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WASHINGTON, D.C.

OPERATIONAL FACTORS/HUMAN PERFORMANCE GROUP CHAIRMAN'S FACTUAL REPORT (10 PAGES)

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Office of Aviation Safety
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OPERATIONAL FACTORS/HUMAN PERFORMANCE
GROUP CHAIRMAN'S FACTUAL REPORT

DCA96MA068

A. ACCIDENT

Operator:	Delta Air Lines Inc.
Location:	Pensacola Regional Airport (PNS). Pensacola, Florida
Date:	6 July 1996
Time:	1424 Central Daylight Time (CDT)[1] - 1924 (UTC)[2]
Aircraft:	McDonnell Douglas Aircraft Co.. MD-88, Registration N927DA, S/N 49714

B. OPERATIONS GROUP

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C. SUMMARY

On July 6, 1996, at approximately 1424 CDT (2:24 p.m.), Delta Air Lines Flight 1288 experienced an uncontained engine failure of the number one[3] (left) engine during takeoff roll on runway 17[4] at Pensacola Regional Airport (PNS). Flight 1288 had 142 passengers on board. The crew consisted of two pilots and three flight attendants. In addition to the crew, two non-revenue Delta employees were on board occupying the cockpit and the aft cabin jump seats.

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[1] All times are Central Daylight Time (CDT) based on a 24-hour clock, unless otherwise noted. Actual time of accident is approximate, determined by Cockpit Voice Recorder (CVR) and Air Traffic Control (ATC) transcripts.
[2] Coordinated Universal Time - Formerly Greenwich Mean Time (GMT) or (Z)
[3] Aircraft engines are numbered consecutively beginning with leftmost outboard engine continuing right.
[4] Runways numbers are relative to approximate magnetic heading. Thus, runway 17 is oriented approximately 170 degrees magnetic heading.

Pieces of the engine penetrated the fuselage of the aircraft, fatally injuring two passengers and seriously injuring two others. The takeoff was aborted and the aircraft stopped on the runway. In exiting the aircraft, three additional passengers were injured.

The Pensacola weather, reported at 1406 CDT. valid at the time of the accident was: Wind from 210 degrees at 12 knots; visibility 7 statute miles; a scattered layer of towering cumulus clouds at 3,500 feet; temperature 90 degrees Fahrenheit (32 degrees Celsius), dew point 77 degrees Fahrenheit (25 degrees Celsius), altimeter setting 29.98, remarks - towering cumulus clouds reported in all quadrants.

D. DETAILS OF THE INVESTIGATION

The current Operations Group Chairman was assigned to the investigation on August 1, 1996, after the majority of on-scene interviews and investigations had taken place. In addition, due to scheduling and other mitigating circumstances, all listed Operations Group members were not necessarily present at all investigative events.

The Operations Group participated in the on-scene accident investigation at Pensacola Regional Airport, Pensacola Florida. The initial phase of the field investigation began July 7, 1996. Members of the Operations Group visited the accident site where they examined the aircraft and collected data and interviewed the pilots. Information was obtained from Delta relevant to the accident airplane as well as weather, fueling, dispatch and weight and balance.

On July 8, 1996. members of the Operations Group visited the Pensacola FAA control tower, where they interviewed the tower personnel who were on duty at the time of the accident. They also obtained copies of tower communications tapes taken before and during the event.

Members of the Operations Group met at the Delta corporate offices in Atlanta on July 9, 1996 where the pilots were interviewed a second time. The operations group obtained manuals, records, diagrams and other materials relevant to the investigation from Delta Air Lines, the Federal Aviation Administration and Pensacola Regional Airport. In conjunction with this investigation, the cockpit jump seat occupant as well as the crew members who flew aircraft N927DA prior to the accident flight were interviewed.

1. HISTORY OF FLIGHT

The pilots involved in the accident on board DL 1288 (N927DA) began a scheduled three day trip sequence on July 5, 1996. The accident occurred on the second day of that sequence.[5] They originated in Atlanta and flew three legs the first day, blocking into Pensacola at 1927 CDT for crew rest. During the first two legs on July 5, 1996, the captain was given a routine line check by a Delta check airman.

July 6, 1996, (the day of the accident). the captain and first officer departed the Holiday Inn Gulf Breeze hotel approximately 1305 CDT for the 10-12 minute ride to the airport. They were scheduled to depart Pensacola at (1415 CDT) for Atlanta's Hartsfield Airport (ATL). The two pilots said they arrived at the airport approximately 1315 CDT. Upon arriving at the airport, the captain first went to the operations office where he reviewed the departure papers and then proceeded to the aircraft. He said he arrived at the aircraft at approximately 1345 CDT. The first officer said he first went to get something to eat at the airport restaurant then reported to the aircraft at approximately 1330 CDT. He stowed his personal gear and began the pre-flight inspection of the aircraft.

[5] Trip schedule attached

The first officer stated he normally begins his pre-flight inspection by checking aircraft fluids, oxygen, and cockpit indicators. He then checks the log book. For this flight there were no deferred maintenance items or other write-ups from the previous crew. The only maintenance item was an engineering order (E.O.) concerning the wing tip navigation light bulbs. The first officer then went outside for his external pre-flight of the aircraft. He stated that he discovered two items which he felt should be mentioned to the captain. The first item he described as a bit of fluid or a few drops of oil on the bullet nose of the number one engine. The other questionable item was two missing rivets on the outboard portion of the left wing.

The captain arrived at the aircraft and began his predeparture preparations. Aircraft N927DA arrived at Pensacola at 1304 CDT[6] the day of the accident and was not the same aircraft the pilots had flown the day before. The flight attendants were on board having flown the previous four legs on the accident aircraft. The captain stated he gave the flight attendants a pre-departure briefing. He said he had briefed the first officer in depth the previous day on abnormalities and emergencies. In essence, they would be handled by the book. and in the event of an aborted takeoff, he, (the captain) would take control of the airplane. He also told the first officer that he prefers to handle the fuel control levers during engine start.

The first officer informed the captain about the oil on the number one engine bullet and the missing rivets on the left wing slat. The captain said he had not seen this oil before but had not seen anything written which would characterize it as an abnormality. According to the captain, he and the first officer discussed these discrepancies. They did not appear significant nor would they likely affect the airworthiness of the aircraft. The captain elected to depart without notifying maintenance.[7]

During the cockpit pre-flight, the first officer said he checked the Passenger Address (P.A.) system and it worked normally. The P.A. system also worked normally when the first officer made a pre-departure announcement to the flight attendants. The interphone between the cabin and the cockpit was not specifically checked, although both pilots stated they monitored flight attendant conversation on the interphone.

The captain and first officer completed their pre-departure preparations by checking and loading navigational information in the Flight Management System (FMS) computers, checking the Automated Weight And Balance (AWAB) information, setting the stabilizer trim, and checking other controls and indicators for takeoff. The captain said he decided to use normal power (normal full rated takeoff thrust[8]) for takeoff instead of flex 45 (reduced takeoff thrust[9]) because the aircraft weight was within approximately 100 pounds of the maximum allowable for flex 45.[10]

There were 142 passengers on board for departure. Fourteen passengers were seated in the first class section of the cabin and 128 in the coach section. In addition to the flight crew, cabin crew and passengers, a Delta B-767 pilot occupied the cockpit jump seat and a Delta flight attendant was seated on the aft flight attendant jump seat.[11]

The crew stated they completed their cockpit preparations and appropriate checklists and were advised by the senior flight attendant that the cabin preparations were complete for departure. The

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[6] Log of aircraft N927DA movement attached.

[7] Delta did not have maintenance personnel at Pensacola although contract maintenance was available.

[8] Based on normal -219 engine takeoff thrust rating with Automatic Reserve Thrust, (ARTS) auto.

[9] Flex 45 or AT45 is approximately 9% less than Max Thrust. Maximum Thrust is also a takeoff thrust option. It is the maximum engine rated takeoff thrust with Automatic Reserve Thrust (ARTS) off.

[10] Actual takeoff weight of aircraft shown on weight and balance - 131,230. Max Weight for flex 45 - 131,374 Max Weight for normal takeoff power - 141,383 (Weight and Balance forms attached.)

[11] Aircraft emergency equipment and seating chart attached.

captain advised the push crew they were ready for push-back and were pushed from the gate at **1415** CDT[12].

The captain elected to start one engine during push-back and start the remaining engine during taxi.[13] They started the number one (left) engine (accident engine) during push-back. The captain said he applied fuel at **22%** N_2. Everything **was** smooth. At 35% N_2 the first officer released the start switch. Everything was normal including EGT, N_2,[14] and electrical loads. **No** engine vibrations were apparent. The first officer stated that the number one engine started uneventfully. There were no vibrations and all indications were normal.

At the completion of push-back, the ground crew disconnectedihe tug. The first officer called for taxi clearance at **1919** CDT[15] and was cleared to taxi to runway **17.** The captain began taxiing using engine number one. Because of the relatively short taxi they immediately began to configure the aircraft for takeoff and the captain ordered the number **two** engine started. Both pilots stated number two engine started normally with no abnormal indications other than a flashing EGT indicator, indicating a potential "Hot Start"[16]. The pilots indicated this was a fairly common occurrence when starting engines in hot weather. They continued the start monitoring the instruments insuring start parameters were not exceeded. Both crew members stated they completed all appropriate checklists and called Pensacola tower requesting takeoff clearance. Delta flight **1288** was cleared for takeoff by the tower at **1923** CDT.[17]

The first officer was designated as the flying pilot[18] and as such initiated the takeoff. The captain aligned the aircraft on the runway and the first officer advanced the throttles to the vertical position on the throttle quadrant. According to the captain, at **1.35** EPR[19] the first officer called for the autothrottles to be set. In the autothrottle mode, the throttles began moving forward toward the takeoff thrust position and according to both crewmembers, the throttles were advancing when the number one engine failed.[20]

The first indication of a problem was a loud "bump" or "thump" as described by both pilots followed immediately by a **loss** of cockpit lighting and a loss of cockpit instrumentation. The captain took control of the aircraft and aborted the takeoff. He retarded both throttles to idle, applied manual brakes[21] and brought the aircraft to a gradual stop on the runway. The captain did not attempt to use reverse thrust. nor were the ground spoilers deployed.[22] The crew is certain the speed of the aircraft at the

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[12] ACARS log attached.

[13] Delayed engine starts are normal procedures used normally for fuel conservation, engine conservation and noise abatement.

[14] EGT - exhaust gas temperature measured in degrees Celsius. (Temperature of jet exhaust at tail pipe) N_2 is the high pressure compressor *or* the rear compressor group of the JT8D jet engine measured in percent **of** maximum.

[15] ATC tower tape transcript
"Engine ground start EGT limits are 475° C. The **EGT** indicator will flash **if** an overtemp or "hot start" **is** imminent.

[17] ATC tower tape transcript

[18] A common airline practice is to alternate flying legs between the captain and the first officer, subject to the captain's discretion. Weather and F/Os experience might mitigate this procedure.

[19] **EPR** - Engine Pressure Ratio. The ratio between inlet air and exhaust air on the engine. A primary means of setting power on JT8D engines.

[20] The Safety Board was unable to determine from testimony whose hands were on the throttles at the time **of** the accident. Delta procedures state: "The Captain will have his hand on the top portion of the throttles until V_1 since the decision to reject or continue the takeoff rests with him." They also state: "If the F/O **is** making the takeoff, he may advance the throttles to the takeoff setting. After takeoff power is set, the Captain will take control **of** the throttles."

[21] The crew stated the auto braking system was armed in the T.O. (takeoff) position, however, the auto brakes did not actuate. (Auto brakes actuate when ground spoilers deploy during a rejected takeoff.)

[22] The crew stated the auto-spoilers were armed for takeoff but since reverse thrust was not used they did not deploy.

moment of the accident was less than 60 knots since the throttles had not yet "clamped."[23] There were no indications or warnings of fire in the cockpit.

The first officer attempted to contact the tower to inform them of the abort, but was unsuccessful due to the loss of normal electrical power and resultant communications loss. He attempted to contact the flight attendants via the cabin interphone and public address system, but both systems were ako rendered inoperative.

The crew turned on the emergency power switch" and recovered communications with the tower. They informed the tower of the aborted takeoff and declared an emergency at 1925 CDT.[25] Both pilots stated a flight attendant entered the cockpit as the jump seat rider was stowing the jump seat. She asked if she should evacuate the cabin. The captain told her not to evacuate. The first officer said the flight attendant used the portable megaphone to tell the passengers to remain calm and stay seated. He used the PA system, which became operable when emergency power was turned on, to deliver basically the same message to the cabin. He also stated he tried to contact the flight attendants in the rear section of the aircraft but was never able to communicate with them via the interphone.

The jump seat rider left the cockpit and penetrated as far as the aft galley and could see what he described as a catastrophic problem There was a large hole in the fuselage, debris scattered throughout the aft section of the cabin and an unknown number of seriously injured passengers whom the flight attendants were attempting to assist. He said there was no smoke or flames of any kind and the passengers were generally "well-behaved". He estimated that 20 - 25 people had exited the aircraft, with some still on the wings and others on the runway. The jump seat rider said he then returned to the cockpit to give the captain a status report

Returning to the cockpit, the jump seat rider met the first officer who at the captain's direction, was moving aft to inspect the aircraft cabin. When he cleared the first class section the first officer noticed the overwing exits were opened and heard engine noise. He returned to the cockpit to advise the captain to shut down the engines. The captain stated he placed both engine fuel control levers off at that time[26]. He informed the tower they had shut down and seven seconds later informed the tower, "be advised we have passengers on the runway."[27]

At 1927 CDT[28] the captain advised the tower of serious injuries and requested medical assistance. He periodically continued asking for medical assistance and asked the tower to have a fire truck inspect the aircraft for fire.[29]

The first officer. again entering the cabin, saw the aft exit was opened as well as the L2 door and the overwing exits[30]. He said he advised the remaining passengers to stay seated and even restrained a passenger who was attempting to jump off the wing, telling her it was safer to remain on

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[23] At 60 knots the CLAMP mode of the autothrottles is engaged. Power is removed from the autothrottle system (ATS) servo and the throttles remain stationary. This is indicated by CLMP illuminating on the flight mode annunciator (FMA).

[24] When emergency power is turned on, the aircraft battery powers selected essential flight instruments, navigational instruments and communications for the life of the battery, approximately thirty minutes

[25] ATC tower tape transcript

[26] ATC tower transcript indicates voice heard on tower frequency at 1926 CDT to "shut engines down!" Followed by "We shut down both engines."

[27] ATC tower transcript

[28] ATC tower transcript

[29] ATC tower transcript

[30] The tail cone was jettisoned and the aft slide deployed. The aft airstairs remained retracted until extended by the first officer when EMT personnel arrived. The L2 door is the galley service door on the left side of the aircraft, afl of the wing. Overwing exits are removable windows, (two on each side of the aircraft over the wing) allowing egress to the top of the wing,

board. He continued to assist in the cabin but estimated approximately one half of the passengers had already evacuated the aircraft. It appeared to him all of the evacuees were from seats aft of the leading edge of the wing while those seated forward of the wing remained on board.

The first officer reported to the captain there was structural damage, damage to the number one engine and several passengers with severe injuries. The captain said he pulled the fire handle of the number one engine to further isolate it.[31] The captain also stated that after he and the first officer assessed the situation, he repeated his instruction to the senior flight attendant, not to evacuate the passengers. The captain asked the tower to arrange for airstairs to deplane the passengers. The first stairs that arrived were unsuitable for passenger use. The captain refused them and requested others. Use of the aft airstairs was not practical because of the casualties in the rear of the aircraft. Suitable airstairs arrived and the uninjured passengers were deplaned and bussed from the area of the aircraft.

With the arrival of the fire, rescue and EMT vehicles the first officer exited the aircraft via a evacuation slide extended the aft airstairs and cut the tail cone slide free. This facilitated entry of EMT and rescue personnel and evacuation of the casualties.

The crew remained with the aircraft until all passengers, except those fatally injured, were removed. They shut the aircraft down in accordance with company procedures and fire and rescue requests, deplaned approximately 1503 CDT[32] and were driven to Delta operations in police vehicles.

2. PERSONNEL INFORMATION

The captain and first officer were certificated in accordance with existing Federal Aviation Regulations (FARs). No violations, incidents or accidents were recorded for either crew member in the records reviewed.

a. THE CAPTAIN

John Ray Bunnell

The captain, age 40, was hired by Delta Air Lines on July 6, 1979. He has been a second officer, (flight engineer) on the B-727, and a first officer on the DC-9. B-727, B-757/767 type aircraft at Delta. He flew one line trip as captain on the DC-9 before transitioning to the MD-88. Before employment with Delta, the captain worked for Coastal Air Limited (D.B.A. Southeastern Airlines) from April 1977 to June 1979 where he flew as a co-pilot on DH-104 and Cessna 310 aircraft.

The captain holds an airline transport pilot (ATP) certificate with multiengine land, DC-9, airplane single engine land, and instrument ratings. At the time of the accident, the captain possessed a first class medical certificate dated January 23, 1996. with the limitation to wear corrective lenses for distant vision. He estimated his total pilot time to be approximately 12,000 hours, including approximately 2,300 hours in the MD-88 as pilot in command. No incidents or accidents involving the captain are on record.

A search of the National Driver Register indicated no history of driver's license revocation or suspension.

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[31] Disables left engine aural fire warnings, trips left generator control relay, shuts off fuel and hydraulic supply to left engine pumps, closes left pneumatic crossfeed valve and arms the fire extinguisher discharge agent.

[32] ATC tower tape transcript

(1.) Captain's 72-Hour History Prior To The Accident

The captain described his activities before the accident as follows. On Wednesday, July 3, he was off duty and spent the day boating at a lake 25 miles from his home. That night he went to bed about 2300 EDT.

Thursday, July 4, he awoke at 0930 EDT. ran errands, went shopping, and had a cookout in the evening. After watching a 4th of July concert on television he went to bed about 0100 EDT.

Friday, July 5, he awoke at 0930 EDT. performed household chores, and departed for work at 1320 EDT. He arrived at the airport at 1426 EDT and reviewed paperwork. Three flights were scheduled that day: ATL-PNS, PNS-ATL. ATL-PNS. He had a routine line check by a Delta check airman during the first two flights. The third flight arrived at Pensacola at 1927 CDT. That evening he and a friend went to a cookout and then to a local establishment to listen to music. He consumed one beer at the cookout and two scotch on the rocks at the local establishment. His last drink was at midnight. He went to bed about 0100 CDT.

Saturday, July 6, he awoke at 0945 CDT, ate breakfast at the hotel, went out to play golf, and returned to the hotel to eat lunch. He departed the hotel at 1305 CDT and arrived at the airport at 1315 CDT where he reviewed paperwork and arrived at the aircraft at 1345 CDT.

b. THE FIRST OFFICER

David William Hawk

The first officer, age 37, was hired by Delta Air Lines on July 5, 1990. He was originally trained at Delta as a second officer (flight engineer) on the B-727, and later flew as second officer on the L-1011. He upgraded to first officer on the B-737. He transitioned to first officer on the MD-88 approximately 12 months before the accident. Before employment with Delta, he flew A-37 and A-10 aircraft in the United States Air Force.

The first officer holds an airline transport pilot (ATP) certificate with airplane multiengine land, airplane single engine land and instrument ratings. At the time of the accident he possessed a first class medical certificate dated June 21, 1996, with no limitations.

He estimated his total pilot hours to be approximately 6,500 at the time of the accident with approximately 500 hours in the MD-88. No accidents or incidents involving the first officer are on record. A search of the National Driver Register indicated no history of driver's license revocation or suspension.

(1.) First Officer's 72-Hour History Prior To The Accident

The first officer described his activities before the accident as follows. On Wednesday, July 3, he awoke at 0630 EDT. worked around the house, and ate three meals. He went to bed between 2230 and 2300 EDT, which was normal for him.

Thursday, July 4, he awoke at 0630 EDT, worked around the house, exercised, had a cookout and watched fireworks.

Friday, July 5, he awoke at 0700 EDT. ran errands, worked around the house and left for work at 1326 EDT. He signed in and performed routine dutiesbefore heading to the aircraft. There were three flights that day: ATL-PNS, PNS-ATL, ATL-PNS. He and his crew arrived in Pensacola at 1927 CDT. He went straight to the hotel and went to bed at 2230 CDT.

Saturday, July 6, he awoke between 0730 and 0800 CDT, had breakfast, updated his publications, exercised, and prepared for the 1305 pick-up. At the airport he ate lunch then went to the airplane.

3. TOXICOLOGICAL TESTING

The captain and first officer submitted urine samples at 2230 EDT on July 7,1996 in accordance with Delta Air Line's drug testing program. The samples were tested at an independent laboratory for amphetamines, phencyclidine, cocaine, cannabinoids and opiates. The results of the examinations were negative for both pilots. No tests for alcohol were performed.

4. AIRPORT INFORMATION

General: The Pensacola Regional Airport (PNS) is located at N30° 28.40' W087° 11.25'. It is situated approximately 3 miles north east of the city of Pensacola, Florida on the west side of Escambia Bay. Pensacola Regional is in the Central Time Zone, and at the time of the accident was on Central Daylight Time, (UTC -5). The published airport elevation is 121 feet above sea level with two intersecting runways oriented approximately north -south and east - west.[33] The main passenger terminal is located in the northwest quadrangle formed by the intersecting runways. The control tower and aircraft rescue and fire fighting (ARFF) facilities are located in the southwest quadrangle. The ARFF airport index is "C"[34]

Runway 17: The runway length is 7,002 feet with a magnetic heading of 166°. The threshold elevation is 171 feet above sea level. The runway is grooved asphalt 150 feet wide with a slight downslope of 18 feet to the far end of the runway, (0.3%). Runway 17 is served with an instrument landing system (ILS) precision approach. Non-directional beacon (NDB), global position system (GPS) and radar surveillance approaches are also available. It has an simplified short approach light system with runway alignment indicators (SSALR[35]), high-intensity runway lights, (HIRL), and runway centerline lights, (CL). There are associated transmissometersfor measuring runway visibility range, (RVR) values for runway 17. The airport is equipped with Low Level Wind Shear Alert System (LLWAS) and a Limited Aviation Weather Reporting Station[36].

Standard weather minimums for departure from runway 17 for 182 engine aircraft are RVR 5,000 or 1 mile visibility. With adequate visibility reference[37], a takeoff may be made with a measured 1,600 RVR or visibility of one quarter mile.

The NOTAMS (Notices to Airmen) published for the Pensacola Regional Airport at the time of the accident are as follows:

PNS 08/030 343.65 VICE 376.8
PNS 08/044 398.95 VICE 380.6
PNS 06/033 TOWER 140 AGL 2.4 NW UNLGTD TIL 07131900

PNS 5/0989 NDB OR GPS RWY 35 AMDT 16
S-35 MDA 540/HAT 419 ALL CATS VIS 1¼ CAT C

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[33] See attached airport diagrams in appendix.
[34] See attached FAR-Part 139 table describing ARFF indices in appendix.
[35] See diagram in appendix.
[36] Observers report cloud height, weather, obstructions to vision, temperature and dewpoint (in most cases), surface wind, altimeter and peninent remarks.
[37] See Take-off minimums explanation in appendix.

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NDB OR GPS RWY 17 ORIG-A
S-17 MDA 640/HAT 519 ALL CATS RVR 5000 CAT C
313 MSL TEMPORARY CRANE 1.0 NM W/NW OF RWY 8 THLD.

5. AIRPLANE INFORMATION

McDonnell Douglas MD-88 aircraft, SIN 49714 was assigned the regishation number N927DA on April 29, 1988.

On October 20, 1988, Delta Air Lines, Inc., was issued an Airworthiness certificate with Fuel Jettisoning System Exemption #415D for McDonnell Douglas aircraft MD-88. registration N927DA, S/N 49714.

A Bill of Sale was executed on November 2, 1988; McDonnell Douglas to Delta Air Lines, Inc., MD-88. N927DA, S/M 49714

The MD-88 aircraft was certificated in the transport category for day or night operations. Delta Air Lines operates the MD-88 under 14 CFR Part 121 regulations. The MD-88 requires a crew of two pilots. The passenger seating configuration of the accident aircraft (N927DA) requires three (3) flight attendants for passenger operation[39]. The aircraft is equipped with a Flight Data Recorder (FDR) and a Cockpit Voice Recorder (CVR).

Aircraft N927DA was configured to carry 142 passengers, (14 first class and 128 coach)

The Delta Air Lines Pilot's Operating Manual (MD-88), Limitations section, provided the following limitations:

Maximum Taxi Weight	150,500 pounds
Maximum Takeoff Weight	149,500 pounds
Maximum Landing Weight	130,000 pounds
Zero Fuel Weight	118,000 pounds

These weight may be further restricted by operating limitations, center of gravity and other considerations.

Power Plant Temperature Limitations described in the Delta Operating Manual are as follows:

EGT Limitations (° C)	Normal Power	Max Power
Starting **Ground (Momentary)** **Flight (Momentary)**	 475° C 625° C	
Idle (with Bleed Extraction)	480° C	
Takeoff (5 minutes)	590° C	625° C
Continuous	580° C	580° C

[38] Landing **weight** up *to* maximum **takeoff** weight is permitted with a maximum sink **rate of** 360 **feet** per **minute** (normal max. landing wt. **Is** 130,000 **pounds).**
[39] FAR 121.391

6, COMPANY HISTORY AND STRUCTURE – DELTA AIR LINES INC.

At the time of the accident, (July 6, 1996), Delta was a 13 billion dollar company and a major international airline with a worldwide route structure. The company had approximately 68,000 employees and operated 536 aircraft with over 2,700 flights each day to 153 domestic and 51 foreign cities.

Their fleet was comprised of fifty-two L-1011 aircraft, fifty-eight 6-767 aircraft, eighty-six 8-757 aircraft, sixty-seven B-737 aircraft, one hundred twenty-nine B-727 aircraft, twelve MD-11 aircraft, twelve MD-90 aircraft and one hundred twenty MD-88 aircraft. Delta has operated MD-88 aircraft since December 30, 1987.

Paul R. Misencik
Chairman, Operations Group