



Loyt
2623A SR-1

National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: December 20, 1996

In reply refer to: A-96-172 and -173

Mr. Lewis Jordan
Chief Executive Officer
ValuJet Airlines, Inc.
1800 Phoenix Boulevard
Suite 126
Atlanta, Georgia 30349

About 1620 central standard time, on January 7, 1996, a Douglas Aircraft Company (Douglas) DC-9-32, N922VV, operated by ValuJet Airlines, Inc., as flight 558, touched down hard in the approach light area short of runway 2R at the Nashville International Airport in Nashville, Tennessee. Flight 558 was operating under the provisions of Title 14 Code of Federal Regulations (CFR) Part 121, as a scheduled, domestic passenger flight from Atlanta, Georgia, to Nashville. The flight departed the William B. Hartsfield Atlanta International Airport at approximately 1540, with five crewmembers and 88 passengers on board. The flight attendant who occupied the rear cabin jumpseat and four passengers reported minor injuries; no injuries were reported by the remaining 88 occupants. The airplane sustained substantial damage to the tail section, nosegear, aft fuselage, flaps, slats, and both engines. Visual meteorological conditions (VMC) prevailed for the flight, which operated on an instrument flight rules (IFR) flight plan.

The National Transportation Safety Board determined that the probable cause of this accident was the flightcrew's improper procedures and actions (failing to contact system operations/dispatch, failing to use all available aircraft and company manuals, and prematurely resetting the ground control relay circuit breakers) in response to an in-flight abnormality, which resulted in the inadvertent in-flight activation of the ground spoilers during the final approach to landing and the airplane's subsequent increased descent rate and excessively hard ground impact in the runway approach light area.

Contributing factors in the accident were ValuJet's failure to incorporate cold weather nosegear servicing procedures in its operations and maintenance manuals, the

incomplete procedural guidance contained in the ValuJet quick reference handbook, and the flightcrew's inadequate knowledge and understanding of the aircraft systems.¹

Before the flight, the captain of flight 558 had conducted the routine preflight walkaround inspection of the airplane. During this inspection, the captain observed that the nosegear shock strut appeared to have normal extension. However, according to Douglas representatives, visual inspection for proper nosegear strut extension by flightcrew members cannot be relied upon to detect underserviced/underinflated nosegear struts. The Safety Board concludes that such preflight visual inspections by flightcrews cannot be relied upon to detect underserviced/underinflated nosegear struts and that more frequent and detailed maintenance inspections of the nosegear shock strut should be included in cold weather maintenance procedures.

The Safety Board notes that numerous airlines follow specific maintenance procedures for cold weather protection and servicing of the nose landing gear, typically following the additional cold weather servicing practices recommended in the DC-9 maintenance manual. However, ValuJet's maintenance manual had not been revised or amended in accordance with the manufacturer's recommended cold weather nosegear servicing procedures. Although ValuJet's route structure involved primarily southern locations that do not normally experience severe cold weather, ValuJet does operate its airplanes in areas where they can be exposed to cold weather conditions. The scope and range of jet travel and the unpredictable nature of weather systems are such that no airline operating in the continental United States can safely consider its aircraft exempt from any such weather extremes. The Safety Board concludes that ValuJet Airlines and the FAA should have recognized the possibility of airplanes being exposed to cold weather conditions and the potential nosegear problems from such exposure, and ValuJet should have developed cold weather nosegear servicing procedures similar to those in the DC-9 maintenance manual to address these problems.

Accordingly, the Safety Board believes that ValuJet should develop, immediately, a more extensive and accurate winter operations manual, with corresponding adjustments to maintenance procedures, to reflect the manufacturer's cold weather nosegear servicing procedures.

Another area in which the Board found that ValuJet's procedures and practices needed improvement was in ValuJet's crew resource management (CRM) training. ValuJet initiated a 2-day CRM training course in January 1995 and that both the captain and first officer of flight 558 had completed this training. The Safety Board is concerned that the ValuJet CRM course may have only provided an overview of cockpit resource management, without thoroughly teaching the concept of total, integrated crew resource management. Pilots who possess an operational awareness of integrated crew resource management practices would likely understand the value of communicating with

¹ For more detailed information, read Aircraft Accident Report—"Ground Spoiler Activation in Flight/Hard Landing, ValuJet Airlines Flight 558, Douglas DC-9-32, N922VV, Nashville International Airport, Nashville, Tennessee, January 7, 1996" (NTSB/AAR-96/07)

operations/dispatch and flight attendants, and of accessing the more detailed procedural and systems information available to them in the AOM.

Although the pilots did not brief the flight attendants about the irregularity and its possible ramifications during the go-around, the pilots indicated that the omission was the result of the limited time available to them during the go-around. Records indicate that the pilots had approximately 6 minutes between the hard landing on runway 2R and their touchdown on runway 31. According to the CVR transcript, approximately 15 seconds before the airplane touched down on runway 31, the first officer stated "...[we] should've braced them in the back." The flightcrew's failure to discuss the irregularity and its possible ramifications with the flight attendants is further evidence of insufficient adherence to the accepted principles of crew resource management training.

Although the direct communication and coordination between the captain and first officer were not an issue in this accident, the Safety Board concludes that the pilots' failure to communicate with and utilize some of the other resources available to them (such as the more detailed written procedural guidance located in the AOM, or in-flight maintenance advice through ValuJet system operations/dispatch in Atlanta or from contract maintenance personnel in Nashville) raises questions about the effectiveness of the CRM training provided. Therefore, the Safety Board believes that ValuJet should clarify for all flightcrews the importance of referencing all available crew reference documents and consulting with company maintenance personnel (time permitting) to resolve in-flight abnormalities before committing a flight to landing.

Therefore, as a result of its investigation of this accident, the National Transportation Safety Board recommends the following to ValuJet Airlines:

Develop, immediately, a more extensive and accurate winter operations manual, with corresponding adjustments to maintenance procedures, to reflect the manufacturer's cold weather nosegear servicing procedures. (A-96-172)

Clarify for all flightcrews the importance of referencing all available crew reference documents and consulting with company maintenance personnel (time permitting) to resolve in-flight abnormalities before committing a flight to landing. (A-96-173)

Also as a result of its investigation, the Safety Board issued Safety Recommendations A-96-166 through -171 to the Federal Aviation Administration.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "...to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken

or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendations A-96-172 and -173 in your reply.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these recommendations.

By: 
Jim Hall
Chairman