**NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety
Washington, D.C. 20594

April 5, 2016

## Group Chairman's Factual Report

# AIR TRAFFIC CONTROL

**ERA15FA025AB**

## Table of Contents

## A. AIRCRAFT ACCIDENT

| | |
|---|---|
| Location: | Frederick, Maryland |
| Date: | October 23, 2014 |
| Time: | 1537 eastern daylight time (EDT) [1] |
| | 1937 coordinated universal time (UTC) |
| Airplane: | Cirrus SR22, N122ES |
| | Robinson R44, N7518Q |

## B. AIR TRAFFIC CONTROL GROUP


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## C. SUMMARY


On October 23, 2014, about 1537 eastern daylight time, a Cirrus SR22 airplane, N122ES, operated by a private individual, and a Robinson R44 II helicopter, N7518Q, operated by Advanced Helicopter Concepts, collided in midair approximately 1 mile southwest of the Frederick Municipal Airport (FDK), Frederick, Maryland. The airplane departed controlled flight after the collision, the ballistic parachute system was deployed, and the airplane landed nose-down in a thicket of low trees and brush. The helicopter also departed controlled flight, descended vertically, and was destroyed by impact forces at ground contact. The private pilot on board the airplane was not injured, and his passenger sustained a minor injury. The flight instructor, commercial pilot, and a passenger in the helicopter were fatally injured. Visual meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the airplane, which departed Cleveland, Tennessee, on a personal flight about 1247. No flight plan was filed for the helicopter, which departed FDK on a pre-rental check-out about 1535. The flights were conducted under the provisions of Title 14 Code of Federal Regulations (CFR) Part 91.


## D. DETAILS OF THE INVESTIGATION

The air traffic control group was formed on October 23, 2013. The group consisted of the group chairman from Operational Factors Division and a representative from the Federal Aviation Administration (FAA) compliance services group (CSG).

From the FAA, the group requested Potomac TRACON (PCT) radar source data, FDK voice recordings, facility logs, position logs, standard operating procedures (SOP), letters of agreement (LOA), training and qualification records, controller work schedules, and related documentation.

On October 24, 2014 the group met at FDK and after receiving a briefing from the NTSB IIC, was provided an in brief by the air traffic manager (ATM). Also present were representatives

[1] All times are eastern daylight time (EDT) based on a 24-hour clock, unless otherwise noted.

from the FAA's CSG, eastern service area quality control group (ESA-QCG), eastern Capital District, and Midwest Air Traffic Control, Inc. The group then conducted an interview with a witnessing air traffic controller that was on break at the time of the accident. The group was then provided with a tour of the tower control facilities, and then reviewed supporting administrative documents before concluding the on-site activities for the day.

On October 25, 2014 after the group chairman attended a status update meeting with the NTSB investigator in-charge (IIC), the group conducted an interview with the air traffic controller that had provided services at the time of the accident, and also attended meetings with the Chief Pilot and owner of Frederick Flight School, and accompanied the IIC and other party members during the interview of the chief flight instructor from Advanced Helicopter Concepts, Inc. The group then conducted further review of other data related to the event and met again with Midwest Air Traffic Control management. The group chairman then met with the IIC and party members for a final progress meeting, completed the group field notes, obtained concurrence, and concluded the field phase of the investigation

## E. FACTUAL INFORMATION

### 1.0 History of Flight

1534:09 N122ES contacted the FDK local controller approximately 10 miles west of the field at 3,000 feet msl[2] with ATIS[3] information "papa". The local controller acknowledged the check-in and instructed the pilot to report three miles west for a left downwind to runway 30. At 1534:31 the pilot of N122ES acknowledged with a correct read back.

*[At the time N122ES checked in, the tower controller had additional traffic including two helicopters (N444PH and N2342U) in the VFR traffic pattern to runway 30, one fixed wing Cherokee (N43T) conducting practice instrument approaches to runway 23, had received an inbound call on a Cirrus (N599BC) from the southeast, and a Citation (N612JD) that had placed an IFR clearance on request]*

1534:43 The accident helicopter (N7518Q) contacted the local controller and stated he was at Advanced (the local helicopter school) and requested to depart for left closed traffic to the grass and reported having the other two helicopters in sight. The local controller then asked if he wanted to depart from taxiway alpha, and at 1534:56 the pilot responded "that's affirmative and we have papa".

1534:59 The local controller cleared N7518Q for take-off from taxiway alpha as requested, issued the current winds which were 330 at 13 knots with gusts to 20 knots. At 1535:11 the pilot of N7518Q responded "cleared for take-off, report left base one eight quebec."

[2] All altitudes are in feet above mean sea level (msl) unless otherwise noted

[3] ATIS – Automatic Terminal Information Service – A continuous broadcast of current, routine information to arriving and departing aircraft by means of continuous and repetitive broadcasts throughout the day or specified portion of the day.

*[The local controller then continued to work the other helicopters in the closed traffic pattern and informed the pilot of N43T that she may have to discontinue his approach due to the three helicopters that were in the closed traffic pattern to runway 30 and N122ES inbound for landing from the west]*

1536:02 The local controller contacted N612JD and informed the pilot she had his clearance and to advise when he was ready to copy. The pilot immediately responded that he was ready and at 1536:06 for approximately 43 seconds the local controller issued the clearance.

1536:49 The pilot of N612JD read back his clearance as required. Also during that transmission, at 1536:52 the pilot of N122ES reported on local frequency that he was three miles out on a 45 for runway 30.

*[Due to control positions being combined in the tower, the two transmissions at 1536:49 and 1536:52 interfered with one another and the read back from N612JD transmitted over the entire transmission from the pilot of N122ES, and part of a transmission from N444PH who had reported a left downwind for approach to the grass]*

1537:10 The local controller cleared N444PH for the option to the grass and requested that he stay at 1,000 feet on his next time around because she had traffic in the downwind. The pilot of N444PH acknowledged the clearance and the altitude restriction.

1537:23 The local controller instructed N122ES to report midfield left downwind for runway 30 and said "I have three helicopters below ya in the uh traffic pattern". At 1537:31 the pilot of N122ES acknowledged and stated he had two of the helicopters in sight. Immediately after that transmission at 1537:34 the local controller said "Alright uh two echo sierra, I have ya in sight runway three zero, maintain your altitude to…until turning base, cleared to land."

*[The last radar return from N122ES was recorded at 1537:17 and indicated an altitude of 1,200 feet. The recorded radar data leading up to the last recorded return indicated the aircraft was in a slow descent and had descended 600 feet in the last minute of recorded data]*

1537:43 An eight second transmission was recorded on local frequency that indicated an individual under extreme duress. It was unclear from voice recordings which aircraft this transmission had been made from.

1537:50 The pilot of N2342U reported that an airplane and helicopter had both gone down. The local controller responded immediately "yes, yes, I just saw it".

*[The tower controller that was in the tower on break stated that she heard the duress transmission, looked up and seen N122ES falling, and immediately called 911 to initiate emergency response. Both controllers continued trying to contact the accident aircraft, ensured emergency responders were on site, and continued with the required accident notifications]*

## 2.0 Radar Data

Radar data was provided by the FAA at PCT and included source data from several radar sites in the Potomac area. Radar data recorded the flight track of N122ES up until seconds before the accident; however, no data was recorded from N7518Q. Attachments 1 and 2 are provided for reference. FDK was not equipped with radar equipment or tower radar displays of any kind.

## 2.1 Weather Information

The weather for October 23, 2014 was obtained from the KFDK Automated Surface Observing System (ASOS)[4], which was augmented by tower weather observers certified through the National Weather Services (NWS) Limited Aviation Weather Reporting Stations (LAWRS)[5] program.

[1445 EDT] KFDK METAR 231845Z 35015G20KT 10SM BKN044 19/07 A2990

Weather at 1445 EDT, wind from 350 degrees at 15 knots with gusts to 20 knots, 10 miles visibility, a broken ceiling at 4,400 feet above ground level (agl), temperature 19 degrees Celsius (C), dew point temperature 7 degrees C, altimeter setting 29.90 inches of mercury.

[1537 EDT] APPROXIMATE TIME OF THE ACCIDENT

[1553 EDT] KFDK SPECI 231953Z 33016G21KT 10SM SCT048 19/07 A2991

Weather at 1553 EDT, wind from 330 degrees at 16 knots with gusts to 21 knots, 10 miles visibility, a scattered cloud layer at 4,800 feet agl, temperature 19 degrees C, dew point temperature 7 degrees C, altimeter setting 29.91 inches of mercury.

## 3.0 Personnel Interviews

## 3.1 Witnessing Controller (WC)

The group interviewed Michelle Salcedo on October 24, 2014. She was represented by Todd Johnson, FDK ATM. In response to questions presented by the group, she provided the following information.

Her air traffic control experience began in the United States Air Force (USAF) where she received initial training and served as an air traffic controller from 2003 to 2012. In September of 2013 she was hired by Midwest Air Traffic Control and began working at Kandahar, Afghanistan (KOKN) and worked there until May of 2014. After a brief period of unemployment, she returned to Midwest Air Traffic Control in June of 2014 and accepted a job at FDK.

[4] ASOS – Automated Surface Observing System - Automated sensor suites that are designed to serve meteorological and aviation observing needs. There are currently more than 900 ASOS sites in the United States. These systems generally report at hourly intervals, but also report special observations if weather conditions change rapidly and cross aviation operation thresholds.

[5] LAWRS – Limited Aviation Weather Reporting Station – An airport weather station that utilized various degrees of automated sensors and/or other automated equipment (ie; AWOS) and is often augmented/backed up by certified tower weather observers at these locations.

Her work schedule was a rotating schedule with regular days off on Tuesday and Wednesday. Her schedule for the week leading up to and including the day of the accident was as follows:

| | | |
|---|---|---|
| Friday | 1200 - 2000 | |
| Saturday | 1200 - 2000 | |
| Sunday | 0700 - 1500 | |
| Monday | 0645 - 1445 | |
| Tuesday | Off | |
| Wednesday | Off | |
| Thursday | 1315 - 2115 | (day of accident) |

She was on lunch break, but had remained in the tower and was present at the time of the accident. She stated that she had not had any operational incidents while at FDK. She had no collateral duties and held no other aeronautical ratings or certificates.

Her operating initials were ME and her supervisor was Todd Johnson. She possessed a current second class medical certificate with no waivers or restrictions and her last ATC physical was conducted in July of 2014. She recalled nothing remarkable about the 72 hours leading up to the time of the accident, with normal rest and meals.

On the day of the accident, she was working her normally scheduled shift and stated that she was current and proficient on all positions for which she was certified. She had reviewed the audio replay of only the 911 call she had made, and declined to listen to the playback of the voice recordings from the accident. There was no training being conducted in the tower at the time of the accident. On a scale of 1 to 5 (5 being the heaviest) she classified the traffic load as 2 at the time of the accident. On a scale of 1 to 5 (5 being the most complex) she classified the traffic complexity as 2 at the time of the accident. She recalled the weather at the time of the accident was VFR and windy, from about 330 gusting to around 20 knots.

Prior to beginning her lunch break she had been relieved by Charlotte Happle, and had offered to remain controller in-charge (CIC), however Ms. Happle declined and said she would keep everything combined. She said after Ms. Happle had been on position a short time, she believed it was around 1520, she offered to split the positions, or relieve her all together, but again Ms. Happle declined stating she would stay on for another hour or so and then they could switch things up. She remembered that the local controller had helicopters in the traffic pattern and that somebody had called on ground control frequency looking for an IFR clearance, so Ms. Salcedo called PCT to get the clearance and provided it to Ms. Happle to relay to the requesting aircraft.

She remembered an aircraft inbound to runway 23 and a Cirrus [N122ES] inbound from the west. She had been observing operations and the local controller was making traffic calls when she looked out the window and could see the Cirrus west of the field approximately 45 degrees from the downwind to runway 30 and heard the local controller say to the pilot of the Cirrus that she had him in sight and instructed him to maintain his altitude until his base turn and then cleared him to land on runway 30. The local controller then turned to break off the aircraft that was on approach to runway 23, when Ms. Salcedo heard screaming over the frequency and

immediately looked back and seen the Cirrus falling from the sky over the AOPA[6] hangar and a deployed parachute that appeared to have a person attached. She later learned it was not a person attached to the parachute, but was actually part of the aircraft's installed ballistic recovery system. Immediately realizing what was happening, she picked up the phone from the ground control position and dialed 911 to report the accident to emergency dispatch personnel, after which she and the local controller began the process of required notifications.

At 1540 Ms. Salcedo assumed the duties of ground control and CIC and at 1553 also assumed the duties of local control and continued to work all positions combined from the ground control position until the ATM was able to provide her with a relief. She said there was really nothing happening from a traffic standpoint since the field was closed, with the exception of a couple of news helicopters that had requested entry into the class D airspace. She initially kept them out of the airspace until she could confirm from the ATM that it was okay to let them in. She did not submit to any toxicology screening since she was on break and had not provided services to the involved aircraft at the time of the accident.

The tower did have an emergency binder that contained a listing of required notifications, and a worksheet to follow in the event of an emergency at the field. She stated Ms. Happle had the binder out and was filling out the worksheet as she made notifications. She did not recall a crash grid[7] being available in the tower. She said all emergency responders came from off the airfield out in town, and in this case remembered calling back 911 to ask about the emergency response because they could not see them from the tower and the emergency dispatcher informed her that emergency responders were on site at both crash locations. She contacted the assistant airfield manager who told her that neither he, nor the airfield manager was at the field, but that he was on his way.

Because the tower did not have any connectivity to the FDIO[8] system, she said that all flight progress strips for IFR operations were handwritten and VFR flights were tracked on small plexi-glass "chips" that could be written on, and were organized on a wooden board called the "chip board" located at the local control position. They would write the pertinent flight information (call sign, type a/c, etc) on the chips with a grease pencil or dry erase marker, and would organize them on one side of the board as needed for visual reference. On the other side of the board there were sections for arrivals, departures, and a section for helicopter movement, runway in use, and current ATIS information. Use of the board was purely technique outside of some basic strip marking guidance that was provided in the facility SOP. There was no strip bay at the local control position but there was one at the ground control position, and she recalled handing the strip on the Cirrus directly to Ms. Happle and said she had observed Ms. Happle utilizing the chip board around the time of the accident.

[6] AOPA – Aircraft Owners and Pilots Association - A non-profit aviation safety organization founded in 1939, who's headquarters, are located in Frederick, Maryland.
[7] Crash Grid – An aerial view of the airport and surrounding local area that is overlaid with a grid system making it easy to correlate a position of an incident, accident, or other situation where communicating accurate position information to management or first responders is time critical.
[8] FDIO – Flight Data Input/Output - A system utilized to distribute flight plan information, weather information, and general information to associated Air Traffic Control facilities across the National Airspace System.

She specifically recalled Ms. Happle using binoculars to locate the Cirrus that was inbound from the west. She said that since they did not have radar at FDK, all aircraft must be located visually. She said that she specifically recalled that because she remembered Ms. Happle lowering them and saying "I have you in sight." She did not see the accident helicopter [N7518Q] take off, and said that she did not know if Ms. Happle had used the binoculars to observe the helicopters departure either.

When asked how she may have done anything differently in this case had she been working the traffic, she stated that using her technique she would have had the inbound fixed wing report a point three miles west of the field since she could usually acquire the aircraft visually at that point. Then she would have had the aircraft report midfield to enter a left downwind for runway 30. She then would have given the actual positions of the helicopter traffic when issuing the traffic to the Cirrus. She would also have reiterated the pattern altitude to the helicopters if she felt that they would be a factor, and anytime if she did not recognize the fixed wing aircraft's call sign as being local. She felt she may utilize phraseology such as "do not start your descent until turning base"; may use specific altitude assignment such as; fixed wings at or above 1,300 feet and helicopters at or below 900 feet to de-conflict.

She was not aware of any published "course rules", SOP's or LOA's with the flight schools at FDK, however there were four or five LOA's with the airport, one with emergency services, and one with PCT. When asked about the local patterns at FDK she stated that it was left traffic for runway 30 and the pattern altitude was 900 feet msl for helicopters, 1,300 feet msl for small fixed wing, and 1,800 feet msl for large twin engine fixed wing. She thought the helicopter pattern altitude was published in the noise abatement procedure but not in the airfield directory (AFD). She felt that the air traffic facility had a good working rapport with both airfield management and PCT.

When asked if she could provide a more detailed recollection of what she had seen at the time the Cirrus was coming down she said that she observed the Cirrus, both wings were intact and the nose was straight down. She said it appeared to be the belly of the aircraft facing her as she could see the entire outline of the aircraft. She did not see any fire and never observed the accident helicopter.

She did not recall exactly what the local controller was saying at that time of the accident, and recalled the only communication between one another was when Ms. Happle instructed her to call 911, which she was already in the process of doing at the time. To the best of her recollection, Ms. Happle seemed collected at the time she was relieved from position, and continued to relay information, make phone calls, and coordinate with the DEN[9] and ATM. When the ATM arrived, he told Ms. Salcedo to put out a special weather observation (SPECI). She filled out the "dash 9" (Form 8020-9 / FAA Accident/Incident Preliminary Notice) as well as the phone log. Once she was relieved, she remained in the tower and just took some time to "absorb it all". She said it all seemed rather surreal saying "it was huge".

[9] DEN – Domestic Events Network – A 24/7 FAA-sponsored telephonic conference call network (recorded) that includes all of the ARTCCs in the United States. It also includes various other governmental agencies that monitor the DEN. The purpose of the DEN is to provide timely notification to the appropriate authority that there is an emerging air-related problem or incident.

### 3.2 Local Controller (LC)

The group interviewed Charlotte Happle on October 25, 2014. She was represented by Todd Johnson, FDK ATM. In response to questions presented by the group, she provided the following information.

Her air traffic control experience began in the USAF where she received initial training and served as an air traffic controller at McGuire AFB (WRI) from 1974-1978. In August of 1981 she was employed by the FAA at Newark ATCT (EWR) and remained until 1984 when she accepted a position at New York TRACON (N90) for two years. From 1986 to 1988 she returned to EWR as a procedures specialist before accepting a Front Line Manager (FLM) position at Teterboro ATCT (TEB) in the spring of 1988. In January of 1990 she returned to N90 as an FLM until February of 1994 when she was selected as the ATM at Morristown ATCT (MMU). In March of 1996 she began working at eastern region in a personnel resource management position and remained until becoming the FAA Command Center Training Manager in March of 1998. In June, 2003 she accepted a position as assistant ATM at Dulles ATCT (IAD) and worked there until she retired from the FAA on May 3, 2009. After four years of performing various non-ATC related volunteer work, she returned to ATC and was hired by Midwest Air Traffic Control and began working at FDK in November of 2013.

Her work schedule was a rotating schedule with regular days off on Monday and Tuesday. Her schedule for the week leading up to and including the day of the accident was as follows:

| | | |
|---|---|---|
| Friday | 0700 - 1500 | |
| Saturday | 0700 - 1500 | |
| Sunday | 0645 - 1445 | |
| Monday | Off | |
| Tuesday | Off | |
| Wednesday | 1315 - 2115 | |
| Thursday | 1200 - 2000 | (day of accident) |

She was working all tower positions combined to the local control position at the time of the accident, which she said was normal at FDK. Her training and qualification record was reviewed by the group, and documentation was consistent with her responses during the interview. She stated that she had no documented operational incidents while at FDK. She had no collateral duties and held no other aeronautical ratings or certificates.

Her operating initials were CJ and her supervisor was Todd Johnson. She possessed a current second class medical certificate with a requirement to wear corrective lenses while performing air traffic control duties. She stated that she was wearing her glasses at the time of the accident. She stated that she had no other waivers or restrictions to her medical certificate and that her last ATC physical had been conducted in October of 2013. She recalled nothing remarkable about the 72 hours leading up to the time of the accident, with normal rest and meals.

On the day of the accident, she was working her normally scheduled shift and stated that she was current and proficient on all positions for which she was certified. She had reviewed the audio replay of the event before being interviewed, and had discussed the incident with the ATM and

staff. There was no training being conducted at the time of the accident. On a scale of 1 to 5 (5 being the heaviest) she classified the traffic load as 1 at the time of the accident. On a scale of 1 to 5 (5 being the most complex) she classified the traffic complexity as 1 at the time of the accident. Staffing at the time of the accident was normal. A position relief briefing was conducted when she assumed the duties as local controller, a checklist was utilized, and it was recorded. She recalled the weather at the time of the accident as VFR, with strong winds out of the northwest around 330 at 14 knots with gusts to 22 or 23 knots, a broken ceiling of about 3,500 feet and 10 miles visibility.

She thought she had been on position for about an hour and a half and said there was little to no traffic and the active runway was 30. She remembered a Cherokee contacting her and wanting to conduct practice approaches to runway 23 which she cleared and issued the standard "no separation services will be provided….etc", instructed him to report RICKE (The intermediate fix for the ILS/LOC runway 23 approach, 4.2 nautical miles from FDK) and asked his intentions. The pilot said that he wanted to fly the published missed approach and return for another approach, which he did, and after executing the missed approach she instructed him to enter the hold at RICKE. He subsequently requested another approach, and she went through "the same spiel" as before and instructed him to report RICKE inbound. While he was on the approach, N444PH called and was taxied to the grassy area via taxiway alpha. Shortly thereafter, N2342U called to taxi to the grassy area also, and both helicopters subsequently entered the VFR helicopter closed traffic pattern to the grass, while the Cherokee conducted the practice approach to runway 23. She had asked N444PH to extend his upwind because the Cherokee was executing the missed approach from runway 23 and she wanted to keep them de-conflicted.

She took a call from PCT at around 1525, but could not recall if that was actually before or after she had started working the Cherokee and helicopters. The call from PCT was the inbound call for the Cirrus [N122ES] who was 14 minutes west….at that point the Cherokee was on the localizer for runway 23 again. She said that N122ES checked in 10 miles west of the field at 3,000 feet and had ATIS information "papa". She instructed N122ES to report 3 miles west for left traffic to runway 30 and the pilot acknowledged. She then recalled N7518Q had called for taxi from Advanced and requested to depart from taxiway alpha and join left traffic with the other two helicopters. At some point in-between, she had read a clearance to a Citation that had filed to Greensboro. After reading the clearance to the Citation, she cleared N7518Q for take-off from taxiway alpha and instructed the pilot to make left traffic to the grass. She then realized that with N122ES inbound from the west, she would need to break off the approach for the Cherokee conducting the practice approach to runway 23, which she did and the Cherokee discontinued the approach.

Looking back, she recalled that the Cirrus was closer than she expected and that she never received the 3 mile call that she had requested. She said that the Cirrus appeared to be approaching at approximately 45 degrees from the downwind for runway 30 and above the pattern altitude at approximately 1,500 feet. She felt he was definitely at an altitude reasonably close to the pattern altitude from her experience because she could see blue sky all the way around the airplane above the ridgeline, and knew that they were a little low when they were below that ridgeline. She instructed N122ES to report midfield left downwind for runway 30 and stated that she had three helicopters below him and instructed him to maintain his altitude until

turning base, then cleared him to land. She did that because she did not want him to descend any lower with the helicopters operating in the pattern below. The pilot of N122ES stated he had two of the helicopters in sight, and the next thing she remembered was seeing the parachute.

She observed N7518Q take off in the direction of taxiway alpha and start a turn to the left, but once above the hangars she really could not see the helicopter against the backdrop of the trees and terrain, especially with its green color that blended in with the background terrain. She never had the opportunity to use the binoculars to visually acquire the helicopter in this case, nor the Cirrus earlier. After the accident, she remembered the parachute appeared to be hung up in power lines and trees and appeared to have a person at the end of it. She later learned it was part of the aircraft's installed ballistic recovery system. She said that Ms. Salcedo called 911 immediately, and then called them again because they had not seen them respond on site after several minutes, but the emergency dispatcher reported that the vehicles were already on site at both accident locations. She could see N444PH and N2342U and knew almost immediately that in addition to N112ES, N7518Q was likely involved as well.

She then closed the airport, instructed the Cherokee to exit the class D airspace, and informed the aircraft that had requested to taxi out for departure that he could not taxi because the airport was closed due to an accident. She pulled the red emergency binder and began making notifications from the phone list, and also filling out the emergency checklist. She remembered the FSDO (Flight Standards Division Office) and ESA-QCG being on the line but declined eastern service area media/public affairs request to join the call until she could coordinate with the ATM. She did not remain on position for very long after the accident occurred, and that the little time she did stay on, nothing was really happening as far as traffic was concerned because the airport was closed. She provided a written statement to the ATM within one hour of the accident occurring. A mobile team dispatched by Midwest Air Traffic Control arrived and conducted toxicology testing with her approximately 4 to 5 hours after the accident.

When asked, she said she did recognize N122ES as being a locally based aircraft. When asked about the local patterns at FDK she stated that all pattern altitudes were published in the AFD and local SOP as well. She stated that the helicopter pattern altitude was 900 feet, fixed wing pattern altitude was 1,300 feet, and large fixed wing pattern altitude was 1,800 feet. She said that on occasion the helicopters would request a "high and tight" maneuver when conducting auto-rotations which required them to climb to 1,200 feet, but that none of the helicopters flying during the time of the accident were doing that. She assumed the helicopters were at 900 feet because that's what was in the SOP and also in the airport noise abatement procedures. In this instance she said she reminded N444PH of the 900 foot pattern altitude because she had a fixed wing entering the downwind. She never had a chance to get back to N7518Q before she saw the parachute.

She said if she had known that the Cirrus was so close when she cleared N7518Q, she would have held off on giving N7518Q the departure clearance until she observed that the Cirrus was clear. She wished she would have received the three mile call from the Cirrus, and since she had not, felt like she had more time and therefore did not issue the fixed wing traffic to the helicopter, and assumed they would never have been a factor. She would sometimes issue traffic

with a departure clearance, but in this case she did not because she believed it would not be a factor.

She had not worked active air traffic since the day of the accident. She had not been able to get the sound of the screaming over the air out of her head. In the time that had passed since the accident, she had thought a lot about the dynamics of the event and knew that helicopters were greatly impacted by the winds, and wondered if the strong and gusty wind conditions on the day of the accident had played a factor. She also added, with regards to staffing in the tower, that it was common to combine positions most of the time and that they basically had to, based on equipment limitations. She said they normally had two positions open unless it was IFR or traffic was very low, like it was initially on the day of the accident. When she first assumed the control duties the day of the accident, there had been zero traffic that day. She felt there would definitely be value added in having some sort of SOP for local operations with the flight schools. She also spent some time stressing the impact to safety that she felt not having radar was having at the facility. She felt the cost (she recalled a figure of around $400,000) was a small price to pay considering the density and complexity of traffic routinely worked at FDK.

## F. LIST OF ATTACHMENTS

Attachment 1 – 2D Radar Plot
Attachment 2 – 2D Radar Plot

Submitted by:

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Brian Soper
Senior Air Traffic Investigator