

Log 1968



# National Transportation Safety Board

Washington, D.C. 20594  
**Safety Recommendation**

**Date:** May 11, 1987

**In reply refer to:** A-87-30 through -37

Honorable Donald D. Engen  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

Southern Air Transport's (SAT) LOGAIR 15 flight, a Lockheed L-382G, was cleared for takeoff from Kelly Air Force Base, Texas, on an instrument flight plan to Warner Robbins Air Force Base, Georgia, at about 0405 on October 4, 1986. Visual meteorological conditions prevailed. There were three flightcrew members aboard the military contracted domestic cargo flight operating under 14 CFR Part 121. All communications with the air traffic control tower were routine. Radar recorded that the airplane reached an altitude of about 700 feet above ground level. Witnesses reported an abnormally steep climb attitude followed by a turn and/or bank to the left, after which the airplane continued to roll to the left and struck the ramp area at about a 90° angle to the departure runway in a near-inverted attitude between two hangars and exploded. A severe ground fire ensued. All three flightcrew members were killed. 1/

In March 1985, a Transamerica Airlines (TIA) pilot report resulted in the replacement of the first officer's control column and the discovery of a broken base below the floor. A ramp inspection by a principal maintenance inspector (PMI) alerted the FAA to the occurrence. The use of an elevator control block in gusty or high wind conditions was suspected as the cause of the failure and the FAA directed TIA to initiate corrective action. As a result, TIA removed all elevator control blocks from their L-382 airplanes and prohibited their further use. Subsequent tests by Lockheed confirmed that the failure was consistent with the use of a mechanical restraint. This information was forwarded to the FAA's Atlanta Certification Office; however, the FAA did not issue either maintenance or operations bulletins to inform other operators of the potential hazards of restricting the control column. The Safety Board believes that the FAA should have acted on this information by disseminating a maintenance and operations bulletin to operators of L-382/C-130 airplanes apprising them of the safety hazards associated with the use of unauthorized control restraints.

Following the accident involving N15ST on October 4, 1986, the FAA issued a General Notice (GENOT) on October 9, 1986, cautioning against the use of elevator leveler/control block devices to hold the elevator in neutral position during loading operations. The GENOT also noted that pressure on the control column when such a

1/ For more detailed information, read Aviation Accident Report--"Southern Air Transport LOGAIR Flight 15 Lockheed L-382G Kelly Air Force Base, Texas, October 4, 1986" (NTSB/AAR-87/4).

restraint was in use could cause cracking in some control columns. The GENOT did not suggest a one-time inspection of control columns below the floor to determine if cracks may have already occurred. The Safety Board believes that such an inspection is warranted. As an additional step to correct this oversight in the GENOT, the Safety Board believes that an Airworthiness Directive (AD) should be issued to require a one-time inspection of control columns below the floor.

On November 6, 1986, the Safety Board spoke to the FAA's L-382 project manager who stated that the FAA did not plan to take any further action in the matter. The rationale was that the airplane had two control columns, thus providing redundancy; that such a failure could occur at any time requiring an inspection after each flight; and that the accident on October 4, 1986, at Kelly AFB was not the result of a control column failure.

While the Safety Board acknowledges that the accident of N15ST was not the result of a control column failure, it believes that the investigation revealed a safety deficiency which may be unknown to other L-382/C-130 operators in the United States and elsewhere. The Safety Board disagrees that an inspection would be required after each flight because if a carrier stopped using restraints of any kind there would be no need for any other inspections beyond the presently scheduled intervals. Redundancy notwithstanding, if the flying pilot of an airplane suddenly experienced a catastrophic control column failure in a critical phase of flight, the result could be the loss of control of the airplane from which recovery could conceivably be impossible. The Safety Board, therefore, believes that a one-time inspection below the floor to look for cracks in the bases of all control columns in L-382/C-130 airplanes is needed.

SAT did not provide any ground or flight training regarding the use of the elevator control block, although it was agreed that its installation and removal was commonly performed by a first officer. There were no elevator control blocks on the airplanes in which the first officer of LOGAIR 15 had obtained his training or his initial operating experience. His first opportunity to see the device was on October 2, 1986, when he served as first officer on N15ST on a flight from McClellan AFB, via Hill AFB, to Kelly AFB. The flight of N15ST to McClellan AFB was a noncargo flight; consequently, the elevator control block was not installed at McClellan AFB. En route, at Hill AFB, its installation would have been expected of the first officer, who probably was not aware of its existence. The Safety Board believes that it is highly probable that the first officer of N15ST was not aware of the elevator control block before the departure from Kelly AFB on October 4, 1986.

According to SAT's chief flight engineer, when not in use the elevator control block was supposed to be stored under the flightdeck bunk behind sliding wooden doors. The device, when in use on N15ST was commonly stowed on the cockpit floor on the right side of the first officer's seat. It should be noted that the cockpit floor in that location was lower than the base of the metal shroud and the flight control column and, while not a prudent place to store the device, it did not pose an immediate hazard to flight safety in that location.

The arriving first officer said that he installed the elevator control block before leaving the airplane on October 4, 1986. Neither he nor any of the other arriving flightcrew mentioned its installation to the departing flightcrew, nor were they required to do so. The cockpit thunderstorm lights provide excellent illumination in the cockpit; however, the elevator control block in N15ST was a relatively inconspicuous device.

According to the first officer of the previous flight, much of the original red paint had worn off and there was no longer a red "remove before flight" warning banner attached to make its presence more obvious. Consequently, it could have blended unobtrusively into the general cockpit environment. It would be possible to gain access to the pilot seats with the small elevator control block installed.

The Safety Board believes that the nonapproved elevator control blocking devices probably were developed by TIA's predecessor and by SAT, and subsequently used by TIA and SAT in the interest of flight safety to prevent damage to the elevator control surfaces during loading operations. However, without the simultaneous development of appropriate operational procedures, policies, and training in the use of such a tool, the potential safety hazards associated with its use were neither apparent nor corrected. If the air carriers who developed and used the devices had sought the approval of the FAA, appropriate procedures and cautions or warnings may have been developed. The Safety Board believes that the FAA should alert air carrier inspectors to the possible use of nonapproved tools by airlines which may pose potential hazards to flight safety.

Lockheed's Maintenance Manual cautions against restraining the control surfaces in gusty wind conditions since the hydraulic booster might be damaged. Built-in snubbers in the booster package prevent the controls from slamming into their stops. In the event of complete hydraulic fluid depletion it is recommended that contour type clamps be installed on the control surfaces. These cautions do not appear in Lockheed's Operations Manual, nor did they appear in TIA's or SAT's Flight Operations Manual (FOM) or Aircraft Operations Manual (AOM.) The installation and removal of the elevator control block was commonly performed by the first officer at SAT, not by maintenance personnel. Its purpose was not to serve as a gust lock against windy conditions, but only to fair the elevator to prevent damage during loading operations. In fact, its use in windy conditions was probably responsible for at least one control column failure at TIA. The Safety Board believes that an operational note, such as a caution against using restraints on the flight controls, should appear in the Operations Manual as well as in the Maintenance Manual.

Since Lockheed did not manufacture the elevator control block and did not recommend control restraints of any kind, except in the event of complete hydraulic fluid depletion, it was only by chance that they became aware of the use of an elevator control block by TIA in 1985. However, the Safety Board believes that Lockheed should have issued a service bulletin advising all operators of L-382/C-130 airplanes about the safety hazards associated with the use of unauthorized control restraints when it came to their attention. Lockheed engineering staff has advised the Safety Board that they would be in favor of an FAA Advisory to operators who had ever used restraints to perform a one-time inspection of control column bases below the floor.

The Safety Board believes that the cautions found in Lockheed's Maintenance Manual regarding flight control restrictions should be reiterated in their Operations Manual and that the addition should be circulated to all operators of L-382/C-130 airplanes.

FAA's Miami Flight Service District Office (FSDO) 65 had the certificate responsibility for SAT. The minimum number of inspections required by the National Required Inspection Program for the airline was exceeded by the Miami FSDO. However, the requirement does not specify that inspections be conducted of each type of airplane operated by an airline, but only of the carrier itself. Consequently, while there were several operational en route inspections of SAT's Boeing 707 fleet, there were none

conducted on SAT's L-382 airplanes. The Safety Board believes that the FAA should establish a minimum number of inspections for each type of airplane in an air carrier's fleet.

SAT's principal operations inspector (POI) had been assigned that duty during an 8-month period when he was required to devote the majority of his time to the certification of another airline under the jurisdiction of another FSDO. Until about August 1986, he was unable to devote more than about 5 percent of his time to the direct surveillance of SAT, since he was also the POI for Arrow Air and devoted about 20 percent of his time to the surveillance of that airline. While the Safety Board does not believe that this contributed directly to the accident, it does believe that the FAA should provide for the continuing direct supervision of 14 CFR Part 121 air carriers when the POI is occupied with other duties for extended periods of time.

As a result of its investigations of the August 25, 1985, accident in Auburn, Maine; the September 23, 1985, accident in Grottoes, Virginia; and the March 13, 1986, accident in Alpena, Michigan, 2/ the Safety Board issued Safety Recommendation A-86-111 to the FAA:

Develop and issue guidelines to air carrier district offices to provide for a minimum level of continual direct surveillance of commuter air carrier operators when the principal operations inspector is occupied with other duties for extended periods of time.

On January 8, 1987, the FAA responded to A-86-111 stating that a memorandum to the regional flight standards division managers will be issued which will direct them to provide a minimum level of direct surveillance to assigned commuters when the POI is absent for an extended period of time. The status of this recommendation is "Open—Acceptable Action."

The Safety Board believes that similar actions should be taken by the FAA regarding the oversight of 14 CFR Part 121 air carrier operators.

The Safety Board appreciates the latest efforts of the FAA to alleviate substandard surveillance problems. In February 1984 they embarked upon an in-depth review of the entire flight standards inspection system. According to the FAA the review, entitled Project SAFE (Safety Activity Functional Evaluation), encompassed a forecast of increased aviation activity under deregulation, the National Air Transportation Inspections (NATI-I and II), the General Aviation Safety Audit (GASA), and an evaluation of existing regulations, directives, programs, and studies and reports concerning flight standards inspection programs. The elements of the flight standards system which received critical appraisal included regulations, directives, work programs, program management information, industrial safety findings, evaluation programs, budget, resources, position descriptions, classifications, hiring practices, career development, training, and supervisory evaluation. Deficiencies identified by Project SAFE have been

2/ For more detailed information, read Aircraft Accident Reports--"Bar Harbor Airlines Flight 1808, Beech B-99, N300WP, Auburn-Lewiston Airport, Auburn, Maine, August 25, 1985" (NTSB/AAR-86/06); "Henson Airlines Flight 1517, Beech B-99, N339HA, Shenandoah Valley Airport, Grottoes, Virginia, September 23, 1985" (NTSB/AAR-86/07); and "Simmons Airlines Flight 1746, Embraer EMB-110P1, Phelps Collins Airport, Alpena, Michigan, March 31, 1986" (NTSB/AAR-87/2).

addressed in an implementation plan with a blueprint for short-term and long-range changes. The FAA has set targets in its implementation plan to update each part of the flight standards system by fiscal year (FY) 1988 and by FY 1989, to standardize and integrate the parts into an automated, interactive system for updating and documenting FAA performance.

The SAFE program is in its early stages and it will be a considerable period of time before measurable benefits can be derived and evaluated. The Safety Board believes that the findings of this accident warrant the development of more timely interim procedures and guidelines which will allow for continued surveillance of carriers during periods when the POI is unable to fulfill those duties because of other work demands.

SAT's POI was not rated in the L-382. Therefore, he turned over the responsibility for the review of SAT's revised AOM and Abbreviated Checklist to another POI at FSDO 65 who was rated in the airplane. The rated/reviewing FSDO 65 POI had recently left military service and was not familiar with the elevator control block. When reference was made to it in the Expanded Checklist, it simply ". . . did not ring a bell." The Safety Board believes that the FAA should strongly consider a mandatory requirement for its POIs to be rated in the category and class of all aircraft operated by the carrier for which the POI has certificate responsibility.

As a result of its investigation of the September 6, 1985, accident involving a Midwest Express DC-9 at Milwaukee, Wisconsin International Airport 3 the Safety Board issued Safety Recommendation A-87-10 to the FAA:

Require principal operations inspectors of 14 CFR 121 certificate holders to have training and experience commensurate with the air carrier involved, including a comparable type rating (e.g., turbojet powered transport category) in the category and class of aircraft to be used by the certificate holder.

The status of this recommendation is "Open—Awaiting Reply."

The Safety Board believes that the circumstances of this accident further emphasize the need for upgrading the qualifications and experience levels of POIs.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive requiring an immediate one-time inspection below the floor for cracks in the bases of control columns in all Lockheed L-382 airplanes. (Class II, Priority Action) (A-87-30)

Issue a Bulletin to air carrier principal operations inspectors and principal maintenance inspectors to be alert to the possibility of nonapproved equipment and tools such as flight control restraints, which may be in use by operations or by maintenance personnel and which may pose a potential hazard to flight safety. (Class II, Priority Action) (A-87-31)

3 For more detailed information, read Aircraft Accident Report—"Midwest Express Airlines, Inc., Douglas DC-9-14, N100MC Milwaukee, Wisconsin, September 6, 1985" (NTSB/AAR-87/01).

Require Lockheed to reiterate in their L-382/C-130 Aircraft Flight Manuals the CAUTION found in L-382/C-130 Aircraft Maintenance Manuals regarding the use of flight control restraints. (Class II, Priority Action) (A-87-32)

Notify foreign certification authorities about the circumstances of this accident and suggest appropriate remedial action. (Class II, Priority Action) (A-87-33)

Amend the National Required Inspection Program to require a specified number of en route inspections for each type of aircraft operated by an air carrier. (Class II, Priority Action) (A-87-34)

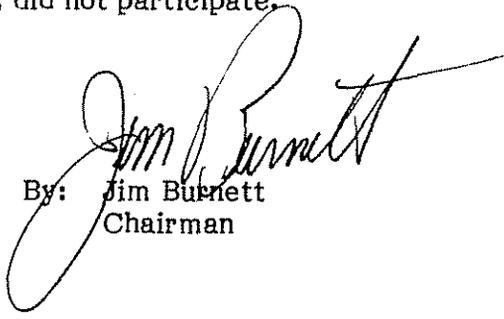
Develop and issue guidelines to Air Carrier District Offices to provide for a minimum level of direct surveillance of air carrier operations when the principal operations inspector is occupied with other duties for extended periods of time. (Class II, Priority Action) (A-87-35)

Notify the Department of Defense of the circumstances of this accident and suggest appropriate corrective actions to be directed to military users of Lockheed C-130 airplanes. (Class II, Priority Action) (A-87-36)

Research in cooperation with Lockheed past loading incidents in which L-382/C-130 elevators have been damaged with a view toward developing positive corrective measures to eliminate the problem. (Class II, Priority Action) (A-87-37)

BURNETT, Chairman, and LAUBER and NALL, Members, concurred in these recommendations.

PATRICIA A. GOLDMAN, Vice Chairman, did not participate.

  
By: Jim Burnett  
Chairman