

16. The captain made the decision to continue the takeoff, as indicated by his command "Lets take it off" during the takeoff roll. He made that decision, however, without aircraft control inputs upon which to determine the cause of the abnormal aircraft behavior.
17. Before the crew fully realized the criticalness of their situation, the takeoff had progressed to a point where they had little or no time to reject the takeoff successfully. This was caused by a combination of factors including inadequate explanation of the rejected takeoff procedures in the handbooks, de-emphasizing of rejected takeoff procedures because of environmental pressures, and the lack of planning for such events before takeoff.

(b) Probable Cause

The Board determines that the probable cause of this accident was a loss of pitch control caused by the entrapment of a pointed, asphalt-covered object between the leading edge of the right elevator and the right horizontal spar web access door in the aft part of the stabilizer. The restriction to elevator movement, caused by a highly unusual and unknown condition, was not detected by the crew in time to reject the takeoff successfully. However, an apparent lack of crew responsiveness to a highly unusual emergency situation, coupled with the captain's failure to monitor adequately the takeoff, contributed to the failure to reject the takeoff.

3. RECOMMENDATIONS

Based on the results of the investigation of this accident, the Board recommended to the Administrator, Federal Aviation Administration, that (1) all DC-8 operators be advised of the hazardous condition that can be created by foreign objects jamming the aircraft's elevators; (2) all DC-8 operators should be advised that takeoffs should be rejected when premature or unacceptable rotation occurs during takeoff until adequate procedures are developed for a positive check of elevator position; (3) the DC-8 flight control system should be evaluated by the FAA with a view to establishing a standard procedure for checking the system from the cockpit. This procedure should provide for positive detection of a jammed elevator; and (4) consideration be given for a requirement to install an elevator position indicator in the cockpit of all DC-8 aircraft.

The Administrator replied November 20, 1970, that engineering evaluations were being completed at Douglas Aircraft Company. He stated that additional time was required to complete these evaluations and he would advise the Board of any action taken as soon as the evaluations

were completed. The Administrator also stated that he needed additional clarification regarding Recommendation No. 2.

The Administrator, on March 8, 1971, reported that he had completed his review and investigation of our recommendations. He stated that the manufacturer had developed a procedure to check for elevator movement and jamming prior to takeoff and that the FAA had issued an operations alert December 1, 1970, requesting that this procedure be brought to the attention of all DC-8 operators. He further stated that the usefulness and value of an elevator position indicator would not justify the large cost and complexity of the installation due to the design of the elevator control system. (See Attachment 3.)

Since a rejected takeoff is a normal response to an emergency event which occurs before flying speed is reached, this would appear to be an event that should be preplanned by flightcrews. Some flight operations recognize the value of proper communication and preparation for contingencies and require flightcrew briefings on takeoff procedures, possible emergencies, and duty assignments dependent on which pilot is handling the flight controls. The value of such a procedure is that each crewmember is mentally prepared for such eventualities each time a flight is commenced.

Our review of flight manuals and operations manuals indicates that the procedures contained in these manuals could be improved by being more specific in duty assignments and functions during a rejected takeoff, particularly by clarifying each pilot's duties in cases where the copilot is handling the flight controls and a rejected takeoff is required. In this connection, the Board believes that the history of rejected takeoff accidents and incidents indicates that additional emphasis is needed on factors other than engine failure that might require the initiation of a rejected takeoff procedure.

Therefore, the Board recommends that:

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The Federal Aviation Administration review the subject of rejected takeoff procedures in air carrier operations with a view to: amplifying and clarifying these procedures; standardizing operation and flight manual procedures for each aircraft; reviewing the role each pilot plays in accomplishing a rejected takeoff; exploring the requirements for rejected takeoff training; providing flightcrews with more specific information regarding the dynamics of rejected takeoff conditions for the specific aircraft; and, requiring a pretakeoff briefing of rejected takeoff and other emergency procedures that the crew may have to employ.