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STATEMENT OF WILLIAM F. MCKEE, ADMINISTRATOR, FEDERAL AVIATION AGENCY, BEFORE THE SENATE COMMITTEE ON AERONAUTICAL AND SPACE SCIENCES, ON JANUARY 26, 1967.

Mr. Chairman and Members of the Committee:

I am William F. McKee, Administrator of the Federal Aviation Agency. I am pleased, in response to your invitation, to be with you today to consider the questions and problem areas in the formulation of aeronautical research and development policy.

In the context that I will use it, the term "aeronautical R&D" encompasses the full range of aeronautics, including the aircraft, the airport, the air traffic control and navigation system and the aviation weather system.

We are not satisfied with the status of our civil aeronautical system. The problems are developing faster than we are able to develop solutions for them. The problem of aircraft noise, for example, is one which will undoubtedly get worse before it gets better. We are still exploring to determine what is the best combination of solutions to that problem and the role that the federal government will play in the overall solution. The problem of airport congestion, delay and access are also becoming more acute.

I am pleased to follow Secretary Boyd this morning. The Department of Transportation will offer a new mechanism through which aviation, and interrelated problems which are not basically aviation

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problems but which bear on aviation progress, will be considered as a whole fabric. Through the efforts of the Department a new direction in transportation planning will develop utilizing the application of systems analysis techniques. This will provide government and industry planners with new insights as to the areas requiring more research and development.

At FAA, we have already been at work on an aeronautical subsystem viewed as a "system". We call it the National Airspace System and it contains a series of subsystems such as air traffic control, weather and airports. The "system" development is planned and managed by a central manager, thus insuring that each component develops as a system component rather than as an independent unit. This is not a new idea, but is new to civil aviation planning, and we think the concept will result in the best possible airspace system to be fit, in turn, into the transportation system as a whole. R&D money, whether government or industry money, will be most wisely spent to meet needs identified through the systems analysis method.

Turning to some of the more specific questions raised in the Staff Report on Policy Planning for Aeronautical Research and Development, I would like to discuss for a moment the question of what kind of foreign competition in aeronautical development can we expect and what our reaction to it ought to be.

There is developing major overseas competition for U.S. manufacturers in all classes of subsonic and supersonic aircraft. Especially significant

work is being done in Europe on the SST (the Concorde), VSTOL and air cushion vehicle development. We consider this competition healthy. European economies will benefit from it and we will be the beneficiaries of some of the vehicle development work being done.

But while we should not expect to dominate every market, we believe that the United States must continue as a world aviation leader because of the importance of a strong aviation industry to our economy and because of national defense requirements.

Moving to another question: What is the proper role for FAA in aeronautics development? FAA now has the responsibility for developing and operating systems for safe and efficient navigation and traffic control of both civil and military aviation, with DOD retaining responsibility for development of systems peculiar to needs of warfare.

The present air traffic control and navigation system, developed by the FAA and its predecessor organizations, has been quite effective. Major elements of this system have been adopted internationally. The rapid increase in all elements of air transportation requires continual improvement of this navigation and air traffic control system. Programs in progress include the integration of information, through the use of computers in air traffic control centers, to assure more efficient radar displays for the more effective and safe movement of aircraft; development of an all-weather landing system to assure more safe aircraft operation even in inclement weather; the study of traffic control of the civil SST and

supersonic military aircraft which will result in the development of control concepts and equipment necessary to assure safe operations.

We will continue to identify the needs of the system we are expected to operate and to assure that adequate R&D is done to provide us the components we need in the system. We at FAA are development, test, evaluation and application engineering specialists rather than researchers in the pure sense. So we will look to NASA and the DOD for research and test results that are useable in the developmental programs that FAA will engage in to meet mission requirements.

An excellent example of interagency cooperation and technological handoff between research and development is the civil SST program. Research and flight test by NASA on supersonic aircraft, and application of this information by the Department of Defense to military aircraft showed the possibility for commercial supersonic aircraft. The FAA has pulled together the government/industry team that is developing the SST. NASA is continuing to use its broad competence in aeronautical research and technology to support the SST program and to examine future SST concepts.

We will continue to provide NASA with our views as to what R&D may profitably be undertaken in all aspects of the aeronautical system.

We will continue whatever research and development work is required to support the establishment of criteria to be applied in the certification of aircraft and in our other regulatory activities.

The Staff Report asks if the responsibilities of the Federal Aviation Act can be reconciled with the placement of competence and facilities in NASA and DOD. We believe that the important competence to accompany the responsibility to operate the aeronautical system is the competence to identify the needs of the system, and that competence is in FAA. From there it is not critically important where the competence and facilities to do the basic research are, as long as we have a source available for the basic knowledge we require in the applied research programs we perform in developing systems to meet our requirements.

Another important role FAA fulfills is to identify for the Defense Department the civil aeronautical requirements which can be built into a developing military system so as to make the military system easily adaptable to civil use. There have been instances in the past where different systems were developed by the military and the civil aeronautics industry to serve basically the same needs. Of course, we are not always able to avoid that result because a military system may not be able to readily, or economically enough, incorporate a civil requirement. But I believe that if we are close with DOD in the early stages of the development of a system, we will be able to avoid some duplication in systems development. We have established mechanisms for accomplishing this coordination between FAA and DOD.

Going now to the question of air safety, I think we can say that the air safety record is improving. While it is true that there has

been no decline in the number of fatalities per 100,000 passenger miles over the last several years, that figure alone does not give a complete story.

Over the period that the rate of fatalities per 100,000 passenger miles has remained fairly constant, we have greatly increased the speed and the number of aircraft moving over the system. We could have expected, without some improvements in handling traffic, a larger increase in the number of near misses and collisions. That we in the United States have been able to hold accidents and fatalities to what they were in the slower, less complex airspace system, and achieve a safety record significantly better than the world's other air carriers, we believe represents a significant accomplishment in air safety.

The Staff Report states that only a few million dollars per year is spent in research directly related to air safety and asks why FAA isn't doing more research to improve air travel safety and operation of aircraft in general.

The aircraft that is in service today is a very safe machine. It is the total environment that we are trying to make safer. The environment includes the aircraft, the people who operate and maintain it, the system for controlling it, and the airports at the beginning, intermediate points and at the end of its journey. Our research and development activity gives attention to all of those elements in order to make and keep the environment safe.

I do not believe that it is necessary or desirable to give NASA a specific safety assignment. Much of the NASA work is directed toward basic technological improvements which make a direct contribution to aviation safety. Questions of safety improvements have a direct relationship to the Government regulatory function. As the Agency responsible for preparation of government safety regulations, FAA is best able to identify areas where feasible safety improvements are possible.

Finally, the staff report asks how tradeoffs between increased payloads, improved safety features, decreased noise and improved handling characteristics can be objectively evaluated. The primary mission of FAA is aviation safety. It is not our policy to tradeoff other performance advantages to the detriment of safety. After safety, however, the reduction of aircraft noise is the next most important factor in the creation of an environment in which aviation can grow.

As to how far regulatory procedures should go toward requiring the full use of technological advancements for safety improvements, noise abatement, and the like, again the answer must be that technological advancements will be incorporated into federal regulatory requirements wherever they can be used significantly enough to justify whatever increased costs are involved.

STATEMENT OF WILLIAM F. McKEE, ADMINISTRATOR, FEDERAL AVIATION AGENCY, BEFORE THE SUBCOMMITTEE ON ADVANCED RESEARCH AND TECHNOLOGY, HOUSE COMMITTEE ON SCIENCE AND ASTRONAUTICS ON MARCH 21, 1967.

Mr. Chairman and Members of the Subcommittee:

I appreciate the opportunity to meet with you today to discuss current projects of the Agency that relate to NASA's activities in supersonic transport research and research on aircraft noise.

The Agency's Deputy Administrator, Mr. David D. Thomas, is with me today, as is Major General J. C. Maxwell, FAA's Director of Supersonic Transport Development. Mr. Thomas will speak to the details of FAA's programs in the field of aircraft noise abatement. General Maxwell will bring you up to date on Agency activity in the SST development program.

My purpose preliminarily is to introduce their more specific comments with some general observations. Since FAA does not normally appear before your Subcommittee to seek authorization for its program activities, I would like to describe the principal reason why we must rely on NASA for inputs that are basic to much of what is done in FAA.

NASA is an invaluable partner of our Agency in assisting us in our responsibility for aviation safety and fostering air commerce. Its contribution to FAA activity is found in the basic research for which it is organized and equipped to perform, and which it has been performing since the organization of its predecessor agency, the National Advisory Committee for Aeronautics, several decades ago.

The distinction between NASA's responsibility for basic research and FAA's research and development activities is fundamental to an understanding

of the interrelationship of the activities of both agencies. NASA's responsibility for basic aeronautical research involves the discovery of new knowledge through experimentation, inquiry, analysis and testing.

FAA's research and development activities look to development and applications engineering, and direct testing and evaluation of systems, procedures, facilities, equipment, and devices of all sorts. Its research is also concerned with providing the Agency with the ability to make long-range plans for the orderly development and use of the airspace and landing areas, including the airways, radar installations and other aids and facilities for air navigation.

We look to NASA, therefore, for basic scientific information to provide the grist for our development programs. To put it in other words, you might say that FAA is oriented toward product development, while NASA seeks to provide through research the basic information that must be available before such development can be undertaken.

It is probably well to keep in mind also that there are military as well as civil uses of the airspace and that NASA's activities produce basic data valuable to both. FAA is interested, however, only in that information relevant to civil uses and requirements, apart, of course, from those that relate to common use of the airspace by military and civil aircraft.

The difference between the agencies is evident in part by the different nature of their facilities. NASA facilities are designed for the purpose of research. For example, their wind tunnels are used to

gain new knowledge in aeronautics and to test models of new airplane designs. NASA has facilities to do research on electronic devices, structural materials, propulsion systems and the like.

FAA facilities, on the other hand, are designed to test equipment which has already been developed and to work out new procedures which will improve aircraft operations, particularly from the point of view of improving safety.

Due to FAA's responsibility for the management of the airspace and our intimate contact with the aircraft manufacturing industry and aircraft operators, we are in the unique position of providing NASA with statements of research requirements. Thus, NASA receives our views as to the research activities that may profitably be undertaken in all aspects of the aeronautical system.

We, in turn, have been and will continue to be dependent upon NASA's research products. Many of our current developmental programs are built on the foundations provided by NASA's research. Satellite communications, inertial navigation, in-flight fire detection and fire-fighting systems, and stability augmentation systems find their roots in the basic research work performed by NASA.

NASA's activities in the fields of metallurgy, boundary layer control, meteorology, aircraft-handling characteristics, and propulsion have all contributed to providing assistance to the FAA in producing a safe and efficient air transportation system.

In sum, NASA produces new knowledge; FAA puts this new knowledge to work. Without such new knowledge, FAA could not do its job, or at best could do only a limited job in developing a safer and more efficient system of air navigation and airspace use.

I believe that the development of a commercial supersonic transport aircraft is one of the best examples of the nature of FAA's development activities and our dependence on NASA's work. The fact is that NASA has been conducting research in supersonic flight for over two decades. It was only in the early 1960's that FAA was called upon to examine the practical application of the results of that research to commercial aviation.

FAA's first studies were done in conjunction with the NASA and the Department of Defense, and concerned the economic and technical feasibility of an SST program. The signal to begin a program to develop an SST aircraft was in President Kennedy's announcement in June 1963. The entire technical foundation for the supersonic transport program was laid by the early work of the NASA in advancing supersonic technology and their studies of supersonic transports.

NASA's research in supersonic technology has a definite bearing on the technical confidence with which we can proceed in the SST program and, further, it is advancing supersonic technology that may very well be applied to future generations of supersonic transports.

General Maxwell, who is here with me, will tell you more about the status of the SST program later on this morning.

The same is true of the work being undertaken at the present time in NASA in research into the characteristics of aircraft noise and the effect of varying aircraft configurations on noise origination and suppression.

FAA is not equipped to do this kind of work. So we must rely on what NASA will produce in the field of noise research before we can apply its results in the construction of engines and aircraft and to devise procedures for their operation. Their research will also provide us with valuable data on the kind of effort that might be necessary in the community environment should research fail to produce a breakthrough that can lead to the development of the long-sought goal -- the quiet engine.

In addition to these two areas, NASA's general aviation research produces information that makes possible advances in safety in general aviation activities. It also includes research in the STOL category of aircraft. These aircraft may very well prove to be the solution to many of the short-range air transportation needs of the Nation on a city center to city center basis. The success of this program can have great meaning for communities, both large and small. It may be the means of providing air service with a minimum investment in airport facilities. Of course, this would be true only insofar as this category of aircraft is concerned; the larger airports will still be needed for the larger transports. But is economic potential is enormous, as is its social

and business value. NASA's work in this area might well lead to a breakthrough in the next decade.

Gentlemen, we are very pleased to be here today. I know you will have questions to ask but before you do, we would like your permission to have Mr. Thomas and General Maxwell brief you more specifically on the Agency's programs in the field of noise and SST, and their relationship to NASA's current projects.

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REMARKS PREPARED FOR DELIVERY BY
WILLIAM F. McKEE, ADMINISTRATOR,
FEDERAL AVIATION ADMINISTRATION,
ATCA CONVENTION, MINNEAPOLIS,
OCTOBER 2, 1967

Thank you Mr. Smith.

I have come here tonight to tell you four things.

I am personally aware of the hard work you are doing.

I, and all members of my staff, deeply appreciate this work and the extra effort you are making.

I am determined to know more about the conditions under which you work. And, finally, I am determined to do whatever is necessary to improve these conditions.

We don't have enough controllers. The reasons for this are many. The first and all important reason, of course, is the unanticipated tremendous growth in operations. The recent sudden expansion of air travel has far exceeded the projections made by our planners and by the planners in industry. There is a wide gap between the forecasts made several years ago and the realities of air travel as we know them today.

This insufficiency has meant many of you men at the consoles have had to work overtime. It has meant many of you gave up vacations. Many of you had to cut weekends short and some had to come back on short notice

during off hours. These contributions of yours demonstrated a tremendous sense of duty and you have shown loyalty, dedication and self sacrifice. And because of your hard work and dedication, air safety has been maintained.

I honor your achievement.

We have set about to correct these situations. We are hiring more controllers now.

We started last spring to bring in 648 new controllers and we are getting them.

We are now awaiting Congressional approval of a new request by President Johnson. If the Congress adopts his proposed amendment, we shall be hiring an additional 800 controllers. This total of 1448 new men should help our current situation.

We are also looking beyond the present dilemma. The growth in aviation will not diminish. It will be increasing at a great tempo. We have, therefore, spent the past summer reassessing our plans. We shall, consequently, be ready to meet the needs of the future.

But let me be honest. The newcomers will not be arriving fast enough to bring about instant improvement. There will be a need yet for overtime. There will be need for some six day weeks -- a need for sacrifice.

We in FAA, however, shall be taking action to lessen the pressure. We want to get you out of the paper shuffling business where possible. We want to reduce data collection, studies, and keeping score. And if you put in overtime or are on standby, we are determined that you shall be paid for it, even if we must seek new legislation to do it.

We have also ordered that watch schedules be set up solely in accordance with operational needs -- without regard to the economic considerations of various pay differentials. And we have required more realism in Holiday staffing.

We are also moving along with our automated equipment. We have installed the new high-speed IBM 9020 computer in the Cleveland Center.

This huge black box can make up to 200,000 calculations a second and can process about 500 flight plans an hour -- and this latter capability can be expanded to keep pace with traffic increases. The 9020 is the key component in the NAS system.

We have also completed installation of all automated equipment at the Jacksonville Center and we expect it will be fully operational next year.

Our early experiences with the NAS system have been promising. We have found unexpected dividends. We have been impressed by the way the Atlanta controllers have become computer specialists. They have -- by innovating and improvising -- shown us ways of reprogramming and modifying the system so that it provides better services.

We are hopeful additional improvements will be forthcoming as more and more controllers are trained in automation. Our present plan calls for us to give lengthy, formal training to some 700 controllers. They will in turn serve as key men and instructors for the remainder. In all, 6,000 controllers will be given varying degrees and amounts of training in the operation of this automated equipment. We want a fully trained cadre on hand when all our centers become fully automated -- sometime in late '72.

Let me here thank you officers of the Air Traffic Control Association for your offer to help in this training effort. We shall need your assistance. We shall be working with you.

I want to mention the current Civil Service study of controller classification and how it came about.

We had a difficult situation at O'Hare. We were -- for a variety of reasons -- finding it difficult to hold qualified controllers -- and just as difficult to bring new controllers in. O'Hare is a busy tower -- very busy. So much so, that it generates enough traffic on the mid-watch to qualify for level 3. We asked the Civil Service Commission to look into the situation and see what it could do. As a result of this study, journeymen controllers at O'Hare were given a three-step increase.

These increases were needed and deserved. I am aware, however, that this action has caused some resentment in other areas. But the fact is, the O'Hare Tower required special action.

I also want to point out that this preliminary study at O'Hare helped to bring about the present Civil Service study.

This study of controllers' classification and qualifications standards is most important. We support it all the way. The Commission has assigned one of their best specialists to the project. Our two representatives are Glenn Tigner of the Air Traffic Service and Joe Allen of P and T -- both able men. The Commission team has already visited three centers and four towers. Others are on the schedule.

This study is making progress. It appears now that the first tentative draft of the new or revised ATC standards will be available in a few months. We shall be seeking your suggestions, comments and questions on them.

You controllers are the subject of other studies -- our annual physical and mental examinations.

We have learned from testing we have done already that controllers -- as a group -- are superior physically and mentally. Given this fact, this annual examination is to your advantage. The vast majority of you had no difficulty with these tests. In the few cases where problems were found, corrective actions were instituted. These few problems we did find -- had they continued unnoticed -- could have meant later deterioration. The physical and mental examinations are, consequently, salvaging far more jobs than they are jeopardizing.

I emphasize again that these examinations do not unearth anything that is not there. Ninety-nine and several hundredths per cent of you, consequently, need not give these tests a second thought. And if they do uncover medical conditions, it is much better for everybody concerned -- yourself, your fellow workers on the watch, the air traveler -- everybody. I know of very few groups who carry so much immediate responsibility as you for the safety of others. On you do we depend completely. It is imperative, therefore, that you be in first class shape.

I also want to point out the data from these examinations will show us what effect your job has on your health and well being over the years. This information will be needed to support any future recommendations for special retirement provisions.

This responsibility of the controller brings me to the theme of your convention -- collision avoidance.

The development of the methods to improve our techniques of separating aircraft has the highest priority of FAA headquarters. Early this spring, we set up a special task force to pull together and evaluate new approaches to insuring better separation -- better approaches to collision avoidance. That group has come up with a number of projects and they are now being further advanced.

The first and biggest need in minimizing this hazard is information. FAA now collects, collates and analyzes all near miss reports. We are looking for clues -- we are looking for patterns. But we need more data. I have, consequently, begun work on a program that will grant pilots and controllers immunity in the reporting of near misses. This should begin about the first of the year. We want to learn why these near misses happen. We want to know how often they happen. We want to know where they happen and when they happen. We want to know everything about them. The first requisite at arriving at a fix is knowledge. We want all we can get.

I know that your interest in collision avoidance will go beyond this convention. I hope that it will be a matter of much discussion in your local chapters -- and in your journal. And I further hope -- and ask -- that the results of these discussions will come to me. You men here tonight -- together with your colleagues who are back home on the boards -- are the most knowledgeable and the best authorities on this matter of improving our air traffic control system and I want to know what you think. I want your suggestions and ideas. There are many ways of reaching us -- through your association -- through the copcom meeting -- through our suggestion program. And if you think you have a good idea for improving our system and none of the above channels seem right, then put it in a letter and send it to me -- McKee -- Federal Aviation Administration, Washington, D. C.

I am determined to improve this whole business of communication. There are some 43, 000 of our employees scattered around the world. Between them and our central headquarters are often vast stretches of space. Between them and us are often long intervals of time. In view of this separation, it must be the function of managers at all levels to serve as means of communications. We are interested in statistics, facts, and data certainly, but our basic tools are human beings. I want to be certain, therefore, that all managers are familiar with the people in their organization -- that they know them -- that they are

always very much aware of them -- of what they are doing and what they are thinking. And I want to make it very, very clear that I expect the resulting knowledge to be passed on up.

To improve these communications between you and me, I have brought Joe Tippets back to Washington. There may still be a couple of you newcomers Joe doesn't know by your first name. But give him a couple of weeks and he'll be around visiting with you to learn more about your problems.

We shall also be trying new techniques. We've opened up a page in Horizons for questions you have on Management, Personnel or Training. If you're uncertain or don't know the answer to problems in these areas, send a letter to Horizons. Joe T. will give you a straight and honest answer. Equally important, you can be sure if we start getting a number of letters all concerned with the same question, that problem is going to be solved -- and solved very promptly.

I hope this new column will serve as a complementary approach to our unsatisfactory condition reports. Since this program began in the spring of '65, Air Traffic Service has received over 815 reports. We found about half of these were, in fact, unsatisfactory and needed correction. This is a high average and speaks well for both you and the program.

I can explain the importance of this business of communications by getting right down to fundamentals. My most important responsibility is administering the airspace -- controlling airplanes. Yet neither I nor any of our staff in Washington ever vectors an aircraft or assigns a flight level. My job is to provide you with the tools and personnel to do these jobs. I am your man in Washington. But I have to know your needs and wants. This is what I mean by communications.

And when I know these needs, I shall act on them for I am very much in your corner. I have, in these past two years, come to know you and to know better the work you do. I admire your skill. Your profession requires rapid decision. Your obligation to move traffic exerts -- with the ebb and flow of this traffic -- varying pressures. You must operate with exacting standards -- alert to the requirements and needs of the aviation public. You must be knowledgeable. You must know airways -- minimum altitudes -- weather conditions -- radar capabilities -- separation criteria and on through a hundred other related items. All this requires professionalism in every sense of the word.

I have learned, too, you perform these tasks with tremendous dedication and pride. I have learned you are sincerely concerned with improving and strengthening your skills. I have learned, finally, you all carry within you an unyielding sense of obligation for the safety of those who travel by air. All this is public service in the best tradition. I welcome, consequently, every opportunity to champion your cause.