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REPORT  
of the  
SECRETARY'S TASK FORCE  
on the  
FAA SAFETY MISSION

April 30, 1975

**REPORT OF THE SECRETARY'S TASK FORCE  
ON THE FAA SAFETY MISSION**

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## SUMMARY OF TASK FORCE RECOMMENDATIONS

### Regulatory and Operational

1. The Task Force commends the FAA for reinstituting and expanding the no-fault report policy and recommends that the record of incidents be available to serve for subsequent review, evaluation, and improvement of safety.
2. In order to keep up with increasing demands of aircraft certification, and the inspection of aircraft manufacturers and air carriers, FAA must continue to place increasing reliance on the role of industry in the safety compliance inspection process. However, FAA must strengthen its technical staff and its ability to monitor the effectiveness of delegated functions, and must assure strict monitoring of all designated representatives' performance.
3. FAA should require more comprehensive and systematic "Design Reviews" as a necessary step in the certification of major aircraft and engine developments, including major subsequent changes.

4. The National Transportation Safety Board (NTSB), as an independent agency, does and should continue to make strong recommendations to the FAA, but it should be FAA's role to develop detailed technical solutions to safety problems. FAA should conduct post-audits, in cooperation with the NTSB, to assure prompt and timely pursuit of recommended solutions.
5. FAA must expedite the rulemaking process in accordance with a priority system. Special emphasis must be given to improving the clarity of rules and the timeliness of their legal review.
6. FAA must develop more specific guidelines for the conduct and content of biennial flight reviews in consultation with the general aviation community, and should consider centralizing compliance records.
7. FAA should require the use of flight data monitoring systems (such as cockpit recording devices), which measure those flight activities and parameters determining the quality of crew and aircraft performance. Such devices should be evaluated on an experimental basis, without threat of legal or disciplinary action, and with the full participation and cooperation of both flight crews and airline operators.

8. FAA must expand cooperative programs involving pilot associations and air carriers to standardize and improve crew performance.
9. FAA should revise its flight check program to reflect normal and emergency operations more realistically. This program should be carried out by air carrier management check pilots under FAA surveillance.
10. FAA must undertake a major safety research program to assure that future aircraft designs make optimum use of crew capabilities, and to ensure that future systems are designed around reasonable criteria for human error.
11. FAA must establish a standing group composed of air carrier, controller, general aviation, military and pilot representatives to review air traffic control procedures and practices. The goals of this review should include more standardization, less ambiguity, and a general clarification and upgrading of terminology and procedures.
12. FAA must use all the information available to it to enhance the overall awareness of where each airplane in positive controlled airspace is, not only in the horizontal, but also

in the vertical plane. A study should also be made of the extent and accuracy of supplementary information that could be made available to the pilot before and during a flight, under visual or instrument flight rules.

### Organizational

13. FAA is and should continue to be a part of DOT. However, FAA does not need and should not receive undue supervision and control by the Office of the Secretary. The Secretary of Transportation should select an FAA Administrator of high managerial and technical competence to whom he can confidently delegate the large and complex task of administering the FAA within broad policy guidelines from the Office of the Secretary. The FAA Administrator should emphasize FAA's role in the development of a balanced national transportation system and foster good working relationships within DOT. Such a streamlined relationship must be achieved, if the FAA is to function effectively within DOT.
14. The Engineering and Manufacturing functions related to aircraft certification should not report to each of the Regional Directors, but should be consolidated within one or more technical field centers. These centers would constitute the engineering strength of the FAA in an environment conducive to the professional growth of FAA's field engineering staff. Such centers should report to FAA



Headquarters at a level just below the Administrator. Similar arrangements should be considered for the air carrier inspection function.

15. An intensive review should be conducted of FAA's Headquarters organization with the objectives of (a) reducing the number of elements which report to the Administrator, and (b) having those elements which do report to the Administrator correspond to the major functions of FAA.
16. A study should be conducted of the FAA regional organization aimed at a reduction in the number of regions and a consolidation of functions determined by program requirements, notably those of air traffic control, which should be managed separately from FAA regulatory functions.
17. FAA should upgrade its personnel planning and management development programs so as to maintain a highly skilled and competent work force for the future.
18. To meet the needs of future air transport systems, FAA must strengthen its program of long-range research and development and assure that the efforts of such R&D are brought on stream. To strengthen R&D, the FAA should utilize and coordinate with other technical elements of DOT, work closely with the laboratories of NASA and DOD, and draw

upon the capabilities of both industrial and university researchers.

19. FAA should establish one or more technical advisory committees composed of experts from government, industry, and universities to advise on the adequacy of current FAA technical programs and the direction future developments should take. A similar approach might be taken for organization and management problems.

## INTRODUCTION

The Federal Aviation Administration (FAA) was established as an integral part of the Department of Transportation by the Transportation Act of 1966. Prior to its becoming an entity of the DOT, FAA was an independent agency of the United States Government. Throughout this period, the FAA's primary safety mission and functions have remained essentially the same, i. e., ". . . the regulation of air commerce in such manner as to best promote its development and safety . . .".

Over the years, FAA has achieved a history of remarkable accomplishment in its dual role of both fostering and regulating aviation. To grasp the dimensions of the FAA's accomplishments, it is only necessary to cite a few examples:

- FAA standards for aircraft, airmen, traffic control, and maintenance inspection are accepted world-wide and have served as the foundation for many fully developed international standards.
- Under FAA stewardship the airlines of the United States have achieved world leadership and have demonstrated record levels of safety performance that are still only future goals for the rest of the world.

- Transport aircraft developed to FAA safety standards and under FAA surveillance and inspection have dominated the airways of the world for decades and continue to set world standards for safety, reliability, and economical performance.

- Under FAA regulation and using FAA safety standards, the United States, in a striking parallel to the development of transport aircraft, has created a general aviation industry whose aircraft dominate the world market.

- The system of air traffic control devised and operated by the FAA has become the pattern for world-wide traffic handling and all-weather airport navigation and landing aids.

Despite these achievements, in recent months the air safety program of the FAA has come under criticism from various quarters. The December 1974 report of the Special Subcommittee on Investigations of the House Committee on Interstate and Foreign Commerce, for example, raised a number of questions concerning the manner in which FAA carried out certain specific safety functions. More questions were raised by the investigation and hearings conducted by the National Transportation Safety Board (NTSB) over the fatal crash in December 1974 of an airliner near Dulles Airport. The public media have reported extensively on "lagging safety programs" of the FAA.

Over the past several months important issues have surfaced in the Congressional inquiries, the TV and press reports, and the NTSB accident investigations. Underlying the public debate over these issues, there is a basic question: What can be done, in a systematic and workable way within government and industry, to improve the record of aviation safety?

With this pragmatic concern in mind, former Secretary of Transportation Claude S. Brinegar decided to establish a special Task Force to review the problems and to recommend appropriate courses of action. To assist in defining the agenda for this review, Secretary Brinegar convened a meeting on January 15, 1975, of top FAA officials, including FAA Regional Administrators and several former employees who had played key roles over the years in shaping FAA safety programs. On January 17, 1975, Secretary Brinegar convened a meeting with the present and former Administrators and Deputy Administrators of the FAA. The participants at these meetings reviewed the FAA's safety role, its organization and management approach, as well as its interface with the carriers, with industry, and with other Federal agencies on questions relating to safety.

The special Task Force held its first meeting on January 28, 1975. At that meeting Secretary Brinegar stated the role of the group as follows:

"The Task Force will examine the FAA's overall organizational structure and management approach, including its use of delegations, in carrying out its legislative safety missions."

"At the end of 60 days the Task Force will submit a report to the Secretary of Transportation. This report should include (1) near-term recommendations for action and (2) recommendations covering areas that require further analysis and study."

Lt. General Benjamin O. Davis, Assistant Secretary of Transportation for Environment, Safety and Consumer Affairs, was named Chairman of the Task Force, and James E. Dow, Deputy Administrator of the FAA, was named Executive Secretary. The other members of the Task Force are: Warren G. Bennis, Michael Collins, Edgar M. Cortright, Willis M. Hawkins, Harold J. Leavitt, Constantine B. Simonides, George A. Warde and Louis B. Young. (Brief biographical information is included in Appendix A).

In selecting the members, Secretary Brinegar sought individuals who enjoy professional recognition in their fields, who are well versed in aviation and/or management of large enterprises, and who have a strong orientation toward the public interest. Their advice would permit the Secretary to consider a wide range of

broad organizational and management alternatives without the normal requirement for extensive and time-consuming background research. Through this approach, changes that appeared desirable would surface promptly and, after consideration and analysis, appropriate actions would be initiated in an expeditious manner.

In a letter (Appendix B) to each of the members on February 7, 1975, Acting Secretary John W. Barnum highlighted former Secretary Brinegar's instructions. The Task Force, in addition to dealing with some of the more specific problems that had been identified, was to concentrate on the more fundamental issues of organizational structure and management approach needed to cope with the "exponential" increase in the complexity of aviation through the '70's and beyond. The Task Force's objectives were (a) to consider and recommend any innovative changes or directions in the way the FAA performs its legislative safety missions, and (b) to suggest how such changes or directions might be implemented.

On subsequent occasions, Acting Secretary Barnum, and, later, newly appointed Secretary William T. Coleman, Jr., emphasized that the Task Force was to provide an independent and objective assessment of the FAA's approach to aviation safety and submit recommendations to the Secretary. The recommendations

received and accepted by the Secretary of Transportation would be directed to the Federal Aviation Administrator for implementation.

During the few weeks that the Task Force has been in existence, the members, individually and collectively, have been briefed on specific FAA and DOT organizational, management, and programmatic matters, conducted interviews with user groups, visited FAA facilities, reviewed numerous studies and reports, and deliberated on the various issues before them.

The report which follows, then, summarizes the discussions, conclusions and recommendations of the Secretary's Task Force on the FAA's safety mission. Follow-on studies, in certain cases, have been suggested to develop in-depth information for future decisions.



## CHAPTER I

SAFETY AND ORGANIZATIONAL EFFECTIVENESS

The Federal Aviation Administration is a very large and complex organization. It employs fifty-five thousand people, including highly skilled technical experts, and management, maintenance and support personnel. The range of its activities extends from sophisticated research studies, to exacting rule-making and certification procedures, to complex field operations -- including air traffic control, security and (in some cases complete) airport management services. These activities are dispersed geographically across the United States and (to a lesser degree) overseas.

It is indeed an awesome task for any one person or group to comprehend all of the functions and responsibilities of this organization, let alone to assess its effectiveness and to recommend improvements -- and to do all this in the space of a few weeks. Given these limitations and the wide scope of the Secretary's charge -- to assess the organizational effectiveness of the FAA -- the Task Force has approached its assignment recognizing the urgent need for further improvement of what is already an enviable record of safety.

Exposure to massive amounts of factual information and to a wide range of opinion, both from within and outside the FAA, has led the Task Force to the general conclusion that there are some realistic and practical steps which can be taken to further improve the effectiveness of the FAA as a public service organization dedicated to aviation safety.

In the main body of the Report, which follows this chapter, the most important areas of improvement and further study are outlined, with a brief comment accompanying each of the recommendations. The discussion of the problems and of the recommended courses of action is organized in two parts: (a) regulatory and operational issues (Chapter II), and (b) issues of FAA internal organization and management structure (Chapter III).

Cutting across all of these issues are some basic premises about the kind of organization the Task Force believes the FAA should be in order to fulfill its safety mission. These organizational imperatives for safety have guided the Task Force deliberations throughout and underlie the specific recommendations. They are:

- . Sensitive Response and Prompt Action
- . Independent Judgment and Regulatory Authority
- . Cooperation and Discipline
- . Technological Excellence

The Task Force does not wish to give the impression that the FAA has been negligent or lax in meeting the above needs. The Task Force wishes to emphasize their importance, however, in furthering the vitality and effectiveness of the FAA as an organization dedicated to the promotion and safety of aviation.

Each of the four areas are briefly discussed below:

A. Sensitive Response and Prompt Action

Some of the criticism that the Task Force has heard describe the FAA as a sluggish organization, bound by red tape and complicated procedures, with multi-layer approvals and long time intervals required for response to needed actions and services. Whether or not the specific criticisms are exaggerated, it is generally true that delays and insistence on cautious and formal procedures may not always work in the interest of safety. The relative advantages of uniform rules and practice (and the economy of effort and expense associated with standardization) should be balanced by the need to respond quickly and, on occasion, to deviate from ordinary practice (by providing redundant altitude information, for example) when special circumstances call for it. The sheer size of the FAA, as well as the nature of its exacting functions, places a high premium on both the need for flexibility and the need for standardization.

Above all, the Task Force believes that safety demands that all FAA divisions and personnel demonstrate a high level of sensitivity to the peculiar needs of each event and each situation. Furthermore, FAA operations should be characterized by a pervasive spirit of service demonstrated in every instance by prompt response and action in relations with all individuals and groups, who are elements of the complex aviation community. Although the record is good on the whole, there is room for improvement in this area, and some of the Task Force recommendations suggest means for such improvement.

B. Independent Judgment and Regulatory Authority

In setting standards and certification procedures, as well as in judging and monitoring the performance of air transport systems (including aircraft, operators, and traffic control hardware and programs) FAA must operate with independent judgment, free of undue influence from any private or public sources. There is some concern -- expressed both within and outside the FAA -- that undue interference from within the Office of the Secretary, or from interest groups related to the FAA and its functions -- such as industry or trade associations, or political groups -- may dilute FAA effectiveness or slow down and hamper its operation. The Task Force believes that the question of the

strategic location of the FAA within DOT and the optimum relationships and structure required to enhance the FAA's role and functions are very important factors for the achievement and maintenance of the best possible record of safety. Accordingly, recommendations were made where the Task Force felt that improvement or changes are needed in this area.

### C. Cooperation and Discipline

In meeting its dual objectives of promoting as well as regulating aviation, the FAA often finds itself in apparently conflicting circumstances. On one hand there is a need for a high degree of external cooperation with the aircraft industry, the carriers, the general aviation public, municipal authorities, and military aviation. On the other hand, there is a legal requirement for evaluative review and, sometimes, for disciplinary measures over these same components of the aviation system. The need to monitor and evaluate imposes a distant (or arm's length) relationship with other organizations; almost always, such a relationship carries with it an air of critical judgment and a fear of punitive action.

As a regulatory agency the FAA cannot escape the institutional role of judge and arbiter. It is most important for the sake of maximum safety, however, that there be full and continuous cooperation and inter-reliance between the FAA and the other organizations

involved in aviation, since joint supportive efforts are essential to complete all flying missions safely.

Recognizing that the record of cooperation between pilots and controllers has been very successful on the whole, the Task Force has sought to find those few areas where changes in the organization structure and the working practices of the FAA might further enhance cooperation and free flow of valuable technical and other information related to performance of aircraft and people, without compromising the statutory judgmental responsibilities of the FAA. It is important to note that both the FAA and the industries it monitors fully recognize that economic growth cannot take place without exemplary safety records. In this sense safety and promotion are not divergent concepts.

#### D. Technological Excellence

The safety of future air transportation systems will depend in a large measure on technology which is yet to be developed. Responsibility within the Government for research and development of advanced aeronautical technology resides with the DOD, NASA, and FAA, with the FAA role being generally confined to air traffic control and related communications equipment. The R&D programs of these groups and agencies must be well coordinated to preclude unnecessary duplication of effort.

The FAA advanced technology program has been characterized as relatively immediate or short term in nature. This is probably the result of intense operational pressures combined with an absence of personnel, equipment, and funding for long-range research. The Task Force would like to see this effort strengthened and has made recommendations accordingly. More broadly, it is the view of the Task Force that a top-level (albeit limited in size) in-house research capability is necessary for the health and viability of an organization such as the FAA, which operates in an environment of rapidly developing and highly sophisticated technical systems.

## CHAPTER II

### REGULATORY AND OPERATIONAL ISSUES

Recent accidents and certain Congressional and GAO reports have raised a number of issues which the Task Force examined to determine what improvements, if any, should be implemented in the present regulatory and operational programs of the FAA.

This section of the Report is devoted to such improvement opportunities in the areas of certification of aircraft and operators, the responsiveness of the FAA and the promptness with which corrective action is taken, rulemaking and the enforcement of compliance with regulations, the monitoring of performance and the design and operation of air traffic control, with its complex man-machine relationships.

#### A. No-Fault Reporting of Near Accidents

Mistakes can be very effective means of learning. Pilots and controllers, however, are often reluctant to confess that they have made any errors or had any close calls.

The recently instituted no-fault incident reporting system for pilots and controllers will encourage full and detailed accounts of all potentially serious deviations from established procedure.



### RECOMMENDATION #1:

The Task Force commends the FAA for reinstituting and expanding the no-fault report policy and recommends that the record of incidents be available to serve for subsequent review, evaluation, and improvement of safety.

#### B. Delegation of Safety Responsibilities

The Federal Aviation Act of 1958 authorized the FAA Administrator to delegate to qualified private persons - under proper Federal supervision - the examination, inspection and testing related to the certification of aircraft, airmen, and air carrier operations. The overall safety record and U. S. dominance of the world aircraft market speak for the success of the present system including the principle of delegation.

The system as it now exists, however, can and must be strengthened. The complexity of the newer generations of aircraft, the continuing demand for greater operational capability -- coupled with a relatively fixed level of FAA personnel capable of adequately monitoring safety requirements -- demand a continuing improvement of present monitoring and inspection functions. Supplementary Type Certification and Parts Manufacturing Authorities granted by the FAA should meet the same high airworthiness standards as original equipment.

In its August 1974 report, "Review of Flight Standards Service Regulatory Programs," to the Secretary of DOT, FAA recognized the need for increased delegation to cope with expanding inspection requirements. FAA proposed that the burden of responsibility for assuring day-to-day compliance with Federal Air Regulations should be shifted to a greater extent to industry. Therefore, FAA, in order to maximize the use of its qualified personnel, would change its surveillance role from "one-to-one" inspections to that of a "monitoring system" employing improved sampling techniques. This is a sound approach to the problem of assuring a comprehensive safety review system, in the face of growing inspection requirements and limited FAA personnel.

RECOMMENDATION #2:

In order to keep up with increasing demands of aircraft certification, and the inspection of aircraft manufacturers and air carriers, FAA must continue to place increasing reliance on the role of industry in the safety compliance inspection process. However, FAA must strengthen its technical staff and its ability to monitor the effectiveness of delegated functions, and must assure strict monitoring of all designated representatives' performance.

### C. Aircraft Design Reviews

FAA is responsible for minimizing the possibility of aircraft design defects which may lead to subsequent accidents. There is, therefore, a need for complete and comprehensive technical reviews of new types of aircraft design, during the process of their certification. In addition, major new versions of previously certified aircraft must be analyzed with the same thoroughness. At the present time such reviews are accomplished by the FAA regional certification personnel, supported by designated representatives on a case-by-case and element-by-element basis - sometimes without the benefit of an overall system review such as would be provided by formal "Design Reviews." Formal reviews, as utilized successfully in military and space programs, provide the necessary overall system examination of both prime and subcontractor designs, trade-offs of design alternatives, and the justification for design decisions. Design Reviews should begin early in the design process and should establish any special conditions that must be met in addition to existing airworthiness standards.

### RECOMMENDATION #3:

FAA should require more comprehensive and systematic "Design Reviews" as a necessary step in the certification of major aircraft and engine developments, including major subsequent changes.

#### D. Realignment of FAA/NTSB Responsibilities

The National Transportation Safety Board (NTSB) is responsible for investigating aviation accidents, determining the probable causes thereof, and making recommendations which will tend to prevent accidents. In making recommendations, the Board often develops specific technical solutions to remedy the cause of each accident; the solutions are then submitted to FAA as recommendations for implementation. These recommendations are developed by the NTSB Bureau of Aviation Safety which has limited technical staff. Each recommendation should be judged on its own merits. But the FAA, possessing a greater technical capability, is probably better equipped to develop the specific technical solutions, in part because of its access to the technical community through certification and operation activities. In addition, NTSB recommendations are made solely from a safety viewpoint, without considering alternative solutions which are equally effective from a safety standpoint, but which also take into account economic factors.

RECOMMENDATION #4:

The National Transportation Safety Board (NTSB) as an independent agency, does and should continue to make strong recommendations to the FAA, but it should be FAA's role to develop detailed technical solutions to safety problems. FAA should conduct post-audits, in cooperation with the NTSB, to assure prompt and timely pursuit of recommended solutions.

E. Expedite Rulemaking

The present FAA rulemaking process is cumbersome and burdened with delays in excess of those envisioned by the Administrative Procedures Act, under which new Federal Air Regulations or changes are issued. Many of these delays in the rulemaking process are attributed to excessive time spent on legal reviews. The final regulations are written in complex legal language, which is confusing to the general user of such rules and which complicates their technical interpretation and implementation. (The GAO report entitled, "Improved Procedures Needed for Implementing Safety Recommendations," dated March 6, 1975, confirmed these problems.) A further problem in the rulemaking process is the lack of a priority system for expediting rules relative to critical safety problems.

RECOMMENDATION #5:

FAA must expedite the rulemaking process in accordance with a priority system. Special emphasis must be given to improving the clarity of rules and the timeliness of their legal review.

F. General Aviation Pilot Proficiency

Because a majority of aviation accidents involve pilot error, it is important to examine periodically the adequacy of initial and recurrent pilot training. Last year the FAA upgraded its requirements for initial training of general-aviation pilots, flight schools, and instructors. This year it will conduct its first Biennial Operations Review to include the regulations under which these pilots fly. The FAA also instituted last year a requirement that all general-aviation pilots have biennial flight reviews conducted at the discretion of a certified instructor/examiner. These reviews should assure that all general-aviation pilots achieve uniform standards of proficiency within their ratings.

The recent requirement for Biennial Flight Reviews for general-aviation pilots is a positive development, but the record-keeping part of this process is not up to modern standards. The centralized maintenance of medical examination records at the FAA data bank in Oklahoma City may serve as a model for improvement in this area.

RECOMMENDATION #6:

FAA must develop more specific guidelines for the conduct and content of biennial flight reviews in consultation with the general aviation community, and should consider centralizing compliance records.

### G. Aircraft and Crew Performance and Monitoring

Over the years, impressive improvements have been made in flying safety, as equipment on the ground and in the air becomes ever more sophisticated and reliable. People, on the other hand, have not changed. In fact, as the equipment improves, it appears that the operator of it tends to become complacent to the point that today human beings may be the weak links in the safety chain.

Controllers can be supervised in a number of ways, including physically looking over their shoulders, but pilots (except in the cases of infrequent check rides) are "alone" in their cockpits. To be effective, cockpit performance review must come from the pilots themselves; it cannot be legislated or enforced by remote control, at least not with the present on-board instrumentation. Check rides, by FAA or company personnel, are no substitute for knowing what is going on in the cockpit on a flight-by-flight basis. A flight data monitoring system (such as a cockpit recorder) is one solution to this problem. However, pilot hostility and resistance to such equipment is certain, unless the pilot perceives it to be in his or her own best interest. The pilots and the operators should be active participants in the

implementation of such monitoring with the incentive of maintaining the highest standards of professionalism on the part of all flight crews.

RECOMMENDATION #7:

FAA should require the use of flight data monitoring systems (such as cockpit recording devices) which measure those flight activities and parameters determining the quality of crew and aircraft performance. Such devices should be evaluated on an experimental basis, without threat of legal or disciplinary action, and with the full participation and cooperation of both flight crews and airline operators.

H. Crew Performance Standardization and Flight Checking

Crew performance standardization needs improvement.

Pilots of the same airline operating over the same routes change their routine considerably as they are assigned to different crews. Pre-flight briefings vary; use of checklists varies; altitude call outs vary; the division of labor between captain and co-pilot varies. The Task Force feels that there is need for greater standardization of performance.

Airline pilots apparently do not have a great deal of respect for the procedure by which FAA pilots give them flight checks. A major portion of the problem seems to be that some of the required in-flight maneuvers and emergency procedures are either hazardous in themselves, or are



unrealistic and sometimes irrelevant to airline operations.

The FAA should survey the airline industry to find out whether simulators are being used to their full potential.

Dangerous maneuvers should be shifted from actual flight checks to simulator demonstrations. The FAA should check the adequacy of each airlines' annual simulator time requirements for its pilots.

A key step in achieving a satisfactory level of cockpit performance is to make sure that each crew member knows precisely what is expected of him, under all normal and emergency conditions. Motivation must come from the pilots themselves. There is no practical way to enforce alertness. Adding more check flights would be useless, since pilots would stay alert while they are being checked. The dangers of boredom and complacency must be made apparent to each individual pilot by a continuing training program. To the maximum extent possible, this education process should be designed and conducted by the pilots themselves, through groups such as the Airline Pilots Association (ALPA). The FAA can assist by making available timely and interesting

training material, especially material relating to recent accidents or incidents in which crew performance (good or bad) has been a factor.

RECOMMENDATIONS #8 and #9:

FAA must expand cooperative programs involving pilot associations and air carriers to standardize and improve crew performance.

FAA should revise its flight check program to reflect normal and emergency operations more realistically. This program should be carried out by air carrier management check pilots under FAA surveillance.

I. Man-Machine System Cockpit Design

Air crews at times become bored, complacent, and inattentive. Modern cockpit layouts, improved aircraft handling qualities, and simple, reliable systems all seem to contribute to this problem. Warning devices "cry wolf" often enough that their valid function may tend to be ignored. Accident boards, having discovered that "pilot error" caused an accident, tend to stop there, but this finding usually does not provide a solution to the problem. In fact, the overall man-machine system needs to be re-examined and better understood. Are pilots being given too much to do during some flight phases, and not enough during others? Do pilots have too much information, or not enough? Do they have information in the

right form and at the right time? Are the other components of the system (the cockpit instruments, plus the information from the ground) helpful or harmful to them in their decision-making process? The DOD and NASA are currently sponsoring such research and their efforts could serve as a base from which an expanded program under FAA leadership should be developed.

RECOMMENDATION #10:

FAA must undertake a major safety research program to assure that future aircraft designs make optimum use of crew capabilities, and to ensure that future systems are designed around reasonable criteria for human error.

J. Joint Review of ATC Practices

Communications must be improved between the FAA and its "customers," especially the pilots. Pilots tend to feel that they are the only ones in command of all the facts necessary to make in-flight decisions. FAA sometimes appears to think it "owns the sky and those who fly in it." This atmosphere is not conducive to the lowering of barriers between the two groups. While an adversary relationship may be acceptable, or even desirable in some phases of FAA's operation, it is the worst possible type of pilot-controller interface. Mutual trust is mandatory, and must

be nurtured wherever possible, by meetings, literature, immunity programs, or whatever else it takes.

There is also apparent confusion in the minds of many pilots, military and civilian, and controllers, with regard to current operating procedures and practices. On-board documentation, such as instrument approach charts, for example, come in several different versions, and differ from the documentation on the ground. It is possible, for example, that a conversation between a military and a civilian pilot and a controller concerning a particular instrument approach might find each of them referring to different documents. Fundamental communications barriers between the FAA and its customers need to be removed, for safety's sake.

Further, the more popular airports are at times saturated with traffic, resulting in departure and arrival delays which cost valuable fuel and time. The future Air Traffic Control System must be able to accommodate expected growth without compromising safety, or inhibiting the efficient flow of aircraft, large or small, in good or bad weather.

RECOMMENDATION #11:

FAA must establish a standing group composed of air carrier, controller, general aviation, military and pilot representatives to review air traffic control procedures and practices. The goals of this review should include more standardization, less ambiguity, and a general clarification and upgrading of terminology and procedures.

K. Use of Supplemental Ground Information

Past improvements in the Air Traffic Control system directed toward prevention of mid-air collisions have been very effective. The focus should now shift to an all-out effort to prevent collisions with the ground. Safety can probably be improved by greater controller participation in providing information related to terrain avoidance procedures. Such information, when provided to the pilot, would not replace his primary responsibility, but the controllers should assume a secondary responsibility to provide information which would prevent collisions with the ground. Information to be supplied, and the procedures for supplying it, should be carefully defined. Some information, such as the alpha numerics altitude data on the radar scopes, must be provided directly by voice. Further, any restrictions which legal considerations impose on controllers' volunteering of helpful supplemental information should be reviewed.

RECOMMENDATION #12:

FAA must use all the information available to it to enhance the overall awareness of where each airplane in positive controlled airspace is, not only in the horizontal, but also in the vertical plane. A study should also be made of the extent and accuracy of supplementary information that could be made available to the pilot before and during a flight, under visual or instrument flight rules.

### CHAPTER III

#### ORGANIZATIONAL ISSUES

The breadth of activities within the FAA, and the unique character of the problems with which it must deal, require a wide span of technological and operational expertise. To succeed in all of its missions, including safety, the FAA must be organized in ways which maximize the opportunities for its highly skilled people to do their job. It is important to review here the major functions of the FAA before discussing the Task Force's approach to various organizational issues and concepts (the FAA organization chart appears in Appendix C).

The principal safety-related functions, which the FAA is organized to fulfill, may be summarized as follows:

1. Certify the design and proper manufacture of all aircraft, engines, and equipment which are flown within the United States.
2. Certify the training and maintenance of proficiency by the crews who must operate such equipment.
3. Certify that the airlines maintain the aircraft, utilize the airways and monitor operating personnel so that the safety inherent in the equipment is achieved.

4. Certify that the airports which receive and embark the aircraft are adequately equipped and maintained.
5. Operate a traffic environment which permits efficient traffic flow without jeopardizing the safety of crews and passengers. This in turn requires creating (designing and procuring) the traffic control system and certifying its adequacy; managing and maintaining the system; and certifying the individual operators and their continuing capability.

In addition to these basic responsibilities, the FAA must be continuously aware and take advantage of the introduction of new ideas by an expanding aviation industry. FAA personnel must not only maintain technical competence but should actually lead developments in the direction of maximum safety.

In this section of the Report, recommendations deal with ways by which the organization of the FAA may be improved to better serve these basic safety functions.

The Task Force is concerned by the fact that the FAA performs both regulatory and operating functions. On one hand, FAA sets the standards and polices conformity to those standards for the design and manufacture of aircraft and related equipment. Such regulatory



functions require not only a cold, hard, evaluative stance on safety matters, but a very high level of specialized technical proficiency. On the other hand, FAA also performs widespread and complex day-to-day operating functions, of which air traffic control is the most important example. Unlike the evaluative posture in certification, air safety in traffic control is best served by a close, cooperative relationship with pilots and the rest of the aviation community, and, incidentally, by completely different technical skills. The Task Force feels that effective performance of each of FAA's major functions may, over the long run, demand not only different but also separate organizational structures. The recommendations suggest some initial steps in these directions.

Another concern is with the degree of regional decentralization of FAA. There are good reasons for allocating a great deal of authority to the regions, and good reasons against. But these reasons interact with the different functions of the FAA, as discussed above. Moreover, FAA's present regionalization raises an issue of the optimum number as well as the quality. How many regions and why?

A third basic internal issue involves the technical and managerial quality of FAA people. FAA needs to be at least as

technically advanced and managerially progressive as the organizations it both serves and regulates. Powerful self renewal and self improvement mechanisms must exist or be built into the FAA organization.

Another important organizational issue centers on the reasonableness (or unreasonableness) of the present headquarters structure of FAA. It is the impression of the Task Force that the Washington offices of the FAA have become more and more complex, perhaps in response to an ever more differentiated environment. But the headquarters growth has produced new problems. The entire headquarters structure is in need of a thorough review.

A final concern has to do with the location of the FAA within the Department of Transportation (DOT) and the organizational interactions with the Office of the Secretary.

One of the easiest and least useful things for an external group to recommend is structural reorganization. Most effective reorganizations are internally, not externally, generated. Therefore, although the Task Force opinions about the strengths and weaknesses of the existing FAA organization structure are quite clear, the recommendations are designed to leave room for sensible and appropriate implementation from within.

A. Relationship Within DOT

FAA was placed within DOT in recognition of the fact that a unified intermodal transportation system is in the national interest. The intermodal concept remains valid today. This organizational arrangement, however, has not worked as well as its architects had hoped. Conflicts between the Office of the Secretary and FAA exist, both real and perceived, and these conflicts appear to have hampered the effectiveness of the FAA.

The Secretary of Transportation should play a major role in the selection of an FAA Administrator, who should be of high technical and managerial competence. Once the Administrator is selected, the Secretary should provide broad policy guidelines to the FAA, and should be involved in major policy decisions. He should delegate responsibility for the day-to-day operation of the FAA to its Administrator. The unique problems of aviation safety should be better understood and supported by the Secretary of Transportation, and the FAA Administrator should serve as his principal advisor for aviation matters of the type assigned to the FAA by statute.

The Task Force also believes that it would be important for the FAA leadership to emphasize the FAA's role in the development of a balanced national transportation system and to foster good working relationships among all agencies within DOT.

RECOMMENDATION #13:

FAA is and should continue to be a part of DOT. However, FAA does not need and should not receive undue supervision and control by the Office of the Secretary. The Secretary of Transportation should select an FAA Administrator of high managerial and technical competence to whom he can confidently delegate the large and complex task of administering the FAA within broad policy guidelines from the Office of the Secretary. The FAA Administrator should emphasize FAA's role in the development of a balanced national transportation system and foster good working relationships within DOT. Such a streamlined relationship must be achieved, if the FAA is to function effectively within DOT.

B. Engineering and Manufacturing and Air Carrier Inspection Functions

The engineering and manufacturing (E&M) functions of FAA, as related to the certification of aircraft, have proven to be effective during a period of significant growth in aviation. There are some problems, however, arising from the increasing complexity of aircraft being produced today, the scarcity of top-flight technical talent in FAA, the inconsistency of interpretation of certification standards between regions, the alleged practice of manufacturers shopping

around the regions for the "best deal", and the need to strengthen FAA's ability to decide "close calls" on certification issues. The Task Force believes that the FAA E&M organization should be strengthened to assure a more effective performance of the certification functions. This issue was the subject of an August 1974 FAA Report which concluded that some of the functions should be consolidated across regional lines.

The reasons, cited above, concerning the E&M function also pertain to the air carrier inspection function and this area also needs to be re-examined.

RECOMMENDATION #14:

The Engineering and Manufacturing functions related to aircraft certification should not report to each of the Regional Directors, but should be consolidated within one or more technical field centers. These centers would constitute the engineering strength of the FAA in an environment conducive to the professional growth of FAA's field engineering staff. Such centers should report to FAA Headquarters at a level just below the Administrator. Similar arrangements should be considered for the air carrier inspection function.

C. FAA Headquarters Organization

FAA headquarters organization has undergone many major changes during the last several years. The number of organizational elements has proliferated over time owing

to transient pressures which may have been justified in each case. The present organization, however, appears to be large and unwieldy and may serve as a detriment to FAA's performance of its safety mission.

RECOMMENDATION #15:

An intensive review should be conducted of FAA's Headquarters organization with the objectives of (a) reducing the number of elements which report to the Administrator, and (b) having those elements which do report to the Administrator correspond to the major functions of FAA.

D. FAA Regional Organization

The present FAA regional organization consists of 12 regions. Nine of these are in the 48 states, with the other three being in Alaska, Hawaii and Europe. The nine regions cover the 10 Federal regions (Regions two and three are combined) which were created by the President in 1969.

FAA must examine its basic functions and reassess its regional talent distribution. The advantages of quick response by delegating authority to centers near the customers must be retained. The functional tie to the FAA central organization can be improved, however, without losing "regional" advantages.

The Task Force believes that the program of regional decentralization of certain operational activities, such as

air traffic control, aviation security and systems maintenance, should continue so as to locate decision-making close to the scene of action where responsible officials are familiar with local conditions. A smaller number of regions, however, may improve FAA effectiveness and efficiency. The ATC function should be the prime determinant of reorganization since it is by far the largest single activity of FAA. The reporting level of the restructured regions should be examined.

RECOMMENDATION #16:

A study should be conducted of the FAA regional organization aimed at a reduction in the number of regions and a consolidation of functions determined by program requirements, notably those of air traffic control, which should be managed separately from FAA regulatory functions.

E. Personnel Development and Education

FAA needs to maintain a steady supply of skilled and competent technical and managerial personnel. The FAA staff needs to be at least as technically proficient and managerially progressive as the organizations it serves and regulates. FAA may soon face a crisis as the wave of World War II personnel pass out of the organization.

RECOMMENDATION #17:

FAA should upgrade its personnel planning and management development programs so as to maintain a highly skilled and competent work force for the future.

## F. Advanced Technology

As discussed in Chapter I of this Report, the FAA advanced technology program has been characterized as relatively immediate or short term in nature. This is probably the result of intense operational pressures combined with an absence of personnel, equipment, and funding for long range research. The Task Force would like to see this effort strengthened. The existence of a strong and supportive Office of Systems Development and Technology within the Office of the Secretary of Transportation will be instrumental in strengthening the FAA's advanced technology program.

Some specific items deserving attention within an expanded program are:

- . ATC system for the years 2000+, a system whose basic character and technology may be quite different from evolutionary derivatives of the present system.
- . Aircraft flight control systems for precision 4 dimensional flight paths under all weather conditions.



- . The man/machine interface and cockpits of the future.
- . Advanced hazard detection and warning.

The following steps should be considered:

- . Creation of an Advanced Technology Office within the FAA with the charter to plan and implement long range R&D programs in support of the FAA mission.
- . Establishment of a Technology Advisory Board of outside experts from Government, industry, and universities to advise the FAA on its future technology needs.
- . Development of effective working relationships with the research laboratories of NASA, DOD the DOT Transportation Systems Center, and industry to complement the current FAA capabilities and to assist in the conduct or direction of FAA sponsored research programs when requested by the FAA to do so.
- . An increase in the FAA R&D budget for long range research.

RECOMMENDATIONS #18 and #19:

To meet the needs of future air transport systems, FAA must strengthen its program of long-range research and development and assure that the efforts of such R&D are brought on stream. To strengthen R&D, the FAA should utilize and coordinate with other technical elements of DOT, work closely with the laboratories of NASA and DOD, and draw upon the capabilities of both industrial and university researchers.

FAA should establish one or more technical advisory committees composed of experts from government, industry and universities to advise on the adequacy of current FAA technical programs and the direction future developments should take.

## APPENDICES

BIOGRAPHICAL INFORMATION  
ON  
TASK FORCE MEMBERS

Dr. WARREN G. BENNIS -- President, University of Cincinnati,  
University Professor, Antioch College, A.B., 1951; London School  
of Economics, Honors Certificate, 1952; Massachusetts Institute  
of Technology (Social Sciences and Economics, Ph.D., 1955).

Dr. Bennis has taught psychology and management at various schools.  
At the Massachusetts Institute of Technology, he was Professor of  
Organizational and Management Psychology and Chairman of the  
Organization Studies Group of the Alfred P. Sloan School of Manage-  
ment.

Dr. Bennis was also the Project Director of MIT's Indian Institute of  
Management in Calcutta. He has taught at Harvard, the University  
of California, the University of Southern California, and Boston  
University. In 1967 he was named Provost of Social Sciences at the  
State University of New York at Buffalo and later became Buffalo's  
Vice President for Academic Development. He is a consulting  
editor of nine academic journals and serves on the boards of several  
educational organizations including the National Commission for  
Cooperative Education and the American Musical Scholarship Association.

MICHAEL COLLINS -- Director, National Air and Space Museum; United States Military Academy, B.S., 1952. Prior to this he served as Assistant Secretary of State for Public Affairs.

Mr. Collins served as an experimental flight test officer at the Air Force Flight Test Center, Edwards Air Force Base, California. He was one of the third group of astronauts named by NASA in 1963. His first mission was that of pilot on the three-day Gemini 10, launched July 18, 1966. Mr. Collins second space mission was that of a Command Module Pilot during the historic Apollo 11 flight launched July 16, 1969. He is a Brigadier General in the Air Force Reserve.

Mr. Collins has received the Presidential Medal of Freedom, the Air Force Distinguished Service Medal and Flying Cross, Air Force Command Pilot Astronaut Wings, NASA Distinguished and Exceptional Service Medals. He is the recipient of the Hubbard Medal, the Collier Trophy, the Harmon Trophy, the General Thomas D. White USAF Space Trophy. Honorary degrees: Doctor of Science, Northeastern University; Doctor of Science, Stonehill College; Doctor of Laws, St. Michael's College.

EDGAR M. CORTRIGHT -- Director, NASA, Langley Research Center. Rensselaer Polytechnic Institute, B.S., 1947; M.S. in Aeronautical Engineering in 1949; George Washington University, honorary doctorate May 1973.

Internationally recognized authority on propulsion aerodynamics through his early work as an aeronautical research scientist at NASA's Lewis Research Center (1948-1958). Served on the team that developed the program plans and operating concepts for the national space agency (NASA) in 1958. Subsequently chosen to be Chief of Advanced Technology in NASA Headquarters and later, Assistant Director for lunar and planetary programs in the Office of Space Flight Programs. As Deputy Director of the Office of Space Sciences and Deputy Associate Administrator for Space Science and Applications, he served as general manager for NASA's unmanned space programs. Prior to his current assignment, he held the position of Deputy Associate Administrator, Office of Manned Space Flight and he chaired the Apollo 13 accident review board.

President-elect of the American Institute of Aeronautics and Astronautics. Member of the National Academy of Engineering; Fellow of the AIAA and the American Astronautical Society. Author of many technical reports and articles, and editor of the book "Exploring Space With a Camera."

WILLIS M. HAWKINS -- Aviation Consultant, retired Senior Vice President of Science and Engineering, Lockheed Aircraft Corp. (1974). B.S. Aeronautical Eng., Univ. of Michigan 1937; Hon. Dr. Science, Univ. of Michigan; Hon. Dr. Science, Illinois College, Employed by Grumman Engineering 1936 Pre Engineering Training and Lockheed Aircraft Corp. 1937-1974 (except three years service as Assistant Secretary, U.S. Army R&D 1963-66). During Lockheed career, served primarily in aircraft design and technical management, including mechanical-structural design, aerodynamic testing and advanced design of Fighter and Transport Aircraft as well as Missiles and Space Systems. In 1953, as one of the founders of the Lockheed Missile Systems Division, he became Director of Engineering; advancing through management to become Vice President and General Manager of the Space Division. In 1962, Hawkins became Corporate Vice President of Engineering with technical responsibilities for all of Lockheed's divisions. After serving the Army he returned to Lockheed to become Senior Vice President Science and Engineering and a Corporate Director (1972). He now serves as a Senior Consultant and as a Director. Hawkins has been awarded both the Army and Navy Distinguished Service Medals, is a member of the National Academy of Engineering and has served as Chairman of the Aeronautics and Space Engineering Board. He is an active pilot and holds multi-engine, instrument, and helicopter ratings.



Dr. HAROLD J. LEAVITT -- Walter Kenneth Kilpatrick Professor of Organizational Behavior and Psychology, Graduate School of Business, Stanford University, Stanford, California. B.A., Harvard College, 1943; B.S., Brown University, 1944; Ph.D. (Industrial Relations) MIT, 1949. Assistant Professor, Rensselaer Polytechnic Institute, 1949-50; Associate Professor, University of Chicago, 1954-58; Professor, Carnegie Institute of Technology, 1958-66; Professor, Graduate School of Business, Stanford University, 1967 - Present.

Vice President, Njelski & Co., 1949-54. Consultant, European Productivity Agency, 1956. Principal, Management Analysis Center, Inc., 1970 - Present. Consultant, Ford Foundation. Past Vice President, Institute of Management Sciences, 1959-1963. Past Board Member, National Training Laboratories, Adviser, 1970 - Present. Author - Managerial Psychology (3 editions, 9 languages). Co-author - The Organizational World, 1975.

CONSTANTINE B. SIMONIDES -- Vice President, Massachusetts  
Institute of Technology. A.B. in economics, Boston University,  
1958; M.B.A. management, Harvard University, 1960.

Mr. Simonides has served in various capacities in the M.I.T.  
administration since 1960. His professional field is organization  
and he serves as a consultant to several educational, government,  
community and business organizations.

GEORGE A. WARDE -- Consultant and former President of American Airlines began his career with American Airlines, Inc., in 1940 as an apprentice mechanic at the newly opened LaGuardia Airport. He progressed to a variety of technical and managerial positions with American Export Airlines covering their trans-Atlantic and European operations. In 1950, he went to work for Pan American World Airways as Superintendent of Line Maintenance. While based both in New York and San Francisco he was responsible for first the European and later the South Pacific areas of Pan American's operating and maintenance departments. He returned to American Airlines in 1960 where he was responsible for the entire domestic systemwide maintenance. He was appointed Senior Vice President Operations in 1968, which added the Flight Department and other functions to his responsibilities. Within a few short years, he became Executive Vice President and General Manager and, in 1972, President and Chief Operating Officer of American Airlines. Since 1974 he has been doing consulting work.

Mr. Warde attended both the University of Alabama and Hofstra College in New York. He is a member of the Board of Directors of Airbus Industrie North America, the National Bank of Tulsa and the National Cowboy Hall of Fame located in Oklahoma City. He is also a member of the Board of Regents of Texas Lutheran College, in Seguin, and Tulsa Junior College.

LOUIS B. YOUNG -- Aviation Consultant. Marietta College, A. B., 1941; University of Illinois, M. S. Physics, 1942. During WWII, Section Chief at MIT Radiation Laboratory engaged in radar development. Employed by the Mead Corporation 1946-51 and engaged in research and development in the paper industry. Joined University of Michigan Willow Run Research Center in 1951 to become Assistant Chief Project Engineer for guided missile developments and air defense systems. Later, Head of Systems for Project Michigan related to battlefield surveillance. Joined Bendix Corporation systems planning staff in 1954, and subsequently became General Manager of Bendix Systems Division. Elected Vice President of Aerospace Marketing in 1966 responsible for planning, contracts, sales, and product support. In recent years represented corporate interests in civil aviation; Chairman of General Aviation Manufacturers Association during 1973. Is a commercial, instrument-rated pilot. Retired from Bendix in early 1975.



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

February 7, 1975

Dear Task Force Member:

Former Secretary Brinegar's press release on our Task Force stated our mission as follows:

"The Task Force will examine the FAA's overall organizational structure and management approach, including its use of delegations, in carrying out its legislative safety mission. It will also examine the relationship of the safety mission to the FAA's other missions. Attention will be paid to the safety issues raised in these two recent reports:

1. Report on Actions to Redirect the Flight Standards Regulation Mission, Functions, and Activities, FAA Flight Standards Task Force, August 1974.
2. Report by the Special Committee on Investigations of the Committee on Interstate and Foreign Commerce, titled "Air Safety: Selected Review of FAA Performance," December 1974.

At the end of 60 days the Task Force will submit a report to the Secretary of Transportation. This report should include (1) near-term recommendations for action and (2) recommendations covering areas that require further analysis and study."

The press release and two cited reports have been furnished to you in a separate mailing. I believe the two reports contain issues with both short- and long-term implications for us to consider.

With respect to the specific recommendations of the Congressional Report of the Special Committee on Investigations (Staggers Report), I have asked the FAA to provide the Task Force members with a concise statement and brief analysis of each issue raised, as well as the status of any remedial action the FAA has, or is taking. I believe this will help us formulate some of our near-term recommendations for action

and allow us to concentrate on some of the more fundamental issues of organizational structure and management approach needed to cope with the "exponential" increase in the complexity of aviation as we move through the '70's and beyond.

We see the Task Force's major objectives to be to consider (1) whether any innovative changes or directions can be recommended in the way the FAA performs its missions, including safety, and if so, (2) how such changes or directions might be implemented. In this respect, would you give some thought to general questions such as the following:

- . What is your assessment of the present FAA organizational structure and management approach to its various missions?
- . To what extent should the ultimate responsibility for aviation safety continue to rest with industry, with the FAA charged only with assuring that minimum safety standards are met?
- . What different roles could aircraft operators and manufacturers play in achieving the highest possible levels of aviation safety?
- . How should the FAA respond organizationally to the increasing importance of foreign manufactured aircraft in the air transportation system?
- . How should the FAA provide the necessary leadership for the '70's and beyond, yet manage a vast domestic and international aviation operation?

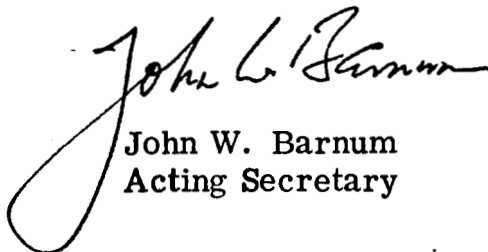
As one possible starting point, and to narrow the focus of our initial discussions, the items listed below give a rough indication of the types of issues that have surfaced in recent meetings on the FAA safety mission:

- . FAA Headquarters/Field organization and relationships
- . Office of Flight Standards organization and role
- . Aircraft certification -- philosophy and process
- . Safety rulemaking process
- . Cockpit discipline

At our meeting scheduled for February 10 in Washington, I have asked the FAA to brief us on their organization and mission, with specific emphasis on the entire process of handling key safety issues. There will be ample time set aside for questions and answers and for round-table discussion.

If you have any other suggestions, please let me know.

Sincerely,

A handwritten signature in cursive script, reading "John W. Barnum". The signature is written in dark ink and is positioned above the printed name and title.

John W. Barnum  
Acting Secretary

**DEPARTMENT OF TRANSPORTATION**  
FEDERAL AVIATION ADMINISTRATION

