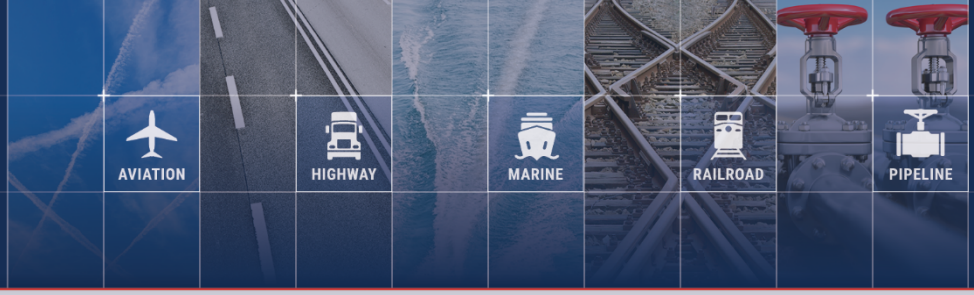

Aviation Investigation Final Report

Location:	Troutdale, Oregon	**Accident Number:**	WPR11LA352
Date & Time:	July 27, 2011, 15:40 Local	**Registration:**	N808LF
Aircraft:	Eurocopter AS 350 B3	**Aircraft Damage:**	Substantial
Defining Event:	Part(s) separation from AC	**Injuries:**	4 None
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The pilot reported that, about 12 minutes into a repositioning flight following a maintenance task performed by a company mechanic, he felt something that he described as similar to a bird strike. The pilot subsequently elected to make a precautionary landing in order to assess the situation. During an examination of the helicopter after the uneventful landing, the pilot discovered that a portion of the tail rotor drive shaft cover was missing and that one main rotor blade and two tail rotor blades had been damaged. Postaccident discussions with the company's director of maintenance determined that the maintenance staff (who had recently performed a maintenance inspection) and the pilot likely looked at the tail rotor drive shaft cover prior to the accident flight and presumed that it was secure or had been secured by someone else; however, it was not secure and came off during flight. Following the accident, the company implemented a primary mechanic position into its Field Mechanic Procedures in order to mitigate a similar occurrence.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The in-flight separation of the tail rotor drive shaft cover as a result of maintenance personnel not ensuring that it was secured after a maintenance inspection; also causal was the pilot's inadequate preflight inspection of the helicopter.

Findings

Personnel issues	Scheduled/routine maintenance - Maintenance personnel
Personnel issues	Preflight inspection - Pilot
Aircraft	Aerodynamic fairings structure - Incorrect service/maintenance
Personnel issues	Lack of action - Maintenance personnel

Factual Information

History of Flight

Prior to flight	Aircraft maintenance event
Prior to flight	Aircraft inspection event
Enroute	Part(s) separation from AC (Defining event)

On July 27, 2011, about 1540 Pacific daylight time, a Eurocopter AS 350 B3 helicopter, N808LF, sustained substantial damage after being struck by an object in cruise flight near Troutdale, Oregon. The commercial pilot and his five passengers were not injured. The helicopter was being operated by Air Methods Corporation of Englewood, Colorado. Visual meteorological conditions prevailed for the repositioning flight, which was being operated in accordance with 14 Code of Federal Regulations Part 91, and a flight plan was not filed. The flight departed the Aurora State Airport (UAO), Aurora, Oregon, about 1528, with Dallesport Airport (DLS), Dallesport, Washington, as its destination.

In a report submitted to the National Transportation Safety Board investigator-in-charge (NTSB IIC), the Air Methods' Aviation Compliance Manager stated that the aircraft departed from its maintenance facility at UAO to its normal base of operations located at DLS. The manager further stated that about 12 minutes into the flight the pilot reported that he felt something, like a bird strike, and elected to make a precautionary landing at TTD to inspect the helicopter for possible damage. Subsequent to an uneventful landing the pilot performed a walk-around inspection of the helicopter, during which it was discovered that a portion of the tail rotor drive shaft covering was missing. Upon further inspection of the helicopter, it was revealed that a single main rotor blade and two tail rotor blades had been damaged.

In a statement provided to the IIC, the Air Methods' Director of Maintenance (DOM) reported that as a result of his review of the maintenance that was performed on the helicopter prior to the accident flight, that all of the procedures for the 100-hour maintenance task were complied with, which included proper documentation of the work performed, including the required "Confirm Your Aircraft" (CYA) procedure, which was documented in the aircraft maintenance logbook. As provided to the IIC by Air Methods, the CYA requirements are as follows:

• Any maintenance performed must be entered in the Air Methods' Record of Maintenance. For all routine maintenance performed in the field by a company mechanic, a "Confirm Your Aircraft (CYA)" check will be performed. Whenever possible, a mechanic who did not sign off the maintenance action will perform the CYA. If a second mechanic is not available, a pilot will perform the check.

• The CYA will include a thorough face-to-face briefing between the person who performed the work and the person performing the CYA. The person performing the CYA is

required to do a general overview of the area in which the maintenance was performed. The person should look for disconnected lines, proper safeties (including safety wire, cotter pins, and lock tabs), oil or fuel, any cowlings/panels that were opened/removed, and any components/lines that were repositioned or removed in order to facilitate maintenance.

• The CYA check shall be performed before the aircraft is returned to service and will include at a minimum, a general overview for the following:

o Loose or missing hardware in the area of maintenance.
o Obvious defects in the area of maintenance.
o Loose hardware or foreign objects left on the aircraft.

The DOM reported that during post-accident discussions with the maintenance staff and the pilot, both felt that the [tail rotor drive shaft] cowling was secured. The DOM further reported that a possible scenario was that the maintenance staff and the pilot looked at the cowling prior to the ground runs and the accident flight and presumed that it was secure and that the work had been reviewed by someone else. The DOM revealed that in order to improve their Air Methods' operations, the company had implemented a new policy designating a Primary Mechanic when more than one mechanic is working on a maintenance task.

Pilot Information

Certificate:	Commercial	**Age:**	38,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	October 19, 2010
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 24, 2011
Flight Time:	2650 hours (Total, all aircraft), 339 hours (Total, this make and model), 2600 hours (Pilot In Command, all aircraft), 47 hours (Last 90 days, all aircraft), 18 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter	**Registration:**	N808LF
Model/Series:	AS 350 B3	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	4983
Landing Gear Type:	Skid	**Seats:**	5
Date/Type of Last Inspection:	July 27, 2011 AAIP	**Certified Max Gross Wt.:**	5225 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Turbo shaft
Airframe Total Time:	282 Hrs at time of accident	**Engine Manufacturer:**	Turbomeca
ELT:	Installed, not activated	**Engine Model/Series:**	Arriel 2B1
Registered Owner:	PNC Band NA Trustee	**Rated Power:**	653 Horsepower
Operator:	Air Methods	**Operating Certificate(s) Held:**	On-demand air taxi (135)

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	TTD,39 ft msl	**Distance from Accident Site:**	
Observation Time:	15:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 4800 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.09 inches Hg	**Temperature/Dew Point:**	24°C / 11°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Aurora, OR (UAO)	**Type of Flight Plan Filed:**	Company VFR
Destination:	Dallesport, WA (DLS)	**Type of Clearance:**	VFR
Departure Time:	15:28 Local	**Type of Airspace:**	

Airport Information

Airport:	Portland-Troutdale TTD	**Runway Surface Type:**	
Airport Elevation:	39 ft msl	**Runway Surface Condition:**	
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Precautionary landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	3 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	4 None	**Latitude, Longitude:**	45.549167,-122.399169(est)

Administrative Information

Investigator In Charge (IIC):	Little, Thomas
Additional Participating Persons:	Bill McKibbon; Federal Aviation Administration; Hillsboro, OR
Original Publish Date:	April 20, 2012
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=81284