National Transportation Safety Board
Aviation Incident Final Report

Location:	Atlanta Hartsfield Intl. Apt. (KATL), GA	**Incident Number:**	OPS10IA001
Date & Time:	10/19/2009, 0605 EDT	**Registration:**	
Aircraft:	BOEING 767	**Aircraft Damage:**	None
Defining Event:	Miscellaneous/other	**Injuries:**	194 None
Flight Conducted Under:			

Analysis

During the flight one of the three required flight deck crew members became ill and was considered to be incapacitated. The remaining two crew members conducted the entire night flight without the benefit of a customary break period. Throughout the flight the crew made comments indicating that they were fatigued and identified fatigue as their highest threat for the approach, but did not discuss strategies to mitigate the consequences of fatigue. At the time of the incident, the crew had been on duty for about 12 hours and the captain had been awake for over 22 hours, while the first officer had been awake for at least 14 hours.

During the descent and approach, the flight crew was assigned a number of runway changes; the last of which occurred near the final approach fix for runway 27L. While the flight was on final approach, the crew was offered and accepted a clearance to sidestep to runway 27R for landing. Although the flight crew had previously conducted an approach briefing for two different runways, they had not briefed the approach for runway 27R and were not aware that the approach light system and the instrument landing system (ILS) were not available to aid in identifying that runway. When the crew accepted the sidestep to runway 27R, the captain, who was the flying pilot, saw the precision approach path indicator and lined the airplane up on what he said were the brightest set of lights he could see. During the final approach, the first officer was preoccupied with attempting to tune and identify the ILS frequency for runway 27R. Just prior to the airplane touching down, the captain realized they were landing on a taxiway. The airplane landed on taxiway M, 200 feet north of, and parallel to, runway 27R.

Postincident flight evaluations of the airport lighting indicated that there were a number of visual cues that could have misguided the captain to align with taxiway M instead of runway 27R while on final approach. These cues included numerous taxiways signs along the sides of taxiway M which, from the air, appeared to be white and could be perceived as runway edge lights. In addition, the blue light emitting diode (LED) lights used on the eastern end of taxiway M were perceived to be brighter than the adjacent incandescent lights on the airfield and the alternating yellow and green lights in the ILS critical area provided the appearance of a runway centerline. The postincident flight evaluations indicated that when the approach lights or the ILS for runway 27R were available and used, it was clearlyevident when the airplane was

not aligned with the runway.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The flight crew's failure to identify the correct landing surface due to fatigue. Contributing to the cause of the incident were (1) the flight crew's decision to accept a late runway change, (2) the unavailability of the approach light system and the instrument landing system for the runway of intended landing, and (3) the combination of numerous taxiway signs and intermixing of light technologies on the taxiway.

Findings

Personnel issues	Identification/recognition - Flight crew (Cause)
	Decision making/judgment - Flight crew (Factor)
	Illness/injury - Instructor/check pilot
	Alertness/Fatigue - Flight crew (Cause)
Environmental issues	Localizer - Availability of related info (Factor)
	Approach lighting - Availability of related info (Factor)
	Taxiway lighting - Contributed to outcome (Factor)
	Taxiway markings/signage - Decision related to condition (Factor)

Factual Information

HISTORY OF FLIGHT

On Monday Oct. 19, 2009, at 0605 EDT (all times in this report will be Eastern Daylight Time unless otherwise noted), a Boeing B767-332ER, N185DN, operating as Delta Air Lines flight 60 from Rio de Janeiro – Galeão – Antonio Carlos Jobim International Airport (SBGL was the International Civil Aviation Organization airport code, and GIG was the three letter International Air Transport Association airport code) to Atlanta Hartsfield International Airport (ATL) landed on taxiway "M" at ATL after being cleared to land on runway 27R. No injuries were reported. The flight deck crew included a check airman, a captain receiving special airport qualification operating experience from the check airman, and one first officer. During cruise flight, the check airman became ill and was located in the cabin for the remainder of the flight; including the approach and landing.

Prior to the flight, on Sunday, October 18, 2009, the flight crew arrived at SBGL to prepare for their flight to ATL. During the preflight activities, the check airman became ill with a gastrointestinal disorder. After a brief time away from the flight deck, the check airman returned to the flight deck and advised the other crew members he was “fine” and continued with the flight preparations.

The flight departed the gate at about 2240 BRST (Brasilia Summer Time) (2040 EDT) with the captain in the left pilot seat, the check airman, who was the captain of record, in the right pilot seat, and the first officer in the observer’s seat. The check airman stated that there were some slight ground delays due to the departure in use that added about 30 minutes to the scheduled flight time.

According to interviews with the crew, it was customary for the relief pilot to calculate rest breaks by subtracting time to climb and descend from the total flight time, and dividing the remainder by the number of crew members to determine the length of each break. After reaching the top of climb, the crew calculated the rest breaks for the flight and determined that the check airman would take the first break of about 2 hours and 50 minutes. The check airman proceeded to the cabin for his rest break. At the completion of his rest break, it was determined that the check airman was ill and the crew enlisted the aid of a physician on board the flight.

The flight crew notified the company dispatcher (dispatch is also referred to as “flight control” in company literature) via satellite communications regarding the check airman’s illness and the captain listed himself as the captain of record. The flight crew elected to continue the flight to ATL for landing and according to flight crew statements; they requested that dispatch arrange for emergency services to meet the airplane when they arrived. According to the dispatcher statement, he received the satellite call on October 19 about 0400 and then notified emergency medical personnel at ATL.

Prior to the top of descent point, the crew prepared for, and briefed for a landing on runway 27L at ATL. Upon check in with Atlanta Approach Control, the controller assigned runway 26R for landing. The crew briefed for an approach to 26R. The crew was subsequently re-assigned to runway 27L and at about the outer marker for that runway approach, the ATL tower local controller offered runway 27R, which the crew accepted. The local controller then cleared the flight to land on runway 27R. The captain stated in an interview that the flight was lined up on

approach to runway 27L and when the flight was cleared to land on 27R he maneuvered for the side step and lined up on "the next brightest set of lights" he saw. He stated that he saw "bright edge lights and centerline lights" and thought he had the runway in sight. The flight crew landed on taxiway M, which was a parallel taxiway located about 200 feet to the north of runway 27R.

PERSONNEL INFORMATION

THE CAPTAIN

The captain held an airline transport pilot certificate with an airplane multi engine land rating and type ratings in Boeing 727, 737, 757, 767, McDonnell Douglas MD-11, and Lear Jet airplanes. The captain was hired by Delta Air Lines in 1990 and according to company records, accumulated about 9,122 hours of total flight time, which included about 3,131 hours in the Boeing 767.

The captain held a first class medical certificate which was issued on August 21, 2009.

THE CAPTAIN'S 72-HOUR HISTORY

The captain was off duty from October 3-15, 2009. When not working, the captain stated that he needed about 8 hours of sleep to feel well rested. He said he was naturally an evening person but events in life pushed him towards being a morning person.

On Friday, October 16, 2009, the captain awoke about 0630-0700, ate breakfast, walked the dog, and went for a run. That afternoon he took a nap for about an hour. He drove to the ATL airport early so he would have time to update his charts and meet with the check airman prior to the flight to SBGL. He felt rested before the flight and said the flight to Rio was normal.

The flight arrived in Rio on Saturday, October 17 at about 0900 BRT (0800 EDT). (BRT is Brasilia Time; the clocks in the Rio de Janeiro time zone were set forward one hour to BRST at midnight between Saturday October 17 and Sunday October 18 in observance of daylight savings time.) The captain said the layover was normal. He napped for about 3-4 hours before meeting some of the crew for dinner. He returned to the hotel about 2330-0000 BRT (2230-2300 EDT).

On Sunday, October 18, the captain awoke about 0930-1000 BRST (0730-0800 EDT). He stayed around the hotel room, sent emails, exercised, and then tried unsuccessfully to take a nap. He said he just could not fall asleep. He had not been hungry during the day so he did not eat. He went down to the hotel lobby for pick up early and had a cappuccino. He went to the airport with the crew and said he felt "fine". Although he had been up for about 11 hours, he said it was not an unusually long time but he was looking forward to his 3 hour break on the airplane because he normally could get a good amount of rest during that time.

The FIRST OFFICER

The first officer held an airline transport pilot certificate with an airplane multi engine land rating and type ratings in Boeing 757, 767, McDonnell Douglas DC-9, and Beechcraft BE-1900 airplanes. The first officer was hired by Delta Air Lines in 2000 and according to company

records, accumulated about 4,000 hours of total flight time, which included about 1,591 hours in the Boeing 767.

The first officer held a first class medical certificate which was issued on April 13, 2009.

THE FIRST OFFICER'S 72-HOUR HISTORY

Prior to the incident trip pairing, the first officer was off duty for "a couple of days". She stated that, when not working, she typically needed 6-8 hours of sleep to feel rested, and more sleep when she exercised.

On Friday, October 16, 2009, the first officer awoke about 0700. She was not scheduled to fly so she went on the computer to try to pick up some flying. The incident trip pairing showed up on the swap board and she picked it up. She packed and organized to leave on the trip that night. She tried to nap but that "did not work so well" because she usually did not nap well and she got a good night's sleep the previous night. She signed in for the trip at 2005 and the flight pushed back from the gate in ATL about 2200. During the flight from ATL to SBGL she ate part of the crew meal but did not believe she had breakfast.

The flight arrived in Rio on Saturday, October 17 at about 0900 BRT (0800 EDT), and she took the bus to the hotel. The flight crew and flight attendants met at the hotel and went down to the beach. She took a nap for about 3 hours and "felt okay" when she awoke. She did not set an alarm and woke up when she woke up. That evening, the flight crew and flight attendants met at the bar around 1800 BRT (1700 EDT) and then dinner about 2000 BRT (1900 EDT). After dinner, the captains and she went back to the hotel. She went to bed about 0130-0200 BRST (2330-0000 EDT).

On Sunday, October 18, she awoke about 0700 BRST (0500 EDT). During the day she studied for recurrent training and went to a market. She napped for about 3-4 hours which she said was "really good" for her. She said she felt good from her nap and felt rested. She then got ready for their pick up and ate a sandwich within the two hours before pick up. She left the hotel about 1950 BRST (1750 EDT), which was the start of the crew's duty time.

AIRCRAFT INFORMATION

The airplane was manufactured in 1995 and was maintained under a continuous airworthiness inspection program. As of its last inspection in February of 2009, it had accumulated 70,009 total hours of operation on the airframe.

METEORLOGICAL INFORMATION

The weather reported at 0552 EDT for ATL included calm winds, clear sky with visibility of 10 statute miles, and temperature of 3 degrees Celsius.

A review of the U.S. Naval Observatory Sun and Moon data for Atlanta, Georgia, at the time of the incident indicated a "waxing crescent with 3% of the Moon's visible disk illuminated." Moonset occurred at 1901 EDT on the preceding day and moonrise was to occur at 0918 on the day of the incident. Civil twilight was to begin at 0721 on the day of the incident.

AERODROME INFORMATION

ATL was owned by the City of Atlanta and operated by the Department of Aviation. The airport was located about ten miles from downtown Atlanta at 33° 28' 21.1" north and 84° 25' 39.6" west, and was certificated under 14 Code of Federal Regulations Part 139.

ATL had five runways for flight operations. All runways were positioned in about an east west direction. Runways 8R/26L and 8L/26R were located to the north of the airport terminal ramp complex. Runways 9L/27R and 9R/27L were located immediately to the south of the terminal ramp complex and runway 10/28 was located to the south of runways 9R/27L and south of the cargo ramp.

Runway 27R was an 11,890 foot-long, 150 foot-wide grooved concrete runway equipped with high intensity runway edge lights, and centerline lights. Runway 27R was equipped with a precision approach path indicator located on the right side of the runway.

Taxiway M was a 75 foot-wide concrete taxiway parallel and to the north (right) side of runway 27R. The taxiway was equipped with edge lights, colored blue, and centerline lights colored green.

LIGHTING SYSTEM

Runway 27R edge and centerline lights operated on a 5-step system. The edge lights at the east and west ends of taxiway M operated on a 3-step system and the edge lights in the middle section of taxiway M, as well as the taxiway M centerline lights, operated on a 5-step system.

Guidance in Federal Aviation Administration order JO 7110.65S, "Air Traffic Control", indicated that runway edge and centerline lights operating on a 5 step system would be set to step 1 at night when the visibility was greater than 5 miles. The guidance also indicated that taxiway edge and centerline lights operating on a 3 step system would be set to step 1 and those operating on a 5 step system would be set to step 3 when the visibility was 1 mile or more, or set to step 1 or 2 when requested by pilots.

Advisory Circular 150/5345-56, (Specification For L-890 Airport Lighting Control And Monitoring System (ALCMS)", recommended that lighting presets for both 3 step and 5 step systems be set to step 1 at night when the visibility was greater than 5 miles.

At the time of the incident, runway 27R edge lights and centerline lights were set on step 1 of 5 with a corresponding amperage output of 2.8 amps. At the time of the incident, the edge lights on the east end of taxiway M were set on step 3 of 3 with a 6.6 amperage output. The taxiway M edge lights west of taxiway J to taxiway T were set on step 5 of 5, and the edge lights on the west end of taxiway M were set on step 3 of 3 each, corresponding to a 6.6 amperage output. The taxiway M centerline lights for the entire length of the taxiway were set on step 2 of 5 which resulted in a 3.4 amperage output.

During a 2009 construction project to extend taxiways M and L, the edge lights and centerline lights on the east end of taxiway M were replaced with new in-pavement LED (light emitting diode) type lights. The resulting configuration included blue LED lights on the edges of

taxiway M from the east end to taxiway J, and incandescent lighting on the edges of taxiway M west of taxiway J. The most eastern approximately 1,700 feet of the taxiway was equipped with alternating green and amber centerline lights identifying the instrument landing system (ILS) critical area. The taxiway M centerline lights from the west end of the ILS critical area up to approximately taxiway J were green LED lights and those west of taxiway J consisted of in pavement incandescent lights.

Interviews with personnel from FAA's Airport Engineering Group indicated that they had received some pilot comments regarding the brightness of LED lights during testing of the new LED lighting conducted at Atlantic City Airport in Atlantic City, New Jersey, but no formal pilot input was collected as part of the testing. The interviews with FAA Airport Engineering also indicated that although incandescent and LED lights of the same color and intensity will test in the same color and brightness range, the LED type lights were perceived by the human eye to be brighter than incandescent lights when in clear visibility. The FAA Technical Center Visual Guidance Program Manager stated in an interview that research conducted by FAA, in conjunction with International Civil Aviation Organization, determined that pilots "do not like" the intermixing of LED and incandescent lights on a movement surface.

FAA personnel confirmed that there was no published standard for intermixing LED and incandescent lighting over one continuous movement surface. However; interviews with FAA personnel indicated that the International Civil Aviation Organization Visual Aids Working Group had formed a subcommittee to conduct research on the use of LED type lights for airport applications. As a result of the subcommittee's study, the Visual Aids Working Group proposed a recommendation to the International Civil Aviation Organization to limit intermixing of LED and incandescent lights.

AIR TRAFFIC CONTROL

ATL was a level 12 Air Traffic Control (ATC) tower responsible for ATC services for aircraft arriving and departing ATL and for aircraft transiting ATL airspace 24 hours a day, 7 days a week.

DAL 60 (Delta Air Lines flight 60) checked in on frequency with the ATL approach controller approach controller at approximately 0554 at which time the approach controller advised DAL 60 to expect a landing on runway 26R. At approximately 0556, the approach controller advised DAL 60 to proceed direct to ANVAL, an intersection depicted on the published approach for ILS 27L. After the flight crew queried the approach controller regarding the expected runway, the approach controller advised DAL 60 that runway 27L was the assigned runway and DAL 60 accepted clearance to ANVAL for an approach to runway 27L. DAL 60 was handed off to ATL tower at approximately 0601.

The local controller cleared DAL 60 to land on runway 27L and then, at approximately 0603, the local controller asked DAL 60 if they had runway 27R in sight and if they would prefer to land on runway 27R. DAL 60 responded in the affirmative to both questions and then accepted a clearance to land on runway 27R.

ATL tower was equipped with an Airport Surface Detection Equipment – Mode X. The radar displays were located on overhead tracks throughout the control tower to augment controller's visual observation of aircraft landing or departing, and of aircraft or vehicles operating on movement areas. The ASDE-X was not programmed to activate alerts for an aircraft landing or

departing from a taxiway and, therefore, when the local controller scanned the ASDE-X display, system safety logic bars indicated that DAL 60 was properly aligned with runway 27R.

At approximately 0605, the ground controller advised the local controller that DAL 60 had just landed on taxiway M. While the airplane was taxiing to the gate, the tower's Front Line Manager called the ramp tower and requested that the captain of flight DAL 60 call him in the tower. According to interviews, the captain called the tower soon after arriving at the gate.

AIR TRAFFIC CONTROL TOWER LIGHTING CONTROLS

Atlanta airport utilized the L-890 ALCMS (Airport Lighting Control and Monitoring System) which was operated by the tower controllers through two touch screen human machine interface displays located in the console panels adjacent to the tower supervisors' positions.

The human machine interface did not provide the Air Traffic Control Tower personnel with the capability to individually control each of the airport lighting circuits in accordance with guidance contained in FAA Advisory Circular 150/5345-56, "Specification for L-890 Airport Lighting Control and Monitoring System".

The ALCMS taxiway edge light preset commands at ATL were programmed to activate all taxiway edge lights at the highest step intensity, regardless of the visibility and night/day criteria, in contrast to the operating guidelines set forth in FAA JO 7110.65S, "Air Traffic Control", paragraph 3-4-11, "Taxiway Lights". Additionally, the human machine interface in the control tower did not provide controllers the capability to adjust taxiway edge light intensities as recommended in Advisory Circular 150/5340-56.

Interviews with control tower personnel indicated that, due to the construction at the airport, the approach lighting system for runway 27R had been "released to maintenance", was turned off at the time of the incident, and that it would require about 20 minutes to coordinate turning the system on.

Interviews also indicated that the localizer for runway 27R was turned off at the time of the incident and normally would be turned on if there was enough time. If an arrival was at or inside the outer marker on approach, there would not be enough time to turn on the localizer prior to the landing.

FLIGHT RECORDERS

The cockpit voice recorder was removed from the airplane and sent to the National Transportation Safety Board's Vehicle Recorder Division. The cockpit voice recorder included two hours and two minutes of excellent quality audio information that was extracted from the recorder without difficulty. The recording included events from cruise, descent, approach, landing, and taxi.

A review of the cockpit voice recorder indicated that prior to the descent; the crew conducted a briefing for the arrival and approach. During the briefing, the captain stated that for this approach, the "…highest threat is exhaustion."

The cockpit voice recorder recording included a crew member yawning while completing a checklist, and comments, during descent, referencing a lack of sleep. After landing, while

taxiing to the gate, the captain stated that he was fatigued when he accepted the last minute runway change, and that he had "fixated on the VASI" (visual approach slope indicator).

The recording indicates that the first realization that they were landing on a taxiway was a comment made by the captain about 4 seconds prior to touchdown.

COMPANY PROCEDURES

APPROACH BRIEF

The flight crew had initially conducted an approach brief for an approach to runway 27L. After check in with Atlanta Approach Control, and being assigned runway 26R, they conducted a briefing for approach and landing on runway 26R. The crew was subsequently reassigned to runway 27L and interviews with the crew indicated that they re-briefed for approach and landing on that runway. The crew was then offered, and accepted, a clearance for approach and landing on runway 27R. The crew did not conduct an additional briefing for runway 27R.

Company procedures required that a crew conduct an approach briefing as soon as adequate information is available and that if an approach was to be flown in night visual meteorological conditions, "…a complete approach plate briefing must be conducted." If a runway change occurs, the briefing must be revised accordingly. Company procedures called for the crew to "retune navigation aids and set the inbound course" and required a positive confirmation of the new runway for last minute runway changes. The company procedures did not specify what constituted a "positive confirmation."

Although not listed in the company flight operations manual as part of the briefing, pilots were trained to include in their brief the highest threat for the approach. The training stated that a crew should utilize the brief to "…list ways to respond to expected threats."

INCAPACITATED CREW MEMBER

The Delta Air Lines Flight Operations Manual, Chapter 2, "Introduction", stated that the manual was distributed to "…pilots and affected operational personnel…." The flight operations manual contained guidance to flight crews regarding the incapacitation of a flight crew member in flight. There was guidance to aid in identifying and determining incapacitation, providing medical assistance, and managing the flight deck following the declaration of incapacitation.

In accordance with company procedures, the flight crew notified the company through flight control/dispatch that a crew member was incapacitated. The flight operations manual did not include guidance on what, if any, assistance should be provided to the crew by flight control or dispatch personnel.

FATIGUE MANAGEMENT

According to interviews, when the flight crew conducted the initial approach briefing prior to descent, the captain identified fatigue as being the highest threat.

Company policy regarding flight crew fatigue was included in the flight operations manual and

stated that it was the pilot's responsibility to be properly rested for each phase of a trip and that no pilot should feel pressured to fly if not properly rested. The manual included guidance for pilots to notify their crew tracking personnel if they were fatigued. The manual did not include guidance on what role the crew tracking personnel would play in mitigating the threat of fatigue once notification had been given.

Additional guidance on fatigue was available, in an electronic format, in chapter 12 of the company flight manual; however, flight crews normally only carried chapters 1 through 11 on board the airplane.

Interviews indicated that the company did not have a formal fatigue management program although there had been one in place between about 2000 and 2002. Interviews also indicated that the information regarding fatigue management was concentrated in the ultra long range guides for flight routes between city pairs of longer than 16 hours duration.

The company published a "Sleep/Fatigue Management Guide" that was distributed in paper format to B777 crews involved in ultra long range flying, and it was also made available to other flight crews through a company website. Interviews with the DAL 60 flight crew indicated that they were not aware of this guidance.

TESTS AND RESEARCH

Members of the investigation team participated in an observational study at the Atlanta-Hartsfield International Airport, Atlanta, Georgia. The study was conducted with the assistance of Delta Air Lines, who provided an airplane and flight crew, Atlanta-Hartsfield Airport Operations personnel, and Atlanta Hartsfield Air Traffic Control tower personnel.

The purpose of the study was to document the nighttime visual cues available to the incident flight crew on approach to runway 27L with a subsequent sidestep to 27R under similar environmental conditions that existed on the morning of the incident; and, to document the visual cues available to pilots flying an approach to runway 27R under various runway and taxiway lighting conditions.

Flight test approaches were observed from the tower cab at the south local control position. From that position it was observed that it was challenging to identify the runway lights due to the taxiway lights appearing much brighter. The airplane landing lights were visually observed from about the final approach fix and remained in sight throughout the approach. However; it was difficult to determine if the airplane was lined up for runway 27R because the airplane lights blended with city lights behind it, and because of the angle of the local controller position with respect to the runway threshold. The line of sight from the local controller position to the threshold was about 45 degrees.

The taxiway M centerline lights were preset to turn on at step 2 while the control screen in the control tower indicated the centerline lights were set at step 1. The light intensity could not be decreased to step 1 from the control screen but could be adjusted between step 2 and step 5. Although step 1 could be selected on the control screen in the tower, no change in the light intensity occurred; a manual override was required from a lighting vault on the airfield.

Observations made from the flight deck during the flight test approaches indicated that when the lights were set to the same levels as were encountered by the incident crew, from about DEPOT intersection, the runway 27R centerline lights were not identifiable and the taxiway M

centerline lights were more prominent. When established on final, the taxiway signs were more visible than runway 27R edge lights. At about 500 feet above ground level the runway centerline lights were barely visible and it appeared that some lights may have been out. The color of the blue taxiway edge lights became distinguishable at about 500 feet above ground level while on approach.

The complete factual reports of the Operational Factors / Human Performance, Air Traffic Control group chairmen and the Airport and Vehicle Recorder specialists are contained in the official docket of this investigation.

History of Flight

Approach	Airport occurrence
Landing	Miscellaneous/other (Defining event)

Pilot Information

Certificate:	Airline Transport	**Age:**	47, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	Class 1 Unknown	**Last FAA Medical Exam:**	08/21/2009
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	12/06/2008
Flight Time:	9122 hours (Total, all aircraft), 3131 hours (Total, this make and model), 71 hours (Last 90 days, all aircraft), 10 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BOEING	**Registration:**	
Model/Series:	767 332	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	27961
Landing Gear Type:	Retractable - Tricycle	**Seats:**	230
Date/Type of Last Inspection:	02/22/2009, Continuous Airworthiness	**Certified Max Gross Wt.:**	412000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Fan
Airframe Total Time:	70009 Hours as of last inspection	**Engine Manufacturer:**	Pratt & Whitney
ELT:	Installed, not activated	**Engine Model/Series:**	PW4000 Series
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	DAL

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Night
Observation Facility, Elevation:	ATL	**Observation Time:**	0552 EDT
Distance from Accident Site:		**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	3°C
Lowest Ceiling:		**Visibility**	10 Miles
Wind Speed/Gusts, Direction:	Calm	**Visibility (RVR):**	
Altimeter Setting:	30.28 inches Hg	**Visibility (RVV):**	
Precipitation and Obscuration:			
Departure Point:	Rio de Janeiro (SBGL)	**Type of Flight Plan Filed:**	IFR
Destination:	Atlanta, GA (KATL)	**Type of Clearance:**	IFR
Departure Time:	2240 BST	**Type of Airspace:**	

Airport Information

Airport:	Atlanta Hartsfield Internation (KATL)	**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	N/A	**IFR Approach:**	Sidestep; Visual
Runway Length/Width:		**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	12 None	**Aircraft Damage:**	None
Passenger Injuries:	182 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	194 None	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	David Helson	**Adopted Date:**	11/15/2010
Additional Participating Persons:	Dave Keenan; Federal Aviation Administration, AAI-100; Washington, DC Jason Ragogna; Delta Air Lines; Atlanta, GA Warren Bildstein; Air Line Pilots Association; Herndon, VA David Osteen; National Air Traffic Controllers Association; Washington, DC		
Publish Date:	11/15/2010		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=74928		