



MEMORANDUM FOR RECORD

Stephen Stein
Air Safety Investigator
National Transportation Safety Board
Office of Aviation Safety - Eastern Region

NTSB Accident Number: ERA14LA424
Aircraft Registration & Make/Model: N900KN; TBM900
Accident Location: Open Water near Jamaica
Accident Date: September 5, 2014

Note: The following electronic mail correspondence were documented by the Investigator –In-Charge (IIC), Stephen Stein.

Interview #1 Summary

Intercept Pilot

United States Air Force F-16 Pilot from McEntire Joint National Guard Base, Eastover, South Carolina

Correspondence date and time: September 15, 2014; 1100 ET

The e-mail correspondence is reflected in the following digest; the witness responses are indicated below their corresponding NTSB questions.

1) Where did you depart from?

Witness: KMMT, McEntire Joint National Guard Base, Eastover, SC.

2) What time did you depart?

Witness: Approximately 1037 EST

3) What time did you intercept N900KN?

Witness: Approximately 1042 EST

4) What was your approximate location when you intercepted N900KN?

Witness: 40 Miles SE of KMMT

5) Please describe what you observed inside and outside the airplane.

Witness: A/C was flying on a consistent heading of 165 at FL 250, indicated airspeed 175Kts. Rear shades were down, anti-collision beacons were operating normally.

6) If you were able to see inside the cockpit...

a. What did you see?

Witness: Initially, could see the pilot occupying the left seat but no-one on the right. Pilot was a white male wearing a yellow golf shirt. His head was resting straight back, with his boom mic pointing straight up. His hands were resting in his lap, and never moved from that position that we could see. A little later, we realized that the right pilot seat was occupied as well (reported as a white male wearing a black baseball cap - heard later that this was his wife). This individual was slumped way down in the seat with her head against the right side of the airplane just aft of the right side pilot window. We could also see her boom mic, so she was wearing a headset. Her hands were also in her lap.

b. Was there any movement?

Witness: We never witnessed any movement from the right side occupant. About an hour and twenty minutes into the intercept, the left side pilot's head slumped straight forward. I was unclear whether this was due to the aircraft hitting turbulence, or the individual coughing unconsciously. Once his head was slumped forward, we could see his chest rising and falling, consistent with a heavy breath pattern of someone who is unconscious (like the deep breathing you see from a fighter who has been knocked out). We could also see the individual had gray hair and was wearing metal framed glasses. After landing, saw a picture of Larry Glazer and can confirm with a high level of certainty that he was the occupant of the left seat.

c. Where were their hands?

Witness: Never moved from their laps.

d. Were they wearing seatbelts?

Witness: Left seat pilot was wearing a standard harness. I'm not sure about the right seat pilot, due to her wearing a dark-colored top.

e. Where were the occupants seated?

Witness: In the pilot and copilots seats.

7) If you were able to see avionics...

Witness: Unable

a. What did you see?

Witness: NA

b. Did you see anything flashing?

Witness: NA

8) While you were flying with N900KN, did the airplane appear to be in straight and level flight or did you observe any unusual attitudes, banking or yawing?

Witness: The aircraft remained in level, unaccelerated flight for the duration of the intercept. At one point, it flew through a small thunderstorm buildup (estimate about 5 miles diameter) and never changed flight characteristics.

9) What was your approximate location when you disengaged from N900KN?

Witness: About 400 miles South/Southeast of McEntire, maybe 60ish miles north of Bermuda.

10) About what time did you disengage from N900KN?

Witness: Approximately noon EST, handed the TOI (target of interest) off to Lucky 01 and 02, flight of 2 F-15Cs who had been scrambled from KHST.

11) Please also advise of any thoughts or input you might have that may assist in the investigation.

Witness: I heard it reported in the media that pilots could see the windows "frosting" or "icing" up. This is not the case for Stalk 51 flight. I did initially report that the right side window was frosting, but later corrected that to say that it was just condensation. In my opinion, the right A/C vent was blowing onto the right side occupant's head (which was slumped to the right), which was deflecting the airflow onto that area of the right side window that was collecting condensation. As I climbed higher to see down into the cockpit, other areas of that window and the front windscreen remained clear.

Interview #2 Summary

Intercept Pilot

United States Air Force F-15C Pilot from Homestead Air Reserve Station, Homestead, Florida

Correspondence date and time: September 19, 2014; 0935 ET

1) Where did you depart from?

Witness: Homestead Air Reserve Station, FL

2) What time did you depart?

Witness: 1125 EST

3) What time did you intercept N900KN?

Witness: 1145 EST

4) What was your approximate location when you intercepted N900KN?

Witness: 70 miles off the east coast of Daytona.

5) Please describe what you observed inside and outside the airplane.

Witness: The target of interest (TOI) was flying start and level at FL250 on a heading of 165 degrees magnetic. The aircraft was traveling at 175 KIAS and held that speed. The aircraft had no visible signs of damage. The pilot's windscreen and side windows were unobstructed but all the passenger windows were obstructed by the sun shades. The turboprop motor appeared to be functioning normally and there was no visible smoke or fluids coming from it. As evidenced by the instrument panel and exterior lights, the electrical systems appeared to working normally.

6) If you were able to see inside the cockpit...

a. What did you see?

Witness: Male pilot (Mishap Pilot 1; MP1) in Captain's seat was sitting straight up but his head was drooped to a point that was just short of his chin being in his chest. MP1 had his hands flat on his legs. There no sign of him holding anything and there was no sign of additional equipment being out (handheld GPS, oxygen mask, etc). It did appear that MP1 had a folded map or approach plate under his right hand which was on his right leg. Aside from the occasional movement of his head while taking a deep breath, MP1 made no movements and gave the appearance of being in a deep sleep. The pilot in right or co-pilot seat (MP2) was appeared to be in a deep sleep but was much harder to observe. MP2 was slumped down in the seat and wedged into the right side of the chair with head up

against the right side of the aircraft's outer wall. Though more difficult to see, MP2 did not have any additional equipment out and MP2's hands were not clearly in sight. MP2 did not have hands on the controls. I did not see any movement from MP2 but there was condensation on the window area close to the place of MP2. Both MP1 and MP2 were wearing headphones.

b. Was there any movement?

Witness: MP1 moved his head only when taking a breath. MP2 did not move at all.

c. Where were their hands?

Witness: Previously discussed.

d. Were they wearing seatbelts?

Witness: Though difficult to see all attachments, MP1 was clearly wearing a seatbelt. Based on the routing of the seatbelt, MP2 was likely wearing a seatbelt properly.

e. Where were the occupants seated?

Witness: Only MP1 and MP2 could be seen. If there were other occupants, they could not be seen.

7) If you were able to see avionics...

a. What did you see?

Witness: The instrument panel appeared to be working normally. The angle of sight and the distance to the displays prevented any further analysis.

b. Did you see anything flashing?

Witness: The angle of sight and the distance to the displays prevented any further analysis.

8) While you were flying with N900KN, did the airplane appear to be in straight and level flight or did you observe any unusual attitudes, banking or yawing?

Witness: The mishap aircraft did not change speed, heading, or altitude.

9) What was your approximate location when you disengaged from N900KN?

Witness: N2400 latitude.

10) About what time did you disengage from N900KN?

Witness: I don't recall exactly but Lucky 1 and Lucky 2 disengaged when the mishap aircraft reached N2400 latitude. If you really need the time, we can get that by another review of the F-15 recording system.

11) Please also advise of any thoughts or input you might have that may assist in the investigation.

Witness: If the windows were frosted over initially, they were clear of the frost when Lucky 1 reached the TOI.

Interview #3 Summary

Intercept Pilot

United States Air Force F-15C Pilot from Homestead Air Reserve Station, Homestead, Florida

Correspondence date and time: September 19, 2014; 1059 ET

The pilot reported that blinds obstructed his view of the passenger cabin. He did not observe any oxygen masks in the lap of MP1 nor had they been donned by either occupant. The intercept pilot's view was primarily forward of the wing line and he did not see any covers on the nose of the airplane or its intake ports.

Interview #4 Summary

Intercept Pilot

United States Air Force F-16 Pilot from McEntire Joint National Guard Base, Eastover, South Carolina

Correspondence date and time: October 1, 2014; 0937 ET

The intercept pilot reported that he did not observe oxygen masks on either the pilot or the occupant. He added that the passenger cabin was not visible as the shades were lowered. Oxygen masks were not present anywhere in the pilot area. Further, there were no visible blockages to the air intakes.



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Interview #1 Summary

Jim Celentano
Director of Maintenance, Columbia Air Services

Interview date and time: November 17, 2015; 1241 ET

Mr. Celentano estimated that the pilot had accumulated about 1,250 total flight hours in his TBM850.

Interview #2 Summary

Jim Celentano
Director of Maintenance, Columbia Air Services

Interview date and time: July 13, 2016; 1002 PT

According to the representative of Columbia Air Services, their facility received the accident airplane after it was assembled in France on March 18, 2014 at a total time of 37.6 flight hours.

The airplane was subsequently presented to the accident pilot with 44.3 total flight hours on April 8, 2014.

Interview #3 Summary

Jim Celentano

Director of Maintenance, Columbia Air Services

Interview date and time: September 1, 2016; 0636 PT

Mr. Celentano stated that his facility would have verified that the airplane's oxygen cylinder was full before it left the facility. He added that ensuring the oxygen supply is replenished is a standard practice at his service center, relative to verifying that the engine has sufficient oil.



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Interview #1 Summary

Joe Robbins
Rice Lake Air Center

Interview date and time: November 16, 2015; 1407 ET

According to Mr. Robbins, the accident pilot purchased a TBM700 “A” model airplane, N5HT, in 1994. He accumulated approximately 2,700 flight hours in the airplane before he purchased a TBM850 Legacy Model (N51LG). The accident pilot flew the TBM850 for about 1,250 flight hours before he purchased the accident airplane.



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Interview #1 Summary

Mitchell Nusbaum
Representative to Pilot's Family

Interview date and time: December 16, 2015; 1647 PT

The family reported to Mr. Nusbaum that they did not observe anything unusual about the pilot and his wife in the 72 hours that preceded the accident. Further, Mr. Nusbaum stated that the pilot appeared to be in "excellent health and spirits" when he met with him the day before the accident.

The family's representative stated that the pilot and his wife's children reported that their father drank infrequently, and would only have one drink on the rare occasions that he did consume alcohol. He employed a personal trainer and exercised on a regular basis. On rare occasions, the pilot smoked a cigar.



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Interview #1 Summary

Richard Clark
Friend of Accident Pilot

Interview date and time: October 7, 2014; 1028 ET

Mr. Clark reported that he had been friends with the accident pilot for many years and the accident airplane was the pilot's first airplane with a Garmin G1000 glass panel avionics suite. The pilot received the airplane with about 40 total hours on it. Mr. Clark subsequently flew with the pilot about a dozen times in the accident airplane and accompanied him when he ferried the airplane to his service facility for its annual inspection. According to the pilot's friend, the pilot regularly verified the cabin altitude by placing his finger on it during each flight although the cabin altitude was adjusted automatically. He added that the pilot always flew himself and was not a risk taker.

Mr. Clark also attended the TBM900 training course at SIMCOM that took place one week prior to the accident. The course covered pressurization system training thoroughly as it covered all the failure modes and messages that would appear on the crew-alerting system. The instructor taught the proper response to each of the failure messages and provided instruction to don their oxygen masks.

The pilot's friend reported that the pilot had a high-altitude endorsement when he purchased his TBM700, but he didn't think the pilot had been in an altitude chamber in the preceding 10 years. The pilot was a cigar smoker, but only smoked 1 cigar the entire week they attended the course at SIMCOM. He exercised regularly and was an occasional drinker. During a trip to Seattle that took place shortly after he purchased the airplane, Mr. Clark observed that the pilot did not encounter any problems walking the hills in the city.

Interview #2 Summary

Richard Clark

Friend of Accident Pilot

Interview date and time: May 20, 2015; 0843 ET

The witness reported that he was not aware of anyone who flew with him to familiarize the pilot with the G1000. Someone provided the pilot with a Garmin G1000 computer study program that allowed him to run through different scenarios; the computer program was not specific to the TBM900. His goal was to train with the Garmin G1000 before he picked up the airplane and attended the TBM900 course at SIMCOM.

The pilot attended a 5-day course that introduced him to the TBM900 at SIMCOM. Mr. Clark accompanied the pilot for 3 days of training. The course at SIMCOM involved 6-7 hours of training each day.

Interview #3 Summary

Richard Clark

Friend of Accident Pilot

Interview date and time: September 1, 2016; 0654 PT

According to Mr. Clark, the pilot ensured the oxygen quantity and switch were both in the ON position during his pre-flight inspections. He subsequently energized the oxygen masks in their stowed position to hear the oxygen flow.

Interview #4 Summary

Richard Clark

Friend of Accident Pilot

Interview date and time: September 1, 2016; 0749 PT

Mr. Clark was subsequently asked if the pilot checked the oxygen system for each flight. The pilot's friend reported that the pilot stored his airplane in a community hangar. After one of his previous airplanes was involved in a minor incident near the hangar, the pilot became meticulous about performing external walk-around inspections. Mr. Clark stated that he remembered the accident pilot "always opening the door to the O2 bottle and looking inside." His friend added that the pilot verified the switch was in the ON position during these inspections and never turned it off. He further recalled the pilot testing the O2 masks inside the cockpit as well.



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Interview #1 Summary

Jerry Chipman
Instructor at SIMCOM

Interview date and time: October 7, 2014; 0900 ET

Mr. Chipman stated that he provided TBM900 transition instruction to the accident pilot and his friend. The instructor reported that they used a TBM850 G1000 simulator for the training, which covered the four pressurization system crew-alerting system indications and their corresponding emergency procedures. Mr. Chipman also instructed them how to properly don their oxygen masks. He emphasized that he trains students to first don their oxygen mask before attempting to troubleshoot the system. The training includes environmental system checks, where the student practices various system problems in the simulator that were previously covered in the classroom. For an emergency descent, Mr. Chipman teaches his students to don their oxygen mask, bring power to idle, and then hold the nose down 15 degrees below the horizon.

Interview #2 Summary

Bob Crook

Representative of SIMCOM

Interview date and time: December 2, 2015; 0900 ET

According to Mr. Crook, Jerry Chipman reported that he would have spent about 45 minutes on pressurization system training in the class room and another 45 minutes of pressurization system training in the simulator.

Interview #3 Summary

Bob Crook

Representative of SIMCOM

Interview date and time: July 26, 2017; 0721 ET

Mr. Crook reported that the course would have taken place over 8 hours each day (including breaks) when both the pilot and his friend were present and about 6 hours per day (including breaks) when the pilot was training one on one with the SIMCOM instructor.



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Interview #1 Summary

Steven St. Amour
Managing Director, Eclipse Group, Inc.

Interview date and time: July 20, 2015; 0643 PT

Mr. Amour reported that the actual water-depth of the accident airplane was 10,065 feet. The accident airplane was located on January 14, 2015 during a private recovery effort. The airplane debris and occupant remains were subsequently recovered to a ship that met with a medical examination forensic team and the NTSB investigative team on January 24, 2015.



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Interview #1 Summary

Melissa Slate

Employee of US Airports Fixed Based Operator (FBO)

Correspondence date and time: October 7, 2014; 1121 ET

According to Ms. Slate, on the day of the accident she received a phone call from the accident pilot approximately 15 minutes before he arrived. During the phone call, the pilot advised that he and his wife would be traveling to Florida and did not require fuel. After they arrived she witnessed them loading bags into the airplane. She further remarked that the pilot and his wife did not appear to be in a rush when she interacted with them.

Interview #2 Summary

Jarrod Hopkins

Employee of US Airports Fixed Based Operator

Correspondence date and time: October 8, 2014; 1008 ET

Mr. Hopkins stated that he pulled the chocks from the airplane and did not observe anything unusual with the exterior of the airplane as he marshalled the airplane off the ramp. The pilot had stored the accident airplane with US Airports in a hangar since he purchased it several months prior. According to the employee of the FBO, the pilot did not appear to be in a rush on the day of the accident.



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Interview #1 Summary

Stephane Jacques
Representative of Daher-Socata

Interview date and time: November 11, 2014; 1630 ET

According to Mr. Jacques, if the powerplant shuts down during cruise flight with the autopilot engaged, the airplane will transition to battery power, which can operate the autopilot for about 1 hour. Without engine power the airplane will decelerate and the autopilot will adjust the trim tab to pitch the aircraft up. When the stall warning begins, the autopilot will shut off and the airplane will begin to oscillate.

Interview #2 Summary

Catherine Herau
Manager of Engineering, Daher-Socata

Interview date and time: June 22, 2015; 0936 ET

Ms. Herau reported that computations completed by her team revealed that the airplane consumed 23 US gallons of fuel during the 20 minute climb phase to FL280 following the airplane's departure on the day of the accident. The cruise flight phase to the approximate time of engine shutdown was about 5 hours and 25 minutes, which correlates to a mean fuel flow of 49 US gallons per hour.

Interview #3 Summary

Daher-Socata

Interview date and time: October 28, 2015; 0700 PT

On October 28, 2015, Daher-Socata held a conference call to discuss a collection of flight tests that were accomplished using a prescribed test apparatus. Attendees included representatives of the BEA, NTSB, and Liebherr Aerospace. Towards the end of the call, the NTSB IIC suggested that Daher-Socata require the pilot to don his/her oxygen mask as a priority checklist item under each corresponding pressurization-related emergency checklist. A representative of Daher-Socata stated that the oxygen mask procedure was already included under the "Cabin Altitude" emergency procedure.

Interview #4 Summary

Catherine Herau

Manager of Engineering, Daher-Socata

Interview date and time: October 10, 2016; 0104 PT

According to the manufacturer, "The cabin is pressurized on ground thanks to a pressurization window put in lieu of the emergency exit. The cabin is slowly pressurized until the overpressure safety protection of the outflow or safety valve opens around 6.2 PSI differential pressure. This differential pressure is maintained 1 minute then the pressurization bench is cut off. The cabin differential pressure is then recorded every 30 seconds and plotted on the leak rate chart. The resulting leak rate curve represents a time history of the cabin differential pressure from 6.2+/- 0.1 to 0 PSI which is compared to the maintenance leak rate chart."

Interview #5 Summary

Catherine Herau

Manager of Engineering, Daher-Socata

Interview date and time: November 14, 2016; 0951 PT

Ms. Herau reported that her team estimated the time for the cabin altitude to reach 28,000 feet is 4 minutes, assuming the aircraft leak corresponds to the production acceptance limit.

Interview #6 Summary

Catherine Herau

Manager of Engineering, Daher-Socata

Interview date and time: December 28, 2016; 1122 PT

On November 9, 2016, the NTSB IIC suggested that Daher-Socata append the emergency procedures section of its pilot's operating handbook (POH) to make donning an oxygen mask the first priority in any emergency checklist that would be used in response to a pressurization system anomaly. This suggestion was the result of concerns of the airplane's fast bleeddown rate, accompanied by a voluminous POH that a pilot would be forced to navigate under numerous pressures while suffering from an insidious and mentally impairing condition that will ultimately lead to incapacitation. The IIC further suggested that they develop an individual checklist as a quick reference guide in the event of a cabin depressurization.

In Daher-Socata's December 28, 2016 response, they indicated that they had already implemented the NTSB's suggestion with their new production model, the TBM 930. The new POH includes the procedure "Use Oxygen Mask" as the first checklist item on each of the relevant emergency procedures. They further stated that they plan to progressively add this language to prior models beginning in 2017. In their e-mail, Daher-Socata asserted that a quick reference procedure to the POH currently exists under the "Cabin Altitude" emergency procedure.



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Interview #1 Summary

Olivier Le Guennec
Business, Helicopters and Military Aircraft Group Leader/Technical Services
Liebherr-AEROSPACE TOULOUSE SAS

Interview date and time: October 10, 2016; 1200 PT

According to the pressurization system manufacturer, when bleed air into the cabin ceases, the outflow and safety valves will close in less than 1 second from their normal control position. Both valves will remain closed unless negative differential pressure is encountered during the airplane's descent.

Interview #2 Summary

Olivier Le Guennec
Business, Helicopters and Military Aircraft Group Leader/Technical Services
Liebherr-AEROSPACE TOULOUSE SAS

Interview date and time: March 14, 2017; 0908 PT

The pressurization system manufacture reported that the Global Air System Controller stores fault codes in its limited memory that are overwritten at each takeoff.