

NATIONAL TRANSPORTATION SAFETY BOARD

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# AIRCRAFT ACCIDENT REPORT

SOUTHERN AIRWAYS, INC.  
DOUGLAS DC-9-15, N92S  
GULFPORT, MISSISSIPPI  
FEBRUARY 17, 1971



NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D. C. 20591

Report Number: NTSB-AAR-71-14

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SOUTHERN AIRWAYS, INC.  
DOUGLAS DC-9-15, N92S  
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FEBRUARY 17, 1971

ADOPTED: SEPTEMBER 1, 1971

NATIONAL TRANSPORTATION SAFETY BOARD  
Washington, D. C. 20591  
Report Number: NTSB-AAR-71-14

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16. Abstract  On February 17, 1971, at approximately 0809 c.s.t., a Southern Airways Douglas DC-9-15, N92S, struck an electric transmission line static cable during a VOR approach to Runway 31 at the Gulfport, Mississippi, Municipal Airport. A successful missed approach was accomplished, and the aircraft landed at Gulfport. Of the seven passengers and four crew aboard the aircraft, the only reported injury was a passenger's scratched hand. The aircraft received substantial damage to the left main landing gear, left wing, left fuselage, and the left engine. There was no fire. The weather was a partial obscuration with visibility 3/4 mile in fog. The National Transportation Safety Board determines that the probable cause of this accident was inadequate monitoring of the approach. The captain was preoccupied with the prelanding checklist during the final approach, and the first officer, who was flying the aircraft, was devoting his attention to an attempt to establish visual contact with the runway in low visibility. These activities resulted in an improperly executed VOR/DME approach during which the aircraft descended below the minimum descent altitude before the crew acquired visual contact with the runway environment.					
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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C. 20591  
AIRCRAFT ACCIDENT REPORT

Adopted: September 1, 1971

SOUTHERN AIRWAYS, INC.  
DOUGLAS DC-9-15, N92S  
GULFPORT, MISSISSIPPI  
FEBRUARY 17, 1971

SYNOPSIS

On February 17, 1971, at approximately 0809, Southern Airways, Inc., Flight 41, a scheduled air carrier passenger and cargo flight, struck an electric transmission line static cable during a VOR/DME approach to Runway 13 at the Gulfport, Mississippi, Municipal Airport. A successful go-around was accomplished and the aircraft was landed at Gulfport without further incident. There were seven passengers (five revenue, two nonrevenue) and a crew of four aboard. One passenger received a scratched hand from flying glass. The aircraft received substantial damage to the left main landing gear, left wing leading edge, and left fuselage. The left engine sustained foreign object ingestion damage. There was no fire.

A special weather observation made at the Gulfport Municipal Airport at 0805 showed a partial obscuration with visibility three-quarters of a mile in fog. The wind was from 040° at 6 knots.

The National Transportation Safety Board determines that the probable cause of this accident was inadequate monitoring of the approach. The captain was preoccupied with the prelanding checklist during the final approach and the first officer, who was flying the aircraft, was devoting his attention to an attempt to establish visual contact with the runway in low visibility. These activities resulted in an improperly executed VOR/DME approach during which

the aircraft descended below the minimum descent altitude before the crew acquired visual contact with the runway environment.

As a result of this investigation, the Board recommends that the Federal Aviation Administration:

1. Develop a ground proximity warning system for use in the approach and landing phases of operation which will warn flightcrews of excessive rates of descent, unwanted/inadvertent descent below Minimum Descent Altitudes, or descent through Decision Height. It would be desirable if the equipment now installed could meet this need; and
2. Develop and implement appropriate operational procedures to provide this type of warning to flightcrews for use during the approach and landing phase of flight.

The Board also recommends that the FAA:

3. Complete the necessary action to commission the ILS equipment at Gulfport since it has been installed for approximately 1 year.

During the investigation, the Board recommended that the Federal Aviation Administration take steps to preclude issuance of approach charts prior to commissioning of the pertinent navigational equipment. The FAA replied that they were examining several ways to improve the correlation of the procedural effective date with the facility commissioning date. (See Attachment 3.)

## INVESTIGATION

Southern Airways Flight 41/17 originated at Moisant Airport, New Orleans, Louisiana, with seven passengers and a crew of four including two stewardesses on board. It departed from the passenger gate at 0745,<sup>1</sup> on schedule, and took off at 0751 for Gulfport, Mississippi. The first officer was operating the controls and occupying the right-side pilot seat. According to the flight plan, the Moisant-Gulfport segment was a distance of 67 miles; estimated time en route was 21 minutes. The en route altitude was 11,000 feet m.s.l. via Victor Airway 20. The flight was conducted on an IFR flight plan, but both pilots stated that they maintained ground contact visually at all times and did not encounter any instrument weather en route. As Flight 41 neared Gulfport, the crew was cleared to descend to 4,000 feet m.s.l. and to contact Gulfport Approach Control 15 miles out.

Attempts to establish an exact time base for the events leading to this accident were not successful. The type of recording equipment installed at the Gulfport tower involved two tapes, one recorded time and the other recorded radio transmissions. While these could be correlated to an accuracy of only  $\pm 30$  seconds, the communication tape and the cockpit voice recorder (CVR) record were easily correlated by use of air traffic control transmissions recorded on both tapes. All times after the initial contact between Flight 41 and Gulfport Approach Control/Tower are expressed in minutes and seconds after the initial callup which occurred at 0804  $\pm 30$  seconds.

Flight 41 reported to Gulfport Approach Control when it was 15 miles west at 4,000 feet about 0804 and was cleared to continue descent to 1,800 feet for "... a straight-in VOR Runway 13 approach." The wind was reported to be 020° at 4 knots, and the altimeter setting was 30.29 inches. Flight 41 replied, "3029 down to 1,800 feet, straight-in to Runway 13, VOR

approach." Approach Control answered, "Southern 41 that's correct, report intercepting seven mile arc." The flight requested the Gulfport weather and was supplied the following: "Weather is sky partially obscured, visibility one-quarter mile with fog and that visibility appears to be lifting some now. Temperature 54, dew point 53."

A short time later, the crew advised the controller that they required at least a half mile before they could commence an approach. At 2 minutes plus 30 seconds, Gulfport Approach Control advised Flight 41, "Visibility is three-quarters of a mile, just came out." This was acknowledged.

The CVR transcript shows that most of the period between about 0804 and 2 minutes plus 30 seconds, when the amended visibility was supplied, was being used to refer to the captain's flight manual for visibility minimum data for a local condition. The crew determined that the approach could be made with one-half mile visibility. During this period, the flight intercepted the 7-mile arc and proceeded on it toward the final approach path. At 3 minutes plus 28 seconds, Flight 41 reported that it was 5 miles out, but part of the message was blocked. The call was repeated, was acknowledged by Approach Control, and the flight was instructed to contact the Gulfport Tower on 121.3 MHz. Upon reporting that it was 4 miles out on final approach to the tower, the flight was cleared to land. The tower controller stated he saw a DC-9 aircraft northwest of the field at that time but lost sight of it shortly thereafter.

There were no communications between Southern Flight 41 and the control tower from 4 minutes plus 14 seconds until 6 minutes plus 15 seconds. At 4 minutes plus 46 seconds, the captain told the first officer, "Tom you're cheating, you got full flaps." The flaps were retracted to 30° by the first officer. At 5 minutes plus 12 seconds, the captain said, "Bring it back up you're one hundred fifty feet---. Don't want to hit that tower over there." According to the crew, the first officer then added power and rotated the nose upward.

<sup>1</sup>All times used herein are central standard, based on the 24-hour clock unless otherwise noted.

The CVR recorded sounds of impact at 5 minutes plus 21 seconds. The tower controller stated that he next observed the aircraft as it was over the threshold end of Runway 13 and it appeared to be executing a missed approach. He observed the aircraft begin a right turn at about midfield and advised the crew, "Southern 41 tower, contact Approach now." Southern 41 replied, "41 would like to land on 31." The flight was then cleared for a contact approach to remain within 3 miles of Gulfport. This exchange occurred between 6 plus 15 and 6 plus 36 seconds. The aircraft was cleared to land on Runway 31 as it reached the final approach zone.

Touchdown was made on Runway 31 and was recorded by the tower at 0812. The controller observed smoke coming from the inboard left main tire as the aircraft taxied past the tower, and he advised the pilot of his observation. The flight taxied to the terminal gate and the passengers deplaned normally.

The aircraft struck a static cable which was approximately 140 feet m.s.l. 8,900 feet northwest of the threshold of Runway 13, approximately on the 140° magnetic course to the Gulfport VORTAC, at about 0809 during daylight hours.

No one on board suffered injuries which required treatment, although one passenger suffered minor scratches from flying glass.

The aircraft received substantial damage to the aft fuselage and leading edge of the left wing. The left inboard tire was cut and the tread came off during the landing. The hydraulic lines and antiskid mechanism were also damaged. The left engine sustained substantial foreign object damage from an unidentified foreign object.

Damage to the powerline consisted of 1,000 feet of static cable pulled from the supporting towers. One support arm of the first tower west of the strike later collapsed due to loss of cable tension. The static wire dragging from N92S fell across a 110 kilovolt-amperes (kv.a.) powerline which arced and burned through. There was no other reported damage.

The flightcrew was certificated and qualified in accordance with existing FAA and company regulations. (See Attachment 2.)

The aircraft was certificated and maintained in accordance with applicable regulations and the FAA-approved company progressive maintenance schedule. There were no carryover items affecting airworthiness. The aircraft was loaded within allowable weight and center of gravity limits, and was fueled to 17,000 pounds of jet fuel at New Orleans.

Surface weather observations were made by certificated FAA control tower personnel at the Gulfport tower and were recorded as follows:

Record 0800 Partial obscuration, visibility one-quarter mile in fog, temperature 54° F., dew point 53° F., wind 030° at 6 knots, altimeter setting 30.28 inches.

Special 0805 Partial obscuration, visibility three-quarters mile in fog, wind 040° at 6 knots, altimeter setting 30.29 inches.

Special 0840 Clear, visibility 3 miles, ground fog, wind calm, altimeter setting 30.30 inches.

Inquiry was made of all passengers on the flight concerning their observations. Of those who replied, none observed anything unusual prior to the accident. Two passengers recalled seeing patches of ground fog with pine trees protruding above it.

Two witnesses were found who observed the aircraft at the scene of the wire strike. Both stated they could hear loud engine sounds before the aircraft came in sight through the fog. The first witness, located about 150 yards east of the aircraft's flightpath, said the aircraft came in sight slightly noseup and hit the wires. The aircraft settled down gradually, then he saw a flash of fire in the wires below the airplane. He lost sight of the aircraft in fog. He said he could see the top of the powerline tower in the fog but

not clearly. The sun was visible, but appeared smoky, with a halo effect.

The second witness, located one-fourth mile south of the first, said he heard the engines making an unusual amount of noise and heard the sounds of the wires shorting electrically before the aircraft came in sight. It passed over him at a very low altitude and went out of sight in the fog to the southeast.

Gulfport Municipal Airport is served by a VORTAC located on the airport. No other aid to navigation is available. Runway 13 is 9,000 feet long and 150 feet wide and hard surfaced. The runway touchdown zone elevation is 24 feet, and the field elevation at the airport Reference Point is 28 feet. There was an approved VOR/DME approach at the time of this accident dated October 1, 1970. VOR/DME minima for a category C aircraft making a straight-in approach to Runway 13 were shown as 420 feet Minimum Descent Altitude (MDA) with three-quarters of a mile visibility. Minimum altitudes were 1,800 feet m.s.l. on the 7-mile DME arc, with descent to 700 feet m.s.l. authorized on the inbound course of 140° to the 3-mile DME fix. Then descent to the MDA was permitted.

Southern Airways, Inc., FAA-approved Operations Specifications, Section II, Page 212 (revised May 15, 1970), Item 26, subject, "Landing Minima, Local Conditions - Regular, Refueling and Provisional Airports - IFR" states, "Unless prohibited in the applicable instrument approach procedure, a landing may be made at an airport when the local visibility is reduced to not less than one-half mile or Runway Visual Range (RVR) is 2400 by purely surface weather conditions such as smoke, haze, dust, ground fog, blowing snow or sand, etc."

The air traffic control communications frequencies used during this time period were busy; however, no significant difficulty was apparent.

The aircraft was equipped with both a cockpit voice recorder and a flight data recorder. Neither recorder was damaged. The recording media were removed and forwarded to the Board's

Washington office for examination and readout or transcription. In addition, a test flight was flown February 18, 1971, and the tape of that flight was forwarded to Washington for readout.

Difficulty was experienced in retrieving all of the intelligence from the CVR tape because of the presence of cockpit speaker emanations on the area microphone channel. The transcription reflects the information gleaned from the pertinent portion of the tape, and voice identification was provided by the flightcrew. (See Attachment 4.)

The foil recording medium from the flight data recorder was read out starting at a point 4:15 minutes prior to reaching the lowest altitude during the initial approach and ending with the landing rollout after the second approach. All traces were active and clearly readable. The altitude recording accuracy was checked against the field elevation at New Orleans and Gulfport. These checks indicated that the recorder was reading 96 feet lower than field elevation at New Orleans and 153 feet low at Gulfport. The allowable tolerance for elevation in this range is  $\pm 100$  feet.

The readout of the accident tape altitude trace showed a descent from an indicated altitude of approximately 2,300 feet to approximately 1,600 feet. The trace stayed near this altitude for approximately 1:30 minutes and then a nearly constant rate of descent began which stopped at an indicated altitude of approximately 100 feet below sea level. The altitude gradually increased to about 175 feet indicated and then a climb was recorded that peaked at approximately 1,200 feet m.s.l.

During the initial descent, the airspeed trace gradually decreased from about 238 knots to between 150 and 160 knots. It stayed in this latter range until the later part of the descent described above when the airspeed gradually decreased to a minimum value of approximately 130 knots.

The heading trace was compatible with the headings flown by the aircraft during the approach. The g trace was relatively stable, with a peak excursion of +1.2 g at approximately the point where the altitude trace indicated its lowest value during the first approach.

The left main landing gear of the aircraft contacted the northernmost of two static cables on a powerline located 8,900 feet north of the runway threshold. The static cables were supported between a tower (166 feet m.s.l.) to the left of the flightpath and a lower tower (120 feet m.s.l.) located 1,030 feet southeast of the higher tower and to the right of the flightpath. The static cable separated at its connector on the higher tower. Mississippi Power Company records showed a power interruption occurred at 0808.9.

The 140° VOR course intersects the powerline about 280 feet west of the higher tower and the static cable elevation was 140 feet m.s.l. at that point, 8,900 feet from the threshold of Runway 13. The extended runway centerline intersects the powerline 590 feet to the west of the lower tower 8,700 feet from the runway threshold. The 140° VORTAC course intersects the extended runway centerline 1,500 feet from the runway threshold. The minimum authorized altitude over the powerline in this case was 420 feet m.s.l.

Static tests were conducted at Gulfport on the pitot static system and both pilots' altimeters. No significant discrepancies were noted except that the first officer's altimeter indicated lower than the test altimeter by amounts varying between 30 feet at sea level to 75 feet at 2,000 feet. These differences were attributed to the presence of hysteresis.<sup>2</sup> Results of the static

<sup>2</sup>Hysteresis Error—The error in the indication of an altimeter imperfectly elastic properties of the aneroid material which prevents the aneroid from assuming its normal shape for any given atmospheric pressure. Air Transport Assc. 34-10-1, dated 6/1/61. Revised 12/1/61.

test in the field were not considered to be of sufficient accuracy due to temperatures, possible scale error, and other factors. The instruments were later tested in the carrier's maintenance facility and then by the manufacturer, where it was determined that they were operating within allowable limits.

Following temporary repairs to the aircraft structure, the aircraft was ferried to Atlanta, Georgia, for permanent repair, and operation of the altimeters during the ferry flight was carefully observed. The captain's altimeter appeared to operate erratically, especially on the ILS glide slope at Atlanta. The altimeters were shipped to the manufacturer for study and a faulty vibrator was discovered in the captain's altimeter. The captain's altimeter had provision for altitude encoding and altitude alerting; however, these features were not functional at the time of the accident.

The radio altimeter was operating and set at 400 feet. The captain stated that he observed the low-altitude warning yellow lights, one located on the altimeter and one on the flight director, when he told the first officer he was low and to "bring it back up" just before the aircraft struck the wire.

The company pilot training facility was visited to review training policies and procedures. No DC-9 training was being conducted; however, the curriculum and procedures were reviewed. A change in nonprecision approach procedures had been developed, but had not been released for use by the aircrews at the time of the accident. The revised sheet was not circulated until March 4, 1971, although the sheet was dated January 12, 1971. It permitted use of 50° (landing) flaps over the approach fix for a short approach where "time to fly" expiration and reaching the MDA coincide. The policy at the time of the accident permitted only 30° flaps until the runway was in sight.

This change also revised the altitude callouts by the pilot not flying the approach to include a call 500 feet above the minimum altitude for the approach. This call was to be in lieu of a call originally required at 500 feet above the field

elevation and was to be made in addition to previously required calls which included:

1. Any deviation below published transition altitudes;
2. 100 feet above minimums;
3. Minimums including an indication as to whether the runway was in sight.

At the time of this accident, there was a published approach plate dated July 20, 1970, which portrayed an approved ILS approach procedure for Runway 13 at Gulfport Municipal Airport. However, the ILS equipment was not and never had been approved or operational. At the time of this accident, the glide slope antenna was not installed.

All approach plates for this airport depicted standard Air Force overrun lights at the approach end of Runway 13. The runway overrun was paved in October 1970, and the overrun lights were not made operational after that time. There were no approach lights installed. High-intensity runway lights were installed and operating on Step 5 at the time of the accident.

Gulfport Municipal Airport is owned and operated by the city of Gulfport; however, the Air National Guard owns Runway 13/31 and uses it as a base for gunnery practice by Air National Guard fighter units, based throughout the country, during encampments and weekend drills. No Air National Guard aircraft are based at Gulfport Municipal Airport.

#### ANALYSIS

Examination of the aircraft showed no evidence that a failure or malfunction of any system or component was related to the accident. The aircraft had been maintained in accordance with the approved maintenance schedule.

Air traffic control functions were properly executed as they related to Flight 41, and there was no evidence of equipment or navigational facility malfunction.

A local ground fog condition, which had restricted surface visibility to one-quarter of a mile, improved to three-quarters of a mile as the

flight approached the airport. Both pilots were able to see the ground or ground objects, such as the water tower located at the airport, referred to by the captain just before the wire strike, but they did not see either the powerline or the runway before impact. They were able to see the airport clearly when they reached it, as well as throughout the circling approach and landing on Runway 31. The sun position, fairly low in the southeast quadrant, would have restricted forward visibility as the aircraft descended into the fog northwest of the airport on a southeasterly heading. The effect of attempting to see the runway through the sun-brightened fog area would be to reduce the ability of the eye to perceive objects ahead, while providing a deceptive degree of visibility to the side of the aircraft and downward, leading the crew to believe visibility was better than was actually the case. The brightness and diffusion would decrease rapidly the farther the field of vision was shifted away from the sun.

The landing minima for the VOR/DME approach to Runway 13 at Gulfport were MDA 420 feet m.s.l. and three-quarters of a mile visibility. The carrier's approved Operations Specifications permitted landing in a locally restricted purely surface condition with one-half mile visibility. The ground fog condition met this requirement with the reported visibility at the airport three-quarters of a mile during the approach. It would still have been necessary to remain at or above 420 feet m.s.l. until the runway or its environment was in sight. At this time, landing flaps could have been lowered and descent for landing initiated.

The flight was proceeding in a routine manner until the surface weather observation reporting one-quarter mile visibility was received. This diverted the attention of the crew from their normal arrival routine while they confirmed the requirement for one-half mile visibility and resulted in their failure to report intercepting the 7-mile arc. It also delayed commencing the pre-landing checklist, which was not accomplished until well into the final approach.

These circumstances prevented the captain from monitoring the approach continuously. The cockpit workload, the distraction associated with the retraction of the flaps to the 30° position, and the crew's attempts to locate the runway visually, diverted their attention from the instrument panel and detracted from the instrument scan that would have kept them aware of their altitude above the ground and their relationship with the MDA. This resulted in a descent through the MDA which was not detected until the aircraft was dangerously low. In the few seconds available, corrective action taken to return to MDA probably prevented a catastrophic accident. No altitude calls, including minimum descent altitude, were detectable on the CVR tape. The aircraft struck the first static cable while in a climb attitude since the nose wheel cleared the wires. It was gaining altitude as evidenced by the undamaged parallel static wire. The aircraft descended again while dragging the static cable. The broken end went forward over the leading edge of the wing and then struck the aft fuselage with a whiplash effect. The wire pulled through the left main tire and dropped off the aircraft.

The aerodynamic effect of extending and retracting the landing flaps was examined and it was found that extending the landing flaps from 30° to 50° added drag but did not change lift. If a constant airspeed was held, the rate of descent was increased. Retraction of the landing flaps from 50° to 30° would result in a decrease in drag, no change in lift, and a decrease in the rate of descent with a constant airspeed. A review of the FDR altitude trace during the descent phase of this flight showed no significant change in rate of descent that could be attributed to the retraction of the landing flaps.

The crew stated they did not observe an altitude reading below 300 feet. They were unable to account for the descent to the powerline height. The CVR, however, clearly reproduced the captain's voice saying 150 feet with the rest of the sentence unreadable. Two evaluations of this figure are possible. First, if as stated by the captain this meant 150 feet below MDA, the aircraft was about 250 feet m.s.l. and descending

or about 100 feet above the wire height at that point. Further descent would have been expected while the first officer acted to stop the descent and initiate a climb. Second, if the 150 feet were a direct reading from the radio altimeter, the aircraft was already below the wire height and further descent would put the aircraft near trees in the area and require the aircraft to climb to the altitude of the wire before striking it. In any event, it is clear that the MDA was exceeded by a considerable amount before the crew detected their error. There is no indication that the altitude was being monitored as required. Appropriate callout of the MDA was not made and both pilots were looking for the runway at a time when the cockpit instruments should have been closely monitored.

During the investigation of this accident, the Board noted that the aircraft was equipped with a barometric altimeter which had a capability of warning the flightcrew, visually, when they approached or deviated from a preselected altitude. This warning system was not functional. The Board has found that this type of warning device is installed in the aircraft of a number of air carriers; however, where it is functional, it is not used as an altitude warning device during instrument approaches, but rather as a device to alert pilots as they approach or deviate from preselected altitudes during the climb, descent, and en route phases of flight. The justification used by the FAA to require the installation of this device was based in part on several aircraft accidents and incidents which occurred during the approach and landing phase of flight. In the interest of preventing accidents occurring during the approach and landing phase of flight, the Board supported the Administrator's proposals by letter February 13, 1968, and by a recommendation January 17, 1969.

#### PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this accident was inadequate monitoring of the approach. The captain was preoccupied with the

prelanding checklist during the final approach and the first officer, who was flying the aircraft, was devoting his attention to an attempt to establish visual contact with the runway in low visibility. These activities resulted in an improperly executed VOR/DME approach during which the aircraft descended below the minimum descent altitude before the crew acquired visual contact with the runway environment.

### RECOMMENDATIONS

The Board finds that altitude alerting equipment now installed on air carrier aircraft is not used as a ground proximity warning device which has been previously recommended and, therefore, the Board recommends that the Federal Aviation Administration:

1. Develop a ground proximity warning system for use in the approach and landing phases of operation which will warn flightcrews of excessive rates of descent,

unwanted/inadvertent descent below Minimum Descent Altitudes, or descent through Decision Height. It would be desirable if the equipment now installed could meet this need; and

2. Develop and implement appropriate operational procedures to provide this type of warning to flightcrews for use during the approach and landing phase of flight.

The Board also recommends that the FAA:

3. Complete the necessary action to commission the ILS equipment at Gulfport since it has been installed for approximately 1 year.

As a result of this investigation, the Board recommended that the Federal Aviation Administration take steps to preclude future issuance of approach charts prior to commissioning of the pertinent navigational equipment. The FAA replied that they were examining several ways to improve the correlation of the procedural effective date with the facility commissioning date. (See Attachment 3.)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/ JOHN H. REED  
Chairman

/s/ OSCAR M. LAUREL  
Member

/s/ LOUIS M. THAYER  
Member

/s/ ISABEL A. BURGESS  
Member

Francis H. McAdams, Member, was absent, not voting.

INVESTIGATION AND HEARING

1. Investigation

The Board received notification of the accident at 0840 c.s.t. on February 17, 1971. The Investigator-in-Charge was dispatched immediately to the scene from the Miami, Florida, Field Office. Working groups were not established due to the nature of the accident. Parties to the investigation were Southern Airways, Inc., the Federal Aviation Administration, and the Air Line Pilots Association. The on-scene investigation was completed on February 19, 1971. Additional investigative activities were conducted at Atlanta, Georgia, between March 2 and 4, 1971, and at the Kollsman Instrument Corporation on March 2, 1971.

2. Hearing

There was no public hearing.

3. Preliminary Reports

No interim report was issued.

## CREW INFORMATION

The pilot-in-command, Captain Gordon W. Cushing, aged 44, held an FAA Airline Transport Pilot Certificate No. 246092 as well as a current first-class FAA medical certificate. Captain Cushing held type ratings for Martin 202/404 and Douglas DC-3, DC-9 aircraft. He was employed by Southern Airways on April 3, 1951, and was upgraded to Douglas DC-3 captain in April 1959. He was upgraded to Martin 404 captain on May 5, 1964, and to DC-9 captain on March 4, 1969. Company records showed his total flying time to have been 16,112 hours, 1,324 hours of which were accumulated in DC-9 aircraft. His latest proficiency check was completed September 17, 1970. His date of birth was September 7, 1926.

First Officer Thomas F. Jett, aged 35, held an FAA Commercial Pilot Certificate No. 1385559 with single-engine land and instrument ratings. He held a current first-class medical certificate. He was employed by Southern Airways on March 14, 1966. Company records showed his total flying time to be 4,929 hours, 1,102 hours of which were accumulated in the Douglas DC-9. His latest proficiency check was completed August 11, 1970. His date of birth was February 23, 1935.

Stewardess Mimi Davenport was employed by Southern Airways May 6, 1968, and completed training May 25, 1968. Her most recent emergency training was completed August 10, 1970.

Stewardess Marcia Dayton was hired January 13, 1969, and completed training February 1, 1969. Her most recent emergency training was completed July 28, 1970.

UNITED STATES OF AMERICA ATTACHMENT 3, p. 1  
NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: April 16, 1971

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD  
at its office in Washington, D. C.  
on the 31st day of March, 1971.

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FORWARDED TO: )  
Honorable John H. Shaffer )  
Administrator )  
Federal Aviation Administration )  
Washington, D. C. 20590 )  
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SAFETY RECOMMENDATION A-71-19

As an outgrowth of the National Transportation Safety Board's continuing investigation of the accident involving a Southern Airways Douglas DC-9 at Gulfport, Mississippi, on February 17, 1971, we noted a situation relating to aeronautical charting which we believe could have a deleterious effect on aviation safety.

It was noted during the early stages of the investigation that, although there is a published instrument approach procedure for an ILS approach to Runway 13 at Gulfport, there is not, and never has been, a commissioned instrument landing system at that airport. The procedure was prepared, and the current approach plate was published and disseminated, in anticipation of a July 30, 1970, commissioning date. When this date passed without facility commissioning, a Flight Data Center (FDC) NOTAM, No. 0/681 FI/T was issued on August 3, 1970, which declared the ILS approach "procedure unusable until further notice."

We understand that the term "FI/T," as used in this type of NOTAM, relates to a condition deemed to be temporary in nature, and not expected to last in excess of 45 days. However, several times that number of days have elapsed since the issuance of FDC NOTAM 0/681, and as yet there is no foreseeable commissioning date for the Gulfport ILS.

During an attempt by a member of our staff to obtain a complete telephone briefing from the Mobile, Alabama, Flight Service Station (the tie-in FSS for Gulfport Airport) relative to a hypothetical proposed instrument flight to Gulfport, no information was provided concerning the text of FDC NOTAM 0/681 until the caller quoted the NOTAM verbatim to the FSS briefer. We recognize that air traffic control would not be based on a noncommissioned or, in fact, nonexistent, facility; however, there is a more critical

point at issue here. For example, a pilot planning to fly to Gulfport in accordance with instrument flight rules, has no practical and sure way of learning in advance of his arrival that an approach aid, upon whose weather minima he is relying for the successful completion of his flight, does not exist. Furthermore, he may be planning to use such an airport as his alternate, predicated upon the lower alternate weather minima applicable to the availability of a precision approach as opposed to a nonprecision approach, and, again, he could be "booby-trapped."

We are aware that the FAA is under constant pressure from the users of the airspace to implement new approach procedures, especially those providing lower minima, without delay, upon the commissioning of an approach aid. However, we believe that the present system of publishing instrument approach procedure charts in advance of commissioning might create more problems than it solves.

In view of the foregoing, it is recommended:

That a policy be established that no instrument approach procedure chart be published in advance of the successful completion of a commissioning flight check of the facility on which the procedure is based.

This subject has been discussed informally with cognizant personnel of your Flight Standards and Air Traffic Services. Our staff is available for further discussions.

This recommendation will be released to the public on the issue date shown above. No public dissemination of the contents of this document should be made prior to that date.

Reed, Chairman; Laurel, McAdams, Thayer and Burgess, Members, concurred in the above recommendation.

/s/

By: Oscar M. Laurel  
Acting Chairman

**DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION**

ATTACHMENT 3, p. 3

WASHINGTON, D.C. 20590



OFFICE OF  
THE ADMINISTRATOR

20 Apr 1971

Honorable John H. Reed  
Chairman, National Transportation Safety Board  
Department of Transportation  
Washington, D.C. 20591

Dear Mr. Chairman:

This is in response to your Safety Recommendation A-71-19 issued on 16 April 1971 concerning the Southern Airways accident at Gulfport, Mississippi.

The conditions cited in your recommendation have been noted, and we concur in the need for improved control over facility commissioning and the publication of new flight procedures.

Of primary concern is the correlation of the facility commissioning date with the effective date of the procedure. In the past, this has not presented a serious problem when limited numbers of facilities were being installed. With the implementation of our ILS program, many new installations are being accomplished and delays in project completion are being experienced more frequently. Since an approach procedure must be submitted for publication approximately eight weeks in advance of the effective date, it is not always possible to anticipate delays that might be encountered during facility installation.

At this time, we are exploring several ways to improve the correlation of the procedure effective date with the facility commissioning date which includes your recommendation for withholding chart publication pending a successful commissioning flight check of the facility. We will also investigate the availability of FDC NOTAM's at Flight Service Stations.

Action on these items will be completed within the next 90-day period, and we will advise you further on the results of our current efforts.

Sincerely,

/s/  
K. M. Smith  
Acting Administrator

EXCERPT FROM  
TRANSCRIPTION OF PERTINENT PORTION OF COCKPIT VOICE  
RECORDER TAPE DOUGLAS DC-9, N92S, SOUTHERN AIRWAYS  
FLIGHT 41, GULFPORT, MISSISSIPPI,  
FEBRUARY 17, 1971, MIA 71-A-MO71

## LEGEND

CAM = Cockpit area microphone sound or voice source  
RDO = Radio transmission from N92S  
-1 = Voice identified as Captain  
-2 = Voice identified as First Officer  
-3 = Voice identified as stewardess #1  
-? = Voice unidentified  
GPT AC = Gulfport Approach Control  
GPT LC = Gulfport Tower Local Controller  
\* = Unintelligible word  
# = Nonpertinent word  
( ) = Words enclosed in parentheses are subject to further interpretation

## ELAPSED

TIME	SOURCE	CONTENT
00:00	RDO-1	Gulfport Approach, Southern forty-one, fifteen west, four thousand
00:15	GPT AC	Southern forty-one, roger, continue descent to one thousand eight hundred, cleared for a straight-in VOR runway one three approach, wind zero two zero degrees at four, altimeter three zero two niner
00:19	RDO-1	Thirty twenty-nine, down to eighteen hundred feet, straight-in runway one three VOR approach
00:24	GPT AC	Southern forty-one, that's correct, report intercepting the seven mile arc
00:27	RDO-1	What's the weather now?
00:37	GPA AC	Southern forty-one, weather is, ah, sky partially obscured, visibility one-fourth mile with fog, and that, ah, visibility's--appears to be lifting some now, temperature fifty-four, dew point five three
00:52	RDO-1	Okay
01:02	CAM-1	We can't make an approach with that, can we?
	CAM-2	No
02:02	CAM-1	Partial, isn't it?
02:10	CAM-2	Yeah
02:15	CAM-1	Well, that's right wait a minute, it's right here somewhere
	CAM-1	It shows a half here
	CAM-2	A half?
	CAM-2	*

ATTACHMENT 4, P. 2

ELAPSED TIME	SOURCE	CONTENT
02:23	RDO-1	Gulfport approach, Southern forty-one, we have to have at least half a mile before we can shoot approach
02:30	GPT AC	Forty-one, roger, you got it. We've got three-quarters of a mile, just come out
02:34	RDO-1	Okay thank you
	CAM-?	* * * *
	CAM-?	* * * * (overridden by cockpit speaker emanation)
03:12	CAM-	Sound of landing gear in transit
03:28	RDO-1	Southern forty-one, we're five mile out -- out now
03:45	GPA AC	.....Southern forty one say again
03:47	RDO-1	Say we're five miles out now
03:52	GPT AC	Forty-one, roger, contact tower one two one point three
03:55	RDO-1	Twenty-one point three
04:08	RDO-1	Gulfport Tower, Southern, ah, forty-one, 'bout four out on final
04:14	GPT LC	Southern forty-one, Gulfport Tower, cleared to land
04:17	RDO-1	Forty-one
04:22	CAM-1	No smoking, ignition -- radar standby, air conditioning armed, gear
	CAM-2	Down three green, door light's out
	CAM-1	Annunciator panel--checked, (spoilers) armed
04:42	CAM-2	Let me know when you see anything
04:56	CAM-1	Tom, you're cheating
05:00	CAM-2	Huh?
	CAM-1	You're cheating, you got full flaps
	CAM	* * *
	CAM	* * * (very long there)
05:12	CAM-1	Bring it back up, you're one hundred fifty feet
05:16	CAM-1	Don't want to hit that tower over there
05:21	CAM	Sound similar to object striking aircraft
05:32	CAM-3	Something's wrong back there and I don't know what it is
05:35	CAM-1	Gear up
05:38	CAM-3	But there's a buzzing noise
05:45	CAM	Sound of buzzing noise
05:53	CAM-3	There's a hole on the left side, somebody said back there
05:56	CAM-1	A HOLE??
06:01	CAM-?	*
06:10	CAM-3	Yeah, there's a hole in the left side, in the back, the man's pointin' to it
06:15	GPT LC	Southern forty-one, ah, contact approach now
06:20	RDO-1	Forty-one'd like to land on, ah, three one
06:33	RDO-1	Gulfport Tower, Southern forty-one

ELAPSED

TIME SOURCE

CONTENT

06:36 GPT LC Southern forty-one you are cleared for a contact approach, ah, remain within three miles of that airport, over

06:41 RDO-1 Okay

\* \* \*

\*\*\*\*\* CAM-1 \* \* \* \*

\*\*\* CAM-2 Huh?

END OF EXCERPT

72401

# NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.--20591



## Safety Information

For Release:

SB 71-93  
(202) 426-8787

Office of the Chairman

ADVANCE For

AM Newspapers  
Wednesday, Nov. 10, 1971

The National Transportation Safety Board, releasing its report on a near-catastrophic airline approach accident, recommended today that the Federal Aviation Administration develop a ground proximity warning system -- preferably writing procedures for use of altimeter equipment already in many airliner cockpits.

Seven passengers and four crewmembers escaped without treated injury when a Southern Airways McDonnell Douglas DC-9 struck and tore loose a cable between two power line towers on the aircraft's final approach to Runway 13 at Gulfport (Mississippi) Municipal Airport last February 17. The aircraft, Southern's Flight 41 from New Orleans, circled and landed safely on Runway 31, but it was substantially damaged.

The left main landing gear of the DC-9 struck the cable at a point 8,900 feet short of and 160 feet higher than the Runway 13 threshold. The altitude of the aircraft at the point of impact was 280 feet below the authorized Minimum Descent Altitude. A Gulfport weather observation at 8:05 a. m., some four minutes before the accident, showed partial obscuration of the sky with three-quarters of a mile visibility in ground fog.

The Safety Board determined that the probable cause was . . .

" . . . inadequate monitoring of the approach. The captain was preoccupied with the prelanding checklist during the final approach and the first officer, who was flying the aircraft, was devoting his attention to an attempt to establish visual contact with the runway in low visibility. These activities resulted in an improperly executed VOR/DME approach during which the aircraft descended below the minimum descent altitude before the crew acquired visual contact with the runway environment. "

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The Board recommended that FAA (1) "develop a ground proximity warning system for use in the approach and landing phases of operation" which would warn pilots of excessive descent rate or descent below MDA or Decision Height, employing "equipment now installed" where practical; (2) develop operational procedures to give pilots such warnings; and (3) "complete the necessary action" to commission Instrument Landing System equipment for Gulfport's Runway 13.

The Safety Board's investigation showed that the flight had been routine until the crew received a weather report incorporating a quarter-mile visibility observation. Checking the captain's flight manual for lowest authorized visibility diverted the crew's attention and delayed the pre-landing checklist until "well into the approach," the Board said. "These circumstances prevented the captain from monitoring the approach continuously."

The Board found it "clear that the MDA was exceeded by a considerable amount before the crew detected" the error. It said MDA and other altitudes were not called out, nor was there any indication that "altitude was being monitored as required... Both pilots were looking for the runway at a time when the cockpit instruments should have been closely monitored."

The aircraft, the Board noted, was equipped with a radio altimeter and with a barometric altimeter which could alert the crew by means of a warning light when the aircraft approached or deviated from a preselected altitude. This warning system was not functional, the Board said, but similar low-altitude warning lights on the radio altimeter and the flight director prompted the captain to direct the first officer to "bring it back up" just before impact with the cable.

The Safety Board said a barometric altitude warning device "is installed in the aircraft of a number of air carriers; however, where it is functional, it is not used as an altitude warning device during instrument approaches, but rather as a device to alert pilots as they approach or deviate from preselected altitudes during the climb, descent and en route phases of flight."

Flight 41 had been making a VOR/DME approach to Gulfport -- a non-precision approach employing VOR directional signals and DME distance information instead of the more precise guidance of an ILS. The localizer (directional) and glide slope equipment for a Runway 13 ILS had been installed in January 1970, and the localizer was commissioned last April 27; technical difficulties have prevented commissioning of the glide slope, according to FAA.

When its investigation showed a Runway 13 ILS approach procedure had been published seven months before the accident, the Safety Board on April 16, 1971 recommended that FAA take steps to preclude issuance of an approach chart prior to commissioning of navigation aids for the approach. FAA has an order in process which it says will synchronize commissioning of a navigation facility with issuance of charts and procedures involving it.

7210

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NATIONAL TRANSPORTATION SAFETY BOARD  
Washington, D. C. 20591

SA-NONE FILE NO. 1-0003

**AIRCRAFT ACCIDENT REPORT**

SOUTHERN AIRWAYS, INC.  
DOUGLAS DC-9-15, N92S  
GULFPORT, MISSISSIPPI  
FEBRUARY 17, 1971

ADOPTED: SEPTEMBER 1, 1971

E R R A T A

The following changes should be made to the subject report:

Page 11 - Technical Report Standard Title Page, Item 16. Abstract,  
line 3, change "Runway 31" to "Runway 13".

Page 5 - Footnote 2, Correct to read:

<sup>2</sup>Hysteresis Error - The error in the indication of an altimeter introduced during an increase or decrease in height, due to the imperfectly elastic properties of the aneroid material which prevents the aneroid from assuming its normal shape for any given atmospheric pressure. Air Transport Assc. 34-10-1, dated 6/1/61. Revised 12/1/61."

November 4, 1971

Report Number: NTSB-AAR-71-14

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