NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Log 1662

ISSUED: MAR 14 1984

Forwarded to:

Honorable Michael J. Fenello
Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-84-14 and -15

On February 15, 1983, a Sierra Pacific Airlines DHC-6, operating as Transwestern Flight 868, crashed during its final landing approach to the Sun Valley Airport, Hailey, Idaho. Of the eight persons aboard the airplane, seven received serious injuries and the other received minor injuries. The airplane was destroyed. 1/

The National Transportation Safety Board's investigation of the accident disclosed that pitch control of the airplane was lost because an elevator control linkage separated. An improper and unsecured bolt had been used in the linkage connection, and the bolt had backed out of the linkage. Further investigation into the origin of the improper bolt and the maintenance performed on the airplane disclosed deficiencies in Sierra Pacific's maintenance and inspection organization and procedures.

The Safety Board's investigation disclosed that the distinction and separation between the company's inspection and maintenance required by 14 CFR 135.423(c) 2/ did not exist. The Director of Quality Control did not manage or supervise the inspectors; he worked only 3 days per week, and his office was located 15 miles from the company's maintenance facility. Also, he testified that he was hired to maintain airplane records, which he did. However, he asserted no control or supervision over mechanics who also possessed inspection authority. Instead, the evidence indicated that the Director of

1/ For more detailed information read Aircraft Accident Report--"Sierra Pacific Airlines, deHavilland DHC-6-300, N361V, Hailey, Idaho, February 15, 1983" (NTSB/AAR-84/03).

2/ Title 14 CFR 135.423(c) states in part, "Each person performing required inspection functions in addition to other maintenance, preventive maintenance, or alterations, shall organize the performance of those functions so as to separate the required inspection functions from the other maintenance, preventive maintenance, and alteration functions. The separation shall be below the level of administrative control at which overall responsibility for the required inspection functions and other maintenance. . .is exercised."

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Maintenance not only directed and supervised the mechanics in their maintenance activities but also directed and supervised their efforts when they performed inspection duties. Also, the Director of Maintenance possessed and used inspection authority. The Safety Board believes that the lack of an independently controlled and supervised inspection function resulted in the commingling of maintenance and inspection functions to the extent that an adequate inspection of the elevator control linkage, which would have revealed the existence of the unproper bolt, was never performed.

The Principal Maintenance Inspector assigned to Sierra Pacific Airlines by the Federal Aviation Administration (FAA) was assigned to three other air carriers and one repair station, and he had secondary responsibility for 12 to 14 other air carriers operating into Tucson, Arizona, under the FAA's area concept. According to maintenance surveillance records, the three airworthiness inspectors assigned to Air Carrier District Office (ACDO) No. 34 in Tucson had inspected Sierra Pacific 56 times between July 2, 1981, and February 9, 1983. Thirty-nine of these inspections were related to the large airplane maintenance program, 7 were related to the DHC-6 program, and 10 involved general meetings on various subjects. However, none of the inspections detected the commingling of Sierra Pacific's maintenance and inspection functions.

Although not factors in the Sierra Pacific DHC-6 accident, other deficiencies existed in the company's operation of the DHC-6. These deficiencies included the use of average baggage weights rather than actual weights; the use of a weight and balance form that did not provide for calculation and recording of the airplane's center of gravity; the placement of baggage in an incorrect location in the airplane; and the cancellation of a flight plan required by company procedures. Failure to detect these deficiencies can be related to the lack of FAA operational surveillance, because no surveillance was conducted of the DHC-6 operation during 2 months of activity.

Similarities to the above maintenance and inspection deficiencies were discovered during the National Transportation Safety Board's investigation of an Air Illinois, Inc., HS 748 airplane accident on October 11, 1983, near Pinckneyville, Illinois. Following a complete electrical failure at night while en route from Springfield, Illinois, to Carbondale, Illinois, the airplane crashed, and the ten persons aboard were killed. The only HS 748 operated by Air Illinois was destroyed.

Although the investigation of the Air Illinois accident is not complete, the Safety Board has found that Air Illinois' maintenance functions and inspection functions for the HS 748 airplane were commingled. In fact, the company's organizational chart showed that the lead mechanics and inspectors were both directly under the supervision and control of the Maintenance Manager for the HS 748 airplane. Also, the Chief Inspector's responsibilities as listed in the company maintenance manual did not include supervision or control of the inspectors. A former lead mechanic and inspector for Air Illinois testified during the Safety Board's public hearing into the accident that when exercising his inspection authority on the HS 748 airplane, he received his instructions and directions from the Maintenance Manager.

Although preliminary findings indicate that the commingling of the maintenance and inspection functions is not related to the cause of the Air Illinois accident, the Safety Board believes that such practices not only do not conform to the provisions of the

Federal Aviation Regulations, 3/ but that they also discourage the exercise of independent authority by an inspector when he/she is performing inspection duties. Such conditions can lead to compromises that could jeopardize the safety of flight.

The Safety Board's investigation also disclosed that the HS 748 airplane's maintenance log contained few entries of mechanical irregularities. However, many mechanical irregularities were recorded on maintenance discrepancy reports which were retained in the maintenance facility. The Safety Board's correlation of airplane maintenance logs with the maintenance discrepancy reports showed that many mechanical irregularities, including significant electrical power generation irregularities, were never entered into the airplane's maintenance log.

Testimony at the Safety Board's public hearing on the Air Illinois accident disclosed that HS 748 flightcrews routinely failed to enter mechanical irregularities in the airplane maintenance log at the conclusion of a flight. Instead, they would either discuss the irregularities with the lead mechanic at the conclusion of a daily flight schedule or would write the irregularities on a separate sheet of paper and leave it for the lead mechanic. The lead mechanic would then record the mechanical irregularities in the maintenance discrepancy report. Since the maintenance corrective action for the irregularities was usually accomplished during the night, the corrective action was recorded on the maintenance discrepancy report from which the lead mechanic would brief the first flightcrew the next morning. Occasionally, the corrective action would be entered into the airplane maintenance log. The Safety Board believes this practice was not in conformity with 14 CFR 121.563 4/ and good maintenance practices. Further, we believe that proper surveillance by FAA operations and airworthiness inspectors should have detected and corrected this practice.

The Safety Board is fully aware of the recently announced plans of the Secretary, Department of Transportation, to increase significantly the size of the FAA's air carrier inspector force, to increase the frequency of air carrier inspection, and to inspect air carriers of all sizes. We believe that these plans when implemented should provide substantial improvements in the FAA's surveillance of the air carriers. However, as demonstrated by the circumstances of these accidents, we believe that several areas of surveillance need emphasis. Accordingly, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Issue an air carrier maintenance bulletin to emphasize: (1) the need for air carrier airworthiness inspectors to require during the certification process that the air carrier's manuals and maintenance organizational structure conform to regulatory requirements regarding the separation of maintenance and inspection functions, and (2) the need to conduct surveillance in a manner that will verify that the air carrier is performing maintenance/inspections functions and duties in accordance with the requirements. (Class II, Priority Action) (84-14)

3/ 14 CFR 121.365(e), same text as footnote 1.

4/ 14 CFR 121.563 states in part, "The pilot in command shall insure that all mechanical irregularities occurring during flight time are entered on the maintenance log of the airplane at the end of that flight time. Before each flight the pilot in command shall ascertain the status of each irregularity entered in the log at the end of the preceding flight."

Issue air carrier maintenance and operations bulletins to emphasize to air carrier airworthiness and operations inspectors the regulatory requirements related to the recording of mechanical irregularities in aircraft maintenance logs and the need for proper surveillance to confirm conformity with the requirements, including scrutiny of aircraft maintenance logs and other maintenance records to verify that applicable maintenance corrective actions correlate to mechanical irregularities recorded by flightcrews in the aircraft maintenance logs. (Class II, Priority Action) (A-84-15)

BURNETT, Chairman, GOLDMAN, Vice Chairman, BURSLEY and ENGEN, Members, concurred in this recommendation. GROSE, Member, did not participate.

Patricia A. Goldman

By: Jim Burnett for
Chairman