

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, DC 20594

February 9, 2016

Onboard Image Recorder

Specialist's Factual Report
By Sean Payne

1. EVENT

Location:	Carlos, Texas
Date:	August 22, 2015
Aircraft:	Robinson Helicopter R44 II, N445HS
Operator:	Perfect Filler LLC.
NTSB Number:	CEN15LA375

2. GROUP

A group was not convened.

3. SUMMARY

On August 22, 2015, about 1742 central daylight time, a Robinson R44 II rotorcraft, N445HS, was substantially damaged after impact with terrain near Carlos, Texas. The pilot and passenger were seriously injured. The rotorcraft was registered to and operated by Perfect Filler LLC under the provisions of 14 *Code of Federal Regulations* Part 91 as a business flight. Day visual meteorological conditions prevailed for the flight, with no flight plan filed. The local flight departed from Coulter Field Airport (CFD), Bryan, Texas about 1630.

4. DETAILS OF INVESTIGATION

On September 21, 2015, the National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following video file:

Recorder Manufacturer/Model:	Unknown Image Recorder
Filename:	KS325901.MXF

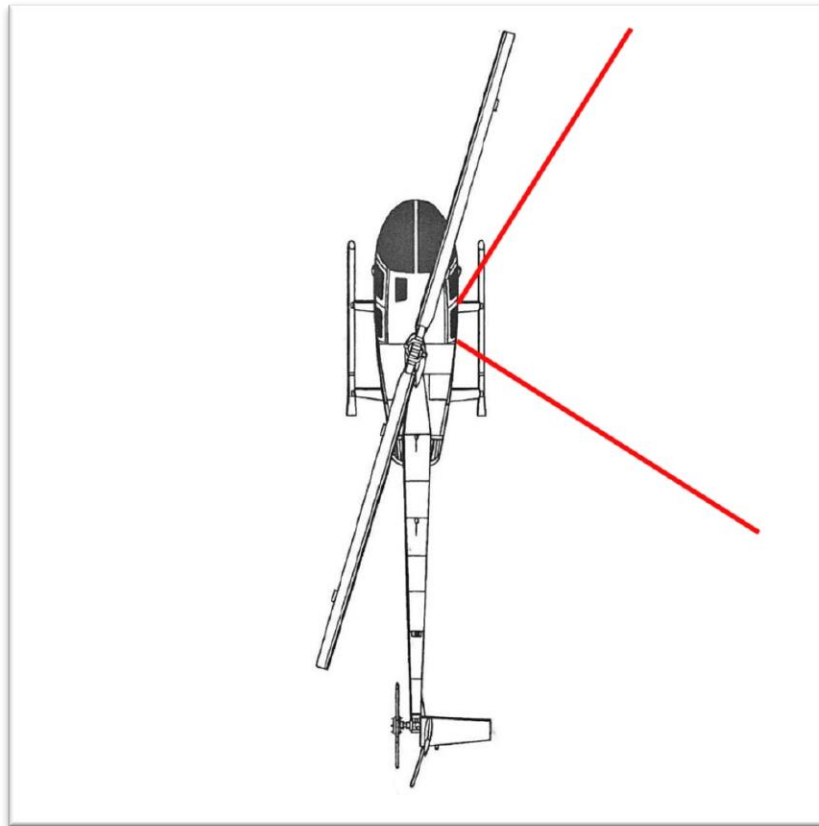
4.1. Video Files

The file received was 1920 x 1080 pixels in resolution and was recorded at a framerate of 29.97 frames per second (fps). The recording was in color and also

contained a 16 bit audio track recorded at a sample rate of 48kHz. The recording was 5 minutes and 13 seconds in length and was of the .MXF¹ format.

The recording was captured by a videographer seated in the back right seat of the rotorcraft. The recording only provides a view from the accident rotorcraft (N445HS) filming another rotorcraft engaging in aerial hunting (N300WZ). For most of the recording, no part of the accident rotorcraft is captured in the recording due to the focal length being used by the camera operator. Because the recording's field of view does not capture any part of the accident rotorcraft during the accident sequence, it is difficult to judge the camera's orientation as compared to the accident rotorcraft's orientation. An estimation of the camera operator's field of view is provided in figure 1 below.

Figure 1. The rear seat camera operator's field of view represented in red.



4.2. Timing and Correlation

Timing of the transcript is expressed as Video Elapsed Time, which is time from the beginning of the recording. The timing format provided is MM:SS, where MM is the number of elapsed minutes and SS is the number of elapsed seconds.

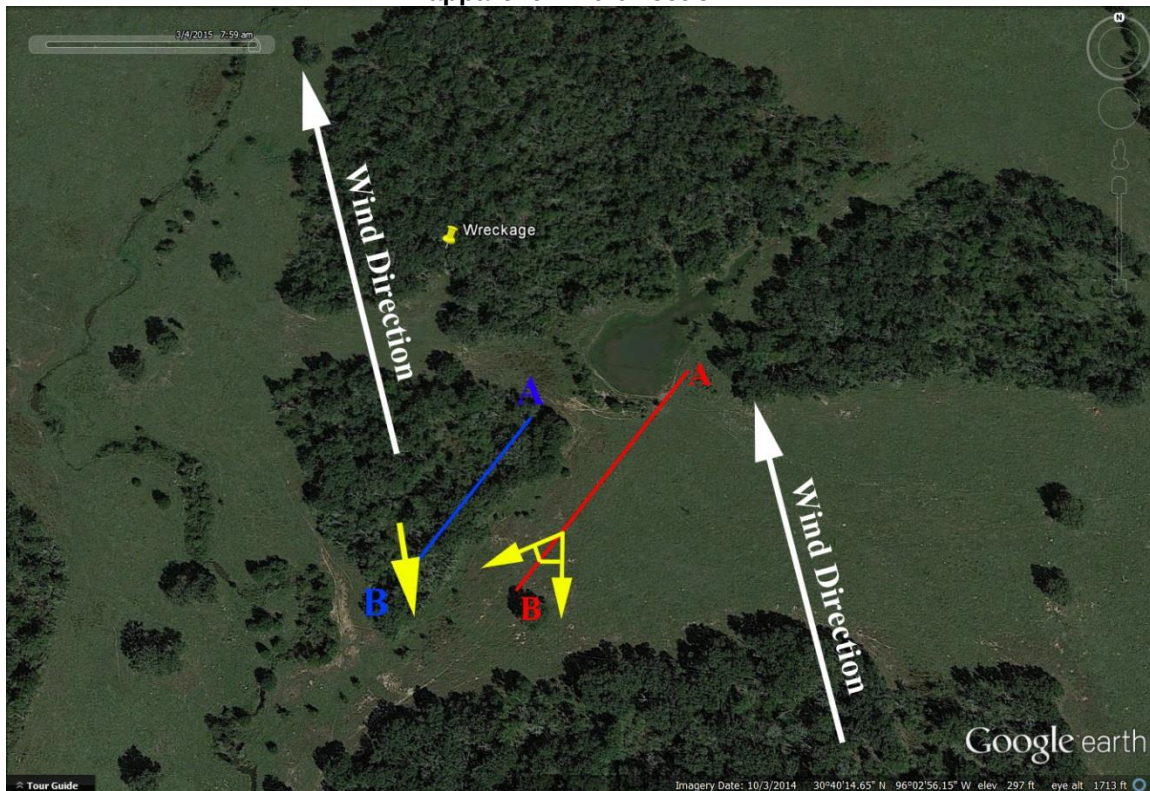
¹ .MXF – Material Exchange Format - A video container format for images and audio.

4.3. Summary of Recording Contents

In agreement with the Investigator-In-Charge, a video group did not convene and a summary report was prepared.

Figure 2 is a depiction of each rotorcraft's ground track overlaid on a Google Earth satellite view of the accident area. The blue path describes the ground track of the N300WZ engaged in hunting activities. The red path describes the accident rotorcraft's ground track, N445HS. Points A and B represent the start position and end position (time of the onset of N445HS's spin) of each rotorcraft across the ground. A yellow arrow represents the heading of N300WZ. A set of yellow arrows represents the range of possible headings for N445HS. White arrows represent the perceived surface wind conditions apparent from the recording.

Figure 2. A depiction of each rotorcraft's ground track, their respective headings and the apparent wind direction.



The video began with the camera view pointed downward from N445HS toward N300WZ which is actively engaged in hunting activities. The camera recorded trees being blown by the rotor wash of N300WZ. The rotor wash of N300WZ does not appear to be directly under the rotorcraft. Instead N300WZ's rotor wash appears to affect treetops in the area to the northwest of the rotorcraft's ground track as described in figure 2. This condition appeared throughout portions of the recording where N300WZ's rotor wash is captured by the camera operator in N445HS.

The camera view was shaky and occasionally zoomed toward the N300WZ. The ground underneath the accident helicopter was not stationary, indicating the rotorcraft had a small component of speed along the ground in the direction of the southwest.

Around 00:05, N300WZ made an approximately 90 degree pedal turn to the right. N445HS appeared to make a similar pedal turn. Around 00:13, N300WZ appeared to gain slight groundspeed toward the southwest. The movement of ground reference points in the vicinity of the accident rotorcraft (N445HS) suggested it is followed N300WZ. Around 00:28, both rotorcraft appeared to have lessened their groundspeed. Around 00:36, the camera's view zoomed in tight to two individuals holding rifles leaning out of N300WZ. Between 00:36 and 00:57, both rotorcraft appeared to be stationary. The camera operator captured the two individuals discharging weapons from the left side of N300WZ. Around 00:58, N300WZ appeared to have begun moving away from its stationary hunting position. The rotor wash under N300WZ appeared to show that the rotorcraft was no longer holding a stationary position; the rotorcraft had resumed movement across the ground. By 01:09, N300WZ moved over an area of clearing in the surrounding vegetation.

At 01:10, N445HS entered a yaw to the right which quickly developed into a rapid spin. The camera's view began to blur within the first second of the onset of the spin. Table 1 characterizes the conditions noted from the recording of N445HS's spin.

Table 1. A characterization of N445HS's spin.

Time	Spins Completed	Notes
01:10	0	The recording exhibits motion blur within one second of spin onset.
01:15	1	Heavy blur, almost nothing distinguishable
01:21	2	
01:27	3	
01:31	4	
01:34	5	
01:37	6	Last recognizable ground feature seen in recording. Tree tops are becoming closer.

From 01:37 forward, the accident rotorcraft was estimated to spin at least one more full rotation. At 01:42, the last view outside of the rotorcraft is captured and the camera's view pointed toward an unknown part of the accident rotorcraft's cabin. Around 01:43 an electronic tone (low rotor rpm) became audible. One second later, at 01:44, the audio levels suggested that the rotorcraft's engine power setting was reduced. Around 01:45 sounds consistent with the accident rotorcraft striking vegetation and trees became audible and the camera's

movement suggested the onset of the impact sequence. By 01:47, the rotorcraft came to rest in a dark area of vegetation.

Immediately after the rotorcraft came to rest the electronic tone was still audible and occupant movement could be heard in the cabin. Voices from both of the rotorcraft's occupants were recorded to the audio track. Both occupant's voices were recorded to the audio track. Both occupants were conscious. The occupants had an exchange regarding their injuries. One of the occupants stated "I can't get loose" around 02:10. The occupants continued to talk about their injuries and how to free themselves from the accident rotorcraft.

Around 03:40, the noise of another rotorcraft became audible. Around 03:55, the voice of a non-occupant responder became audible. Around 04:02, the electronic tone stopped sounding. The sound of flowing liquid then became audible. The rotorcraft's instrumentation gyros were audible and were heard reducing in rotational speed. The recording ends as non-occupant responders were interacting with the occupants of the accident rotorcraft. A non-occupant stated that the occupants should not move if they have broken bones. An occupant stated that he'd like to be removed from the accident rotorcraft. Around 05:03, a non-occupant responder stated the presence of a fuel leak and added, "there is leaking fuel out the rotor." The recording ends as one of the occupants was in the middle of making a injury self-assessment.