NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Washington, DC

Medical Factual Report

June 1, 2015

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Chief Medical Officer

A. ACCIDENT:

On May 31, 2014, about 2140 eastern daylight time, a Gulfstream Aerospace Corporation G-IV, N121JM, operated by Arizin Ventures, LLC, crashed after a rejected takeoff and runway excursion at Laurence G. Hanscom Field (BED), Bedford, Massachusetts. The two pilots, a flight attendant, and four passengers were fatally injured. The airplane was destroyed by impact forces and a postcrash fire. The personal flight, which was destined for Atlantic City International Airport (ACY), Atlantic City, New Jersey, was conducted under the provisions of 14 Code of Federal Regulations Part 91. An instrument flight rules flight plan was filed. Night visual meteorological conditions prevailed at the time of the accident.

B. GROUP IDENTIFICATION:

No group was formed for the medical evaluation in this accident.

C. DETAILS OF INVESTIGATION

1. Purpose

   This investigation was performed to evaluate the pilots for any medical conditions, the use of any medications/illicit drugs, and the presence of any toxins.

2. Methods

   For each pilot, the FAA medical certification file, FAA medical case review, toxicology results, autopsy report, and the investigator's reports were reviewed.

Second in Command Pilot (Right Seat)

FAA Medical Record

The 61 year old male SIC was first awarded a third class medical certificate without limitations in 1973. He reported having had an ulcer

and a tonsillectomy in childhood. He obtained as second class medical certificate in 1974 and maintained that until he obtained a first class medical certificate in 1976. He maintained a first class medical certificate until 1988, when he began to routinely obtain second class medical certificates. In 2001, he began to have a limitation placed on his certificate, "Must have available glasses for near vision." In 2004, he began to routinely obtain first class medical certificates and continued doing so until his last medical exam in February 2014. Throughout, he reported occasional visits to his primary care physician for minor illnesses.

Autopsy

The Massachusetts Office of the Chief Medical Examiner determined that the SIC's cause of death was smoke inhalation and thermal injuries. In addition, he had five rib fractures and bilateral hemothoraces (blood in both chest cavities). No significant natural disease was identified.

Toxicology

Forensic toxicology testing was performed at the FAA's Civil Aerospace Medical Institute. The pilot was negative for ethanol or any tested for drugs. His carbon monoxide level was 61%; no cyanide was detected.

Pilot in Command – Flying Pilot (Left Seat)

FAA Medical Record

The 45 year old PIC was first medically certified in the first class without restrictions in 1991. This was renewed in 1992. In 1993, for the first time he answered "yes" to two history questions: 18.u, "admission to hospital" and 18.x, "Other illness, disability or surgery". In the section for additional information he noted a hospital admission from 11/2/1992 to 11/28/1992 for fractures of his foot and jaws related to an aircraft accident. The Aviation Medical Examiner (AME) made no comments and awarded the pilot a first class medical certificate. The PIC reported the same information in on his next exam in March, 1994 and the AME noted, "Injured as passenger in aircraft accident 11/92. Hospitalized over 3 weeks with surgery to foot and face. Fully recovered with no residuals. No limitations in motion or use of left foot. Not unconscious after crash." His first class medical certificate was awarded in the first class.

In September, 1994 the PIC applied for another first class medical certificate and reported the same information. This time the AME noted repeatedly, "excellent complete recovery from plane accident" and awarded a first class certificate.

In September 1995, the PIC applied for a first class medical certificate without restriction. This time, after checking the same history boxes, his

only comment was “previously reported, no change.” The AME made no comments and awarded the certificate without limitation.

In March, 1996, the PIC checked the same boxes and noted, “explained as before, no change.” He reported 2690 lifetime flight hours with 170 in the previous six months and was rated as an airline transport pilot. This time the AME commented, on the physical exam that the PIC had a tracheostomy scar, a “feeding tube scar in the epigastrium, “ and multiple facial and cranial scars. He went on to comment, “18.u, due to airplane accident and prolonged period of a coma, I have decided to defer his case.” The medical certificate was not awarded and the FAA requested the complete physician records from the hospitalization as well as a current neurological evaluation for further review.

The records provided include a letter dated April 23, 1996, from the surgeon who had treated the patient in 1992 which described the facial and lower extremity injuries and their care at the time. It states, “(the PIC) sustained an intracerebral contusion” and noted that his care involved a neurosurgeon. The letter goes on to state that the PIC “was at no point comatose, but that his mental status mere reflected the level of injury to his internal nervous system.”

Hospital records present in the FAA’s medical certification file from the 1992 admission detail the PIC’s extent of injuries at the time including multiple complex facial fractures and a complex fracture dislocation of the left talus (the bone between the shin bones and the heel bone). His initial mental status was described as combative with comprehensible sounds and purposeful movements of all four extremities. He was sedated and placed on a ventilator to allow further medical and surgical care including multiple surgical procedures on the face, ankle, and foot. The report from the initial CT scan of the brain notes, “The intracranial structures appear normal. There is no evidence of subdural or intracranial hemorrhage.” Multiple CT scans of the head during the initial week did not identify any injury to the brain parenchyma or any collections of blood (“no acute intracranial hemorrhage”).

During the initial days of the hospitalization, the PIC did not readily arouse when his sedation was reduced. However, over the next two weeks his neurologic status slowly improved. Based on the slow neurologic progress and early deficits in concentration, short and long term memory, the PIC was diagnosed with a closed head injury. These deficits improved over the course of his hospital stay, and the discharge summary describes him as at that point being neurologically intact with retrograde amnesia for the accident itself; his short term and cognitive functions were described as “virtually intact.”

A report from the Netherlands Aerospace Medical Centre in Dutch is included in the FAA medical certification file. An English translation is not present. However, the Dutch Safety Board was able to provide a general translation. The pilot had a psychological evaluation and was tested for a number of cognitive skills including processing speed, spatial awareness, visual discrimination and reasoning. His overall performance was documented as moderately positive and it was felt his cognitive abilities were sufficient for flight.

The PIC received an unrestricted, first class medical certificate in August, 1996 with a warning that "operation of an aircraft is prohibited at any time new symptoms or adverse changes occur or any time medication is required." From that point until his last medical certification exam on April 7, 2014, the PIC continued to report the accident and routinely obtain first class medical certificates.

Autopsy

The Massachusetts Office of the Chief Medical Examiner determined that the cause of death was smoke inhalation and thermal injuries. In addition, the pilot had an acute subdural hematoma (a collection of blood between the brain and interior surface of the skull). No significant natural disease was identified.

Toxicology

Forensic toxicology testing was performed at the FAA's Civil Aerospace Medical Institute. The pilot's blood carbon monoxide level was 27%; no cyanide was detected. The testing did not identify any tested for medications or illicit drugs.

Two types of alcohol were identified in the pilot's blood: n-butanol and ethanol (0.035 gm/dl). However, no ethanol was detected in brain or muscle tissue. Ethanol is the alcohol found in beer, wine, and spirits but may also be produced in body tissues by microbial action after death. N-butanol is primarily produced by microbial action after death.

D. SUMMARY OF FINDINGS

This investigation did not identify any report of a significant medical condition in the Second-in-Command. He held a first class aviation medical certificate. The Pilot-in-Command had had a previous airplane accident in 1992. At that time he suffered multiple facial injuries, a fracture-dislocation of his ankle, and a closed head injury. He had recovered and held a first class aviation medical certificate at the time of this accident. No tested for medications or illicit drugs were identified by toxicology testing in either pilot.