

Aircraft Accident/Incident Summary Reports  
Erie, Pennsylvania--October 14, 1984  
Albuquerque, New Mexico--February 11, 1985

(U.S.) National Transportation Safety Board  
Washington, DC

:30 Sep.86

U.S. Department of Commerce  
National Technical Information Service

PB86-910407

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# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C. 20594

## AIRCRAFT ACCIDENT/INCIDENT SUMMARY REPORTS

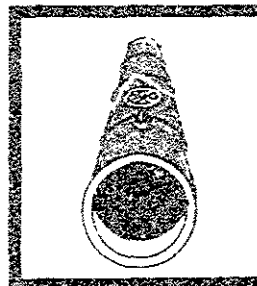
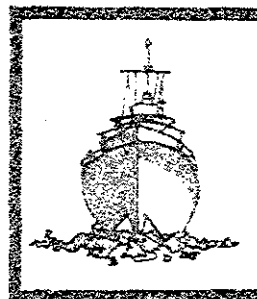
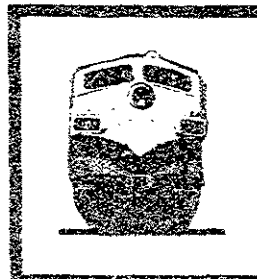
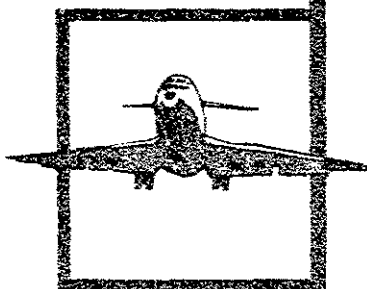
ERIE, PENNSYLVANIA -- OCTOBER 14, 1984

ALBUQUERQUE, NEW MEXICO -- FEBRUARY 11, 1985

NTSB/AAR-86/02/SUM

UNITED STATES GOVERNMENT

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**CONTENTS**

**ACCIDENT/INCIDENT SUMMARY REPORTS .. ..... 1**

**Erie, Pennsylvania**

**October 14, 1984..... 1**

**Albuquerque, New Mexico**

**February 11, 1985 ..... 9**



National  
Transportation  
Safety Board

Washington, D.C. 20594

# AIRCRAFT ACCIDENT/INCIDENT SUMMARY

File No.	5121
Aircraft Owner:	<b>USAir</b>
Aircraft Type, Registration:	McDonnell-Douglas, DC-9 <b>N965VJ</b>
Location:	Erie International Airport Erie, Pennsylvania
Date and Time:	October 14, 1984, 0409 eastern daylight time
Occupants on <del>Rack</del>	<b>Crew--6</b> <b>Passengers--71</b>
<b>Injuries:</b>	None
Aircraft Damage:	<b>Minor</b>
Other Damage:	<b>Minor Ground Damage</b>
Type of <b>Occurrence:</b>	<b>Off Runway Landing--</b> <b>Miscellaneous/Other</b>
Phase of Operation:	<b>Landing--Touchdown</b>

## Description of the Incident

At 0409 on October 14, 1984, USAir, Flight 4381, a charter flight of the Youngstown State University football team from Nashville, Tennessee, to Erie, Pennsylvania, landed 6 feet off the right edge and came to rest 800 feet from the end of runway 24 at Erie International Airport following an instrument landing system (ILS) approach at published landing minimums. The left main landing gear sank 2 feet in soft ground and the airplane received minor damage. The passengers disembarked in an orderly manner from an emergency slide at the left main cabin door and left overwing exits. None of the 77 occupants were injured.

The flightcrew had arrived in Nashville at 2339 the day before, following a ferry flight from Syracuse, New York. During the ferry flight, the flightcrew learned that Youngstown, the intended return destination, was below landing weather minimums. The flight was scheduled to depart Nashville at 2400; however, the football team was late in arriving at the airport because its game had been delayed. The weather conditions at Erie, an alternate airport, were forecast to be slightly above landing minimums. Fog in the northeast and the Ohio Valley was responsible for varying weather conditions and the closure of several airports. While on the ground at Nashville, the captain contacted System Control (USAir dispatch center in Pittsburgh, Pennsylvania) to obtain current weather for Youngstown and to determine the course of action to take in the event a flight to Youngstown would not be possible. The captain obtained a complete weather briefing from the dispatcher and, after discussing the weather situation, decided that a landing at Youngstown would not be possible and that the chances for landing at Erie would be "less than fifty-fifty."

According to the captain, the football team coach and the business manager were disappointed when they were told that the flight would have to land at Harrisburg, Pennsylvania, if the weather at Erie continued to deteriorate. They preferred to stay overnight in Nashville; however, they were not able to find lodging for the entire team. It was their desire to land at an airport in the Ohio Valley, and they expressed concern about obtaining ground transportation from Harrisburg to Youngstown. The dispatcher

told them that bus transportation was readily available at Harrisburg and that, in his opinion, Harrisburg was the logical alternate airport. However, the captain and the dispatcher decided that there was sufficient fuel on board the airplane to allow the captain to "...take a look at Erie and continue to Harrisburg" if it were necessary. The captain stated that Erie, "...had minimum weather for the approach. I didn't think the weather would hold but it had minimum weather." The business manager made arrangements for bus transportation from Erie to Youngstown and was willing to pay for the buses even if they had to return from Erie empty. If unable to land at Erie, the airplane would fly to the Harrisburg airport, where the weather was clear with 15 miles visibility and the team would *board* buses for the trip to Youngstown.

The flight departed Nashville at 0215 and climbed to Flight Level 330. At some point in the course of the flight, the business manager occupied the cockpit jumpseat and remained there throughout the rest of the flight. The captain stated that the business manager was "...fairly persistent in requesting progressive information on the status of the flight," and the captain accommodated him two or three times. Reportedly, the business manager did not interfere in any way.

During the course of the flight, the dispatcher informed the flightcrew that weather at Erie had deteriorated. The captain asked if he should proceed to Harrisburg. The dispatcher responded that he believed there was still a possibility of landing at Erie. The captain decided that he would not remain holding at Erie with less than 10,500 pounds of fuel. At 0250, Erie weather was: indefinite ceiling--100 feet, sky obscured; visibility--1/4 mile in fog; temperature--53°; dew point--50°; wind 170' at 4 kts. While in contact with the Cleveland Air Route Traffic Control Center (ARTCC), the flight obtained clearance to descend to 14,000 feet. At about 0319, the flight replied that, "...we'd like to stay up awhile, it looks like we're gonna have to hold pending improvement in Erie's weather, we'd like to stay at fourteen." At about 0325, while 15 miles from Erie, the ARTCC controller reported, "...we haven't had anyone going to Erie for the last couple hours ...one did make the approach, reported the weather was about a hundred feet above minimums." The controller then reported that he did not have any communications at all with Erie and the flight should let him know when it wanted to commence the instrument approach procedure. The flight responded that it was in communication with its dispatch center and they were checking on the weather.

Subsequently, the dispatcher reported the visibility as 3/8 mile. At his request, the flightcrew obtained further clearance to hold at the initial approach fix to runway 24 instead of the VOR, in order to be in a better position to execute the approach in the event the visibility improved to 1/2 mile. (The landing weather minimum for a full ILS approach to runway 24 is 1/2 mile visibility with a decision height (DH) of 200 feet; however, without the runway alignment indicator lights or approach light system operating, the minimum is 3/4 mile visibility with a DH of 200 feet.)

At 0331:49, the flight requested, "We'd like to go down to procedure turn altitude twenty eight hundred feet, and go to Cascade" (initial approach fix for the ILS Rwy 24 approach). The controller provided the following clearance: "...cleared to Cascade, maintain twenty eight hundred, report established in the holding pattern." The flight acknowledged the clearance. At 0337:02, the controller reported losing radar contact with the flight and the flight replied that it was approaching 2,800 feet. Although the flight was within radio range, this was the last transmission air traffic control (ATC) received from the flight.

At 0351, the weather at Erie was: indefinite ceiling--100 feet, sky obscured; visibility--3/8 mile in fog; temperature--51°; dew point--49°; wind--calm.

At 0406:00, the visibility was reported by the National Weather Service as 1/2 mile, and the station agent at Erie reported this to the flightcrew through the dispatcher. Shortly thereafter, the flightcrew departed the holding pattern and commenced the approach.

The captain reported that he had just tuned inbound on the localizer course when he began the landing approach. The airplane was at a speed of about 200 KIAS and it was configured quickly for the landing. The flight checklist was completed, and the captain intercepted the glide slope and flew a stabilized approach without difficulty. The first officer made the standard company call-outs. He called "decision height" and said, "I don't have it." The captain then scanned left and right and spotted lights off to his right "...at about the 12:30 to 1 o'clock position." He stated that he turned the landing lights on "...as soon as I saw the airport environment." He thought he was slightly left of course and made a small roll correction to the right. He also stated he wished he had not turned on the landing lights because of the glare caused by the fog reflecting the lights. He said his attention was directed "...more to the left side of the aircraft and maintained my alignment with what I believed to be the left side of the runway. I was very close to touchdown at this point."

The touchdown was described as hard. During the initial rollout, the captain said, "I felt a sharp jolt and I didn't understand that because I expected a smooth rollout. The airplane began shaking and vibrating. It was a noisy rollout and I thought I'd blown a tire." After the airplane came to a stop he realized that it was off the runway. The passengers disembarked from an emergency slide and overwing exits without difficulty and were taken to the terminal by bus.

The Erie International Airport is a certificated air carrier airport (14 CFR Part 139), which is attended continuously. Both a Federal Aviation Administration (FAA) Flight Service Station and a National Weather Service office are located on the premises. The FAA ATC tower is manned from 0600 to 2300 Monday through Friday and from 0700 to 2300 Saturday and Sunday.

Runway 24 is equipped with medium intensity approach lighting and alignment indicator lights. When the control tower is closed, pilots must activate the lights by keying the microphone on the local control frequency. The system consists of a three-step control response to three, five, or seven clicks of the microphone to achieve various levels of lighting intensity. Seven clicks within 5 seconds would obtain the highest level of intensity. The approach lights will remain on for 15 minutes after the most recent activation.

The runway also is equipped with high intensity runway lights. There are five levels at which the lights can be set, steps 1 to 5. When the control tower is closed the lights are set at step 2. However, because of some on-going construction to upgrade the runway lights, at the time of the incident a short in the wiring had reduced the intensity level of the lights to step 1.

The investigation disclosed that radar contact with the flight was lost during the flight's descent from 14,000 to 2,800 feet because of limited radar coverage in that area. Also, the flightcrew failed to notify ATC when they were established in the holding pattern at 2,800 feet and when they were commencing the instrument approach. Furthermore, even though the flightcrew was aware of the fact that they had to activate the approach lights, they failed to do so.



The captain was hired in November 1967 by Mohawk Airlines, which later merged with Allegheny Airlines and which subsequently became USAir. In May 1983, he was checked out as a captain. At the time of the incident, he had a total flight time of 15,256 hours, of which about 5,000 hours was acquired in the DC-9, and had accumulated about 300 hours as pilot-in-command in the DC-9. He held an airline transport pilot certificate and a first class medical certificate without limitations. This was the captain's first experience with a football team charter flight.

The first officer was hired by Braniff International Airlines in February 1967 and later became a second officer on the Boeing 747 and a first officer on the Boeing 727. In September 1983, he was hired by USAir as a first officer on the DC-9. At the time of the incident, he had a total flight time of 12,376 hours, of which 300 hours was acquired in the DC-9. He held a commercial pilot certificate and a current first class medical certificate with a limitation that corrective eyeglasses be worn. He was wearing his glasses at the time of the incident.

The Safety Board found that the flightcrew met the appropriate Federal and company training and proficiency requirements. In addition, neither the captain nor the first officer appeared to have been adversely affected by physical or medical factors. However, they failed to comply with certain Federal regulations and company procedures during the course of the flight. They did not comply with 14 CFR Part 121.583(a) and 121.587 and company policy because they permitted an unauthorized person to occupy the cockpit observer's seat and did not keep the cockpit door closed and locked. They did not comply with 14 CFR Parts 91.115(b) and 91.116(c) because they departed the holding fix and executed the instrument approach without obtaining an appropriate ATC clearance. They executed the approach below the specific weather minimums authorized for the instrument approach, since they failed to turn on the approach lights as required for the 1/2-mile visibility minimum approach. Additionally, the captain ignored the first officer's report of not having the runway environment in sight and descended below DH in an attempt to complete the approach when he should have made a missed approach.

A record of the cockpit voice recorder (CVR) conversation during the landing approach was not available because the captain did not pull the CVR circuit breaker after the airplane came to a stop to preserve the CVR record in accordance with the intent of 14 CFR 121.359(e). It was erased because the auxiliary power unit was on and the CVR continued to operate. Therefore, the Safety Board was not able to determine the exact crew actions immediately before the incident. However, the evidence indicates poor decision making and coordination on the part of the flightcrew. Executing an ILS approach without obtaining ATC clearance, failing to activate the approach lights, and allowing a passenger in the cockpit were actions contrary to Federal regulations. The Safety Board believes that the late hour of the flight, in combination with the number of hours that the captain had been awake, may have contributed to his being less than fully alert at the time of the incident.

The captain had awakened at 0830 the previous morning and had been on duty since 1325 that afternoon. Thus, at the time of the incident, he had been on duty for over 14.5 hours and awake for 19.5 hours. Had the flight ended successfully in Pittsburgh, he would have exceeded the company's maximum allowed duty time of 14 hours within 24 consecutive hours. (Company pilots can, however, make a special request for up to 15 or 16 hours as necessary.) The first officer had not flown for a week before the incident. He remained on the west coast until traveling to Pittsburgh on October 12. However, he reported for duty at 1740 on October 13 and had been on duty for 10.5 hours. This situation suggests that the flightcrew may have been fatigued which may have degraded their ability to be fully alert and make sound decisions.

It is apparent that when the airplane reached decision height, the captain, without the aid of approach lights did not have sufficient visual cues to execute the landing safely and successfully. His decision to complete the approach under these conditions was contrary to company procedure, Federal regulations, standard safe operating practices, and the flightcrew coordination concept. A missed approach should have been executed at decision height.

In addition, other factors which probably contributed to the flightcrew's deficient performance was the subtle, yet controllable, pressure exerted on them by the football team's business manager and the dispatchers apparent desire, as well as that of the Captain himself, to accommodate the team. The Safety Board believes that the presence of the business manager in the cockpit observer's seat was a distraction and served as a constant reminder to the captain of the advantages in landing the team at Erie.

Although holding over Erie was a conservative course of action, the time spent there reduced the amount of fuel available. They could not legally initiate an approach with a report of weather below landing minimum. However, once the 1/2-mile visibility report was received, the flightcrew had only two courses of action: either land successfully at Erie on the first approach or proceed directly to Harrisburg. There was not enough fuel to proceed to Harrisburg if a second attempt to land at Erie was unsuccessful.

Therefore, the Safety Board concludes that the flightcrew made a series of errors, the last of which would have prevented the incident had the captain made a missed approach when the first officer reported not having the runway environment in sight at decision height. The reduced level of flightcrew performance was the result of their susceptibility to the subtle pressure provided by the business manager who occupied the jumpseat and possibly a reduced level of alertness due to fatigue. The role of the dispatcher contributed to the incident because he encouraged the flightcrew to attempt to land at Erie.

The attached brief of aviation accident contains the Safety Board's finding(s) of probable cause(s) relating to the incident.

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

/s/ JIM BURNETT  
Chairman

/s/ PATRICIA A. GOLDMAN  
Vice Chairman

/s/ JOHN H. LAUBER  
Member

/s/ JOSEPH T. NALL  
Member

September 16, 1986

National Transportation Safety Board  
Washington, D.C. 20594

Brief of Incident

File No. - 5121 10/14/84 ERIE, PA A/C Reg. No. N965VJ Time (Lcl) - 0409 EST

Basic Information

Type Operating Certificate - AIR CARRIER - FLAG/DOMESTIC Aircraft Damage  
Name of Carrier - US AIR MINOR  
Type of Operation - SCHEDULED, DOMESTIC, PAX/CARBO Fire  
Flight Conducted Under - 14 CFR 121 NONE  
Incident Occurred Under - LANDING

Aircraft Information

Make/Model - MC80NELL-BOUGLAS DC-9-30 End Make/Model - P1W JT8B-7A  
Landing Gear - TRICYCLE-RETRACTABLE Number Engines - 2  
Max Gross Wt - 105000 Engine Type - TURBOFAN  
No. of Seats - 110 Rated Power - 46250 LBS THRUST

Environment/Operations Information

Weather Data  
Wx Briefing - COMPANY  
Method - TELEPHONE  
Completeness - FULL  
Basic Weather - IMC  
Wind Dir/Speed - 180/004 KTS  
Visibility - .500 SM  
Lowest Skv/Clouds - 200 FT  
Lowest Ceiling - 200 FT  
Obstructions to Vision - FOG  
Precipitation - NONE  
Condition of Light - NIGHT (DARK)

Pilot-In-Command

Certificate(s)/Rating(s)  
COMMERCIAL-ATP  
SE LAND; IE LAND

Medical Certificate

Valid - 48 Months Since - UNK/MR  
Current - UNK/MR  
Aircraft Type - UNK/MR  
Multi-End - UNK/MR  
Total Flight Time (Hours) - 15556  
Make/Model - 5000  
Instrument - UNK/MR  
Rotorcraft - UNK/MR

Instrument Rating(s) - AIRPLANE

Narrative

THE ORIG DESTN WAS YOUNGSTOWN, OH, BUT ITS WX WAS BLD HNS, SO THE FLT TO TRANSPORT A FOOTBALL TEAM WAS PLANNED TO ERIE WHICH WAS SLIGHTLY ABOVE HNS. THE COACH & BUSINESS MANAGER WERE NOT HAPPY ABOUT THIS, BUT PLANS WERE MADE TO SUB THE TEAM ON TO YOUNGSTOWN. EN ROUTE, THE MANAGER OCCUPIED A JUMPSEAT IN THE COCKPIT IN VIOLATION OF 14 CFR 121. THE WX AT ERIE DETERIORATED TO 100' OBSCD & 1/4 MI VIS WITH FOG. THE CREW ENTERED HOLDING WITHOUT CLNC TO WAIT FOR THE WX AT IMPROVE. THEY ELECTED TO MAKE AN ILS APCH (HNS 200' CIG & 1/2 MI VIS) & LEFT THE HOLDING PATTERN WITHOUT CLNC. AT APCH 2800', RADAR CONTACT WITH ATC WAS LOST, BUT THEY RECEIVED AN ABOVE HNS WX REPORT FH THE STATION AGENT & CONTD THE APCH WITHOUT AN ATC CLNC. THEY DID NOT ACTIVATE THE APCH LGTS. AT THE 9H, THE COPLT SAID 'I DON'T HAVE IT', BUT THE CAPT SAW LOTS TO HIS LEFT & CONTD THE LANDING. THE ACFT LANDED ON SOFT GND BESIDE THE RUY & ROLLED TO A STOP WITH MINOR DNG. RUY LOTS AT STEP 1 INSTEAD OF 2 DUE TO A WIRING PRBLM. CAPT WAS ON DUTY APRX 15 HRS, AWAKE 19.5 HRS. 2 EMERG SLIDES MALF.

Airport Proximity  
ON AIRPORT

Airport Data  
ERIE INT'L  
Runway Ident - 24  
Runway Lth/Wid - 6500/ 150  
Runway Surface - ASPHALT  
Runway Status - BRY

Itinerary  
Last Departure Point  
WASHVILLE, TN  
Destination  
SAME AS ACC/INC

ATC/Airspace  
Type of Flight Plan - IFR  
Type of Clearance - IFR  
Type Arch/Lnds - ILS-COMLETE

ELT Installed/Activated - NO -N/A  
Stall Warning System - YES

	Fatal	Serious	Minor	None
Injuries	0	0	0	6
Crew	0	0	0	71
Pass	0	0	0	71

Brief of Incident (Continued)

File No. - 5121

10/14/84

ERIE, PA

A/C Reg. No. N965VJ

Time (Lcl) - 0409 EDT

Occurrence #1 MISCELLANEOUS/OTHER  
Phase of Operation LANDING - FLARE/TOUCHDOWN

Findings(s)

1. PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
2. WEATHER CONDITION - LOW CEILING
3. WEATHER CONDITION - FOG
4. WEATHER CONDITION - OBSCURATION
5. FLIGHT INTO KNOWN ADVERSE WEATHER - CONTINUED - PILOT IN COMMAND
6. FLIGHT TO ALTERNATE DESTINATION - NOT PERFORMED - PILOT IN COMMAND
7. IMPROPER DECISION, SELF-INDUCED PRESSURE - PILOT IN COMMAND
8. IMPROPER DECISION, COMPANY-INDUCED PRESSURE - DISPATCHER
9. IMPROPER DECISION, PRESSURE INDUCED BY OTHERS - OTHER PERSONNEL
10. AIRPORT FACILITIES, RUNWAY EDGE LIGHTS - FAILURE, PARTIAL
11. AIRPORT FACILITIES, INSTRUMENT APPROACH LIGHTS - NOT OPERATING
12. MISCELLANEOUS EQUIPMENT - NOT USED - PILOT IN COMMAND
13. IFR PROCEDURE - NOT FOLLOWED - PILOT IN COMMAND
14. DECISION HEIGHT - DISREGARDED - PILOT IN COMMAND
15. MISSED APPROACH - NOT PERFORMED - PILOT IN COMMAND

---Probable Cause---

The National Transportation Safety Board determines that the Probable Cause(s) of this incident is/are findings(s) 13,15

Factor(s) relating to this incident is/are findings(s) 2,3,4,5,6,7,8,9,10,11,12,14



National  
Transportation  
Safety Board

Washington, D.C. 20594

## AIRCRAFT ACCIDENT/INCIDENT SUMMARY

Pile No.:	744
Aircraft Operator:	Special Coating Systems, Inc.
Aircraft Type & Registration:	Cessna 421C, N6866K
Location:	Albuquerque, New Mexico
Date:	February 11, 1985
Time:	1015 mountain standard time (m.s.t.)
Injuries:	Fatal - 6
Other Damage or Injury:	None
Type of Occurrence:	Uncontrolled collision with terrain
Phase of Operation:	Maneuvering

About 1015 m.s.t., on Monday, February 11, 1985, a **Cessna 421C**, N6866K, crashed about 1 mile south-southwest of the Coronado **Airport** in Albuquerque, New Mexico. The airplane was destroyed, and the pilot and all five passengers died as a result of the postimpact fire.

The pilot, his wife, and four passengers had arrived at the Coronado **Airport** at 0950 to fly to Aspen, Colorado. Shortly afterward, the baggage, including skis, was loaded aboard the airplane in the nose baggage compartment. N6866K took off on runway 35, a 4,020-foot-long asphalt-overed runway. Coronado **Airport** is an uncontrolled airport, and there were no two-way radio communications between the ground facilities and N6866K prior to the takeoff or during the flight.

An airport employee who was watching the airplane on the takeoff run said that the airplane disappeared behind a hangar, and that a few seconds later he heard the sound of whining engines. He said that the airplane was in a 60° or more left bank at about 300 to 400 feet above ground level with the landing gear down and that he commented to others nearby that it was "an awful steep turn and a very high angle of attack." Another witness who observed N6866K after takeoff estimated that the angle of bank was about 45° when the airplane turned left (west).

A witness located in the southeast corner of the airport's administrative offices said that he glanced up as N6866K flew by and noticed that the right-front (nose) baggage door was open. He stated that the takeoff appeared to be normal except for the open baggage door, described by another witness as being "in a vertical position." The witness then went to the fully glass-enclosed east side of the building to watch the progress of the flight and saw the airplane make a climbing left turn. He said the nose pitched up 15° to 20° while in a left bank of 30° to 40°. About this time the airport general manager attempted to contact the pilot on the Unicom frequency but received no response. The witness returned to a window facing south and watched as the airplane flew south with the gear down. He said that the airplane appeared to be returning for a landing on runway 35, at an altitude of 500 to 700 feet in level flight.

Another witness who observed N6886K take off also continued to watch the flight on the downwind leg "because the gear was still down;" he estimated that the height was 600 to 800 feet above ground.

A workman about two-thirds of a mile from the accident site said that he looked up when the engine ~~noise~~ stopped. He also said that the airplane was just overhead, that the left engine propeller was not turning, and that the right engine propeller was turning but there was no engine ~~noise~~. A fellow workman at the same location reported that he heard the engine but it sounded like it was "wrapped out or going hard . . . and then it quit."

Another witness located 200 yards northwest of the accident site said he "heard an engine running, that's why I looked up," and saw the airplane. "It was too low and coming down way too fast, and that's when it hit the tree tops. It was running as it hit the trees" bordering the west side of a southbound frontage road which ran parallel to Interstate-25. The airplane, which was at a 22.7° descent angle, then struck the southbound frontage road of 1-25 in a left-wing, nose-low attitude, 55 feet from the trees and stopped in an upright position in an open field. Witnesses who arrived at the scene shortly afterward said that the airplane was engulfed in flames and that they did not observe movement or hear sounds inside the airplane.

The downwind leg roughly parallels the west side of the southbound lane of 1-25, a major divided highway with a median strip separating the northbound and southbound lanes. Along the outside edge of each interstate highway lane is a frontage road, separated from each of the interstate lanes by a gravel and dirt median. The postaccident inspection revealed that the wreckage path continued across the median between the southbound frontage road and 1-25, extended to the median between the northbound and southbound lanes of 1-25, and crossed a ditch, a wire fence, and the northbound frontage road. Seven propeller slash marks made by the right propeller were found in the southbound lane of 1-25.

Fire erupted immediately upon impact, and the intense fuel-fed fire, predominantly from the left wing fuel tank, consumed the entire occupiable area of the airplane, and burned from the front left portion of the fuselage and wing area to the right aft portion of the fuselage and empennage.

The flaps were found in the full up position, and the landing gear was in the down and locked position. Continuity of the airplane's flight control system was established.

The left engine, which had sustained extensive fire damage, was found inverted and had rolled inward toward the fuselage. The propeller was attached to the engine mounting flange, and two of the three blades still mounted in the hub were in the feathered position. The third blade, which had separated from the hub, was bent in a "C" shape and exhibited leading edge damage and chordwise scratch marks. One of the two blades in the hub exhibited longitudinal scratch marks and was covered with soot. The second blade in the hub had several diagonal scratch marks, and the outboard trailing edge near the tip was bent. The evidence indicated that the left propeller was not rotating at impact.

The right engine was found separated from its mounts and rolled inward toward the fuselage. It had sustained extensive fire damage. The propeller was still attached to the engine, and the three blades were bent in a "C" shape opposite to the direction of the rotation. Various signature marks on the internal pitch change mechanism and latching device indicated that the blade angle was in the approximate low-pitch position.

and the propeller was **rotatii** at impact. Leading edge damage and chordwise scratch marks on the blades and propeller strike marks at the accident site further indicated that power **was** being developed at time of impact.

The **cockpit** flight controls, instruments, and switches were destroyed by fire or impact damage. Postcrash examination of the power control quadrant revealed that the left throttle handle was two-thirds full forward and the right throttle was full aft, that the left propeller control was in the propeller feather detent and the right propeller control was in the full forward, high rpm) position, and that the left mixture control was in the full forward (full rich position) and the right mixture control was slightly aft of the forward stop. The quadrant handles were manipulated and traveled forward and aft of their documented position and, when released, returned to the documented position.

Postcrash teardown and examination of the engines and propellers disclosed no evidence of pre-impact mechanical malfunction or failure of these components. The left engine examination revealed that the vernatherm expansion capsule (temperature control valve) 1/ had ruptured. Copper powder and oil from the capsule were loose within the vernatherm pocket and had passed into the Nos. 1 and 2 crankshaft main journal bearings; however, there was no evidence of operation of these bearings with this debris present. Normal operating patterns were found on the No. 3 connecting rod bearing, characteristically the first bearing in this engine series to show lubrication distress. Normal operating patterns prevailed throughout the crankshaft, hydraulic lifters, gear train components, cylinders, and pistons with no evidence of debris which would be present if the vernatherm had ruptured in flight.

Postcrash examination of the nose baggage compartment doors revealed that the left door was secured in its proper position at the time of impact. The right baggage door was found close to, but separated from, the main wreckage. The door had been exposed to fire but remained intact. One of the two top-mounted hinge arms was found attached to the door and was broken; the second hinge arm was torn from its mounting position on the door. The center key locking device was found in the "locked open" position. The locking arm did not exhibit any evidence of pre-impact or postimpact damage. The locking slot on the fuselage frame was normal, and there was no evidence that the locking arm had been in the locking slot at the time of impact. The aft upper corner of the door was displaced outward and the forward upper corner was displaced inward. Both of the over-center latches mounted on the lower edge of the door were found in their normal mounting position and were capable of normal operation.

The pilot of N6866K held private pilot privileges in single- and multiengine airplanes, instrument and glider-aero tow ratings, and a commercial certificate with a balloon rating. Entries in the pilot's logbooks indicated a total of 2,054 hours in multiengine airplanes, including 91.3 hours in the Cessna 421; the last recorded entry date was October 31, 1984. An application for aircraft insurance dated October 10, 1984, indicated the pilot had a total of 3,560 flight hours, with 2,060 hours in multiengine airplanes, which included 470 hours in the Cessna 421. The pilot's application for a medical certificate on September 2, 1983, indicated 4,000 hours total flight time. He held a valid Third Class Medical Certificate with a limitation that glasses must be available for near vision. It could not be determined if the pilot was wearing glasses at the time of the accident.

1/ This thermally-operated valve either bypasses the oil around the externally mounted cooler or routes it through the cooler passages for cooling of all parts which require lubrication; the temperature element contains copper dust and wax which expands when heated and closes the valve.

The pilot had accomplished a biennial flight review (BFR) in the Cessna 421 on October 19, 1983; however, the examiner reported that the review did not include multiengine emergency procedures.

The airplane was manufactured in 1981 and was issued a standard airworthiness certificate, normal category. It was equipped with two remanufactured Teledyne-Continental GTSIO-520-N gear-driven, turbo-charged, fuel-injected engines, rated at 375 horsepower each, and two McCauley full-feathering, constant-speed, three-bladed propellers. N6866K had a gross takeoff weight of 7,500 pounds and was equipped with the normal configuration of eight seats. Based on available information, the maximum gross weight and center of gravity for N6866K at the time of the accident were determined to be within allowable limits.

The accident was classified as survivable. The occupiable area in the cockpit and cabin remained comparatively intact and the impact forces were within the limits of the occupant restraint system and human tolerance. Autopsy and toxicology examinations revealed that the impact trauma injuries were nonfatal. The occupants succumbed to thermal injuries. The toxicology report for the pilot reported no evidence of drugs or ethyl alcohol in blood, lung, or liver tissue fluids.

In summary, although extensive impact and fire damage existed, no pre-impact engine failure or malfunction was evident during the postcrash teardown and examination of the two engines. If the vernatherm in the left engine had ruptured in flight, the copper powder would have been found throughout the engine oil lubrication system, or the oil galleys would have been plugged with copper dust, and signs of bearing distress due to oil starvation would have been evident. The fine copper dust was found only in the rear two main bearing journals, and there was no evidence of wear on other components, an indication that the system was properly lubricated before the engine was shut down. Further, there was no evidence of airplane structure or flight control system failure.

Eight witnesses said the airplane engine or engines were producing power of varying degrees throughout their observation before it struck the ground. Three witnesses said the engine or engines stopped abruptly in flight, and two witnesses said that, because the left propeller stopped turning the left engine was not running.

Witnesses who observed the airplane during the final stages of flight agreed that it had descended at a high rate either during or shortly after the turn to the east from the southerly downwind leg. All the witnesses agreed that the landing gear remained down throughout the flight, and none observed any baggage fall from the nose baggage compartment during the flight.

Flight tests have shown that continued flight is possible with an open nose cargo door, even though an open cargo door during flight is distracting. In 1979, the Cessna Aircraft Company conducted tests to evaluate the airplane handling characteristics with a nose baggage door open. Takeoff tests included evaluation with a slow, controlled opening of the door and sudden or rapid opening of the door. The results were reported in a Cessna engineering memorandum on January 3, 1980, which stated that during all tests the airplane was easily controllable, the airplane demonstrated no unusual flight characteristics, and except for noise and slight vibration, there was no noticeable change in performance.



Section 3, "Emergency **Procedures**," of the **Cessna 421C Pilots Operating Handbook**, a flight manual approved by the Federal Aviation Administration, states, "Warning: **The propeller on the inoperative engine must be feathered, landing gear retracted and wing flaps up or continued flight may be impossible.**"

The handbook also states, "It should **be** noted that **as** the **speed** is reduced, **directional** control becomes more difficult."

**Based** on the propeller and flight control positions evident during the postaccident investigation and witness statements, the Safety **Board** concludes that the pilot attempted to shut down **and** secure the right engine and feather the right propeller, probably because he was **unsure** of **the** clearance between the right propeller and the open door. Concerned with flying **the** aircraft, navigating back to the airport, and reassuring the passengers, it is likely that he probably did not use the appropriate emergency engine securing checklist. Instead, he retarded **the** right engine throttle but inadvertently feathered the left propeller. With the landing gear down, the right engine at a **low** power setting, and the left propeller feathered, a left banking turn **was** executed. Before the pilot could detect end remedy **the** decrease in airspeed and the rapid descent rate, the aircraft descended into the ground from its already low altitude.

The attached Brief of Accident contains the Safety Board's conclusions, findings of probable cause, and related factors.

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

/s/ JIM BUBNETT  
Chairman

/s/ PATRICIA A. GOLDMAN  
Vice Chairman

/s/ JOHN X. LAUBER  
Member

/s/ JOSEPH T. NALL  
Member

NTSB # DEN85FA075

## Brief of Accident

RUHDATE: 4 15 84

File No. - 744

2/11/85

ALBUQUERQUE,NM

A/C Reg. No. N6866K

Time (Lcl) - 1015 MST

## -----Basic Information-----

Type Operating Certificate-NONE (GENERAL AVIATION)

Aircraft Damage

Type of Operation -PERSONAL  
 Flight Conducted Under -14 CFR 91  
 Accident Occurred During -MANEUVERING

DESTROYED  
 Fire  
 ON GROUND

Crew Pass	Injuries			
	Fatal	Serious	Minor	None
1	0	0	0	0
5	0	0	0	0

## -----Aircraft Information-----

Make/Model - CESSNA 421C  
 Landing Gear - TRICYCLE-RETRACTABLE  
 Max Gross Wt - 7500  
 No. of Seats - 8

Eng Make/Model - CONTINENTAL GTSIO-520-N  
 Number Engines - 2  
 Engine Type - RECIP-FUEL INJECTED  
 Rated Power - 375 HP

ELT Installed/Activated - YES/NO  
 Stall Warning System - YES

## -----Environment/Operations Information-----

## Weather Data

Wx Briefing - FSS  
 Method - TELEPHONE  
 Completeness - WEATHER NOT PERTINENT  
 Basic Weather - VMC  
 Wind Dir/Speed - 030/009 KTS  
 Visibility - 60.0 SM  
 Lowest Skw/Clouds - CLEAR  
 Lowest Ceiling - NONE  
 Obstructions to Vision - NONE  
 Precipitation - NONE  
 Condition of Light - DAYLIGHT

## Itinerary

Last Departure Point  
 SAME AS ACC/INC  
 Destination  
 ASPEN, CO

Airport Proximity  
 OFF AIRPORT/STRIP

## Airport Data

CORONADO  
 Runway Ident - 35  
 Runway Lth/Wid - 4020/ 60  
 Runway Surface - ASPHALT  
 Runway Status - DRY

## ATC/Airspace

Type of Flight Plan - NONE  
 Type of Clearance - NONE  
 Type Appch/Lnds - TRAFFIC PATTERN

PRECAUTIONARY LANDING

## -----Personnel Information-----

Pilot-In-Command  
 Certificate(s)/Rating(s)  
 PRIVATE, COMMERCIAL  
 SE LAND, ME LAND  
 FREE BALLOON

Age - 54  
 Biennial Flight Review  
 Current - YES  
 Months Since - 16  
 Aircraft Type - 421C

Medical Certificate - VALID MEDICAL-WAIVERS/LIMIT  
 Flight Time (Hours)  
 Total - UNK/NR  
 Make/Model - UNK/NR  
 Instrument - UNK/NR  
 Multi-Eng - UNK/NR  
 Last 24 Hrs - UNK/NR  
 Last 30 Days - UNK/NR  
 Last 90 Days - UNK/NR  
 Rotorcraft - UNK/NR

Instrument Rating(s) - AIRPLANE

## -----Narrative-----

THE FLT WAS FLYING HIS WIFE & HER 4 FRIENDS TO ASPEN, CO FOR A SKI VACATION. WITNESSES REPORTED THAT DURING TAKEOFF, THE RGT BAGGAGE DOOR OPENED. THEY OBSERVED THE ACFT TURN LEFT ONTO A DOWNWIND WITH THE LANDING GEAR EXTENDED. EIGHT WITNESSES REPORTED THE ENG(S) WERE PRODUCING POWER OF VARYING DEGREES; 2 STATED THE LEFT ENG STOPPED RUNNING & 2 REPORTED THE RGT ENG HAD A REDUCTION OF POWER OR RPM. IN THE VICINITY OF WHERE THE FLT WOULD HAVE MADE A BASE TURN, THE ACFT ENTERED A LEFT DESCENDING TURN, COLLIDED WITH THE TOPS OF TREES BESIDE A ROAD, IMPACTED IN THE ROADWAY ON AN EASTERLY HEADING, SLID TO A STOP & BURNED. AN EXAM REVEALED THE GEAR WAS DOWN, THE LEFT PROP WAS FEATHERED & THERE WAS EVIDENCE THE RGT BAGGAGE DOOR WAS OPEN. THE THROTTLE QUADRANT WAS FOUND WITH THE LEFT THROTTLE 2/3 FORWARD, THE RGT THROTTLE FULL AFT, THE LEFT PROP CONTROL IN THE FEATHER POSITION, THE RGT PROP CONTROL FULL FORWARD & THE MIXTURES AT DR NEAR THEIR FORWARD POSITIONS. THE FLT CHARACTERISTICS OF THE ACFT WERE CONSIDERED NORMAL WITH THE BAGGAGE DOOR OPEN.

Brief of Accident (Continued)

File No. - 744

2/11/85

ALBUQUERQUE, NM

A/C Reg. No. N6866K

Time (Lcl) - 1015 MST

Occurrence #1 MISCELLANEOUS/OTHER  
Phase of Operation TAKEOFF - INITIAL CLIMB

Findings(s)

1. AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND
2. DOOR, CARGO - UNLOCKED
3. IMPROPER USE OF EQUIPMENT/AIRCRAFT, DIVERTED ATTENTION - PILOT IN COMMAND
4. GEAR RETRACTION - NOT PERFORMED - PILOT IN COMMAND
5. PRECAUTIONARY LANDING - INITIATED - PILOT IN COMMAND

Occurrence #2 FORCED LANDING  
Phase of Operation MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Findings(s)

6. EMERGENCY PROCEDURE - IMPROPER - PILOT IN COMMAND
7. THROTTLE/POWER CONTROL - REDUCED - PILOT IN COMMAND
8. WRONG PROPELLER FEATHERED - INADVERTENT - PILOT IN COMMAND

Occurrence #3 IN FLIGHT COLLISION WITH OBJECT  
Phase of Operation MANEUVERING - TURN TO LANDING AREA (EMERGENCY)

Findings(s)

9. OBJECT - TREE(S)

Occurrence #4 IN FLIGHT COLLISION WITH TERRAIN  
Phase of Operation DESCENT - UNCONTROLLED

----Probable Cause----

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

Factor(s) relating to this accident is/are finding(s) 1,2,3,4,9

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