

National Transportation Safety Board

Office of Research and Engineering

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PAST FLIGHT ONBOARD VIDEO RECORDING FILES

Specialist's Factual Report

March 6, 2024

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A. ACCIDENT SUMMARY

Location: Galliano, Louisiana
Date: December 29, 2022
Time: About 0833 central standard time (CST)
Airplane: Bell 407, N595RL
Operator: Rotorcraft Leasing Company, LLC

B. PAST FLIGHT ONBOARD VIDEO RECORDING FILES SPECIALIST

Specialist: W. Deven Chen
Electrical Engineer - Recorder Specialist
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C. DETAILS OF THE INVESTIGATION

The NTSB Vehicle Recorder Division received a USB thumb drive containing Appareo Vision 1000 past flight onboard video recording files. Those recordings were provided to the Operations Group Chairman of this investigation by the Rotorcraft Leasing Company (operator). In agreement with the Investigator-In-Charge (IIC) and the Operations Group Chairman, an onboard video group of those past flight recordings was not conducted, and a summary report was prepared.

1.0 Appareo Vision 1000 Description

The Appareo Vision 1000 device is a small self-contained image, audio, and data recorder. The unit is typically mounted in the overhead panel of the aircraft's cockpit and records an image at a rate of four frames per second with its internal camera. The device is also capable of recording audio that is synchronized with the image data. A GPS receiver is included that receives GPS satellite-based aircraft time, position, altitude, and speed. The Appareo unit also has a self-contained real-time inertial measuring unit that records 3-axis acceleration, and derived pitch, roll and yaw data.

Two independent audio tracks can be recorded, depending on installation and configuration. One track is from anything that can be picked up by the internal microphone of the device. The second track can be wired to an external audio source, such as the helicopter's intercom, as well as the communication between the pilot and crew through headphones.

The Appareo unit records the image, audio, and parametric data on a removable SD¹ memory card that is inserted into the unit. Depending on card size,

¹ SD - Secure Digital - A type of nonvolatile memory card used extensively in portable devices.

this removable memory retains approximately the last two hours of image and audio data and about the last 100 hours of parametric data. In addition to the removable memory, the Vision 1000 is also equipped with a memory module that is mounted internally to the unit.

In a typical installation, the Appareo unit is connected to the aircraft's electrical bus. Any time the battery switch is turned on, the Appareo unit will start to record audio, images, and data. The Vision 1000 unit creates a new file for every electrical power application and can create multiple files for the same power cycle if the recording time exceeds a certain time limit.

1.1 Past Flight Onboard Video Recording Files Description

There were 103 recording files in the past flight onboard video recordings, ranging from October 20, 2022, to December 20, 2022. Seven of the recording files were identified to be associated with the accident pilot. One of the seven recording files associated with the accident pilot contained limited viewable images and revealed no usable data. The other six recording files contained a total of 28 flights across four different dates. For the purpose of this report, one flight is equal to one takeoff and one subsequent landing.

In addition to all the flights associated with the accident pilot, three other recording files were randomly selected for review. Those three recording files were associated with three different pilots, and they were noted as pilot A, pilot B, and pilot C for this report. Each of those three recording files contained three flights.

The review of these recorded data focused on the takeoff and landing of each flight on the offshore platforms, to verify whether they were following the standard procedures of the operator.

According to the director of training (DoT) of the operator the standard takeoff procedure is:

- Apply power until the helicopter is light on the skids.
- Bias the weight on the heels of the skids.
- Find equilibrium.
- Lift straight up to a 3-foot to 5-foot hover and stop.
- Glance at the gauges, and then lift off or reposition.

According to the DoT of the operator and GOM (general operations manual), the standard landing procedure is:

- Land to the center of the platform regardless of the size of the platform.
- The pilot could then reposition from the center of the platform to no closer than 3 feet of the edges of the platform.

1.2 Summary of Past Flight Recordings of the Accident Pilot

Table 1 below summarizes the details of the review of the accident pilot's past flight recordings. The Y/N/UK on the table stands for Yes, No, and Unknown. For example, the flight #2 on December 5, 2022, took off from a platform at around 20:14 UTC; the accident pilot applied power until the helicopter was light on the skids; evaluated by checking the nose of the helicopter as it lifted on the video, it was determined that the accident pilot biased the weight on the heels of the skids; the accident pilot found equilibrium; the accident pilot then lifted off the helicopter but without a stop at 3-foot to 5-foot hover; it was unknown whether the accident pilot glanced at the gauges prior to the lift off from the video; at around 20:11 UTC, the accident pilot landed the helicopter on another platform; it was unknown whether the helicopter was landed at the center of the platform, but it was within the aiming circle of the platform. In summary of the review of the recorded data:

- Among 27 takeoffs on offshore platforms, 25 of them did not show a stop at 3-foot to 5-foot hover prior to the lift off.
- During takeoffs, it was unknown whether the pilot glanced at the gauges prior to lift off due to the point of view of the camera.
- All landings were in accordance with the company procedures.
- Landings were generally within the aiming circle on the platforms, however, due to the limited point of view of the camera, it was uncertain whether the landings were at the center of the helipads.
- There was not a reposition of the helicopter observed after landings.

1.3 Summary of Past Flight Recordings of the Other Pilots

Tables 2 to 4 below summarizes the details of the review of the other three pilots' past flight recordings. In summary of the review of the recorded data:

- Among six takeoffs on offshore platforms, one of them did not show a stop at 3-foot to 5-foot hover prior to the lift off.
- During takeoffs, it was unknown whether the pilot glanced at the gauges prior to lift off due to the point of view of the camera.
- All landings were in accordance with the company procedures.
- Landings were generally within the aiming circle on the platforms, however, due to the limited point of view of the camera, it was uncertain whether the landings were at the center of the helipads.
- There was not a reposition of the helicopter observed after landings.

Submitted by:

Deven Chen
Electrical Engineer - Recorder Specialist

Table 1. Summary details of the review of the past flight recordings of the accident pilot.

Date	Flight #	Takeoff Time in UTC (HH:MM)	Takeoff Description (Y/N/UK)					Landing Time in UTC (HH:MM)	Landing Description (Y/N/UK)
			Apply power until the helicopter is light on the skids	Bias the weight on the heels of the skids (evaluated by checking the nose of the helicopter as it lifted)	Find equilibrium	Lift straight up to a 3-foot to 5-foot hover and stop	Glance at the gauges, and then lift off or reposition		Land at the center
12/5/2022	1	20:03	Y	Y	Y	N	UK	20:11	UK
	2	20:14	Y	Y	Y	N	UK	20:30	UK - within aiming circle
	3	20:33	Y	Y	Y	N	UK	20:35	UK
	4	17:16	Y	Y	Y	N	UK	17:22	Y
	5	17:31	Y	Y	Y	N	UK	17:52	UK - within aiming circle
12/7/2022	6	17:33	Y	Y	Y	N	UK	17:34	N - not at the center of aiming circle of a large helipad
	7	17:37	Y	Y	Y	N	UK	17:44	UK
	8	17:53	Y	Y	Y	Y	UK	18:00	UK - within aiming circle
	9	18:04	Y	Y	Y	N	UK	18:06	UK
	10	18:11	Y	Y	Y	Y	UK	18:31	Y
	11	18:39	Y	Y	Y	N	UK	18:45	Y
	12	18:49	Y	Y	Y	N	UK	18:55	UK - within aiming circle; landed with unknown tail wind
	13	19:03	Y	Y	Y	N	UK	19:45	Standard landing on airport
	14	19:58	Y	Y	Y	N	UK	20:11	Standard landing on home base
	15	20:20	Takeoff from home base, not evaluated					20:59	Y

Date	Flight #	Takeoff Time in UTC (HH:MM)	Takeoff Description (Y/N/UK)					Landing Time in UTC (HH:MM)	Landing Description (Y/N/UK)
			Apply power until the helicopter is light on the skids	Bias the weight on the heels of the skids (evaluated by checking the nose of the helicopter as it lifted)	Find equilibrium	Lift straight up to a 3-foot to 5-foot hover and stop	Glance at the gauges, and then lift off or reposition		Land at the center
	16	21:03	Y	Y	Y	N	UK	21:41	Standard landing on home base
12/8/2022	17	17:19	Y	Y	Y	N	UK	17:26	Y
	18	17:30	Y	Y	Y	N	UK	17:54	Y
	19	18:00	Y	Y	Y	N	UK	18:03	Y
	20	18:08	Y	Y	Y	N	UK	18:23	N - forward from the center
	21	18:31	Y	Y	Y	N	UK	18:38	Y
	22	18:42	Y	Y	Y	N	UK	18:46	Y
	23	18:50	Y	Y	Y	N	UK	19:09	Y
	24	19:12	Y	Y	Y	N	UK	19:18	Y
	25	20:31	Y	Y	Y	N	UK	21:10	Standard landing on home base
12/9/2022	26	20:53	Y	Y	Y	N	UK	20:54	UK - within aiming circle
	27	20:58	Y	Y	Y	N	UK	21:21	Y
	28	21:24	Y	Y	Y	N	UK	22:17	Standard landing on home base

Table 2. Summary details of the review of the past flight recordings of the pilot A.

Date	Flight #	Takeoff Time in UTC (HH:MM)	Takeoff Description (Y/N/UK)					Landing Time in UTC (HH:MM)	Landing Description (Y/N/UK)
			Apply power until the helicopter is light on the skids	Bias the weight on the heels of the skids (evaluated by checking the nose of the helicopter as it lifted)	Find equilibrium	Lift straight up to a 3-foot to 5-foot hover and stop	Glance at the gauges, and then lift off or reposition		Land at the center
12/17/2022	1	13:59	Takeoff from home base, not evaluated					14:36	Y
	2	14:42	Y	Y	Y	Y	UK	14:58	Y
	3	15:06	Y	Y	Y	N	UK	Video froze and stopped before landing	

Table 3. Summary details of the review of the past flight recordings of the pilot B.

Date	Flight #	Takeoff Time in UTC (HH:MM)	Takeoff Description (Y/N/UK)					Landing Time in UTC (HH:MM)	Landing Description (Y/N/UK)
			Apply power until the helicopter is light on the skids	Bias the weight on the heels of the skids (evaluated by checking the nose of the helicopter as it lifted)	Find equilibrium	Lift straight up to a 3-foot to 5-foot hover and stop	Glance at the gauges, and then lift off or reposition		Land at the center
12/15/2022	1	12:55	Takeoff from home base, not evaluated					13:39	UK
	2	13:44	Y	Y	Y	Y	UK	13:59	UK
	3	14:05	Y	Y	Y	Y	UK	Video froze and stopped before landing	

Table 4. Summary details of the review of the past flight recordings of the pilot C.

Date	Flight #	Takeoff Time in UTC (HH:MM)	Takeoff Description (Y/N/UK)					Landing Time in UTC (HH:MM)	Landing Description (Y/N/UK)
			Apply power until the helicopter is light on the skids	Bias the weight on the heels of the skids (evaluated by checking the nose of the helicopter as it lifted)	Find equilibrium	Lift straight up to a 3-foot to 5-foot hover and stop	Glance at the gauges, and then lift off or reposition		Land at the center
12/2/2022	1	13:02	Takeoff from home base, not evaluated					13:50	UK
	2	13:54	Y	Y	Y	Y	UK	14:18	Y
	3	14:23	Y	Y	Y	Y	UK	14:42	UK