



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

May 27, 2016

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

ERA15FA340

A. AIRCRAFT ACCIDENT

Location: Kernersville, North Carolina
Date: September 7, 2015
Time: 1203 eastern daylight time / 1603 coordinated universal time
Airplane: N36HT, Raytheon-Beech A-36 Bonanza

B. AIR TRAFFIC CONTROL GROUP

Mr. Scott Dunham
National Transportation Safety Board
Washington, DC

Mr. Heath Honse
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Warrenton, Virginia

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National Air Traffic Controllers Association (NATCA)
Rancho Cordova, California

C. DETAILS OF THE INVESTIGATION

On September 7, 2015, about 1203 eastern daylight time, N36HT, a Beech A-36, was destroyed when it impacted terrain near Kernersville, North Carolina, during arrival to the Piedmont Triad International Airport (GSO), Greensboro, North Carolina. The certificated private pilot and the two passengers were killed. The airplane was registered to and operated by Central Penn Aviation Academy Inc, Paxinos, Pennsylvania. An instrument flight rules (IFR) flight plan was filed for the flight that departed Sarasota-Bradenton International Airport (SRQ), Sarasota, Florida, about 0819. Instrument meteorological conditions (IMC) prevailed for the personal flight conducted under the provisions of 14 Code of Federal Regulations Part 91.

1.0 History of Flight

The pilot first contacted the GSO approach control South Radar (SR) position at 1132:54, reporting that he was descending through 5,700 feet. The SR controller replied that Automatic Terminal Information Service (ATIS) information Delta was current, the altimeter setting was 30.19, and the pilot should expect to land on runway 5R. The pilot read back the runway assignment, and then asked if he should expect a visual approach. The controller stated that the pilot should expect the instrument landing system (ILS) approach, and asked the pilot to report when he had received information Delta. The pilot confirmed that he had information Delta, and then asked if the assigned runway was 5L. The controller reconfirmed the original assignment, runway 5R.

At 1133:51, the pilot asked the controller to confirm that N36HT was cleared to 5,000 feet. The controller responded that if 5,000 was the altitude assigned by the previous controller, it was correct, and also noted that he (the SR controller) had not issued any other altitude instructions. The pilot acknowledged.

At 1135:19, the pilot again asked the controller to confirm whether he should expect runway 5R or 5L. The controller responded, "The right side – R-I-G-H-T." The pilot read back, "Five right 36HT."

At 1140:43, the SR controller instructed the pilot of N36HT to fly heading 360 for sequencing into Greensboro, and the pilot acknowledged. At 1143:26, the SR controller instructed the pilot to contact Greensboro on 124.35, which was the West Radar (WR) frequency.

The pilot contacted the WR sector controller at 1144:00, reporting level at 5,000 feet. The controller provided the Greensboro altimeter setting, 30.19. At 1145:24, the WR controller cleared the pilot to descend to 3,000 feet. At 1148:01, the controller advised the pilot of potentially conflicting traffic ahead, type and altitude unknown. The pilot responded, "Roger – 36HT is about to go IMC." The airplane was descending through 3,600 feet at the time.

At 1148:38, the controller advised the pilot that traffic was no longer a factor and instructed him to turn right heading 010. The pilot correctly read back the heading. At 1149:04, the pilot reported level at 3,000 feet, and then asked if the controller wanted him to remain at 3,000 feet. The controller responded, "Affirmative."

At 1150:35, the WR controller transmitted, "N36HT niner miles from Pagan, turn right heading 020, maintain 3,000 until established on the localizer, cleared ILS runway 5R approach." The pilot responded, "Turning right heading 020 for Pagan." The controller restated the altitude restriction and the approach clearance, and the pilot read the clearance back correctly.

At 1152:48, the pilot asked, "How do you like this route of flight?" The WR controller responded, "You look just a little bit right of course for the ILS, turn left heading 0...make that 360 for the ILS, report established." The pilot then asked, "Turning left or turning right for 360?" The controller replied, "left to 360," and the pilot acknowledged.

At 1153:59, the controller asked the pilot of N36HT, "...are you established? [on the localizer]" The pilot responded, "Established if I could have vectors to final, please." The WR controller then asked, "...Are you established on the localizer?" The pilot stated, "I believe I am, 36HT." The controller continued, "Now you look like you just actually went through the localizer." The pilot replied, "Roger – request a vector for final for 36HT."

The controller issued an instruction to another aircraft, then at 1154:29 transmitted, "N36HT cancel your clearance, maintain 3,000, turn left heading 320 for sequencing." The pilot read back, "Left 320."

At 1156:43, the WR controller instructed the pilot of N36HT to turn left heading 230 for vectors to the ILS runway 5R approach. The pilot correctly read back the instruction. At 1157:29, the controller asked the pilot to verify that he was flying heading 230. The pilot replied, "Negative, and 36HT is close to..." The transmission ended incomplete. The controller then took a landline coordination call from another facility.

During that call, the pilot of N36HT called again in a strained tone, stating, "N36HT request vectors," and the controller also noticed that the airplane's altitude was below 3,000 feet. He ended the call and at 1157:57 responded to the pilot, "Bonanza 36HT you need to be level at 3,000, altitude shows you 2,500, Greensboro altimeter 30.19." The pilot responded, "6HT

climbing to three.” The controller asked the pilot to verify that he was on a 230 heading. The pilot did not respond.

At 1158:40, the controller asked the pilot to verify the airplane was at 2,900 feet. The pilot did so. At 1159:17, the controller asked the pilot to verify the aircraft’s heading. The pilot responded that the airplane was heading 166. The pilot continued, “We need a descent, we are almost disoriented, N36HT...2,700.” In the background of the transmission, a female voice said, “Turn something off.”

At 1159:35, the controller asked if the pilot could accept a no-gyro turn to final. The pilot said he could. At 1159:43, the controller instructed the pilot to start a left turn and 16 seconds later told the pilot to maintain at least 2,500 feet. The pilot did not verbally respond, but radar showed that the aircraft began a left turn. At 1200:16, the controller instructed the pilot to start a right turn. The pilot responded, “Right turn, 36HT leveling off 2,500.”

At 1200:47, the controller transmitted a low altitude alert to N36HT along with the altimeter setting, and asked the pilot to say altitude. The pilot did not acknowledge the transmission, and radar data showed that during the next minute the aircraft completed a 360 degree turn.¹

At 1201:24, the controller transmitted, “N36HT climb and maintain 4,000, I can see if I get you back up into the uh above the clouds.” At 1201:35, the controller continued, “N36HT Greensboro approach you up? Last altitude showed 2,100.” At 1201:41, the pilot transmitted “N36HT” in an agitated voice. The controller replied, “N36HT just climb and maintain 4,000, I’ll block altitude for you.”

At 1202:06, the controller asked the pilot of N36HT, “... if he was able to take the climb,” and continued, “Last tops were reported at 3,500, if I can get you up to 4,000 maybe you can square it back off.” At 1202:18 a short unidentifiable sound was heard, possibly from N36HT. At 1202:39, the controller advised the pilot that his altitude readout showed 2,100 feet.

At 1202:44, an unidentified transmission similar to breathing sounds was heard on the frequency. At 1202:54, the pilot asked, “Is there a nearby field for 36 ho-.” The controller responded, ...the nearest airport is Greensboro airport, off your left wing and off your current heading 7 miles. Right now showing 1000 overcast for the ceiling.”

At 1203:21, the controller asked the pilot for his altitude. At 1203:34, screams were heard on the frequency. There were no further communications with N36HT. GSO notified first responders of a possible accident 7 miles southwest of the airport. The aircraft’s wreckage was located near a quarry shortly afterward.

A review of radio communications and radar data for N36HT beginning with departure from Sarasota revealed no unusual events or operational issues. The aircraft was at 9000 feet for most of the flight, until shortly before beginning descent into GSO.

¹ The radius of the turn was small compared to the radar range setting the controller was using, and he stated that he did not notice the maneuver when it occurred.

2.0 Radar Data

Radar data for this accident was obtained from the GSO Automated Radar Terminal System (ARTS-IIIE) and the ASR-9 radar located on the airport. Figures 1 and 2 show the radar targets associated with the airplane as it approached GSO and after the initial canceled approach clearance.

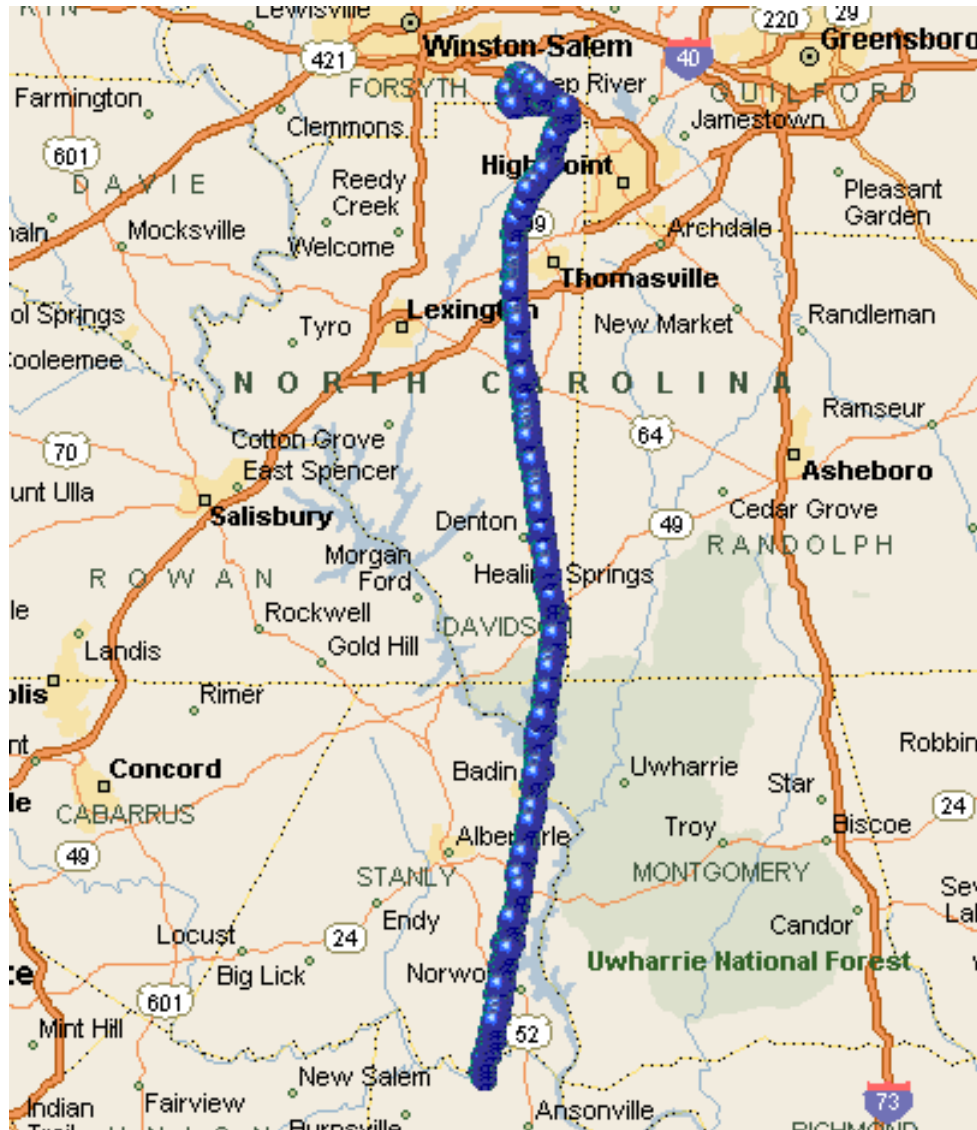


Figure 1 – N36HT flight track overview.

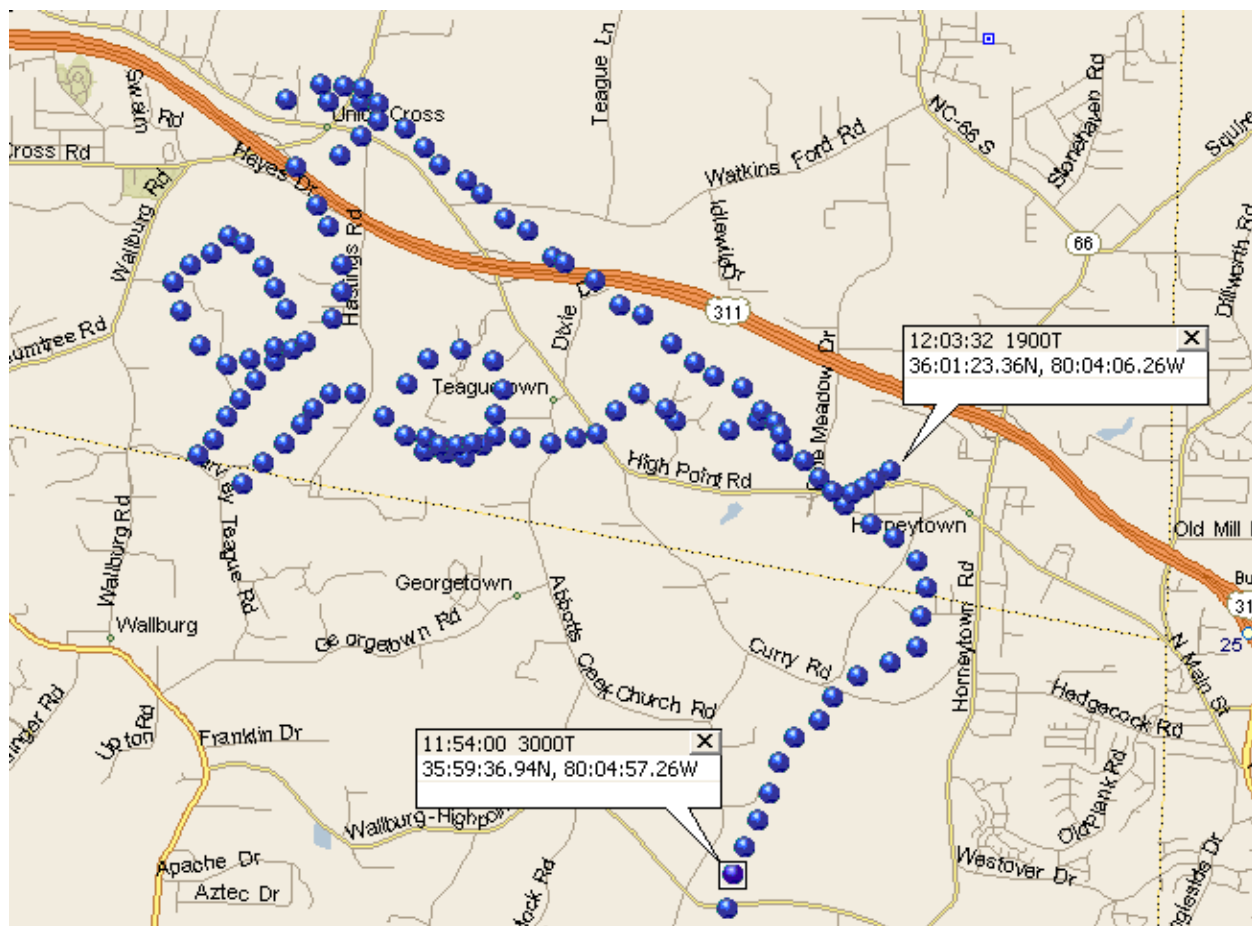


Figure 2 – Closeup view of the ground track just before the accident. Data tags show time (EDT), altitude corrected for local altimeter setting, latitude, and longitude.

3.0 Personnel Interviews

Jeffery Butler

South Radar (SR) CPC

Mr. Butler has been employed by the FAA since August of 1990. His first facility was Orlando Executive (ORL), where he stayed until transferring to Sanford, Florida (SFB) in December 1990. In January of 1994, he moved to Florence, SC (FLO), his first radar facility. He transferred to GSO in September 2005.

Mr. Butler had no pilot experience and no previous military experience. He had a current FAA medical with a restriction to wear corrective lenses while working.

Mr. Butler's regular days off were Thursday and Friday. He stated that his normal Saturday and Sunday shifts were 1500-2300. On Mondays he usually worked from 0800 to 1600, and on Tuesdays and Wednesdays he usually worked from 0600-1400. Mr. Butler said he does not work midnight shifts and does not usually work overtime.

On the day of the event, Mr. Butler was working the SR position. He took control of N36HT from Charlotte Approach. Mr. Butler did not notice anything unusual while working with N36HT. He said that the pilot checked in with the weather information, and he told the pilot to expect runway 5R. There was some confusion with the runway assignment between himself and the pilot. He mentioned that he had to repeat the correct runway in use numerous times to the pilot, even spelling out the word R-I-G-H-T for emphasis. He stated that it was not normal but also not unusual for a pilot to be confused about a runway assignment. Mr. Butler stated that the letter of agreement with Charlotte requires most GSO arrivals to be routed over Gants intersection at 9000 feet. He also said that many arrivals were cleared to descend to 5000 feet entering GSO airspace, but that any odd altitude was acceptable.

When asked if he thought his handling of N36HT was normal or somewhat normal, Mr. Butler replied, "yes." It was only after transferring the flight to the next sector that he realized there was a problem. Mr. Butler, while scanning, saw that the aircraft was not in a normal position for an arrival to runway 5R. Either he or the WR controller, Kendall Garland, shouted to the front line manager (FLM) that there were problems with N36HT.

Mr. Butler said that the FLM was not right at the sector at the time, but was only a few feet away. At some point he became aware of the FLM's presence directly behind him. Mr. Butler said he began to assist Mr. Garland by watching his traffic and coordinating on landlines. He solicited a cloud tops report from another pilot, who reported that the tops were at 3,500 feet, and passed that information directly to Mr. Garland. When asked if he had experienced other emergencies, Mr. Butler stated that he recalled a Beechcraft Baron that had crashed five years earlier and another King Air accident at Mount Airy, NC.

Mr. Butler was asked what a pilot meant when they say they are "disoriented." He answered that it meant the pilot was "in a bad place." He further stated that it meant that the pilot, "...doesn't know which way is up." Asked if there was anything that a controller could do to help a pilot in this type of a situation, Mr. Butler replied that he would try to get the pilot to a safe place to reorient himself or vector him into visual flight conditions. He stated that he would try to get the pilot to get his wings level and hold altitude and headings. Mr. Butler said he would avoid abrupt turns and his main focus would be the aircraft's altitude.

Mr. Butler was unable to explain how to obtain an aircraft's location in latitude and longitude using the ARTS system. When asked about the proper procedures for issuing no-gyro vectors, Mr. Butler seemed confused by the question and said that it has been a very long time since he was trained on the technique.

When asked if a VFR-only pilot in the clouds was an emergency situation, Mr. Butler said no. When asked if any co-workers were pilot qualified, Mr. Butler named three. Mr. Butler correctly defined hypoxia as oxygen deprivation and listed the effects as bad decision making and losing consciousness.

Mr. Butler was asked about possible reasons that a pilot could get disoriented. He stated that it would be because the pilot lost touch with the ground and didn't know which way was up. Asked if any issues with the aircraft could cause the pilot to experience disorientation, Mr. Butler

replied, “I suppose his instrumentation.” Mr. Butler stated that he had not received any training on these topics.

Mr. Butler was asked if he knew the requirements for solicitation of pilot reports (PIREPS). Mr. Butler responded that it was required hourly for visibility less than five miles or a ceiling less than 5000 feet, icing, wet runways, thunderstorms and turbulence. When asked how PIREPS were handled in the facility, Mr. Butler responded that the controller-in-charge or FLM calls them into Flight Service (FSS), and noted that GSO was very good at making sure the PIREPS get called in to FSS. PIREP information was “sometimes” kept at the operating positions.

Mr. Butler was asked if he knew the definition of a standard rate turn. He said he recalled the term, but not the specifics.

The FLM on duty was very proactive in assisting during the emergency, but was not wearing a headset at the time. No other controllers other than WR and SR were involved.

Mr. Butler stated that he was familiar with the emergency obstruction video map (EOVM), and said that it was combined with the minimum vectoring altitude (MVA) map. The EOVM depicted mountain peaks, manmade obstructions, and the location of hospitals.

Kendall Garland

West Radar (WR) Controller

Mr. Garland began working for the FAA in September 2008 at the Longview, Texas, control tower, and became fully certified there. He transferred to GSO in May 2012, and completed training in January 2013. He had no previous ATC experience. Mr. Garland’s operating initials were KG.

Mr. Garland was qualified and current on all required positions at GSO. Mr. Garland’s second class medical certificate was current with the no restrictions. Mr. Garland held no other FAA airman certificates.

Mr. Garland’s normal work schedule consisted of Wednesday-Thursday off, followed by two 1330-2130 shifts, one shift of either 0800-1600 or 1100-1900, one 0600-1400 shift, and either a 2230-0630 shift or another 0600-1400 shift. On the day of the accident, Mr. Garland was working a 0630-1430 shift. Mr. Garland stated that he felt rested and there were no unusual occurrences or conditions affecting operations.

When asked to describe the event, Mr. Garland stated that he was working the WR position and that he accepted the handoff on N36HT from the SR controller. Mr. Garland noticed that there was an R in the scratchpad, which meant the aircraft was expecting the ILS approach to runway 5R as advertised on the ATIS broadcast. When the pilot checked on, Mr. Garland cleared him to descend from 5000 feet to 3000 feet for the approach. As the aircraft approached the localizer, Mr. Garland gave the pilot a heading to intercept the final approach course followed by clearance for the ILS approach. The pilot later asked Mr. Garland how his track looked, which was not a common question from a pilot on a precision approach. Mr. Garland responded that the track looked right of course, gave the pilot another vector to intercept the final approach course, and

told him to report established on the approach. Mr. Garland observed N36HT fly through the final approach course and asked the pilot if he was established. The pilot responded that he was established if he could get another vector to final.

Mr. Garland didn't ask the FLM to get involved and didn't remember exactly when he came to assist, but remembered the FLM slipping him a flight progress strip with the 05R localizer frequency on it. Mr. Garland gave the pilot another vector to final, and after seeing that he wasn't taking it, cancelled the approach clearance and turned N36HT to a 320 heading for sequencing. N36HT appeared to take the 320 heading, so Mr. Garland cleared a following aircraft for the ILS approach. Mr. Garland then issued a 230 heading to N36HT to put the aircraft on downwind. Mr. Garland observed that N36HT did not appear to be taking the assigned heading. Mr. Garland was unsure why the pilot would fly the 320 heading, but not the 230 heading. Mr. Garland stated that it was common for pilots to come to GSO for training approaches, and having an aircraft through final and need to be resequenced was not unusual. There were pilots from training schools in the vicinity that regularly did practice approaches at GSO.

Watching the aircraft, Mr. Garland couldn't tell that the aircraft was flying in circles. It just appeared that he was flying his own headings. Mr. Garland's preference settings were at the furthest allowable setting to allow him to see what was coming and going around GSO, approximately 60 miles. Mr. Garland heard the pilot say that he was getting disoriented, and detected a change in his voice. Mr. Garland then gave the pilot another instruction, and the pilot's voice seemed to be calm again.

Mr. Garland then asked the pilot if he could accept a no-gyro vector. He responded that he could, so Mr. Garland instructed the pilot to start a turn. Mr. Garland said it didn't appear that he took the turn, and the pilot then quit responding to his transmissions. The pilot asked where the nearest airport was. Mr. Garland told him it was GSO and gave the pilot his position from the airport. Mr. Garland remembers either the FLM or the SR controller telling him that the cloud tops in the area were 3600 feet. Mr. Garland instructed the pilot to climb to 4000 feet so he could possibly get above the clouds and reorient himself, but there was no response. Shortly afterward, Mr. Garland observed the target disappear and not reacquire. He transmitted, "radar contact lost" and put a ring around the area where the aircraft was last seen. Mr. Gardner was relieved from the position not too long after that.

When asked about no-gyro procedures, Mr. Garland was unfamiliar with standard rate turns and only knew to watch the track and call a stop turn when the aircraft appeared to be close to the desired heading.

When asked about things that could cause a pilot to get disoriented, Mr. Garland stated possibly distractions and/or medications. Mr. Garland was unfamiliar with the term "hypoxia." Mr. Garland stated that if an instrument-rated pilot was flying in IFR conditions, he expected the pilot to comply with ATC instructions and tell him if something was wrong. Mr. Garland stated that he thought the best thing to do if a pilot was disoriented was stay calm with him and try not to get snappy or make the pilot feel any more uncomfortable than he already was. Mr. Garland said that he was staying calm and trying to get N36HT on a solid vector so the pilot could level the aircraft and then later climb above the clouds to regain visual orientation.

Mr. Garland was unaware of where the EOVM maps were located or how to use them. Mr. Garland didn't recall the last time he received training on emergencies or emergency determination. Mr. Garland didn't recall receiving simulator training on emergencies at GSO, and definitely not since his certification.

Mr. Garland stated that he thought N36HT was a priority but not an emergency. Mr. Garland stated that he was transferring aircraft that he no longer needed to talk to off his frequency so that he could focus more on N36HT. Mr. Garland had never worked a similar situation. He had worked emergencies in the past, but nothing memorable. When asked if he would consider a VFR aircraft in the clouds to be an emergency, Mr. Garland stated that he would not unless the pilot felt it was an emergency. Such a scenario would require special attention, but Mr. Garland would not declare it an emergency unless circumstances changed or the pilot declared an emergency.

William S. Watson

GSO Front Line Manager

Mr. Watson began working for the FAA on June 8, 1992, as a controller at Greenville Downtown Airport, SC, and completed certification there. Mr. Watson transferred to Winston-Salem Airport, NC, on July 27, 1993, and to GSO on April 18, 1994. He completed certification at GSO and has remained there since 1994. Mr. Watson held a temporary supervisor position for approximately 6 months to a year, but became a full time FLM in April 2006. Before coming to the FAA, Mr. Watson was an Air Force approach controller at Myrtle Beach from 1987 to 1991. Mr. Watson's operating initials were KT. Mr. Watson held a current second class medical, and no other FAA airman certificates.

Mr. Watson's work schedule consisted of 5 midday shifts, usually from 1000 to 1800 but sometimes adjusted to cover leave with Saturday and Sunday off. On the day of the accident, Mr. Watson was working a 1000-1800 shift. Mr. Watson said he felt rested and there were no unusual personal or operational circumstances affecting services.

Mr. Watson was not the direct supervisor of any of the controllers working in the radar control room at the time of the event. When asked to describe the event, Mr. Watson stated that he was the FLM in the radar room. He was circulating between the sectors and the supervisor desk, which was located approximately 15 feet away from the control positions. Mr. Watson recalled Mr. Butler asking if it was snarky or unprofessional to spell out the right runway to emphasize the clearance to a pilot who wasn't getting it. Mr. Watson told him that plain, easy to understand language should be used.

Mr. Watson heard Mr. Garland telling the pilot of N36HT that he was right of course and giving him an additional vector. Mr. Watson slid a flight progress strip to Mr. Garland with the 5R localizer frequency written on it. Mr. Watson was not wearing a headset, but was occasionally monitoring via handset from the flight data position located between WR and SR. Mr. Watson heard Mr. Garland cancel the approach clearance and issue the 320 heading. He looked over and N36HT appeared to be taking the assigned heading. Mr. Watson heard Mr. Garland issue a 230 heading and then comment that the pilot was not flying the assigned heading.

Mr. Watson went over and started coordinating for Mr. Garland so he could focus on giving more attention to N36HT. He thought Mr. Garland was doing fine, and didn't offer any suggestions. Mr. Watson heard Mr. Garland mention that the aircraft wasn't holding altitude, and then heard the pilot say that he was becoming disoriented. Mr. Watson notified the tower that they needed to prepare for his arrival and not put anyone in front of N36HT once the aircraft was established on final. He started an Alert 1 in the event things escalated. Mr. Watson stated that he "felt in his gut" that things weren't going well.

Mr. Watson heard Mr. Garland issue a no gyro turn to N36HT and saw the aircraft turn again, appearing to line up for Runway 05L. The target disappeared, which is common at low altitudes and usually occurs closer to the runway, but the tag didn't reacquire. Mr. Watson then called an Alert 3 for a suspected accident. Mr. Watson provided the location by using a visual estimate from the airport and told Mr. Garland to put a ring up where the aircraft was last observed. Mr. Watson stated that he was mostly aware of what was going on in the control room, with breaks when he was coordinating for Mr. Garland. Mr. Watson said the WR sector wasn't very busy, probably 6-8 aircraft, but that the workload was higher than usual because of the marginal weather and high demand for approaches.

When asked about no-gyro procedures, Mr. Watson was familiar with standard rate turns and proper procedures for using them, but stated that he had not used them in many years. Mr. Watson was not very familiar with why a controller would need to use them.

When asked about how to help a pilot who is disoriented, Mr. Watson stated that it was best to help him get into visual conditions or get on the ground, that it was important to get the plane level, keep the aircraft on a single frequency if able and get the aircraft to a safe altitude.

Mr. Watson was aware of what EOVM maps were and stated that he believed that they were on the same map as the MVAs. Mr. Watson was sure he had received training on recognition of emergencies but couldn't recall when. Mr. Watson said he was currently scheduling recurrent and recovery training that would be including those items, but that not everyone had taken the training yet.

Mr. Watson thought that the PIREP solicitation and dissemination process at GSO was up to par. He preferred to pass PIREPs to Flight Service via telephone because he thought the online entry program was cumbersome and took too long to use, but said that some others use it frequently.

Mr. Watson decided the situation with N36HT was serious when he heard the pilot use the word "disoriented" for the second time, and he thought he heard a second voice in the background of the transmission.

4.0 Post-Accident Training Activities

GSO's local Safety Committee, made up of union and management personnel, reviewed the circumstances surrounding this accident and recommended the following training actions:

- No-gyro vectors. A face to face briefing was put together and conducted with all operational personnel. It was also incorporated into GSO's recovery training.
- A Powerpoint presentation was created for procedures with handling VFR aircraft emergencies. This presentation was completed by all operational personnel and was also incorporated into GSO's annual refresher training.
- A Powerpoint presentation was created on procedures for handling aircraft emergencies and equipment failures. This presentation was completed by all operational personnel and was also incorporated into GSO's annual refresher training.
- A Powerpoint presentation was created about the requirements for pilot report and weather dissemination. This presentation was completed by all operational personnel and was also incorporated into GSO's annual fall and early spring refresher training.