National Transportation Safety Board
Office of Aviation Safety
Washington, DC 20594

ERA22LA145

LANDING DOLLY FACTUAL REPORT

February 23, 2023

TABLE OF CONTENTS

A. ACCIDENT

Location: Abingdon, Virginia
Date: March 6, 2022
Time: 2359 local
Airplane: Eurocopter Deutschland GMBH MBB-BK-117 C-2 (N29VA)

B. SUMMARY

On March 6, 2022, at 2359 eastern standard time, a Eurocopter Deutschland GMBH, MBB-BK-117 C-2 helicopter, N29VA, was substantially damaged when it was involved in an accident at the Virginia Highlands Airport (VJI), Abingdon, Virginia. The pilot sustained serious injuries and the two flight paramedics were not injured. The helicopter was operated by the Virginia Department of State Police as a public state aircraft.

C. DETAILS OF THE INVESTIGATION, SCOPE OF REPORT

The landing dolly involved in the accident was examined at the Virginia Department of State Police (VSP) hangars at VJI airport. The following report details the factual findings pertaining to the pilot's reported approach to the dolly and the subsequent examination of damage sustained to the dolly and helicopter skids. Based upon measurements of the dolly taken by the investigative team, Airbus Helicopters produced computer generated models of the dolly and helicopter. The models are provided within this report.

D. THE APPROACH TO LANDING

The pilot reported[1] that he approached runway 6 at VJI and maneuvered right onto the taxiway that led into the VSP ramp and hangar. The landing dolly had a tractor connected to the 5 ft boom connection point and it had not been moved since the helicopter had last been pulled from the hangar for the accident flight. The dolly was oriented in a general north-south direction and aligned with the ramp pavement, which enabled the helicopter to be pulled straight out and straight back into the hangar. The tractor was positioned on the north side of the dolly.

The pilot further reported that once he entered the ramp environment, he completed a pedal turn to orient the helicopter 180° opposite the direction flown from runway 6. After facing northward or away from the hangar, he entered a sidestep maneuver to the right over top of the dolly and allowed the helicopter to

[1] Refer to the Pilot Interview Transcript for the entirety of the pilot's statement to the investigation

descend after he believed his skids were aligned with visual references points he was accustomed to viewing on the tractor and dolly.

The pilot reported that he briefly felt what he believed to be a skid touchdown on the dolly, however, simultaneously, he heard what he believed to be an engine surge similar to what he experienced earlier in the flight on takeoff from the hospital. Subsequently, he reported that suddenly the helicopter abruptly entered a nose low and right banking attitude and became oriented toward the south facing hangars to the east of the VSP hangars. He applied aft cyclic, abruptly lowered the collective, and the helicopter impacted terrain about 50 feet to the east of the dolly. The engines remained running after the helicopter impacted the terrain. Figures 1-3 provide an overview of a pictorial view of the flight track, recreated based upon the pilot's statement and photographs taken after the accident.

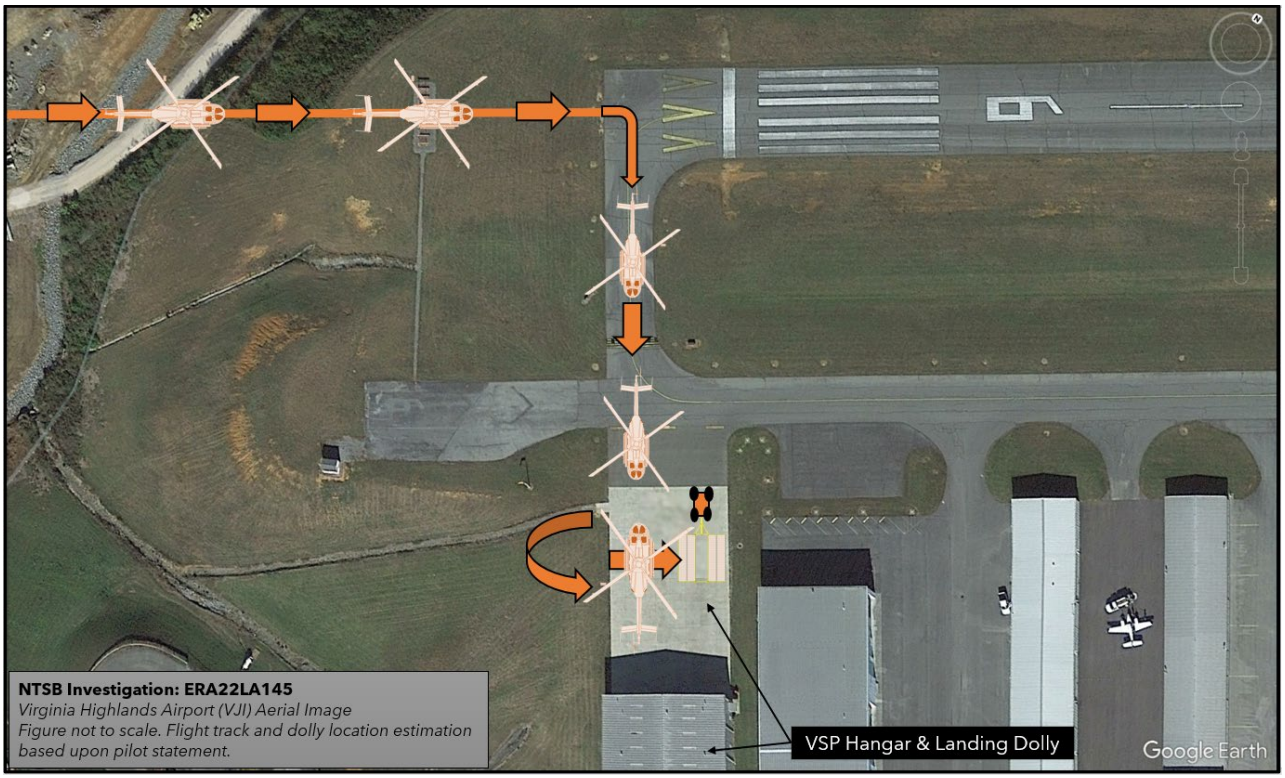

Figure 1: Flight track to landing recreated based upon pilot statement.

Figure 2: Estimated flight path over the dolly and final resting location of the helicopter based upon the pilot's statement.

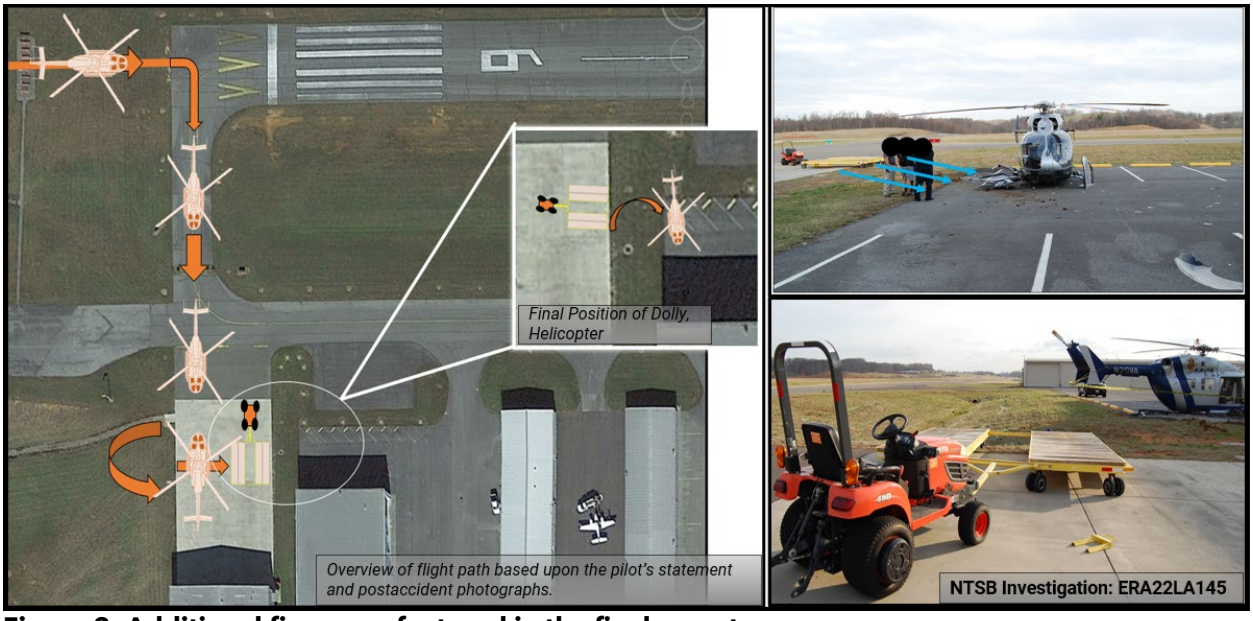

Figure 3: Additional figure, as featured in the final report.

E. LANDING DOLLY DESCRIPTION

The dolly was placarded as a Main Line Corporation, Helicopter Handler Dolly, Bar Code #073373 (Wilmington, DE, USA). The dolly sat 18 inches from the ground on wheels and it possessed an open center gap that was 3 ft 6 inches wide. Figure 4 provides an overview of the landing dolly as depicted in a model created by Airbus Helicopters, which was based upon NTSB measurements.

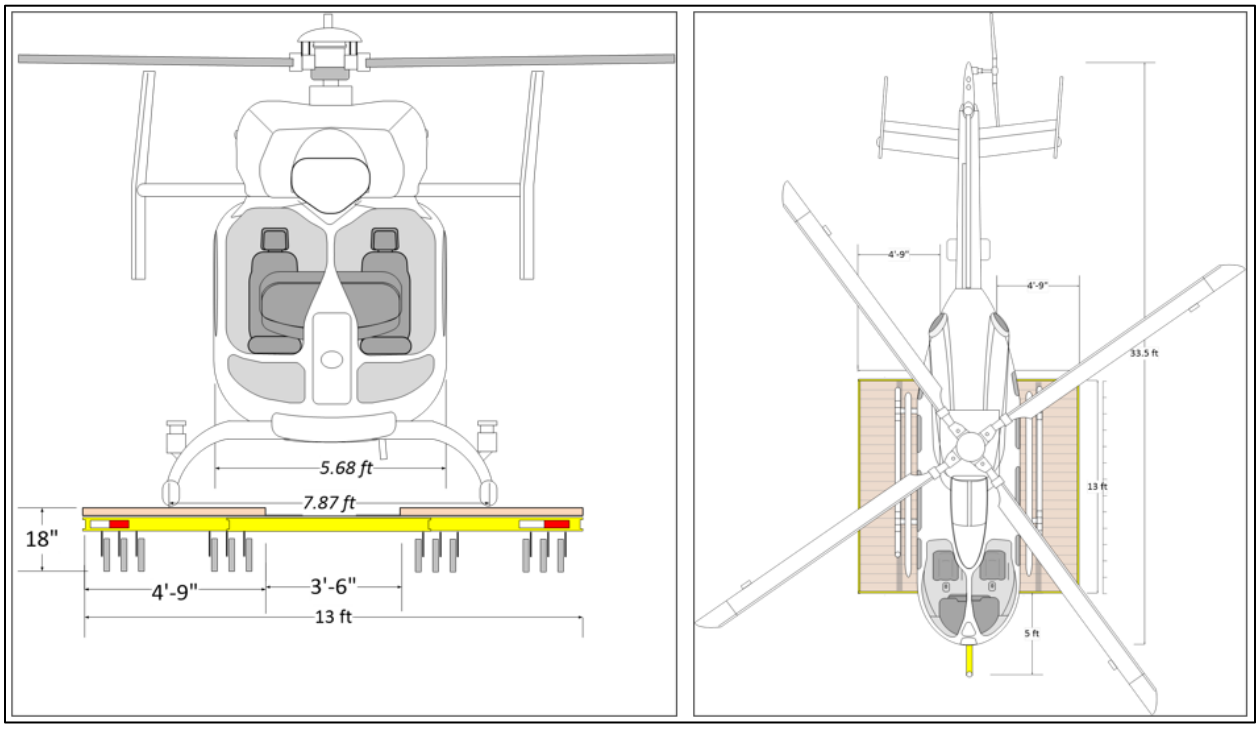

Figure 4: Forward and top down model view of the helicopter and dolly (Models Courtesy Airbus Helicopters)

Photographs taken the morning after the accident showed that the helicopter had come to rest in the parking lot to the east of the VSP ramp. The dolly and tractor, which had been oriented on a general north-south direction aligned with the ramp pavement, was dragged by the helicopter partially off the ramp and reoriented facing northeast/ southeast. Figures 5 and 6 show where the helicopter came to rest and the location of where the dolly had been dragged and reoriented to.

Figure 5: View of the helicopter and dolly the morning after the accident (Photo Courtesy Virginia State Police)

Figure 6: View of the helicopter and dolly the morning after the accident (Photo Courtesy Virginia State Police)

F. LANDING DOLLY EXAMINATION

The landing dolly had sustained impact related twisting, deformation, and witness marks. The following figures provide an overview of the damage sustained to the dolly as a result of the helicopter's entanglement with it.

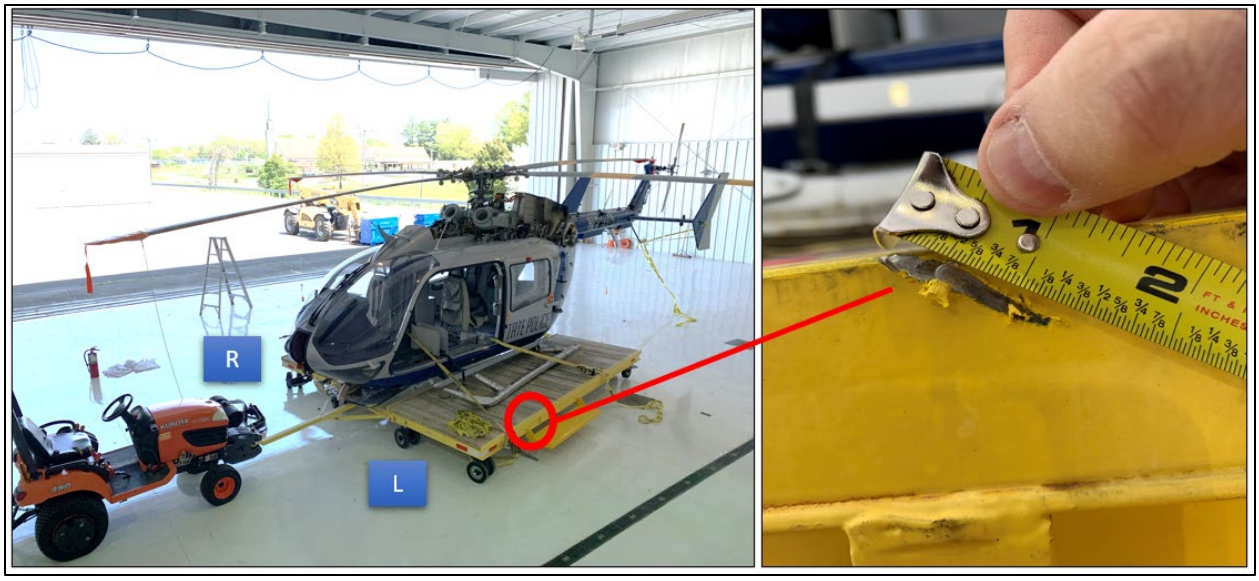

Figure 7: Overview of dolly damage and witness marks.

As shown in Figure 7, a witness mark was observed 48 inches from the front of the dolly platform. The mark was measured to be about 1 and ¼ inches at a 32° angle.

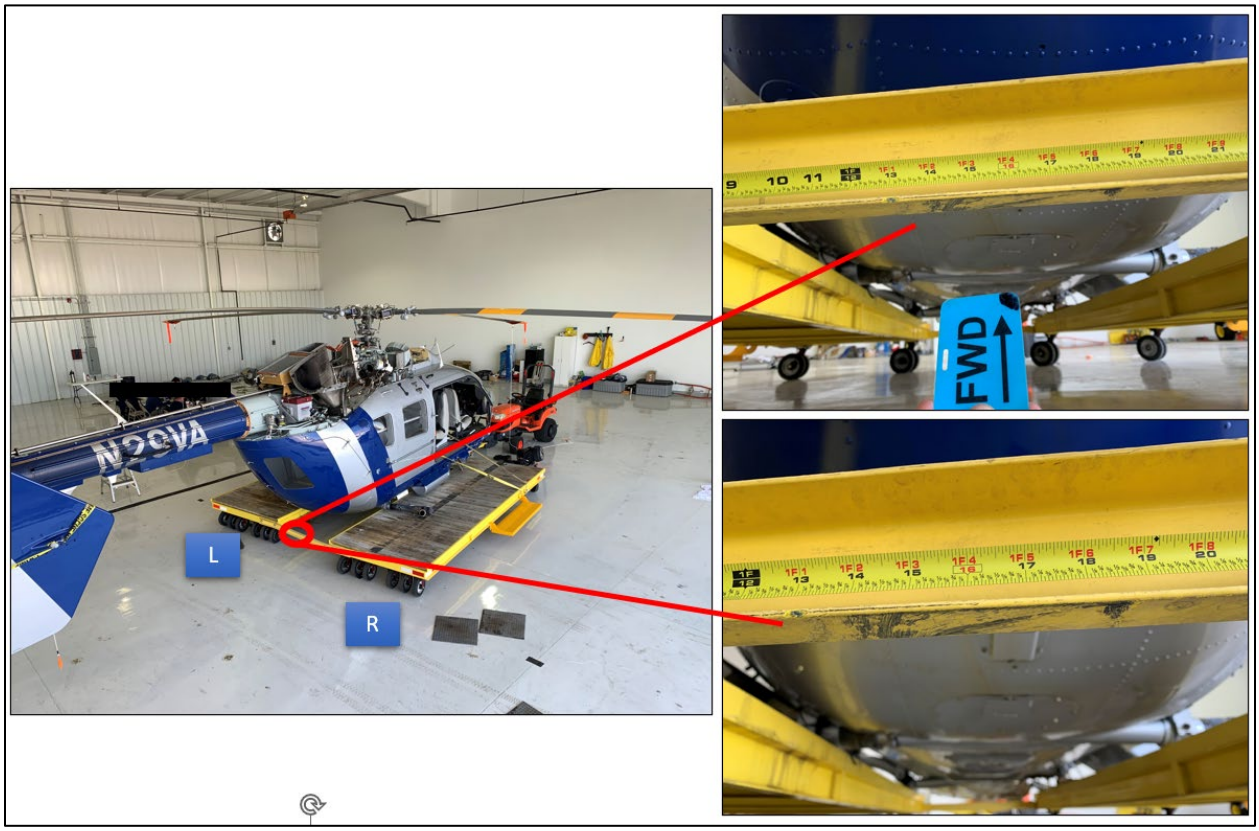

Figure 8: Overview of dolly damage and witness marks.

As shown in Figure 8, on the rear center crossbar underside, black scuffing and scars were observed. The crossbar also exhibited bending and deformation.

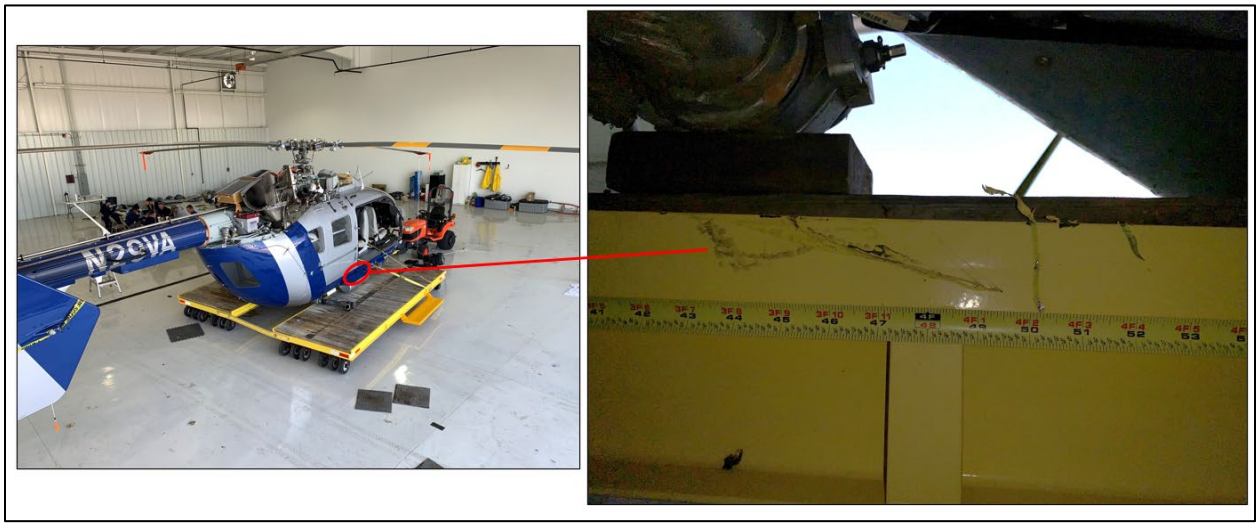

Figure 9: Overview of dolly damage and witness marks.

As viewed in Figure 9, the right inboard section of the dolly, 43-52 inches rearward from the front of the dolly exhibited black scuffing and witness marks.

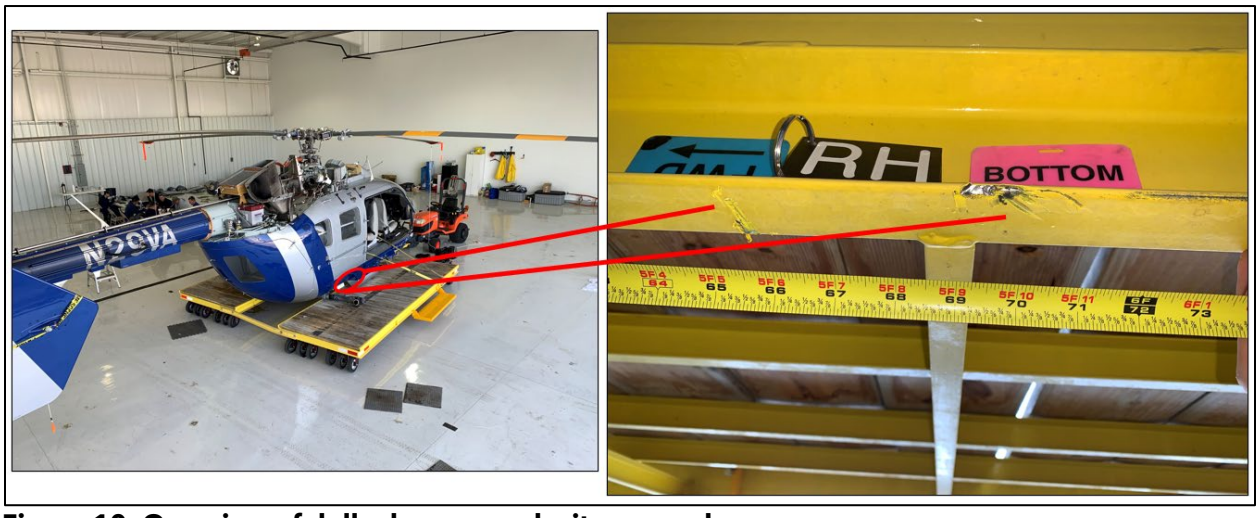

Figure 10: Overview of dolly damage and witness marks.

As viewed in Figure 10, on the right inboard bottom section of the dolly, from the front of the dolly 65-71 inches rearward, witness marks, gouging, and paint transfer was observed. Additional areas of yellow paint peeling were observed on this inboard right side of the dolly.

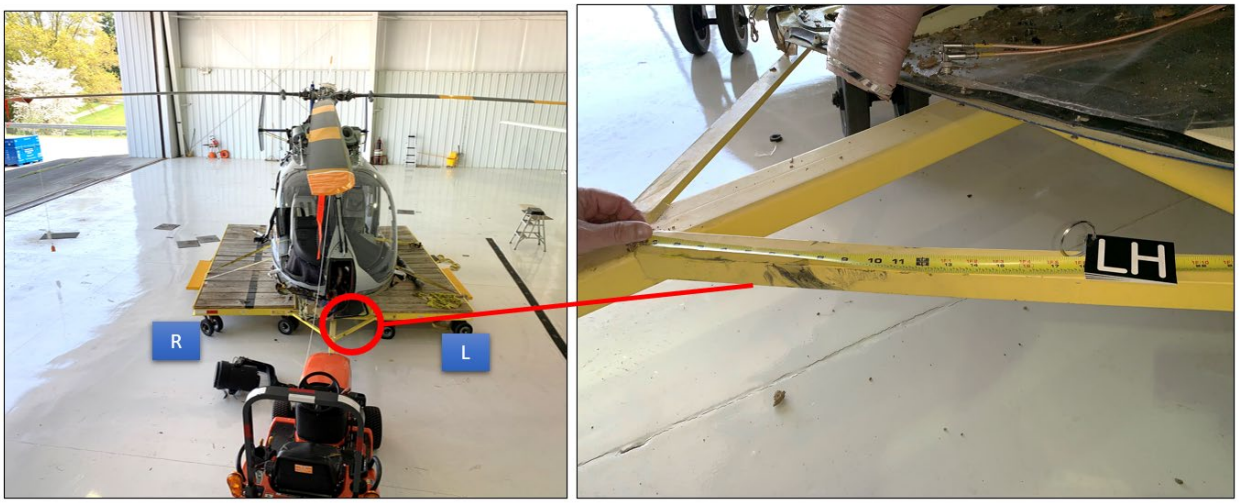

Figure 11: Overview of dolly damage and witness marks.

As viewed in Figure 11, on the forward left brace of the dolly, an area of black scuffing and gouging was observed.

G. HELICOPTER SKID EXAMINATION

The helicopter's skids and spotlight exhibited evidence of yellow paint transfer consistent with paint found on the dolly. The following figures provide an overview of the witness marks located on the helicopter.

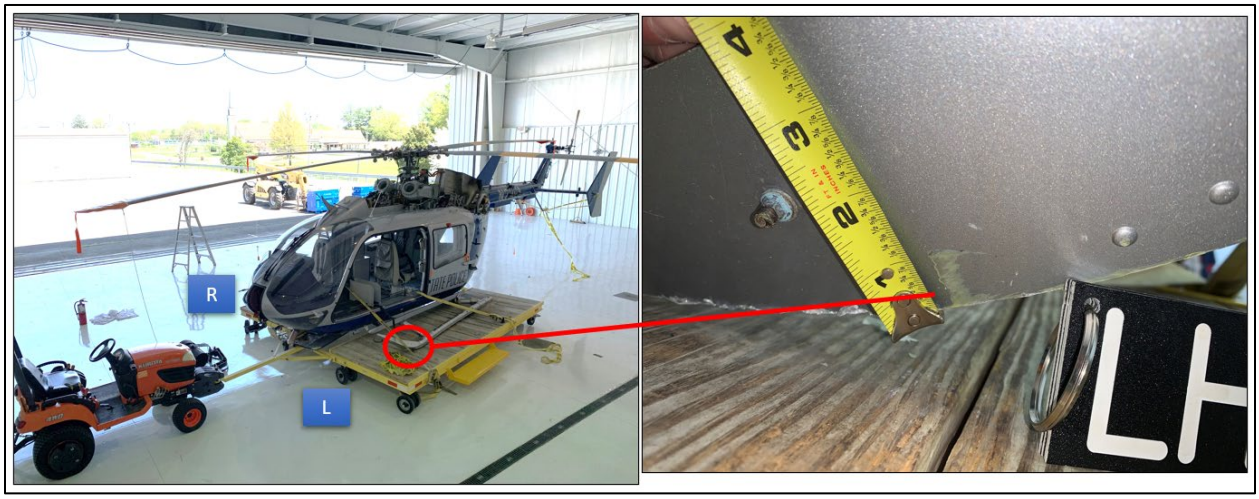

Figure 12: Overview of helicopter skid and dolly related witness marks.

A viewed in Figure 12, a 1-inch yellow paint transfer witness mark and additional yellow paint transfer was observed 22 inches from the tip of the left skid on its inboard and bottom areas.

Figure 13: Overview of helicopter skid and dolly related witness marks.

As viewed in Figure 13, circled in red on the helicopter's bottom left skid, yellow stripping of paint remnants was observed.

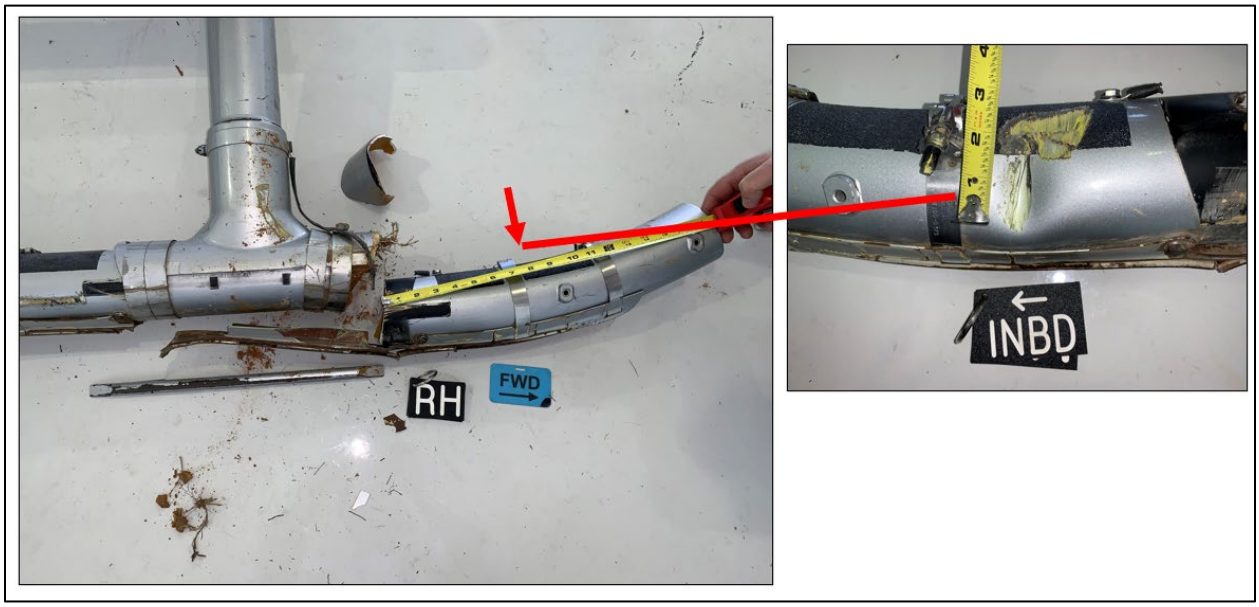

Figure 14: Overview of helicopter skid and dolly related witness marks.

As viewed in Figure 14, an 18-inch forward section of the right skid tubing had separated and peeled from the rest of the skid. The inboard section of the separated portion displayed denting deformation and yellow paint transfer. The clamps in this area exhibited paint transfer as well.

Figure 15: Overview of helicopter skid and dolly related witness marks.

As viewed in Figure 15, the forward area of the right skid exhibited caked/ packed mudding. The separated piece was largely free of mud. The figure also provides an additional view of the inboard right skid area exhibiting denting and yellow paint transfer.

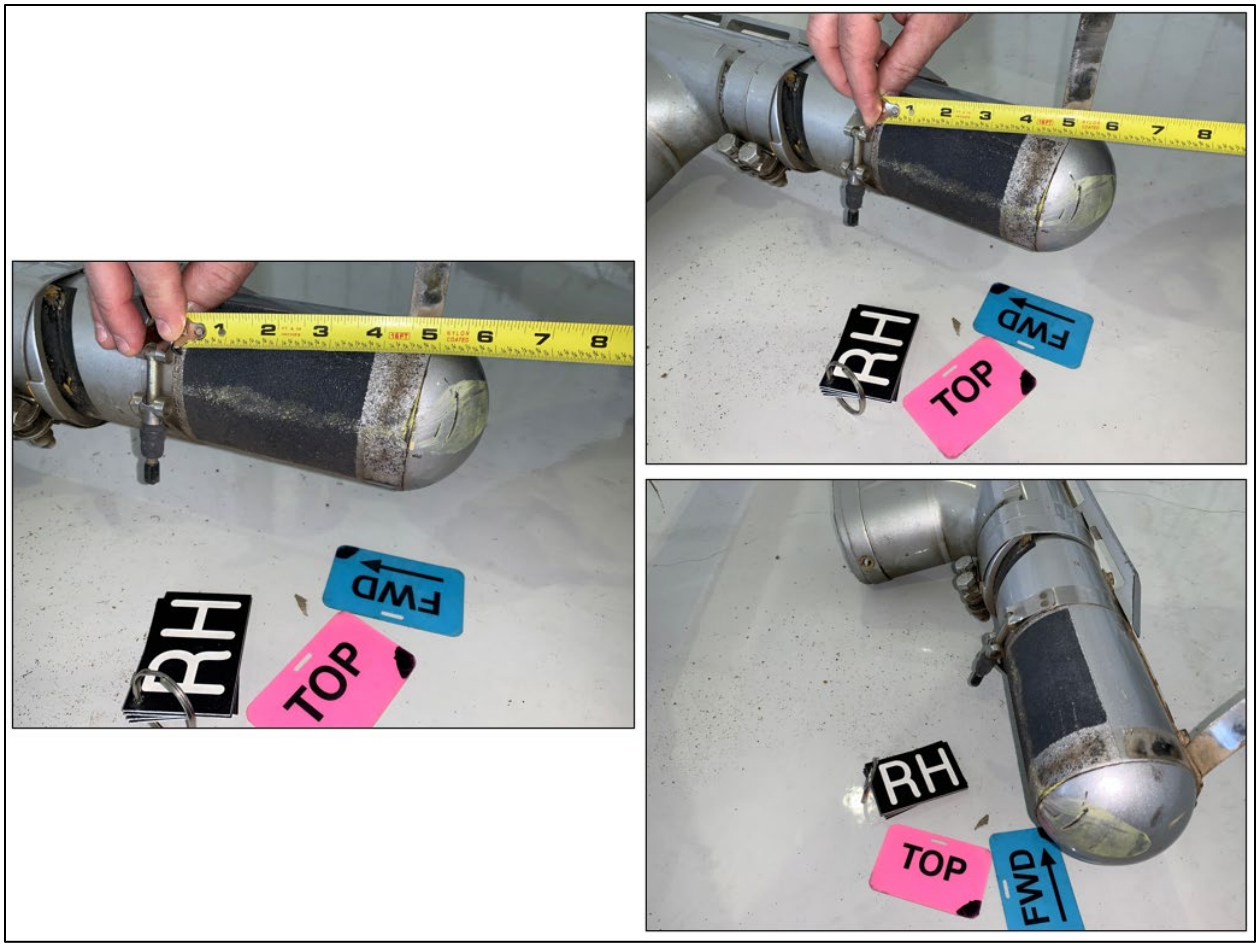

Figure 16: Overview of helicopter skid and dolly related witness marks.

As viewed in Figure 16, the most rearward portion of the right skid exhibited yellow paint transfer and scuffing on the top of the skid and its end cap area.

Figure 17: Overview of helicopter's police spotlight and dolly related witness marks.

As viewed in Figure 17, the spotlight exhibited denting and yellow paint transfer on the right outboard forward area casing.

H. NEW DOLLY EQUIPMENT

Following the accident, the VSP provided photographs of the landing dolly that had replaced the accident landing dolly. The new dolly was similar in size to the accident dolly; however, the new dolly contained a metal center plate.

Figure 18: View of the replacement dolly utilized by Virginia State Police

Report submitted by:

Adam Gerhardt
Senior Air Safety Investigator