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Office of Aviation Safety

Washington, DC 20594



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OPERATIONAL FACTORS/HUMAN PERFORMANCE

Group Chairs' Factual Report

November 12, 2024

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A. ACCIDENT

Location: Houston, Texas
Date: October 24, 2023
Time: 1520 Central Daylight Time (CDT)
2020 Universal Coordinated Time (UTC)
Airplane 1: N510HM; Cessna Citation Mustang
Airplane 2: N269AA; Raytheon Hawker 850XP

B. OPERATIONAL FACTORS/HUMAN PERFORMANCE GROUP

Group Chair	Shawn Etcher NTSB - AS-30 - Operational Factors Washington D.C.
Group Chair	Katherine Wilson NTSB - AS-60 - Human Performance Washington, D.C.
Subject Matter Expert	Contessa Blum NTSB - AS-30 - Operational Factors Washington, D.C.
Group Member	Todd Gentry FAA AVP-100 Washington, D.C.

C. SUMMARY

On October 24, 2023, about 1520 Central Daylight Time (CDT)¹, a Raytheon Hawker 850XP, N269AA, and a Cessna Citation Mustang, N510HM, collided at the intersection of runways 13R and 22 at William P. Hobby Airport. The Citation Mustang sustained damage to the aft lower portion of the vertical stabilizer and the Hawker sustained damage to the left wing and winglet. The pilot and 3 passengers on the Citation Mustang and the 2 pilots and 1 passenger on the Hawker were not injured. The Citation Mustang was being operated under Title 14 *Code of Federal Regulation* (CFR) Part 91 and the Hawker was being operated under Title 14 CFR Part 135 as an On-Demand Operation. The Citation Mustang had departed Fulton County Executive Airport/Charlie Brown Field (FTY), Atlanta, Georgia at 1346 eastern daylight time with a destination of William P. Hobby International Airport (HOU), Houston, Texas. The Hawker was departing HOU and destined for Waukesha County Airport (UES),

¹ Times in this report will be in central daylight time unless otherwise noted.

Waukesha, Wisconsin. Both flights were operating on an instrument flight rules flight plan. Day visual meteorological condition prevailed at the time of the accident.

D. DETAILS OF THE INVESTIGATION

1.0 SPECIALISTS ACTIVITIES

October 24, 2023 - The Operational Factors and Human Performance Group Chairs were notified of the accident and coordinated interviews with the pilots and made travel arrangements.

October 25, 2023 - The group interviewed the pilot of the Cessna Mustang at a local fixed base operator (FBO) and participated in the organizational meeting.

October 26, 2023 - The group interviewed the pilots of the Hawker and an airport operations employee that responded to the accident.

October 27, 2023 - The group worked on field notes and the Human Performance group chair participated in ATC group interviews of the local controller and operations supervisor.

December 1, 2023 - The group requested further manual documentation from the Operator of the Hawker and also a request to CAE for pilot training records.

July 17, 2024 - The group reconvened in West Chicago, Illinois, to interview the DuPage Aerospace Corporation's Director of Operations and then travelled to Des Plaines, Illinois, to interview the FAA Principal Operations Inspector for DuPage Aerospace and his front-line manager.

August 7, 2024 - the group interviewed the DuPage Aerospace Corporation Chief Pilot, via Zoom.

2.0 HISTORY OF FLIGHT

The history of flight was compiled from ADS-B data, Air Traffic Control interviews, and pilot interviews. N510HM, departed FTY about 1347 eastern daylight time (1247 CDT) and climbed to an enroute altitude of FL400. The aircraft then began a descent about 1431 CDT. According to the pilot, the flight was uneventful until the last "10 seconds."

The flightcrew of N296AA departed the hotel about 1345 and arrived at a HOU fixed base operator (FBO) before 1400 for a scheduled 1545 departure. When they arrived, they realized their passenger was already there. The pilot flying went to the airplane to conduct the preflight and prepare the airplane for departure. The pilot

monitoring went to modify the flight plan for an earlier departure. During the fueling of the airplane, the pilot flying was transferring fuel to balance the wing fuel tanks; however, during that process some fuel vented out of the wings onto the ground. The fuel was cleaned up, and the aircraft was towed on the ramp to a location away from the fuel spill. About 1500 the passenger boarded the airplane and the crew began the before engine start checklist. Subsequently, the pilot flying contacted HOU ground control and received taxi clearance from the FBO ramp on taxiway "Kilo" to runway 22. As the flight passed taxiway "K2" they switched frequency from ground control to the air traffic control tower (ATCT) controller. As the airplane began the left turn towards the hold short line for the runway, the flightcrew noticed that the V-speeds were no longer displayed on the display screens. About 1518, the ATCT controller issued the flight a line up and wait authorization (LUAW). The pilot monitoring (PIC²) responded with *"line up and wait uh 22 uh 2269 Alpha"* at 1518:06. N296AA entered runway 22, and subsequently began their departure roll, without ATCT authorization.

About 1518:30, N510HM was on an approximate one and a half mile final for runway 13R.

The local controller was alerted to N269AA rolling by the flight data/clearance delivery controller and about 1519:49 the ATCT controller commanded N269AA with *"Nine Alpha Alpha Stop hold position."* With no audible response recorded at 1519:54 the ATCT controller again stated, *"Alpha Alpha hold your position- stop."*

About 1520, N510HM landed runway 13R and subsequently exited the runway at taxiway "L" and taxied to the FBO.

At 1520:31 the pilot monitoring contacted the ATCT and stated, *"nine alpha alpha we need to come back."* Subsequently, the ATCT controller cleared them to maintain 3,000 ft and fly heading 230.

At 1520:41 the pilot monitoring stated, *"we just had a midair and we can't do that."*

At 1520:43 the controller responded with *"you say what."*

At 1520:44 the pilot monitoring stated, *"somebody just...you guys cleared somebody to takeoff or land and we hit em on departure."* The controller subsequently responded, *"yes sir you need to come back to the airport correct."*

At 1520:53 the pilot monitoring stated, *"yes immediately."* Subsequently, the controller provided the crew with a heading, to which the pilot monitoring responded.

² Pilot in Command

At 1521:12 the ATCT controller provided N269AA clearance to land on runway 13R and the crew responded.

About 1524 N269AA landed runway 13R and subsequently cleared the runway at taxiway "Q."

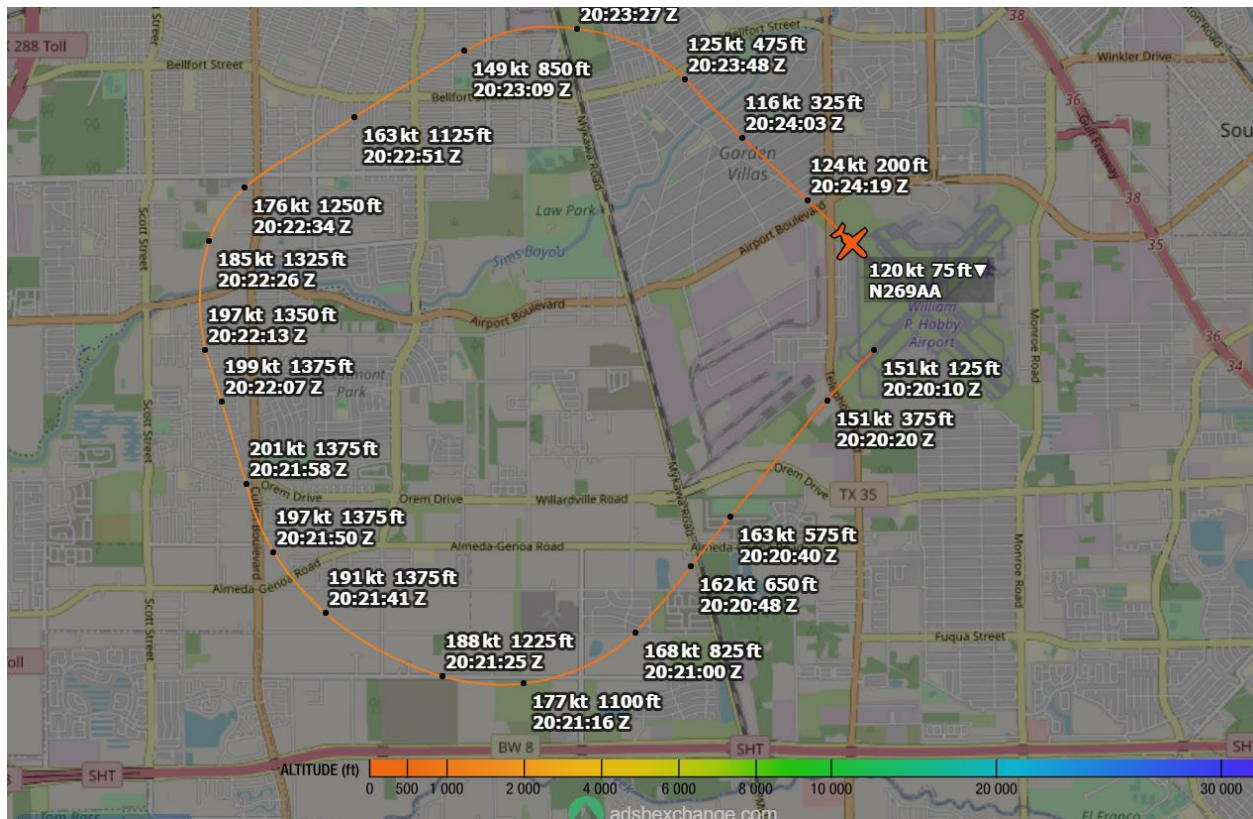


Figure 1. N269AA Accident Flight (Source: ADSBExchange.com)

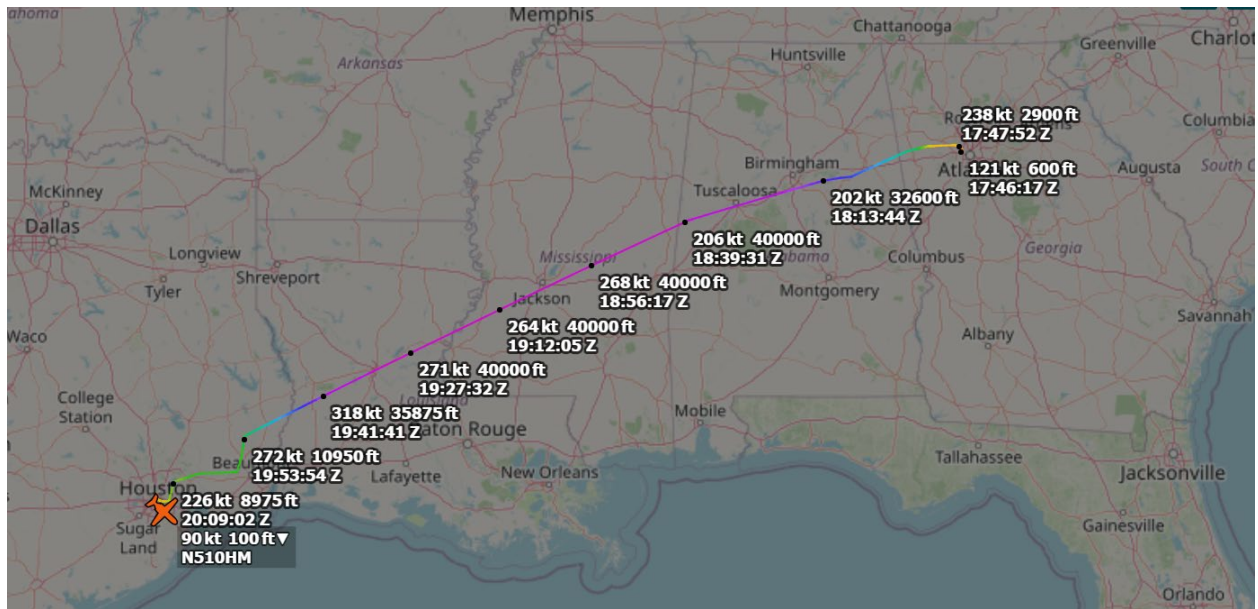


Figure 2. N510HM Accident Flight (ADSExchange.com)

3.0 N510HM



Figure 3: Accident Airplane (Cessna Citation Mustang) (Source: JetPhotos.com)

The aircraft was a Cessna Citation Mustang, Serial No. 0468, and was manufactured in 2016. The aircraft had a standard airworthiness certificate in the normal category which was originally issued on September 14, 2016. It was powered by two Pratt & Whitney Canada PW615F-A-67B engines, capable of producing 1,460 pounds of thrust. The aircraft had 2 crew seats and 4 passenger seats. Additionally, a Garmin G1000 was installed on August 9, 2019.

The airplane was manufactured on July 28, 2016, and registered to SB 501 LLC (Rhino Aviation CJ510, LLC) on August 28, 2021. The airplane's registration was renewed on June 16, 2023.

In an interview with the pilot, he stated that he did not see the Hawker airplane but heard a sound similar to a truck tire blowing out on a highway. He further stated there was no yaw and the airplane had no controllability issues rolling down the runway or taxiing to the ramp. It wasn't until the pilot got out of the airplane that he saw the damage to the airplane.

3.1 N510HM Pilot Information

The pilot, age 40, held a FAA Private Pilot certificate with ratings for Airplane Multiengine Land, Airplane Single-Engine Land, Instrument Airplane, and a type rating in the CE-510S³. He had a FAA Third Class medical certificate issued on May 3, 2023, with no restrictions or limitations.

3.2 N510HM Pilot Certification Records

FAA records of the pilot indicated the following certificate history:

Student Pilot; Limitations - Carrying Passengers is Prohibited certificate was issued on November 4, 2018.

Private Pilot - Airplane Single-Engine Land; Limitation: English Proficient certificate was issued on January 9, 2019.

Private Pilot - Airplane Single-Engine Land; Instrument - Airplane; Limitations: English Proficient certificate was issued on January 11, 2021.

Private Pilot - Airplane Single-Engine, Multiengine, Instrument; Limitations: English Proficient certificate was issued on September 30, 2021.

Private Pilot - Airplane Single-Engine, Multigene, Instrument; CE-510⁴; Limitations: English Proficient, CE-510 Second in Command Required certificate was issued on October 30, 2021.

Private Pilot - Airplane Single-Engine, Multigene, Instrument; CE-510, CE-510S; Limitations: English Proficient certificate was issued on March 3, 2022.

3.3 N510HM Pilot's Certification and Ratings Held at Time of the Accident

PRIVATE PILOT (Issue March 3, 2022)

Airplane Multiengine Land
Airplane Single-Engine Land
Instrument Airplane
Type Rating: CE-510, CE-510S
Limitations: English Proficient

MEDICAL CERTIFICATE THIRD CLASS (issued May 3, 2023)

³ Textron Aviation Inc. 510 (Single Pilot). Source: FAA Order 8900.1 Figure 5-88 dated July 15, 2019.

⁴ Textron Aviation Inc. 510 (SIC Required). Source: FAA Order 8900.1 Figure 5-88 dated July 15, 2019.

3.4 N510HM Pilot's Flight Times

The pilot's estimated flight hours were based on the information the pilot provided during a post-accident interview. The pilot estimated he had about 1,000 total hours of flight experience and about 300 of those hours were in the accident airplane make and model.

3.5 N510HM Pilot's Training and Proficiency Checks

The following training record information was provided by Executive Flight Training:

Date of Most Recent FAA Flight Review	March 3, 2022
Date of Most Recent CFR 61.58 Recurrent Training	November 3, 2022

4.0 N269AA



Figure 4: Accident Airplane (Hawker 850XP) (Source: Planespotters.net)

The aircraft, a Raytheon Aircraft Company Hawker 850XP, Serial No. 25880, was manufactured in 2006. The aircraft was issued a Transport category Standard Airworthiness certificate on August 23, 2006.

N269AA's planned route of flight to UES was INDIE8.TPAKK LIT LEEDN.GOPAC3 with a planned enroute altitude of FL390, a fuel burn of approximately 4,000 lbs. of fuel, and had an estimated time enroute of 2:07. According to the DuPage Aerospace Trip Log, the pilots went on duty at 18:30 UTC (1330). The accident flight taxied out at 20:13 UTC (1513) and departed at 2019 UTC (1519). The flight returned and landed HOU at 2024 UTC (1524) with a total flight of 0.1 hours and a fuel burn of approximately 500 lbs. The day prior to the accident flight, the flight departed UES at 1313 UTC (0813) and arrived HOU at 1550 UTC (1050) This flight was 2.4 hours in duration and used 4,200 lbs. of fuel.

In an interview with the pilots, they stated there was no discrepancies with the airplane prior to departure. Both crew members stated that they did not see the Citation Mustang until about 1 second prior to impact. They described the feeling of the impact as a "thud." Additionally, during the beginning of the takeoff roll the Pilot Flying reported that he felt the rudder bias engage and in order to clear that bias, he pulled the engines back towards idle and then advanced them evenly and slowly. Additionally, they described receiving an elevator trim annunciator light, while beginning the takeoff roll, but the pilot monitoring rolled the trim wheel about "a sixteenth of an inch" and the light extinguished. Both pilots had experienced the trim light on previous flights and knew that rolling the trim wheel slightly would extinguish the annunciator light.

4.1 Elevator Trim

A document provided by DuPage Aerospace Corporation, dated November 2011, provided the following information, in part, about the elevator trim:

The elevators provide primary control of the aircraft in the pitch axis mechanically through control column movement or electronically through the autopilot elevator servo...a microswitch in each trim jack monitors elevator trim setting. If the elevator trim is set outside the takeoff range with weight-on-wheels, advancing the throttles about the 60% N1 RPM position causes the microswitches to illuminate the MWS panel amber ELEV/AIIL TRIM annunciator. Setting elevator within the takeoff setting range extinguishes the annunciator...

4.2 Elevator Out-of-Trim Warning

A document provided by DuPage Aerospace Corporation, dated July 1995, provided the following information on the warning system:

A warning of the elevator being out of trim for take-off is given by the ELEV/AIL TRIM annunciator being lit (on the main MWS⁵ panel) if the following conditions apply:

- Aircraft weight is on wheels.*
- Both engine thrust levers are advanced to more than 40 to 60% N1 power.*

4.2.1 Elevator Out-of-Trim Warning Annunciator

The elevator out of trim annunciator was located on the main MWS panel and indicated the following:



According to an interview with the DuPage Aerospace Corporation Chief Pilot the company takeoff briefing included: *"the first line of it is below knots, we'll abort for any fault or failure called from either seat."*⁶ Additionally, the Chief Pilot expanded that *"The training is and the briefing is, below 80 knots, we'll abort for any fault or failure, called from either seat. That is the briefing. And, you know, in my particular case, if somebody says, well, it was just a little out. I go, how did you know? By the time you look down and decided to re-trim the airplane, you could have been stopped, you know. Again, if we're going to brief that we're going to abort for a fault or failure, and a fault pops up on the annunciator panel, then you should be aborting, and they would have been aborting at 10 knots, okay. It would have no brake cooling. There would have been no cooling they would have had to announce that they needed to clear the runway, and we'll call you when we're ready again... It depends what the fault or failure is. If they look down and see elevator trim and it's actually dead center of the green arc, I'd be all concerned myself. If they see it way at the bottom or way at the top of the green arc, although it may appear to be in the green arc, it's not there, by the little micro switch or whatever that's in the pedestal, I would re-trim the airplane. I would move the throttles up and back into the takeoff position and make sure the light doesn't come on. If it came on again, even though the airplane was re-trimmed, I wouldn't go... Because you never know. It might be actually out of trim and the indicator broken. It could have lost a push rod to the trim tab. Who knows what it could be. But -- so, yes, the answer to your question is, if you re-trim and it tests okay, then I would taxi back and go. If you re-trim and it doesn't test okay, then I'd be taxiing back to the ramp and calling management."*⁷

⁵ Master Warning System.

⁶ Operational Factors/Human Performance - Attachment 4 - "DuPage Aerospace Corporation Personnel Interview Transcripts" pg. 85 lines 3-5.

⁷ Operational Factors/Human Performance - Attachment 4 - "DuPage Aerospace Corporation Personnel Interview Transcripts" pg. 118 line 17 thru pg. 119 line 7.

4.3 Rudder Bias

A document provided by DuPage Aerospace Corporation provided the following information about the rudder bias system:

The rudder bias system automatically reacts with rudder movement if an engine failure or malfunction occurs. A spring strut reduces the rudder bias effect at large rudder deflections.

Engine bleed air from the LP⁸ stage of each engine drives the rudder bias system. LP bleed air from each engine travels to opposite ends of a double-acting pneumatic strut. Under symmetrical power conditions, the LP bleed air pressures balance within the struts, resulting in no net rudder input. Under asymmetric power conditions, air pressure differential between the engines operates the pistons so the rudder moves to counteract the asymmetric thrust.

Note: *The rudder bias switches must be ON and the systems operative during each takeoff.*

A guard cover holds the RUDDER BIAS switches ON to prevent inadvertent shutoff. With one or both RUDDER BIAS switches OFF, an amber RUDDER BIAS annunciator illuminates. With one switch OFF, the rudder bias system produces less assistance.

During flight with both switches OFF, no rudder bias assistance is available.

Two electrically heated elements embedded in a muff prevent strut icing.

Both rudder bias systems must be operative before takeoff. Check the rudder bias system while taxiing. Place both RUDDER BIAS switches in OFF then advance the left throttle to about 80% N2 RPM. The rudder pedals should not deflect. Continue by placing the A switch ON with the B switch OFF then placing the A switch OFF and the B switch ON.

The rudder bias system should deflect the rudder in the appropriate direction to counteract asymmetric thrust from the left engine. Close the left throttle and repeat the same test for the right engine. After checking the system, place both RUDDER BIAS switches ON and close their guards.

⁸ Low Pressure

4.4 N269AA Pilot Flying Information

The pilot flying (PF) was 69 years old and had a FAA Airline Transport Pilot certificate with ratings for airplane single- and multiengine land airplane, with type ratings for B-737, B-757, B-767, B-777, B-787, DC-9, HS-125 with limitations of B-757, B-767, B-777, B-787 circling approaches - VMC only, and English Proficient. Additionally, he had a Flight Engineer certificate with rating of Turbojet Powered and a Mechanic certificate with Airframe and Powerplant.

FAA Records indicated that the PIC was involved in an incident on April 15, 2023, in which the airplane he was flying landed with the landing gear retracted.

4.4.1 N269AA PF's Certification Records

FAA Records of the PF indicated the following certificate history:

Private Pilot - Airplane Single-Engine Land certificate was issued on October 28, 1974.

Commercial Pilot - Airplane Multiengine Land - limited to center thrust; Instrument-Airplane; Private Privileges - Airplane Single-Engine Land certificate was issued on August 9, 1984.

Airline Transport Pilot - Airplane Multiengine Land; Private Pilot Privileges - Airplane Single-Engine Land certificate was issued on October 7, 1984.

Notice of Disapproval - Flight Engineer was issued on January 11, 1986. Unsatisfactory items: Entire Oral: Recommend 4 hours classroom instruction on engine wing anti-icing, and 1 hour instruction on limitations.

Flight Engineer - Turbojet Powered; Limitations: This certificate is subject to the provisions of Exemption No. 2095, as amended certificate was issued February 9, 1986.

Flight Engineer - Turbojet Powered certificate was issued February 19, 1986.

Airline Transport Pilot - Airplane Multiengine Land, DC-9; Private Pilot Privileges - Airplane Single-Engine Land certificate was issued on June 1, 1992.

Airline Transport Pilot - Airplane Multiengine Land, DC-9, B-737; Private Pilot Privileges - Airplane Single-Engine Land certificate was issued on August 22, 2000.

Airline Transport Pilot - Airplane Multiengine Land, DC-9, B-737, B-757, B-767; Private Pilot Privileges - Airplane Single-Engine Land; Limitations: B-757 B-767 Circ Apch-VMC Only, English Proficient certificate was issued on April 5, 2008.

Airline Transport Pilot – Airplane Multiengine Land, DC-9, B-737, B-757, B-767, B-777; Private Pilot Privileges – Airplane Single-Engine Land; Limitations: B-757 B-767 B-777 Circ Apch- VMC Only, English Proficient certificate was issued on November 3, 2011.

Airline Transport Pilot – Airplane Multiengine Land, DC-9, B-737, B-757, B-767, B-777; Commercial Privileges – Airplane Single-Engine Land; Limitations: B-757 B-767 B-777 Circ Apch- VMC Only, English Proficient certificate was issued on October 20, 2016.

Airline Transport Pilot – Airplane Multiengine Land, DC-9, B-737, B-757, B-767, B-777, B-787; Commercial Privileges – Airplane Single-Engine Land; Limitations: B-757 B-767 B-777 B-787 Circ Apch- VMC Only, English Proficient certificate was issued on January 17, 2018.

Airline Transport Pilot – Airplane Multiengine Land, DC-9, B-737, B-757, B-767, B-777, B-787, HS-125; Commercial Privileges – Airplane Single-Engine Land; Limitations: B-757 B-767 B-777 B-787 Circ Apch- VMC Only, English Proficient certificate was issued on October 20, 2021.

Mechanic – Airframe, Powerplant certificate was issued on December 14, 2022.

4.4.2 N269AA PF's Certification and Ratings Held at the Time of the Accident

AIRLINE TRANSPORT PILOT issued October 20, 2021

Airplane Multiengine Land

Commercial Privileges

Airplane Single-Engine Land

Type Ratings: B737, B757, B767, B777, B787, DC-9, HS-125

Limitations: English Proficient B737, B757, B767, B777, B787 Circle Approach VMC only.

FLIGHT ENGINEER issued February 19, 1986

Turbojet Powered

MECHANIC issued December 14, 2022

Airframe, Powerplant

MEDICAL CERTIFICATE FIRST CLASS issued May 12, 2023

Restrictions: Must use correct lens(es) to meet vision standards at all required distances].

4.4.3 N269AA PF's Flight Hours

The following information was obtained from the PF's interview, company and FAA records. The times below are approximate:

Total Flight Experience	24,000
Total Flight Experience in an HS-125	300

4.4.4 N269AA PF's Training

According to DuPage Aerospace Corporation documentation, the PIC's training records, in part, indicated the following:

Basic Indoctrination Training	October 22, 2021
Most Recent Recurrent Ground Training ⁹	January 30, 2023
Most Recent Recurrent Training ¹⁰	February 3, 2023
Most Recent FAR 135.293(a) (b) ¹¹	February 3, 2023
Most Recent FAR 135.297 and 135.299 ¹²	September 24, 2023
Most Recent HS-125-900XP Difference Training	May 1, 2023

4.4.5 N269AA PF's Recent Activities

He had a crash pad in Aurora, Illinois, about a 30-minute drive from the DuPage airport. He had been in Illinois since October 12 or 13th flying short trips lasting 2 or 3 days. On October 22, 2023, he flew a trip and arrived back to DuPage about 1600. He arrived at his crash pad close to 1800, had dinner and was in bed between 2000 and 2100.

On October 23, the PF set his alarm for 0330 because he had a 0630 departure from DuPage. He felt rested that day. He took about an hour nap, went to the gym, had dinner, and then went to bed. His bedtime was unknown.

On October 24, he woke up about 0830 and had breakfast at 0900. He had an extended checkout and completed paperwork and training before the flight. He thought he dozed off while completing the training but felt rested for the flight. He did not recall if they took an uber or shuttle to the airport.

He had no issues falling asleep or staying asleep and had never talked to his doctor about a sleep disorder. He thought he needed 7 hours of sleep on average per

⁹ Ground training began on January 30 and concluded on January 31.

¹⁰ Included 2 simulator session which were conducted on February 1 and 2, an Oral exam and checkride on February 3, 2023. The simulator training on included February 1 included a rejected takeoff which was graded as a "2-33" or "Additional training required during single training session." Additionally, it was demonstrated on the checkride and was graded "S" or satisfactory.

¹¹ The event was conducted in a simulator and 45 events and all were marked as "S" or satisfactory.

¹² The Recurrent proficiency check included 29 events to be examined and all were graded with "s" or satisfactory. The checking event was marked as conducted in aircraft and was "approved."

night to feel rested. He may sleep up to 10 hours when arriving back home in San Diego after flying.

4.5 N269AA Pilot in Command Information

The PIC was 67 years old and held an FAA Airline Transport Pilot Certificate with ratings for Airplane Single- and Multiengine Land and type ratings of B-727 , B-737, CE-500 , DA-20 , DC-9, G-200 , HS-125, LR-JET . Limitations of B-737 circling approach - VMC only and English Proficient. Additionally, he held a Flight Engineer certificate with rating of turbojet powered. He held a First-Class medical certificate, dated September 26, 2023 with a limitation of Must use corrective lens(es) to meet vision standards at all required distances."

FAA's NPTRS¹³ database indicated that the PIC was involved in a pilot deviation on December 19, 2015, during a Part 135 training flight violated a Class D airspace without establishing the required two-way radio communication. Additionally FAA Records indicated that on November 9, 1999 the pilot's certificate was suspended for 30-days due to violation of Section 121.547 "Admission to the flight deck," of the Federal Aviation Regulations. Additionally on February 29, 2000 the pilot's ATP certificate and Flight Engineer Certificate were suspended for 120-days and 60-days respectively due to violations of CFR 61.15(f) "Offenses involving alcohol or drugs," and CFR 67.403 (a)(1) "Applications, certificates, logbooks, reports, and records: Falsification, reproduction, or alteration' incorrect statements."

4.5.1 N269AA PIC's Certification Records

FAA Records of the PIC indicated the following certificate history:

Private Pilot - Airplane Single-Engine Land certificate was issued on February 20, 1973.

Commercial Pilot - Airplane Single- and Multiengine Land - Carrying Passengers in Airplanes for Hire is Prohibited at Night and on Cross-Country Flights of More than 50 Nautical MILTS [sic]. certificate was issued on November 4, 1978.

Notice of Disapproval - Commercial Pilot Airplane Single-Engine Land, Instrument Airplane was issued on January 24, 1979. Unsatisfactory items: Pilot Operation: IIA, III A&O, IV H&I Failed to use approved instrument departure procedures. ILS & Steep Turns not Accomplished.

Commercial Pilot - Airplane Single- and Multiengine Land; Instrument - Airplane certificate was issued on February 4, 1979.

¹³ National Program Tracking and Reporting Subsystem.

Airline Transport Pilot – Airplane Multiengine Land; Commercial Privileges: Airplane Single-Engine Land certificate was issued on November 13, 1979.

Airline Transport Pilot – Airplane Multiengine Land, LR-JET¹⁴; Commercial Privileges: Airplane Single-Engine Land certificate was issued on July 17, 1981.

Notice of Disapproval - Flight Engineer – Turbojet Powered was issued on October 14, 1983. Unsatisfactory Items: Complete Oral examination.

Flight Engineer – Turbojet Powered; Certificate issued under the provisions of exemption No. 2095D certificate was issued on October 26, 1983.

Flight Engineer – Turbojet Powered certificate was issued on December 30, 1983.

Airline Transport Pilot – Airplane Multiengine Land, LR-JET, CE-500¹⁵; Commercial Privileges: Airplane Single-Engine Land certificate was issued on December 6, 1984.

Airline Transport Pilot – Airplane Multiengine Land, LR-JET, CE-500, DC-9; Commercial Privileges: Airplane Single-Engine Land certificate was issued on August 1, 1990.

Airline Transport Pilot – Airplane Multiengine Land, B-727¹⁶, DC-9, LR-JET, CE-500; Commercial Privileges: Airplane Single-Engine Land certificate was issued on January 9, 1980.

Airline Transport Pilot – Airplane Multiengine Land, B-727, B-737, DC-9, LR-JET, CE-500; Commercial Privileges: Airplane Single-Engine Land; Limitation: B-737 Circ. Apch. – VMC Only certificate was issued on February 16, 1999.

Airline Transport Pilot – Airplane Multiengine Land, B-727, B-737, DC-9, LR-JET, CE-500, DA-20¹⁷; Commercial Privileges: Airplane Single-Engine Land; Limitation: B-737 Circ. Apch. – VMC Only certificate was issued on March 16, 2009.

Airline Transport Pilot – Airplane Multiengine Land, B-727, B-737, DC-9, LR-JET, CE-500, DA-20, HS-125; Commercial Privileges: Airplane Single-Engine Land; Limitation:

¹⁴ Learjet Inc. 24, 24A, 24B, 24D, 24e, 24F, 28, 29, 31, 31A, 35, 35A, 36, 55, 55B, 55C. Source FAA Order 8900.1, Figure 5-88 dated July 15, 2019.

¹⁵ Textron Aviation Inc. 500, 501, 550, S550, 551, 552, 560. Source: FAA Order 8900.1, Figure 5-88 dated July 15, 2019.

¹⁶ The Boeing Company B727, B727-100, B-727-200. Source: FAA Order 8900.1, Figure 5-88 dated July 15, 2019.

¹⁷ Dassault Aviation Fan Jet Falcon, Fan Jet Falcon Series C, Fan Jet Falcon Series D, Fan Jet Falcon Series E, Fan Jet Series F, Fan Jet Falcon Series G, Mystère Falcon 20-C5, Mystère Falcon 20-D5, Mystère Falcon 20-E5, Mystère Falcon 20-F5. Source: FAA Order 8900.1, Figure 5-88, dated July 15, 2019.

B-737 Circ. Apch. – VMC Only, HS-125 SIC Privileges only certificate was issued on March 31, 2015.

Notice of Disapproval – Airline Transport Pilot Multiengine Land- Airplane was issued on December 6, 2015. Unsatisfactory items: Instrument Procedures: AOA V, Task D; Task F. AOA II, III, and IV Task A, Task B, and Task F all complete satisfactory.

Notice of Disapproval – Airline Transport Pilot Multiengine Land- Airplane was issued on December 8, 2015. Unsatisfactory items: Instrument Procedures: AOA V, Task B.

Airline Transport Pilot – Airplane Multiengine Land, B-727, B-737, DC-9, LR-JET, CE-500, DA-20, HS-125, MU-300¹⁸; Commercial Privileges: Airplane Single-Engine Land; Limitation: B-737 Circ. Apch. – VMC Only certificate was issued on January 6, 2016.

Airline Transport Pilot – Airplane Multiengine Land, B-727, B-737, DC-9, LR-JET, CE-500, DA-20, HS-125, MU-300, G-200¹⁹; Commercial Privileges: Airplane Single-Engine Land; Limitation: B-737 Circ. Apch. – VMC Only certificate was issued on November 10, 2021.

4.5.2 N269AA PIC's Certificates and Ratings Held at the Time of the Accident

AIRLINE TRANSPORT PILOT

Airplane Multiengine Land

Commercial Privileges Single-Engine Land

Type Ratings: B727, B737, CE-500, DA-20, DC-9, G-200, HS-125, LR-JET

Limitations: English proficient B737 Circle Approach VMC only

4.5.3 N269AA PIC's Flight Hours

According to the PIC's interview he had about 28,000 hours of total flight experience and approximately 3,800 hours of flight experience in the accident aircraft make and model.

4.5.4 N269AA PIC's Training

According to DuPage Aerospace Corporation documentation, the PIC's training records, in part, indicated the following:

Basic Indoctrination Training	November 8, 2014
-------------------------------	------------------

¹⁸ Textron Aviation Inc. MU-300, MU-300-10, 400, 400A, 400T. Source: FAA Order 8900.1, Figure 5-88, dated July 15, 2019.

¹⁹ Gulfstream Aerospace LP Galaxy, Gulfstream 200. Source: FAA Order 8900.1, Figure 5-88, dated July 15, 2019.

Most Recent Recurrent Ground Training ²⁰	January 28, 2023
Most Recent Recurrent Training ²¹	February 1, 2023
Checkairman and Instructor (Ground/Flight	June 1, 2023
Most Recent FAR 135.293(a)2-3(b) ²²	February 1, 2023
Most Recent FAR 135.297 and 135.299 ²³	August 28, 2023
Most Recent HS-125-900XP Difference Training	April 27, 2023

4.5.5 N269AA PIC's Recent Activities

He had flown a multi-day trip which ended on Saturday, October 21, 2023. He was off duty on Sunday, October 22. He did work around his house. He thought he went to bed about 2100 and got a good night's sleep.

On Monday, October 23, he had an early show, he thought 0430, for a 0630 departure from DuPage. He thought he woke up about 0230 or 0300. They flew to Waukesha and then flew to Houston. He thought he may have napped sometime during the afternoon. He thought they arrived at the hotel about 2030 or 2100 and he went to bed after Monday Night Football ended.

On Tuesday, October 24, he woke up by 0830 with his alarms which were set for 0800, 0815 and 0830, and went downstairs for a coffee and breakfast snack. He went back to his room and got ready for his day. He did not nap prior to the accident flight. He thought Signature picked them up and took them to the airport. He felt "perfect" and was excited to go flying.

He had no issues falling asleep or staying asleep.

4.6 Medical and Pathological Information

The Hawker pilots underwent postaccident urine drug testing and breathalyzer alcohol testing on the day of the accident as a part of the Department of Transportation's Drug and Alcohol Testing program. No tested-for substances (6-

²⁰ Ground training began on January 27 and concluded on January 28.

²¹ Included 2 simulator session which were conducted on January 30 and 31, an Oral exam and checkride on February 1, 2023. The simulator training on January 30th included a rejected takeoff which was graded as a "3" or "proficient. The exercise has been mastered and performance is consistently repeatable." Additionally, it was demonstrated on the checkride and was graded "S" or satisfactory.

²² The event was conducted in a simulator and 45 events and all were marked as "S" or satisfactory.

²³ The Recurrent proficiency check included 29 events to be examined and all were graded with "s" or satisfactory. The checking event was marked as conducted in aircraft and was "approved."

aceyate morphine, marijuana metabolites, cocaine metabolites, amphetamines, MDMA, opiates, and phencyclidine) nor alcohol were detected.

4.7 N269AA Weight and Balance

The N269AA's weight and balance graphical depiction (pictured below) indicated that the take off for "leg 2" was below the maximum takeoff weight and above the maximum landing weight. The center of gravity also was within the allowable range.

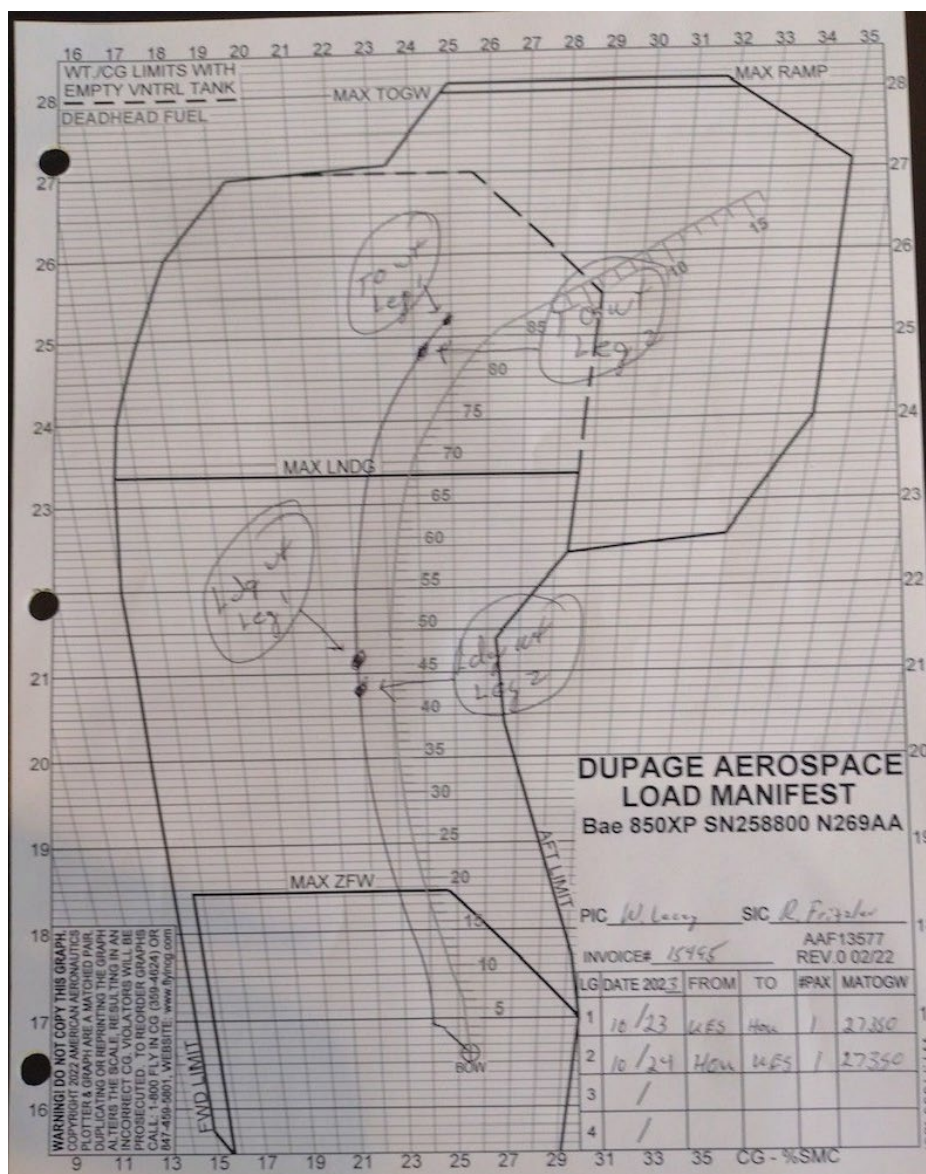


Figure 5: Actual Weight and Balance for Accident Flight (Note: Accident Flight is "Leg 2")

4.8 N269AA Operator

N269AA was operated by DuPage Aerospace Corporation. According to the company's website, DuPage Aerospace Corporation was a 14 *CFR* Part 135 operator, located on DuPage Airport in West Chicago, Illinois.²⁴ The fleet consisted of 8 aircraft, of which 5 were Hawkers.

5.0 AIRPORT INFORMATION

William P. Hobby Airport was located about 8 miles southeast of Houston, Texas. It was a publicly owned airport by the City of Houston. The airport elevation was 46 ft above mean sea level and had three paved landing surfaces designated as runway 4/22, 13R/31L, and 13L/31R. The paved surface for runway 13R/31L was 7,602 ft long and 150 ft wide, Runway 4/22 was 7,602 ft long and 150 ft wide, and 13L/31R was 5,148 ft long and 100 ft wide. The airport was serviced by an air traffic control tower, which was in operation at the time of the accident. Operations in a 12-month period, ending on April 30, 2023, totaled 207,669 of that, 57,272 were considered general aviation.

²⁴ Source: dupageaerospace.com

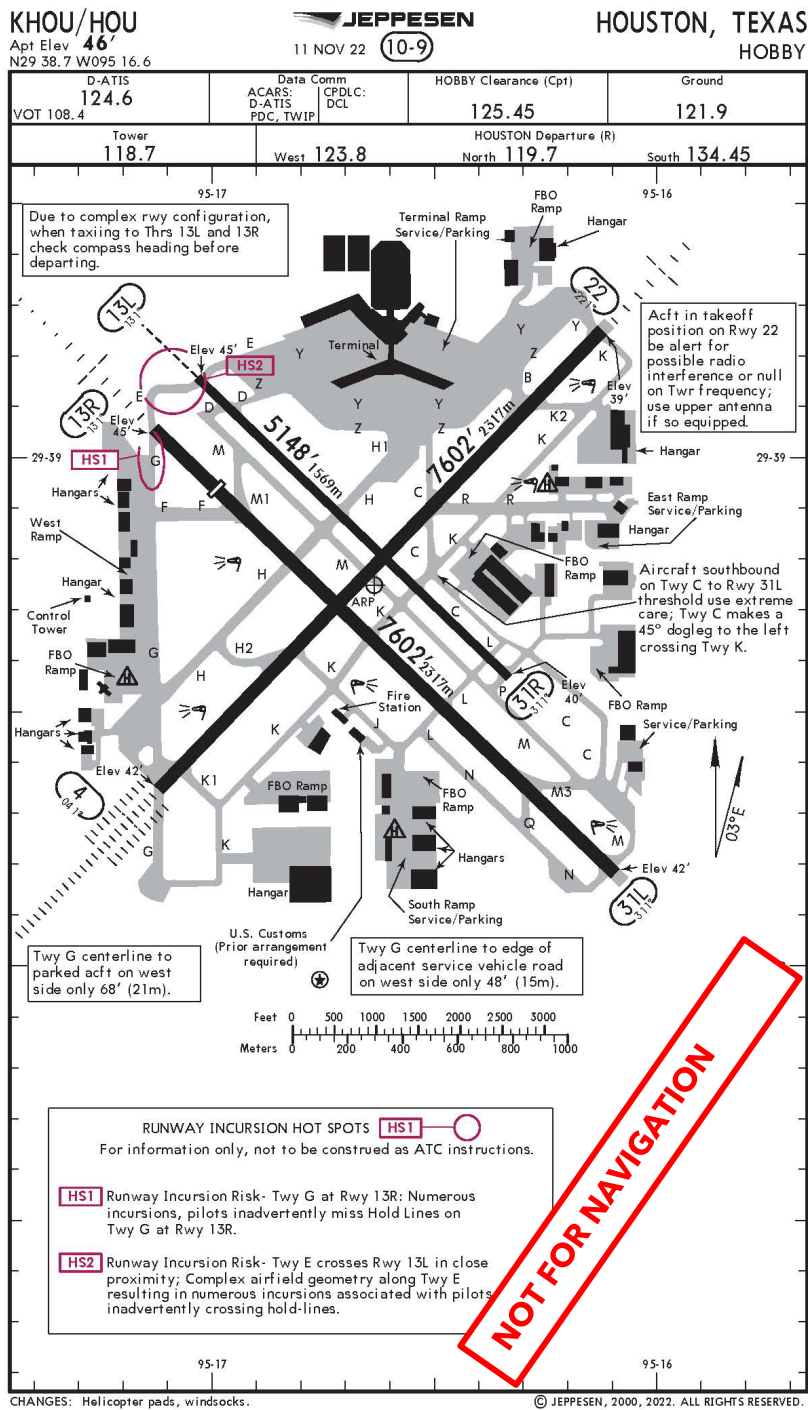


Figure 6: HOU Airport Page (Source: Jeppesen)

6.0 METEOROLOGICAL INFORMATION

The NTSB Meteorologist reported the following meteorological conditions surrounding the time of the accident:

KHOU 242153Z 15016G26KT 10SM SCT034 SCT055 29/19 A2994 RMK AO2 PK WND 15026/2127 SLP142 T02890194

KHOU 242053Z 15017G24KT 10SM SCT035 SCT060 29/20 A2995 RMK AO2 PK WND 14028/2005 SLP146 T02940200 56014

accident time ~2020 UTC

KHOU 241953Z 15017G27KT 10SM SCT035 SCT055 29/20 A2995 RMK AO2 PK WND 17030/1924 SLP146 T02940200

KHOU 241853Z 13019G28KT 10SM BKN040 30/20 A2997 RMK AO2 PK WND 14028/1847 SLP153 T03000200

PIREPs²⁵ around the time of the event:

IAH UA /OV IAH360020/TM 1847/FL040/TP E545/SK B040

IAH UA /OV 6R3/TM 1900/FL070/TP C208/SK B050 T065/TB LGT

HOU UA /OV HOU/TM 1900/FL065/TP B738/SK B032 T065

HOU UA /OV HOU315010/TM 1934/FL033/TP B737/SK BASES BKN033

CXO UA /OV CXO/TM 1955/FL002/TP C172/RM WINDY

accident 2020 UTC

IAH UA /OV IAH270015/TM 2212/FL041/TP E145/RM BASES 041

7.0 DuPage Aerospace Guidance

7.1 Crew Reporting

The DuPage Aerospace Corporation Standard Operating Procedures, dated October 1, 2021, provided the following information:

Crew Reporting

*Unless otherwise limited by FAR duty/rest requirements the following show time policy will be adhered to. Crewmembers are expected to report for duty at least 1 ½ hours if departing **with no** Passengers and 2 hours if departing **with** Passengers prior to the scheduled departure time provided by dispatch.*

The captain may designate an earlier report time for the crew at his/her discretion. Report time should not be set so early that it could compromise the maximum duty day requirements. If an earlier report time is needed, the Captain must inform Scheduling. Some customers require our aircraft and crews to be in position and ready to go 1 hour prior to the scheduled departure time.

A show time of 2½ hours or more might be necessary if:

- There are unusual circumstances regarding the flight which would require extra preparation time*

²⁵ Pilot Reports

- *Adverse weather is expected which would dictate extra flight planning time (deicing, fueling, etc.)*
- *Extended cabin preparation (extensive catering, special client requests, past client history, etc...)*

When positioning the aircraft from one airport to another for the purpose of picking up passengers and/or cargo, the PIC must take into consideration the weather and anticipated ATC delays in determining the show time and departure time from the origination airport.

If duty time is a possible critical issue, a "short show" (less than the normal 2 hours or 1 ½ hours) may be approved by either the Chief Pilot or Director of Operations with specific limitations. The reduction in show time hours must not affect safety.

7.2 General Operations

The DuPage Aerospace Corporation Standard Operating Procedures, dated October 1, 2021, provided, in part, the following general operations guidance:

- *The captain will occupy the left seat for all takeoffs and landings except as follows:*
 - *A type rated first officer, with left seat authorization from the Chief Pilot, may fly from the left seat at the captain's discretion.*
 - *A company first officer who is preparing for a type rating, with left seat authorization from the Chief Pilot, may fly from the left seat while receiving training on deadhead legs only.*

7.3 PIC Operational Control, Responsibility and Command Authority

The DuPage Aerospace Corporation General Operations Manual, dated May 15, 2013, provided, in part, the following guidance:

PIC OPERATIONAL CONTROL

Each Pilot in Command of a company aircraft assumes operational control of that flight pursuant to that described under FAR 91.3, responsibility and authority of the pilot in command.

Management's assignment of a flight crew for a flight authorizes the Pilot in Command to exercise operational control of that flight, to include the departure, arrival, and any planned intermediate stops. This authorization does not prohibit the PIC from exercising his authority to deviate as necessary from the flight release to ensure the safety of that flight or managements operational control

authority to deviate or terminate a flight for safety or security reasons. Any diversion and landing at other than the originally planned destination requires that the PIC notify the company as soon as practical of the location of the aircraft and crew and the reason for the diversion.

PIC RESPONSIBILITY and COMMAND AUTHORITY

Responsibility: The assigned PIC of the flight, as designated on the flight paperwork, will remain the PIC for the entire flight and is responsible for the safe conduct of that flight. In the case when two captains are assigned to the same flight, the PIC may occupy either pilot seat provided he has received seat dependency training. The PIC may be the pilot not flying. A SIC will not occupy the left seat unless meeting operating experience requirements of a new PIC in which case the person occupying the right seat would be the PIC serving as an approved check captain.

The PIC's responsibility for the aircraft, its occupants, and its cargo, commences when the aircraft is released to him by the Company, and remains in force until the termination of the flight. The aircraft will be operated in accordance with all applicable regulations, OpSpecs, and company policies and procedures. This does not preclude the PIC from deviating from any regulation or operating practice during an emergency to ensure the safety of the flight. The PIC's responsibility for the aircraft terminates when the aircraft and associated flight documentation for that specific flight is completed at the end of the assigned flight.

The exception to the PIC's command authority and responsibility is if the PIC becomes incapacitated during flight. In this case, the SIC would assume command authority and responsibility for the flight. In the event the Pilot in Command becomes incapacitated, the SIC will as soon as practical and by the most expeditious means, notify the Company as to the nature of the emergency and the actions taken.

Command Authority: The PIC assumes command authority over the aircraft, passengers, cargo, and all flight crewmembers from the time the aircraft is released to him, including all intermediate stops, until such time as that PIC relinquishes command authority back to company after completion of the flight assignment. The PIC will be responsible for the crewmember logistics when away from the principal operations base to include the duty report times.

PILOTS - GENERAL

It is the intent of this section to list specific duties and responsibilities for both the PIC and SIC. The PIC has final authority in the execution of these duties and may

at his discretion make changes as necessary to assure the safe and efficient conduct of the flight.

DuPage Aerospace Corporation will designate, for each assigned trip, a PIC and when applicable an SIC. This designation will be noted on the load manifest and on the flight log.

This designation will be valid for the entire assigned trip regardless of the number of flight legs. If a change in crewmember status becomes necessary during the course of a multiple day or multiple flight leg assignment the Charter Coordinator on duty must be made aware of that fact and the appropriate notations made on the load manifest and flight log.

The PIC has the ultimate responsibility and therefore the authority for the conduct of the assigned flight. In the case of a two-person crew, the PIC authority should not be interpreted as unchallengeable, should the SIC feel that proper procedures are not being followed for the safe and efficient conduct of the flight.

When two pilots are assigned, guidelines have been established for job assignments. These guidelines are provided as an orderly and efficient means to accomplish tasks required in the preparation, conduct, and completion of the flight.

During the Preflight, Inflight, and Postflight phases, some tasks must be accomplished by the PIC while those tasks not specifically required to be accomplished by the PIC may be delegated to the SIC.

7.4 Preflight Duties

The DuPage Aerospace Corporation General Operations Manual, dated May 15, 2013, provided, in part, the following guidance on preflight:

PIC Preflight

...

12. Supervises the SIC, to ensure that his actions are in compliance with ATC instructions, applicable regulations, the Aircraft Flight Manual, OpSpecs, and company policies and procedures.

...

SIC PREFLIGHT

...

5. Monitoring of the fueling of the aircraft in accordance with the procedures established in this GOM.

7.5 Fueling Procedures

The DuPage Aerospace Corporation General Operations Manual, dated May 15, 2013, Chapter 4 "Fueling Procedures" provided, in part, the following guidance:

- M. *The PIC or SIC will take fuel samples from each sump, on the first flight of the day checking for contamination and proper fuel type and grade. In addition, the procedures for draining the sumps, as outlined in each specific AFM, will be followed.*
- N. *Secure all caps and their access doors following service.*
- O. *The PIC or SIC will monitor the fueling procedure to ensure that the procedures in this chapter are adhered to.*
- P. *In the event of a fuel spill, the aircraft must be moved away from the spill if the APU is operating and prior to starting the engines.*

7.5.1 Aircraft Fuel Requirements and Procedures

The DuPage Aerospace Corporation Standard Operating Procedures, dated October 1, 2021, provided the following information about fuel spills:

When a fuel spill occurs any flight crewmember shall notify the facility. In addition, they shall notify the company and provide them with an estimate of the amount of fuel spilled, the party responsible for the fuel spill, and any action being taken by the facility. Prior to engine start, the aircraft shall be relocated a safe distance away from the fuel spill area, if the fuel spill area has not been secured.

7.6 CVR and TAWS Preflight Testing

The DuPage Aerospace Corporation General Operations Manual, dated April 3, 2016, provided the following guidance for testing the CVR²⁶ and TAWS²⁷ systems:

If either a CVR (Cockpit Voice Recorder) or a TAWS (Terrain Awareness Warning System) is installed in the aircraft, it will be Preflight Tested as per the original AFM or its supplements prior to each take-off.

²⁶ Cockpit Voice Recorder

²⁷ Terrain Awareness Warning System

7.6.1 Before Engine Start Checklist

The DuPage before engine start checklist was located on the normal checklist for the Hawker 800XP Fleet:

BEFORE ENGINE START	
1. Charts	ON BOARD
2. Cabin	CHECKED CLEAN AND STOCKED
3. EMERGENCY EXIT Pin	REMOVED/STOWED
4. REFUEL Switches.....	OFF
5. Circuit Breakers.....	CHECKED
6. SAFETY EQUIPMENT	CHECKED/STOWED
7. PUMP HANDLE.....	STOWED
8. Landing Gear.....	DOWN/LOCKED/PIN UP
9. Parking Brake.....	SET
10. Trims (3).....	TEST & SET FOR TAKEOFF
11. Thrust Levers.....	STOWED/POWER OFF
12. HP Cocks.....	CLOSED
13. LP Cocks	LEVERS UP
14. X-Feed and Transfer.....	LEVERS UP
15. Battery.....	ON – 3 GREEN GEAR LIGHTS
16. Battery Voltage.....	>23 VOLTS
17. Battery Isolate.....	NORM
18. Bus Tie Open Annunciator.....	CHECK ON-ILLUMINATED
19. Fire Extinguisher Switches.....	OFF – INDICATORS CLEAR
20. STBY Instruments.....	ARM
21. Warning Horn.....	CANCEL
22. APU Fire.....	TEST
23. APU Master.....	ON
24. Left Boost Pump.....	EMERGENCY
25. APU.....	START
26. Bus Tie.....	CLOSE
27. STBY Inverter.....	ARM/CHECK
28. Inverters.....	ON/CHECK
29. APU Bleed Air	AS REQUIRED
30. Radio/EFIS/MFD Masters.....	ON
31. IRS (if Installed).....	ON
32. Pass Oxygen.....	ON
33. Oxygen.....	ON & CHECK
34. Oxygen Masks.....	CHECK
35. Audio Panels.....	SET
36. Side Panels.....	CHECK
37. CVR.....	TEST
38. MWS and Flight Annuns.....	TEST/DIM/OVERRIDE/NORM
39. Reversion/Transfer Switches.....	GREEN
40. Aux Hydraulic handle.....	STOWED
41. Aux Hydraulic Pump Socket.....	CHECK/DOWN
42. Dump Valve.....	SHUT
43. Glareshield.....	CHECK
CAUTION – DO NOT TEST ENG FIRE IF ENG ARE RUNNING	
44. Overhead Test Panel.....	TEST ALL FUNCTIONS
45. Cabin Notices	ON
46. Emergency Lights.....	ARM
47. Yaw Damper.....	TEST
48. Trims.....	TEST / SET FOR TAKEOFF
49. Fuel Used Counter.....	RESET
50. FMS/ Speeds/Altimeters/Avionics/Clocks/N ₁ ref.....	SET
51. Pressurization.....	SET
52. STBY horizon.....	UNCAGE
53. Passenger Briefing.....	COMPLETE

Figure 7: DuPage Aerospace Before Engine Start Checklist

According to the DuPage Aerospace Corporation Chief Pilot's interview transcript "It [CVR] is to be checked on every flight as part of my -- every line of every checklist on every flight, okay. So, when you go to school at CAE, they're going to brush over the cockpit voice. It's over there, okay. It's become infinitely important that you do more than push the test button, okay -- which I'm sure everybody pushes the test button and moves onto the next thing. But there's a series of lights that flash, and the last light would say, red fail, green pass, okay... And, so I am personally stressing at this point

that that check be completed until you get the pass light, okay. I personally had the maintenance department go trip the G switch in a Hawker, and if you press the test button, nothing lights up. It doesn't stop you from pushing the button down and moving onto the next thing... it's my understanding that that G switch, if you put a hard landing on the airplane, you know, nothing to structurally affect the airplane, but you can trip that switch, okay... It's also my understanding that it's in the rear bay to reset it. So it's nothing that would show in the cockpit except for the CVR doesn't light up...²⁸

7.7 DuPage Aerospace Newsfeed Article (Post Accident)

In June 2024, guidance was provided by DuPage Aerospace to employees via their "newsfeed." The information in that was to address new policies, operational issues, and safety concerns that arose within the previous month. The guidance provided, in part, the following information on rejecting a takeoff:

Remember that as a flight crew member, it is very easy to fall into a habit of complacency. We all do our appropriate briefings, but are we listening? When the Flying Pilot briefs "Below 80 knots we will abort for any fault of failure" are you prepared to do just that, or when the Flying Pilot says "After V1 we will treat it as an inflight emergency and hold all checklists until a safe altitude" do you really relate that briefing to the actual profile that should be flown? Remember to listen to your partners briefing, but also think about what is being said, and ask questions if needed.

E. ATTACHMENTS

- Attachment 1 - Cessna Mustang Pilot's Transcript and Passenger Written Statement
- Attachment 2 - N510HM Pilot Training [Excerpts]
- Attachment 3 - N269AA Pilot Transcripts
- Attachment 4 - DuPage Personnel Interview Transcripts
- Attachment 5 - Airport Operations Coordinator Interview Transcript
- Attachment 6 - FAA Personnel Interview Transcripts
- Attachment 7 - N269AA Crew Training Records [Excerpts]
- Attachment 8 - N269AA Crew Trip Schedule
- Attachment 9 - N269AA Flight Plan
- Attachment 10 - N269AA Trip Log
- Attachment 11 - DuPage Aerospace Corporation Hawker Checklist
- Attachment 12 - N269AA Accident Flight Weight and Balance
- Attachment 13 - Hawker Elevator Control Guidance
- Attachment 14 - Hawker Trim and Rudder System Guidance

²⁸ Source: Operational Factors/Human Performance - Attachment 4 - DuPage Aerospace Corporation Personnel Interview Transcript" pg. 110 lines 8 thru pg. 111 line 17.

Attachment 15 - Hawker Fuel System Guidance
Attachment 16 - DuPage Aerospace Corporation Standard Operating
Procedures [Excerpts]
Attachment 17 - DuPage Aerospace Corporation General Operations Manual
[Excerpts]
Attachment 18 - DuPage Aerospace Corporation Newsfeed Article
[Postaccident]
Attachment 19 - HOU Airport Video

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