

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



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MEDICAL

Specialist's Factual Report

July 7, 2023

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A. ACCIDENT

Location: Metz, West Virginia
Date: August 11, 2022

B. MEDICAL SPECIALIST

Specialist Turan Kayagil, MD, FACEP
National Transportation Safety Board
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C. DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the pilot for potentially impairing substances and potentially impairing medical conditions.

2.0 Methods

The Federal Aviation Administration (FAA) medical case review and the pilot's autopsy and toxicology reports were reviewed. Selected investigator reports and relevant regulation and medical literature were also reviewed.

D. FACTUAL INFORMATION

1.0 FAA Medical Case Review

According to the FAA medical case review, the 50-year-old male pilot's last aviation medical examination was on July 8, 2015. At that time, he reported 233 total civilian flight hours. He was 74 inches tall and weighed 232 pounds. He reported no medication use and no active medical conditions. No significant issues were identified, and he was issued a third-class medical certificate without limitation. This medical certificate expired in 2017. The pilot completed a BasicMed Course and Comprehensive Medical Examination Checklist in May 2021.¹

¹ BasicMed provisions allow pilots who meet certain requirements to fly without current medical certification. Among those requirements, a pilot must have completed a BasicMed training course within 24 calendar months and must have had a medical examination with a state-licensed physician using the CMEC within 48 months. Aircraft and operating restrictions also apply. For details, see [14 Code of Federal Regulations \(CFR\) Part 68](#), [14 CFR 61.113\(i\)](#), [14 CFR 61.23\(c\)\(3\)](#), and https://www.faa.gov/licenses_certificates/airmen_certification/basic_med/.

2.0 Autopsy

The State of West Virginia Office of the Chief Medical Examiner performed the pilot's autopsy. According to the pilot's autopsy report, his cause of death was extensive, generalized blunt force injuries and his manner of death was accident. The extent of injuries markedly limited structural evaluation of the heart, and the brain and lungs were absent. Within these severe limitations, no significant natural disease was identified.

3.0 Toxicology

3.1 NMS Labs Toxicology Results

At the request of the Office of the Chief Medical Examiner, NMS Labs performed toxicological testing of postmortem liver tissue from the pilot.² This testing detected ethanol at 0.44 g/hg.³ Caffeine was presumptively detected (identified by the initial screening test without a second confirmatory test being performed).

3.2 FAA Toxicology Results

The FAA Forensic Sciences laboratory also performed toxicological testing of postmortem specimens from the pilot.⁴ Ethanol was detected at 0.141 g/hg in liver tissue, 0.072 g/hg in muscle tissue, and 0.108 g/hg in heart tissue.⁵ N-propanol was detected in liver tissue and heart tissue and n-butanol was detected in heart tissue. No blood, urine, or vitreous fluid was available for FAA testing.

3.3 Descriptions of Detected Substances

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and, if consumed, can impair judgment, psychomotor performance, cognition, and vigilance.⁶ FAA regulation imposes strict limits on flying after consuming ethanol, including prohibiting pilots from flying with a blood ethanol level of 0.04 g/dL or greater.⁷ However, consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can sometimes be produced by microbes in a

² Additional information about the testing procedure is available from the NMS Labs website ([Test Code 8052TI](#)).

³ In tissue, concentrations in g/hg are approximately equivalent to concentrations in g/dL.

⁴ The FAA Forensic Sciences laboratory has the capability to test for around a thousand substances including toxins, prescription and over-the-counter medications, and illicit drugs.

⁵ In tissue, concentrations in g/hg are approximately equivalent to concentrations in g/dL.

⁶ Cook CCH. Alcohol and aviation. *Addiction*. 1997;92(5):539-555.

⁷ [14 Code of Federal Regulations § 91.17](#).

person's body after death. Postmortem ethanol production is made more likely by severe trauma and delayed recovery of remains, and can affect different specimens from the same individual to different extents, causing large variations in measured ethanol levels across the specimens. N-propanol and n-butanol are other alcohols that can be produced by microbes in a person's body after death.⁸

Caffeine is a central nervous system stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate, and is also an ingredient in certain anti-drowsiness medications and headache medications.^{9,10} Caffeine is not generally considered impairing.

E. SUMMARY OF MEDICAL FACTS

The 50-year-old male pilot's last aviation medical examination was on July 8, 2015. At that time, he reported no medication use and no active medical conditions. He was issued a third-class medical certificate without limitation. This certificate expired in 2017. The pilot completed a BasicMed Course and Comprehensive Medical Examination Checklist in May 2021.

According to the pilot's autopsy report, his cause of death was blunt force injuries and his manner of death was accident. The extent of injuries markedly limited structural evaluation of the heart, and the brain and lungs were absent. Within these severe limitations, no significant natural disease was identified.

The pilot's postmortem toxicological testing detected ethanol at 0.44 g/hg in one liver tissue specimen, 0.141 g/hg in another liver tissue specimen, 0.072 g/hg in muscle tissue, and 0.108 g/hg in heart tissue. N-propanol was detected in liver tissue and heart tissue and n-butanol was detected in heart tissue.

Submitted by:

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Medical Officer

⁸ Kugelberg FC, Jones AW. Interpreting results of ethanol analysis in postmortem specimens: a review of the literature. *Forensic Sci Int*. 2007;165(1):10-29. doi:10.1016/j.forsciint.2006.05.004.

⁹ National Institutes of Health National Library of Medicine. NoDoz Alertness Aid. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=e700e809-29b5-799e-e053-2a95a90a235c>. Updated October 11, 2022. Accessed July 7, 2023.

¹⁰ National Institutes of Health National Library of Medicine. Fioricet. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c018be7d-f7b8-45e2-97b8-8e7a71740657>. Updated January 1, 2021. Accessed July 7, 2023.