

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



CEN23FA079

MEDICAL

Specialist's Factual Report

November 25, 2024

TABLE OF CONTENTS

A. ACCIDENT.....	3
B. MEDICAL SPECIALIST.....	3
C. DETAILS OF THE INVESTIGATION	3
1.0 PURPOSE	3
2.0 METHODS.....	3
D. FACTUAL INFORMATION.....	3
1.0 CFI.....	3
1.1 FAA Medical Records.....	3
1.2 Personal Medical Records	5
1.3 Autopsy	6
1.4 Toxicology	6
1.4.1 OCME Toxicology Results	6
1.4.2 FAA Toxicology Results	6
1.4.3 Descriptions of Detected Substances	7
2.0 PILOT.....	10
2.1 FAA Medical Certification File.....	10
2.2 Autopsy	10
2.3 Toxicology	10
E. SUMMARY OF MEDICAL FACTS.....	11
1.0 CFI.....	11
2.0 PILOT.....	12

A. ACCIDENT

Location: Kingfisher, Oklahoma

Date: January 16, 2023

B. MEDICAL SPECIALIST

Specialist Turan Kayagil, MD, FACEP
National Transportation Safety Board
Washington, DC

C. DETAILS OF THE INVESTIGATION

1.0 Purpose

This investigation was performed to evaluate the 68-year-old male flying club certificated flight instructor (CFI) and the 53-year-old male second pilot (pilot) for potentially impairing substances and potentially impairing medical conditions.

2.0 Methods

The final Federal Aviation Administration (FAA) medical case review and the CFI's FAA medical certification file were reviewed. Selected personal medical records pertaining to the CFI were reviewed, comprising records from the health system of the CFI's primary care provider for a period of 3 years prior to the crash date. The autopsy and toxicology reports of the CFI and pilot were reviewed. Selected investigator reports and relevant regulation and medical literature were also reviewed.

D. FACTUAL INFORMATION

1.0 CFI

1.1 FAA Medical Records

The CFI's last aviation medical examination was March 16, 2022. At that time, he reported medical history including high blood pressure, seasonal allergies, and 2021 bilateral cataract surgery. The aviation medical examiner (AME) noted that the CFI's high blood pressure was qualified under Conditions AMEs Can Issue (CACI) criteria. The AME also noted a history of prostate cancer, which the AME documented as being qualified under CACI criteria, although the AME noted that the CFI was

using medication to treat the prostate cancer.¹ The CFI reported using olmesartan / hydrochlorothiazide (a combination of two prescription medications for blood pressure control), atorvastatin (a prescription medication for cholesterol control and cardiovascular risk reduction), and leuprolide (a long-acting prescription injection used to suppress testosterone production, as part of treatment of prostate cancer – commonly referred to as androgen deprivation therapy). The AME issued the CFI a second-class medical certificate limited by requirements to wear corrective lenses and to use hearing amplification. No time limitation was included on the medical certificate.

The CFI's FAA medical certification file documented that, in March 2020 and April 2021, the CFI had been granted Authorizations for Special Issuance of medical certification for recurrent prostate cancer being treated with medication. The most recent of these Authorizations remained current as of the CFI's last aviation medical examination. Under this Authorization, the CFI was instructed to bring a recent history and clinical examination report from his treating physician to his AME examination. If the AME found that there were no adverse changes in the CFI's condition, the AME could issue a medical certificate, with the required restriction, "Not valid for any class after February 28, 2023." The AME would then be required to submit the CFI's application and the treating physician's reports to the FAA for review. There was no indication in the CFI's FAA medical certification file that this occurred at the CFI's last aviation medical examination in March 2022.

In November 2022, the FAA sent the CFI a letter stating that, based on a review of his March 2022 application for medical certification, the FAA was unable to establish his eligibility to hold a medical certificate. The FAA requested a current history and clinical examination from the CFI's treating physician regarding the CFI's prostate cancer, as well as a current eye evaluation (documented on FAA Form 8500-7) from the CFI's treating physician related to his history of cataract surgery.² The FAA medical certification file included a December 2022 letter from the CFI's oncologist, stating that the CFI's prostate cancer was currently in remission due to prior treatment with whole gland cryotherapy in 2018, as well as ongoing treatment with androgen deprivation therapy (leuprolide injections). The FAA medical certification file also included a completed FAA Form 8500-7 from the CFI's optometrist reporting the results of a February 2022 eye evaluation at which no concerns were identified. No

¹ The FAA website includes the [current CACI prostate cancer worksheet](#) and [a prior Guide for Aviation Medical Examiners](#) containing the (very similar) CACI prostate cancer worksheet that was in effect at the time of the CFI's last aviation medical examination. To determine an applicant's eligibility for certification under CACI criteria for prostate cancer, the AME must review a current progress note from a treating physician. Among the CACI criteria, the condition must be stable and active treatment (including with medication) must be complete, with no ongoing symptoms. If an AME determines that an applicant is CACI-qualified for prostate cancer, the AME is not required to submit related documents to the FAA.

² FAA Form 8500-7, Report of Eye Evaluation, is available from the FAA website at: <https://www.faa.gov/forms/index.cfm/go/document.information/documentid/185784>.

further FAA medical certificate action was documented prior to the January 2023 crash date. According to the FAA medical case review for this crash, the CFI's medical certificate was valid when the crash occurred.

1.2 Personal Medical Records

According to reviewed medical records, the CFI's medical history included high cholesterol, high blood pressure, obesity, insomnia, hearing loss, and seasonal allergies. He also had a history of prostate cancer diagnosed in 2015, treated with radiation and surgery, and subsequently treated with leuprolide.³

At a routine primary care visit on March 17, 2022 (one day after his last aviation medical examination), the CFI underwent screening that identified moderately severe hearing loss (no details provided), no cognitive impairment (no details provided), and "yes" answers to both initial screening questions for depression. Reported marijuana use was noted.⁴ The CFI was started on low-dose nightly quetiapine for insomnia at that visit and the provider noted that the CFI was going to follow up with a psychiatrist. Reviewed records (which did not include psychiatric records) did not document a psychiatric diagnosis.

At the CFI's next primary care visit in August 2022, it was noted that leuprolide injections had been held since January due to side effects. The CFI complained of continuing hot flashes, shaky hands, dizziness, and fatigue. The CFI was noted to be using venlafaxine (a prescription antidepressant medication with various uses) to treat the hot flashes associated with his androgen deprivation therapy.

The CFI's most recent documented primary care visit was in September 2022 for cough; no complete medication list was documented at that visit. The CFI was prescribed promethazine/dextromethorphan (a prescription combination medication for relief of upper respiratory symptoms) as needed for his cough.

The most recent medication list documented in reviewed records was from an Emergency Department visit for a foot injury in November 2022. At that visit, the CFI's documented home medications were atorvastatin, olmesartan/hydrochlorothiazide, leuprolide (as an every-3-months injection), quetiapine (dosing unchanged), venlafaxine, and as-needed promethazine/dextromethorphan, as well as etodolac (a prescription non-steroidal anti-inflammatory drug that may be used to treat musculoskeletal pain) and extended-release bupropion (a prescription antidepressant medication, at a typical starting dose). The CFI was given a short

³ Reviewed primary care records indicated that the CFI had experienced a recurrence of his prostate cancer after initial treatment, and that salvage cryosurgery had been performed in 2018.

⁴ A history of marijuana (including edible) use was also documented elsewhere in reviewed records, including a record from October 2021 that indicated medical cannabis use.

prescription for hydrocodone/acetaminophen (a prescription combination opioid/non-opioid pain medication) to use as needed for pain related to his foot injury.

The CFI's most recent healthcare visit in reviewed records was 1 week before the crash, on January 9, 2023; this was an orthopedic clinic visit for a 7-week postoperative check of his right foot injury (a midfoot fracture dislocation that had required surgery with internal fixation). At that time, no concerns were noted; he was ambulating in normal shoes without much pain. His height was documented as 71 inches and his weight as 230 pounds.

1.3 Autopsy

The Office of the Chief Medical Examiner (OCME), Central Division, Oklahoma City, Oklahoma, performed the CFI's autopsy. According to the CFI's autopsy report, his cause of death was blunt force and thermal injuries, and his manner of death was accident. Due to the extent of his injuries, his autopsy was severely limited for evaluation of natural disease. The brain, heart, and majority of lung tissue were not available for examination.

1.4 Toxicology

1.4.1 OCME Toxicology Results

OCME screening of femoral blood from the CFI for selected drugs of abuse did not detect any screened-for-substances.⁵

1.4.2 FAA Toxicology Results

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem muscle and lung tissue specimens from the CFI. Delta-9-tetrahydrocannabinol (delta-9-THC) was detected at 388.6 ng/g in lung tissue and at 220.6 ng/g in muscle tissue. 11-hydroxy-tetrahydrocannabinol (11-hydroxy-THC) was detected at 87.1 ng/g in lung tissue and at 65.9 ng/g in muscle tissue. Carboxy-delta-9-tetrahydrocannabinol (carboxy-delta-9-THC) was detected at 216.6 ng/g in lung tissue and at 138.9 ng/g in muscle tissue. Quetiapine was detected at 203 ng/g in lung tissue and at 30 ng/g in muscle tissue. Norquetiapine was detected in lung tissue and was detected at 98 ng/g in muscle tissue. Bupropion was detected at 98 ng/g in lung tissue and at 40 ng/g in muscle tissue. Hydroxybupropion was detected at 1602 ng/g in lung tissue and at 187 ng/g in muscle tissue. Venlafaxine was detected at 7238 ng/g in lung tissue and at 757 ng/g in muscle tissue. O-

⁵ The report of the OCME toxicology results listed screened-for substances as amphetamine, methamphetamine, fentanyl, cocaine, opiates, PCP, barbiturates, and benzodiazepines. Screening was noted to have been done using an immunoassay that does not detect oxycodone, methadone, or clonazepam.

desmethylvenlafaxine (desvenlafaxine) was detected at 9340 ng/g in lung tissue and at 1490 ng/g in muscle tissue. Notably, all detected substances were drugs or metabolites of drugs that the CFI had a documented history of using per reviewed medical records.

1.4.3 Descriptions of Detected Substances

Delta-9-THC is the primary psychoactive chemical in cannabis, including marijuana, hashish, and cannabis edibles. 11-hydroxy-THC and carboxy-delta-9-THC are metabolites of delta-9-THC. Delta-9-THC may be inhaled or ingested recreationally by users seeking mind-altering effects. It may also be used medicinally, such as to treat illness-associated nausea and appetite loss. Psychoactive effects of delta-9-THC vary depending on the user, dose, and route of administration, and may impair motor coordination, reaction time, decision making, problem solving, and vigilance.^{6,7} Marijuana is a federal Schedule I controlled substance, and the FAA considers its use by pilots unacceptable, regardless of state laws.^{8,9,10}

Quetiapine, sometimes marketed as Seroquel, is a prescription antipsychotic medication. Norquetiapine is a metabolite of quetiapine. Quetiapine may be used in the treatment of schizophrenia, bipolar disorder, and major depressive disorder.¹¹ Quetiapine also is regularly prescribed for off-label uses, including in low doses for

⁶ Couper FJ, Logan BK. Drugs and Human Performance Fact Sheets. National Highway Traffic Safety Administration. DOT HS 809 725. April 2014 (Revised). <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/809725-drughumanperformfs.pdf>. Accessed October 23, 2024.

⁷ Compton RP. Marijuana-Impaired Driving: A Report to Congress. National Highway Traffic Safety Administration. DOT HS 812 440. July 2017. <https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812440-marijuana-impaired-driving-report-to-congress.pdf>. Accessed October 23, 2024.

⁸ Federal Aviation Administration. Guide for aviation medical examiners: pharmaceuticals (therapeutic medications) do not issue - do not fly. Federal Aviation Administration website. https://www.faa.gov/ame_guide/pharm/dni_dnf. Updated July 10, 2023. Accessed October 23, 2024.

⁹ Federal Aviation Administration. Aeromedical factors. In: *Pilot's Handbook of Aeronautical Knowledge*. FAA-H-8083-25C. Oklahoma City: United States Department of Transportation, Federal Aviation Administration, Airman Testing Standards Branch, AFS-630; 2023. https://www.faa.gov/sites/faa.gov/files/19_phak_ch17.pdf. Accessed October 23, 2024.

¹⁰ Federal Aviation Administration. Controlled substances and CBD products. Guide for Aviation Medical Examiners. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/media/Controlled_Substances_and_CBD_Products.pdf. Updated May 25, 2022. Accessed October 23, 2024.

¹¹ National Institutes of Health National Library of Medicine. Seroquel. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=0584dda8-bc3c-48fe-1a90-79608f78e8a0>. Updated January 27, 2022. Accessed October 23, 2024.

treatment of insomnia without underlying psychiatric illness.^{12,13} Quetiapine commonly causes drowsiness, especially in the initial days after starting a treatment regimen; users may develop tolerance to this effect over time.^{11,14} Quetiapine typically carries a warning that it has the potential to impair judgment, thinking, and motor skills, and that users should be cautioned about performing activities requiring mental alertness, such as operating a motor vehicle or hazardous machinery, until they are reasonably certain that the drug does not affect them adversely.¹¹ The FAA considers quetiapine to be a “Do Not Issue/Do Not Fly” medication.⁸ According to the FAA medical case review for this accident, quetiapine is unacceptable for FAA medical certification.

Bupropion is a prescription medication that acts on the central nervous system (CNS) and can be used to treat depression and to help people quit smoking.^{15,16} Hydroxybupropion is a metabolite of bupropion. Bupropion’s mechanism of action and side-effect profile differs from other antidepressants; it does not typically cause sedation but may contribute to insomnia.^{15,17} One small study of healthy subjects found no significant impact of sustained-release bupropion on psychomotor performance, including on tests intended to simulate flying performance.¹⁸ In patients with major depression, bupropion may improve associated neurocognitive deficits.¹⁹ Research on motor vehicle crash risk indicates that depression, antidepressants, or the combination of depression and antidepressants may present a safety hazard, but

¹² Neubauer DN. Pharmacotherapy for insomnia in adults. In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/pharmacotherapy-for-insomnia-in-adults>. Updated April 29, 2024. Accessed October 23, 2024.

¹³ Modesto-Lowe V, Harabasz AK, Walker SA. Quetiapine for primary insomnia: consider the risks. *Cleve Clin J Med*. 2021;88(5):286-294. doi:10.3949/ccjm.88a.20031.

¹⁴ Jibson MD. Second-generation antipsychotic medications: pharmacology, administration, and side effects. In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/second-generation-antipsychotic-medications-pharmacology-administration-and-side-effects>. Updated July 17, 2024. Accessed October 23, 2024.

¹⁵ National Institutes of Health National Library of Medicine. Wellbutrin XL. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=a435da9d-f6e8-4ddc-897d-8cd2bf777b21>. Updated March 1, 2024. Accessed October 23, 2024.

¹⁶ National Institutes of Health National Library of Medicine. Wellbutrin SR. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=cbc8c074-f080-4489-a5ae-207b5fadeba3>. Updated April 22, 2024. Accessed October 23, 2024.

¹⁷ Stahl SM, Pradko JF, Haight BR, Modell JG, Rockett CB, Learned-Coughlin S. A review of the neuropharmacology of bupropion, a dual norepinephrine and dopamine reuptake inhibitor. *Prim Care Companion J Clin Psychiatry*. 2004;6(4):159-166. doi:10.4088/pcc.v06n0403.

¹⁸ Paul MA, Gray G, Kenny G, Lange M. The impact of bupropion on psychomotor performance. *Aviat Space Environ Med*. 2002;73(11):1094-1099.

¹⁹ Gualtieri CT, Johnson LG. Bupropion normalizes cognitive performance in patients with depression. *MedGenMed*. 2007;9(1):22.

the independent contributions of antidepressants to that hazard generally are not well-defined.²⁰ Bupropion commonly carries a warning that any drug that acts on the CNS may impair users' ability to perform tasks requiring judgment or motor and cognitive skills, and that bupropion users should not drive or operate hazardous machinery until they are reasonably certain that the drug does not adversely affect their performance.^{15,16} According to the FAA medical case review for this crash, bupropion was considered unacceptable for pilot medical certification. In May 2023, the FAA added extended-release and sustained-release formulations of bupropion to the list of antidepressants that may be considered for FAA medical certification via Special Issuance on a case-by-case basis.²¹

Venlafaxine is another prescription antidepressant medication. Desvenlafaxine is an active metabolite of venlafaxine and is also available as a prescription antidepressant medication. Venlafaxine has a variety of uses for psychiatric and other conditions. Among its off-label uses is the treatment of hot flashes associated with androgen deprivation therapy for prostate cancer.²² Venlafaxine commonly carries a warning that it can cause drowsiness, and that users should not drive, operate heavy machinery, or do other dangerous activities until they know how the drug affects them.²³ One small study of healthy subjects given relatively low doses of venlafaxine did not find a significant impact of venlafaxine on psychomotor and driving tests, except for some diminished performance on a test of sustained vigilance.²⁴ According to the FAA medical case review for this crash, venlafaxine was considered unacceptable for pilot medical certification. In April 2024, the FAA added venlafaxine to the list of antidepressants that may be considered for FAA medical certification via Special Issuance on a case-by-case basis.²¹

Notably, in addition to commonly causing hot flashes, androgen deprivation therapy for prostate cancer commonly is associated with fatigue and decreased

²⁰ Hill LL, Lauzon VL, Winbrock EL, Li G, Chihuri S, Lee KC. Depression, antidepressants and driving safety. *Inj Epidemiol.* 2017;4(1):10. doi:10.1186/s40621-017-0107-x.

²¹ Federal Aviation Administration. Guide for aviation medical examiners: decision considerations - aerospace medical dispositions, item 47, psychiatric conditions - use of antidepressant medications. Federal Aviation Administration website. https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/ame/guide/app_process/exam_tech/item47/amd/antidepressants. Updated April 24, 2024. Accessed October 23, 2024.

²² Smith MR. Side effects of androgen deprivation therapy. In: Post TW, ed. *UpToDate*. Waltham, MA: UpToDate Inc. <https://www.uptodate.com/contents/side-effects-of-androgen-deprivation-therapy>. Updated October 20, 2022. Accessed October 23, 2024.

²³ National Institutes of Health National Library of Medicine. Effexor XR. DailyMed. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=c848a5d8-ba94-4c84-80e3-0bf35fb8e32e>. Updated August 15, 2023. Accessed October 23, 2024.

²⁴ O'Hanlon JF, Robbe HW, Vermeeren A, van Leeuwen C, Danjou PE. Venlafaxine's effects on healthy volunteers' driving, psychomotor, and vigilance performance during 15-day fixed and incremental dosing regimens. *J Clin Psychopharmacol.* 1998 Jun;18(3):212-21. doi: 10.1097/00004714-199806000-00006.

strength. There is mixed evidence of an association between androgen deprivation therapy and risk of cognitive dysfunction.²²

2.0 Pilot

2.1 FAA Medical Certification File

The pilot's last aviation medical examination was October 17, 2022. At that time, he reported no medication use and no active medical conditions. He was issued a first-class medical certificate without limitation.

2.2 Autopsy

The OCME, Central Division, Oklahoma City, Oklahoma, performed the pilot's autopsy. According to the pilot's autopsy report, his cause of death was blunt force and thermal injuries, and his manner of death was accident. Due to the extent of his injuries, his autopsy was severely limited for evaluation of natural disease. The heart and the majority of brain and lung tissue were not available for examination.

2.3 Toxicology

OCME screening of aortic blood from the pilot for selected drugs of abuse did not detect any screened-for-substances.⁵

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem muscle and lung tissue specimens from the pilot. Most of the same substances were detected as had been detected in the CFI's specimens, except at lower levels.²⁵ These results were considered unreliable for purposes of this medical investigation. No substances other than those found in the CFI's specimens were detected in the pilot's specimens.

Notably, some of the recovered remains in this case were comingled. The specimens used for toxicology testing were from remains that had been identified using fingerprints. The OCME followed procedures to prevent cross-contamination during specimen collection. The FAA Forensic Sciences Laboratory followed procedures to prevent cross-contamination during testing. An e-mail from an FAA forensic toxicologist indicated that the reported results were reproducible across repeated tests of the same specimens.

²⁵ Specifically, delta-9-THC, 11-hydroxy-THC, carboxy-delta-9-THC, bupropion, hydroxybupropion, venlafaxine, and O-desmethylvenlafaxine were detected in lung and muscle tissue.

E. SUMMARY OF MEDICAL FACTS

1.0 CFI

The certificated flight instructor's (CFI's) last aviation medical examination was March 16, 2022. At that time, he reported medical history including high blood pressure, seasonal allergies, and 2021 bilateral cataract surgery. The aviation medical examiner (AME) noted that the pilot's high blood pressure was qualified under Conditions AMEs Can Issue (CACI) criteria. The AME also noted a history of prostate cancer being treated with leuprolide (a long-acting prescription injection used to suppress testosterone production, as part of treatment of prostate cancer - commonly referred to as androgen deprivation therapy). The AME issued the CFI a second-class medical certificate limited by requirements to wear corrective lenses and to use hearing amplification. Although the pilot had a current Authorization for Special Issuance of medical certification for his prostate cancer being treated with medication, the AME did not certify the CFI under this Authorization; instead, the AME certified the CFI under CACI criteria for prostate cancer. Individuals being actively treated with medication for prostate cancer are generally excluded from certification under CACI criteria.

In November 2022, the Federal Aviation Administration (FAA) sent the CFI a letter stating that, based on FAA review of his March 2022 application for medical certification, the FAA was unable to establish his eligibility to hold a medical certificate. The FAA requested additional information, including a current history and clinical examination from the CFI's treating physician regarding the CFI's prostate cancer. The FAA medical certification file included a December 2022 letter from the CFI's oncologist, stating that the CFI's prostate cancer was currently in remission due to prior treatment with whole gland cryotherapy in 2018, as well as ongoing treatment with androgen deprivation therapy (leuprolide injections). No further FAA medical certificate action was documented prior to the January 2023 crash date. According to the FAA medical case review for this crash, the CFI's medical certificate was valid when the crash occurred.

The CFI's most recent medication list documented in reviewed personal medical records was from November 2022. At that time, the CFI's documented home medications included leuprolide (as an every-3-months injection), atorvastatin (a prescription medication for cholesterol control and cardiovascular risk reduction), olmesartan / hydrochlorothiazide (a combination of two prescription medications for blood pressure control), quetiapine (a prescription antipsychotic medication which the CFI was prescribed at a low dose for insomnia), venlafaxine (a prescription antidepressant medication which the CFI was prescribed for treatment of hot flashes associated with androgen deprivation therapy), and extended-release bupropion (a prescription antidepressant medication, at a typical starting dose). The CFI's personal medical records also documented a history of marijuana (including edible) use.

According to the CFI's autopsy report, his cause of death was blunt force and thermal injuries, and his manner of death was accident. Due to the extent of his injuries, his autopsy was severely limited for evaluation of natural disease. The brain, heart, and majority of lung tissue were not available for examination. OCME screening of femoral blood from the CFI for selected drugs of abuse did not detect any screened-for-substances.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem muscle and lung tissue specimens from the CFI. Delta-9-tetrahydrocannabinol (delta-9-THC) and its metabolites 11-hydroxy-tetrahydrocannabinol (11-hydroxy-THC) and carboxy-delta-9-tetrahydrocannabinol (carboxy-delta-9-THC) were detected in the tested tissues, as were quetiapine and its metabolite norquetiapine, bupropion and its metabolite hydroxybupropion, and venlafaxine and its metabolite O-desmethylvenlafaxine. All detected substances were drugs or metabolites of drugs that the CFI had a documented history of using per reviewed medical records.

2.0 Pilot

The pilot's last aviation medical examination was October 17, 2022. At that time, he reported no medication use and no active medical conditions. He was issued a first-class medical certificate without limitation.

According to the pilot's autopsy report, his cause of death was blunt force and thermal injuries, and his manner of death was accident. Due to the extent of his injuries, his autopsy was severely limited for evaluation of natural disease. The heart and the majority of brain and lung tissue were not available for examination. OCME screening of aortic blood from the pilot for selected drugs of abuse did not detect any screened-for-substances.

The FAA Forensic Sciences Laboratory performed toxicological testing of postmortem muscle and lung tissue specimens from the pilot. Most of the same substances were detected as had been detected in the CFI's specimens, except at lower levels. These results were considered unreliable for purposes of this medical investigation. No substances other than those found in the CFI's specimens were detected in the pilot's specimens. Notably, some of the recovered remains in this case were comingled. The specimens used for toxicology testing were from remains that had been identified using fingerprints.

Submitted by:

Turan Kayagil, MD, FACEP
Medical Officer