U.S. Department
of Transportation
**Federal Aviation
Administration**

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Damage Report - Incident Number ERA13IA313

From : MARC CABIBBO ASI FSDO-AEA-11

To: Paul Cox NTSB, James Ciccone FAA

Date: July 8, 2013

MARC CABIBBO ASI FSDO-AEA-11 Accident June 30, 2013 @ 12:15 EDT
FAA IIC Marc H. Cabibbo received a call from AEA-RO communications center reporting a helicopter down on the Hudson River near 79 street boat basin New York, NY. FAA Inspectors Marc Cabibbo and James Ciccone responded and were present at the accident site at 1335 hours EDT. The aircraft was at that time secured at the 79street dock, stable on its emergency pop out floats. There were no injuries in connections with this event. The circumstances are as follows:

On June 30, 2013 at approximately 11:55 hours Local (15:55Z) a Bell 206LIV S/N 52391 Reg. N405MR was conducting a sightseeing tour with four(4) passengers and one (1) Pilot. The aircraft had departed the Wall Street Heliport and was north bound on the Hudson when the Pilot heard a loud bang from the engine. The Pilot also reported an engine Chip Light on the master caution panel. The Pilot entered and autorotative descend and performed a power-off water landing. The aircraft was equipped with pop –out emergency floatation gear which was deployed upon landing. The aircraft came to rest on the Hudson river stable on the six inflated float bags. The Crew and passengers were assisted by a passing boat and removed to the 79 Street boat basin. The four (4) passengers were removed to St Luke Hospital as a precaution, there were no injuries, the four passengers were released shortly after and returned to the local Precinct to be interviewed by this Office. The Pilot was not injured and refused any medical treatment. The Pilot of the aircraft was Mr. Micheal J. Campbell of [redacted] Buffalo NY, 14201 - Pilot Certificate, Commercial Rotorcraft/CFI [redacted] DOB [redacted].

The passengers are listed below and were visiting from Sweden and are domicile at the Crown Plaza New York, New York. The Pilot stated he started his duty day at Linden airport NJ, at 07:30 hours, and he conducted a preflight inspection and found no discrepancies. The Pilot stated that the Engine had been replaced at the last inspection and had been released back to service on June 29, 2013. At 11:15 the Pilot refueled at Kearney Heliport (65NJ) taking 70 gallons, then repositioned to the Wall Street Heliport to pick up the four (4) passengers. The aircraft had only logged approximately 2 hours since its maintenance release. After the initial investigation at the scene, the Inspectors form FSDO - 11 conducted an on sight fuel audit of the Kearny Heliport Fuel Facility. The Fuel samples taken were satisfactory however several quality issues were documented. The aircraft fuel sample was taken on July 2nd and was found to be satisfactory. The Aircraft was removed from the water by the Army Corp of Engineers and moved to the Wall Street Heliport and secured. An inspection of the aircraft by this office revealed no external signs of a

catastrophic engine failure and only minor damage to the airframe and rotor systems. This flight was operated under Part 91.

Location of accident site was the Hudson River near 79 Street

**Approximate Coordinates of site 40°47'5.65"N 73°59'17.10"W**

**Aircraft** was a 2009 Bell Helicopter Textron B206L-4 Serial # 52391 aircraft registration # N405MR issued to;

New York Helicopter Charter Inc.
Address: Downtown Heliport Pier 6 E River New York NY 10004
Date of registration issue: March 05, 2009 Expires March 31, 2014
Airworthiness certificate category: Standard-Normal
Airworthiness certificate issued: replacement 01-05 2009

The Aircraft had 2,536.4 Total Time on the airframe and 10,965 Total Cycles/Landing
The Engine had 2,536.4 Total Time Total Cycles 1850

**Pilot**: Mr. Micheal J. Campbell
Address: [redacted] Buffalo NY, 14201
DOB: [redacted]
Contact phone given: Home Cell: [redacted]
Airman Certificate # [redacted]
Ratings held: Pilot Certificate, Commercial Rotorcraft/CFI Issued June , 05 2011- CFI 08/21/2011

**Passengers:**

**Passengers Name / Nationality**

Valiharjur Juhani Jyrki - Sweden - No Injuries
Anna Kristina Soderblom - Sweden - No Injuries
Martin Soderblom - Sweden – No Injuries
Matilda Soderblom - Sweden – No Injuries

**Pilot Statement**

*To: Aviation Safety Inspector James Ciccone*

*From: Micheal Campbell*

*Re: Bell Helicopter 405MR*

*Pursuant to your request, I make this statement regarding circumstances that occurred on Sunday, June 30, 2013 in a Bell Helicopter registered as N405MR. I, Micheal Campbell, certificate no. [redacted], was pilot in command of helicopter 405MR on 6/30/13.*

*My duty day began at 7:30 am. My assigned duties were to pre-flight the aircraft and prepare the morning paperwork for the day. I started the aircraft at 9:32 for my first flight. I departed Linden en route to JRB and touched down at JRB at 9:50. My first tour of the day began at 9:55 and landed at 10:12. My second tour began at 10:14 and landed at 10:36. The third tour began at 10:41 and landed at 11:05. I then ferried to Kearney for fuel, followed by ferrying to Linden.*

*I later ferried to JRB for another tour, landing at 11:40. I picked up four passengers for a tour bravo. As with all tours, and as required by the regulations and the company GOM, I gave the passengers the standard briefing prior to departure. The flight began normally and I was following the published tour bravo route approaching the boat basin at 1500' when I heard a bang. A passenger in the back of the aircraft asked if I had hit a bird. I said no. I next heard the Engine Out warning horn go off, and I looked at my N2 gauge and saw that it was dropping. I concluded that immediate autorotation was required. Just prior to lowering the collective and rolling the throttle to flight idle, the Engine Chip light illuminated. All indications suggested an engine failure. I notified the passengers that we were going down, and I transmitted a mayday call to LaGuardia tower. I deployed the floats during the flare and checked to make sure they were inflated. To avoid the potential for nosing over, I held the flare as long as possible to bleed off all forward airspeed prior to touchdown. Following impact, the chin bubbles broke and water rushed into the cabin.*

*Once the aircraft came to rest, I verified that all passengers were safe and I made a final call to LaGuardia tower to inform them that no one was injured. I turned off all switches and circuit breakers, then saw an approaching boat. I helped the passengers onto the boat, secured the helicopter doors, and boarded a boat for shore where I was greeted by police and emergency personnel.*

*Mike Campbell*

**Fuselage/Main Cabin**

The fuselage/main cabin was intact with damage to the left and right lower chin bubble windows, damage to the Transmission cowling. The Intermediate fuselage showed no signs of oil canning.

**Tailboom/Tail Rotor**

The Tailboom and Tail rotor was intact with damage to the tail rotor blade due to sudden stoppage contact with the water. The left vertical stabilator had contact damage from the main rotor blade flexing downward during impact. Tailboom attachment area and Intercostal area showed no signs of deformation.

**Flight control continuity**

Flight control continuity was established from the cockpit controls to all the controls, Cyclic, Collective and Anti – Torque (Tail Rotor) Friction on collective/cyclic appeared normal.

**Landing Gear**

The aircraft was equipped Light weight Pop out floatation system on High Skid gear. The forward cross tube showed deflection on the right side. The float bags remained inflated and secured to the skid tubes.

**Main Rotor**

The Main Rotor system was intact and did not appear to have an abnormal set, the White main rotor blade had slight contact marks in line with the contact damage to the left stabilator.

**Engine**

The engine is a, Rolls Royce 250C30P turbo shaft. The engine underwent a cursory inspection June 30th and a detailed inspection on July 2nd. On June 30th the engine and accessories were visually inspected with no anomalies noted, and with no obvious fuel leakage. The Fuel control system and Power turbine governor system lines were checked for security and leaks none were discovered. Power was applied and the fuel gauge read 525 lbs of Jet A on board. With power on verified that the ENG CHIP Amber caution light remained illuminated. The power turbine was viewed through the exhaust collector and no defects or metal spray noted, the power turbine turned freely in both directions. A Fuel sample was obtained on July 2, 2013 under controlled conditions and appeared normal, clear and bright. The Fuel Farm was audited on June 30$^{th}$. The fuel at the storage facility was found to be clear and bright, in addition, a free water test was conducted and found to be within Specification. The engine oil tank was checked and was approximately .5 quart low. The engine to transmission drive shaft was inspected, and the aircraft is equipped with a K - Flex driveshaft and no issues were noted.

The Engine was photographed to archive data prior to disassembly. The mechanical linkages to the fuel control and power turbine governor was checked, no issues were discovered.

Only July 2, 2013 the aircraft had been moved to the Operators hangar and met by the Rolls Royce Investigator, the Repair Station Quality Manager, the Director of Maintenance for the Air Carrier, ASI Jeff Rose AW, and the undersigned. During the disassembly and inspection the following was noted

1. With power applied to the Battery Bus the ENG CHIP light was illuminated
2. Motored engine but starter would not turn engine. (N1 Locked)
3. Turned first stage compressor by hand, hard to turn.
4. Inspected compressor inlet- normal no damage or evidence of FOD
5. Removed both engine chip plug, caked with carbon and small metal specks.
6. Removed Scavenge oil filter removed , small metal flacks and carbon.
7. Removed Turbine section from Accessory Gearbox-Turbine and N2 shafts turned freely
8. N1 shaft when installed into Accessory Gearbox very hard to turn –suspected No.2 bearing
9. The combustor housing and liner was removed with no defects noted
10. The first stage nozzle and wheel was inspected with no defects noted

At this point a consensus was reached by the investigating members to remove the engine to a repair facility to continue the investigation. On July 17, 2013 all the parties to the investigation were present at Keystone Turbine Services, Pennsylvania, were a tear down inspection was conducted. Below is the tear down report provided by Inspector Eric Sieracki, ASI FSDO -17.

**Engine Town Down Report 7/12/2013 – ASI Eric Sieracki**

Inspector Statement
Eric Sieracki, ASI

Aircraft
N405MR, B206 L4, SN 52391 EA11 Incident Number IEA1120130010
Power plant-
Rolls-Royce: PN- 23062065 Model 250-C30P
SN- CAE-896108
Turbine PN-23035128 SN-CAT-98741
Compressor PN-23051643 SN-CAC-92356
Gearbox PN-23035178 SN-CAG-96117

Power plant log book was not reviewed during the tear down.

Tear down of power plant was conducted at Keystone Turbines, LLC, Certificate Number 8MHR893B, on 7/11/2013.

The owner/operator brought the power plant to Keystone Turbines, LLC (KTS), for disassembly. The power plant was separated into three modules, prior to arriving at KTS. The power plant was separated into the Turbine, Compressor and the Gearbox. The three modules were in cardboard boxes when they arrived at the facility (Figure 1). No damage from shipping was noted.

Figure 1, Power plant Modules, as received and delivered by Owner on 7/11/13

**Compressor**

The compressor module was the first removed from the shipping container and reviewed. The #2 bearing in the compressor was noted at the operator's maintenance facility as being seized. During an inspection of the #2 bearing there was a noted lack of oil and high temperature signatures (Figures 2, 4 & 5). The bearing had debris on it, the ball bearings were damaged, showed coking, no cracks noted. The bearing appeared to have more heat damage on the forward side of the bearing (Figure 4) compared to the aft side (Figure 5). The races showed signs of high temperature as well (Figures 3 & 5). The gearbox and compressor had not been separated while the current owner/ operator had owned the aircraft/power plant. The Spur adapter gear shaft (Figure 6) was inspected during the tear down and showed signs of high temperature as well. **The #2 bearing with races and shims and the Spur adapter gear shaft were taken by NTSB for further evaluation.**

#2 Bearing PN- 23009670 SN-001578

Figure 2, #2 Bearing installed

Figure 3, aft race #2 Bearing

Figure 4, #2 bearing, removed (fwd view)

Figure 5, #2 bearing, removed (aft view)

Figure 6, fwd Race #2 Bearing

Figure 7, Spur Adapter gear shaft

The Impeller was also inspected. During the tear down to get to the Impeller, it was difficult to separate the Impeller from the housing. The housing showed signs of high temperature, most evident in the 12 and 6 o'clock positions (Figures 8, 9, 10, 11, 12, 13 & 14). Once the Impeller was removed, there was evidence that the Impeller had rubbed on the housing (Figure 12).

Figure 8, Impeller housing, inside

Figure 9, Impeller housing, inside

Figure 10, Impeller housing, outside

Figure 11, Impeller housing, outside

Figure 12, Impeller, rub marks shown


Figure 13, Compressor, aft view


Figure 14, Compressor, fwd view

**Turbine**

This module was able to spin freely and did not show major signs of damage. The combustion liner had a rough coating that was not normal (Figure 15). It was not disassembled. Over haul was conducted by KTS during 11/2012. In preparation for overhaul the turbine module was separated by the owner/operator and shipped to KTS. The gearbox and compressor modules were not sent to KTS at that time.


Figure 15, Combustion liner

**Gearbox**

The module was disassembled as well on 7/11/13. During an over view of the gearbox it was noted that the oil pressure regulator had a setting to decrease oil pressure (Figure 16). The technician performing the tear down pointed this out to the observers. The regulator is set to nominal at approximately 5 ½ turns after bottoming out (Figure 17). The regulator is screwed in until in bottoms out and is turned out approximately 5 ½. After which, the regulator is adjusted during power plant testing to regulate the correct pressure. The technician attempted to bottom the regulator adjustment cap, in the housing, but was unsuccessful at doing so. When screwed all the way in, he was able to dislodge the plunger that is accessible from the bottom of the regulator housing.



Figure 16, Oil Pressure Regulator (N405MR)  Figure 17, Regulator set to nominal setting

Prior to separating the gearbox halves an oil flow test was accomplished. During the test it was noted that the piccolo tube (Figure 18 & 20), that supplies oil to the #2 bearing, only produced a few drops of oil. The oil should have squirted out of the tube. No visible clogs were noted. Other holes in the piccolo tube produced oil. The oil filter screen for the piccolo tube appeared to be heavily coated (Figure 19). **The piccolo tube and filter screen were taken by the NTSB for further evaluation.**


Figure 18, Piccolo Tube


Figure 19, Piccolo tube filter screen

Figure 20, Piccolo Tube

The oil pump was disassembled. The pump was able to spin by hand and did not show signs of damage (Figure 21).

Figure 21, Oil Pump, disassembled

The party members listed below were involved in the observation of the tear down, including the technician and KTS Chief Inspector included.

Paul Cox- NTSB Eric
Sieracki- FAA
Paul Madej- Bell Helicopter, and Canadian TCCA advisor
Tim Walsh- KTS Chief Inspector
Anthony Carter- KTS Technician
Casey Lehman- Rolls-Royce
Mike Roth- Owner New York Helicopters

This concludes my tear down report/statement of the aforementioned power plant. This statement is based on observations and information available at the time of the power plant tear down.

---Original Signed---- Eric

Sieracki, ASI
FSDO-17
610-595-1500[redacted]

**Fuel System**

The aircraft fuel gauge read 525 lbs with power applied (June 30th). An aircraft fuel sample was obtained on July 2, 2013 under control conditions and appeared normal, clear and bright. This sample was taken from the electrically operated fuel sump valve. A visual check though the filler cap revealed no anomalies (June 30th). The Fuel Facility (Kearny Heliport 65NJ) which fueled the aircraft just prior to the engine failure was audited on June 30th , the fuel was found to be clear and bright and a free water test was conducted and found to be within Specification.

On June 30, 2013 at 17:30 Hours the aircraft was moved to the Downtown Heliport by the Army Corp of Engineers. An Inspection of the aircraft was conducted and the aircraft was photographed.

Photograph Log

**June 30, 2013**

**Recovery**

Photo 0734 – N405MR at 13:30 hours after being towed to the 79 St Marina NYC

Photo 0736 – N405MR at 13:30 hours after being towed to the 79 St Marina


Photo 0744 – N405MR at 15:49 hours –Recovered by Army Corp - DCV  Hayward

Photos 0758 - 0763 – N405MR at 17:35 hours –Relocated to Downtown Heliport by Army Corp DCV Hayward- Cardinal Points



**Flight Deck and Controls**

Photo 0752 – 2204  N405MR at 17:35 hours secured at the Downtown Heliport.



FUEL QTY
FWD
TOTAL
X10
TEMP
CX100
FUEL
QTY
LOAD
FUEL
PSI
CHRONOMETER


ENGAGE ROTOR BRAKE BETWEEN
30% & 90% ROTOR RPM


FUEL QTY
VALVE
PRESS
ENGINE
START
OFF


PASS
OFF

**PowerPlant**

Photo 0752 – 2204  N405MR at 17:35 hours secured at the Downtown Heliport.

Powerplant Installation Right Side

Powerplant Installation Left Side



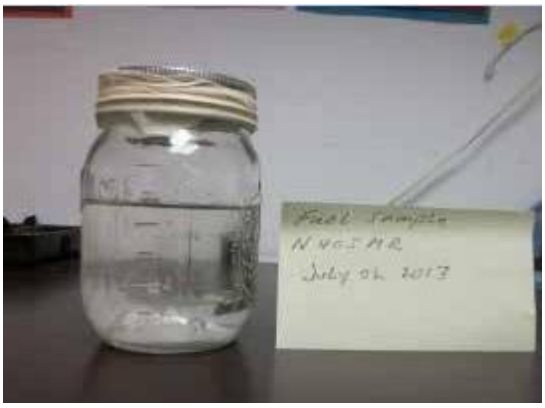

Power Turbine and Exhaust Collector


Main Drive shaft and Fuel Tank


Compressor Inlet  July 2, 2013 – First Stage turbine nozzel guide vanes


Combustor Liner with Fuel Nozzle/ AGB with N1 Coupling Shaft-  July 2, 2013


Fuel Samples N405MR left-7/2/2013




Fuel Storage 65NJ Right 6/30/2103 w/free water test

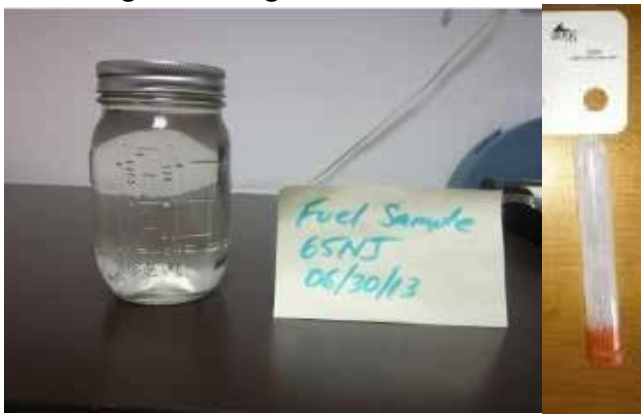
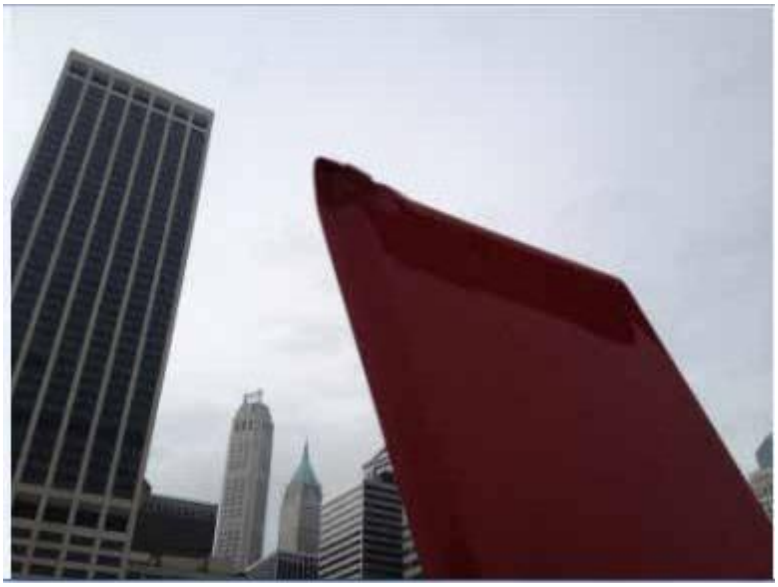



**Photo N405MR at 17:35 Damage areas**

Forward landing gear cross tube deflected

Left and Right Chin Bubble windows

Left vertical Stabilator



White Main Rotor Blade

Transmission Cowling

Tail Rotor Blade

**Conclusion**

This incident [redacted] is still under investigation by the NTSB and Rolls Royce. The oil servicing of the engine by the operator was investigated to ensure that no mixing of oil Mil-Spec and brands occurred in contrary to the cautions and warning listed in the Rolls Royce maintenance manual section 72-00-00. This engine was serviced since new with Royco 560 and at the time of the failure was serviced with the same. The operator has submitted an Service Difficulty Report (SDR) via the SDR website. The SDR number is 2013FA0000424. [redacted]

Signed _____ Date August 12, 2013
Marc H. Cabibbo ASI FAA IIC AEA-FSDO-11