official in the Office of the Associate Administrator for Aviation Standards advised us that he encountered similar difficulties in attempting to obtain information on certain safety projects and finding support for specific decisions and actions. He found that documentation was inadequate and that individuals were often unable to fill in gaps because they were not present when the actions were taken or decisions were made.

Turnover and reduction of personnel have been relatively high both in the Flight Standards Service, where most agency safety projects have originated, and the Office of the Chief Counsel, which has responsibility for the legal aspects of

rulemaking. Of the 276 Flight Standards Service personnel on board as of June 30, 1975, only 132, or about 48 percent, were still assigned to the Service as of June 30, 1979. Also, of the approximate 21 full-time regulatory attorneys assigned to the Office of Chief Counsel as of June 30, 1974, only 9, or about 43 percent, were still on board as of June 30, 1979. The problem in the Office of the Chief Counsel was compounded further because, according to the Assistant Chief Counsel with responsibility for processing rulemaking actions, it takes about 2 years to train an attorney in the rulemaking area.

NEED FOR IMPROVED PROGRESS REPORTING ON AND MONITORING OF SAFETY PROJECTS

Once a commitment to solve or reduce a safety hazard has been made and a plan has been prepared, the monitoring of actual performance will indicate the progress being made. Without sufficient monitoring, management lacks knowledge on which to evaluate performance.

The kind of systems FAA used to monitor safety projects varied from more formalized systems to unstructured systems. FAA's Systems Research and Development Service included project progress reporting as one element of its overall management information system. The Flight Standards Service formally monitored projects once they advanced to the rulemaking stage but left how nonregulatory projects would be monitored to the division director's discretion. One Flight Standards division director allowed project managers flexibility to track progress as they deemed appropriate--his only requirement was that they be able to brief him on the project if requested. We believe that while varying degrees of formality in monitoring systems may work well within offices or divisions, they are less effective when projects require the coordinated effort of various organizational components.

FAA's past efforts to improve cabin safety illustrate how related efforts need overall monitoring. The FAA Administrator, in April 1979 congressional testimony, acknowledged that one reason for FAA's inabililty to make timely improvements in cabin safety has been its splintered approach and lack of cohesive effort. The Administrator's remedy was to appoint the Director, Office of Aviation Safety, as the individual responsible for overseeing and monitoring agencywide efforts to improve cabin safety. In a similar move, the Administrator appointed one official as overall monitor for all FAA actions directed at reducing midair collisions. This action was not taken, however, until after the San Diego, California, midair collision in September 1978.

In addition to pointing out problems with project file documentation, the June 1978 evaluation of the project controls used by a division of the Flight Standards Service cited other problems related to progress reporting and monitoring activities. For example, the evaluation report contained the following comments:

--The majority of projects were not progressing as scheduled and were not being properly maintained.

--Broad problem areas included: many older projects had no priority classification ratings assigned; scheduled completion dates were changed with no justification given and without official approval; component tasks involved in accomplishing a project were not progressing in accordance with the projected timetable identified by the project officer; entries showing actual progress against the projected timetable were not recorded; adjustments to the projected timetable were not made when the scheduled completion date for the entire project was extended; pertinent background material was seldom provided for the central project file; and monthly status updates provided no useful information whatsoever.

--Many significant activities discussed during quarterly program reviews have had no formal projects authorized although more than 40 hours have been expended on them.

--At a recent program review, a supervisor mentioned that a particular project had seen no activity in quite some time. "What he did not realize was that the project had been closed for almost one full year."

--Some supervisors believed that there was just not enough time or adequate staffing to be concerned with completing more reports, more paperwork, etc.

This evaluation report recommended improvements to correct these problems. As evidenced in the safety problems we examined, the deficiencies outlined above were not unusual. Many weaknesses were attributed to the lack of documentation, progress reporting, and monitoring activities. We believe these areas still require strengthening.

The chief of the Flight Standards Service office responsible for research and development coordination acknowledged that in the past staff shortages severely restricted his ability to adequately monitor ongoing Systems Research and Development Service research. He was confident, however, that the recent reorganization

of Aviation Standards would result in greater emphasis on this very important and necessary function.

We believe many of the problems affecting the timeliness and effectiveness of FAA's safety project efforts can be addressed through a comprehensive planning process and by formal safety project plans, as discussed in chapters 3 and 4 of this report. In addition, however, FAA must continually monitor plan implementation. This latter process is crucial because it enables top management to assess how well its commitment is being carried out and to revise that commitment as necessary.

Without adequate monitoring activities, the best plans can become useless pieces of paper. Monitoring represents the followthrough to guarantee successful completion. Thus, planning and control are intrinsically interlinked aspects of the manager's job. If one is done without the other, the organization is unlikely to achieve its objectives. Continual monitoring of each safety project by top management officials within each Associate Administrator's office or, as needed, by our recommended Administrator's Safety Advisory Group, can reaffirm commitments to the solution process and provide for taking appropriate actions in the most timely and effective manner.

NEED FOR A SAFETY PROJECT TIME CHARGE SYSTEM

FAA has no agencywide requirement for recording time actually charged on safety project work. The Flight Standards Service, however, required time expended on safety projects to be recorded in project folders. We were advised by Flight Standards Service officials that this procedure was not generally complied with. Without such a system, a valuable management tool to compare planned and actual manpower commitments and to better assess progress and performance is lost.

Some FAA officials believed a time charge system would be a beneficial management control device. One Associate Administrator told us that he believed a time charge system was a good idea and that such a control was needed because all too often FAA is unable to know what something cost in terms of time. Further, he advised us that FAA should know where the time is being spent and needs such data in evaluating how well personnel resources are being utilized.

TYPES OF INFORMATION FOR INCLUSION IN PROJECT FILES

To better monitor safety project work and report on its progress, we believe specific documented evidence should be required to be maintained within the primary FAA operational component in project files for each safety project effort. These items, which were either not maintained in agency project files or were maintained in varying degrees of quality include

--project planning documents (originals and annual updated revisions);

--modifications to or deviations from the plan relative to priority, requirements, cost-benefit analyses, interim corrective actions, accountability, etc.;

--progress reports/program reviews;

--evidence of internal coordination;

--summation of staff time charged to the project; and

--description of any factors affecting the timeliness and effectiveness of the work.

CONCLUSIONS

FAA's system of controls over ongoing safety project work has been inappropriate and too informal to constitute a viable and credible means of monitoring work progress. Specific actions and efforts have not been uniformly documented; monitoring and progress reporting have not been consistently accomplished; and no mandatory safety project time charge system existed.

RECOMMENDATIONS

We recommend that the Secretary of Transportation direct the FAA Administrator to:

--Develop a comprehensive system of controls to guide and monitor safety project work both before and during the rulemaking process. For those efforts that do not involve rulemaking actions, record specific key project events and maintain project files.

--Develop a mandatory, written progress report system.

--Implement a system of recording in project folders staff time charged to safety projects.

--See that each safety project is monitored continually. The monitoring can be done either within each Associate Administrator's office or, as needed, by our recommended Administrator's Safety Advisory Group.

AGENCY COMMENTS

DOT, in commenting on our draft report, did not address our specific conclusions and recommendations. It stated that major changes to FAA's regulatory process, effective in September 1979, have increased management's monitoring of the entire process.

In addition to not addressing our specific conclusions and recommendations, DOT's comments do not appear to recognize that our views concerning a proper system of controls apply to the addressing of safety hazards from the time problems are apparent through the final stages of the solution process. This may or may not involve the regulatory process. Accordingly, changes made to the regulatory process do not address controls in the often lengthy phases of the solution process (research, development, analysis, etc.) that precede rulemaking. Further, even the changes to the regulatory process were not issued until our review was being concluded in September 1979. The changes were issued on an interim basis at that time and, as of January 15, 1980, had not been included in FAA's directive system. In addition, DOT acknowledged the changes were too recent to assess how FAA was now functioning.

We can only reaffirm the importance of the improved controls needed in all phases of the safety hazard solution process that our conclusions and recommendations recognize and address.

CHAPTER 6

NEED FOR AN EFFECTIVE PROGRAM EVALUATION SYSTEM

Program evaluation is an integral part of effective management. It provides the feedback which an agency needs to measure performance against objectives and, when necessary, to redefine those objectives. An effective system for objectively evaluating the effects of its programs would be especially valuable for an agency like FAA which is responsible for regulating a dynamic field such as aviation.

In April 1979 we reported 1/ that FAA management placed little emphasis on formal program evaluation and that there was no systematic process whereby comprehensive program evaluation studies were planned or conducted. We determined in our study that the Office of Aviation Safety, though assigned major evaluative functions since 1976, had not carried out this responsibility. Also, the Program Review Staff in the Office of the Associate Administrator for Administration, though assigned functional responsibility to conduct special and independent evaluations, and actually performing 21 evaluations over the past 5 years, did not, in our opinion, provide for appropriate independence in carrying out these evaluations. This left FAA without all the information it needed to make effective program decisions to manage its resources; impaired FAA's ability to evaluate performance, the controls over the work, and the effects of its work; and reduced feedback that could be used for planning and priority setting. Further, FAA had not always evaluated the effectiveness of nonregulatory actions that addressed safety problems, and there was no agency requirement that such evaluations be made.

THE OFFICE OF AVIATION SAFETY HAS NOT PERFORMED ASSIGNED EVALUATIVE FUNCTIONS

The Office of Aviation Safety from 1976 to 1979 was charged with two major evaluative functions--(1) conduct special evaluations of aviation safety policies, programs, and activities and make recommendations to the Administrator to improve their effectiveness and to ensure attainment of FAA's aviation safety objectives and (2) review

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1/"Evaluation of Programs in the Department of Transportation--An Assessment" (PAD-79-13, Apr. 3, 1979).

and analyze safety data and conduct studies and investigations of critical safety issues and report findings and recommendations to the Administrator. However, this Office did not, with one exception, perform these assigned functions during this period.

The Office of Aviation Safety was reorganized in June 1979 and assigned the following evaluative functions--(1) coordinate and manage selective studies or programs concerning significant safety matters and issues and (2) conduct special evaluations and make recommendations to improve the effectiveness of aviation safety policies, programs, and activities and make recommendations concerning the direction of overall FAA safety programs. This Office was to be staffed with about eight evaluators. Unlike its predecessor office, it did not report directly to the Administrator. It was too early for us to assess this Office's performance of these functions.

OTHER FAA EVALUATION ACTIVITIES ARE LIMITED

To assure that it is effectively carrying out its mission and achieving established goals, FAA created a decentralized evaluation system in 1974 whereby Associate Administrators, regional and center directors, and heads of other offices reporting directly to the Administrator were responsible for evaluating their own programs. Responsibility for monitoring agency evaluation programs was assigned to the Program Review Staff within the Office of the Associate Administrator for Administration.

Prior to decentralizing evaluation functions in 1974, FAA conducted indepth studies of organizational and functional areas and evaluations of agency performance through an Office of Appraisal which reported to the FAA Administrator. This Office was staffed with 52 full-time positions in 1974. Evaluations were also performed by headquarters operating components. The Flight Standards Service, for example, was staffed with as many as nine individuals conducting evaluations during the 1960s and 1970s, but this number was reduced to four by fiscal year 1979 and one by fiscal year 1980.

The Program Review Staff, by agency order, was responsible for conducting special and independent evaluations as directed by the Administrator. During the past 5 years, this three-person office conducted 11 evaluations--which it considered to be special and independent--as directed by the Administrator, another evaluation at the request of the Deputy Administrator, and 9 others at the request of the Associate Administrator for Administration.

We were informed, however, that in most instances the Program Review Staff acted only as evaluation team leaders. The evaluation team members were ad hoc specialized personnel from various FAA offices, assigned on a project-to-project basis. Evaluation results were presented orally to the Administrator by either the Program Review Staff or the Associate Administrator for Administration. There were no formal, documented evaluation reports. Although DOT characterizes these evaluations as independent, we question whether independence and objectivity could have been maintained when the evaluation teams were comprised almost totally of members whose offices or organizations were possibly being evaluated. This appeared to be in conflict with FAA's current evaluation order which states:

> "* * * Evaluations should be independent. Team members should not be regularly assigned to the facility, sector, or other organization element being evaluated. While self-evaluation activities are often productive, they do not satisfy the objectivity requirements of this order."

RECENT ASSESSMENT OF FAA EVALUATION ACTIVITIES

Our report "Evaluation of Programs in the Department of Transportation--An Assessment," dated April 3, 1979, stated that most of FAA's evaluation activities were performed by regional offices in their overview of some 1,100 facilities/field office operations; most regionally conducted evaluations were technical reviews focusing on whether equipment and facilities had been inspected for compliance with agency policies, standards, and regulations; and there were wide variances in the resources committed to evaluation by the regional offices and the manner in which regional evaluation teams were staffed. This report stated that:

> "* * * there is no agencywide evaluation planning process whereby major areas/issues of concern are identified and decisions are made regarding which problems FAA should study."

The report also stated that:

> "Beyond establishing an evaluation system in 1974, we found that top agency management placed little emphasis on formal program evaluation. We also found that there was no systematic process whereby comprehensive program evaluation studies are planned or conducted. While FAA has devoted considerable effort to compliance

reviews and technical studies of equipment/ facility inspection activities, the evaluation system is producing little evidence of how well programs are meeting the objectives contained in authorizing legislation. In its audit report on the evaluation function within FAA headquarters, DOT's Office of Audit also found that top management officials are not receiving important information concerning the performance of FAA systems and whether approved programs are achieving established objectives."

According to a knowledgeable FAA official, the agency-wide planning process has been improved. For example, in late 1978 the Associate Administrators and office directors were asked to identify topics they felt needed evaluation at that time. Of the more than 20 topics submitted, the Associate Administrator for Administration recommended to the FAA Administrator that 4 be selected for special evaluation emphasis. The Administrator agreed with these recommmendations and designated offices of primary interest to manage each evaluation. An evaluation of professionalism in the Air Traffic Service was one such evaluation. It was to be managed by the Air Traffic Service and was to evaluate the program at facility and regional headquarters levels to determine (1) progression in job responsibility and accountability at all levels and (2) the effect of the program on system errors.

As noted in our discussion of the Program Review Staff's special and independent evaluations, independence and objectivity are impaired when evaluations are performed by personnel within the organization being evaluated. These special emphasis evaluations could provide top management with valuable results. In our opinion, however, independence and objectivity were not assured.

NEED FOR MORE EMPHASIS ON EVALUATING THE EFFECTIVENESS OF NONREGULATORY CORRECTIVE ACTIONS

Our report "Improved Procedures Needed for Implementing Safety Recommendations," dated March 6, 1975, concluded that often FAA did not determine the effectiveness of its nonregulatory corrective actions aimed at improving safety. Nonregulatory actions would include instructions to FAA field inspectors or advisory circulars which provide informational material to the public. The report recommended that FAA review internal directives and public issuances to determine whether they were meeting their objectives and establish procedures to ensure that adequate feedback about the effectiveness of these nonregulatory actions was obtained.

We determined during our current review that FAA still did not always evaluate the effectiveness of its nonregulatory actions. Though the issue areas we reviewed generally had not reached the point where ultimate corrective actions were taken, nonregulatory actions had been taken in some cases as interim measures. For example, in response to a July 1978 NTSB recommendation, FAA distributed excerpts from the results of its research efforts to develop a stall training syllabus for general aviation pilots. The excerpts were distributed in February 1979 to flight instructor refresher clinics so that the privately operated clinics could pass the information on to flight instructors. However, as of October 1979 according to an FAA official, FAA had made no formal attempt to evaluate how or if the information was being used.

In another case FAA began a project in December 1973 to develop crew member uniform flammability standards. As an interim measure, FAA in February 1974 asked its field inspectors to encourage air carriers to replace or eliminate uniform articles that were known to be highly flammable. As of September 1979, FAA was still working to develop uniform flammability standards. We found no evidence, however, that any evaluation was made of air carrier compliance with FAA's request to eliminate known hazardous uniform materials.

In a third case FAA issued an updated advisory circular on the hazards of wind shear in January 1979. FAA subsequently instructed its field inspectors to, among other things, request air carriers to (1) provide training on the information contained in the advisory circular and (2) program their aircraft simulators to give realistic wind shear demonstrations to flight crew members. According to an FAA official, however, no formal followup had been conducted to determine how many air carriers were actually complying with these requests.

A May 1974 memorandum signed by the Director, Flight Standards Service, stated that when directives relate to a potential safety problem, it was important for the Washington, D.C., office to know what conditions were found and what actions were taken to correct identified deficiencies. The memorandum asked Flight Standards' offices in Washington, D.C., to ensure that directives to the field offices include a provision for reporting back to headquarters on conditions found and corrective measures taken. An FAA official told us that this memorandum should have been made a part of Flight Standards' permanent directives but this had not happened. This official told us that such a requirement will be included in a revised directive.

FAA officials advised us that Aviation Standards personnel are encouraged to address the adequacy of nonregulatory actions, but they agreed with us that with existing controls there was no assurance that followup was occurring.

CONCLUSIONS

Evaluation and appraisal have received varying commitment and attention during FAA's history. In recent years, these functions have not received much priority and have diminished in use at FAA. The failure to perform these functions with appropriate independence and objectivity has impaired FAA's ability to evaluate performance and reduced feedback that could be used for planning and priority setting. Further, FAA had not always evaluated the effectiveness of nonregulatory actions that address safety problems, and there was no agency requirement that such evaluations occur.

RECOMMENDATIONS

We recommend that the Secretary of Transportation direct the FAA Administrator to:

--Prepare an annual report on the safety evaluation activities, both as planned and achieved, by the Office of Aviation Safety. Also, monitor the safety evaluation activities of this Office.

--Assign appraisal responsibilities and the requisite manpower resources to the Program Review Staff, Office of the Associate Administrator for Administration, to conduct independent and objective agency-wide evaluations of major areas or issues of concern, or assign this responsibility to a new organizational component reporting to the FAA Administrator.

--Establish permanent procedures to ensure that adequate feedback about compliance is obtained on nonregulatory safety actions.

We further recommend that the Secretary of Transportation have FAA's management of its safety mission periodically evaluated, including assessing the annual report on the Office of Aviation Safety's evaluation activities.

AGENCY COMMENTS

In its comments on our draft report, DOT was ambiguous about whether it agreed or disagreed with our recommendations to direct the FAA Administrator to prepare an annual report on the safety evaluation activities, both as planned and achieved, of the Office of Aviation Safety and to monitor

the safety evaluation activities of this Office. The comments focused on the evaluation functions of the Office of the Associate Administrator for Aviation Standards. However, it appears that DOT disagreed with our recommendation in stating that feedback on evaluation is provided through a number of continuing reports produced after evaluations which cover all factors of aviation safety and related agency activities. DOT concludes that an annual report is unnecessary.

We disagree with DOT on this issue because of past activities and results of the Office of Aviation Safety and the organizational placement of this Office today. As cited in our report, the Office of Aviation Safety that existed between 1976 and 1979 had major safety evaluation functions but, with one exception, had not performed such functions. For most of this period, the Office reported directly to the Administrator. The Office was placed under the executive direction of the new Associate Administrator for Aviation Standards in November 1978 and was reorganized in July 1979. Although now one level removed from the Administrator, the Office still has major agencywide safety evaluation functions. Furthermore, the performance of many of its functions will require evaluations of programs and activities of other offices also under the executive direction of the Associate Administrator for Aviation Standards. For these reasons, we continue to believe it appropriate for the FAA Administrator to monitor the safety evaluation activities of this Office and to prepare an annual report on its safety evaluation activities, both as planned and achieved.

Commenting on our second recommendation, DOT disagreed with the need to assign appraisal responsibilities and the requisite manpower resources to the Program Review Staff to conduct agencywide evaluations of major areas or issues of concern or assign this responsibility to a new organizational component reporting to the FAA Administrator. DOT states that the Program Review Staff is responsible for making appraisals and conducts special and independent evaluations as directed by the FAA Administrator. Rather than add full-time staff, DOT prefers to handle increased workload with ad hoc specialized personnel, assigned on a project-to-project basis. DOT adds that this approach enables it to assemble a high level of specialized talent for certain evaluations and to achieve a more effective, efficient operation.

In clarifying DOT's comments, we learned that 21 evaluations were led or conducted by officials of the Program Review Staff over a 5-year period. However,

evaluation results were not incorporated into formal, documented reports. We have modified our report to reflect this information. Also, as discusssed on page 62 of the report we still perceive problems with the independent nature of the Program Review Staff's "special and independent" evaluations. If the Staff is functioning only as the evaluation team leader but the team is made up of members whose offices or organizations are possibly being evaluated, we question whether independence or objectivity can be assured. To assure independence for agencywide evaluations of major areas or issues of concern, we believe DOT should adopt our recommendation.

It was difficult for us to determine if DOT agreed or disagreed with our recommendation to establish permanent procedures to ensure that adequate feedback about compliance is obtained on nonregulatory safety actions. We learned, however, that in response to our recommendation FAA intends to include a permanent directive requiring such feedback in an FAA order now under development.

DOT agreed with our last recommendation on the need to periodically evaluate the management of FAA's safety mission. In its comments, DOT pointed out that the Secretary's establishment of a "blue ribbon panel" on aircraft maintenance and certification was just such an effort. As discussed earlier, DOT disagreed with the need to require an annual report on the Office of Aviation Safety's evaluation activities.

We recognize that DOT has the responsibility and capability to evaluate FAA's safety programs. The establishment of a blue ribbon panel, as cited in DOT's comments, is a recent example. We believe that DOT must be assured that recent FAA actions, as cited in its comments, are adequate to correct the identified problems. More DOT evaluations of the management of FAA's safety mission can assist in determining how well FAA is conducting its safety mission.

CHAPTER 7

SCOPE OF REVIEW

To examine the broad management issues of hazard identification, planning, controls over safety projects, and program evaluations, we reviewed pertinent legislation; related congressional reports and hearings; and reports, studies, and documents from numerous sources both inside and outside FAA. In addition, we interviewed both current and former FAA top management officials, including all FAA Administrators or Acting Administrators, except one, who were in office since late 1968. We also held discussions with and reviewed reports and documents of other Federal departments and agencies, including the Department of the Air Force, Federal Railroad Administration, National Aeronautics and Space Administration, and NTSB. Further, we held interviews and conducted telephone conversations with officials of and reviewed data supplied by various user/interest groups. (See app. II.)

To examine FAA's management controls to reduce or eliminate safety hazards, we selected and reviewed a number of individual hazards, including some brought to FAA's attention by NTSB and which were and still are the subject of congressional interest. We examined the following 16 hazards:

--Aircraft seat strength.

--Cabin material fire safety.

--Child restraint system.

--Communication problems associated with the control of aircraft on the ground.

--Crew member uniform flammability.

--Crew rest.

--Frangible runway approach light towers.

--Fuel fires or explosions.

--Hijacking.

--In-flight turbulence.

--Midair collisions.

--Ozone contamination.

--Passenger restraint systems.

--Servicing of aircraft oxygen systems.

--Stalls of general aviation aircraft.

--Wind shear.

In examining the broad management issues of hazard identification, planning, controls and evaluations and in examining the 16 hazards, we relied extensively on interviewing various officials at FAA headquarters in Washington, D.C., and other FAA locations to determine the actions FAA had taken or should take to identify and reduce or eliminate safety hazards. These interviews were necessitated by the lack of adequate or complete project file documentation; turnover of key personnel; nonexistent, outdated, or inconsistently applied directives/guidance materials; and the recently effected organizational and policy changes.

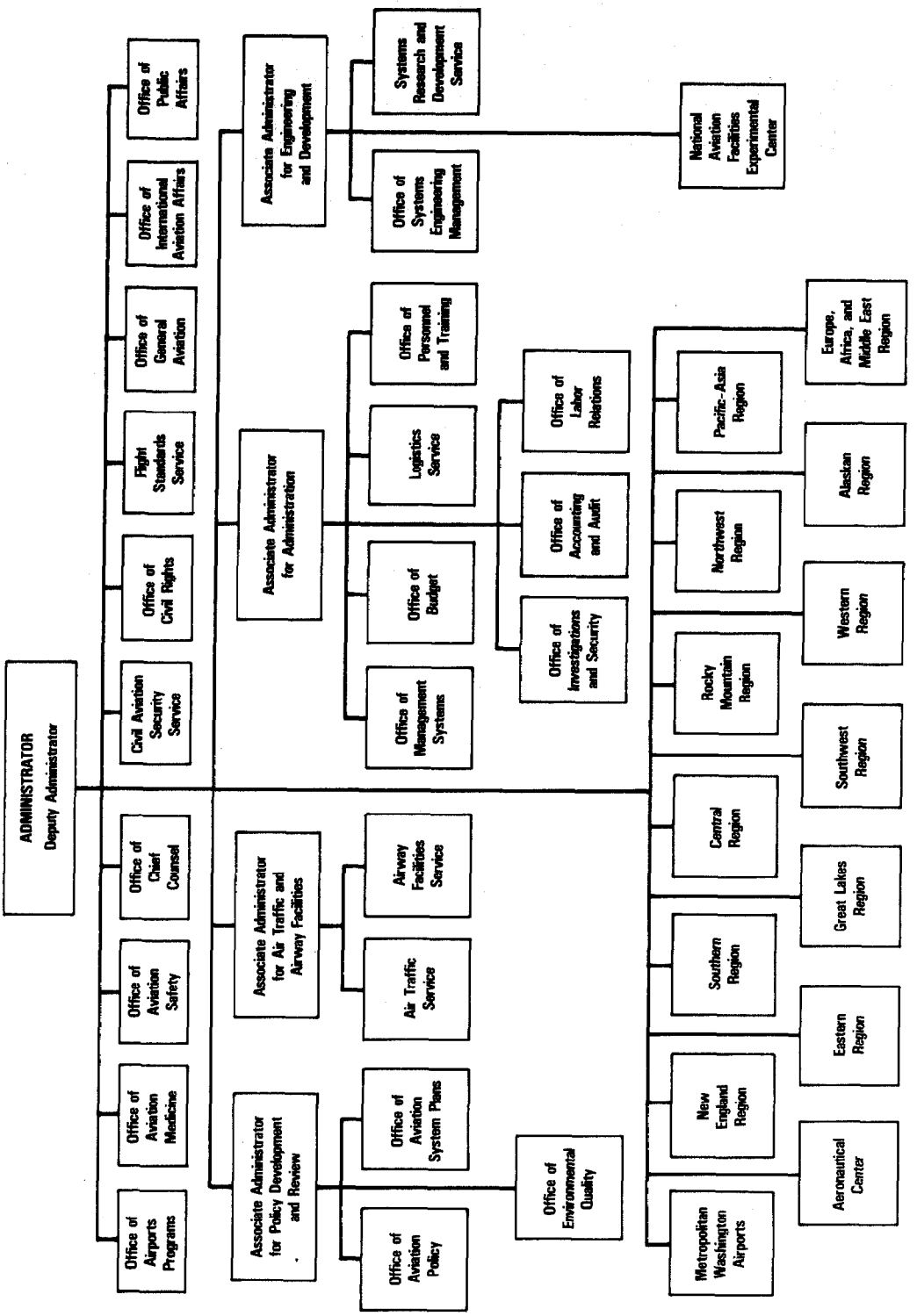
We conducted our review at FAA headquarters in Washington, D.C., and visited various FAA offices including the Mike Monroney Aeronautical Center in Oklahoma City, Oklahoma; the National Aviation Facilities and Experimental Center in Atlantic City, New Jersey; the Southern Regional Office in Atlanta, Georgia; the Air Carrier District Office in Atlanta, Georgia; and the General Aviation District Office in Atlanta, Georgia.

We discussed our review with officials of various internal evaluation groups--DOT's Office of Inspector General and FAA's Program Review Staff and Office of Aviation Safety--and determined that they had done no overall studies of the topics we were addressing.

APPENDIX I

FAA ORGANIZATIONAL STRUCTURE IN 1977

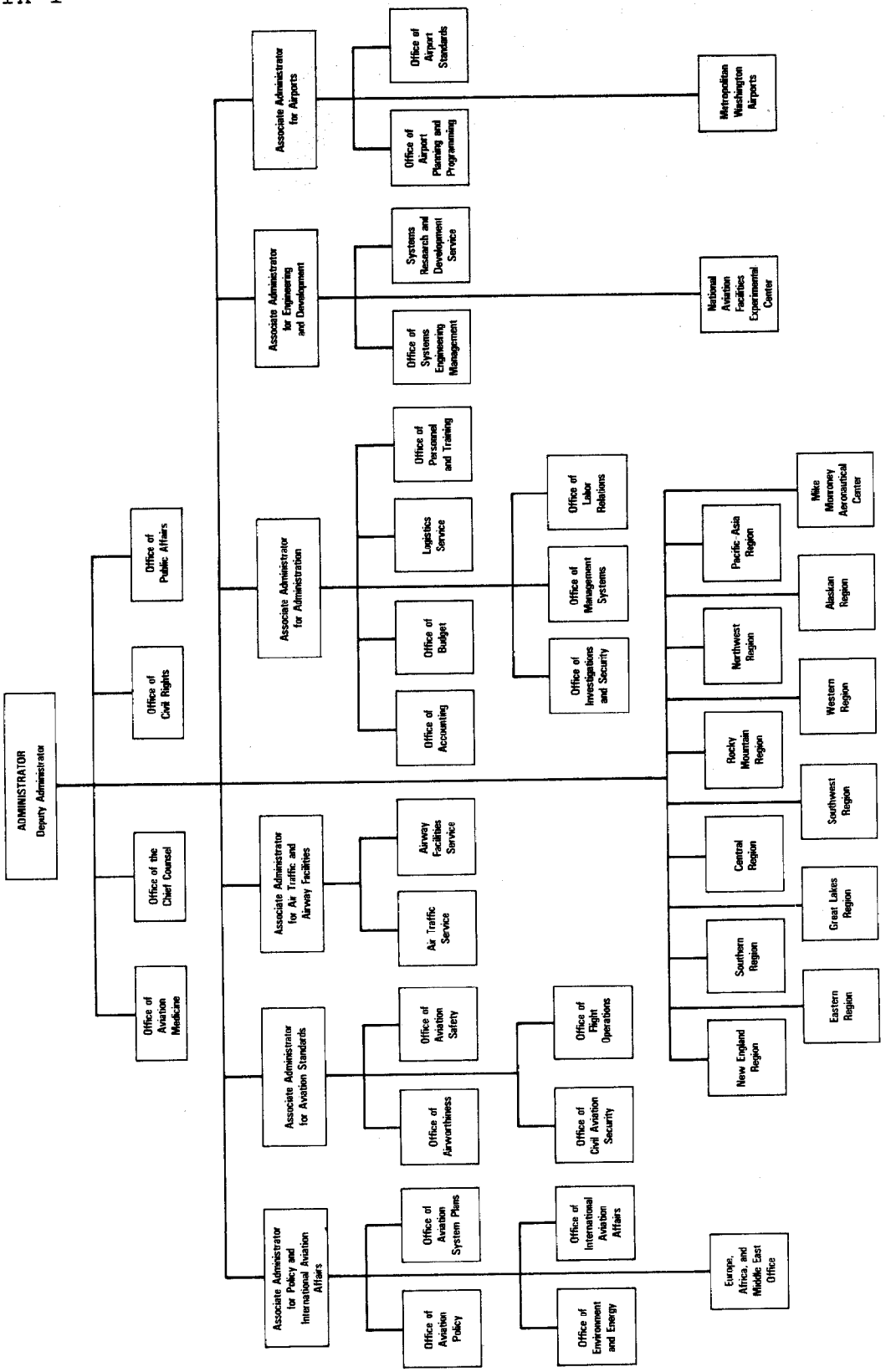
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION



APPENDIX I

FAA ORGANIZATIONAL STRUCTURE AS OF SEPTEMBER 30, 1979

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION



APPENDIX II

LISTING OF USER/INTEREST GROUPS INCLUDED IN SCOPE OF REVIEW

Aerospace Industries Association of America, Inc.,
Washington, D.C.

Aircraft Owners and Pilots Association,
Washington, D.C.

Air Line Pilots Association,
Washington, D.C.

Airport Operators Council International, Inc.,
Washington, D.C.

Air Transport Association of America,
Washington, D.C.

Association of Flight Attendants,
Washington, D.C.

Aviation Consumer Action Project,
Washington, D.C.

Flight Safety Foundation,
Arlington, Virginia

General Aviation Manufacturers Association,
Washington, D.C.

Independent Federation of Flight Attendants,
New York, New York

Independent Union of Flight Attendants,
Burlingame, California

National Business Aircraft Association, Inc.,
Washington, D.C.

Professional Air Traffic Controllers Organization,
Washington, D.C.

Southwest Flight Crew Association,
Sacramento, California

DEPARTMENT OF TRANSPORTATION COMMENTS

This appendix contains the Department of Transportation's comments on our report. DOT noted that

> "* * * Many of GAO's findings coincide with observations of FAA that caused changes which have been put into effect. We agree with many of the general findings of GAO as to the past. However, there has not been sufficient experience under the new structure for these past observations to have applicability to FAA as it is now functioning."

We have summarized and evaluated DOT's comments at the end of each applicable report chapter and, in a few instances, changes were made to the report. Our evaluation of DOT's comments that were not covered at the end of the various chapters are included in this appendix, enclosed in brackets, immediately under the paragraph or set of paragraphs in which a point is raised.

APPENDIX III

DEPARTMENT OF TRANSPORTATION REPLY TO GAO DRAFT REPORT OF NOVEMBER 20, 1979 ON FAA SHOULD IMPROVE ITS MANAGEMENT OF EFFORTS TO IDENTIFY AND ADDRESS HAZARDS TO AVIATION SAFETY

SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

The General Accounting Office (GAO) concludes that the Federal Aviation Administration (FAA) does not have (1) effective systems for identifying safety hazards; (2) a comprehensive planning process to address safety issues facing aviation; (3) an adequate system for planning and approving individual safety efforts; (4) a proper system of controls to govern the implementation of safety project efforts; or (5) sufficient evaluative activities of safety programs and projects. Within these areas GAO makes a number of specific recommendations for improvement.

POSITION STATEMENT

The GAO study was conducted amidst a major change in the structure and philosophy of the FAA. Since assuming the position of Administrator in May 1977, the present Administrator has concentrated his energies on reorganizing both the structure and philosophy of the agency. Many of the GAO's observations coincide with the observations of the Administrator that caused the changes that have been effectuated. The FAA is in agreement with many of the general observations of the GAO as to the past. However, it is clear that there has not been sufficient experience under the new structure for these past observations to have applicability to the FAA as it is now functioning. Recognizing the difficult analytical task assigned the GAO, we have attempted to point up areas in which the GAO's observations are not applicable to the present organization. We would emphasize that the GAO effort has been extremely useful to management because it has allowed us the opportunity to cross-check our observations and the observations of the FAA's outside consultants with those of the GAO.

In August 1978 the Administrator took formal action to correct the deficiencies in FAA's organizational structure which made effective handling of safety program activities difficult. Following an in-depth analysis, he established a major safety oriented organizational component with responsibility and authority over sensitive safety issues. These responsibilities are assigned to four offices and two staffs under the Associate Administrator for Aviation Standards.

The major responsibilities of these offices and staffs are:

- The Office of Aviation Safety: Responsible for accident investigation, safety analysis including evaluation, and purview over special programs such as cabin safety, human factors, helicopter task force, the Aviation Safety Reporting System, and National Transportation Safety Board (NTSB) liaison.

- The Office of Civil Aviation Security: Responsible for antihijacking, antiterrorism, and hazardous materials transportation activities.

- The Office of Flight Operations: Responsible for activities involving aircraft pilots, including certification of airmen; operating rules, procedures, and regulations; and enforcement of operating regulations for air transportation, business, and general aviation.

- The Office of Airworthiness: Responsible for engineering, manufacturing, and maintenance activities involving aircraft, including airplane types and airworthiness certification, engine and powerplant certification, and avionics.

- The Safety Regulations Staff: Responsible on behalf of the Associate Administrator for Aviation Standards for assuring active development of necessary regulations, coordination with the Office of Chief Counsel, and liaison with industry and the aviation public on regulatory matters. The chief of this staff serves as the principal Aviation Standards complex spokesperson on regulatory issues.

- The Program Management Staff: Responsible on behalf of the Associate Administrator for Aviation Standards to assure continual program emphasis on activities of the Aviation Standards complex through program monitoring and reviews, allocation of resources, priority setting, goals orientation, and management alerts for activities requiring corrective action.

These offices and staffs provide complementary functional activities under the direction of the Associate Administrator for Aviation Standards, and provide for a decision-making process which ensures high level management attention to specific issues when needed. Further, it assures continuing attention at appropriate management levels to safety regulatory and other safety related activities. This complex, its processes and programs, have already addressed the significant areas in the GAO report. We will,

of course, continually search for further improvements and incorporate them where appropriate.

[GAO COMMENT: DOT is in general agreement with many of our findings and observations but did not, either in this or other sections of its comments, clearly address or did not address at all specific conclusions and recommendations presented in the report. DOT states that the FAA Administrator since occupying his position in May 1977, and more specifically in August 1978, had taken action to correct deficiencies in FAA's organizational structure and maintains that recent changes within FAA, especially in the offices and staffs under the Associate Administrator for Aviation Standards, and the processes and programs of these offices and staffs have addressed the significant areas discussed in the GAO report.

DOT's reference to August 1978 as to the taking of corrective action in this and other sections of its comments is both misleading and in conflict with DOT's comment in the first paragraph of its position statement which states there has not been sufficient experience under the new structure to assess how FAA is now functioning. The major changes to the FAA organizational structure took place on July 10, 1979, and the basic policies and procedures governing the FAA regulatory program were implemented on an interim basis on September 14, 1979, and had not been incorporated in FAA's directive system as of January 15, 1980.

The fact that changes made to the FAA structure and regulatory process took place toward the end of our review and other changes did not take place at all confirms that our observations were accurate at the time of our review. DOT's comment, as previously indicated, acknowledges there has not been sufficient experience with respect to changes to

assess how FAA is now functioning. Furthermore, to reorganize and create new organizational components is one thing, but FAA has not been responsive to our recommendations that will improve on the process, procedures, and controls that govern FAA's efforts in addressing safety hazards from the time a problem is known to exist to the time a proper solution is effected.]

Our comments on each of the five areas contained in the GAO report are provided below.

1. In the area of effective systems for identifying safety hazards, the Aviation Standards organization, discussed above, has this primary responsibility. In addition, the ongoing FAA/Transportation Systems Center (TSC) safety analysis effort, as discussed in the GAO report, will develop long-term and short-term methods and systems to better utilize data base information and predictive analytic techniques to support safety and regulatory activity. Long-range planning, achievement of program objectives, and effective progress monitoring are integral program elements. Also, the system provides a high degree of management awareness of overall safety improvement efforts. The system is operated by TSC, and is equally accessible to the Office of the Secretary of Transportation and FAA management. By virtue of this accessibility, we believe the FAA/TSC system meets the requirement for reporting to the Secretary.

   We have also been working with NTSB to obtain a common FAA/NTSB approach to accident information. The FAA Administrator has expressed his awareness of the possible benefits that shared accident information might offer in correspondence to NTSB Chairman King. A working group of FAA/NTSB reprsentatives is presently exploring the possibility of sharing data collected by the agency/board and will submit a report on its findings for incorporation in the FAA/TSC program.

   With respect to human factors research, the need for better coordination, definition, and a long-range plan to include budgetary information is acknowledged. The human factors area has been identified as a special

program with central focus under the Office of the Associate Administrator for Aviation Standards.

[GAO COMMENT: DOT's response is discussed at the end of chapter 2.]

2. Concerning the need for a comprehensive planning process to addresss safety issues facing aviation, the FAA is actively engaged in establishing a comprehensive planning process. The organizational mission, and definition of specific goals and objectives have already been accomplished. The remaining stages: priorities, implementation, and feedback for safety and safety related efforts will be included. The Special Programs Division, Office of Aviation Safety, will ensure that implementation and evaluation are integral parts of the planning process. With this more effective planning, there is no need to establish a Safety Advisory Group. Further, accountability properly belongs in the formal organization structure to maximize commitment to the desired results.

[GAO COMMENT: DOT's response is discussed at the end of chapter 3.]

3. With respect to the need for an adequate system for planning and approving individual safety efforts, recent action has corrected the problem areas cited.

[GAO COMMENT: DOT's response is discussed at the end of chapter 4.]

The FAA has a system for determining regulatory priorities which thoroughly considers safety issues. This system is based upon Executive Order 12044, Improving Government Regulations, and the implementing Regulatory Policies and Procedures order issued by the Secretary of Transportation on February 15, 1978. Quarterly, an agenda of significant regulations under development or review is published. In order to

determine the "earliest expected date" on whether to issue the proposed or final regulation, it is necessary to consider several factors, the foremost being agency priorities.

Priorities are established during a selective review process that includes the Administrator and Associate Administrators jointly reviewing each project. Quarterly, progress of each regulatory project is tracked until final completion through a systematic review process which again includes top level management.

[GAO COMMENT: DOT, in its comments here and in many other sections of its response, addresses our observations and conclusions by discussing changes to its regulatory process made on an interim basis in September 1979, which had not been included in FAA's directive system by January 1980. DOT's comments are not responsive to our specific conclusions and recommendations. Also, DOT discusses priorities only with respect to the rulemaking process and does not address priorities for phases of the solution process that precede and/or supplant the regulatory phase. Further, the changes under discussion took place near the end of our review and were too new to assess their impact on the functioning of FAA.]

Within the Office of Aviation Safety, the Special Programs Division is assigned the responsibility for identifying functional areas that require attention; establishing priorities agencywide; and describing the necessity for the safety related effort. Specific program plans will be developed which will include early estimates of cost, benefits, potential interim actions and necessary coordination, and resource requirements and accountability. A similar process exists for activities not warranting special program emphasis. Responsibility for this process is vested with the Program Management Staff under the Associate Administrator for Aviation Standards.

The system developed within FAA ensures that individual safety projects of large magnitude are reviewed and approved at the Associate Administrator level. In this process, full coordination between independent organizational elements is assured and the Administrator is involved in the review and approval cycle.

[GAO COMMENT: DOT's response is discussed at the end of chapter 4.]

4. With respect to establishing a proper system of controls to govern the implementation of safety project efforts, major changes to the agency's regulatory process have increased management's monitoring of the entire process. These changes, effective in September 1979, together with those instituted under the previously discussed Executive Order and OST Procedures have resulted in a process which is more responsive to compressed schedules. The revised procedures were developed as a result of the decision made by the Administrator to reduce unnecessary regulatory review and to streamline the process.

A major reorganization of the safety regulatory activities of the agency was begun on July 10, 1979. Included in this action was the creation of the Safety Regulation Staff under the Associate Administrator for Aviation Standards. This Staff has centralized responsibility for rulemaking actions and, in addition, has initiated actions for proper project file documentation.

Working with the Office of the Chief Counsel, the Staff completed a review of the agency's regulatory activity. As a result of this work, the Administrator revised the basic policies and prodedures governing the FAA regulatory program. These have been implemented on an interim basis and are being incorporated in a revised handbook on agency rulemaking.

[GAO COMMENT: DOT's response is discussed at the end of chapter 5.]

5. On the need for an effective program evaluation system, the Program Review Staff, Office of Associate Administrator for Administration, has the responsibility for the appraisal function. Under our decentralized system, each major FAA organization has an evaluation program which includes a formal planning process. In addition, there is an agencywide planning process whereby major areas/issues of concern are identified and selected for "special emphasis" evaluations each year.

The Staff serves as focal point for the agency evaluation system, providing policy guidance and coordination to assure an effective overall operation. Also, it conducts periodic reviews of evaluation systems and provides status reports to the Administrator. Further, it conducts special and independent evaluations as directed by the Administrator. Contrary to the statement contained in the GAO report that this Staff had not performed any special and independent evaluations, about 20 such evaluations have been conducted. Rather than add full-time manpower, we prefer handling an increased workload with ad hoc specialized personnel, who are assigned on a project-to-project basis. We have found that this approach enables us to assemble a high level of specialized talent for certain evaluations and to achieve a more effective, efficient operation.

Continuous evaluation is also a central function of the Office of the Associate Administrator for Aviation Standards, its headquarters and field offices. The Administrator is charged with the responsibility for aviation safety, and that charge is carried out within the Aviation Standards complex through surveillance, examination, and inspection of the aviation industry as a whole.

The Associate Administrator for Aviation Standards has additionally established a procedure for special emphasis evaluations of the aviation industry. It utilizes a team approach comprised of specialists with the special qualifications needed for an effective evaluation.

Feedback on evaluations is provided through a number of continuing reports produced after evaluations. They cover all factors of aviation safety and related agency activities. Therefore, an annual report is unnecessary.

The requirement for feedback is addressed in the directive system. It specifies what information is required on potential safety problems for deficiencies and corrective actions taken.

With respect to the Secretary of Transportation periodically evaluating FAA's safety related missions, we agree this should be done and that FAA's evaluation activities should be scrutinized to determine their effectiveness. In fact the establishment of the Blue Ribbon Panel on aircraft maintenance and certification is just such an effort. It should also be noted that the Secretary exercises careful budget oversight which provides a useful means of safety analysis.

[GAO COMMENT: DOT's response is discussed at the end of chapter 6. In addition we clarified our report to show that an agencywide planning process for program evaluations does exist and to show that 21 evaluations were conducted during the past 5 years.]

Based on the above and the suggested corrections or clarifications to the report set forth in Attachment 1, we believe our actions which have been set in motion will accomplish the results desired by the GAO observations and recommendations. We would reemphasize that the GAO effort has been extremely useful because it permitted us the opportunity to check our observations against theirs during this restructuring effort.

[GAO COMMENT: DOT's position is that it believes the actions which have been set in motion will accomplish the results desired by the GAO observations and recommendations.

We have no basis for determining, since there was not sufficient experience under the changes that had been made and since some of the changes were still evolving or being planned in January 1980, whether FAA's actions would effect improvements

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with respect to the conditions evidenced by our review. However, we feel strongly that the specific procedures, processes and controls we recommended are required to correct the deficiencies we identified. FAA, in completing its plans, should incorporate into its new procedures, processes, and controls the recommendations made in this report.]

DEPARTMENT OF TRANSPORTAITON REPLY
TO
GAO DRAFT REPORT OF NOVEMBER 20, 1979
ON
FAA SHOULD IMPROVE ITS MANAGEMENT OF EFFORTS
TO IDENTIFY AND ADDRESS HAZARDS TO AVIATION SAFETY

SUGGESTED CORRECTIONS/CLARIFICATIONS TO GAO REPORT

Pages 31, 37 and 41 - Midair Collision

There appears to be an erroneous conclusion drawn regarding the priority of Midair Collision efforts. The agency has always assigned a high priority to resolving the problem. This fact is attested to in the budget requests for resources and the statements of agency officials at a very high number of Congressional hearings. The "low priority" comments of former Flight Standards officials could only relate to the internal priorities of the Flight Standards organization pending the development of a technical solution to the problem. The letter from the Administrator (John McLucas) dated February 9, 1976, to Senator Cannon on the subject can put the past emphasis/priority of these efforts in focus (copy enclosed). 1/ The current Administrator has always placed collision avoidance among his highest priorities.

With regard to an agencywide plan for collision avoidance, the previously mentioned letter to Senator Cannon, a conference with the user community held jointly by the engineering and development and the operation services in September 1976, and the testimony at numerous Congressional hearings since then (see enclosed testimony) 1/ refute any contention that there was no agencywide plan for collision avoidance. The San Diego incident did not bring about any major change in the agency's overall planned approach to resolving the problem. Consideration was given to expanding the current procedural techniques into additional locations and it was established that the development programs were already proceding in the most expedited manner possible.

1/These documents have not been made a part of this report because of their volume and the fact that the information was obtained and considered during our review.

[GAO COMMENT: We agree, as stated in our report, that FAA's research on a collision avoidance device appears to have been given high priority historically. We found, however, that nonresearch actions in other FAA components may not have received the same high priority. For example, FAA actions to encourage the use of standardized aircraft traffic patterns at uncontrolled airports and to promote pilot awareness of other air traffic at such airports through better radio frequency management and better radio procedures have been very slow to take place. We were told by cognizant FAA officials that this was because of the low priority given the efforts or disagreements or misunderstandings within FAA as to which component had responsibility. We also found that some of the proposed actions outlined in FAA's February 9, 1976, letter to Senator Cannon have been delayed or never completed. Again, we were told that this was because of disagreements within FAA.

The statements made by present and former Flight Standards officials refer to an expression of frustration at not being closely involved earlier with research efforts conducted by FAA's Engineering and Development Service. They believe that close coordination between these two components is absolutely necessary. They attributed this failure to the low priority given the problem by Flight Standards prior to the September 1978 San Diego accident. We noted that during one attempt in 1976 and 1977 to define FAA's goals and priorities (discussed on pages 20 and 21 of this report) Flight Standards recommended against making midair collision work an agency priority.

With respect to an agencywide plan for collision avoidance, we agree that research efforts addressing the midair collision have received high visibility, but even these efforts have not been guided by a current approved program plan.

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As of January 15, 1980, the last comprehensive Engineering and Development Service midair collision related program plan was issued in October 1968. An April 1979 DOT evaluation report on major FAA research programs also noted this deficiency.

Even more important is the apparent lack of historical agencywide agreement on policy, approach, timing, and direction for steps dealing with the midair collision problem. Memorandums obtained from Flight Standard's files dated in 1977 and 1978 show that disagreements between Flight Standards and the Engineering and Development Service over such matters went unresolved for at least a full year.

With one exception, the FAA congressional testimony attached to DOT's comments postdates the San Diego accident. The one predating the accident addresses future needs for FAA's air traffic control system, not specific planned steps to lessen the midair collision hazard.

FAA's December 1978 Plan For Enhanced Safety of Flight Operations in the National Airspace System is the only documented evidence we found of a systematic, agencywide, agreed upon approach to the midair collision problem. Development of this plan followed the San Diego midair collision. It outlined the steps to be taken by the various FAA services and offices. In addition, an agencywide monitor was assigned to coordinate and oversee implementation of the plan. We could find no documentation of a similar organized and monitored agencywide approach to this problem prior to the San Diego accident.

DOT's statement concerning no major changes in FAA's overall planned approach to resolving the midair collision following the San Diego accident is misleading. The following paragraph is quoted from

the preface to FAA's Plan for Enhanced Safety of Flight Operations in the National Airspace System issued in December 1978.

"As a part of the investigation of the recent midair collision over San Diego, we directed a review of the Federal Aviation Administration's air traffic control system and procedures to determine what actions could be taken in the near future to reduce the probability of midair collisions. This report outlines the planned and proposed actions that we have determined necessary to implement the outcomes of this review. In some cases, new programs are planned; in others, current programs are accelerated. The costs of these program changes are estimated at $43 million, including establishment of instrument landing systems at 24 general aviation airports in large metropolitan areas. The long-term program costs to support ground-based collision avoidance systems are included within FAA's current budgetary plans."]

Page 31 - Agency Priorities

The GAO report states that the FAA had no agencywide system of priorities and that the agency would be in a better position to justify its actions if priorities were established systematically. As to the agency's rulemaking activities, these statements, which are basically unsupported, do not at all reflect present agency procedures adopted in accordance with policies set by the President, the Secretary of Transportation and the Administrator.

The FAA does have a system for determining regulatory priorities which thoroughly considers safety issues. The Administrator, Chief Counsel and other high agency officials are an integral part of this priority system. This system is based upon Executive Order 12044 (Executive Order), "Improving Government Regulations," signed by President Carter on March 23, 1979, and the Regulatory Policies and Procedures issued by the Secretary of Transportation on February 15, 1978. (DOT Procedures).

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Section 2 of the Executive Order requires agencies to publish at least semiannually an agenda of significant regulations under development or review. Paragraph 13 of the DOT Procedures expanded the requirements of the Executive Order by requiring the publication of an agenda four times each year. While the Executive Order only required the publication of significant regulations, the DOT Procedures also require publication of nonsignificant items. For all items contained in the agenda, the earliest expected date for a decision on whether to issue the proposed or final regulation must be set forth in the agenda.

In order to determine what the "earliest expected date" will be for each of the approximately 70 significant and nonsignificant regulations in the FAA's agenda, it is necessary for several factors to be considered, the most important being agency priorities. The final agenda is only agreed to after these priorities are presented by the Administrator, the Chief Counsel and other agency officials. If the Administrator agrees with the priorities presented, he then and only then signs the document transmitting the agenda to the Office of the Secretary. This requirement applies to each proposed and each final regulation that the agency is considering for issuance "during the succeeding 12 months or such longer period as may be anticipated." Therefore, all regulatory projects which are under development are considered during this priority determination.

Thus, this agenda, which is updated every 3 months, serves as an agencywide listing of priorities. The review of the agenda is not the only method utilized by the Administrator in determining agency regulatory priorities.

Pursuant to the Executive Order and the DOT Procedures, the agency must develop a Work Plan before we "proceed to develop a significant regulation." One of the items which must be included in the Work Plan is tentative target dates for "completing each step in the development of the regulation." Thus, the Administrator, at the earliest stages of regulatory development of all significant regulations, reviews the projected schedule (including its priority in the agency's overall regulatory process) for each such regulation.

By these actions alone, the agency has a systematic and periodic method by which agency regulatory priorities are developed. The Administrator, in order to monitor the agency's regulatory process, established a procedure by which he receives briefings on the status of all agency regulatory projects. These briefings provide the Administrator with an opportunity to review the issues involved

in individual rulemaking actions and the projected schedule for individual and series of regulatory actions. As a result of the briefings, the Administrator may direct that additional resources be made available to complete a project before scheduled or he might direct a change to the agency's priorities. These changes are then reflected in the agency's agenda.

One of the examples cited in the report as an example of the lack of agencywide priorities is wind sheer. The GAO report incorrectly states that "FAA's plans called for issuing a notice of proposed rulemaking (NPRM) within 6 months ..." and that priorities then shifted. Although the project was authorized in July 1977, it was not added to the "agencywide" priority system until January 30, 1979, when it was included in the FAA agenda. This is a further example of how the priority system works. Although the original project authorization stated that an NPRM was to be issued, that was a preliminary service position, not an agency decision. When the project was added to the agenda, it was scheduled for issuance as an advanced NPRM 1/ in July 1979. As evidence of the agency's ability to complete agencywide priorities, the advanced NPRM was issued in April 1979, 3 months ahead of schedule.

Another example used to show the lack of an agencywide priority system is the "child restraint system." However, the material included in the report shows that at one point, the project was cancelled because specific standards were not developed and it was cancelled a second time because of other priorities. Contrary to the report's assertion, this is evidence of the effectiveness of a priority system not evidence of a lack of one.

As a result of the procedures developed in response to the Executive Order and DOT Procedures, as supplemented by the Administrator's review process, the FAA has a thorough and visible listing of regulatory priorities which are constantly reviewed and updated. These priorities are developed in accordance with a formal process in which all offices and

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1/The report criticizes the use of an advanced NPRM, when the use of it is consistent with the President's objective of increasing early participation by the public in agency rulemaking actions and the development of meaningful regulatory alternatives. Surely, GAO is not recommending that the agency should have issued an NPRM when information was not available to sufficiently set forth a regulatory approach to the problem.

services involved in rulemaking take part. The GAO report ignores this process and uses examples which do not at all illustrate their conclusions. The GAO report further states that as a benefit of such a priority system, agency personnel would be informed "about what is important." The agenda developed as a result of the aforementioned process and the priority list used to prepare that agenda are distributed to all employees involved in the rulemaking process. Although the agendas are changed, each office is fully aware of the agency's priorities. The former FAA official interviewed on this issue either was not involved in rulemaking or did not understand the process.

The comments contained in the report on agency priorities show an apparent misunderstanding of the working of a priority system. Priorities are set based upon the importance of projects at the time they are set. Safety considerations, statutory responsibilities, and importance of issues vary over periods of time. A priority system, to be responsive to the needs of the public and to enable the agency to fulfill its statutory mandate, must reflect these changes. The report appears to be stating that priorities should be set at a given time and no adjustments made after that point. Adoption of such a priority system by the agency would be contrary to the interests of safety and inconsistent with President Carter's regulatory directives.

[GAO COMMENT: DOT's discussion in this section centers on our conclusions that FAA does not have an agencywide priority system. DOT states that FAA does have a system for determining regulatory priorities which thoroughly considers safety issues. DOT's position fails to recognize that we are discussing priorities in a broader sense, that is, with respect to safety issues/problems from the time the problem is known through the final stages of the solution process, and not just with respect to regulatory actions which may or may not be the solution to a safety hazard. Further, even the changes made to the regulatory process were only beginning to be used in the latter stages of our audit.

We acknowledge that the changes being made to the rulemaking process may be useful in setting regulatory priorities,

but FAA may approach a safety issue from many different avenues in many different offices before deciding upon a regulatory solution. Even then, a nonregulatory solution such as a system acquisition or research and development may be chosen. These activities may take months or even years. This work, on safety issues, is what we believe needs an agencywide priority designation. During the course of our audit, we asked numerous FAA officials to provide us with an agencywide list of safety issue priorities. No such list was provided, apparently because no such list existed. FAA's views on this point seem to be more specifically addressed earlier in the DOT comments when DOT states that the new Special Program Division in FAA's Office of Aviation Safety has been assigned the task of establishing agencywide priorities on activities warranting special program emphasis. In addition, DOT states that the Program Management Staff under the new Associate Administrator for Aviation Standards has a similar responsibility for activities not warranting special program emphasis. While these activiies look promising, we cannot comment on their adequacy until more experience is gained using these new procedures and processes.

Our examples on wind shear and child restraint were included to illustrate the effects of shifting emphasis in the absence of a systematic, agencywide priority system of safety issues. It is difficult to understand why years of effort to develop a child restraint device were shelved in May 1978 to be revived again as a high priority effort in January 1979.

Our report has been revised to show that the original project authorization for airborne wind shear detectors was a Flight Standards authorization. This

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does not change our point, however. We are attempting to show that projects should have a stronger, broader priority basis than the informal priority which may be attached to the project by a single individual.

Also, it was not our intention to criticize the proper use of the advance notice of proposed rulemaking as implied in DOT's comments.]

Page 33 - The Establishment of Specific Requirements for the Agency's Rulemaking Efforts

As illustrations of this "problem," the GAO report lists the following efforts: frangible runway approach light towers; stalls of general aviation aircraft; and fuel fires or explosions. Each of these projects was initiated 5 or more years ago. These examples are not appropriate to establish the agency's present "failure to establish specific requirements for rulemaking efforts" since all were initiated at dates well in advance of the procedures established by the Administrator to ensure his participation in all rulemaking efforts.

As previously mentioned, both the Executive Order and the DOT Procedures require that a Work Plan be prepared before the agency "proceeds to develop a significant regulation." Thus, Work Plans are written at the inception of the regulatory process. Among the items included in a Work Plan are the need and objectives for the regulation. Since the Administrator must approve all Work Plans, he and other high ranking FAA officials do focus on research areas or data needed to support rulemaking actions before all significant regulations are developed.

The Administrator's review of agency priorities and the other briefings given, as cited above, provide additional vehicles for the development at the earliest possible time of specific requirements for agency rulemaking efforts.

An example of how the "briefing" process initiated by the Administrator has been effective in increasing involvement of high agency officials in rulemaking decisions early in the process is a recent NPRM issued by the agency concerning "Advanced Flight Training Simulators" (49 F.R. 65550, 11/13/78). The NPRM proposes to permit expanded training,

checking, and certification of flight crewmembers in advanced flight training simulators. During the initial stages of the project development, several regulatory alternatives relating to simulation training were discussed with the Administrator, Chief Counsel, and other agency officials. After a review of these alternatives, a decision was made to proceed with the current NPRM. As a result of these decisions, a NPRM was issued on November 6, 1979, which should result in substantially improved safety, fuel conservation, and a reduction of airport congestion.

An essential aspect of the early establishment of data needed to support rulemaking is early public involvement in the development of regulatory alternatives. In order to create an opportunity for early participation in agency rulemaking actions by state and local governments, business organizations, and individual members of the public, the FAA issued (effective on March, 1979) an amendment to Part 11 of the Federal Aviation Regulations which requires publication in the Federal Register of petitions for rulemaking or exemption submitted to the agency within 60 days of receipt. Prior to the amendment, the agency acted on petitions for rulemaking when the agency deemed it appropriate and without the benefit of public comment. By receiving comments at this stage of the decision making process, additional information is available to the agency during the consideration of regulatory alternatives. This has further resulted in increased support for rulemaking action.

The agency uses other methods to increase public participation in rulemaking actions including public reviews and meetings and advanced notices of proposed rulemaking. This is a further example of conclusions made in the report not based upon current information. A review of the actions taken by the agency during the past 2 years show clearly that the FAA has established at the earliest possible time clear, specific requirements for rulemaking. It must also be noted that the report does not contain any basis for the statement that requirements are "ill defined until the latter stages of the solution process." It is apparent from a review of the report that GAO does not understand the process involved in the development of regulatory solutions to safety issues. Although every effort is made to define these issues early in the process, questions and new issues not contemplated when actions are initiated often arise during the process. It would be contrary to the interest of safety to proceed with rulemaking without a full review of these "new" issues. This

additional review may result in a modification of estimated completion dates, however, it does not reflect delay on the part of the agency or on a failure to establish requirements.

[GAO COMMENT: Again, we believe that DOT's comments significantly overemphasize the importance of recent changes made to FAA's regulatory process. The regulatory process is begun when a regulatory solution is decided upon. A significant amount of work including research or development may precede this determination. It is this work that needs better requirements definition. Our examples covering stalls of general aviation aircraft and fuel fires or explosions typify the problem. Although work on these projects was initiated years ago, both remained active during out audit. Neither involves rulemaking actions, but rulemaking is a future possibility in both cases.

These two examples show that FAA may now be in a very poor position to even initiate rulemaking action because needed justification and support for such action was not well defined when the work began years ago. We fail to see how new regulatory procedures will solve this problem. The frangible runway approach light towers example shows that requirements definition is equally important when a systems acquisition is the final solution.]

Page 36 - Early Consideration of Costs and Benefits

The draft report again fails to take into consideration procedures enacted during the past 2 years. The Executive Order and the DOT Procedures require that a regulatory analysis be prepared for certain regulations. Among the items discussed in the analysis are: a statement of the issues; a description of major alternatives; and analysis

of the economic alternatives and the reason for choosing one alternative over the others. This analysis must be prepared before any regulatory proposal is issued.

Even though the initial determination is made that a regulation is not "major" every proposed regulation is evaluated through the medium of regulatory evaluation which includes an economic analysis. If it is subsequently determined that the impact of the action is $100 million or more; will result in a major effect on the economy in terms of costs, consumer prices, or production; will result in a major increase in costs or prices for individual industries, levels of government, or the geographic regions; will have a substantial impact on the United States balance of trade; or if the Secretary or Administrator determines an analysis is needed, the evaluation is expanded to become a regulatory analysis. A review of all evaluations is made by the Administrator, the Chief Counsel, and other agency officials. During their review, if they believe additional economic questions must be addressed, then this information is supplemented.

The following regulatory actions are examples of the depth of review of the economic aspects of rulemaking considered by the Administrator and other agency officials as part of this process.

On February 16, 1978, the FAA issued Notice No. 78-3 concerning Flight and Duty Time Limitations and Rest Requirements for Crewmembers. In response to questions raised by the Administrator concerning the economic effect of the proposal, it was decided that certificate holders should be asked to submit information concerning the economic impact of the proposal. In addition to asking general questions concerning economic impact, the agency solicited responses to specific questions in this area. The submittal of this financial information will assist the agency in considering and analyzing meaningful alternatives before a final regulation is issued and is part of an agency effort to ensure that information concerning costs and benefits or rulemaking will be attained at the earliest rulemaking stages.

Another example is the Part 135 NPRM which was issued in August 1977. The NPRM was issued after a review conference held in November 1976 which was attended by 400 persons. More than 112 proposals were discussed at the conference and more than 100 written comments were received after issuance of the NPRM. The NPRM, which proposed substantial

revisions to the requirements for operations by persons holding air taxi/commercial operator (ATCO) operating certificates issued by the FAA, was the largest, most complex safety rulemaking project ever undertaken by the FAA.

As a result of the number of comments received and the complexity of issues presented, the Administrator directed that more detailed and consistent data on industry cost impacts be developed. Therefore, an independent and comprehensive assessment of the cost impacts likely to result from the proposed changes was undertaken. This assessment examined the impact of individual proposed changes as well as all changes taken together. As a result of the analysis and review process, 32 specific proposed Part 135 changes were identified that were likely to impose operator cost impacts. In parallel with the cost impact identification activity, a major effort was undertaken to develop a data base for analytical purposes. This was accomplished by obtaining information from FAA and Civil Aeronautics Board (CAB) sources and by interviewing a sampling of commuter and on-demand operators. After a comprehensive analysis of the cost impact information, a final cost analysis was prepared.

This cost analysis was presented to the Administrator who then received several briefings on the proposals and the analysis. After these briefings were completed, a decision was made to change nine of the proposed changes. This resulted in a $19 million reduction in the cost impact. Included in this reduction were in excess of $4 million in cost reductions resulting from the deletion of requirements between the notice and final rule.

Another example of increased involvement of agency officials in the regulatory process is the area of aircraft wheels, tires, and brakes. During the past several years, there have been several accidents involving large commercial jet airplanes that involved failures of tires, wheels and brakes, and anti-skid devices. These accidents resulted in destruction of aircraft, death and injury. After an analysis of information obtained as a result of a safety surveillance effort, agency officials presented the data gathered to the Administrator. After reviewing all alternatives, the Administrator determined that NPRMs would be issued to upgrade standards for aircraft wheels and wheel-brake assemblies and tires.

The Administrator directed that agency officials continue to monitor incidents of tire failures. After this information was presented to the Administrator, Chief Counsel

and other high agency officials, a determination was made that additional regulatory action was needed to improve safety. It was further decided that this action would be taken simultaneously with those actions already issued. In order to ensure that all alternatives were considered as part of this effort, the Administrator directed that the economic and technical effects of this additional regulatory action be fully reviewed. A comprehensive cost impact analysis was then prepared reviewing all regulatory alternatives. This analysis was thoroughly reviewed as part of the process and was subsequently included in the NPRM in order to generate public participation in the agency's assessment. In order that this effort be accomplished in the shortest possible time frame, the Administrator directed that the adjustments be made to the agency's regulatory priorities. A decision was then reached to proceed with a NPRM that would require all wide-body and standard-body aircraft to be equipped and operated with tires meeting new standards (issued on the same date) at the earliest possible dates after the tires are available. The dates contained in the NPRM were decided upon by the Administrator after a thorough review of all information developed during this several year effort.

This is a clear example of the early establishment of specific requirements for the FAA's rulemaking efforts and the early consideration of costs and benefits by high agency officials. It further is an example of the agency's ability to thoroughly analyze and process rulemaking actions according to a short schedule.

The FAA issued NPRM Notice No. 77-1 (Section 30 Regulations - Civil Rights) on January 13, 1977. The notice contained regulations to implement Section 30 of the Airport and Airway Development Act of 1970, as amended by the Airport and Airway Development Act Amendments of 1976. The notice proposed regulations which would assure that no person is excluded on the grounds of race, creed, color, national origin, or sex from participating in any project for airport development, airport master planning, or airport system planning conducted with or benefiting from funds received from a grant made under the Act. The comment period which was scheduled to close on March 14, 1977, was twice extended to May 20, 1977, based upon public requests.

As a result of the large number of commments received and the complex, legal issues contained in the NPRM, the Administrator asked that he be briefed on the entire program. As part of the series of briefings given to the Administrator

in response to his request, detailed information was given to him on the economic, social and legal aspects of the notice. After these briefings, the Administrator directed that substantial changes be made to the proposed final rule. The purpose of these changes was to eliminate overlapping and inconsistent provisions and minimize compliance costs and other burdens on the public while, at the same time, ensuring that the final rule reflected the intent of the Act.

Another example is the Boeing 707 Airworthiness Directive concerning horizontal stabilizer modifications. The final Airworthiness Directive was based on a NPRM published on May 8, 1978. Under agency procedures, airworthiness directives are prepared and issued by regional offices. In this case, the airworthiness directive was considered significant due to anticipated public controversy and to its cost. In addition to the NPRM, a work plan and regulatory analysis was submitted to FAA headquarters for review. These documents underwent extensive scrutiny by top management officials including the Administrator and the Chief Counsel. The primary areas of concern of these officials were the alternatives presented for implementation and in particular the proposed time frame for compliance. Both the Administrator and the Chief Counsel asked regional personnel to provide to them additional cost data before they were willing to agree to the issuance of the NPRM.

The FAA's cost evaluation program is comprehensive. The data for regulatory analyses is derived from: FAA statistical data sources on air carrier and air taxi fleets; aircraft registration and airmen certification files; CAB traffic and financial statistics; the Official Airline Guide; the aviation community; solicitation via NPRMs and advanced NPRMs; and through manufacturers' data. Quality is assured by cross-checking data from different sources. For information derived from other than official sources, tests of statistical validity are applied, and where appropriate, matters of judgment or individual experience are exposed to public review in the rulemaking process. Currently, FAA has two people in the Office of Aviation Policy spending full-time and another four people working part-time on regulatory analysis or evaluations. In addition to the analysts' time, people in FAA's technical and legal offices have to spend considerable amounts of time supporting, reviewing, and coordinating the analyses. In addition, an estimated $1,217,000 in contract research funds was obligated for regulatory analyses in FY 1978 and FY 1979.

The GAO report correctly states that cost-benefit analysis has been recognized by FAA as a useful tool to aid decision-making. As shown by the aforementioned, the agency has taken several steps to assure that economic information is made available to decisionmakers throughout the rulemaking process and that full economic analyses are prepared at the earliest possible stages of the solution process. The GAO report does not set forth a basis for this conclusion and is deficient in that it does not recognize these steps.

[GAO COMMENT: Once again, we believe DOT has significantly overemphasized the importance of the recent changes made to the regulatory process. DOT offers examples to show that the cost and benefits are now considered during the regulatory process. We agree that sometimes a regulatory solution is immediately apparent and the regulatory process may provide timely consideration of costs and benefits. In other cases, however, the regulatory process is the last activity which culminates many months or years of effort working toward a solution to a safety problem. In addition, the appropriate solution is not always a regulatory one. It is in these cases, as typified by our examples, that we believe the costs and benefits could be considered earlier. Naturally precise estimates may not be possible this early, but even rough approximations can be a valuable tool in planning and decisionmaking about whether and what solutions will be pursued. We reemphasize that the use of cost-benefit analyses during the planning stages before rather than after the formulation of projects has been stated FAA policy since April 1965. We believe that more emphasis is needed to put this policy into practice.]

Page 41 - Coordination Not Assured

The requirement for improved coordination was recognized by the Administrator and action taken to achieve that improvement was included in the formation of the Associate Administrator for Aviation Standards.

The comment concerning the engineering and development internally generated projects being the area in which the lack of coordination could be highlighted is erroneous. Virtually every effort conducted in the Flight Standards area of concern was and is supported by a validated request for the effort. A review of the utilization of the products of the development program would show a very high percentage of successful completions.

It is appropriate to note that the SAFER committee which has just completed an assessment of requirements and programs found that the ongoing engineeering and development programs were responsive with minor exceptions to all the identified requirements.

[GAO COMMENT: We recognize that many efforts involving research and development are supported by validated requests for the efforts. However, the point we are making concerns the need for improved coordination on safety projects once projects are initiated. In this respect, coordination and documentation thereof as discussed in the report is a problem that is in need of management attention.]

Page 44 - Untimely Rulemaking Process

Although there are instances in which it has taken long periods of time to complete certain rulemaking actions, these instances do not lead to the conclusion that the agency's "rulemaking process has been very slow." The report fails to recognize significant changes in the regulatory process and major regulatory actions taken during the past 2 years.

A review of the Flight and Duty Time Limitation NPRM (referred to as "crew rest" in the GAO report) shows that the agency has been actively working on completion of this complex area. Notice 78-3 was published on February 27, 1978, with reply comments due by August 15, 1978. The

comments received in response to the NPRM (which contained numerous and detailed questions) comprise 16 volumes (each with several hundred pages) and approximately the same number of individual attachments which include computer print-out sheets, concerning airlines trip-pairing and crew scheduling information.

The complexity of the issues involved in this NPRM are enormous considering that most of the Part 121 flight time rules are at least 30 years old and were written when air carrier operations were vastly different from today's operations. The age complexity of those regulations has caused difficulties in interpretations for all persons working with the rules. For example, the Chief Counsel's office has issued well over 1,000 pages of interpretations. The agency also has been sued over the meaning of certain phrases in the current regulations and has had to respond to numerous congressional inquiries about these regulations. Few areas of the regulatory world are as complex and controversial as flight and duty time regulations. The present project is intended to bring the regulation of this area into the 1980 environment with a greatly simplified and shortened body of regulations. This is responsive to today's environment and the President's goal of regulatory simplification.

Adding to the complexity of these issues are the questions involved with respect to Part 135. In the Part 135 final rule published October 10, 1978, the FAA stated it was deferring Part 135 flight and duty time changes for consideration in conjunction with the Part 121 rulemaking proceeding. Ultimately, after analysis of the comments, it was decided to combine the Parts 121 and 135 rulemaking actions because of concepts common to each. This was consistent with the Airline Deregulation Act of 1978 (P.L. 95-504; October 24, 1978) which dramatically changed the operating environment of air carriers and brought the commuter air carrier regulated under new Part 135 into the foreground as one of the fastest growing segments of the air carrier industry.

From the above, it is clear that the agency has proceeded with this rulemaking based upon a schedule that reflects the technical and economic complexities of the issues therein.

There are numerous examples of major regulatory projects which have been completed in brief periods of time. For example, a project was established for "Total Simulation"

on July 20, 1979, with a proposed completion date of January 1, 1980, with 800 estimated man-hours needed for completion. The NPRM was actually issued on November 6, substantially ahead of schedule. Another example of the agency's ability to complete rulemaking in a short period of time is Amendment 121-151, effective April 23, 1979. This Amendment was in response to petitions for rulemaking submitted on November 6, 1978, and March 16, 1979, to modify training requirements which had resulted in several injuries.

As previously mentioned, major changes to the agency's regulatory process have increased management's monitoring of the entire process. These changes, effective in September 1979, together with those instituted under the Executive Order and OST Procedures have resulted in a process which is more responsive to compressed schedules.

The Administrator made a determination after arriving at the FAA that alternatives to the Regulatory Council should be explored. He questioned the need for the structured and often lengthy review conducted by the Regulatory Council. He was particularly concerned about the requirement wherein all members of the Council, even those not affected by a particular regulation, would take part in a review of it. A decision was then reached that only those offices or services involved in a regulation need review it. However, formal implementation of this new procedure could not be accomplished until the reorganization of various services involved in rulemaking was accomplished. This reorganization was not finalized until July 1979. The revised Regulatory Procedures, enacted in September, were developed as a result of the decision made by the Administrator to reduce unnecessary regulatory review and to streamline the process. These new procedures reflect the Administrator's belief that coordination of this type could be more efficiently accomplished by having the office of primary interest (OPI) assume the responsibility to insure that proper coordination of each regulatory project is accomplished as early as possible in the process. This change streamlined the process as now only those projects which need to be coordinated are provided to only those organizations which need to review the particular project.

Under the old system preliminary coordination was accomplished during the development of the regulatory project and each Regulatory Council member could request formal Council review of a proposed NPRM or advanced NPRM. Unless waived by the Chairman of the Council all amendments were

formally reviewed either at a meeting or through circulation of the final draft. The final package on the action was not prepared until this formal review was accomplished thereby extending the processing time on the project.

These new procedures have been extremely effective in processing regulatory projects. Since September 1979, under this procedure, the agency has issued or has in final coordination 7 NPRMs, 12 Amendments, and 2 withdrawals. In addition, the agency should issue three additional final amendments before the end of the year. This totals 15 amendments which should be issued over a 4-month period. This compares favorably with the fact that in all of 1977 and 1978 only 29 amendments were issued. Considering that many of these actions were significant (including Controlled Visual Flight, Commuter Security Requirements, Part 125, Aircraft Wheels and Brakes, Aircraft Tires and Section 30 Regulations) it becomes even more apparent that the agency has made substantial changes to the regulatory process which have resulted in improved and more timely handling of regulatory documents. This also disputes the notion that the Office of the Chief Counsel has in any way hindered the issuance of regulatory documents. Therefore, there is no basis for the statement that the agency's rulemaking process is "very slow." Such a conclusion cannot be supported by an examination of rulemaking actions taken during the past 2 years.

While the agency has taken steps to streamline the rulemaking process, eliminate unnecessary levels of review, and eliminate unnecessary paperwork, GAO has recommended that the agency create a new level of review (Safety Advisory Group) and to create additional paperwork (comprehensive system of controls and written progress reports). Adoption of these procedures would negate all the actions taken by the Administrator which have clearly been effective and would be inconsistent with President Carter's goals as established in the Executive Order.

Much of the information contained in the report is based upon unfounded statements and was apparently obtained from individuals without detailed knowledge of the agency-wide regulatory process.

The FAA has always been innovative in proposing regulatory solutions to complex technical issues. Actions taken during the past 2 years by the agency have been widely recognized as significantly furthering the objectives of the Executive Order. The GAO report fails to recognize

these actions and also fails to recognize that safety problems cannot be predicted years before they arise and that any solution of such problems must be based upon a thorough analysis which includes a method of assuring ample opportunity for public participation. A solution process, such as the one proposed in the draft report, which doesn't recognize these objectives would be contrary to the promotion of aviation safety.

[GAO COMMENT: As discussed previously, the most potentially substantive changes made by FAA to the regulatory process were not implemented until September 1979 on an interim basis, and had not been incorporated in FAA's directive system as of January 15, 1980. It is too early to assess, even according to DOT's own comments, the impact of these changes.

FAA claims that the notice of proposed rulemaking on flight and duty time limitation was issued in February 1978, with the public comment period ending in August 1978. Although a final rule is not yet published, FAA believes that, considering the complexities of the issue, it has proceeded in a timely manner. The following events, however, have been overlooked.

In August 1963 FAA issued an advance notice of proposed rulemaking concerning an overall review of the flight time limitation rules. As in the 1978 notice of proposed rulemaking, FAA stated then that present rules had remained essentially unchanged for many years, despite the many changes which had occurred in the nature of operations, and these rules have been subject to numerous interpretations over the years in response to specific questions. FAA stated then, as it did in 1978, that varying standards to different types of operations may no longer be justified. This advance notice of proposed rulemaking was canceled, with no specific stated reason, in January 1970, over 6 years later.

As outlined in our report, FAA's operations review, from which the current flight and duty time limitation proposal emanated, was begun in February 1975. Final action was to be taken on all operations review proposals by February 1977. Final action on the flight and duty time limitation proposal and many other proposals had not been taken as of January 15, 1980.]

Pages 62 and 63 - Office of Inspector General

The report contains a statement attributed to an official of the Office of Inspector General (OIG) that the OIG would focus on fraud, waste, and abuse areas, and that the responsibility for independent evaluation of FAA's overall effectiveness was FAA's own through its Program Review Staff. In view of the current OIG emphasis on program audits, this statement should be modified or deleted. We recommend that it be deleted since it adds nothing to the substance of the report.

[GAO COMMENT: We contacted appropriate officials of the Office of Inspector General after receiving these comments. They advised us that the planning structure for the Office of Inspector General would be completed in a matter of months and though program evaluations were not the emphasis of the past, there would be emphasis on such evaluations in the future. Based on this information, we have deleted references to the Office of Inspector General activities in chapter 6 of this report.]

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