National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation H-90-22-23

Date: April 4, 1990

In reply refer to: A-90-49 and -50

Honorable James B. Busey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On October 21, 1988, at 1753 local time, a Piper PA-28RT-201, N8291Z, crashed into a mountain ridge about 10 miles northwest of the Frederick Municipal Airport, Frederick, Maryland.[1] The pilot had been cleared by controllers at the Baltimore Terminal Radar Approach Control (TRACON) for an instrument landing system (ILS) approach to runway 23 although the pilot was not receiving radar service from the air traffic control (ATC) facility. A special weather observation taken at the Frederick Airport about 33 minutes before the accident reported marginal visual meteorological conditions with light rain and fog, although other pilots who had landed at Frederick during this time estimated that the ceiling and visibility were lower than what was reported.

A review of recorded ATC radar data indicates that N8291Z began deviating off course shortly after crossing the Frederick VOR[2] while flying the outbound transition for the ILS. Although the outbound transition would have occurred on a northeasterly heading, the off-course deviation progressively worsened northwesterly until the airplane traveled over a mountain ridge where it crashed.

N8291Z had departed Lexington, Kentucky, on an instrument flight rules (IFR) flight plan to Frederick, Maryland. The flight operated without reported difficulties and was subsequently instructed to contact the TRACON at Dulles International Airport (Dulles) before being handed off to the TRACON at Baltimore-Washington International Airport (BWI), the controlling facility for Frederick Municipal. During the landline coordination at the time of the hand off, the BWI controller instructed the Dulles controller to clear N8291Z to the VOR at 4,000 feet and "...just terminate him cause we're

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[1]NTSB Field Accident Report BFO-89-F-A003, Brief No. 2245 (attached).

[2]Very high frequency omnirange station.

not going to get him on radar." Dulles then cleared N8291Z to descend to 4,000 feet and proceed direct to the Frederick VOR. The Dulles controller also advised N8291Z that radar service was terminated and instructed the pilot to contact Baltimore Approach Control. The pilot established radio contact with BWI and was cleared to the Frederick VOR and for the ILS approach to runway 23 at Frederick. The pilot was instructed to report when inbound on the ILS. About 8 minutes later, the pilot reported the procedure turn inbound. The controller again advised that radar service was terminated and issued a change to the advisory frequency. When the pilot of N8291Z acknowledged these instructions, the airplane was west of the ILS approach course and, in fact, had never been established either on the outbound or inbound course.

The Safety Board's investigation of this accident has identified several issues that require corrective action by the FAA. Specifically, these issues are related to the ability of the controllers at BWI TRACON to provide radar service to users at Frederick Municipal Airport and the process under which Flight Data Center (FDC) Notices to Airmen (NOTAMs) are disseminated.

Radar Coverage

After the accident, the Safety Board received continuous data recording (CDR) time sequence output tapes of radar data from both BWI and Dulles TRACONs. A review of these data revealed the following:

1. Dulles TRACON recorded a total of 177 radar returns between 1738:04 and 1754:08 that would have been displayed to the controller on the radar scope. It was during this period that N8291Z crossed the VOR, traveled west of the outbound course on a northerly heading, then turned to a westerly heading and crashed into the mountain ridge. The radar returns tracked N8291Z between 4,700 feet and 1,700 feet above mean sea level (msl).

2. BWI received only two radar returns on N8291Z: one at 1743:07 and the other at 1743:11, when the airplane was at an altitude of 3,900 feet and 3,800 feet, respectively. These two returns were received after N8291Z had crossed the VOR and was west of the outbound course.

3. Dulles received 39 minimum safe altitude warning (MSAW) alarms on N8291Z between 1742:56 and 1754:29. The alarms began when the airplane initiated its descent from 3,800 feet and continued until the last radar target was recorded at an altitude of 1,800 feet.

The Safety Board believes that the number of radar returns received by each ATC facility indicates that Dulles TRACON has better radar coverage for aircraft on the approach to the Frederick Municipal and west of the airport than does BWI, although BWI is the controlling facility for Frederick and has responsibility for providing ATC services in that area. The Safety Board

notes that radar data from an earlier accident also indicated that better radar coverage existed at Dulles. The earlier accident occurred October 26, 1986, at Mt. Pleasant, Maryland, northeast of the site where N8291Z crashed.

The lack of radar coverage at BWI not only affects the large number of general aviation airplanes that use Frederick Municipal Airport, but also the flight operations of Presidential aircraft. Frederick Municipal Airport is a designated relief facility for transporting the President to Camp David when weather conditions prevent Marine One from flying directly to the camp. At about 1530 local time on October 21, 1988, an advance airplane, a C-12 (King Air 200), which supports U.S. Presidential flight operations, arrived at Frederick. Air Force One (Gulfstream, G-III) followed and landed at 1730. In interviews with Safety Board investigators, the pilots of both flights stated they were surprised when they were cleared for the approach by controllers at the BWI TRACON and radar service was terminated at an altitude of 4,000 feet.

The Safety Board is aware that the FAA developed and implemented a reorganization of the northeast corridor airspace, known as the East Coast Plan, about 2 years ago. As a part of this reorganization, ATC services and responsibilities for both the Frederick Municipal Airport and Montgomery County Airpark, Gaithersburg, Maryland, were to be reassigned to Dulles TRACON because, it was believed, that Dulles had better radar coverage in these areas and therefore would be able to provide better service to those areas' users. The Safety Board understands, however, that because this transition would result in a loss of traffic count at BWI, thus causing BWI to be reclassified and possibly downgraded, this part of the plan was never implemented. The Safety Board notes that the Air Traffic Control Handbook, 7110.65F, paragraph 2-3, advises controllers to use radar separation in preference to nonradar separation when it will be an operational advantage. The Safety Board believes that the FAA should evaluate and accordingly designate control responsibility to the ATC facility that can provide the highest level of service to the users of the Frederick Municipal Airport in accordance with the provisions of the ATC Handbook.

Flight Data Center Notices to Airmen

The investigation of N8291Z also revealed a discrepancy pertaining to the dissemination of FDC NOTAMs. In March 1988, the Westminster VOR was removed from service after being struck by lightning. Because the Westminster VOR established the holding fix for the missed approach procedure for the ILS approach for runway 23, the FAA issued FDC NOTAM #8/657 (dated March 8, 1988) revising the missed approach procedure. In October 1988, the VOR was recommissioned; on October 11, 1988, the FAA issued FDC NOTAM #8/3518 to cancel #8/657. A Safety Board review of NOTAMs effective October 20 through November 3, 1988, disclosed that the first NOTAM was still published as being in effect. The contents page of the publication states, "NOTAM information current as of October 6, 1988." The Safety Board staff telephoned three flight service stations to check the status of the station's information; only one of the stations provided the correct NOTAM information. When personnel from the Flight Service Branch of the FAA Washington Headquarters were questioned regarding the dissemination of current NOTAM

information, they were unable to explain why the erroneous information was issued. Although the Safety Board acknowledges that this deficiency did not contribute to this accident, it believes that corrective action is necessary by the FAA to review the process under which FDC NOTAMs are disseminated.

As a result of its investigation of N8291Z, the National Transportation Safety Board recommends that the Federal Aviation Administration:

> Examine the areas of radar coverage that currently exist at the Dulles and Baltimore-Washington (BWI) TRACONS and their ability to provide radar service to users of the Frederick Municipal Airport and local area. After completing this evaluation, reassign that airspace to the Dulles TRACON or improve the existing radar coverage at the BWI TRACON so that either facility will be able to provide maximum service. (Class II, Priority Action) (A-90-49)
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> Review the dissemination process for Flight Data Center (FDC) Notices to Airmen (NOTAMs) so that this information is available in a more timely manner to all flight service stations. (Class II, Priority Action) (A-90-50)

KOLSTAD, Chairman, COUGHLIN, Acting Vice Chairman, LAUBER and BURNETT, Members, concurred in these recommendations.

By: James L. Kolstad
Chairman

National Trans tion Safety Board
Washings ., D.C. 20594

Brief of Accident

File No. - 2245 10/21/88 FREDERICK,MD A/C Reg. No. N8291Z Time (Lcl) - 1753 EDT

----Basic Information----
Type Operating Certificate-NONE (GENERAL AVIATION)
Type of Operation -PERSONAL
Flight Conducted Under -14 CFR 91
Accident Occurred During -APPROACH

Aircraft Damage
DESTROYED
Fire
ON GROUND

Injuries	Fatal	Serious	Minor	None
Crew	1	0	0	0
Pass	0	0	0	0

----Aircraft Information----
Make/Model - PIPER PA-28RT-201
Landing Gear - TRICYCLE-RETRACTABLE
Max Gross Wt - 2900
No. of Seats - 4
Eng Make/Model - LYCOMING IO-360-C1C6
Number Engines - 1
Engine Type - RECIP-FUEL INJECTED
Rated Power - 200 HP
ELT Installed/Activated - YES/NO
Stall Warning System - YES

----Environment/Operations Information----
Weather Data
Wx Briefing - FSS
Method - TELEPHONE
Completeness - FULL
Basic Weather - IMC
Wind Dir/Speed- 010/006 KTS
Visibility - UNK/NR
Lowest Sky/Clouds - UNK/NR
Lowest Ceiling - UNK/NR
Obstructions to Vision- FOG
Precipitation - RAIN
Condition of Light - DAYLIGHT

Itinerary
Last Departure Point
LOUISVILLE,KY
Destination
FREDERICK,MD

ATC/Airspace
Type of Flight Plan - IFR
Type of Clearance - IFR
Type Apch/Lnds - ILS-COMPLETE

Airport Proximity
OFF AIRPORT/STRIP

Airport Data
FREDERICK
Runway Ident - 23
Runway Lth/Wid - 5220/ 100
Runway Surface - N/A
Runway Status - N/A

----Personnel Information----
Pilot-In-Command
Certificate(s)/Rating(s)
PRIVATE
SE LAND
Instrument Rating(s) - AIRPLANE

Age - 36
Biennial Flight Review
Current - YES
Months Since - 9
Aircraft Type - PA-28RT

Medical Certificate - EXPIRED

Flight Time (Hours)			
Total -	348	Last 24 Hrs -	6
Make/Model-	348	Last 30 Days-	UNK/NR
Instrument-	59	Last 90 Days-	19
Multi-Eng -	0	Rotorcraft -	0

----Narrative----
DRG ARR, DULLES APCH CTL (IAD) CLRD FLT TO FREDERICK TVOR (FDK) AT 4000' & TRMTD RADAR CTL WITH HANDOFF TO BALTIMORE APCH CTL (BWI). FLT WAS CLRD FOR ILS RWY 23 APCH & TOLD TO RPRT IBND ON APCH. PROC FOR APCH WAS TO FLY OBND ON FDK 048 DEG RADIAL TO RICKE INT/OM, MAKE PROC TURN (MIN ALT 2300'), RTRN TO OM ON ILS COURSE (HDG 229 DEG, MIN ALT 1600') & INTERCEPT GLIDE PATH. HOWEVER, FLT DEPD FDK ON NORTHERLY & SOMEWHAT ERRATIC COURSE. BWI DID NOT HAVE POSITIVE RADAR CTC (RCVD ONLY 2 RTRNS DRG ARR & NO RTRNS BLO 3800'). ABEAM RICKE INT/OM, ACFT MNVRD (AS IF IN A PROC TURN), AS IT WAS TURNING BACK TWD FDK, PLT RPRTD 'PROC TURN IBND, RWY 23' & WAS CLRD TO ADZY FREQ (NO FURTHER RDO CTC WITH ACFT). ACFT THEN TURNED WEST. AFTER MNVRG ABT 8 MIN, IT HIT MTS ABT 7 MI NW OF ARPT (ELEV 1700') ON HDG TWD FDK. IAD HAD RADAR CTC & MIN SAFE ALT WARNING (MSAW) OCCURRED BFR ACDNT. IAD CTLR DIDN'T TRY ALERTING BWI OR PLT, BUT MSAW WAS AFTER PLT WAS CLRD TO ADZY FREQ. CANCELED NOTAM STILL ISSUED AS ACTIVE, BUT FDK WAS PLT'S HOME BASE.

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Occurrence #1 IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation APPROACH - IAF TO FAF/OUTER MARKER (IFR)

Finding(s)
1. NOTAMS - INACCURATE - ATC PERSONNEL(FSS)
2. WEATHER CONDITION - LOW CEILING
3. WEATHER CONDITION - FOG
4. WEATHER CONDITION - RAIN
5. APPROACH CHARTS - INACCURATE
6. IFR PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND
7. BECAME LOST/DISORIENTED - INADVERTENT - PILOT IN COMMAND
8. RADAR,APPROACH/DEPARTURE - INADEQUATE
9. TERRAIN CONDITION - MOUNTAINOUS/HILLY
10. PROPER ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND

----Probable Cause----

The National Transportation Safety Board determines that the Probable Cause(s) of this accident is/are finding(s) 6,10

Factor(s) relating to this accident is/are finding(s) 2,3,4,7,8,9