National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: LAX02GA209	Aircraft Registration Number: N40NT
Occurrence Date: 06/25/2002	Most Critical Injury: Serious
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
Ontario	CA	91761	1410	PDT	

Airport Proximity: Off Airport/Airstrip	Distance From Landing Facility: 1

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
McDonnell Douglas	369E	Helicopter

Revenue Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

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

*** Note: : NTSB investigators either traveled in support of this investigation or conducted a significant amount of investigative work without any travel, and used data obtained from various sources to prepare this public aircraft accident report. ***

HISTORY OF FLIGHT

On June 25, 2002, at 1410 Pacific daylight time, a McDonnell Douglas 369E, N40NT, experienced a total loss of engine power during initial climb from the Ontario International Airport, Ontario, California. The pilot initiated an autorotative descent during the forced landing. The helicopter touched down hard about 1/2 mile south of the airport, and it was destroyed by a post impact ground fire. The helicopter was operated by the City of Ontario Police Department. The pilot was employed as an Ontario police officer, and he possessed a Federal Aviation Administration (FAA) commercial pilot certificate. The on-board mechanic/passenger was also a City of Ontario employee. Both occupants were seriously injured during the public-use, post-maintenance evaluation flight. Visual meteorological conditions prevailed during the local area flight, which was performed under the provisions of 14 CFR Part 91. The flight originated from Ontario about 1409.

Ontario Police Department management personnel reported that the accident occurred during commencement of the flight, which was the first flight following the on-board mechanic's accomplishment of a 100-hour inspection. No anomalies had been reported during the pilot's preflight inspection or initially during takeoff.

FAA personnel in the Ontario Air Traffic Control Tower indicated that at 1408:45 the pilot initially contacted their facility. After the air traffic personnel issued the pilot his requested departure clearance, at 1409:06, the pilot indicated that he was commencing the flight. No subsequent communications were received from the helicopter pilot. The on-duty controller reported that, after the helicopter took off and initially climbed, she observed it descending until it disappeared from her view behind buildings to the south of the airport.

The pilot reported that seconds after becoming airborne, engine power suddenly decreased, the helicopter yawed left, and he entered a low altitude autorotation between 100 and 150 feet above ground level. At the time, the helicopter's airspeed was more than 40 knots. While descending toward the forced landing site, the pilot maneuvered to avoid wires and automobiles. With low main rotor rpm, the helicopter touched down hard on a city street. Responding fire department personnel reported their aggressive use of fire retardants was needed to suppress the fuel-fed fire, which consumed most of the helicopter's cabin.

PERSONNEL INFORMATION

Pilot.

The pilot held a commercial pilot certificate.

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Narrative (Continued)

His ratings were airplane single engine land, instrument airplane, and rotorcraft-helicopter. Also, the pilot held a certified flight instructor (CFI) certificate that was last issued on March 25, 2002. The CFI certificate listed the following ratings: airplane single engine and rotorcraft-helicopter.

The pilot's last flight review was accomplished in March 2002. His second-class aviation medical certificate was issued in February 2002.

The pilot reported that his total flying experience was about 5,056 hours, of which 3,918 hours were flown in the accident model of helicopter. During the 90- and 30-day periods preceding the accident, the pilot had flown the accident model of helicopter about 119 and 31 hours, respectively.

On March 27, 2002, the pilot completed 1.1 hours of emergency recurrency training in a helicopter model similar to that of the accident helicopter. In pertinent part, the training involved nighttime touchdown autorotations.

Mechanic/Passenger.

Since about 1990, the mechanic had been employed by the City of Ontario and worked as a mechanic for the police department. He held an FAA mechanic certificate, issued in 1974, with airframe and powerplant ratings. He also had inspection authorization.

HELICOPTER INFORMATION

The City of Ontario Police Department owned, operated, and maintained the helicopter using city personnel. According to police department management personnel, they operated the helicopter under the FAA program of annual inspections, which were supplemented with 100- and 300-hour inspections. The last annual inspection was completed on June 6, 2002. On that date, the airframe's total time was recorded at 6,762.9 hours.

The accident occurred during a maintenance test flight at the completion of a 100-hour inspection. The mechanic who had performed the maintenance and inspection was on board. The helicopter's time since last receiving a 100-hour inspection and its total time were 92.7 and 6,855.6 hours, respectively.

Based upon a review of the operator's records, at the inception of the accident flight, all pertinent airworthiness directives, service bulletins, and pilot write-ups (squawks) had been resolved and/or complied with.

Two days before the accident, on June 23, 2002, the helicopter had been flown without mishap for 4.5 hours. The flying pilot (not the accident pilot) indicated that he did not experience any airworthiness problems. Thereafter, the pilot wrote one note in the daily maintenance log regarding a malfunction. The pilot subsequently reported that his note was in reference (in part) to the white strobe light on top of the doghouse being inoperative. (The "doghouse" referred to an area on top of the helicopter in the vicinity of the plenum chamber, inside which air enters the turbine engine's compressor.)

On June 25, 2005, the aforementioned pilot indicated that he had observed the same mechanic perform part of a 100-hour inspection on the helicopter. The pilot observed that the mechanic was working on the helicopter around the plenum chamber area. Thereafter, the pilot assisted the mechanic by performing various maintenance tasks on the helicopter, which were supervised by the mechanic.

WRECKAGE AND IMPACT INFORMATION

Evidence of the helicopter's initial point of ground impact (IPI) was noted by the presence of fragmented components from the helicopter and gouges in the street's pavement. The IPI was located in the vicinity of the following global positioning satellite coordinates: 34 degrees 02.802 minutes north latitude by 117 degrees 36.108 minutes west longitude. The main wreckage was found approximately 217 feet east (091 degrees, magnetic) of this location.

Narrative (Continued)

Ontario City police personnel performed the initial documentation of the accident site. They photo-documented the locations of 134 pieces of debris on the street and adjacent areas. One type of article that was found and photographed in three different locations in the debris field was a black, plastic wire tie (see photograph showing the wreckage debris distribution including item numbers 12, 63, and 100).

The helicopter was recovered from the accident site and examined by the National Transportation Safety Board investigator with the designated participants from Boeing and Rolls-Royce. The participants reported that their inspection of the helicopter's structure and systems, including the fuselage, landing gear, flight controls, and drive train, did not identify any material issue. These components exhibited impact and/or fire damage signatures. No evidence was found of preimpact component separations. The integrity of the flight control and rotor drive/control system was confirmed.

The examination of the turboshaft engine revealed evidence of ingested debris and foreign objects (aka foreign object damage (FOD)). In summary, the Rolls-Royce participant reported following the on-site engine examination that "...the compressor sustained extensive damage. Splitting the case halves showed that all of blades on stages 1-6 were either damaged or missing. The first stage wheel had one blade missing and the remaining blades were present, but heavily damaged. There was a piece of what appeared to be a section of wire tie adhering to one of the case halves in the sixth stage area. Additionally, there was a significant amount of metallic debris collected from the compressor as well as the outer combustion case."

TESTS AND RESEARCH

Fuel Quality Examination.

The company that had supplied fuel to the helicopter collected samples of fuel from the fueling nozzle on its tank truck. The fuel quality was evaluated and, according to the company's operations manager, "the quality of the Jet-A fuel in truck 92 is not in question."

Engine Examination.

The Rolls-Royce (Allison) 250-C20B engine was removed from the wreckage and transported to the Rolls-Royce Corporation, Indianapolis, Indiana. Between August 1 and 2, 2002, a partial teardown examination was performed under the supervision of the Safety Board investigator.

In summary, Rolls-Royce reported that its "metallurgical investigation has determined the presence of foreign objects in both the compressor and the outer combustion case (OCC). The foreign object found in the compressor was a section of a wire [tie] wrap and the foreign material found in the OCC was made up of an aluminum-magnesium-silicon alloy, which was determined to be foreign to the engine. Also, it has been determined that the single blade liberated from the first stage compressor wheel occurred as a result of overload and was the initiator to all additional damage in the compressor."

The Safety Board investigator observed that the size, shape, and color of the wire tie found in the engine was consistent with the wire ties found at the accident site debris field. Also, bundles of similar wire ties were found in storage at the police department's maintenance facility.

No "shadow" boxes were used by the mechanic for tool storage at the maintenance facility. Utilization of shadow boxes for tool accountability was not required, according to the Ontario Police Department participant. The Safety Board investigator was unable to ascertain if any tools were missing from the facility.

Maintenance Records.

The Safety Board investigator and Rolls-Royce personnel reviewed the helicopter's maintenance records.

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Narrative (Continued)

The Rolls-Royce participant reported that its review of the records "indicated that the engine 100- and 300-hour inspections were being performed on a regular and timely basis. The checklist used for the inspections was the current checklist taken from the Operations and Maintenance Manual...."

Plenum Chamber (Doghouse).

The Safety Board investigator noted that an anticollision light is attached to the helicopter in the vicinity of the plenum chamber. The plenum chamber cover can be opened for the performance of maintenance. When opened, items placed/dropped inside the area can enter the engine air intake.

ADDITIONAL INFORMATION

The helicopter wreckage was released to the operator's insurance agent on September 18, 2002. No parts or records were retained.

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Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
Ontario	ONT	944 Ft. MSL	NA		

Runway Surface Type: Unknown

Runway Surface Condition: Unknown

Approach/Arrival Flown: NONE

VFR Approach/Landing: Forced Landing

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
McDonnell Douglas	369E	0513E

Airworthiness Certificate(s): Normal

Landing Gear Type: Skid

Amateur Built Acft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	4	3000 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Shaft	Allison	250-C20B	420 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
100 Hour	06/2002	0 Hours	6856 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type	ELT Operated?	ELT Aided in Locating Accident Site?
No		

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
City of Ontario Police Department	200 N. Cherry Avenue	Ontario	CA	91764

Operator of Aircraft	Street Address	City	State	Zip Code
City of Ontario Police Department	200 N. Cherry Avenue	Ontario	CA	91764

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Public Use

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First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	48

Sex: M | Seat Occupied: Left | Occupational Pilot? Police | Certificate Number: On File

Certificate(s): Flight Instructor; Commercial

Airplane Rating(s): Single-engine Land

Rotorcraft/Glider/LTA: Helicopter

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Single-engine; Helicopter

Current Biennial Flight Review? 03/2002

Medical Cert.: Class 2 | Medical Cert. Status: With Waivers/Limitations | Date of Last Medical Exam: 02/2002

- 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	5056	3918	488	1	2785		111	4586		
Pilot In Command(PIC)	4952	3918	400		2700			4500		
Instructor	657	100	20		75			650		
Instruction Received										
Last 90 Days	126	119	7		53			119		
Last 30 Days	35	31	4		14			31		
Last 24 Hours	0	0	0		0			0		

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

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
Same as Accident/Incident Location		ONT	1409	PDT

Destination	State	Airport Identifier
Local Flight	CA	ONT

Type of Clearance: VFR

Type of Airspace: Class D

Weather Information

Pilot's Source of Wx Information:

Unknown

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Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
ONT	1409	PDT	944 Ft. MSL	1 NM	180 Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 17000 Ft. AGL

Condition of Light: Day

Lowest Ceiling: None Ft. AGL

Visibility: 10 SM

Altimeter: 29.94 "Hg

Temperature: 32 °C

Dew Point: 15 °C

Weather Conditions at Accident Site: Visual Conditions

Wind Direction: 230

Wind Speed: 15

Wind Gusts:

Visibility (RVR): Ft.

Visibility (RVV) SM

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Destroyed

Aircraft Fire: Ground

Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot		1			1
Second Pilot					
Student Pilot					
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers		1			1
- TOTAL ABOARD -		2			2
Other Ground					
- GRAND TOTAL -		2			2

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Administrative Information

Investigator-In-Charge (IIC)

WAYNE POLLACK

Additional Persons Participating in This Accident/Incident Investigation:

Gabriel Serrano
Federal Aviation Administration
Riverside, CA

Adrian Booth
The Boeing Company
Mesa, AZ

John Swift
Rolls-Royce Corporation
Indianapolis, IN

Brad Schneider
City of Ontario Police Department
Ontario, CA