
Uncontained engine failure, Boeing 747-269B, July 29, 1999

Micro-summary: This Boeing 747-269B experienced an uncontained engine failure on climb.


Event Date: 1999-07-29 at 1500 ADT

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

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

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|---|--|---------------------------------|----------------------------------|--------------------------------------|------------------|
|  | | NTSB ID: ANC99LA099 | | Aircraft Registration Number: N707CK | |
| | | Occurrence Date: 07/29/1999 | | Most Critical Injury: None | |
| | | Occurrence Type: Accident | | Investigated By: NTSB | |
| Location/Time | | | | | |
| Nearest City/Place ANCHORAGE | | State AK | Zip Code 99502 | Local Time 1500 | Time Zone ADT |
| Airport Proximity: Off Airport/Airstrip | | Distance From Landing Facility: | | Direction From Airport: | |
| Aircraft Information Summary | | | | | |
| Aircraft Manufacturer Boeing | | Model/Series 747-269B | | 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 July 29, 1999, about 1500 Alaska daylight time, a Boeing 747-269B airplane, N707CK, had an uncontained engine failure during climb-out from the Anchorage International Airport, Anchorage, Alaska. The flight was being conducted under Title 14, CFR Part 121, as a nonscheduled international cargo flight, operated by Kitty Hawk International, Inc., as Flight 11281. There were no injuries to the five crewmembers aboard. Visual meteorological conditions prevailed at the time of departure from Anchorage, and an instrument flight plan had been filed for the flight to Bangkok, Thailand.</p> <p>During an interview with the National Transportation Safety Board (NTSB) investigator-in-charge on July 30, a company quality assurance official stated that about 20 minutes after departure, the crew noted a loud "thump," followed by a change in the number three engine instrument indications. He said that one of the crewmembers went to the back of the airplane to visually check the status of the engine, and noted there was a "fist-sized hole in the side of the engine cowling." The quality assurance official stated that the captain shut down the number three engine, returned to Anchorage International Airport, and landed without further incident.</p> <p>A postaccident inspection revealed that the inboard aileron sustained substantial damage.</p> <p>On July 30, 1999, the airplane was three-engine ferried from Anchorage to the operator's maintenance base in Oscoda, Michigan, where the engine was removed. The engine was subsequently shipped to a maintenance facility in Tel Avia, Israel, for disassembly and examination.</p> <p>On September 7, 1999, the engine was disassembled under the direction of an NTSB Powerplant Group Chairman, and in the presence of the parties to the investigation. The disassembly revealed that there were eleven 2nd stage turbine blades that were fractured in the midspan area, and one other 2nd stage turbine blade that was elongated and necked down in the midspan area, with most of the shroud tip rubbed off.</p> <p>The turbine exhaust case had a 16 1/2-inch long hole between the case front flange and the front mount rail.</p> <p>The Powerplants Group completed its examination of the engine on September 8. A copy of the Group Chairman's report is included in this report.</p> <p>An examination of the engine maintenance records revealed the engine was removed from service due to a cracked diffuser case on August 1, 1998, at 43,946 hours total time, and 11,629 cycles. During this maintenance procedure, an overhauled turbine exhaust case was installed.</p> <p>The engine records revealed that when the turbine exhaust case was overhauled, FAA Airworthiness Directive (AD) 96-25-10 was complied with by incorporating Chromalloy Anniston Division's,</p> | | | | | |
| FACTUAL REPORT - AVIATION | | | | | |
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National Transportation Safety Board

FACTUAL REPORT

AVIATION

SAFETY BOARD

NTSB ID: ANC99LA099


Occurrence Date: 07/29/1999


Occurrence Type: Accident

Narrative (Continued)

Supplemental Type Certificate (STC) SE00047AT-D. The intent of STC SE00047AT-D is to comply with FAA Airworthiness Directive (AD) 96-25-10 by increasing the wall thickness of the turbine exhaust case, thus providing enhanced containment capabilities in the event of an internal engine failure.

A portion of the turbine exhaust case was sent to the National Transportation Safety Board's Materials Laboratory for examination. A Safety Board metallurgist confirmed that both the hardness and microstructure were consistent with design specifications stipulated in Chromally Anniston Division's STC. A copy of the NTSB materials laboratory factual report is included in this report.

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|--|------------------------------------|--|------------------------------------|------------------------|--------------|
|  National Transportation Safety Board FACTUAL REPORT AVIATION | | NTSB ID: ANC99LA099 | | | |
| | | Occurrence Date: 07/29/1999 | | | |
| | | Occurrence Type: Accident | | | |
| Landing Facility/Approach Information | | | | | |
| Airport Name | Airport ID: | Airport Elevation Ft. MSL | Runway Used 0 | Runway Length | Runway Width |
| Runway Surface Type: | | | | | |
| Runway Surface Condition: | | | | | |
| Type Instrument Approach: NONE | | | | | |
| VFR Approach/Landing: None | | | | | |
| Aircraft Information | | | | | |
| Aircraft Manufacturer Boeing | | Model/Series 747-269B | | Serial Number 21541 | |
| Airworthiness Certificate(s): Normal | | | | | |
| Landing Gear Type: Retractable - Tricycle | | | | | |
| Homebuilt Aircraft? No | Number of Seats: 8 | Certified Max Gross Wt. | 800000 LBS | Number of Engines: 4 | |
| Engine Type: Turbo Fan | Engine Manufacturer: P&W | Model/Series: JT9D-7J | Rated Power: 48650 LBS | | |
| - Aircraft Inspection Information | | | | | |
| Type of Last Inspection Continuous Airworthiness | Date of Last Inspection 07/1999 | Time Since Last Inspection 268 Hours | Airframe Total Time 59727 Hours | | |
| - Emergency Locator Transmitter (ELT) Information | | | | | |
| ELT Installed? Yes | ELT Operated? No | ELT Aided in Locating Accident Site? | | | |
| Owner/Operator Information | | | | | |
| Registered Aircraft Owner KITTY HAWK INTERNATIONAL, INC. | | Street Address 5063 SKYWAY STREET | | | |
| | | City OSCODA | State MI | Zip Code 48750 | |
| Operator of Aircraft Same as Reg'd Aircraft Owner | | Street Address Same as Reg'd Aircraft Owner | | | |
| | | City | State | Zip Code | |
| Operator Does Business As: | | | Operator Designator Code: K4HA | | |
| - Type of U.S. Certificate(s) Held: | | | | | |
| Air Carrier Operating Certificate(s): Cargo | | | | | |
| Operating Certificate: | | | Operator Certificate: | | |
| Regulation Flight Conducted Under: Part 121: Air Carrier | | | | | |
| Type of Flight Operation Conducted: Non-scheduled; International; Cargo | | | | | |
| FACTUAL REPORT - AVIATION | | | | | |

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|  <p>National Transportation Safety Board FACTUAL REPORT AVIATION</p> | NTSB ID: ANC99LA099 |
| | Occurrence Date: 07/29/1999 |
| | Occurrence Type: Accident |

First Pilot Information

| | | | | |
|-----------------|-----------------|------------------|--------------------------|-----------|
| Name On File | City On File | State On File | Date of Birth On File | Age 45 |
|-----------------|-----------------|------------------|--------------------------|-----------|

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

Certificate(s): Airline Transport

Airplane Rating(s): Multi-engine Land; Single-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--w/ waivers/lim. | Date of Last Medical Exam: 04/1999 |
|------------------------|--|------------------------------------|

| - 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 | 11000 | | | | | 5000 | 500 | | | |
| Pilot In Command(PIC) | | 16200 | | | | | | | | |
| Instructor | | | | | | | | | | |
| Last 90 Days | | 203 | | | | | | | | |
| Last 30 Days | | 41 | | | | | | | | |
| Last 24 Hours | | 10 | | | | | | | | |

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

Flight Plan/Itinerary

Type of Flight Plan Filed: IFR

| | | | | |
|------------------------------|-------------|---------------------------|------------------------|------------------|
| Departure Point ANCHORAGE | State AK | Airport Identifier ANC | Departure Time 1510 | Time Zone ADT |
|------------------------------|-------------|---------------------------|------------------------|------------------|

| | | | |
|------------------------|-------|----------------------------|--|
| Destination BANGKOK | State | Airport Identifier VTBD | |
|------------------------|-------|----------------------------|--|


Type of Clearance: IFR

Type of Airspace: Class G

Weather Information

Source of Briefing:
Company

Method of Briefing:

| | |
|--|-----------------------------|
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| | Occurrence Date: 07/29/1999 |
| | Occurrence Type: Accident |

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|-------------------------------------|-----------------------|--|--------------------|---------------------------------|------------------------------|
| Weather Information | | | | | |
| WOF ID | Observation Time | Time Zone | WOF Elevation | WOF Distance From Accident Site | Direction From Accident Site |
| | 0000 | | 0 Ft. MSL | 0 NM | 0 Deg. Mag. |
| Sky/Lowest Cloud Condition: Unknown | | | 0 Ft. AGL | Condition of Light: Day | |
| Lowest Ceiling: Unknown | | 0 Ft. AGL | Visibility: 100 SM | Altimeter: 29.00 | "Hg |
| Temperature: -10 °C | Dew Point: °C | Wind Direction: | | Density Altitude: Ft. | |
| Wind Speed: | 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 | | | | | |

| | | |
|------------------------------|---------------------|--------------------------|
| Accident Information | | |
| Aircraft Damage: Substantial | 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 | | | | 1 | 1 |
| Cabin Attendants | | | | | |
| Other Crew | | | | 2 | 2 |
| Passengers | | | | | |
| - TOTAL ABOARD - | | | | 5 | 5 |
| Other Ground | 0 | 0 | 0 | | 0 |
| - GRAND TOTAL - | 0 | 0 | 0 | 5 | 5 |

National Transportation Safety Board

FACTUAL REPORT

AVIATION



NTSB ID: ANC99LA099

Occurrence Date: 07/29/1999

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

CLINTON O. JOHNSON

Additional Persons Participating in This Accident/Incident Investigation:

TERRENCE R MUSICK (FAA)
4510 WEST INT'L AIRPORT ROAD
ANCHORAGE, AK 99502