



MEMORANDUM FOR RECORD

Todd Gunther
Air Safety Investigator
Eastern Region

Date: April 17, 2020
Subject: Pilot's Knowledge and Training – Vortex Ring State
NTSB Accident Number: ERA17FA274

According to Sgt. Jeffrey Bush of the Virginia State Police Aviation Unit, He attended Heli-Expo in March of 2017 in Dallas, Texas. While there, Sgt. Bush attended a class on vortex ring state which included the Vuichard recovery technique. This was his first introduction to this technique and being a newly certificated flight instructor (CFI), he was excited to bring this technique back to his unit. The accident pilot (Lt. Jay Cullen) who was the aviation unit commander, and Sgt. Bush discussed the method and Lt. Cullen indicated that he was already familiar with it and displayed knowledge of the technique as they talked. Sgt. Bush then suggested that they perform this maneuver during their May 2017 recurrent unit training with Bell, and Lt. Cullen agreed. Sgt. Bush performed the recovery technique during the training, and while he recalled that several pilots performed this procedure at the training, he was unsure if Lt. Cullen performed the maneuver.

Review of Lt. Cullen's personal logbook by Sgt. Bush indicated that Lt. Cullen recorded several flights as a student and as an instructor. Sgt. Bush contacted several of those instructors and students, to find out what instruction Lt. Cullen received, and what he taught. No students (pilots) however, had specific notes referencing vortex ring state in their logbooks.

Sgt. Bush, also spoke with a personal student whom Lt. Cullen was instructing in April 2017, and the student remembered a ground school discussion about settling with power (vortex ring state). In speaking with the student on April 13, 2020 over the telephone, Sgt. Bush's first line of questions was about emergency procedures. The answers did not reveal anything about vortex ring state. The student mentioned that Sgt. Bush was testing his memory and putting him on the spot asking such questions. He did say they had many discussions about helicopter dynamics, and it was Lt. Cullen's knowledge that put the student at ease getting back in the cockpit of a helicopter. Sgt. Bush's follow-up question was, "What did you talk about in your ground school discussions." The student mentioned several items including settling with power. Sgt. Bush did not immediately ask about settling with power to not draw attention to that subject, and when Sgt. Bush "circled back" to the topic of settling with power the student stated, "We talked about

it but didn't demo it. He (Lt. Cullen) said to watch your descent on a steep approach. You don't want to descend too fast because you can get into it (vortex ring state). If you did and depending on your room, you would fly forward or even to the side."

Sgt. Bush also advised that on August 12, 2017 (during the Charlottesville rally), the downlink went to tablets on the ground that were recording to an SD card. The recordings found on the downlink files were saved and discovered months after when the VSP was preparing for the criminal trial for James Alex Fields, Jr. During the accident flight the downlink was out of range and did not record any transmissions from the helicopter. What was recorded though was a discussion prior to the crash between Lt. Cullen and the observer (Trooper Burke Bates), and later between Trooper Bates and Sgt. Bush.

Review of the audio indicated that during the conversation between Lt. Cullen and Trooper Bates that Lt. Cullen was speaking about Loss of Tailrotor Effectiveness (LTE) which he stated was "like a vortex ring state on your tailrotor".