

		NTSB ID: ENG10IA029		Aircraft Registration Number: N510UA	
		Occurrence Date: 05/16/2010		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Chantilly	State VA	Zip Code 20151	Local Time 2117	Time Zone EST	
Airport Proximity: On Airport/Airstrip		Distance From Landing Facility:			
Aircraft Information Summary					
Aircraft Manufacturer BOEING		Model/Series 757/200		Type of Aircraft Airplane	
Revenue Sightseeing Flight: No			Air Medical Transport Flight: No		
Narrative					
<p>Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:</p> <p>*** Note: NTSB investigators traveled in support of this investigation and used data obtained from various sources to prepare this aircraft incident report. ***</p> <p>HISTORY OF FLIGHT</p> <p>On May 16, 2010, about 2117 eastern daylight time, the flight crew of United Airlines flight 27, a Boeing 757-200, N510UA, declared an emergency because of a fire in the cockpit and diverted to Washington Dulles International Airport (IAD), Chantilly, Virginia. The flight was en route from John F. Kennedy International Airport (JFK), Queens, New York, to Los Angeles International Airport (LAX), Los Angeles, California. The airplane landed at IAD without incident. No evacuation was conducted, and none of the 7 crewmembers or the 105 passengers sustained injuries. The scheduled, domestic passenger flight was operating under the provisions of 14 Code of Federal Regulations Part 121 on an instrument flight rules flight plan. Night visual meteorological conditions prevailed at the time of the incident.</p> <p>The captain was the flying pilot. During post incident interviews, the captain stated that the flight departed JFK for LAX about 2030. The flight crew reported that the taxi, takeoff, and climbing phases of the flight were normal.</p> <p>According to the captain, the first indication of a problem occurred shortly after the airplane had leveled off at its cruise altitude of 36,000 feet. Subsequently, both the captain and first officer heard a hissing sound and saw smoke emanating from below the glare shield. The captain stated that, "within a couple of seconds," a fire started and that he saw flames emanating from the top of the glare shield. He stated that the smoke was not thick but that it was acrid. The captain got a burning sensation in his eyes and nose before he and the first officer were able to don their oxygen masks and smoke goggles. The captain stated that he transferred control of the airplane to the first officer and told him to declare an emergency with air traffic control (ATC), which the first officer did at about 2136.</p> <p>According to the captain, he got out of his seat because flames were in front of him and he needed to immediately reach the Halon bottle (fire extinguisher). The extinguisher was not reachable from his seat because it was located on the back wall of the cockpit behind his seat. As he reached for the Halon bottle, his oxygen mask and goggles were "torn off" because he moved beyond the reach of the oxygen mask hose. He retrieved the Halon bottle, re-donned his mask and goggles, and discharged the bottle. After he emptied the Halon bottle, the fire went out momentarily, but it re-ignited after a few seconds. His oxygen mask came off again when he opened the cockpit door to receive another Halon bottle from a flight attendant. He discharged the second Halon bottle at the fire, and it went out. According to the first officer, he turned all four window heat switches off shortly after the fire re-ignited. After the fire was extinguished, the captain returned to his seat and re-gained command of the aircraft.</p>					
FACTUAL REPORT - AVIATION					

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Narrative (Continued)

The first officer informed the captain that ATC was asking where they wanted to go, and the captain replied, "go to Washington Dulles Airport," because it was about 50 miles away. The captain indicated that he thought IAD was the best choice because the airport had better maintenance and fire support.

The autopilot remained engaged until the airplane descended through about 10,000 feet, at which time, the flight crew began to slow the airplane to configure it for landing. As the airplane descended through about 500 feet, the flight crew heard a "loud explosive bang," and the inner pane of the captain's windshield cracked. The captain then transferred control of the airplane to the first officer because his vision was impaired because of the shattered windshield. The captain stated that he could see through the window but it was "spider webbed". The first officer landed the airplane and reduced its speed. The captain then took control of the airplane and taxied it off the runway.

DAMAGE TO AIRPLANE

On May 16, 2010, a National Transportation Safety Board (NTSB) investigator visually examined the captain's No. 1 windshield and the area near the windshield. The windshield had fractured and its lower aft portion exhibited signs of high thermal damage and soot staining. Remnants of the J5 power terminal block, which had been mostly consumed by fire, were in this area.

Visual examination of the J5 power terminal block and its attachment hardware revealed that a lock washer was not present beneath the screw that connects the wiring harness terminal lug to the terminal block. Examination of the remaining terminal blocks on the captain's windshield, as well as the three power terminal blocks and the two terminal sensing blocks on the first officer's windshield, revealed that no lock washers were present beneath any of the screws that attach the wiring harness terminal lugs to their respective terminal blocks.

PERSONNEL INFORMATION

The captain, age 59, held a multi-engine land airline transport pilot (ATP) certificate with type ratings in Boeing 737, 747-4, 757, and 767; Citation CE-500; Lockheed L-300; and Airbus A320 airplanes. The captain held a first-class Federal Aviation Administration (FAA) medical certificate, dated May 3, 2010. His most recent Boeing 757 flight proficiency check occurred in May 2009. He had flown 170, 60, and 7 hours in the 90 days, 30 days, and 24 hours, respectively, before the incident.

The first officer, age 45, held a multi-engine land ATP certificate with type ratings in Boeing 757 and 767 and A320 airplanes. The first officer held a first-class FAA medical certificate, dated August 20, 2009. His most recent Boeing 757 flight proficiency check occurred in November 2009. He had flown 191, 79, and 7 hours in the 90 days, 30 days, and 24 hours, respectively, before the incident.

AIRPLANE INFORMATION

All six cockpit windows have an electrically heated conductive layer for anti-icing and defogging. Two thin electrical conductors, called bus bars, are installed on the upper and lower edges of the window to transmit electrical current from the power wires to the conductive heating film.

The windshield heat system for the captain and first officer's No. 1 windshield comprises three power terminal blocks that are located on the edge of the windshield; J1 is located at the upper aft corner, J4 at the upper forward corner, and J5 at the lower aft corner. Two sensing terminal blocks (J2 and J3) are located along the upper edge of the windshield to provide sensing functions for the system. Power is supplied to the windshield heat system by a window heat controller through a wiring harness with molded terminal connector lugs on the end. One side of the wire harness connects to the airplane wiring (to the heat controller), and the other side connects to each of the windshield terminal blocks via the terminal lugs. Each terminal lug is connected to its respective terminal block on the windshield with a screw and a lock washer.

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Narrative (Continued)

The windshield is a bolted-edge design that uses internal and external aluminum retainers to secure the windshield in the fuselage opening. The anti-ice function is accomplished using PPG's Nesatron heating film to provide clear vision during inclement conditions. A polysulfide moisture seal around the windshield perimeter protects the interlayer materials from moisture ingress. According to United's maintenance records, at the time of the incident, the windshield had accumulated 12,065 hours and 2,325 cycles since installation.

A review of United Airlines maintenance records revealed that TIMCO Aviation Services, Inc. (GSO) performed a scheduled maintenance check on the airplane in January 2007. During the maintenance check, GSO replaced the Number 1 left-side window because its lower, forward, inboard corner exhibited signs of delamination. The newly manufactured replacement window (part number 141T4801-49) was installed on January 29, 2007, in accordance with the Boeing 757 Aircraft Maintenance Manual (AMM) 56-11-01/401, "No.1 Windshield - Removal/Installation."

A review of the airplane's service history revealed that, on May 15, 2010, the day before the incident, the airplane diverted to McCarran International Airport (LAS), Las Vegas, Nevada, because of a report of an electrical odor in the cockpit. United Airlines maintenance personnel inspected the airplane at LAS, and no defects or odors were found. The airplane was then ferried to San Francisco International Airport (SFO), San Francisco, California, for additional maintenance. During the flight from LAS to SFO, no electrical odors were noted by the flight crew, and the only unusual odor was reported to have come from the forward galley ovens. Upon arrival in SFO, United Airlines maintenance personnel inspected the airplane and could not find the source of the smell; however, they replaced both forward galley ovens as a precaution. The airplane was returned to service on May 16, 2010.

During the first revenue flight from SFO to JFK, after the maintenance was performed, the flight crew reported that the right No. 1 windshield lower outboard power connector appeared burnt and was hot to the touch. During post incident interviews, the captain of that flight stated that, based on the previous maintenance write-ups, he was fully aware of the reports of smoke and fumes in the cockpit. During the flight, he looked the cockpit over to see if he could determine where the smoke and fumes might have initiated. He stated that when he looked at the power connector, it looked unusual, and he noticed that the lower left terminal block on his windshield was blackened or charred. When he put his finger on it, he noticed that it was too hot to keep his finger on, which he thought was unusual. He got out of his seat, felt every other terminal block on every other window, and noted that none of them were hot. He then submitted an information item to the maintenance reporting manual (United's maintenance write-up system) via the Aircraft Communications Addressing and Reporting System (ACARS).

Upon arrival at JFK, a JFK maintenance technician met with the captain in the cockpit to discuss the maintenance write-up. According to the captain, he touched the connector at the captain's No. 1 windshield to show the mechanic the connector that he was concerned about and told him that it was hot and looked charred. The window heat had been turned off before the technician came on board the airplane as part of the normal aircraft shutdown procedures.

During a post incident interview, the JFK maintenance technician stated that he visually inspected the window, bus bar, power terminal, connector, and wires. He stated that, at the time of the inspection, he thought that the power terminal was part of the bus bar. He referred to the United Airlines AMM 56-11-00/601, "Flight Compartment Windows - Inspection / Check," which indicated that the window should be replaced due to the discoloration of the bus bar. (When an AMM is referred to as "United Airlines AMM" as opposed to a "Boeing AMM", it indicates that United Airlines has customized the original "Boeing AMM" by either including or clarifying maintenance procedures to help the maintenance technician perform the task.)

However, the limitations section of the United Airlines AMM states, "When bus bar(s) show signs of blackening or burning, the condition is acceptable for continued service, although the window must be replaced within 50 flight-hours." After the inspection, the technician spoke with the other lead technician at JFK, and they decided to defer the maintenance write-up for 50 flight hours. The mechanic signed off the maintenance write-up and returned the airplane back to service.

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Narrative (Continued)

A review of the Boeing AMM 56-11-00/601, "Flight Compartment Windows - Inspection / Check," revealed that it does not contain a limitations section and that it states to replace the windshield if there are any indications of arcing. On May 20, 2010, United Airlines revised AMM 56-11-00/601 from a significantly customized United AMM to a pure Boeing AMM to adopt the latest damage limits and definitions for in-service damage.

FLIGHT RECORDERS

The airplane was equipped with a Honeywell Model 9804700 solid-state flight data recorder (FDR). The FDR was in good condition, and the data were extracted normally. The data did not contain any information regarding the windshield heating system.

The airplane was equipped with a Honeywell Model 6020 solid-state cockpit voice recorder (CVR). The CVR was sent to the NTSB's laboratory for readout evaluation. The CVR was in good condition, and the audio information was extracted without difficulty. None of the audio information was pertinent to the incident, and it was consistent with the recording being overwritten by subsequent events.

FIRE

On May 16, 2010, a NTSB investigator visually examined the captain's No. 1 windshield (part number 141T4801-49, serial number 06039H6554) and its respective wiring harness before the components were removed from the airplane. (The Boeing 757 cockpit has six windows: three on the captain's side [left] and three on the first officer's side [right], and they are numbered center to outboard 1, 2, and 3.) Examination revealed that the airplane exhibited relatively little fire damage except for some soot staining and surface charring in the area of the captain's windshield. Soot staining was evident moving up the aft portion of the window frame brace and below the instrument panel glareshield. In addition, some slight charring existed in about a 1-square-inch area on the top surface of the instrument panel glareshield.

The lower aft portion of the windshield exhibited the most thermal damage and soot staining. Remnants of the J5 power terminal block, which had been mostly consumed by fire, were found in this area. The terminal connector lug associated with the J5 terminal block was charred and melted, and the electrical contacts inside appeared oxidized and corroded consistent with exposure to high temperature. The screw that had been embedded in the terminal block also exhibited a heavily oxidized appearance consistent with exposure to high temperature. The visual examination did not reveal any additional evidence of fire damage in the cockpit.

TEST AND RESEARCH

The windshield, wiring harness, and all of the attachment hardware were removed from the airplane and shipped to PPG Aerospace facility in Huntsville, Alabama for more detailed examinations. The examinations were conducted on June 16, 2010 under the supervision of the NTSB and witnessed by representatives from PPG Aerospace, FAA, United Airlines, Boeing, International Brotherhood of Teamsters, and Air Line Pilots Association. The windshield part and serial numbers indicated that the windshield was manufactured in 2006 under PPG's Parts Manufacturing Approval from the FAA.

Examinations revealed that the upper 75 percent of the windshield's inner pane exhibited a dense network of cracks that emanated from the lower, aft corner of the windshield. The upper and lower bus bars were intact and exhibited very little discoloration. No evidence of moisture ingress was found on the windshield or and there were no seal repairs to the aft and upper edges. Soot was found on the inboard glass pane along the entire length of the aft windshield edge. A check of the electrical resistance between each terminal (power and sensor) and its respective braid wire found that all of the connections were within their specified limits. Other than the lower, aft J5 connector, all power terminal blocks and sensors remained intact and attached with no apparent damage. The J5 connector was found to be extensively burned with only the aft edge remaining. The area on the glass underneath the J5 terminal block had some small areas of charred polysulfide sealant and some areas of soft pliable sealant.

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Narrative (Continued)

Examination of the wiring harness revealed no evidence of chafing, rubbing, or repairs to any of the wires in the harness. The J5 terminal connector and lug exhibited charring damage, and the housing was cracked in multiple places. A small area of bluing was found on the surface of the lug where it mated with the screw head. The wire insulation was consumed for about 2 inches from the connector and charred for an additional 2 inches. Portions of the cap shoulder areas on the J2 and J3 terminal connectors were fractured from the connectors. The J5 screw measured 0.75 inches in length, and it exhibited a small area of bluing on the lower surface of its head. The J5 terminal lug exhibited oxidation and discoloration on all surfaces. The lug thread depth measured 0.410 inches; the drawing specified thread depth was 0.38 inches minimum. No evidence of cross threading on the screw or terminal lug was found.

As noted, GSO had replaced the No. 1 left-side window on January 29, 2007, in accordance with the Boeing 757 AMM 56-11-01/401, "No.1 Windshield - Removal/Installation." A review of United Airlines' version and Boeing's version of AMM 56-11-01/401, "No. 1 Windshield - Removal/Installation," revealed that both versions stated to connect the electrical wires to the power terminals and tighten the screws to 25 to 30 inch-pounds; however, neither manual contained a procedure or step to install a lock washer between the screw and the terminal. After the May 16, 2010 incident, Boeing released a temporary revision (TR56-1004) to AMM 56-11-01/401 which adds specific instructions for the installation of the lock washer and graphics depicting its installation. United has incorporated the information contained within TR56-1004 into their maintenance manual.

The Boeing 757 Illustrated Parts Catalog (IPC) 30-41-52-03, Revision 81, "WINDOW ASSY-NO. 1, 2, 3 (ICE AND RAIN PROTECTION ONLY)," contains a figure depicting the power and sensor terminal block connector installation. The figure depicts a lock washer between the screw and the terminal block for each of the power and sensing terminals. However, the part numbers for the attachment hardware (lock washer and screw) were not provided in the IPC. On June 3, 2008, Boeing released Multi Operator Message (MOM) 1-855016051 regarding the elimination of wire bundle breakdown data from the IPCs for all 737, 747, 757, 767, and 777 aircraft. The MOM stated the following:

Beginning 6/15/2008 the Boeing Aircraft Illustrated Parts Catalog...will discontinue listing the breakdowns for Wire Bundles unless the bundle contains components with Spares Interchangeability relationships that are documented in the Spares Engineering STEPS system. The existing data pertaining to wire bundle breakdowns will be removed over the next 12 months in order to ensure that there will be no conflicting information between the wiring data systems products and the Aircraft Illustrated Parts Catalog.

ADDITIONAL INFORMATION

The Safety Board has investigated several similar smoke/fire events at the windshield heat terminal connection since 2004 and is aware of many more events. In June 2010, Boeing informed the Safety Board that, from the period of January 2001 through May 2010, they had received a total of 35 reported smoke/flame events associated with the screw and lug type power terminal connections on the Boeing 747, 757, 767, and 777 No. 1 windshields. In some cases, the initiating cause of the event was determined to be related to a cross-threaded screw at the J5 terminal block. In other cases, the initiating cause was undetermined. In addition, the Transportation Safety Board (TSB) of Canada investigated a similar incident on a Boeing 777 airplane operated by Air France in 2002. (See TSB Aviation Investigation Report A02C0227, which is available at <www.tsb.gc.ca>)

Further, another windshield power terminal overheating event has occurred since the May 16, 2010, United Airlines event. On July 27, 2010, the pilots of Delta Airlines flight 1553, a Boeing 757 200, N649DL, diverted to Spokane International Airport (GEG), Spokane, Washington, because of an electrical odor in the cockpit. The flight was en route from Minneapolis - St. Paul International Airport, Minneapolis, Minnesota, to Seattle/Tacoma International Airport, Seattle, Washington. The airplane landed without incident at GEG. No evacuation was conducted, and none of the 6 crewmembers or the 176 passengers sustained injuries. During the examination of the J5 power terminal block and its attachment hardware at the PPG Aerospace facility a lock washer was not present beneath the screw that connects the wiring harness terminal lug to the terminal block.

In 2004, Boeing redesigned the No. 1 windshield terminal block installation by improving the electrical connection between the terminal block and its respective wiring harness.

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Narrative (Continued)

The new connections are made with a pin and socket connector instead of the current lug connector, which must be secured using a screw and a lock washer. Boeing incorporated this new terminal block installation into new production airplanes in mid-2004 and informed the Safety Board that service bulletins (SB) for all existing 747, 757, 767, and 777 airplanes would be issued to retrofit these airplanes with the redesigned terminal block. At that time, the FAA also informed the Board that it would issue airworthiness directives (AD) that would make the SBs mandatory.

Boeing redesigned the 757 windshield in 2005 to incorporate a pin-socket connection from the shipside wire to the windshield and a screw-crimped ring connection from the braid wire to the power terminal block. The new windshield was released after production on the 757 stopped but is available as a spare replacement. Boeing SB's 757-30-0019 and 757-30-0020 provide for inspection of the terminal blocks on all old windshields and replacement of the windshields on all 757 airplanes with a new windshield that incorporates a pin-socket type terminal block.

Boeing Service Bulletins (SB) 757-30-0019, revision 2, dated April 19, 2010, and 757-30-0020, revision 2, dated March 31, 2010, provide for initial and repetitive inspections of the terminal blocks or, alternately, replacement of the windshield and shipside wire to use pin-socket type power connections on all 757 airplanes. At the time of the May 2010 incident, United Airlines had not performed the actions specified in SB 757-30-0019 on the incident airplane, nor were they required to do so by the FAA.

In September 2007, the NTSB issued Safety Recommendation A-07-50, which asked the FAA to issue an airworthiness directive (AD) to replace the windshield heat terminal blocks on all Boeing 747, 757, 767, and 777 airplanes in accordance with their respective Boeing SBs. This safety recommendation was issued to the FAA as a result of two incidents involving Boeing 757-200 airplanes. The first occurred on January 21, 2004, when an electrical fire started near the windshield heat terminal on an Air Greenland 757-200 airplane in Copenhagen, Denmark, which was on the ground while being readied for flight. The second event occurred 4 days later, on January 25, 2004, and involved American Airlines flight 1477, a 757-200 airplane, which declared an emergency on departure from Dallas Fort Worth International Airport, Texas, because of smoke and fire emanating from the vicinity of the windshield heat terminal (See NTSB Investigation Report ENG08IA011). In April 2008, the FAA issued a notice of proposed rulemaking (NPRM) to make the inspection of the J5 terminal blocks mandatory and the replacement of the windshield a terminating action for the inspections. In its comments on the NPRM, the NTSB asked that it be revised to include inspections of the J1 and J4 terminals since some of the events involved arcing at these locations. Before this incident, the NTSB made several inquiries about the status of the pending AD with little or no response. On July 13, 2010, the FAA issued AD 2010-15-01, which mandated repetitive inspections for damage (including arcing, loose terminal, or heat damage) of only the J5 terminal at the No. 1 left and right cockpit windows and corrective actions if necessary for certain model Boeing 757, 767, and 777 series airplanes. The AD also allows for replacing the No. 1 cockpit window with a new and improved cockpit window equipped with different electrical connections, which terminates the repetitive inspections for that cockpit window. The FAA is currently working on an AD to mandate inspections at the No. 1 left and right cockpit windows for the Boeing 747 series airplane.

Updated on Mar 14 2011 2:41PM

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		Occurrence Type: Incident			
Landing Facility/Approach Information					
Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Washington Dulles	IAD	Ft. MSL	N/A		
Runway Surface Type:					
Runway Surface Condition:					
Approach/Arrival Flown: Unknown					
VFR Approach/Landing: Unknown					
Aircraft Information					
Aircraft Manufacturer		Model/Series		Serial Number	
BOEING		757/200		24780	
Airworthiness Certificate(s): Normal					
Landing Gear Type: Retractable - Tricycle					
Amateur Built Acft? No	Number of Seats: 116	Certified Max Gross Wt.	240000 LBS	Number of Engines: 2	
Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:		
Turbo Fan	Pratt & Whitney	PW 2037	37500 LBS		
- Aircraft Inspection Information					
Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time		
Continuous Airworthiness	03/2010	Hours	67253 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed?/Type No	ELT Operated? No	ELT Aided in Locating Accident Site?			
Owner/Operator Information					
Registered Aircraft Owner		Street Address			
VX Capitol		City	State	Zip Code	
		San Francisco	CA	94111	
Operator of Aircraft		Street Address			
United Airlines		City	State	Zip Code	
		San Francisco	CA	94111	
Operator Does Business As: United Airlines			Operator Designator Code: UALA		
- Type of U.S. Certificate(s) Held:					
Air Carrier Operating Certificate(s): Flag Carrier/Domestic					
Operating Certificate:			Operator Certificate:		
Regulation Flight Conducted Under: Part 121: Air Carrier					
Type of Flight Operation Conducted: Scheduled; Domestic; Passenger Only					
FACTUAL REPORT - AVIATION					

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First Pilot Information

Name On File	City	State	Date of Birth On File	Age 59
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Sex: M	Seat Occupied: Left	Occupational Pilot? Yes	Certificate Number: On File
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Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA:

Instrument Rating(s): Airplane

Instructor Rating(s):

Current Biennial Flight Review?

Medical Cert.: Class 1	Medical Cert. Status: With Waivers/Limitations	Date of Last Medical Exam: 05/2010
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- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Multi-Engine	Night	Instrument		Rotorcraft	Glider	Lighter Than Air
						Actual	Simulated			
Total Time	9425	2066								
Pilot In Command(PIC)		2066								
Instructor										
Instruction Received										
Last 90 Days		170								
Last 30 Days		60								
Last 24 Hours		7								

Seatbelt Used? N/A	Shoulder Harness Used? N/A	Toxicology Performed?	Second Pilot? Yes
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Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point Queens	State NY	Airport Identifier KJFK	Departure Time 2043	Time Zone EST
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Destination Los Angeles	State CA	Airport Identifier KLAX	
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Type of Clearance: IFR

Type of Airspace: Class A

Weather Information

U.S. Source of Wx Information:
Company

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Weather Information					
WOF ID	Observation Time	Time Zone	WOF Elevation Ft. MSL	WOF Distance From Accident Site NM	Direction From Accident Site Deg. Mag.
Sky/Lowest Cloud Condition:				Ft. AGL	Condition of Light: Night
Lowest Ceiling:			Ft. AGL	Visibility: SM	Altimeter: "Hg
Temperature: °C	Dew Point: °C	Weather Conditions at Accident Site:			
Wind Direction:		Wind Speed:		Wind Gusts:	
Visibility (RVR): Ft.		Visibility (RVV) SM			
Precip and/or Obscuration:					

Accident Information		
Aircraft Damage: Minor	Aircraft Fire: In-flight	Aircraft Explosion: None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants				5	5
Other Crew					
Passengers				105	105
- TOTAL ABOARD -				112	112
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	112	112

National Transportation Safety Board

FACTUAL REPORT
AVIATION



NTSB ID: ENG10IA029

Occurrence Date: 05/16/2010

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

Michael Hauf

Additional Persons Participating in This Accident/Incident Investigation: