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Subject: Memorandum of Record: Interview with the pilot of Airbus Helicopters EC135 T1, registration N109BC, regarding the accident that occurred in Pompano Beach, Florida on August 28, 2023 (NTSB No. ERA23FA352)

Contact: Daron Roche (pilot)

The pilot, Daron Roche, was interviewed via telephone conference call. Participants to this interview were the NTSB investigator-in-charge (Robert Gretz), NTSB airworthiness group chair (Chihoon Shin), NTSB powerplants group chair (Thomas Driscoll), and the interviewee's chosen representative (attorney Michael Miska). The interview began about 10:00 am eastern daylight time and concluded about 10:55am eastern daylight time.

The pilot was asked which engine he started first on the day of the accident. The pilot stated he typically started the engine with the highest T1, which on that day would be the right engine as it was on the side the sun was shining on. Additionally, he stated that the left engine occasionally "hangs on" during startup but the mechanics could not figure out why. However, on the day of the accident, the pilot stated he did not recall which engine he started first.

The pilot was asked if he recalled when the air conditioner was turned on during the start-up sequence of the helicopter. He stated that he usually turned on the air conditioner after both engines were started. However, the pilot could not recall exactly when he turned on the air conditioner on the day of the accident.

The pilot was asked if he saw anything unusual or out of the ordinary during start up of the helicopter. He stated that it was a normal start, a normal day, and a normal call, and recalled nothing out of the ordinary for the start up.

The pilot was asked if, during hover and climb out, if he recalled for the engine power demand and helicopter performance. The pilot stated that during takeoff, it was just below maximum continuous power (MCP), about 69% torque, and recalled the helicopter was performing normally.

The pilot was asked to describe the test switch for the warning unit and the cockpit display system (CDS). He stated it was an overhead switch that has to be held in a position to test the warning unit and the CDS, and that the switch would automatically reset once it's let go. He stated this was a pre-start checklist item. He believed an aural gong would also annunciate during this testing, but wasn't certain. He stated he does not distinctly remember hearing the aural gong (for caution indications) annunciate during the accident flight.

The pilot was asked if, after placing the left engine to idle, the engine controls were manipulated, either the switches on the instrument panel or the twist grips, prior to ground impact. The pilot stated that after he heard the first bang and saw the turbine outlet temperature (TOT) for the left engine rising, he immediately reduced power, by about 5%, by lowering the collective and then placed the left engine to idle via the engine control (on the instrument panel) in order to control its TOT. He stated he was scanning the cockpit panels to find the issue, and was keen on landing back at Pompano Beach Airport since there was not enough power to hover with only one engine at the helicopter's current weight. He stated he was prepared to manipulate the twist grip if there was a FADEC or governor failure light, but stated he did not manually manipulate the twist grip. He stated he flew the helicopter within limits and that the only anomalous indication was the high TOT for the left engine. When asked if he considered turning off the left engine, he stated he considered it the entire time, but he was worried he may shut off the wrong engine based on past accidents he knew about in which that error occurred. Specifically, he wanted to verify that the right engine was not "overworking" due to placing the left engine to idle. He stated that after the left engine was switch to idle, he didn't recall if he switched the left engine back to the flight setting (from the idle setting). He stated the last few seconds of the flight is when everything started happening, so he didn't know why he would have turned the left engine back to flight from idle.

The pilot was asked to recall the value or range of the left engine's TOT after hearing the first bang. He stated the TOT quickly approached the yellow area, even with the left engine set to idle. When the pilot was asked to describe how the left engine TOT rose, he stated the needle wasn't erratic, but it was consistently going up. When asked to recall the highest value, he thought the value was above 900° C, close to the maximum of 1,000° C, but he couldn't recall the exact number. He recalled that

right before the engine fire warning light illuminated, he said to himself that he had "cooked" the left engine, so he believed the TOT value was very hot.

The pilot was asked if he recalled looking at the left engine's other gauges (N1, N2, torque) after the first bang occurred, and if he recalled their values. The pilot stated that the left engine's N2 was in the triple tachometer (with right engine's N2 and the rotor speed NR), and that they were all within limits. He recalled he looked at all the gauges and recalled that NR did not increase. He also recalled that the TOT of the right engine was within limits, and does not recall seeing any of the other engine gauges out of their normal limits with the exception of the left engine's TOT. When asked if he recalled if the digital engine parameters on the CDS showed normal values, he stated that they may have but he could not specifically recall. He stated that he usually keeps the vehicle engine display, located below the caution advisory display (CAD), showing the N1 value, but could not recall what the N1 indications were. He stated that he was looking for parameters that were out-of-limits the entire time, but did not recall which specific parameters were out of limits. This included the parameters for the right engine as well as the left engine.

The pilot was asked if, after the first bang but before the second bang, he could describe the behavior of the helicopter's stability and flight handling characteristics. He stated that there was no changes to the helicopter's flight handling characteristics or its stability after the first bang, and that he tried to keep the helicopter as level as possible during the accident flight.

The pilot was asked if there were any smells present after the first bang, but before the second bang. He recalled not smelling anything notable, neither electrical nor smoke. The only time he recalled smelling smoke was right before the fire warning light illuminated, when the crewmember sitting in the front-left seat (next to the pilot) stated that there was smoke behind the helicopter's flight path as they were coming out of the turn during the return to Pompano Beach Airport.

The pilot was asked if he could recall the "check engine light" or the "chip light" that the other surviving crewmember had recalled seeing during the accident flight. The pilot stated that he did not recall seeing any caution lights illuminating until the engine fire warning light illuminated about 3 seconds before the tail boom separated. The pilot also stated that, based on past experiences and training, the crewmember sitting in the front-left seat would have pointed out to the pilot anything unusual he may have seen illuminate on the instrument panel. However, the front-left seated crewmember did not point out anything that had illuminated on the instrument panel to the pilot during this accident flight.

The pilot was asked to clarify a previous statement he made in reference to a "high overtemp illumination" that he saw during the accident flight. He stated that while he was still scanning the instruments during final approach to Pompano Beach Airport, the crewmember sitting in the front-left seat stated seeing smoke behind the helicopter, and within one second, the fire warning light illuminated, which was about three seconds before the tail boom separated. He stated there was also a heating overtemperature (HTG OVTEMP) indication that appeared the same time as the fire warning light illuminated. He stated there was not a generator overheat indication. He recalled that there was no aural gong at any point leading up to the fire warning light illumination and that he was constantly checking the CAD to see if he would get any additional indications, but that there were not any until the fire warning light and the HTG OVTEMP indications occurred. The pilot clarified that the fire warning light has a unique aural alert, which he described as a "ding", associated with it, and that he heard this ding when the fire warning light illuminated. He stated that he did not hear the aural gong (for caution indications) at any time, and that the HTG OVTEMP indication could have triggered the aural gong, but that the fire warning aural alert could have been prioritized over it. The pilot stated that when the fire warning light illuminated, that he pressed the fire button and recalled seeing the green "active" light illuminate. After ground impact, he stated he pushed the left engine fire warning light again.

The pilot was asked if he recalled whether both engines were still running after the helicopter impacted the ground. He recalled hearing very loud noises after the accident, and it sounded like the engines were not powering down but instead trying to run. The pilot was asked if he manipulated the engine control switches after ground impact. He stated that he turned both engines off, that he started at the top of the instrument panel and worked his way down. He stated he did not manipulate the switches overhead, but pushed the fire warning light again, turned off the engine switches (on the instrument panel), then the FADEC switches, then likely the generator switches, and then the battery switch.

The pilot was told that some helicopters are equipped with a camera on their vertical fin or horizontal stabilizer that can show a view of the helicopter on a cockpit display. The pilot was asked if he would have time to use this equipment during the accident flight to help triage the emergency if this type of equipment was installed on the accident helicopter. The pilot stated that this type of equipment would have helped him determine what was going on with the engines and would have changed his decision-making process if he saw evidence of fire from the left engine. When the pilot was asked if the presence of a second pilot would have helped during the accident flight, he stated that it was a safe option but that the crewmember sitting next to him (in the front-left seat) was trained to assist with the operation and trained

to look at the instrument panel for cautions and warnings and to speak up if something notable is observed on the instrument panel.

The pilot was asked to characterize the first bang sound. The pilot stated that he had previously experienced a compressor stall on a Bell 206, but that this bang sound was different. He stated that it was louder than if a crewmember (in the cabin) dropped a heart monitor battery on the deck. He recalled that he could "feel" where the bang sound occurred, specifically behind him and on the left side of the helicopter. He stated the sound was a huge boom, almost like an explosion, and was loud as if standing next to someone shooting a 12-gauge shotgun. He stated not hearing echoing of the loud bang.