



# National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

Date: February 23, 1994  
In reply refer to : A-94-35

Honorable David R. Hinson  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

On March 13, 1993, while on approach to O'Hare International Airport, Chicago, Illinois, the flightcrew of a USAir Fokker F-28-MK-0100 (Fokker 100) could not get a nose landing gear "down-and-locked" indication. Alternate landing gear extension procedures also failed to provide a nose gear down-and-locked indication. Airport control tower personnel visually examined the airplane and informed the crew that the nose gear appeared to be extended. The cabin crew was informed of the situation, and a landing was performed on runway 4R. At the end of the landing roll, as the airplane came to a stop, the nose landing gear collapsed. The passengers exited the airplane through the forward cabin door via a step ladder, and none were seriously injured. The incident was investigated by the National Transportation Safety Board (NTSB), the Federal Aviation Administration (FAA), USAir, and Fokker Aircraft BV.

As the airplane was removed from the runway, pieces of ice fell from the area of the nose landing gear, and the nose landing gear fell to the extended position. Inspection of the landing gear extension/retraction mechanisms revealed that the spring-loaded nose gear downlock plunger was frozen in the unlocked position. A screwdriver was used to chip ice away from the plunger. As the ice was removed, the plunger popped up into the locked position.

The nose gear downlock mechanism on the Fokker 100 incorporates a spring-loaded downlock plunger, which engages a bracket to lock the nose gear in the down position. A nose gear retraction actuator unlocks the plunger through a mechanical linkage. Sensors are used to monitor the position of the downlock plunger.

A review of the design of the nose gear downlock mechanism indicates that the nose gear downlock plunger in the nose wheel well is susceptible to ice contamination. The nose landing gear doors remain open at all times when the landing gear is extended. This allows precipitation to enter the wheel well area. The mechanism's exposure to ice increases the potential for failures such as that experienced by the incident airplane. The Safety Board believes that the potential for failure of the nose

landing gear as a result of icing requires design modifications to the system to preclude additional failures, aircraft damage, and potential injuries.

The weather conditions prevailing in Charlotte when the airplane departed were a major factor in the amount of snow and ice found in the airplane's nose landing gear wheel well after landing in Chicago.

According to information from the National Weather Service and the Charlotte/Douglas International Airport Director's Office, at least one inch of wet snow and slush was on the departure runway 22 minutes prior to the airplane's departure from Charlotte, North Carolina. Information provided to the flightcrew when they were dispatched indicated only that the runway surfaces were wet. The acting station manager did not inform the USAir dispatcher of the airport surface conditions or enter the information into the USAir computer system.

USAir's procedures for takeoff on a contaminated runway state that a takeoff should not be attempted when, "standing water, slush, or wet snow is between 1/4 inch to 1/2 inch and covers an appreciable portion of the runway unless the Captain and the System Control Center approve the operation" or "the average depth of standing water, slush, or wet snow covering an appreciable portion of the runway is in excess of 1/2 inch."

USAir's procedures for determining runway conditions and relaying runway condition reports are outlined in its Customer Services Training Document, "Penalizing Runway Conditions." This document states, in part:

The station is responsible for entering all weather related Field Conditions (FC) information, along with ramp and gate NOTAMS in the Computerized Weather Program, and the weather related runway conditions in the Computerized Takeoff Weight Program.

The acting station manager at Charlotte did not follow established USAir procedures that required reporting the current conditions to USAir dispatch and the captain of the flight. If the information had been provided, either all operations to and from the airport may have been canceled or a discussion should have taken place between dispatch and the Captain regarding the operation of the flight under the inclement field conditions. The Safety Board believes that USAir should conduct recurrent training for all station personnel who have the responsibility for determining airport surface conditions. The USAir training/reference document entitled "Penalizing Runway Conditions (Annual Review of the Operations Departure Control Computer Entries for All Stations) could be used as the basis for this training.

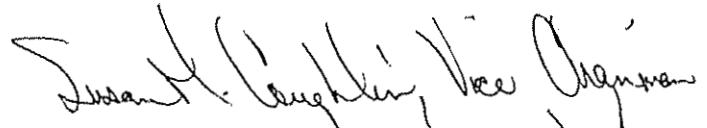
As a result of the investigation of this incident, the Safety Board believes that operating the Fokker 100 in freezing precipitation conditions can be made safer.

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

Issue an airworthiness directive pertaining to the Fokker 100 to require the installation of a system or device to prevent ice from rendering the nose gear downlock system inoperable. (Class II, Priority Action)(A-94-35).

Also as a result of its investigation, the Safety Board issued Safety Recommendation A-94-36 to USAir Group, Inc.

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HAMMERSCHMIDT, and HALL concurred in this recommendation.

  
By: Carl W. Vogt  
Chairman