Aircraft Accident Report - Lord J Company, Convair 240, N55VM, Gillsburg, Mississippi, October 20, 1977

U.S. National Transportation Safety Board, Washington, D C

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Abstract

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There were 24 passengers and 2 crewmembers on board the aircraft. The 2 crewmembers and 4 of the passengers were killed; 20 others were injured. The aircraft was destroyed by impact; there was no fire.

The flight had reported to the Houston Air Route Traffic Control Center that it was "low on furl" and requested radar vectors to McComb, Mississippi. The aircraft crashed in a heavily wooded area during an attempted emergency landing.

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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594

AIRCRAFT ACCIDENT REPOKT

Adopted: June 19, 1978

L & J COMPANY
CONVAIR 240, N55VM
GILLSBURG, MISSISSIPPI
OCTOBER 20, 1977

SYNOPSIS

About 1852 c.d.t. on October 20, 1977, a Convair *240* (N55VM) owned and operated by L & J Company and transporting the Lynyrd Skynyrd Band from Greenville, South Carolina, to Baton Rouge, Louisiana, crashed 5 miles northeast of Gillsburg, Mississippi.

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The National Transportation Safety Board determines that the probable cause of this accident was fuel exhaustion and total loss of power from both engines due to crew inattention to fuel supply. Contributing to the fuel exhaustion were inadequate Flight planning and an engine malfunction of undetermined nature in the right: engine which resulted in higher-than-normal fuel consumption.

1. FACTUAL INFORMATION

1.1 History of the Flight

On October 20, 1977, L & J Company Convair 240 (N55VM) operated as a charter flight to transport the Lynyrd Skynyrd Band from Greenville, South Carolina, to Baton Rouge, Louisiana. The aircraft was owned by L & J Company of Addison, Texas, and the flightcrew was employed by Falcon Aviation of Addison. A lease agreement had been entered into by Lynyrd Skynyrd Productions, Inc., and the L & J Company for the period October 11, 1977, to November 2, 1977.

At 0430 c.d.t. 1/ on October 18, N55VM had arrived at the Greenville Downtown Airport, Greenville, South Carolina, from Lakeland, Florida. While on the &round at Greenville, the aircraft had been refueled with 400 gallons of 100-octane, low-lead fuel.

On October 20 at 1602 c.d.t., the flight had departed Grecnville Downtown Airport for Baton Rouge, Louisiana. The pilot had filed an IFR flight plan by telephone with the Greenville Flight Service Station. The route of flight was to be Victor 20 Electric City, direct Atlanta, direct La Grange, direct Hattiesburg Victor 222 McComb, V194 and to Baton Rouge. The pilot requested an altitude of 12,000 ft m.s.l. 2/ and stated that his time en route would be 2 hours 45 minutes and that the aircraft had 5 hours of fuel on board. The pilot was also given a weather briefing.

The flight was initially cleared as filed, except the pilot was told to maintain 5,000 ft. Shortly after takeoff, the flight was cleared to 8,000 ft and was asked to report when ieaving 6,000 ft. When the flight reported leaving 6,000 ft, it was issued a frequency change. The pilot did not adhere to the 8,000-ft restriction but continued to climb to 12,000 ft. The flight was allowed to continue its climb to 12,000 ft and the clearance was so amended.

After reaching 12,000 ft, N55VM proceeded according to flight plan and at 1839:50 was cleared to descend to and maintain 6,000 ft. This clearance was acknowledged. At 1840:15 the flight told Houston Air Route Traffic Control Center (ARTCC), "We're out of one two thousand for six thousand." About 1842:00 N55VM advised Houston Center, "Yes, sir, we need to get tu a airport, the closest airport you've got, sir." Houston Center responded by asking the crew if they were in an emergency status. The reply was, "Yes, sir, we're low on fuel and we're just about out of it, wc want vectors to McComb, post haste please, sir."

1/ All times herein have been converted to central daylight based on the 24-hour clock.

2/ All altitudes herein are mean sea le-el, unless otherwise indicated.

Houston Center gave the flight vectors to McComb and at 1842:55 advised it to turn to a heading of 025°. N55VM did not confirm that a turn was initiated until 1844:12. At 1844:34, the pilot of N55VM said, "We are not declaring an emergency, but we do need to get close to McComb as straight and good as ire can get. sir."

At 1845:12 N55VM advised Houston, "Center, five victor Mike we're out of fuel." The center replied, "Roger, understand you're out of fuel?" N55VM replied, "I am sorry, it's just an indication of it." The crew did not explain what that indication was. At 1845:47 Houston Center requested N55VM's altitude. The response was, "We're at four point five." This was the last recorded communication between N55VM and the ARTCC. Several attempts were made by Houston Center to contact the flight but there was no response. At 1855:51 an aircraft reported picking up a weak transmission from an emergency locator trnnsmittor (ELT)

The aircraft had crashed in heavily wooded terrain, during twilight hours, at an elevation of 310 ft, and at latitude 31° 04' 19" and longitude 90° 35' 57" near the town of Gillsburg, Mississippi.

1.2 Injuries to Persons

Injuries	crew	Passengers	~~Others~~
Fatal	2	4	0
Serious	0	19	0
Minor/None	0	1	0

1.3 Damage to Aircraft

The aircraft was destroyed.

1.4 Other Damage

Trees in the impact area were damaged.

1.5 Aircraft Information,

N55VM was purchased by the L & J Company in April 1977. The aircraft vas manufactured in 1947 and had accumulated 29,013.6 flight-hours. The aircraft was certificated ant'. equipped in accordance with current regulations and procedures.

1.6 Meteorological Information

At 1855, the weather at McComb, Mississippi, was 5,000 ft a.g.1. scattered, 12,000 ft a.g.1. scattered, 25,000 ft a.g.1. thin broken, visibility--15 mi, temperature--62°F, dewpoint--57°F, wind--calm, altimeter setting--30.12 in.Hg.

At 1900, the winds aloft observation at 12,000 ft for Athens, Georgia, was 335° at 10 kn; at Centerville, Alabama, 310° at 15 kn; and at Jackson, Mississippi, 320° at 6 kn. The radiosonde observations for Athens, Centerville, and Jackson showed dry air at 12,000 ft and below. The temperature at Athens and Centerville at 12,000 ft was near 0° C, 9° C warmer than International Standard Atmosphere (ISA) temperature. The temperature at Jackson at 12,000 ft was about -1° C, 8° C warmer than ISA temperature.

1.7 Aids to Navigation

The Houston ARTCC was equipped with ARSR-1E and ATC BI-4 radar; the ATC BI-4 was equipped with NAS Stage-A automation. All radar equipment was operating normally when radar vectors were given to N55VM.

1.8 Communications

Communications between N55VM and any facility contacted were not a factor in this accident.

1.9 Aerodrome and Ground Facilities

The McComb-Pike County Airport was the closest facility available to N55VM when the pilot asked for vectors to the closest airport. Runway 15/33 is 5,000 ft long. Runway 15 is equipped with medium intensity runway lights, a medium intensity approach light system, sequence flashers, and abbreviated approach slope indicators. Runway 33 is similarly equipped except it does not have an approach lighting system and sequence flashers.

The runway lights and the rotating beacon were controlled by a light-sensitive photo cell. It could not be determined if the runway lights were on the night of the accident. However, 2 days later, the lights were monitored and they illuminated at 1822.

The localizer had been out of service for several months and was transmitting without identification; a Notice to Airmen (NOTAM) to this effect had been issued. The outer marker, a nondirectional beacon, was cut of service and was not transmitting at the time of the accident.

1.10 Flight Recorders

The aircraft was not equipped with either a flight data or cockpit voice recorder, nor were they required.

1.11 Wreckage and Impact Information

The aircraft crashed in a heavily wooded area. The descent angle through the trees was about 5° initially. The angle steepened

after the aircraft hit the second tree and continued the steeper angle until it hit the ground. The wreckage path was about 495 ft long. Trees as high as 80 ft and as large as 3 ft in diameter were struck during the final 300 ft of flight. The left horizontal Stabilizer and the outboard section of both wings were torn from the aircraft and found 100 ft from the main wreckage along the wreckage path. The right outboard wing pane' separated from the aircraft after initial contact with trees. The left horizontal stabilizer and the left outboard wing panel also struck trees and separated along the wreckage path. The wreckage distribution was on a magnetic heading of 012'. The fuselage continued forward on that heading and came to rest about 140 ft from the point of initial impact. The fuselage separated forward of the bottom leading edge of the vertical stabilizer. The center wing and engine nacelles were twisted to the left of the forward fuselage. The cockpit structure was crushed against trees. Cabin seats separated during the impact sequence. (Pee. Appendix D.)

'All of the fuel crossfeed and fuel dump valves were in the closed position. Both fuel tank filler caps were in place. Fuel tank selector valves were in the closed position.

Both engines remained within their nacelles; the left propeller separated from the engine. while the right propeller remained attached. The propeller blades were not extersively damaged.

The cylindrr heads and most of the accessories of both engines remained intact, attached, and undamaged. The cooling fins on several cylinders had been damaged slightly.

The spark plugs of both engines were intact and generally undamaged. The spark plug electrodes were not damaged nor did they bear any evidence of a combustion chamber malfucction. The carburetor fuel strainers of both engines were free of contamination; no entrapped or pressurized fuel was found in either carburetor. The landing gear and flaps were retracted. Both landing ilghts were in the retracted position.

Positions of cockpit switches and controls were as follows:

SWITCH	SETTING
Left generator	On
Right generator	On
Battery switch	On
Left magneto	Eoth
Right magneto	Both
Gear handle	up Position
Fuel quantity indicator (pcsition unknown)	Pointer (Missing)
Left fuel boost pump switch	On
Right fuel boost pump switch	On

Radio master switch	Off
Left engine blower switch	High
Right engine blower switch	High
Left and right throttles	Full Forward
VHF Comm 1	125.20 MHz. Baton Rouge ATIS
VHF Nav 1	109.10 MHz. McComb Localizer
ADF	272 kHz. Undetermined
VHF Comm 2	123.80 MHz. Houston Approach-W.
VHF Nav 2	116.50 MHz. Baton Rouge VOR
Transponder 1	3,171
Transoonder 2	3,281
Fire extinguishers	Nonnal
Left fuel tank selector switch	Closed
Right fuel tank selector switch	Closed
Fuel crossfeed lever	Off

1.12 Medical and Pathological Information

Post-mortem examinations of the flightcrew and passengers were made to determine cause of death and to identify types of injuries. Toxicological examination of the flightcrew disclosed no evidence of drugs, alcohol, or elevated levels of carbon monoxide in the blood. Both flightcrew members and the four passengers died as a result of traumatic injuries sustained at impact.

All surviving passengers were hospitalized. Most of the passengers received multiple fractures and severe lacerations. However, three passengers received only contusions and abrasions. Two of these passengers were hospitalized over 48 hours and were, therefore, listed as seriously injured.

1.13 Fire

There was no fire.

1.14 Survival Aspects

Warning was given to the passengers before the crash landing. Most passengers assumed the crash position after being told by a flightcrew member that an emergency landing was imminent.

The accident vas survivable for passengers in the cabin because there was no fire and some sections of the fuselage retained their integrity during impact. However. other sections, particularly the cockpit area, sustained massive impact deformation and therefore the accident, for occupants of these sections, was nonsurvivable. No fire erupted during the crash sequence because there was no fuel in the wing tanks when wing sections separated from the main structure. Survival was also enhanced by the six medical doctors and 20 corpsmen and emergency medical technicians at the Crash site who diagnosed, treated, and helped stabilize crash victims during the evacuation and en route to hospitals.

At 1855, the United States Coast Guard Station at New Orleans notified an airborne HH3F helicopter of the accident. The helicopter arrived in the general area of the accident 30 minutes later. After receiving an ELT signal, the helicopter located the wreckage at 1936. The helicopter hovered at 25 ft above the trees over the crash site and illuminated the area. Ground parties and emergency vehicles reached the wreckage area about 30 minutes later. At 2055 and 2100 Coast Guard helicopters landed within yards from the accident site with personnel, communications equipment, and medical supplies. A Coast Guard C-131 aircraft arrived over the accident site at 2010 and assumed on-scene command duties.

Pike County Civil Defense Council, Pike and Amite Counties Sheriffs' Departments, Mississippi Highway Patrol, and Southwest Mississippi Regional Medical Center jointly implemented disaster plans and helped to rescue aircraft occupants.

The crash rescue personnel had displaced the wreckage in order to rescue injured passengers and to recover bodies. The fuselage was fractured aft of the trailing edge of the wings and forward of the leading edge of the wings. The fractured portions of the fuselage were completely displaced and pointed in different directions. The cockpit and center portion of the aircraft was upright and essentially level.

The cabin was partitioned into three passenger compartments with seating for 24 persons. Two aft facing seats were located in the aft section on the right side of the aircraft; between these two seats a table had been installed. An executive-type swivel seat had been installed on the left side of the aircraft facing forward. Facing it (aft facing) another swivel-type seat had been installed. A collapsible table was located between these two seats. In this section of the aircraft, the floor was completely disrupted and all seats had torn loose. No deformation from impact was noted on any of these seats. All passengers in this section survived, but were injured seriously.

In the center section of the aircraft, six double-unit, forward facing seats had been installed; only one of these units remained attached to the floor. Although this unit had been bent and deformed to the right, the seat legs were not fractured. The other seats in this section of the aircraft were completely displaced and scattered about the cabin; the floor also broke up. One passenger in this section was killed, while others in the section received minor to serious injuries.

In the forward section of the aircraft on the right side a four-place side-facing couch had been installed. The couch was damaged extensively; however, investigators could not differentiate between damage from impact and damage from rescue operations. On the left side of this section were two swivel seats; one aft facing, the other forward

facing with a table installed in between them. Although both seats separated from the floor, no impact load damage to either seat was obvious. The cockpit seats were in place, however, they were damaged extensively by impact forces. The major loads on these seats appeared to be to the right. Both crewmembers were killed.

All seats in the aircraft were fitted with slip-through. metal-to-fabric seatbelts. There were no shoulder harnesses installed. The seatbelts in the aircraft did not fail, although some had been cut by rescue personnel to remove the occupants. The buffet, both the forward and aft lavatory, and the aft storage compartment were extensively damaged by impact. The aft stairway entry door was closed and locked. The forward service door directly behind the cockpit was bent and the handle was in the locked position. The two overwing exits on the left side of the aircraft and the forward ovrrwing exit on the right side , were in place. The aft right overwing exit was outside the aircraft about 26 ft forward and to the right of the wreckage.

1.15 Tests and Research

Under the direction of Safety Board investigators. functional tests of fuel, ignition system, and propeller control components Were conducted at various test facilities.

1.16 Carburetors

Both carburetors were 'flow tested. The density values obtained were slightly over limits. The right carburetor's automatic mixture control was disassembled and examined; there was no evidence of corrosion or contamination. The control wear pattern was normal.

Results of the left Carburetor flow test indicated that most flow test points were within the manufacturer's specifications. The altitude compensation feature of the automatic mixture control was slightly lean. At low operating ranges the right carburetor produced fuel flow rates above manufacturer's specifications. At or above cruise operating ranges, the fuel. flow rates were within manufacturer's specified limits.

1.16.1 Propeller Governors and Blade Angles

The selected positions of the governor's head rack were determined to be 1,200 rpm.

Since the auxiliary check valve on the left propeller governor was broken away from the governor housing, the governor could not be tested "as received." Therefore, the governor head, the high-pressure valve, and the cut-out solenoid switch were removed from the hydraulic governor "as received" and installed on an equivalent governor housing. These components functioned satisfactorily when tested.

The right propeller governor was intact and undamaged. Results of the propeller governor functional test were sntisfactory, except that the propeller feathering cutoff switch would not allow high pressure to build up for the feathering/unfeathering cycle. The clearance between the hydraulic governor body base bore and the gave-nor drive shaft was measured; the bore measured 0.8762 inch, while the governor drive shaft measured 0.8726 inch. The manufacturer's allowable tolerance for the bore dimension is 0.8745 to 0.8750 inch. The gear shaft bushing, P/N 322565F, was not installed.

Propeller blade impact angle measurements were obtained from the spider shim plates which were removed from both propellers. Average readings were +30°.

1.16.2 Magnetos and Distributors

The left magneto was not damaged externally. The magneto rotor shaft turned freely. The "E" (timing) gap locating pin functioned normally. A resistance check of the four coils showed normal electrical continuity. A high voltage check to the ground of the magneto primary cable showed no leakage. A trace of depolymerized potting material had leaked onto the low tension coil in the "L1" position of the magneto. No other mechanical or electrical discrepancies were present.

"'ne right magneto was not damaged externally. The magneto rotor shaft turned freely. The resistance check of the four coils showed normal electrical continuity. A high voltage check to the ground of the magneto primary cable disclosed no leakage. Normal operating voltage is 200 volts; test voltage was 500 volts. No mechanical or electrical discrepancies were found during the examination of the right magneto.

1.16.3 Distributors

Left Engine. Neither the left nor right distributor was damaged and the individual carbon distributor brushes were intact. Both distributor shafts turned freely.

The distributor timing was checked. The opening duration of the No. 1 breaker point was 17° for the left distributor and 15° for the right distributor. The opening duration of the No. 2 breaker point was 15 1/2° for the left distributor and 15' for the right distributor. Bendix Publication Form L-242-4 specifies tolerances of 16° ± 1/2° for the No. 1 breaker, and ± 2" for the No. 2 breaker point. The static timing angular relationship between the left distributor's No. 1 breaker point assembly and its No. 2 breaker point assembly was 260' after the No. 1 breaker point assembly opened. The same relationship on the right distributor's breaker opening was 258°. Specified tolerances are 260° ± 15'.

The two capacitors installed in the left and right distributors were tested with a Bendix 11-1767-3 primary condenser tester for series resistance, leakage, and capacitance; these capacitors were all within service overhaul manual specifications. The carbon brush free heights were 13/64 inch for the left distributor and 11/64 inch for the right distributor. The service overhaul manual specifies 1/8 inch minimum free brush height. The breaker point contacts were in normal condition. No mechanical or electrical discrepancies were found in either distributor. All distributor primary wiring was intact and undamaged.

Right Engine. The left distributor was extensively damaged; primarily, the housing had cracked and collapsed and attaching bolt blanges had broken. The lower section of both capacitors were crushed inward about 1/4 inch. The distributor rotor had cracked over its cross-sectibnal area. The No. 1 breaker point assembly was displaced from its installed position. The No. 2 breaker point assembly was not damaged and remained in its installed position. The distributor shaft turned freely.

Because the No. 1 breaker point nssembly was displaced, opening duration and angular relationship could not be determined. The No. 2 hreake: point's opening duration was 13°.

The two capacitors were within service overhaul manual tolerances for series resistance, leakage, and capacitance. Free brush height Cor the carbon brushes was 1/4 inch. The condition of the breaker points was normal with respect to the distributor's operating time.

The right distributor was not damaged externally. The distributor shaft turned freely and the distributor brushes were intact. The breaker point opening duration for the No. 1 breaker point assembly was 17' and the angular relationship between the No. 1 breaker point and the No. 2 breaker point was 261". The breaker point opening duration for the No. 2 breaker point was 18 1/2°. The two capacitors were within service. tolerances for series resistance, leakage, and capacitance. Carbon brush free heights were 13/64 inch. Distributor operating time was normal. Nc electrical OK mechanical discrepancies were found in the distributor. Because of impact deformatton and displacement, distributor to engine timing could not be determined.

1.16.4 Fuel Pumps and Gages

Both the left and right fuel boost pumps and engine-driven fuel pumps were functionally tested and operated normally. The fuel quantity gages were examined at the Safety Board's Laboratories in Washington, D.C.; the following resulted:

One gage, S/N 508C, had been crushed upward on the lower forward end. The case was dented, distorted, and cut on the right side. The rear cover and some of the internal components were missing. The

glass face was broken and the graduated-dial face was buckled; its pointer was missing. The pointer pivot shaft was in place and was examined under a IO-power magnifying glass, which disclosed the outline of the pointer's position on the pivot shaft. By placing a pointer in the outline, the Safety Board determined that the pointer was indicating either 100 pounds or 4.000 pounds.

The ocher gage, serial number unknown, had been crushed on the aft end and the electrical connecror had been broken off. The case was distorted and gouged. The glass face was broken and the graduated dial-face had been crushed inward and gouged. The pointer was attached to its shaft and was indicating zero pounds. The long side of the pointer as bent inward and could not be moved above zero pounds, the pointer could be moved below zero pounds.

1.17 Additional Information

1.17.1 Aircraft Fuel Consumption

Normal average fuel consumption for the Convair 240 aircraft powered with the Pratt 6 Whitney R2800CB-16 engine is about 183 gallons per hour.

A surviving pilot-qualified passenger stated that he had seen torching from the right engine on the flight from Lakeland, Florida, to Creenville, South Carolina. Flames had extended from the engine as far as 10 feet for a period of about 5 minutes. This passenger had also visited the cockpit and noted that the right engine was being operated with the mixture control in the auto-rich position. The crew had explained that they were operating in this manner in order to alleviate a rough operating condition of the engine.

Eased on carburetor flow specifications obtained from the engine manufacturer, the difference in fuel flow between the auto-rich (650 lbs/hr) and the auto-lean fuel flow (500 lbs/hr) at 12,000 feet and 1,100 brake horsepower is about 150 lbs./hr. or 25 gallons/hr.

The aircraft departed Addison. Texas, with 1,300 gallons of fuel; its fuel capacity was 1,550 gallons. At it's first stop, Jacksonville, Florida. 200 gallons of fuel were added. At Statesboro, Florida. 200 gallons were added; at Miami, 400 were added; at St. Petersburg, 250 gallons were added, at Lakeland, 200 gallons were added, and at Creenville. 400 gailons were added. The total flight time for this itinerary, including the 2.8 hours frcm Greenville to the accident site, was 13.5 hours. Based on :he average fuel consumption of 183 gallons per hour and 82.5 gallons for each of the seven taxi, takeoff, and climb operations, sufficient fuel should have been on board the aircraft to reach its destination. Fuel consumption calculations, based on available operational data, disclosed that 2.8 hours (512 gallons) of fuel was available from Creenville to

the accident site. Rest estimates indicate that 207 gallons of fuel should have been on board at the accident site. The Safety Roard could not determine why the flight plan reflected 5 hours of fuel on board. Fuel consumption data, based on fuel added at each intermediate stop after the flight left Addison, cannot support the presence of a 5-hour, or 900-gallon, supply at Greenville. However, the precise number of hours during which the right engine was operated with the mixture in "auto-rich" could not be established. It is. therefore, impossible to calculate exactly how much fuel was on hoard the aircraft after 400 gallons were added at Greenville.

1.17.2 Leasing Data

On October 11, 1977, a lease agreement was made between the L & J Company and Lynyrd Skynyrd Productions, Inc. (See Appendix E.) Federal Aviation Regulations 14 CFR 91, "General Operating and Flight Rules," 91.54 paragraph (a)(2), requires:

> "Identification of the person the parties consider responsible for operational control of the aircraft under the lease or contract of conditicnnl. sale and certification by that person that he understands his responsibilities for compliance with applicable Federal Aviation Regulations."

Further, 14 CFR 91.54 (c) (1) requires that:

> "The lessee or conditional buyer, or the registered owner if the lessee is not a citizen of the United States, has mailed a copy of the lease or contract that complies with the requirements of paragraph (a) of this section, within 24 hours of its execution, to the Flight Standards Technical Division, Post Office Box 25724. Oklahoma City, OK 73125."

Examination of the aircraft records on file with the Federal Aviation Administration (FAA) in Oklahoma City disclosed that the lease agreement for N55VM executed on Octnber 11, 1977. was received by FAA on October 25. 1977. The envelope in which the lease agreement was mailed had affixed to it Pitney Bowes Meter postage, dated October 17, 1977, at Addison, Texas. The Pitney Bowes postage was cancelled by the Dallas, Texas. Post Office during "pm" of October 21, 1977.

i.18 New Investigative Techniques

None

2. ANALYSIS

The flightcrew was properly certificated and trained in accordance with applicable regulations. There was no evidence of pre-existing medical problems that might have affected the flightcrew's performance.

The aircraft was certificated and equipped according to applicable regulations. The gross weight and c.g. were within prescribed limits. The aircraft's structure and components were not factors in this accident. There was no evidence of any malfunction of the aircraft or its control system. The propulsion system was operating and was producing power until fuel was exhausted. The right engine had been malfunctioning for some time and caused the flightcrew to operate that engine on auto-rich fuel mixture during the accident flight and during previous flights in order to obtain an acceptable level of performance from it.

Although examination of tile engine and its components did not identify the exact discrepancy. the Safety Board believes that the discrepancy was of a general nature, such as an ignition or induction problem, and was not a major mechanical failure. Components of the right engine's ignition system were so badly damaged by impact that engine to distributor timing could not be determined. Consequently, the pre-impact condition of the ignition system could not be determined from the evidence available.

Hosed on wreckage examination, the Safety Board concludes that hoth engines ceased producing power because of fuel exhaustion. Only one quart of fuel was recovered from both engines. Evidence obtained fron the fuel quantity gages indicates that both fuel tanks were empty at the time of impact.

According to the best estimates, the aircraft should have had about 207 gallons of fuel on hoard at the time of the accident. This figure is based on a normal cruise configuration with both engines operating with "auto-lean" fuel. mixture.

In order to determine the reason for the discrepancy between calculated fuel on board and actual fuel on board, the Safety Board analyzed the following three explanations:

First, there could have been a fuel leak. However, no evidence of fuel leakage, such as stains or loose fuel tank caps or lines, was found in the wreckage. Although this possibility cannot be discounted completely. because there is a remote possibility that leakage evidence could have been obliterated at impact, the Snfety Board does not believe it to be the most viable explanation.

Secondly, the aircraft may not have been fueled with the amount shown on the fuel slips. The Safety Board considers this explanation relatively remote because the fuel meters on refueling trucks cannot be reset and, if functioning properly, will reflect the total amount of fuel dispensed to a given aircraft.

Finally. the engines or an engine could have been burning more fuel than specified and more than the flightcrew expected to be burned. The witnesses report of torching from the right engine would indicate a rich fuel mixture or other discrepancy associated with inadequate combustion. Operating an engine in the auto-rich configuration would increase the fuel consumption by about 25 gallons per hour for that engine, from 183 gal/hr to 208 gal/hr. During the accident flight of 2.3 hours this would have amounted to about 70 gallons. It is impossible to determine how long the aircraft was operated with the right engine in auto-rich, but it was evidently long enough to exhaust the useable fuel. on board the aircraft. Regardless of the high fuel consumption of the right engine, the 5-hour, or 900+ gallon, fuel supply listed on the flight plan would have been sufficient to reach the destination. Considering the increased fuel consumption on the right engine, 583 gallons would. have been required *to* complete 2.8 hours of flight from Creenville to the accident site. Therefore, the Safety Board concludes that the right engine was burning more fuel than anticipated because it was being operated in the auto-rich fuel mixture.

The crew was either negligent or ignorant of the increased fuel consumption because they failed to monitor adequately *the* engine instruments for fuel flow and fuel quantity. Had they properly monitored their fuel supply and noted excessive fuel consumption early in the flight, they could have planned an alternate refueling stop rather than attempting to continue flight with minimum fuel. In addition, the Safety Board believes that the pilot was not prudent when he continued the flight with a known engine discrepancy and did not have it corrected before he left Greenville.

This accident involves another operation where the party which had operational responsibility is in controversy. It appears that it was the intent of L & J Company to have the operational responsibility assumed by the lessee, Lynyrd Skynyrd Productions. The lessee, however, appears to have had no understanding that it was the operator and had assumed the responsibilities thereby inposed. The question of who was the legal operator of this flight is currently being litigated by the FAA in an enforcement action against L & J Company and will be addressed in civil litigation arising out of this accident.

In examining this relationship, the Board reviewed the lease for this flight. The lease was not drafted to meet the "letter of the regulations" in that the "truth in leasing provisions" were not in the concluding paragraph or in "large print" as required by 14 CFR 91.54.

However, it did contain the information required by 14 CFR 91.54(a)(1)(2) and (3), particularly paragraphs 4 and 5 of the lease which clearly indicate the lessee vas to be the operator and thereby have "paramount. and complete responsibility for the supervision and direction of the flightcrew.. .."

There may have been sufficient information in the lease for the lessee to understand his status, if he read it and if he did, understood it. However, the lessee did not understand what his role was on the basis of the lease, nor would he have had any better understanding if the provision had been drafted as intended by the regulations.

It therefore appears to the Safety Roard that whether this lease was or was not adequate is not the primary safety problem, but how docs the system in such a case protect a lessee who *is* uninformed either by design, by inadvertence, or by his own carelessness. The requirement that a copy of the lease be sent to FAA within *24* hours of its execution has not been effective. In this case, this requirement was not even met. However, in November 1977, FAA amended CFR 91.54 to require that lessees notify the nearest FAA office *48* hours prior to tha first flight under a lease and provide information concerning (1) the departure airport, (2) time of departure, and (3) the registration number of the aircraft. In adopting the amendment; the FAA stated *that* the purpose of the new requirement was to give the FM notice prior Lo the flight and thereby an opportunity to conduct preflight surveillance of lease and contract operations. This requirement should serve to protect innocent lessees if (1) they comply with the requirement and contact the FM office, and (2) the FAA office takes action to assure that there is a clear understanding by the lessee as to who is the operator and what responsibilities and obligations are thereby assumed. If this occurs, it should be a step toward resolving the problem of the uninformed lessee.

3. CONCLUSIONS

3.1 Findings

1. Both engines of N55VM ceased to produce power because the aircraft's useable fuel. supply was exhausted.

2. The crew failed to monitor adequatelv the fuel flow, en route fuel consumption, and fuel quantity gages.

3. The crew failed to take appropriate preflight and maintenance action to assure an adequate fuel supply for the flight.

4. The crew operated the aircraft for an indeterminate amount of time before the accident with the right engine's mixture control in the auto-rich position.

5. There were no discernible discrepancies between the amounts of fuel added to the aircraft and the amounts shown on the fuel receipts from the servicing facilities.

6. There was no evidence of a fuel leak.

7. There was no fire after impact because little fuel remained in the aircraft's fuel system.

8. The survival of many passengers was due to the lack of severe impact deformation in the center of the fuselage and the absence of a postcrash fire.

9. The provisions of the lease intended to satisfy the requirement for a "truth in leasing clause" did not result in this lessee having an adequate understanding as to who was the operator of this flight and what that means.

3.2 Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was fuel exhaustion and total loss of power on both engines due to crew inattention to fuel supply. Contributing to the fuel exhaustion were inadequate flight planning and an engine malfunction of undetermined nature in the right engine which resulted in higher-than-normal fuel consumption.

4. SAFETY RECOMMENDATIONS

No safety recommendations were submitted as a result of this accident. FAA issued Advisory Circular 91-37A on January 16, 1978, with detailed guidance relative to leasing of aircraft.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PHILIP A. HOGUE
Member

/s/ ELWOOD T. DRIVER
Member

June 19, 1978

5. APPENDIXES

APPENDIX A

INVESTIGATION

Investigation

At 2025 e.s.t. on October 20. 1977, the National Transportation Safety Board was notified of the accident by the FAA Communications Center in Washington, D.C. An investigative team was dispatched immediately to McComb, Mississippi, and working groups were.established for operations, human factors, structures, systems, powerplants, air traffic control, witnesses, weather, and aircraft records.

The Federal Aviation Administration, Convair Division of General Dynamics, and Prntt 6 Whitney Aircraft Group of United Technologies participated in the investigation.

APPENDIX B

PERSONNEL INFORMATION

Captain Walter W. McCreary

Captain Walter W. McCreary, aged 34, held a first-class medical certificate dated September 19, 1977, with no waivers or restrictions. He also held Airline Transport Pilot Certificate No. 1804920, dated September 12, 1977, with multiengine land ratings in the DC-3, Convair 240, 340, and 440 aircraft. He also had commercial privileges, airplane single-engine land. He had accrued a total of 6,801.6 flight-hours, 68 of which were in the Convafr aircraft.

First Officer William J. Gray, Jr.

First Officer William J. Gray, Jr., aged 32, held a second-class medical certificate dated December 30, 1976, with the restriction that "holder shall wear correcting glasses while exercising the privileges of his airman's certificate." He also held Commercial Pilot Certificate No. 75224, issued March 4, 1976, with airplane single- and multi-engine land and instrument ratings. He had accrued 2,362 flight-hours, 38 of which were in the Convair aircraft.

APPENDIX C

AIRCRAFT INFORMATION

The aircraft, a Convair 240, serial No. 3, United States registry N55VM, was manufactured in 1947 by Convair in San Diego, California. N55VM had accumulated 29,013.6 flight-hours as of October 16, 1977. The aircraft was equipped with one Pratt & Whitney R2800-CB-16 engine, one R2800-CB-17 engine, and two Hamilton Standard 43E60 propellers.

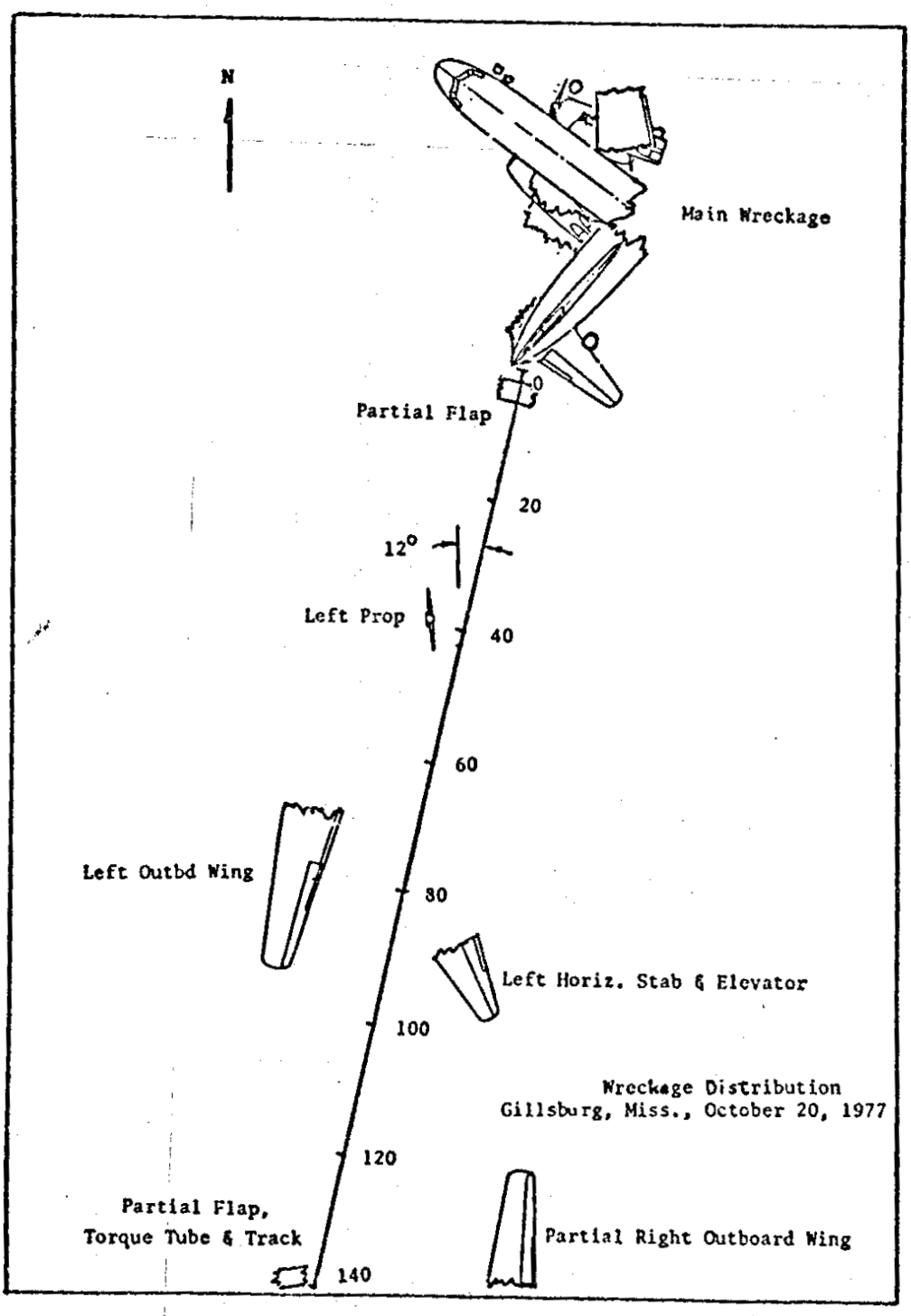
Engine serial numbers and vital data were as follows:

Engine Position	Serial No.	Date Installed	TSO
No. 1	P 36878	5/7/73	922 hrs
No. 2	P 31683	4/24/70	1,807 hrs

Although the aircraft registration certificate carried U. S. registry marks N55VM, the airworthiness certificate carried in the aircraft carried U. S. Registry marks N55VX.

At the time of the accident, the aircraft was leased to Lynyrd Skynyrd Production, Inc., and was being operated under provisions of 14 CFR 91.

APPENDIX *D*


N
Main Wreckage
0
Partial Flap
20
12°
Left Prop
40
60
Left Outbd Wing
80
Left Horiz. Stab & Elevator
100
Wreckage Distribution
Gillsburg, Miss., October 20, 1977
120
Partial Flap,
Torque Tube & Track
Partial Right Outboard Wing
140

APPENDIX E

AIRPLANE LEASE AGREEMENT

THIS LEASE AGREEMENT, made and executed on this 11th day of October 19 77, by and between L&J Company, (hereinafter LESSOR)

with principal offices at Addison, Texas and Lynyrd-Skynyrd Prod, Inc., (entity) Corporation with principal offices in the State of

WITNESSETH:

(1) LESSEE is desireous of leasing from LESSOR, and LESSOR is desireous of leasing to LESSEE, subject to the terms and conditions set forth herein, and for the consideration hereinafter set out, an aircraft known as Convair 240, whose registration number issued by the Federal Aviation Administration (FAA) is N-55VM.

(2) LESSOR is the sole owner of the aforementioned civil aircraft number N-55VM, and is duly empowered and authorized to make and execute this lease.

NOW THEREFORE, the parties hereto, for the mutual covenants and conditions contained herein, do hereby agree as follows:

(1) The LESSOR shall LEASE unto LESSEE civil aircraft number N-55VM.

(2) The parties hereto agree that the term of this LEASE shall commence on the 11th day of October, 19 77, and shall be continuous until the proposed date of Nov. 2 1977.

APPENDIX E

19 77 . At the expiration of this lease, civil aircraft number N-55VM shall be returned to LESSOR in as good or in the same condition as when received by LESSEE, normal wear excepted.

(3) LESSOR agrees, understands, and acknowledges that the scheduling usage and operation of civil aircraft number N-55VM , when operated under this LEASE, shall be under the supervision and control of LESSEE. LESSEE hereunder shall have the exclusive right to use the aircraft leased hereunder. Full operational control of the aircraft shall rest with LESSEE, (including arrangements for the performance of required maintenance).

(4) LESSEE agrees that it will be the operator of civil aircraft number N-55VM during the times and flight hours said aircraft is utilized for and on account of its own business and will not utilize civil aircraft number N-55VM for the purpose of providing transportation of cargo or passengers in air commerce for compensation or hire, unless it holds appropriate authority to do so, and complies with all regulations, both state and federal, in exercising that authority.

(5) LESSEE, in executing this LEASE, covenants, agrees, acknowledges and certifies that it is to have paramount and complete responsibility for the supervision and direction of of the flight crew engaged, employed, hired or leased by it to fly civil aircraft number N-55VM , and shall pay crew and expenses of same throughout the duration of the lease.

APPENDIX E

(6) LESSOR AND LESSEE agree and understand that title to civil aircraft number N-[redacted] shall and does remain vested in LESSOR.

(7) LESSEE WARRANTS and agrees by execution of this LEASE to conduct all its operations under and during the term of this LEASE in accordance with all applicable regulations from whereever derived, in a good, safe and reasonable manner.

(8) The parties hereto agree that this LEASE shall not be assigned.

(9) In consideration of the above LEASE, LESSEE agrees to pay LESSOR the sum of [redacted] per running statute mile flown. Based on itinerary presented said sum shall be paid in increments as follows:

1st. Increment [redacted] in advance
2nd. Increment days after beginning of LEASE
3rd. Increment days after beginning of LEASE

Total amount of this LEASE shall be [redacted]

(10) This LEASE may be continued on an indefinite basis by prior arrangement with LESSOR at the same monetary consideration shown above.

(11) LESSOR shall supply $2,000,000 Liability Insurance: $100,000.00 per seat Liability and Hull insurance for the total value of the aircraft.

(12) LESSEE shall hold LESSOR harmless in any event that drugs or narcotics of any kind should be brought aboard this aircraft for any purpose.