

STATEMENT OF THE HONORABLE LANGHORNE M. BOND, FEDERAL AVIATION ADMINISTRATOR, BEFORE A JOINT HEARING OF THE SUBCOMMITTEES ON AVIATION AND OVERSIGHT AND REVIEW, OF THE HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE, CONCERNING FAA CERTIFICATION AND INSPECTION PRACTICES. JUNE 19, 1979.

Mr. Chairman and Members of the Committee:

I appreciate having the opportunity to appear before you today to discuss the certification and inspection of U.S. air carrier aircraft. I am confident that today's hearing will provide a meaningful forum for thoughtful discussion of major issues concerning air safety, and I welcome the benefit of your views.

Since the hearing today is occasioned by the recent DC-10 accident in Chicago, I am enclosing, as an appendix to my statement, a chronology of major events and actions which have taken place in the aftermath of that tragedy. We will naturally be pleased to answer any questions you may have about the information contained in the appendix.

Since I know you have a number of questions you would like to ask us, I will be brief in my discussion of our certification and inspection procedures. I want to make it clear, though, that my discussion of certification and maintenance practices

reflects the way we currently do business. If, as we learn more about the cause of the DC-10 accident, new and better methods are found or if deficiencies in the present process come to light, I will make whatever changes are necessary. At present, the investigation is not sufficiently complete as to tell what changes may be needed. I would like to further assure this Committee that, in addition to our ongoing efforts to keep the certification standards current with technological change, I will undertake a reexamination of the structure of the certification process to ensure the FAA is participating in every critical phase of the process.

I will also assure this Committee that because of reorganizational steps within the FAA, which I initiated prior to this accident, there will be a far better coordination within the FAA among the engineering, manufacturing, and maintenance disciplines. Further, we are in the process of implementing a "lead region" concept that will have the effect of greater standardization and concentration of expertise in the certification of aircraft.

Let me turn now to the certification process itself. The first phase of the certification process begins with the development and promulgation of rules by the FAA. These rules, which are

extensive, provide the basis for certification of an aircraft. For transport category aircraft, Part 25, contained in nearly 150 pages of the Code of Federal Regulations, covers over 350 regulatory standards on a diversity of subjects as reflected in an appendix to my statement. These rules are developed with full public participation and under the safeguards of the full regulatory process.

The next phase of the certification process begins when an aircraft manufacturer files a type certification application with the FAA. Generally this occurs at the aircraft's concept/design stage. The filing of the application is normally followed by a period of several months in which initial contacts are made with the applicant, and matters of general concern, such as the type certification process and procedures, are discussed. Once these initial steps have been completed, a Preliminary Type Certification Board meeting is convened. This Board, comprised of FAA engineering, manufacturing, and maintenance representatives of different specializations, is presented the concept and engineering basis for the aircraft by the applicant. At this preliminary meeting, the FAA specifies the relevant Federal Aviation Regulations that will form the certification basis for the aircraft.

After this preliminary board meeting, an extensive evaluation is initiated. During this process, the applicant proposes a regulatory compliance program--flight tests, computer analysis, laboratory tests, and other sophisticated techniques--by which the applicant will demonstrate to the FAA that the aircraft complies with applicable Federal Aviation Regulations.

Following the FAA's approval of the compliance approach, the applicant must propose a testing methodology or analysis for each of the aircraft's thousands of engineering design details. Each of the applicant's proposals are reviewed by the FAA which requests modifications, rejects the proposed methods of demonstrating compliance with the regulations or approves the proposal.

After these detailed procedures are found to be satisfactory to the FAA, the actual testing and analysis is conducted under the FAA's surveillance. Upon completion of these test procedures and analyses, the applicant formally documents the results and submits them to the FAA for further review.

The evaluation activities take the largest portion of time in the certification process since they involve analyses or tests

on literally thousands upon thousands of parts, components and assemblies, and finally the actual aircraft. During the evaluation process, one or more Interim Type Certification Boards are held to permit the applicant and the FAA to review progress and to establish plans for subsequent portions of the evaluation process.

The evaluation process continues until the applicant concludes the aircraft is ready to be subjected to formal flight testing. By this time the initial aircraft has been built, and the applicant has conducted its own initial flight testing. Generally this occurs with less than a year remaining before anticipated aircraft certification.

When the applicant informs the FAA that the aircraft is ready for FAA flight testing, a Preflight Certification Board is held, and progress is again reviewed with the applicant. If the FAA finds the aircraft ready for flight inspection and testing, a Type Inspection Authorization is issued, and a period of flight testing follows with applicant and FAA personnel both participating.

During the flight test process, evaluation results that were previously assessed are rechecked in light of actual aircraft performance, and the engineering design is thoroughly reviewed. If, at the completion of this phase, the FAA finds all applicable safety regulations have been met, a type certificate is issued.

The certification process requires literally thousands of engineering judgments and decisions. The amount of testing and evaluation conducted to enable us to make those decisions is staggering. For example, the original type certification of the DC-10-10, the first model of the series, took 2 1/2 years (the original application for the DC-10 was filed on December 26, 1967, amended on January 20, 1969 for the DC-10-10, and type certification granted on July 29, 1971). During this period of time, the following materials were received by the FAA from McDonnell-Douglas: 190,000 drawings and drawing changes; 1,400 engineering reports and revisions; 150 vendor reports; 80 ground tests; and 1,200 letters.

At this point, I would like to take note of the Committee's expressed concern about our use, in accordance with statute, of Designated Engineering Representatives (DERs) in the

certification process. Though FAA employees are directly involved at every juncture of the certification process we consider critical, I assure you that our methods of using DERs will be assessed carefully should anything in our ongoing investigations lead me to conclude that there may be problems in this area. Should it be necessary to insert FAA personnel further into the process, I will not hesitate to do so.

The development of a safe aircraft is, of course, only one part of the safety equation. Procedures must be in place to assure that the aircraft remains in a safe (airworthy) condition. For this reason, the FAA requires the airlines to have a comprehensive maintenance program for the aircraft they operate. Such a program must be developed and approved by the FAA before an airline receives FAA certification to operate. There are several facets to this program you should focus upon.

The FAA requires that an adequate organization exist to carry out an air carrier's continuous airworthiness maintenance program. For designated positions, the air carrier's employees must be certificated by the FAA, and a training program must be established to assure that the carrier's employees remain up to

date with changes in maintenance practices. To assure that adequate "checks and balances" exist, the FAA requires that inspection personnel be separated organizationally from maintenance personnel who perform the work. Further, auditing procedures and detailed recordkeeping of performed maintenance are also required of the carrier by the FAA to ensure that the carrier is constantly monitoring the quality of maintenance performed and to permit detailed examinations of carrier maintenance activities that have not been observed firsthand by FAA maintenance inspectors.

As part of their maintenance programs, the FAA requires carriers to have a "maintenance specification" which sets out intervals for general inspections of the complete aircraft, for detailed inspections of specified structural areas, and for checks, tests or periodic replacement of systems and components. The initial specification adopted by a carrier is normally derived from the Maintenance Review Board (MRB) Report for a particular model aircraft. This report is the end product of the MRB which is convened and chaired by the FAA to review and approve an initial maintenance specification for each new model aircraft. Input is received from committees staffed by airlines purchasing the aircraft, the aircraft

manufacturer, the engine manufacturer, and other component manufacturers, with FAA personnel assigned to each committee. These participants, headed by a selected FAA maintenance specialist, constitute the board.

The carrier normally incorporates the MRB specification in its maintenance control system to schedule accomplishment of each maintenance task within the time limitation specified by the specification. This schedule is then submitted for FAA approval when the preparation of the operator's entire maintenance program for the new aircraft has been completed.

The specification may be revised after the aircraft is in service. Revisions primarily reflect service experience as disclosed by disassembly analysis of removed components and analysis of inspection findings. Revisions may also result from manufacturers' service bulletins, experience by other operators, service difficulties and other indications of a need for program improvement. Further revisions emanate from FAA through Airworthiness Directives and other means as a result of observations of improper or inadequate maintenance during FAA inspections, review of service difficulty reports or other reports concerning mechanical performance.

Revisions to the specification are individually approved by FAA or may be made by the carrier without advance approval in accordance with special procedures incorporated in its reliability program approved by FAA. In the latter case, FAA is informed of all revisions and the basis for the revisions, and, of course, retains the right to disapprove revisions.

The aircraft manufacturer is required by the FAA to provide detailed instructions considered necessary for the proper maintenance of the aircraft. This material must be compiled, to the satisfaction of the FAA unit charged with responsibility for certificating the aircraft, prior to delivery of the first aircraft to the operator.

The carrier adopts these instructions as a basis for the maintenance manuals required by the FAA of each carrier. Normally, these instructions are adopted verbatim; however, the operator may make changes to accommodate peculiarities of its operation such as average flight lengths, operating environment, or established maintenance practices or equipment relating to other type aircraft. These manuals are reviewed by FAA with particular attention paid to revisions made by the

operator. Any aspect of the maintenance manual to which the FAA objects must be corrected before the operator's maintenance program for that aircraft is approved.

The purpose of the FAA required operator's maintenance manuals is to provide instructions for methods, techniques and practices pertinent to maintenance activities such as component changes, adjustments, operational tests and aircraft inspections. These instructions include detailed specifications for the accomplishment of inspections of the aircraft, in general, and of specific areas of the aircraft.

Under FAA surveillance, the operator's maintenance manuals are continually revised as a result of service experience, improved support equipment, recognition of the need for more detail, modifications, service difficulties, Airworthiness Directives and numerous other factors. Many of these changes are initiated by FAA. Others reflect more effective ways of accomplishing maintenance tasks. The continuing revision of these manuals makes for a strong, viable maintenance program.

The FAA assigns to each carrier a Principal Maintenance Inspector (PMI) whose responsibility is to oversee the

carrier's maintenance practices. It is not the function of the PMI, or his staff, to observe firsthand the performance of all maintenance or carrier maintenance inspections on the operator's aircraft. We do not believe this is a proper role for us any more than we believe the Federal Government should have an employee on every air carrier flight observing the pilots. Instead, our role is one of assuring both that an effective system is in place and that there is compliance with the procedures dictated by that system. To do so, we work with the carrier's employees to improve their practices, and monitor their activities through spot-checks, reviews of their maintenance records, and through other similar means. Though we see our role as a critical one in assuring safety, people sometimes overlook the airline's role in the process. As the Members of this Committee know well, the Congress has specifically recognized by statute the duty of air carriers to provide the highest degree of safety (§601 of the Federal Aviation Act of 1958) and to perform inspections, maintenance, overhaul and repairs in accordance with the Federal Aviation Act or any rules or regulations the FAA issues pursuant to the Act (§605). I assure you that we take seriously our duties under the Act, and it has been our experience that the carriers do too.

We remain continuously vigilant for any evidence of safety problems which may need to be resolved through Airworthiness Directives, changes in maintenance cycles or procedures, and the like. One way we do this is by requiring airlines to provide us with Service Difficulty Reports whenever certain kinds of problems occur with an aircraft. These reports are provided to the PMI directly, who reviews the information and transmits a copy to our data analysis center in Oklahoma City for entry into our computer. Daily compilations of service difficulties are then printed out and transmitted to all PMIs as well as to the engineering offices which have been responsible for aircraft certification. This enables us to detect defect trends for a given type of aircraft or component. I should point out that, for major problems which are discovered, the PMI is required to contact Washington Headquarters directly so that the need for immediate action can be assessed and appropriate action directed.

Our data collection point in Oklahoma City is supported by FAA employees with operational, maintenance, and engineering backgrounds. Each Service Difficulty Report is reviewed by an FAA engineer to determine whether it calls into question the

airworthiness of the aircraft. If so, corrective action is immediately initiated. In a typical month, the FAA data collection point in Oklahoma City spends on the order of 600 hours reviewing over 2,000 Service Difficulty Reports.

Usually, 10 to 15 special studies are undertaken each month to review and analyze data, identify problems, and alert field organizations of their findings. The point I want to stress, Mr. Chairman, is that we have a sophisticated method to identify at the earliest possible time safety problems that may be developing in the system.

With respect to the Committee's interest in determining whether deficiencies in certification or inspection practices contributed to the tragic accident in Chicago, I will have an answer only when the various investigations are complete. But I am concerned with such a possibility and that is why we have underway intensive investigations into maintenance practices and the design of the DC-10 engine mounting structure.

I would like to quote you relevant portions of both Orders to demonstrate to the Committee the scope of the Investigations. The first Order I would cite is directed at McDonnell Douglas Corporation. It states in relevant part that I have ordered that:

"1. An investigation be conducted of the type certification of the engine to wing attachment structure of the McDonnell Douglas DC-10 series aircraft;

2. To determine whether modification, alteration, maintenance and repair practices and procedures recommended by the manufacturer in the form of Maintenance Manuals, Service Bulletins, or other documents are adequate to assure continued airworthiness of the product pursuant to an Airworthiness Certificate;

3. To determine whether certification practices, procedures, and regulations prescribed by the Federal Aviation Administration are adequate to assure the integrity of the engine to wing attach structure."

The second Order is directed at all U.S. air carrier DC-10 operators and sets forth that I have ordered that:

"An investigation be conducted in order to determine; (a) Whether the findings of the foregoing inspections are related to maintenance and airworthiness practices, procedures,

methods, or regulations; or (b) Whether maintenance and airworthiness practices, procedures, methods, or regulations are adequate to assure continued airworthiness; or (c) Whether such findings are related to a lack of instructions or qualifications of maintenance and engineering personnel or management; and (d) To determine whether such findings are related to a failure to comply with all Federal Aviation Administration safety regulations, or orders, practices, procedures, and methods prescribed by the Federal Aviation Administration, or whether such regulations, orders, practice procedures, and methods are adequate."

The point I want to stress is that I am critically examining not only the manufacturer and the air carriers but the FAA itself. If evidence is found that indicates the scope of these investigations needs to be broadened, I will not hesitate to do so.

We have had on site, at carrier maintenance bases, four teams, comprised of Washington and field personnel, who are scrutinizing the maintenance practices of eight DC-10 operators--American, United, Continental, Northwest, National, Western, World Airways, and Trans International. Each team is

composed of a team leader, two maintenance specialists, one engineer, and an attorney. The principal maintenance inspectors of the carriers involved provide additional support to the teams. Their field research was essentially completed this past weekend and they are currently analyzing and collating the data gathered.

All information developed by the teams is being reviewed by a Design Response Team. The Design Response Team is coordinating with a team on site in Los Angeles which is analyzing the adequacy of the certification of the pylon.

With respect to the Order of Investigation directed at the manufacturer, we have four teams in place directing their efforts towards: 1) Pylon Design and Review; 2) Service Bulletins; 3) Airworthiness Directives Results and Service Difficulty Reports; and 4) Quality Control. Again, there is a continuing flow of information to Washington of the information developed in these reviews. Should it become necessary to augment these efforts, new teams will be established.

Before concluding, Mr. Chairman, let me touch upon two issues. The first concerns the notion that the FAA takes action only after an accident. Certainly it is true that we aggressively

pursue the causes of aircraft accidents; we would be irresponsible if we didn't try to identify the reasons accidents happen so that changes can be made where necessary. But that in no way means that we don't do our best to prevent accidents before they happen.

The U.S. aviation safety record, I believe, clearly demonstrates that the aviation community works long and hard to prevent accidents from happening. But it is also clear that Airworthiness Directives are seldom newsworthy; that only an occasional rulemaking activity meets the public eye; that most are unaware of our maintenance personnel who, at all hours of the day and in all weather conditions, are calibrating or repairing navigational equipment in remote areas throughout the country; that few people, other than pilots, know of our safety clinics which are held continuously; and that our ongoing R&D programs to improve safety are rarely in the public spotlight. And the list of continuous safety activities carried out in relative obscurity by the FAA goes on and on. I think it's important for the American public to recognize, and I am sure you agree with me Mr. Chairman, that, the mere fact that our day to day efforts to promote aviation safety may not be well known or publicized, does not mean that we do not do all we can

to protect the public welfare by preventing accidents from happening.

The second point I would make is that there are some who have fostered the idea that there is a conflict between the FAA's safety mandate and its role in promoting aviation. In fact, there is no such conflict because the best way to promote aviation is to promote safety. I can tell you, based upon my two years of experience as Administrator, that I have continually operated on the premise that safety is the best promoter of aviation.

Mr. Chairman, I am willing to take all necessary steps to ensure that the aircraft certification and maintenance systems used in the United States are the best possible. Much work was underway in these areas before the crash and this crash adds impetus. I sincerely believe that the FAA has demonstrated that it can take firm, effective action to deal with safety problems. I only ask that this Committee help provide us the opportunity to perform the necessary investigations and, subsequently, when all the facts are in, to rationally assess with us any and all steps necessary to improve our processes.

In sum, we need your support to continue our work and you can be assured of our dedication and resolve. In every phase of this effort, we are prepared to keep the Committee fully apprised of our problems and our accomplishments.

Mr. Chairman, that completes my prepared statement. My associates and I will be pleased to answer any questions you may have at this time.