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## Uncontained engine failure, Boeing 747-240, AP-BAK, December 6, 1995

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**Micro-summary:** This Boeing 747 encountered an uncontained engine failure shortly after takeoff.

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**Event Date:** 1995-12-06 at 2150 EST

**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: NYC96IA036		Aircraft Registration Number: APBAK	
		Occurrence Date: 12/06/1995		Most Critical Injury: None	
		Occurrence Type: Incident		Investigated By: NTSB	
Location/Time					
Nearest City/Place JAMAICA		State NY	Zip Code 11401	Local Time 2150	Time Zone EST
Airport Proximity: Off Airport/Airstrip		Distance From Landing Facility:		Direction From Airport:	
Aircraft Information Summary					
Aircraft Manufacturer Boeing		Model/Series 747-240		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:					
<p>On December 6, 1995, about 2150 eastern standard time, a Boeing 747-240, APBAK, operated by the Pakistan Government as Flight 722, sustained minor damage during an uncontained engine failure after takeoff from the John F. Kennedy International Airport (JFK), Jamaica, New York. Visual meteorological conditions prevailed for the commercial passenger flight that departed, at 2148. The crew of 15, and 240 passengers, were not injured. An instrument flight rules flight plan had been filed for the flight conducted under 14 CFR Part 129.</p> <p>The three flight crewmembers provided similar accounts of the event. In the Flight Engineer's statement, he said that the engine start and taxi were normal, and full power was applied before the airplane reached 80 knots. At that time all of the engine parameters were equal. During the climb, about 1,000 feet, a "thudding noise" was heard on the left side of the airplane. This was followed by all of the parameters of the number two engine falling to zero, which included the oil quantity. There was no engine fire warning light. An engine shut down was completed, and the airplane was vectored by the Air Traffic Controller while they "dumped" fuel. The airplane was then flown back to JFK, and completed an uneventful landing on runway 31L, at 2311. The airplane was taxied to the gate and the passengers deplaned. An emergency evacuation was not performed.</p> <p>Two NTSB Powerplant Group Chairman were assigned to the accident at different times. The first Powerplant investigator conducted the on scene investigation. A second Powerplant investigator conducted the examination of the engine at the General Electric facility, Ontario, California.</p> <p>The airplane had been equipped with General Electric CF6-50E2 engines. Examination of the airplane revealed that the low pressure turbine (LPT) module, which included a portion of the fan mid shaft (FMS), exhaust cone, exhaust nozzle, and turbine rear frame were missing. The LPT case had separated from the turbine mid frame. The airplane sustained damage to the wing adjacent to the number two engine, the left wing leading and trailing edge flaps, and to the left main wing landing gear door. Additional damage was observed to the number one engine nacelle, fan, and engine core.</p> <p>The NTSB Powerplant Group Chairman's Factual report dated June 5, 1997, stated that the engine examination was conducted on January 3, 1996. The disassembly of the engine revealed that the FMS had multiple fractures between 21 and 26 inches aft of the forward end. The report also stated:</p> <p>"...The visual and scanning electron microscope (SEM) examination of the fracture face on the forward end of the FMS showed there were multiple fatigue origins and circumferential cracks on the outer diameter (OD) of the shaft. The air duct forward and center stiffener rings were also found to have fatigue cracks that were parallel to the centerline of the air duct...GEAE's examination of the FMS showed that there were areas on the FMS OD that were heat affected, but the Sermetel paint over those area was not rubbed. Fatigue cracks that were located in the heat-affected areas were</p>					
FACTUAL REPORT - AVIATION					
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National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**

SAFETY BOARD


NTSB ID: NYC96IA036


Occurrence Date: 12/06/1995

Occurrence Type: Incident

**Narrative** (Continued)

found to have Sermetel paint and debris in the cracks. GEAE provided the Safety Board with a summary of the maintenance history of the FMS that fractured. The FMS had previously been installed in a PIA CF6-50 engine that had sustained a No. 3 bearing inner race failure. The records did not show that PIA had inspected the FMS for heat affected material that would have occurred if the FMS had been rubbed following the bearing failure or at any of the subsequent maintenance exposures."

 <b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b>		NTSB ID: NYC96IA036				
		Occurrence Date: 12/06/1995				
		Occurrence Type: Incident				
<b>Landing Facility/Approach Information</b>						
Airport Name JOHN F KENNEDY INTL		Airport ID: JFK	Airport Elevation Ft. MSL	Runway Used 0	Runway Length	Runway Width
Runway Surface Type:						
Runway Surface Condition:						
Type Instrument Approach:						
VFR Approach/Landing:						
<b>Aircraft Information</b>						
Aircraft Manufacturer Boeing		Model/Series 747-240		Serial Number		
Airworthiness Certificate(s): Transport						
Landing Gear Type: Retractable - Tricycle						
Homebuilt Aircraft? No		Number of Seats:		Certified Max Gross Wt. LBS		Number of Engines: 4
Engine Type: Turbo Fan		Engine Manufacturer: GE		Model/Series: CF6-50E2		Rated Power: 50400 LBS
- Aircraft Inspection Information						
Type of Last Inspection Continuous Airworthiness		Date of Last Inspection		Time Since Last Inspection Hours		Airframe Total Time Hours
- Emergency Locator Transmitter (ELT) Information						
ELT Installed? No		ELT Operated?		ELT Aided in Locating Accident Site?		
<b>Owner/Operator Information</b>						
Registered Aircraft Owner PAKISTAN GOVERNMENT		Street Address JFK INTL AIRPORT				
		City JAMAICA		State NY	Zip Code 11401	
Operator of Aircraft PAKISTAN INTERNATIONAL AIRLINE		Street Address Same as Reg'd Aircraft Owner				
		City		State	Zip Code	
Operator Does Business As: PAKISTAN INTL AIRLINES				Operator Designator Code: PIAF		
- Type of U.S. Certificate(s) Held: None						
Air Carrier Operating Certificate(s):						
Operating Certificate:			Operator Certificate:			
Regulation Flight Conducted Under: Part 129: Foreign						
Type of Flight Operation Conducted: Scheduled; International; Passenger/Cargo						
FACTUAL REPORT - AVIATION						

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: NYC961A036
	Occurrence Date: 12/06/1995
	Occurrence Type: Incident

**First Pilot Information**

Name On File	City	State	Date of Birth On File	Age 59
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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--w/ waivers/lim.	Date of Last Medical Exam: 10/1995
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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	15000	4000	700							
Pilot In Command(PIC)	10000	3500								
Instructor										
Last 90 Days	50	50								
Last 30 Days	32	32								
Last 24 Hours										

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

Departure Point Same as Accident/Incident Location	State	Airport Identifier JFK	Departure Time 2148	Time Zone EST
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Destination PARIS,FRANCE	State	Airport Identifier	
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Type of Clearance: IFR

Type of Airspace: Class B

**Weather Information**

Source of Briefing:  
Company

Method of Briefing:

 <p><b>National Transportation Safety Board</b> <b>FACTUAL REPORT</b> <b>AVIATION</b></p>	NTSB ID: NYC961A036
	Occurrence Date: 12/06/1995
	Occurrence Type: Incident

<b>Weather Information</b>					
WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
JFK	2250	EST	13 Ft. MSL	0 NM	0 Deg. Mag.
Sky/Lowest Cloud Condition: Scattered			1200 Ft. AGL	Condition of Light: Night/Dark	
Lowest Ceiling: Overcast		2500 Ft. AGL		Visibility: 20 SM	Altimeter: 30.00 "Hg
Temperature: 4 °C	Dew Point: -8 °C	Wind Direction: 260		Density Altitude: Ft.	
Wind Speed: 7	Gusts:	Weather Conditions at Accident Site: Visual Conditions			
Visibility (RVR): 0 Ft.	Visibility (RVV) 0 SM	Intensity of Precipitation: Unknown			
Restrictions to Visibility: None					
Type of Precipitation: None					

<b>Accident Information</b>		
Aircraft Damage: Minor	Aircraft Fire: None	Aircraft Explosion: None

Classification: Foreign Registered/U.S. Soil					
<b>- Injury Summary Matrix</b>	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				12	12
Other Crew					
Passengers				240	240
- TOTAL ABOARD -				255	255
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	255	255

National Transportation Safety Board

**FACTUAL REPORT**

**AVIATION**

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL TRANSPORTATION SAFETY BOARD

NTSB ID: NYC96IA036

Occurrence Date: 12/06/1995

Occurrence Type: Incident

Administrative Information

Investigator-In-Charge (IIC)

ROBERT L. PEARCE

Additional Persons Participating in This Accident/Incident Investigation:

CHARLES L FOWLER

FAA

GARDEN CITY, NY

MICHAEL E SCHNEIDER

GENERAL ELECTRIC AIRCRAFT ENG

CINCINNATI, OH

IMTIAZ UL HAQUE

PAKISTN INTL AIRLINES

JAMAICA, NY