



Anatomy of a Mountain Crash: Error Chain Leads to Tragedy

When the captain decided to take off under visual flight rules (VFR) despite low ceilings and fog-shrouded mountainous terrain, he left too little room for error.

—
by
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On Dec. 11, 1991, a Beechjet (Be 400) aircraft, owned by Bruno's Inc., a chain of supermarkets and related stores, slammed into a mountain summit near Rome, Georgia, U.S., shortly after takeoff. The crash killed the two pilots and seven corporate executives aboard for an annual Christmas tour of Bruno's facilities.

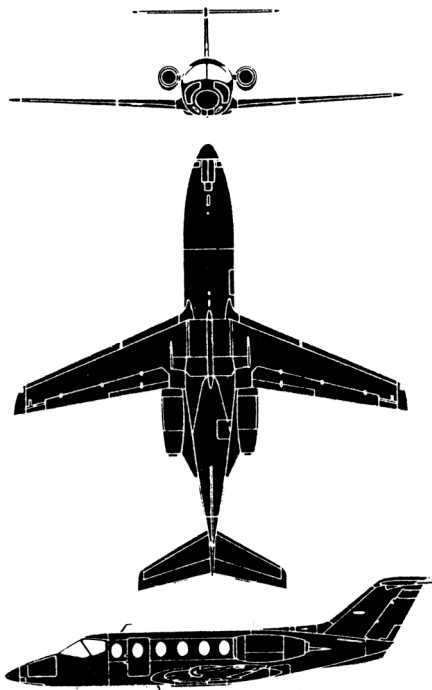
The aircraft had stopped briefly at Rome and was to continue on to Huntsville, Alabama, a flight of some 15 minutes, where the passengers would be driven to 11 Bruno facilities between Huntsville and Birmingham.

According to a recent U.S. National Transportation Safety Board (NTSB) report, the captain filed an instrument flight rules (IFR) flight plan before departure for the 80-nautical-mile flight to Huntsville and the return to Birmingham. He estimated departure from Rome at 0915. Flight time was estimated at 15 minutes and there was sufficient fuel for two hours of flight.

The passengers returned to the airport about 0925. According to a driver who transported the passengers to the airport, several of them had discussed the possibility of seeing a potential site during the flight for a Bruno's facility in Rome. (There was no evidence of that activity after the aircraft was airborne.) Employees of the fixed base operator (FBO) overheard several passengers comment about trying to maintain a schedule and one passenger reportedly told another that there was no time for him to browse at the FBO shop because the flight had to depart quickly.

The aircraft was equipped with a cockpit voice recorder (CVR), which indicated that the airplane's engines were started at 0930. Shortly thereafter, the captain told the first officer (who was the pilot flying) that, given the prevailing weather conditions, "We could run out under the edge but there's no edge anymore."

The takeoff commenced at 0937 under visual flight rules (VFR). No reference was made by either pilot to a checklist or pre-takeoff and departure briefings. In addition, no reference was made by either pilot to a sectional chart used for navigation under VFR.



The Beechjet Be400

The Beechjet was originally manufactured in component form in Japan and assembled as the Mitsubishi Diamond in Texas. The twin-engine executive Diamond I first flew in 1978 and was followed by the upgraded Diamond IA. A Diamond II version, with improved payload and performance, first flew in 1984. In 1985 the Beech Aircraft Corp. acquired the Diamond II program and renamed it the Beechjet. It is now manufactured in the United States. The eight-passenger Beechjet has a range of 1,930 nautical miles and a cruising speed of 388 knots an hour.

At takeoff time, weather was reported as 1,000 feet overcast, visibility 10 miles. The level of the cloud ceiling obscured the tops of nearby terrain that exceeded 1,600 feet mean sea level (MSL) elevation.

At 0937:13, the captain contacted the Atlanta Air Route Traffic Control Center (Atlanta Center) to advise that the flight had just departed Rome, was flying under VFR and was “looking for a clearance over to Huntsville.” Atlanta Center told the flight to maintain VFR because “we have traffic four and five right now southeast of Rome. We will have something for you later.” At 0939:14, Atlanta Center asked the crew to report their altitude. The response was, “We’re at thirteen hundred VFR, just southwest of Rome airport.”

At 0939:39, the captain advised the first officer, “We’re

gonna have to get away from that mountain down there pretty soon.” At 0939:52, he told the first officer: “You’re getting close. You’re gonna (have to) go to the right.” The first officer responded that he could not “see over there.” The captain then stated that if they maintained their present course, they could run into an airplane on approach to Rome and pointed out that there was a mountain in one direction and an antenna in another that would be hidden by fog.

The first officer then asked the captain if he should “just punch up,” (which the NTSB described as flying through the cloud layer to reach visual conditions without air traffic control clearance). According to the NTSB, the pilots should have been aware of the approximate altitude of the tops of clouds (2,000 feet MSL according to another pilot who had landed about the time of the accident) because they had arrived at Rome about an hour before the accident flight. The captain told the first officer not to fly through the cloud layer because of their proximity to the airplanes that were on approach to Rome.

At 0940:07, the captain directed the first officer to fly “back to the right” and the first officer stated: “I can’t see over here. That’s why I wanted to go the other way.” The CVR transcript indicates that the pilots recognized that the airplane was close to obscured terrain. The CVR stopped recording at 0940:55.

At 1033, a person notified the airport that he had seen a plume of smoke near the 1,701 MSL foot summit of Mt. Lavender. Rescuers located the wreckage about six miles west of the airport. It was destroyed and everyone on board had been killed. Post-mortem examinations showed that all were killed by blunt force trauma associated with the accident.

According to the NTSB, the captain, age 59, held an airline transport pilot (ATP) certificate and had an estimated 16,350 total flight hours (with about 850 hours in the Be400), all in the company airplane. Records showed no training or performance problems, and U.S. Federal Aviation Administration (FAA) records showed no violations, accidents or incidents.

Pilots who had flown with the captain before his employment with Bruno’s commented favorably on his flight operating practices and others stated that he did not feel pressured by Bruno’s to engage in unsafe flight operating practices. “He [the captain] had mentioned to a close acquaintance that he believed that the first officer occasionally paid unnecessary attention to checklists,” the report said. The captain reportedly said that he did not believe that it was necessary to read the airplane checklist verbatim “because he had considerable experience in the airplane.”

However, several pilots who had flown with the captain during his employment at Bruno's had observed him performing what they considered questionable practices, the NTSB report said. "One pilot noted that the captain did not conduct departure briefings and, on occasion, would fly through or very close to thunderstorms. The captain was also observed to fly below decision height without having the runway or its associated lighting or markings in sight."

A pilot who had flown as first officer with the captain believed that the captain "did not have a complete understanding of U.S. Federal Aviation Regulations (FAR)."

The NTSB report added: "He saw the captain cancel his IFR flight clearance and descend through clouds to locate an airport and, on another occasion, he saw the captain descend below decision height before identifying the runway. Another pilot said that the first officer told him that the captain had occasionally flown with less than the minimum required fuel load on board the airplane."

The first officer, age 27, possessed an ATP certificate and had accrued an estimated 3,100 total flight hours of which 850 hours were in the Be 400, all in the company aircraft. No training or performance difficulties were noted and there was no record of FAA enforcement actions, driver's license suspensions or arrests.

Pilots who flew with the first officer regarded him highly and described him as a serious pilot who "went by the book." According to family members and fellow pilots, the first officer disapproved of aspects of the captain's piloting and independently told NTSB investigators that the first officer had complained to an executive at Bruno's "that the captain was operating the airplane in violation of FAR and in disregard of good operating practices." According to their testimony, the executive did not support the first officer and told him that he was satisfied with the captain's performance. When questioned by the NTSB, the executive denied receiving the complaints from the first officer.

Several of the pilots said that the first officer had discussed with them the possibility of anonymously reporting the captain's alleged violations to the FAA. However, he was described as reluctant to report the captain because, as first officer with the captain when the violations were alleged to have occurred, he feared that the FAA could then charge him with violating a rule. Moreover, if he was to be considered for employment as a pilot with an airline, an apparent goal of his, he was concerned that he might be rejected

in reprisal for reporting a fellow pilot to the FAA.

According to the NTSB, the captain elected to depart Rome under VFR at a time when, as he knew or should have known, the ceiling obscured the tops of nearby terrain in all quadrants, leaving only a few miles in which he could legally and safely fly VFR.

After departure, the crew attempted to avoid the two aircraft that were on approach to the Rome airport while trying to remain clear of the clouds and the terrain. Given the hazards that the conditions presented, the most prudent course of action the captain could have selected after departure would have been to return to the airport. Continuing flight in such conditions only exacerbated his initial mistake of departing VFR before obtaining an IFR clearance.

If the captain had requested an IFR clearance from Rome to Huntsville, air traffic control rules would have required that the airplane depart within a specified five-minute period. But if the passengers did not return in time to allow a departure within this period, the clearance would then have to be voided. If the captain had then attempted to obtain a second clearance from Rome it is likely (because other aircraft were present in the non-radar environment) that he would have encountered a delay. Thus, the NTSB concluded that the captain may have believed that the only way to quickly leave Rome was to depart under rules that would not have required a departure clearance, i.e., VFR, and attempt to proceed to Huntsville while trying to receive the clearance aloft.

Given his awareness of the passengers' busy schedule, this explanation appears to characterize the actions of the captain. In fact, the NTSB said the aircraft took off 22 minutes after the departure time that the captain had given when he filed the IFR

flight plan, just over 10 minutes after the passengers had returned to the airport.

There was no evidence that the captain attempted to overfly Bruno's facilities near Rome or that he was pressured by the passengers to depart when they returned to the airport. To the extent that he could, he may have sought only to facilitate the passengers' adherence to a schedule that called for 11 site visits after landing at Huntsville. However, the NTSB believed that given the terrain and meteorological conditions, the captain should have been willing, in the interest of safety, to forgo flexibility in the departure time and request an IFR clearance to depart from Rome. The CVR indicated that the

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captain intended to fly just below the cloud layer until the requested clearance could be obtained. This type of flight operation, commonly called “scud running,” is a highly dangerous operation in any environment, particularly a mountainous one.

The NTSB found no evidence to indicate that the crew was using a sectional chart and that this compromised the crew’s ability to operate the airplane safely in the existing conditions. Comments on the CVR indicated that neither pilot was aware of the exact location of terrain and their proximity to it during the flight.

Corporate officials, the NTSB said, often have little knowledge and understanding of the need for rigorous adherence to FAR and depend on company pilots to maintain flight safety standards. With little FAA oversight of flights operating under FAR Part 91, corporate flight operations often depend on the pilot’s knowledge and interpretation of the FAR to provide a safe foundation to guide operations, training and maintenance.

The captain’s behavior on this flight (according to NTSB conclusions and statements made to NTSB investigators) suggested that “he did not always employ good operating practices.”

Moreover, the NTSB’s evidence suggested that the first officer recognized this and may have attempted, unsuccessfully, to draw the attention of Bruno’s management to the alleged practices.

“In situations where a junior flight crew member (who is attempting to gain experience in sophisticated aircraft) is not supported by the corporate management in attempts to improve flight safety, that crew member has few options available other than to leave the corporation and, as a consequence, possibly risk delaying or giving up long-term piloting aspirations,” the NTSB said.

To encourage adherence to good operating practices among pilots of corporate owned and/or operated aircraft, and to enhance the ability of first officers of corporate aircraft to participate in the management of the cockpit, the NTSB recommended that the FAA (in conjunction with professional aviation associations and manufacturers of turbine-powered aircraft) inform corporate aircraft operators of the circumstances of this accident and encourage them to examine their flight operations to verify that policies and procedures are established to prevent such accidents and to “encourage first officers to play an active role in cockpit decision-making.”

The NTSB also recommended that the National Business Aircraft Association (U.S.) inform corporate aircraft operators of the circumstances of the accident to ensure as wide a distribution as possible to the corporate aviation community.

Based on its investigation, the NTSB made the following conclusions :

- There were no airplane-related abnormalities.
- Air traffic control was not a factor in this accident.
- The captain departed Rome under VFR despite the low ceilings and mountainous terrain.
- The crew was not aware of their precise location relative to the mountainous terrain.
- A ground proximity warning system (GPWS) would have alerted about 12 seconds before impact and would most likely have provided sufficient time for the pilots to have taken action to avoid the terrain.

[On April 20, 1992, an FAA rule took effect requiring that all turbine-powered aircraft with 10 or more passenger seats operating under Federal Aviation Regulation (FAR) Part 135 be equipped with an operating GPWS within two years. The NTSB noted that the Beech accident underscored the “need to equip all turbojet-powered airplanes with the GPWS, regardless of the regulation governing the conduct of the flight.” The NTSB has urged the FAA to require GPWS on all turbojet aircraft with six or more passenger seats operating under FAR Part 91.]

The NTSB determined that the probable cause of this accident was the captain’s decision to initiate visual flight into an area of known mountainous terrain and low ceilings and the failure of the flight crew to maintain awareness of their proximity to the terrain.

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Policies and Procedures Should Be Part Of Company Operations Manuals

The policies and procedures recommended by the NTSB would be most effective if included in company operations manuals and read by all crew members with the understanding that those company policies are inviolate. Given the Bruno captain’s attitudes and operational phi-

losophies, the written word may not have been sufficient, but there would be a legitimate cause for investigation had the stated policies been continually ignored.

Several deficiencies were identified by the NTSB that could have been addressed in an operations manual, including the following:

VFR vs. IFR flight plans. Many corporate operators do not permit their aircraft to fly unless an IFR flight plan has been filed. VFR flights in turbine-powered aircraft are discouraged even if there are mitigating circumstances that might indicate that such flights could be conducted safely. In those instances where VFR flights are permitted, corporate aviation managers often stipulate a number of conditions that the pilot-in-command must consider before flying under VFR.

In this accident, the cloud ceiling was 1,000 feet with 10 miles visibility. A specific statement outlining the conditions under which VFR flight could be initiated might have kept this captain on the ground until an IFR clearance was obtained.

Checklist use. The captain apparently did not care for the first officer's desire to read the airplane checklist verbatim. This may not be an unusual feeling among captains who have accumulated considerable time in the same aircraft and who usually fly with the same first officers. Familiarity with the airplane may contribute to a disregard of safe cockpit procedures, but accidents attributable to overlooking checklist items continue to occur. In itself, that suggests that a written policy making checklist use mandatory, no matter who is flying the airplane, is a positive safety measure.

Takeoff and departure briefings. Some corporate pilots may shorten these briefings in an attempt to save time. Some corporate operations require a full takeoff briefing for the first flight of the day and then stipulate a standard takeoff briefing for all subsequent takeoffs. That assumes that both pilots know what is in the briefing and that there are no unusual conditions apparent.

If cockpit resource management is to be effective, a complete takeoff briefing, no matter how tedious it may seem, is necessary to ensure that each pilot knows exactly what is expected of him or her. This is especially important if there are any conditions that could impact on the safety of the flight such as marginal weather or an event that would require aborting the takeoff.

If a takeoff briefing is important, so is an instrument

approach or pre-landing briefing, and those should also be made mandatory.

Sectional charts. The NTSB faulted the crew for not having a sectional chart used for navigation under VFR.

"Given the low ceiling and the high terrain, the Safety Board believes that both crew members failed to demonstrate good operating practice by attempting to circumnavigate obscured terrain without a sectional chart."

It can be argued that carrying all the sectional charts is an unnecessary burden. But if VFR flights are permitted, then a requirement for the appropriate sectional chart should be written into the policy manual. Corporate operating handbooks should list specifically what the aircrew

must have on board and a statement such as "aeronautical charts necessary for the type flight to be conducted" should be included.

The First Officer Sometimes Faces a Serious Dilemma

The young first officer on the flight found himself in a difficult position.

What should a first officer do when confronted with a captain who flagrantly ignores FAR and demonstrates unsafe flying practices? The NTSB said that there were few avenues open.

In a large corporate aviation department where there is a department manager or chief pilot, the first officer may have recourse by sharing concerns about safety to that person. This conversation is at least held with someone who understands cockpit management and discipline and there is a chance the situation can be modified.

In a small operation such as Bruno's, where only the captain and first officer composed the aviation department, taking the case to the corporate executive in charge of aviation may not accomplish much. The executive may know nothing about the cockpit environment, FAR or pilot age and, since that person may have hired the captain, complaints may be brushed aside.

But that does not leave the first officer without any options. One option would be to continue to fly with the captain but very guardedly. It takes courage for the first officer to assert himself in compromising situations. The captain must understand that the first officer's concern is

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for safety. Captains who have had cockpit resource management training would probably accept an assertive first officer as part of the team concept.

In this accident, the captain twice told the first officer (who was flying the airplane) to go to the right and twice the first officer responded that he could not "see over there." What should the first officer have done to assert himself with this captain?

If management refuses to act and compromises to flight safety continue, one has to consider whether to stay in that job. Job survival is important, but it is not worth the risk of death or serious injury.

It may be difficult to establish a company policy that provides for appropriate and legitimate complaints or discussion about flying practices. But adding cockpit resource management training for captains and first officers could create a better cockpit environment for both and avoid the need for what could be an unpleasant complaint procedure.

Schedule Demands Should Never Compromise Safety

The captain of the accident flight was aware of the passengers' itinerary and that may have influenced his decision to depart VFR. In this regard, his actions may have been commendable from the passengers' point of view in maintaining a schedule.

But, the captain as pilot-in-command could have taken a stand on delaying departure for safety reasons. Waiting for an IFR clearance would have been a proper decision that should have been acceptable to the passengers.

One role of corporate aircraft is to furnish on-demand transportation to satisfy corporate travel needs. Sometimes those needs are very demanding and the executives involved may be intolerant of delays and excuses. Nevertheless, it is the pilot-in-command who is responsible for the safety of the passengers and the company is dependent on that person's experience, wisdom and judgment to do the job.

Saying "no" to a schedule demand that cannot be met may be unpleasant but the end result may be worth much more than the time lost. ♦

About the Author

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