NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

November 8, 2018

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

ERA17FA190

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A. ACCIDENT

Location: New Castle, Delaware
Date: May 25, 2017
Time: 1153 eastern daylight time (EDT)[1]
1543 coordinated universal time (UTC)
Airplane: Eurocopter EC135 P2, N62UP

B. AIR TRAFFIC CONTROL GROUP

Brian Soper
Group Chairman
Operational Factors Division (AS-30)
National Transportation Safety Board

Ross Knoll
ATC Specialist
Safety Services (AJI-151)
Federal Aviation Administration

Eric Stormfels
Air Safety Investigator
Pittsburg ATCT/TRACON (PIT)
National Air Traffic Controllers Assn.

C. SUMMARY

On May 25, 2017, at 1153 eastern daylight time, a Eurocopter Deutschland GMBH EC 135 P2, N62UP, was destroyed when it impacted terrain near New Castle, Delaware. The airline transport pilot was fatally injured. The helicopter was registered to the University of Pennsylvania and operated by Metro Aviation as a 14 *Code of Federal Regulations* Part 91 flight. Instrument meteorological conditions prevailed about the time of the accident, and the flight was operated on an instrument flight rules (IFR) flight plan. The flight originated from Atlantic City International Airport (ACY), Atlantic City, New Jersey, about 1115.

D. DETAILS OF THE INVESTIGATION

The air traffic control (ATC) work group was formed on May 26, 2017. The group consisted of the chairman from operational factors, a subject matter expert from the Federal Aviation Administration (FAA), and an air safety investigator from the National Air Traffic Controllers Association (NATCA). The NTSB Investigator in Charge (IIC) was also present for the on-site investigation at both Philadelphia Air Traffic Control Tower (PHL ATCT) as well as Wilmington (ILG) ATCT.

The group requested radar source data and voice recordings covering the entire accident flight from the FAA compliance services group. Additionally, the group requested copies of both PHL ATCT and ILG ATCT standard operating procedures (SOP), controller training and

[1] All times are in eastern daylight time (EDT) unless otherwise noted.

qualification records, various administrative documents, and preservation of a STARS[2] playback including weather from the day of the accident.

On May 30, 2017 the group met at PHL ATCT and was provided with an in-brief from the air traffic manager (ATM) and several members of her staff. Also present at the in-brief were members from FAA's compliance services group (CSG), office of general counsel, eastern service area quality control group (ESA QCG), attorney from NATCA, NTSB IIC and a regional investigator from the NTSB Office of Aviation Safety's Anchorage office. The group was provided with an operational tour of the terminal radar approach control (TRACON) and tower cab, followed by a demonstration of the air traffic control tower simulator. The group reviewed the STARS playback of services provided to N62UP by PHL ATCT, followed by an interview with the south arrival (SA) controller. The SA controller had provided ATC services to N62UP upon initial check-in with PHL ATCT until being handed off to the south departure (SD) controller.

On May 31, 2017 the group met at PHL ATCT and reviewed controller training and qualification records, as well as additional data provided by PHL ATCT management. The group conducted interviews with the SD controller, front line manager (FLM), and operations manager (OM) that were working at the time of the accident.

On June 1, 2017 the group met at ILG ATCT and was provided with an in-brief from the ATM and several members of his staff. Also present at the in-brief were members from FAA's CSG, office of general counsel, ESA QCG, attorney from NATCA, and NTSB IIC. After the in-brief, the group was provided an operational tour of the control tower cab. The group reviewed data and conducted interviews with the local (LC) controller, FLM, and controller in-charge (CIC) who were working at the time of the accident. The IIC and ATC group chairman were also provided an airfield tour in order to take a closer look at the ILS critical area markings before concluding the onsite activities for the day. The group completed field notes and obtained concurrence of the data as written.

E. FACTUAL INFORMATION

1.0 History of Flight

About 1128 the pilot of N62UP first contacted PHL ATCT and reported at 4,000 feet msl and direct to Cedar Lake. The radar south arrival (SA) controller issued the current altimeter and advised the pilot that ATIS information "tango" was current at ILG. The pilot acknowledged and said he would advise when he had picked up tango. The controller then vectored N62UP for the ILS approach to runway 1.

About 1135 the pilot of N62UP requested an IFR clearance back to ACY after completion of his [practice] approach into ILG. The SA controller advised the pilot that the next controller would have it for him.

[2] STARS – Standard Terminal Automation Replacement System – A system that receives radar data and flight plan information and presents the information to air traffic controllers on high resolution, 20" x 20" color displays allowing the controller to monitor, control, accept hand-off of air traffic, and assist with weather avoidance.

About 1139, the SA controller transferred communications with N62UP to the South Departure (SD) controller and advised the pilot the receiving controller had been made aware of his request to pick up his clearance to ACY on the go. The pilot acknowledged and established contact with the SD controller.

The SD controller continued vectoring N62UP for the ILS runway 1 approach until about 1150 when he cleared him for the approach with a restriction to maintain at or above 2,000 feet until established on the approach. The pilot acknowledged with a correct readback. The SD controller then transferred communications with N62UP to the local (LC) controller at ILG ATCT.

About 1150 the pilot of N62UP first contacted the Local (LC) controller at ILG ATCT and reported crossing the fix HADIN at 2,000 feet. The LC controller issued the current wind and cleared the pilot to land runway 1. The pilot acknowledged with a correct readback.

About 1151, a position relief briefing (PRB) took place on the LC position. N62UP was the only traffic and was included in the PRB. Directly following the PRB, the pilot of N62UP reported that he would like to go around, start his missed approach, and come back around for another approach. The on-coming LC controller asked the pilot if he had previously coordinated the missed approach with PHL ATCT, and the pilot said “uh, we didn’t want to ma’am”.

About 1153, the on-coming LC controller asked the pilot if he was having trouble getting the field in sight, and the pilot responded that he had received some bad vectors at the very end and just wanted to line up and come back around again. The on-coming LC controller instructed the pilot to fly the missed approach, and then coordinated the approach with PHL ATCT. There was no response from the pilot.

The on-coming LC then continued trying to contact the pilot of N62UP for the next several minutes, and about 1157 stated to the PHL ATCT SD controller that they could see black smoke and could not reach the pilot.

2.0 Radar Information

Radar data for this report was obtained from the FAA PHL ATCT in STARS plot playback (.ppb) format. The data provided primary and secondary radar target information from 1117 to 1156. Radar data was of good quality and useable in the investigation.

Airport Surveillance Radars (ASR) are short range (about 60 nautical mile) radars used primarily to provide ATC services in terminal areas. ASR Antennas rotate at about 13-14 rotations per minute (rpm) providing a radar return every 4.5 to 5 seconds. The ASR radar can detect precipitation and this information is updated in the STARS system every 60 seconds and displayed in six levels on the controller’s radar display in radar, or on the tower display workstation (TDW) in the control tower.

To improve the consistency and reliability of radar returns, most aircraft are equipped with transponders that sense beacon interrogator signals broadcast from radar sites, and in turn transmit a response signal. Even if the radar site is unable to sense a weakly reflected primary radar return, it will sense the response signal broadcast by the transponder and determine the aircraft's position from this information. The response signal can also obtain additional information, such as the pilot selected Mode 3 or "beacon code" that is being transmitted, as well as the aircraft's pressure altitude (also referred to as "Mode C" altitude). These transponder derived signals are called secondary returns. In this case, N62UP was assigned and transmitting a beacon code of 3676.

The radar figures provided in attachment 2 were produced specifically using the PHL ASR-9 radar source data. The PHL ASR-9 was located about 21 miles northeast of the accident site, at an elevation of 14 feet msl, and having a magnetic variation of 11° west.

3.0 Weather Information

The closest weather reporting station to the accident site was New Castle airport (ILG), which had federally installed and maintained Automated Surface Observing System (ASOS), which was augmented by National Weather Service (NWS) certified observers and/or LAWRS certified tower controllers. The accident site was located about 1 mile south of the airport center, and the following conditions were reported surrounding the time of the accident:

KILG special weather observation at 1106 EDT, wind from 080° at 8 knots, visibility 2 ½ miles in light rain and mist, overcast ceiling at 500 feet above ground level (agl), temperature 15° Celsius (C), dew point 14° C, altimeter 29.53 inches of mercury (Hg). Remarks: automated observation system with a precipitation discriminator, rain began at 1100, hourly precipitation 0.00 inches, temperature 15.0° C, dew point 14.4° C.

KILG weather observation at 1151 EDT, wind from 050° at 7 knots, visibility 2 ½ miles in mist, overcast ceiling at 500 feet agl, temperature and dew point 16° C, altimeter 29.53 inches of mercury (Hg). Remarks; automated observation system with a precipitation discriminator, rain began at 1100 and ended at 1130 EDT, sea level pressure 999.8-hPa, hourly precipitation 0.01 inches, temperature 16.1° C, dew point 15.6° C.

KILG special weather observation at 1159 EDT, wind from 060° at 8 knots, visibility 2 ½ miles in mist, overcast ceiling at 400 feet agl, temperature and dew point 16° C, altimeter 29.53 inches of mercury (Hg).

[1106 EDT] SPECI KILG 251506Z 08008KT 2 1/2SM -RA BR OVC005 15/14 A2953 RMK AO2 RAB00 P0000 T01500144

[1151 EDT] METAR KILG 251551Z 05007KT 2 1/2SM BR OVC005 16/16 A2953 RMK AO2 RAB00E30 SLP998 P0001 T01610156

[1153 EDT] <u>TIME OF ACCIDENT</u>

[1159 EDT] SPECI KILG 251559Z 06008KT 2 1/2SM BR OVC004 16/16 A2953 RMK AO2 T01610156

For more detailed weather information, see the Meteorology Factual Report located in the public docket.

F. AIR TRAFFIC PROCEDURES

1.0 PIREP Solicitation and Dissemination

FAA Order JO 7110.65W, *Air Traffic Control*, Chapter 2, Section 2, Paragraph 2−6−3 stated in part:

> 2−6−3. PIREP INFORMATION
> Significant PIREP information includes reports of strong frontal activity, squall lines, thunderstorms, light to severe icing, wind shear and turbulence (including clear air turbulence) of moderate or greater intensity, volcanic eruptions and volcanic ash clouds, detection of sulfur gases (SO2 or H2S) in the cabin, and other conditions pertinent to flight safety.
>
> a. Solicit PIREPs when requested or when one of the following conditions exists or is forecast for your area of jurisdiction:
> 1. Ceilings at or below 5,000 feet. These PIREPs must include cloud base/top reports when feasible.
> *TERMINAL*. Ensure that at least one descent/climbout PIREP, including cloud base/s, top/s, and other related phenomena, is obtained each hour.
> *EN ROUTE*. When providing approach control services, the requirements stated in *TERMINAL* above apply.
> 2. Visibility (surface or aloft) at or less than 5 miles.
> 3. Thunderstorms and related phenomena.
> 4. Turbulence of moderate degree or greater.
> 5. Icing of light degree or greater.
> 6. Wind shear.
> 7. Volcanic ash clouds.
>
> d. Handle PIREPs as follows:
> 1. Relay pertinent PIREP information to concerned aircraft in a timely manner.
> 2. *EN ROUTE.* Relay all operationally significant PIREPs to the facility weather coordinator.
> 3. *TERMINAL*. Relay all operationally significant PIREPs to:
> (a) The appropriate intrafacility positions.
> (b) The FSS serving the area in which the report was obtained.
> *NOTE−The FSS is responsible for long line dissemination.*
> (c) Other concerned terminal or en route ATC facilities, including non−FAA facilities.
> (d) Use the word *gain* and/or *loss* when describing to pilots the effects of wind shear on airspeed.

2.0 Approach Information and Arrival Procedures

FAA Order JJO 7110.65W, Air Traffic Control, Chapter 4, Section 7, Paragraph 4−7−10 stated in part:

> a. Both en route and terminal approach control sectors must provide current approach information to aircraft destined to airports for which they provide

approach control services. This information must be provided on initial contact or as soon as possible thereafter. Approach information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. For pilots destined to an airport without ATIS, items 3−5 below may be omitted after the pilot advises receipt of the automated weather; otherwise, issue approach information by including the following:

1. Approach clearance or type approach to be expected if two or more approaches are published and the clearance limit does not indicate which will be used.
2. Runway if different from that to which the instrument approach is made.
3. Surface wind.
4. Ceiling and visibility if the reported ceiling at the airport of intended landing is below 1,000 feet or below the highest circling minimum, whichever is greater, or the visibility is less than 3 miles.
5. Altimeter setting for the airport of intended landing.

FAA Order JO 7110.65W, *Air Traffic Control,* Chapter 5, Section 10, Paragraph 3−10−1 stated in part:

3−10−1. LANDING INFORMATION
Provide current landing information, as appropriate, to arriving aircraft. Landing information contained in the ATIS broadcast may be omitted if the pilot states the appropriate ATIS code. Runway, wind, and altimeter may be omitted if a pilot uses the phrase "have numbers." Issue landing information by including the following:

NOTE−Pilot use of "have numbers" does not indicate receipt of the ATIS broadcast.

a. Specific traffic pattern information (may be omitted if the aircraft is to circle the airport to the left).
b. Runway in use.
c. Surface wind.
d. Altimeter setting.
e. Any supplementary information.
f. Clearance to land.
g. Requests for additional position reports. Use prominent geographical fixes which can be easily recognized from the air, preferably those depicted on sectional charts. This does not preclude the use of the legs of the traffic pattern as reporting points.
h. Ceiling and visibility if either is below basic VFR minima.
i. Low level wind shear or microburst advisories when available.
j. Issue braking action for the runway in use as received from pilots or the airport management when Braking Action Advisories are in effect.
k. If the pilot does not indicate the appropriate ATIS code, and when a runway has been shortened, controllers must ensure that pilots receive the runway number combined with a shortened announcement for all arriving aircraft.

3.0 Vectors to Final Approach and Final Approach Course Interception

FAA Order 7110.65W, *Air Traffic Control*, Chapter 5, Section 9, Paragraph 5−9−1 stated in part:

5−9−1. VECTORS TO FINAL APPROACH COURSE
Except as provided in para 7−4−2, Vectors for Visual Approach, vector arriving aircraft to intercept the final approach course:

a. At least 2 miles outside the approach gate unless one of the following exists:

1. When the reported ceiling is at least 500 feet above the MVA/MIA and the visibility is at least 3 miles (report may be a PIREP if no weather is reported for the airport), aircraft may be vectored to intercept the final approach course closer than 2 miles outside the approach gate but no closer than the approach gate.

FAA Order 7110.65W, *Air Traffic Control*, Chapter 5 Section 9, Paragraph 5−9−2 stated in part:

5−9−2. FINAL APPROACH COURSE INTERCEPTION

a. Assign headings that will permit final approach course interception on a track that does not exceed the interception angles specified in TBL 5−9−1.

TBL 5−9−1
Approach Course Interception Angle

Distance from interception point to approach gate	*Maximum interception angle*
Less than 2 miles or triple simultaneous approaches in use	20 degrees
2 miles or more	30 degrees (45 degrees for helicopters)

G. LIST OF ATTACHMENTS

Attachment 1: Interview Summaries
Attachment 2: Radar Graphics / Figures
Attachment 3: Tabular Radar Data
Attachment 4: FAA ATC Accident Package

Submitted by:

Brian Soper
Senior Air Traffic Investigator

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