Dual engine failure and loss of directional control, Douglas DC-9-32, December 19, 1995

Micro-summary: **This Douglas DC-9-32 experienced a dual engine flameout on landing and a subsequent loss of directional control.**

Event Date: **1995-12-19 at 0911 CST**

Investigative Body: **National Transportation Safety Board (NTSB), USA**

Investigative Body's Web Site: **http://www.ntsb.gov/**

Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).

2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***

3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.

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National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI96IA059	Aircraft Registration Number: N925L
Occurrence Date: 12/19/1995	Most Critical Injury: None
Occurrence Type: Incident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
SAINT LOUIS	MO	64134	0911	CST	

Airport Proximity: On Airport	Distance From Landing Facility: 1	Direction From Airport:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Douglas	DC-9-32	Airplane

Sightseeing Flight: No Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

HISTORY OF THE FLIGHT

On December 19, 1995, at 0911 central standard time (cst), a DC-9-32, N925L, operated as Trans World Airlines (TWA) flight 605, experienced a dual engine flameout during landing on runway 30L at Lambert International Airport, Saint Louis, Missouri. The airplane subsequently lost directional control and slid on the runway. Instrument meteorological conditions prevailed at the time of the incident. The flight was being conducted as regular scheduled domestic air carrier service under 14 CFR Part 121. An IFR flight plan was on file. There were no reported injuries to the 5 crew and 49 passengers who deplaned normally after the airplane was towed to the gate. The flight originated from Hartford, Connecticut, at 0700 eastern standard time (est).

The first officer said that the first Automated Terminal Information System (ATIS) broadcast they monitored, advised the flight to expect the ILS to runway 30R. An updated broadcast reported runway 30L as the active runway, and that the runway had been plowed, sanded and deiced. The captain said that after holding for 30 minutes, they received clearance for the ILS approach to runway 30L. The first officer said that they were outside the outer marker when they configured the airplane for landing and performed the before landing check.

The airplane touched down in the runway touchdown zone area. The captain lowered the nosewheel to the runway as he applied reverse thrust. The captain said that he saw the "unlock lights indicating the reversers deployed, but something didn't sound right. It was quieter than normal." The first officer said he saw the "two amber unlock lights for the thrust reversers (illuminate), but the two, blue in-reverse lights never came on." "It seemed like a long time, then multiple flags and relays came on." The captain said that he applied the brakes to slow the airplane down. As the airplane slowed to taxi speed, the nose started turning right. The captain put in steering controls, but the plane continued to turn. The first officer said that they began to slide. "The airplane stopped within half an airplane width from the edge of the runway, 70 degrees off runway heading." The captain said that he "set the brakes and then realized the engines were not operating."

A mechanic at the airport, who observed the airplane land reported that when the airplane touched down, it was "engulfed in a cloud of snow. It sounded like it lost intake air, then became silent."

AIRCRAFT INFORMATION

Following the incident, the airplane was towed to the gate by TWA maintenance personnel. Both engines were started and run through their normal operating range. No anomalies were found with either engine during the test.

The airplane underwent a post-incident maintenance inspection performed by TWA maintenance at Saint

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Narrative (Continued)

Louis, Missouri, on December 19 and 20, 1995. The number one and number two engine fuel control units were replaced. Both units were bench tested and no anomalies were found. Both engine fuel boost pumps were checked and certified for proper operation. A structural damage inspection was performed and no discrepancies were found.

The airplane's left nosewheel tire was inspected by a company service engineer. He said the tire chine was in good condition and met manufacturer's specifications. The airplane's right nosewheel tire was inspected at TWA's Tire Change Station at John F. Kennedy International Airport, New York. A Quality Assurance Inspector said that the tire chine was in good condition and met manufacturer's specifications.

METEROROLOGICAL INFORMATION

The National Weather Service Weather Observation Facility at Lambert International Airport's 0850 est observation was a 600 foot ceiling, with visibility 3/8 of a mile in snow and fog. The temperature was 32 degrees Fahrenheit. The dew point was 31 degrees Fahrenheit. The surface winds were 360 degrees magnetic at 16 knots with gusts to 27 knots. On giving flight 605 landing clearance, the tower reported surface winds of 360 degrees at 19 knots.

AIRPORT INFORMATION

Prior to the incident, the Air Traffic Control Tower at Lambert International Airport broadcasted that braking action, as reported by an airport vehicle on runway inspection, was fair to poor. At approximately 0907 est, the tower broadcasted a report by another air carrier aircraft which had previously landed, that runway braking action was poor. At 0919 est, the tower broadcasted a special weather observation which included a remark of 1/4 inch of snow on the runway.

The Director of Airport Field Operations for Lambert International Airport, who was directing snow removal operations when the airplane landed and observed the airplane during post- incident towing operations, described the runway's surface condition as a mix of wet snow, slush and deicing fluid. He also said that there were areas on the runway with slush accumulations greater than one-quarter inch.

TESTS AND RESEARCH

A representative from McDonnell Douglas, Aircraft Company, Inc., stated that the nosewheel tires chines are designed to deflect water/slush/snow away from the airplane. The specifications for tire chine design are based on data gathered during taxi tests conducted in the 1960's.

A representative from Pratt and Whitney, Inc., stated that the JT-8D-9A engine is susceptible to flameout if enough water is ingested into the engine inlet. The factor the company uses for defining "enough water" is 1/4 inch of slush. The potential for engine flameout increases if the 1/4 inch of slush figure is exceeded, and if the engines are at low power, such as ground idle. The JT-8D-9A engines do not have a flight idle adjustment, therefore the engines are at ground idle when the throttles are fully retarded, as in landing.

ADDITIONAL INFORMATION

Parties to the investigation were the Federal Aviation Administration Flight Standards District Office, Saint Louis, Missouri, and the Air Line Pilot's Association, Bridgeton, Missouri.

The airplane was released and put back into service on December 20, 1995. The flight data recorder was released and returned to TWA.

National Transportation Safety Board

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Occurrence Date: 12/19/1995

Occurrence Type: Incident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
LAMBERT INTERNATIONAL	STL	605 Ft. MSL	30L	11019	200

Runway Surface Type: Concrete

Runway Surface Condition: Ice; Slush covered; Snow--wet

Type Instrument Approach: ILS-complete

VFR Approach/Landing: None

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Douglas	DC-9-32	47357

Airworthiness Certificate(s): Transport

Landing Gear Type: Retractable - Tricycle

Homebuilt Aircraft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	85	109000 LBS	2

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Jet	P&W	JT-8D-9A	14500 LBS

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness	04/1995	1494 Hours	1289 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?	ELT Operated?	ELT Aided in Locating Accident Site?
Yes	No	

Owner/Operator Information

Registered Aircraft Owner	Street Address		
FIRST SECURITY BANK UTAH	79 SOUTH MAIN STREET		
	City: SALT LAKE CITY	State: UT	Zip Code: 84111

Operator of Aircraft	Street Address		
TRANS WORLD AIRLINES, INC.	515 N. 6TH STREET		
	City: SAINT LOUIS	State: MO	Zip Code: 63101

Operator Does Business As: TRANS WORLD AIRLINES

Operator Designator Code: TWAA

- 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

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: CHI96IA059

Occurrence Date: 12/19/1995

Occurrence Type: Incident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	57

Sex: M | Seat Occupied: Left | Principal Profession: Civilian Pilot | Certificate Number: On File

Certificate(s): Airline Transport; Flight Engineer

Airplane Rating(s): Multi-engine Land

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): None

Type Rating/Endorsement for Accident/Incident Aircraft? Yes | Current Biennial Flight Review?

Medical Cert.: Class 1 | Medical Cert. Status: Valid Medical--no waivers/lim. | Date of Last Medical Exam: 11/1995

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	16290	2408	1927	14363	4787	4787				
Pilot In Command(PIC)	4327	2053	1900	2053	650	650				
Instructor										
Last 90 Days	189	189		189						
Last 30 Days	47	47		47						
Last 24 Hours	6	6		6						

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
HARTFORD	CT	BDL	0700	EST

Destination	State	Airport Identifier
Same as Accident/Incident Location		STL

Type of Clearance: IFR

Type of Airspace: Class B

Weather Information

Source of Briefing: National Weather Service

Method of Briefing:

National Transportation Safety Board

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Occurrence Type: Incident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
STL	0919	CST	605 Ft. MSL	1 NM	200 Deg. Mag.

Sky/Lowest Cloud Condition: Unknown 0 Ft. AGL

Condition of Light: Day

Lowest Ceiling: Obscured 600 Ft. AGL

Visibility: 0.38 SM

Altimeter: 29.00 "Hg

Temperature: 0 °C

Dew Point: -1 °C

Wind Direction: 360

Density Altitude: 590 Ft.

Wind Speed: 16

Gusts: 27

Weather Condtions at Accident Site: Instrument Conditions

Visibility (RVR): 3000 Ft.

Visibility (RVV) 0 SM

Intensity of Precipitation: Moderate

Restrictions to Visibility: Blowing Snow

Type of Precipitation: Snow Shower

Accident Information

Aircraft Damage: None

Aircraft Fire: None

Aircraft Explosion None

Classification: U.S. Registered/U.S. Soil

- 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				3	3
Other Crew					
Passengers				49	49
- TOTAL ABOARD -				54	54
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	54	54

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: CHI96IA059

Occurrence Date: 12/19/1995

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

DAVID C. BOWLING

Additional Persons Participating in This Accident/Incident Investigation:

CHARLIE BUTTON
FAA - 10801 PEAR TREE LANE
SAINT ANN, MO 63074

JOHN A ROHLING
FAPA - 3221 MCKELVEY ROAD
BRIDGETON, MO 63044