NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

September 14, 2015

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

DCA15MA029

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A. AIRCRAFT ACCIDENT

Location:	Gaithersburg, Maryland
Date:	December 8, 2014
Time:	1041 eastern standard time (EST)[1]
	1541 coordinated universal time (UTC)
Airplane:	Embraer Phenom EMB-500, N100EQ

B. AIR TRAFFIC CONTROL GROUP

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C. SUMMARY

On December 8, 2014, about 1041 Eastern Standard Time (EST), an Embraer EMB-500 Phenom 100, N100EQ, impacted terrain and houses about 0.75 miles short of runway 14 while on approach to Montgomery County Airpark (GAI), Gaithersburg, Maryland. The airline transport rated pilot and two passengers were fatally injured as well as three persons on the ground. The airplane was destroyed during the impact and ensuing fire. Marginal visual meteorological conditions prevailed at the time and the flight was operating on an instrument flight rules (IFR) flight plan. The airplane was registered to and operated by Sage Aviation LLC., of Chapel Hill, North Carolina, under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. The flight originated from Horace Williams Airport (IGX), Chapel Hill, North Carolina, with GAI as its intended destination.

D. DETAILS OF THE INVESTIGATION

The air traffic control group was formed on December 8, 2014. The group consisted of the group chairman from Operational Factors Division, a subject matter expert from the FAA safety and technical training group, and an air safety investigator from the National Air Traffic Controllers Association (NATCA). The group chairman met with the NTSB investigator in charge (IIC) and received a full status briefing upon arrival.

[1] All times are eastern standard time (EST) unless otherwise noted.

From the FAA compliance services group, the group requested Potomac Terminal Radar Approach Control (PCT TRACON) radar source data, voice recordings, daily facility log, position logs, controller work schedules, and related documentation.
On December 9, 2014 after the group chairman attended the IIC's organizational meeting, the group met at PCT TRACON, and was provided an in brief by the acting air traffic manager (ATM) and several members of her staff, also present were representatives from the FAA compliance services group, eastern service area quality control group, and eastern Capital District. The group then conducted an interview with front line manager (FLM) that was on duty at the time of the accident.

The group then spent some time reviewing administrative documents and other data pertaining to the accident investigation. The MULLR sector radar controller (RC) that provided services to the accident aircraft prior to the accident was still on OWCP (Office of Workman's Compensation Programs) leave, and therefore the group conducted the interview at his residence. The group chairman attended the IIC's evening progress meeting via telephone, briefed findings and then conducted an out brief with the PCT TRACON acting ATM, several members of her staff, those that were present for the in brief, and several unnamed representatives from the FAA monitored via TELCON.

E. FACTUAL INFORMATION

1.0 History of Flight

At 1018:48 N100EQ first contacted PCT TRACON and spoke with the BARIN sector RC descending to 7,000 feet msl[2]. The BARIN RC issued the Dulles altimeter of 30.58 and instructed the pilot to descend and maintain 5,000 feet. The accident pilot acknowledged.

At 1019:09 the BARIN RC controller asked the pilot of N100EQ how he had been filed to GAI to which the pilot responded "uh martinsburg uh westminster direct."[3] The BARIN RC then verbally coordinated this route with the MULRR sector.

At 1019:50 the BARIN RC instructed N100EQ to maintain a good rate through 9,000 feet. The accident pilot said he did not understand and asked the controller to repeat. The controller then repeated the instruction to maintain a good rate through 9,000 feet. At 1020:04 after the accident pilot acknowledged the instruction, the BARIN RC said "phenom zero echo quebec affirmative no delay through nine descend and maintain five thousand". The accident pilot acknowledged with a correct read back.

At 1021:15 the BARIN RC instructed N100EQ to contact approach [MULRR sector] on frequency 126.1. After no response on the first attempt, the BARIN RC immediately re-stated the frequency change. The pilot acknowledged with a correct read back.

At 1021:38 N100EQ checked in with the MULRR RC. The MULRR RC issued the Dulles altimeter of 30.58 and asked if the pilot had the current weather and what type of approach he

[2] All altitudes are in feet above mean sea level (msl) unless otherwise noted.
[3] Radio transmission quotes are from the certified ATC communications transcript.

was requesting. The accident pilot responded that he did have the weather and said he would like to do the GPS[4] approach to runway 14 circle to land runway 32. The MULRR RC responded and told him he could expect that.

At 1022:16 the pilot of N100EQ stated that he would like to just do the GPS runway 14 approach *[without circling to land runway 32]*. The MULLR RC acknowledged.

At 1024:10 the pilot of N100EQ requested to proceed direct BEGKA when able. The MULLR RC instructed N100EQ to fly heading 060 *[a heading towards BEGKA until he could coordinate direct]*. The accident pilot acknowledged with a correct read back.

At 1026:22 the MULLR RC instructed N100EQ to fly heading 080 *[a heading further toward BEGKA while coordinating]*. The accident pilot acknowledged with a correct read back.

At 1028:12 the MULLR RC called the WOOLY RC and pointed out N100EQ on the GPS runway 14 approach into GAI. The WOOLY RC approved the point out.

At 1028:28 the MULLR RC instructed N100EQ to proceed direct to BEGKA and to descend and maintain 4,000 feet. The accident pilot acknowledged with a correct read back.

At 1028:38 the MULLR RC called the ASPER RC and pointed out N100EQ five miles east of Martinsburg on the GPS runway 14 approach into GAI descending to 3,000 feet. The ASPER RC approved the point out.

At 1029:45 the MULLR RC instructed N100EQ to descend and maintain 3,000 feet. The accident pilot acknowledged with a correct read back.

At 1031:21 the MULLR RC cleared N100EQ for the RNAV/GPS runway 14 approach into GAI. He issued his position as 11 miles from BEGKA and instructed him to cross BEGKA at 3,000 feet. The pilot acknowledged with a correct read back.

At 1035:40 the MULLR RC instructed N100EQ to report the cancellation of IFR in the air on his frequency or on the ground upon landing. There was no response to this transmission.

At 1038:20 the MULLR RC asked N100EQ "and november zero echo quebec you still with me". The accident pilot responded "zero echo quebec sure are". The MULLR RC then asked the pilot what his response was to the earlier instruction about cancelling his IFR that he had not responded to. At 1038:27 the accident pilot stated "uhhh we're IMC at the moment, we should be uh we should be clear in just a minute or two we'll let you know."

At 1038:33 the MULLR RC said "November zero echo quebec roger that's fine change to advisory frequency's approved make sure to remain on your assigned beacon code until landing and do not forget to cancel." The accident pilot acknowledged stating "okay one hundred echo

[4] GPS – Global Positioning System – a satellite based radio navigation system that allows users to determine their exact location, velocity, and time 24 hours a day, in all weather conditions, anywhere in the world.

quebec." That was the last recorded transmission from N100EQ on PCT air traffic control frequencies.

[The following was obtained from privately recorded audio of the UNICOM/CTAF[5] frequency at GAI. The audio was not certified and times were correlated as accurately as possible with the cockpit voice recorder (CVR), flight data recorder (FDR), and ATC audio recordings.]

At approximately 1039:01 someone cautioned of numerous birds in the vicinity of the runway.

At approximately 1039:06 N100EQ reported 7 miles out straight in for runway 14.

At approximately 1039:10 N52632 (student pilot) reported turning base for runway 14.

At approximately 1039:29 someone again announced to watch out for birds around runway 14.

At approximately 1039:59 N52632 (student pilot) reported final for runway 14.

At approximately 1040:05 N100EQ reported 6 miles out straight in for runway 14.

At approximately 1040:20 N5215E reported turning crosswind runway 14.

At approximately 1040:34 N9400L reported an unusual amount of birds in the vicinity of runway 14 and requested the cannon for assistance in dispersal.

At approximately 1040:45 N100EQ reported 3 miles straight in for runway 14.

At approximately 1041:02 N5215E reported turning downwind runway 14.

At approximately 1041:22-50 there was discussion between two pilots about incoming weather.

At approximately 1042:02 a pilot reported "hey guys, I think that Phenom just came up short".

At approximately 1042:08 N9400L reported a Phenom had crashed at the end of the runway.

2.0 Radar Data

Radar data for the flights was obtained from PCT TRACON and included source data from several radar sites in the Potomac area. Radar data recorded the flight track of N100EQ up until seconds before the accident. Radar data indicated a straight line course to the runway, with a typical speed and rate of descent. The last recorded radar return was received at 1041:38 and indicated an altitude of 800 feet msl, which was approximately 280 feet above ground level (agl), and was located approximately 1 mile from the runway 14 threshold.

[5] UNICOM/CTAF – Universal Communications/Common Traffic Advisory Frequency – This is a combined frequency in use at GAI which means that it functions as both air-to-ground communications for advisory services at the airport (UNICOM), as well as, air-to-air communications for traffic coordination of aircraft operating into, out of, or in the vicinity of the airport (CTAF).

Attachments 1 is a 2D overhead view of the last several minutes of the accident aircrafts flight track with the threshold for runway 14 at GAI depicted with the Maltese cross symbol. Attachment 2 is a 2D overhead view of the accident aircraft's flight track with the published fixes and corresponding altitudes for the GPS runway 14 approach depicted in blue and correlated with the time and altitude the accident aircraft crossed each fix in red for comparison. Attachment 3 is the accident aircrafts flight track overlaid on the standard instrument approach procedure chart for the GPS runway 14 approach into GAI. Attachments 4 and 5 are 3D radar plots overlaid in Google Earth[6] for further reference and include a comparison of the flight tracks of N100EQ and N52632 that landed just prior to the accident.

3.0 Weather Information

The GAI weather for December 8, 2014 was obtained from the KGAI Automated Weather Observing System[7] (AWOS-3). The KGAI AWOS-3 is owned and maintained by the airport authority at GAI and not by the FAA. For more detailed weather information see the Meteorological Factual Report in the public docket.

[1015 EST] KGAI METAR 081515Z 05005KT 10SM FEW023 OVC030 M01/M08 A3061 RMK AO1

KGAI weather at 1015 EST, wind from 050° at 5 knots, 10 statute miles visibility, few clouds at 2,300 feet agl, an overcast ceiling at 3,000 feet agl, air temperature -1° Celsius (C), dew point temperature -8° C, altimeter 30.61 inHg. Remarks, station without precipitation discriminator.

[1035 EST] KGAI METAR 081535Z 04006KT 10SM FEW021 OVC032 M01/M08 A3061 RMK AO1

KGAI weather at 1035 EST, wind from 040° at 6 knots, 10 statute miles visibility, few clouds at 2,100 feet agl, an overcast ceiling at 3,200 feet agl, air temperature -1° C, dew point temperature -8° C, altimeter 30.61 inHg. Remarks, station without precipitation discriminator.

[1041 EST] APPROXIMATE ACCIDENT TIME

[1055 EST] KGAI METAR 081555Z 05005KT 10SM OVC032 M01/M08 A3060 RMK AO1

KGAI weather at 1055 EST, wind from 050° at 5 knots, 10 statute miles visibility, an overcast ceiling at 3,200 feet agl, air temperature -1° C, dew point temperature -8° C, altimeter 30.60 inHg. Remarks, station without a precipitation discriminator.

[6] Google Earth – A web based virtual globe, map and geographical information program that maps the Earth by the superimposition of images obtained from satellite imagery, aerial photography and geographic information system 3D globe.

[7] AWOS – Automated Weather Observation Station - A computerized system that automatically measures one or more weather parameters, analyzes the data, prepares a weather observation that consists of the parameter(s) measured, provides dissemination of the observations and broadcasts the observation to the pilot in the vicinity of the airport.

4.0 Personnel Interviews

4.1 Front Line Manager (FLM)

The group interviewed Tony Hernandez on December 9, 2014. Mr. Hernandez was represented by Mr. John Regan, PCT quality assurance manager. In response to questions presented by the group, Mr. Hernandez provided the following information.

His air traffic control experience began in September of 1991 at the FAA Academy in Oklahoma City, Oklahoma. After successful completion of initial training he began working at Seattle Air Route Traffic Control Center (ZSE) and remained there until September of 2011 when he accepted a transfer to PCT.

His regular work schedule the week leading up to and including the day of the accident was a rotating shift schedule with some credit hours worked on two of those days. His work schedule was as follows:

Tuesday	1030 - 1400	(3 credit hours only / collateral duty)
Wednesday	Off	
Thursday	1030 - 1400	
Friday	1430 - 2230	
Saturday	1430 - 2230	
Sunday	1330 - 2130	
Monday	0630 - 1600	(Day of the accident // 1.5 credit hours worked)

He was the Chesapeake area front line manager (FLM) at the time of the accident. He stated that he had no suspensions and no documented operational incidents (OI's) while at PCT. He held collateral duties as the area training manager, as well as, the management representative to the local safety council. He had not been on any recent details. He recalled the weather at the time of the accident as being a broken ceiling between 2,500 and 3,000 feet. He recalled nothing remarkable about the 72 hours leading up to the time of the accident.

His operating initials were HT and his supervisor was Mr. Ed Kesler. He possessed a current second class medical certificate and his last ATC physical had been conducted in June of 2014. He stated that he had a restriction to wear corrective lenses while performing air traffic control duties and that he was wearing them at the time of the accident. He stated that he had no other waivers or restrictions to his medical certificate. He held no other aeronautical ratings or certificates.

On the day of the accident, he was working his normally scheduled shift and stated that he was current and proficient on all positions for which he was certified. He had reviewed the audio and video replay of the event prior to the interview. He stated there was no training being conducted at the time of the accident. On a scale of 1 to 5 (5 being the heaviest) he said that he would classify the traffic load as 2 at the time of the accident. On a scale of 1 to 5 (5 being the most complex) he said that he would classify the traffic complexity as 1 at the time of the accident. He did not recall any distractions leading up to or around the time of the accident. He said that no

relief briefing was conducted when he assumed the position as FLM because he was the one that opened the position. He stated that he did not file an ATSAP[8] report as a result of this accident.

He first received word that there had been an accident when he was called over by the WOOLY RC. The WOOLY RC was listening to a pilot who had reported an aircraft accident on the GAI 320 radial at one mile. The FLM immediately went to the DEN position and relayed the reported accident information to the DEN[9]. After relaying the information to the DEN position, he went to the operations manager in charge (OMIC) position and relayed the same information and then returned to the supervisor's desk to notify the fire department. When he called the fire department, they reported that they had already received a report of an accident and asked if it was the same one. At that time, the FLM stated they were not certain yet, but that it could have been it. He then tried to call the airport directly, but there was no answer. He then returned to the DEN position to see if they had any aircraft in the pattern at GAI and if the accident aircraft may have been one of them. He said he then went to the WOOLY sector to ask if they had cleared anyone into GAI and had not received a cancellation. The WOOLY RC stated that they had taken a point out from the MULLR sector on an aircraft landing GAI and that they were waiting on a cancellation. *[The WOOLY RC that had received the point out on the accident aircraft had been relieved and was on break. The controller that relayed the information to the FLM was the relieving WOOLY RC]*. He then returned to the DEN position to see if they could figure out which aircraft it was and upon arriving, another controller brought over a flight progress strip on N100EQ and stated that it might be the accident aircraft. He was then able to confirm through the DEN and GAI airport personnel, that N100EQ was not on the ground at GAI. He said that at that point he knew N100EQ was very likely the accident aircraft. From that point forward he said it was just communication and coordination in support of search and rescue and first responders.

When asked about the lifecycle of a PIREP[10] within PCT, he stated that when a controller received a PIREP he would copy it down on a form and give the form to the flight data (FD) controller who would then call flight service with the PIREP information where it was further disseminated. Once the FD controller called flight service, they would give the original PIREP form to the FLM for the area and the FLM would verbally tell any controller in the area that he felt the PIREP was pertinent to. He said the controllers would usually keep any PIREP given to them and issue it as appropriate for about two hours, or during an hourly update whichever was shorter. With a SIGMET[11] or AIRMET[12], he said he received those from the FD controller as well and when they were within 50 miles of their airspace he would pass it to the first controller

[8] ATSAP – Air Traffic Safety Action Program - Voluntary reporting program that allows air traffic controllers and other employees to report safety and operational concerns.
[9] DEN – Domestic Events Network - A twenty-four hour a day communications network that includes over 100 agency partners. Through the DEN, agencies monitor ongoing activity in the National Airspace System (NAS) along with their respective areas of expertise to identify anomalies to determine whether they could pose a threat and to coordinate operational responses to defeat any such threats.
[10] PIREP – Pilot Weather Report – A report made by a pilot of meteorological phenomena encountered by an aircraft in flight.
[11] SIGMET – Significant Meteorological Information - A weather advisory issued concerning weather significant to the safety of all aircraft. SIGMET advisories cover severe and extreme turbulence, severe icing, and widespread dust or sandstorms that reduce visibility to less than 3 miles.
[12] AIRMET – Airmen's Meteorological Information - In-flight weather advisories issued only to amend the area forecast concerning weather phenomena which are of operational interest to all aircraft and potentially hazardous to aircraft having limited capability because of lack of equipment, instrumentation, or pilot qualifications.

on the line who would read the advisory on the air and the pass it down the line until all controllers on that line had broadcasted the information. The last controller in the line would then file the strip. All strips and PIREP forms were retained with facility records in accordance with FAA retention standards.

He felt that the PIREP process was working well at PCT, and that they received an answer when they called flight service to pass a PIREP at least 90% of the time. When asked, he stated that it was his practice to require controllers in his area to solicit PIREPs hourly whenever the weather was below 5,000 feet ceiling or 5 miles visibility. He also said that if he had any recommendation to make about PIREPs that it would be to do it more like how he remembered doing it while he was at ZSE. At ZSE, he said the controller would take a PIREP, then pass it to TMU[13] who would enter it into a system that distributed it automatically to all the sectors that required it, and it then remained available on position for one to two hours, or until a subsequent PIREP was received.

He said they did utilize a set of emergency checklists, and that they were maintained with the OMIC. He did not recall how long it was in this case before the radar controller was relieved after the accident. When asked in retrospect if there was anything he would have done differently, he stated that he could not think of anything. He added that in this case the FAA Regional Operations Center (ROC) was notified within 10 minutes of the accident and that they were the last on the notification list, and therefore felt that the notification process went extremely well.

4.2 MULRR Sector Radar Controller (RC)

The group interviewed Jonathan Stell on December 9, 2014. Mr. Stell was represented by Mr. Matt Sullivan, PCT NATCA facility representative. In response to questions presented by the group, Mr. Stell provided the following information.

His air traffic control experience began in May of 2008 when he received initial training at the FAA Academy in Oklahoma City, OK. After successful completion of initial training, he reported to PCT in September of 2008.

His regular work schedule the week leading up to and the day of the accident was a rotating shift schedule with regular days off on Wednesday and Sunday. His work schedule was as follows:

Tuesday	0700 - 1500	
Wednesday	Off	
Thursday	1500 - 2300	
Friday	1100 - 1900	
Saturday	0700 - 1500	
Sunday	Off	
Monday	0630 - 1430	(Day of the accident)

[13] TMU – Traffic Management Unit - A non-control, coordination unit at the Air Route Traffic Control Center (ARTCC) connected to the central flow control function at the ATCCC and responsible for dissemination of flow control information at the local level, and interaction with national level flow programs.

He was the MULLR RC at the time of the accident. He stated that he had no suspensions and had no documented operational incidents while at PCT. He held no collateral duties and had not been on any recent details. When asked about the weather at the time of the accident, he said that he recalled the bases were at about 3,000 feet. He recalled nothing remarkable about the 72 hours leading up to the time of the accident.

His operating initials were JZ and his supervisor was Mr. Bill Hribal. He possessed a current second class medical certificate and his last ATC physical had been conducted in January of 2014. He stated that he had no waivers or restrictions to his medical certificate. He held no other aeronautical ratings or certificates and had earned an associate's degree in aviation administration from Miami-Dade Community College.

On the day of the accident, he was working his normally scheduled shift and stated that he was current and proficient on all positions for which he was certified. He had reviewed the audio and video replay of the event prior to the interview. He stated there was no training being conducted on his position at the time of the accident. On a scale of 1 to 5 (5 being the heaviest) he said that he would classify the traffic load as 1 at the time of the accident. On a scale of 1 to 5 (5 being the most complex) he said that he would classify the traffic complexity as 2 at the time of the accident. He did not recall any distractions leading up to or around the time of the accident. He said that a relief briefing was conducted when he assumed the position as MULRR sector radar controller, a checklist was utilized, and that it was recorded. He stated that he did not file an ATSAP report as a result of this accident.

He recalled everything being routine and that when the accident aircraft first checked in with him, he confirmed that the pilot had the current weather, to which the pilot responded that he did. He asked the pilot what type of approach he wanted and the pilot initially stated that he wanted the GPS runway 14 circle to land runway 32 and then changed his mind and said he was just going to do the GPS runway 14 and requested to proceed direct to BEGKA. He instructed the pilot to stand by, and then issued him a 060 heading and then a 080 heading in order to keep him from having to fly too far. He then initiated point outs to WOOLY sector and then ASPER sector. He said the accident aircraft was about 11 miles from BEGKA at 3,000 feet when he cleared him for the approach. Shortly after that, he asked the pilot if he was ready to cancel but received no response. Then when the aircraft was still outside of the final approach fix (TIMBE), he asked again about the cancellation and the pilot stated that he was still IMC. The controller then approved the accident pilot to change to advisory frequency and instructed him to remain on his beacon code, and to report the cancellation. Again, he received no response from the pilot.

He said that about 15 minutes after he had approved the pilot of N100EQ to change to advisory frequency, the WOOLY RC called and inquired about N100EQ, to which he confirmed that he had cleared him into GAI and that the pilot had not cancelled yet. Shortly after the inquiry by the WOOLY RC, he was called again and asked about the same aircraft. Then, shortly after being relieved from position and while in the break room, he learned that N100EQ had crashed.

He recalled no weather advisories around the time of the accident (SIGMETs, AIRMETs, etc), however had taken a PIREP earlier from an aircraft at 5,000 feet on the Dulles corridor for light

rime icing. He stated that that aircraft reported the icing dissipated by 3,000 feet. He stated that he gave that PIREP to the FD controller who called and relayed it to flight service as required. He did not recall receiving any reports of precipitation from any other aircraft.

F. LIST OF ATTACHMENTS

Attachment 1 – 2D Radar Plot
Attachment 2 – 2D Radar Plot (standard instrument approach comparison)
Attachment 3 – 2D Radar Plot (overlaid onto standard instrument approach procedure)
Attachment 4 – 3D Radar Plot
Attachment 5 – 3D Radar Plot (comparison with other aircraft)

Submitted by:

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Brian Soper
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