Little Thomas

From: jan sandberg [redacted]
Sent: Friday, July 13, 2012 1:23 PM
To: Little Thomas
Subject: N380TL

Tom,
since our meeting on May 24th, I have come up with some ideas that the NTSB probably already knows.
Enclosed are two links to local news and media that came out right after the accident.

http://www.azfamily.com/news/2-injured-in-Phoenix-helicopter-crash-149882835.html

http://www.azcentral.com/community/phoenix/articles/2012/05/02/20120502phoenix-helicopter-crash-into-home-abrk.html

Both articles make light of the fact that the tail rotor blades were still spinning after impact by several eye witnesses.
You probably have better pictures of the roof top at the impact site. From what I can see is that the helicopter settled on the south side of the roof as it was in an westbound course. As the roof collapsed the vertical fin and tail rotor blade impacted the air conditioning unit, simultaneously the tail boom rose to a 90 degree angle as the roof gave way. The helicopter fell to the block fence, the main rotor blades started impacting and slowing. The tail and main rotor blades are still connected until the mains stop, at this point the tail rotor blades are still spinning at 1500 rpm and cause the tail rotor driveshaft to split forward of the tail boom. I also suspect the cotter keyed nut with the severed pinion spline shaft broke on this sudden stoppage as well.
Hopefully the lab can ascertain this.
Looking over the design of the tail rotor driveshaft assembly, I can see no way that even if the pinion spline shaft broke inside the cotter keyed nut inflight that the driven spline could move aft decoupling the tail rotor. It is held forward by the rear mounting nuts on the tail rotor assembly in a failsafe design.
The driven spline floats on the pinion shaft and did not fly off because of gravity at the 90 degree angle final position.
I hope this helps in the investigation.

Thanks,

Jan Sandberg

Little Thomas

From: jan sandberg [redacted]
Sent: Thursday, April 25, 2013 3:24 PM
To: Little Thomas
Subject: Fw: WPR12FA191 N380TL, Hughes 269C, Phoenix, AZ 5.2.12 NTSB Materials Lab Factual Report: Report No. 13-023

To: Jan Sandberg [redacted]
Subject: Re: WPR12FA191 N380TL, Hughes 269C, Phoenix, AZ 5.2.12 NTSB Materials Lab Factual Report: Report No. 13-023

Tom,
I have been looking over the lab report over the last week and the similar crash listed on the first page. That helicopter's pinion shaft broke forward of the upper pulley severing the drive train to the main rotors and the pilot was forced into an autorotation.
In the case of our helicopter N380TL, the main rotors were still connected to the drive train. In my opinion, I think the torsional fretting and spline damage occurred on impact. By virtue of design, the tail rotor was still connected and turning at impact. I think when the main rotors impacted the ground and were slowing, the tail rotor blades were still at full rpm. This energy had to go somewhere which resulted in cracking the aft threaded part of the spline plus gouging the driven spline and severing the tail rotor driveshaft. As it twisted prior to severing, the spline pulled a little forward as indicated by the damage, then the tail rotor driveshaft severed. The helicopter was in a vertical position at this point and that is why the driven spline and severed drive shaft remained on the pinion spline. Several people on the ground witnessed the crash and said it took awhile for the tail rotor to slow down and stop as it was still under power.

The NTSB lab sent me the parts tested, I coupled the pinion shaft to the driven spline and inserted it into the forward part of the drive shaft and the parts do not spin separately. I will not share these parts any or information until instructed to do so by you.

Are you available for a call tomorrow?

Best regards,
Jan

Best regards,
Jan
Sent from my iPad

[redacted]