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## Pilot incapacitation, Boeing 757-200, June 10, 2003

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**Micro-summary:** This Boeing 757-200 incapacitated the captain when a decompression panel fell and struck him on the head.

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**Event Date:** 2003-06-10 at 1030 MDT

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

**Investigative Body's Web Site:** <http://www.nts.gov/>

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  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!***
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		NTSB ID: DEN03IA101		Aircraft Registration Number: N704X	
		Occurrence Date: 06/10/2003		Most Critical Injury: Minor	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place Dodge City		State KS	Zip Code 67801	Local Time 1030	Time Zone MDT
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 757-200		Type of Aircraft 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 FLIGHT					
<p>On June 10, 2003, at 1030 mountain daylight time, a Boeing 757-200, N704X, owned by ILFC VOLARE Inc., and operated by Trans World Airlines (TWA) LLC, as American Airlines flight 2885, was in cruise flight at 35,000 feet, 34 nautical miles southwest of Dodge City, Kansas, when the captain was struck on the head by the flight deck door's upper decompression panel, rendering him incapacitated. The first officer requested an immediate flight deviation to Denver, Colorado, where he made an uneventful landing. The airline transport certificated captain received minor injuries. The airline transport certificated first officer, 3 flight attendants, and 93 passengers were not injured. Visual meteorological conditions prevailed at the time of the incident. The scheduled domestic passenger flight was being conducted on an instrument flight rules (IFR) flight plan under the provisions of Title 14 CFR Part 121. The flight originated at St Louis, Missouri, at 0955 central daylight time, and was en route to Santa Ana, California.</p> <p>According to witnesses aboard the plane, the lead flight attendant had given the captain a tray of refreshments and was attempting to secure the flight deck door. While slamming the door, the upper pressure relief latch activated, and the upper decompression panel opened, falling forward and down, striking the captain on the head. The captain received a 1-inch cut on his head.</p> <p>The first officer requested and received clearance for an immediate descent and landing at Denver, Colorado. A "deadheading" captain, who was seated in the cabin, assisted the injured captain and then assisted the first officer as the first officer made an uneventful landing at Denver International Airport at 1055 mountain daylight time.</p> <p>When the airplane arrived at the gate, the injured captain was taken to the hospital. A replacement flight crew took control of the airplane and began departure preparations to continue the flight to Santa Ana, California. At that same time, maintenance personnel boarded the airplane to assess the security of, and perform an operational check of the flight deck door.</p> <p>A maintenance technician, whom was called to check N704X's flight deck door, stated that he was given a report indicating that the lead flight attendant had closed the flight deck door "excessively hard," which caused the upper flight deck door decompression panel to deploy. He said he inspected the flight deck door, reinstalled the upper decompression panel, and completed an operational check of the flight deck door from inside the cockpit. The maintenance technician closed the flight deck door several times with "a good amount of force," and said that "the panel held without releasing." The lead flight attendant then assisted the maintenance technician as they closed the flight deck door together. The maintenance technician said that he remained in the cockpit as the lead flight attendant closed the flight deck door. He said that when the lead flight attendant demonstrated how she closed the door in-flight, she "slammed the door shut with a great amount of force." The slamming of the door caused the "fuse mechanism to release" and the</p>					
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upper decompression panel to fall forward and down into the technician's hands.

The maintenance technician stated that he contacted TWA maintenance with the information and was told, "It was normal." He was then told to reinstall the panel. He reinstalled the upper decompression panel and signed off the write-up as: "Reinstalled upper panel in flight deck door, door operation checks good. Maintenance Manual Reference: 52-51-00-0, item 2C and 2D."

Following the completion of the maintenance checks, the replacement flight crew requested and received clearance for pushback and taxi. The crew taxied the airplane out for departure to Santa Ana.

When the airplane arrived in Santa Ana, California, an FAA inspector from the Long Beach, California, Flight Standards District Office (FSDO), met the crew and requested to inspect, remove, and secure the airplane's flight deck door, flight data recorder (FDR), and cockpit voice recorder (CVR). Prior to removal of the flight deck door, the FAA inspector, assisted by TWA maintenance personnel, conducted several operational checks of the door. Each time the door was "slammed closed," the upper decompression panel inadvertently deployed. TWA replaced and secured the flight deck door and the recorders, and put the airplane back into revenue service.

## TESTS AND RESEARCH

On June 11, 2003, the FDR and CVR were sent to the National Transportation Safety Board (NTSB) vehicle recorder laboratory in Washington D.C., for examination. All data contained on the FDR and CVR was downloaded. The examination showed that all CVR data relevant to the incident had been recorded over because the CVR continued to capture data as the flight proceeded from Denver to Santa Ana. Data recorded on the FDR was unremarkable.

The incident flight deck door was manufactured by C&D Aerospace. An examination of the door showed that it had the correct placard mounted. However, the door did not comply with the manufacturer's issued Service Bulletin (SB), B231001-52-02 for Boeing model 757-200 flight deck door, dated December 6, 2002. On further examination, it was revealed that the doorstop, mounted on the bottom of the flight deck door, was loose and missing one attachment screw. According to FAA, this misalignment caused the door to "hang and catch" the floor, which required added force to close the door.

The model number 757-200 flight deck door is similar to the model 757-300, and 737-200 through 737-900 series flight deck doors. These doors are also manufactured by C&D Aerospace. These designs include two decompression panels. The top decompression panel assembly is hinged at the bottom and is secured by a pressure relief latch at the top. The pressure relief latch is designed so that if an excessive pressure differential exists, the relief latch activates, and the decompression panel is released to fall forward, and down, into the cockpit, equalizing pressure between the flight deck and the cabin.

On June 12, 2003, NTSB investigators and FAA inspectors conducted a series of flight deck door inspections and functional tests on airplanes at the Denver International Airport. The door inspections and functional tests were done on several different Boeing 757 and Boeing 737 airplanes, one of which was N704X, which had returned to Denver. Three of the airplanes checked, including N704X, had flight deck doors installed that were not in compliance with the SB. When the doors, including the replacement door on N704X, were "slammed" shut, the top decompression panel inadvertently deployed. Although each of these doors had the correct placard installed, two were incorrectly modified, and one was not modified at all.

Further investigation showed that C&D Aerospace was aware of several incidents where flight deck door decompression panels had opened inadvertently. On December 6, 2002, C&D Aerospace had issued SB B231001-52-02 for Boeing model 757 and SB B221001-52-03 for Boeing model 737 doors. These SB's

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required installation of a new decompression latch strap (P/N B221080-1), a new pressure latch spacer (P/N B221081-1), and new hardware on the pressure relief latch. The modifications outlined in the SB were to prevent the decompression panel from opening inadvertently. Although these modifications were mandatory as outlined in an SB, according to the FAA, they were required to be completed only "as soon as manpower, facilities, and retrofit kits become available."

The SB included procedures for modifying the upper and lower pressure relief latch assemblies for the reinforced flight deck door. The procedures for modifying the upper pressure relief latch assembly included removing the upper pressure relief latch assembly and spacer, installing a new decompression latch strap, reinstalling the existing upper pressure relief latch assembly and spacer, installing a second "new" pressure relief latch spacer, the repositioning of hardware and the installation of the placard.

## ADDITIONAL INFORMATION

To prevent further injury and to ensure the integrity of the flight deck door, as well as addressing the identified safety of flight and breach of security issues, the NTSB drafted an URGENT safety recommendation letter on June 13, 2003. The safety recommendation, requested that the FAA issue an Airworthiness Directive (AD) to mandate SB B221001-52-03 and SB B231001-52-02 on all models of Boeing 737 and 757 respectively. The FAA agreed with the Safety Board's recommendations and responded by stating that they would take immediate action and would plan for an "Immediate Adopted Rule" to issue an AD.

On July 2, 2003, the FAA released AD 2003-14-04 with an effective date of July 25, 2003. The AD required that "within 90 days after the effective date of this AD, modify the upper and lower pressure relief latch assemblies on all applicable reinforced flight deck doors by accomplishing instructions in C&D Aerospace Service Bulletin B221001-52-03, Revision 3, C&D Aerospace Service Bulletin B231001-52-02, Revision 4, and C&D Aerospace Service Bulletin B211200-52-02, Revision 1."

As cited in AD, the FAA had received several reports of inadvertent decompression panel latch release incidents involving the reinforced flight deck door on certain Boeing Model 737-300, 737-500, 737-800, and 757-200 series airplanes. In these incidents, slamming the flight deck door caused the decompression latch to inadvertently release and the decompression panel in the door to open. The AD cited that this condition, if not corrected, could result in the decompression panel hitting and injuring a flight crewmember, if the crewmember is in close proximity to the flight deck door when the decompression panel opens. The decompression latches for the reinforced flight deck doors on certain Boeing Model 737-200, 737-400, 737-600, 737-700, 737-900, and 757-300 series airplanes; and certain McDonnell Douglas Model DC-10-10F, DC-10-30, DC-10-30F, DC-10-40, MD-10-30F, MD-11, and MD-11F airplanes; are identical to those on the affected Model 737-300, 737-500, 737-800, and 757-200 series airplanes. Therefore, all of these models may be subject to the same unsafe condition. The subject reinforced flight deck doors meet the ballistics and intrusion resistance security requirements of Section 25.795 "Security Considerations," of the Federal Aviation Regulations Title 14 CFR 25.795, when the door is properly closed, latched, and locked. The possibility that the decompression panel may open if the door is slammed shut is unrelated to the flight deck door's ballistics and intrusion resistance characteristics.

Additionally, the AD cited that the FAA reviewed and approved C & D Aerospace Service Bulletin B221001-52-03, Revision 3, dated March 25, 2003, which applies to certain Boeing Model 737-200, -300, -400, -500, -600, -700, -800, and -900 series airplanes; and C & D Aerospace Service Bulletin B231001-52-02, Revision 4, dated March 19, 2003, which applies to certain Boeing Model 757-200 and -300 series airplanes. Those SB's describe procedures, as stated earlier, for modifying the upper and lower pressure relief latch assemblies on the reinforced flight deck door.

The AD also cited that the FAA reviewed and approved C & D Aerospace Service Bulletin B211200-52-02, Revision 1, dated June 3, 2003, which applies to certain McDonnell Douglas Model

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DC-10-10F, DC- 10-30, DC-10-30F, DC-10-40, MD-10-30F, MD-11, and MD-11F airplanes. The SB described similar procedures for the modification of the upper and lower pressure relief latch assemblies on the DC-10, MD-10, and MD-11 reinforced flight deck doors.

According to the FAA, "since a situation exists that required the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days," and that the "accomplishment of the actions specified in the applicable service bulletin is intended to adequately address the identified unsafe conditions."

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<b>Landing Facility/Approach Information</b>					
Airport Name N/A	Airport ID:	Airport Elevation Ft. MSL	Runway Used NA	Runway Length	Runway Width
Runway Surface Type: Unknown					
Runway Surface Condition: Unknown					
Type Instrument Approach: Unknown					
VFR Approach/Landing: Unknown					
<b>Aircraft Information</b>					
Aircraft Manufacturer Boeing		Model/Series 757-200		Serial Number 28163	
Airworthiness Certificate(s): Transport					
Landing Gear Type: Retractable - Tricycle					
Homebuilt Aircraft? No	Number of Seats: 174	Certified Max Gross Wt.	255000 LBS	Number of Engines: 2	
Engine Type: Turbo Fan	Engine Manufacturer: Pratt & Whitney	Model/Series: PW-2037	Rated Power: 37000 LBS		
- Aircraft Inspection Information					
Type of Last Inspection Continuous Airworthiness	Date of Last Inspection 06/2003	Time Since Last Inspection 26 Hours	Airframe Total Time 22891 Hours		
- Emergency Locator Transmitter (ELT) Information					
ELT Installed? Yes	ELT Operated? No	ELT Aided in Locating Accident Site? No			
<b>Owner/Operator Information</b>					
Registered Aircraft Owner ILFC VOLARE INC.		Street Address 1999 Ave Of The Stars 39th Floor			
		City Los Angeles	State CA	Zip Code 90067	
Operator of Aircraft TWA Airlines LLC.		Street Address Same as Reg'd Aircraft Owner			
		City	State	Zip Code	
Operator Does Business As: American Airlines Flight 2885			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					
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**First Pilot Information**

Name On File	City On File	State On File	Date of Birth On File	Age 54
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Sex: M	Seat Occupied: Left	Principal Profession: Civilian Pilot	Certificate Number: On File
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Certificate(s): Airline Transport

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?
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Medical Cert.: Class 1	Medical Cert. Status: Valid Medical--no waivers/lim.	Date of Last Medical Exam: 05/2003
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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	18464	3969		18464						
Pilot In Command(PIC)	3524	511		3514						
Instructor										
Last 90 Days	213	213		213						
Last 30 Days	70	70		70						
Last 24 Hours	2	2		2						

Seatbelt Used? Yes	Shoulder Harness Used? Yes	Toxicology Performed? No	Second Pilot? Yes
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**Flight Plan/Itinerary**

Type of Flight Plan Filed: IFR	
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Departure Point St Louis	State MO	Airport Identifier STL	Departure Time 0955	Time Zone CDT
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Destination Santa Ana	State CA	Airport Identifier SNA	
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Type of Clearance: IFR

Type of Airspace: Class A

**Weather Information**

Source of Briefing:  
Company

Method of Briefing: Aircraft Radio

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**Weather Information**

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
DDC	1153	CDT	2594 Ft. MSL	34 NM	230 Deg. Mag.

Sky/Lowest Cloud Condition: Clear	Ft. AGL	Condition of Light: Day
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Lowest Ceiling: None	Ft. AGL	Visibility: 10	SM	Altimeter: 29.86	"Hg
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Temperature: 23 °C	Dew Point: 14 °C	Wind Direction: 30	Density Altitude: 4209 Ft.
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Wind Speed: 13	Gusts:	Weather Conditions at Accident Site: Visual Conditions
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Visibility (RVR): Ft.	Visibility (RVV) SM	Intensity of Precipitation:
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Restrictions to Visibility:

Type of Precipitation:

**Accident Information**

Aircraft Damage: None	Aircraft Fire: None	Aircraft Explosion: None
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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				1	1
Passengers				168	168
- TOTAL ABOARD -			1	173	174
Other Ground					
- GRAND TOTAL -			1	173	174

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Administrative Information

Investigator-In-Charge (IIC)

David C. Bowling

Additional Persons Participating in This Accident/Incident Investigation:

Joe Hanley  
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