STATEMENT OF THE HONORABLE LANGHORNE M. BOND, FEDERAL AVIATION ADMINISTRATOR, BEFORE THE HOUSE GOVERNMENT OPERATIONS COMMITTEE, SUBCOMMITTEE ON GOVERNMENT ACTIVITIES AND TRANSPORTATION, CONCERNING VARIOUS ISSUES RELATING TO THE DC-10. JUNE 18, 1979.

Mr. Chairman and Members of the Subcommittee:

You have asked me to appear before you today to discuss various issues related to the DC-10. Before addressing some of the specific issues you have asked me to discuss, I would first like to briefly touch upon several issues which arose at the hearing before you a week ago.

Perhaps the most important issue that I believe is not yet clear from reviewing the record is the implication that information stored in the FAA's computer system in Oklahoma City gave advance warning of the potential for an accident such as occurred at Chicago. During the course of last week's hearing, and afterwards, several references were made to an FAA document that purported to show a problem in the DC-10 pylon area well before the accident in Chicago. This document was a computer printout of Service Difficulty Reports pertaining to the DC-10. Several of the remarks made seemed to suggest that this information would somehow have forecast that tragic accident had only the information been examined and action taken. Such suggestions are wrong.

As Service Difficulty Reports are made, each one is examined by an FAA engineer before entry into the computer to make sure that what is reported doesn't call into question the airworthiness of the aircraft. If the airworthiness of the aircraft is called into question, immediate action is taken. Regardless of the engineer's determination, all reports are entered into the computer to create an historical base. Each month a trend analysis of the historical base is performed to make sure that a pattern of problems doesn't exist. If we receive or find an unusual number of reports or a pattern that may affect the safety of the aircraft we go back and examine the area again, taking corrective action wherever necessary.

In this specific case, references have been made to the 60 some entries in our computer on the DC-10 nacelle/pylon area. Remember that this is a large, complex structure consisting of many parts that perform a multiplicity of functions. I have had my staff go back over the referenced computer data again. This examination has shown that there was <u>no</u> single report or pattern of reports that suggests a potential for catastrophic failure of the pylon. In fact, there is no report or pattern of reports of the type of problem which we suspect may have occurred at Chicago. As the investigation continues however,

we will correlate our findings with the Service Difficulty Reports to see if we can learn more from them. Should you or any member of this Subcommittee wish a detailed briefing on past nacelle/pylon service difficulty reports we will certainly make such a briefing available.

What I have said here should not however be taken as a conclusion by me that all phases of the Service Difficulty Report system are perfect. We have underway, as I told you last week, a formal investigation of the maintenance and airworthiness practices of all U.S. operators of DC-10s. Among the areas of inquiry is the quality of the reports that the licensed mechanics working on aircraft are sending us pursuant to our regulations. When this investigation is complete, I will make a determination as to the need for changes in the system.

At last week's hearing you expressed concern with a discrepancy report regarding Northwest Airlines pylon to wing front spar attachment lower monoball perimeter bolts. Having had time to check out the document, we have verified that the report in question is one that was received telephonically by the Western Region and reported telephonically to Washington in one of the daily telephone conferences that covered the

day's developments. It was the judgment of both Washington and Western Region FAA engineers that the report did not contain items that were safety significant. The document you showed us was but a written confirmation of the oral report which we requested for our files. In fact, the written report is confusing because it has several clerical discrepancies from the oral report.

There also seemed to be some concern expressed at the hearing about the fact that inspections of maintenance performed on aircraft are made by "designees" of the FAA. This is not the case. In fact, inspections are made by qualified airline employees who are authorized to do so. Anyone signing off on a record of inspection must have been licensed by the FAA. That license, the same as a pilot license, certifies that the individual has been determined to meet FAA standards and to possess the qualifications necessary to perform the kind of work authorized by the license. I should also note that Congress in Section 605 of the Federal Aviation Act has expressly made it the duty of an air carrier to inspect, repair, overhaul and maintain aircraft in accordance with such regulations as may be issued by the FAA.

The FAA's statutory role as to air carrier maintenance is essentially to assure that the licensed carrier has an

adequate system for performing maintenance and inspections in place, and that the system is complied with by the airline. We accomplish that through assigning Principal Maintenance Inspectors and staffs to each air carrier. They perform spot-checks of maintenance performed, review the detailed records of maintenance and inspections we require the airlines to keep, and work with the carriers to help them continue to improve their maintenance operations. We do not believe it necessary, or even desirable, for every airline maintenance activity or inspection to be monitored firsthand by an FAA employee any more so than it would be to have an FAA employee aboard every plane observing the pilot.

Mr. Chairman, you seem to have reservations generally that the FAA "relies on the industry" on important safety matters. I would like to clear up any misconceptions in this area. It requires a detailed knowledge of the process, the critical versus non-critical items, and the FAA's role in the process before one can begin to express an informed opinion on this subject. Certainly it is true, as I have described to you,

that the FAA does not maintain the airlines' aircraft, nor do we build the aircraft or fly them. In that sense of the word, we--and the American public--rely upon the industry. But at the same time one must realize that critical people and critical components are licensed by the FAA--that includes pilots, rated mechanics, flight instructors, repair stations, the aircraft and its engines, and the airlines themselves. There are FAA standards on which the issuance of any of these licenses are predicated, and there are regulatory criteria governing the use of the licenses. And beyond that, through surveillance, we oversee regulatory compliance by all those holding licenses in all phases of our air transportation system. In short, the question is not whether the FAA relies on the industry but, rather, has the FAA inserted itself in the process at the appropriate point to be able to effectively monitor the industry's performance? I have and will continue to review the FAA's systems to evaluate the FAA's response to this question.

In light of your concerns about FAA's certification practices, I believe it would be helpful if I provide some information which reflects our continuing concern for strengthening our aircraft certification rules. In December 1974, we held a 10

day conference with five separate committees, comprised of members of the public, industry, foreign authorities, aircraft manufacturers, and aircraft operators, meeting simultaneously. At this conference, approximately 750 proposed changes to aircraft certification and related rules were reviewed and discussed. After this conference, we proposed nearly 700 rule changes for public comment. Since that time, over 500 rule changes have been adopted by the FAA, with more changes to be adopted in the future. At present we are in the process of developing a new Federal Aviation Regulation Part 24, designed for commuter aircraft.

There is another issue I want to clear up. That concerns our Airworthiness Directive requirement that visual inspections be made for cracks in the pylon aft bulkhead. There have been statements made that a variety of other tests should have been conducted.

X-Ray inspection was rejected by the FAA because to use this technique you need to know what defect you are looking for. Defects are often not apparent in the X-Rays unless the procedures are carefully adapted to the structure being inspected and the type of defect that can be anticipated. At

the time of the issuance of our first AD, the only particular defect we had reason to suspect was a failure in the thrust link bolt, reported by the NTSB as a fatigue failure. Consequently, a special nondestructive testing provision was included in the first AD for which we made special provision in the inspection procedure.

Flourescent penetrant was rejected as the required inspection because repeated use of penetrant in these enclosed areas would likely result in a cumulative residue of dye that could mask rather than highlight the defect. The proximity of a structural joint makes the use of penetrant even less acceptable.

Eddy current was rejected because of the extensive area to be inspected. This technique is generally used after a localized area has been identified.

Not knowing either the type or location of the cracks that might exist when we issued the first AD, a close visual inspection was determined to be appropriate for detection of the type of defects that were either expected or in fact found. Further, the service bulletin, incorporated by

reference in our AD, specifically stated that, if cracks were suspected through a thorough visual inspection, they should be verified by flourescent penetrant inspection.

You have also made references to our legal proceedings concerning the Airline Passengers Association's efforts to secure a temporary restraining order to require the grounding of DC-10s. I am enclosing as an appendix to my statement a detailed chronology of events concerning our legal proceedings and my decision to suspend the type certificate for the DC-10s which should clear up any misconceptions.

As I have stated before, Mr. Chairman, I do not intend to reinstate the DC-10 type certificate until I am satisfied that, based on the facts, the aircraft is safe to return to service. And, as I mentioned before, one way I am getting those facts is by a thorough on-site investigation into the pylon design. The four teams in place are engaged in comprehensive efforts directed towards: 1) Pylon Design and Review; 2) Service Bulletins; 3) Airworthiness Directives Results and Service Difficulty Reports; and 4) Quality Control. I have also added as principal scientist to this team, Dr. Raymond Bisplinghoff. Dr. Bisplinghoff enjoys a

well deserved reputation in aeronautical engineering including distinguished service with NASA and with the Massachusetts Institute of Technology.

With respect to your concern about the certification of the DC-10 hydraulic system, I can only state to you, as I did last week, that FAA is participating with the NTSB in a review of the hydraulic system and its possible involvement in the Chicago accident. As you should be aware, the time tested practice is for the FAA to work side-by-side with the NTSB in the investigation of an accident.

None of the facts elicited so far, as they have been expressed to me, are suggestive of total hydraulic failure. In fact evidence to date indicates that two of the three hydraulic systems were operative until impact. As in the case of the pylon, should facts arise that call into question the certification of the hydraulic system of the DC-10, whatever additional efforts may be called for by the facts will be undertaken. We do have concerns as to the procedures that were used by the pilot pursuant to his standard training and we are studying both those procedures and the information available to the crew at the time of the engine/pylon separation.

All of the widebody aircraft employ a hydraulic design philosophy that is markedly different from that found on the narrowbody aircraft. Prior to the widebodies, aircraft employed the concept of mechanical reversions for the control systems which means that, if the hydraulic system should fail, the crew is able to resort to a system of cables to control the aircraft. It became readily apparent with the advent of the widebodies, that the physical size of the aircraft would preclude the use of a mechanical reversion system. The response to this problem was the development of all-power control systems for the widebodies. Recognizing the need to thoroughly test the new concept, the FAA formed a special team to develop effective testing procedures to be applied to all widebody aircraft.

By Notice of Proposed Rulemaking No. 68-18 published in the Federal Register on August 22, 1968, the FAA proposed over 100 amendments to the aircraft certification standard set forth in Parts 1 and 25 of the Federal Aviation Regulations. Included in this proposal was a change to the hydraulic system certification standards to effectively test the newly developing all-power control systems for widebodies. Approximately 300 comments were received in response to the

Notice of Proposed Rulemaking from such groups as the Airline Pilots Association, the U.K. Air Registration Board, Aerospace Industries Association of America, the Experimental Aircraft Association and others. Based upon this input as well as independent analysis performed by an FAA Headquarters team, a final rule was drafted that was issued on April 1, 1970. Because the U.S. manufacturers had applied for their widebody type certificates prior to the issuance of the final rule, the requirements set forth in the final rule were imposed upon these aircraft by special condition. It should be noted that while the DC-10 special condition is dated January 7, 1970, and amended July 9, 1971, the requirements contained in the special condition and the final rule are essentially the same. As a result of this process, all widebody hydraulic systems have been subjected to the same testing procedures. I would further point out that the intent of the special condition and the regulation was to produce an equivalent or greater level of safety than that which existed under the mechanical reversion approach.

Encompassed in the regulatory requirements applicable to widebody hydraulic systems are all of the normal component design requirements, functional tests, endurance tests,

operational, and environmental tests necessary to assure that the systems will perform properly when installed in the aircraft. However, since control of the aircraft is totally dependent on the performance of the systems, it is further required that the airplane be demonstrated to be capable of safe flight and landing if any one system fails, or if any combination of system failures, which could occur, does occur. In determining that this goal is met, complex failure analyses are conducted, failure modes of components are verified and tested, and complete systems are functionally checked under simulated and actual failure conditions.

Further, after the design evaluation is complete, flight tests are conducted to verify the predicted effects of hydraulic problems on flying qualities and performance. In general, the effects on aircraft control of total failure, including loss of fluid, of the most critical single hydraulic system are evaluated in all normal maneuvers and throughout the full speed and altitude ranges, because we assume for test purposes that any single system can fail at any time. For this same reason, we measure aircraft stopping distance, ground steering, emergency descent with speed brakes, and aircraft controllability assuming a failure of one hydraulic activator

to any control surface. In addition, to assure that the aircraft is safely controllable throughout descent, approach, and landing we evaluate the effects of multiple system failures, assuming loss of the second system occurs at high altitude cruise. Then, after engineering tests are completed, an accelerated functional and reliability test program requires the aircraft to be flown in simulated airline service, while cycling all aircraft systems heavily in an effort to introduce an aircraft test is as nearly trouble-free as humanly possible.

That concludes my prepared statement, Mr. Chairman. I would like at this time to have an FAA hydraulic specialist provide you a specific look at the DC-10 hydraulic system to demonstrate to you how it is that the DC-10 hydraulic system meets the certification standard. I feel that the information that Gil Thompson will provide is essential to any Subcommittee inquiry into the certification of the DC-10 hydraulic system. You will note that there are a number of diagrams of the hydraulic system attached to my prepared statement for your review.