Rapid Depressurization, Boeing 747SR-146B SF, JA-8158, December 5, 2004

Micro-summary: **This Boeing 747 encountered a sudden depressurization in-flight.**

Event Date: **2004-12-05 at 1400 AST**

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

Investigative Body's Web Site: **http://www.ntsb.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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National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: ANC05IA016	Aircraft Registration Number: JA8158
Occurrence Date: 12/05/2004	Most Critical Injury: None
Occurrence Type: Incident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
Anchorage	AK	99502	1400	AST	

Airport Proximity: Off Airport/Airstrip	Distance From Landing Facility:	Direction From Airport:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Boeing	747SR-146B SF	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

On December 5, 2004, about 1400 Alaska standard time, a Boeing 747SR-146B SF airplane, Japanese registration JA8158, sustained minor damage during a rapid decompression event while in normal cruise flight, about 137 miles west of Anchorage, Alaska. The airplane was being operated as Flight KZ103, by Nippon Cargo Airlines of Tokyo, Japan, as an instrument flight rules (IFR) non-scheduled international cargo flight under Title 14, CFR Part 129, when the incident occurred. The three flight crew members were not injured. Visual meteorological conditions prevailed, and an instrument flight plan was filed. The flight originated at the Ted Stevens International Airport, Anchorage, about 1338, and was bound for the Narita International Airport, Tokyo, Japan.

Upon reaching an altitude of 30,000 feet the airplane had a rapid decompression, and returned to the Ted Stevens International Airport.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC) on December 5, the FAA aviation safety inspector who examined the airplane said he saw a 12-inch elliptical tear in the right side of the pressure bulkhead web separating the electronics service bay from the nose wheel well.

During an examination of the airplane by the IIC on December 7, a rupture of the right side pressure bulkhead web inside the nose wheel well was seen. The tear extended about 12-inches along a horizontal rivet line. Both ends of the torn skin turned downward approximately 80-90 degrees, and the skin was bent outward 90 degrees to the bulkhead. No other damage resulting from the rupture was seen.

The damaged area (STA 260-280, WL 160-170) was excised from the structure by a team from Boeing, and delivered to the IIC.

AIRPLANE INFORMATION

The accident airplane is a Boeing 747-100SR (cargo configuration), serial number 22711. At the time of the incident the airplane had logged 58,185 flight hours, and 27,243 cycles/landings.

TEST AND RESEARCH

On January 19, the excised material was hand-delivered to the Boeing Material and Process Technology Fracture Analysis Group, Seattle, Washington. Under the supervision of the NTSB, a detailed examination of the fracture mechanism was conducted. The fracture exam concluded that the web fracture was initiated by fatigue from multiple origins on the outboard surface within the pressure vessel. A total of 10 separate fatigue cracks, ranging from 0.48 to 0.94 inch in width,

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Narrative (Continued)

propagated through the full web thickness, before the onset of rapid ductile tearing. Each fatigue crack formed adjacent to a fastener hole common with the WL 170 beam. The cracking was in line with the edge of the bonded strip doublers on the inboard surface (wheel well side). Metallurgical analysis showed the material met all the engineering drawing requirements. A copy of the fracture examination is attached to the docket for this case.

OTHER INFORMATION

Inspection criteria for the affected area is contained in Boeing Service Bulletin 747-53A24645 (April 5, 2001), and Alert Revisions 1 thru 4. Information gathered during the material analysis of this incident investigation was instrumental in the creation/adoption of Alert Revision 4 (February 24, 2005). Alert Revision 4 adds the requirement for repeated inspections of areas 1 and 2, at 500 flight-cycle intervals once the airplane has reached 20,000 flight cycles. It also decreased the inspection intervals of area 3 from 6,000 flight-cycles to 1,500 flight-cycles.

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NTSB ID: ANC05IA016

Occurrence Date: 12/05/2004

Occurrence Type: Incident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	NA		

Runway Surface Type:

Runway Surface Condition:

Type Instrument Approach: NONE

VFR Approach/Landing: Forced Landing; Full Stop

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Boeing	747SR-146B SF	22711

Airworthiness Certificate(s): Transport

Landing Gear Type: Retractable - Tricycle

Homebuilt Aircraft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	13	750000 LBS	4

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Fan	General Electric	CF6-50E2	51800 LBS

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Continuous Airworthiness		Hours	58179 Hours

- Emergency Locator Transmitter (ELT) Information

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

Owner/Operator Information

Registered Aircraft Owner	Street Address		
NIPPON CARGO AIRLINES	Shiodome City Center 8F 5-2,Higashi-Shinbashi,		
	City: Minato-Ku, Tokyo	State:	Zip Code: 105-7108

Operator of Aircraft	Street Address		
Same as Reg'd Aircraft Owner	Same as Reg'd Aircraft Owner		
	City	State	Zip Code

Operator Does Business As: Nippon Cargo Airlines

Operator Designator Code: NIPF

- Type of U.S. Certificate(s) Held:

Air Carrier Operating Certificate(s): Foreign Operation

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 129: Foreign

Type of Flight Operation Conducted: Non-scheduled; International; Cargo

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: ANC05IA016

Occurrence Date: 12/05/2004

Occurrence Type: Incident

First Pilot Information

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

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

Certificate(s): Foreign

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

Rotorcraft/Glider/LTA: None

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Instrument Airplane

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

Medical Cert.: Class 1 | Medical Cert. Status: | Date of Last Medical Exam: 06/2004

- 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	17678	4370								
Pilot In Command(PIC)	13649	3512								
Instructor										
Last 90 Days	133	133								
Last 30 Days	69	69								
Last 24 Hours	7	7								

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		PANC		ADT

Destination	State	Airport Identifier
Tokyo-Narita		NRT

Type of Clearance: IFR

Type of Airspace:

Weather Information

Source of Briefing: Unknown

Method of Briefing:

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: ANC05IA016

Occurrence Date: 12/05/2004

Occurrence Type: Incident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
PANC	1353	AST	152 Ft. MSL	NM	Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 400 Ft. AGL

Condition of Light: Day

Lowest Ceiling: Broken 1100 Ft. AGL

Visibility: 7 SM

Altimeter: 29.65 "Hg

Temperature: -11 °C

Dew Point: -12 °C

Wind Direction: 30

Density Altitude: Ft.

Wind Speed: 5

Gusts:

Weather Condtions at Accident Site: Visual Conditions

Visibility (RVR): Ft.

Visibility (RVV) SM

Intensity of Precipitation:

Restrictions to Visibility: No Obscuration; No Precipitation

Type of Precipitation:

Accident Information

Aircraft Damage: Minor

Aircraft Fire: None

Aircraft Explosion None

Classification:

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot				1	1
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer				1	1
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -				3	3
Other Ground					
- GRAND TOTAL -				3	3

National Transportation Safety Board

FACTUAL REPORT
AVIATION

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Occurrence Date: 12/05/2004

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

Lawrence R. Lewis

Additional Persons Participating in This Accident/Incident Investigation:

Patrick Crowley
FAA Anchorage, FSDO-03
Anchorage, AK