NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 4, 2014

Group Chairman's Factual Report

AIR TRAFFIC CONTROL

DCA13MA133

A. AIRCRAFT INCIDENT

Location: Birmingham, AL

Date: August 14, 2013

Time: 0447 central daylight time (CDT) / 0947 coordinated universal time (UTC)[1]

Aircraft: United Parcel Service (UPS) 1354, an Airbus A300-600

[1]All times are expressed in central daylight time (CDT) unless otherwise noted.

B. AIR TRAFFIC CONTROL GROUP

Chairman: Mr. Daniel Bartlett
National Transportation Safety Board (NTSB)
Washington, D.C.

Mr. Michael Matthews
Federal Aviation Administration (FAA)
Washington, D.C.

Mr. Adam Rhodes
National Air Traffic Controllers Association (NATCA)
Houston, TX

Ms. Dorsey DeMaster
United Parcel Service (UPS)
Louisville, KY

C. SUMMARY

On August, 14, 2013, at about 0447 central daylight time (CDT), United Parcel Service (UPS) flight 1354, an Airbus A300-600, N155UP, crashed short of runway 18 while on approach to Birmingham-Shuttlesworth International Airport (BHM), Birmingham, Alabama. The captain and first officer were fatally injured and the airplane was destroyed. The scheduled cargo flight was operating under the provisions of 14 Code of Federal Regulations (CFR) Part 121 and originated from Louisville International-Standiford Field Airport (SDF), Louisville, Kentucky.

D. DETAILS OF THE INVESTIGATION

The air traffic control (ATC) group convened at the air traffic control tower (ATCT) located at the Birmingham-Shuttlesworth International Airport, Birmingham, Alabama, on August 15, 2013, to review ATC elements of the accident investigation and conduct controller interviews. The ATC group met with and was provided an in-brief by the air traffic manager (ATM) and his staff. Also present at the in-brief were representatives from the FAA general counsel's office, the FAA Eastern Service Area quality control group, the BHM systems support coordinator, and the local NATCA facility representative.

A representative of United Parcel Service (UPS) joined the ATC group on September 17, 2013. The group reconvened at BHM on September 18, 2013, to gather additional information on ATC equipment and procedures and clarify previously provided information.

The group reconvened at the FAA William J. Hughes Technical Center, Atlantic City, New Jersey, on October 24, 2013. The group met with FAA subject matter experts on minimum safe altitude warning (MSAW) software to discuss general MSAW policies and procedures as well as specific issues related to MSAW configuration/adaptation for runway 18 at BHM.

E. FACTUAL INFORMATION

1. History of Flight

UPS1354 departed Louisville International Airport-Standiford Field (SDF), Louisville, Kentucky on August 14, 2013, at 0503 eastern daylight time (EDT, 0403 CDT) en route to BHM. The pilot was cleared to climb to flight level 280, and the flight subsequently received routine air traffic services from controllers at Indianapolis, Memphis, and Atlanta air route traffic control centers. At 0541 EDT (0441 CDT), the flight was under control of Atlanta Center and level at 11,000 feet approximately 25 nautical miles from BHM and within the lateral confines of BHM airspace. The pilot requested a lower altitude. The Atlanta controller directed UPS1354 to contact BHM approach control.

The pilot of UPS1354 contacted BHM ATCT level at 11,000 feet with automatic terminal information service (ATIS) information "Papa" and requested a lower altitude. (See figure 1.) At 0441:53 CDT, the BHM controller cleared the pilot to descend to 3,000 feet in compliance with minimum vectoring altitude (MVA) restrictions. The controller advised the pilot that runway 6 was closed and offered the localizer approach to runway 18, which the pilot accepted. (See figure 2.) The controller issued a 10 degree radar vector to the right to join the localizer and again instructed the pilot to maintain 3000 feet. The pilot acknowledged. At 0443:28, the controller advised the pilot that the airplane was 11 miles from the BASKN final approach fix, directed the pilot to maintain 2,500 feet until established on the localizer, and cleared the pilot to fly the localizer runway 18 approach. (See figure 3.) The pilot acknowledged the clearance. At 0445:21, the controller directed the pilot to contact BHM tower on the local control frequency, 119.9. The pilot contacted the local controller at 0445:31. The local controller issued a clearance to land on runway 18 and reported that the wind was calm. There were no further communications between ATC and the pilot of UPS1354.

At 0448:05, Airport 12, a vehicle operator working on the airfield in conjunction with the maintenance project on runway 6/24, observed the crash of UPS1354 and radioed the local controller to ask if he had seen the event. Two seconds later, the local controller responded that UPS1354 had crashed on a 3 mile final.

2. Weather Information

The 0353 Aviation Routine Weather Report (METAR) observation for BHM was wind calm, visibility 10 statute miles, broken clouds at 1000 feet above ground level (agl), overcast clouds at 7,500 feet agl, temperature 23 degrees C, dew point 22 degrees C, altimeter 29.97 inches of mercury. METAR remarks included a variable ceiling between 600 and 1300 feet.

The 0404 Special METAR observation for BHM was wind calm, visibility 10 statute miles, scattered clouds at 1100 feet agl, broken clouds at 7,500 feet agl, temperature 23 degrees C, dew

point 22 degrees C, altimeter 29.97 inches of mercury. There were no remarks addressing a variable ceiling.

The 0453 METAR observation for BHM was wind 340 degrees at 4 knots, visibility 10 statute miles, few clouds at 1100 feet agl, broken clouds at 3,500 feet agl, overcast clouds at 7,500 feet agl, temperature 23 degrees C, dew point 22 degrees C, altimeter 29.97 inches of mercury. There were no remarks addressing a variable ceiling.

Two other aircraft operated at BHM during the early hours of August 14; Skylab 301, a Piper Navajo, and Mountain Air Cargo (MTN) 8375, an ATR. Both pilots were interviewed to obtain their observations of flight conditions in the area.

The pilot of MTN8375 said that he had flown from Memphis to BHM and used the instrument landing system (ILS) approach to runway 6, landing at approximately 0334 CDT. The pilot recalled responding to a request from the BHM ATCT for a PIREP[2] and reported the cloud base at the MCDEN fix as 1700 feet agl / 2300 feet above mean sea level (msl). (See figure 4.) The pilot reported that when he departed BHM runway 18 approximately 45 minutes later, the weather conditions had significantly improved.

The pilot of Skylab 301 said that he flew into and out of BHM on a routine basis. On the night of the accident, the pilot had departed BHM en route to Nashville and returned, arriving at BHM at 0417. The pilot said that he had flown the localizer runway 18 approach and was able to see the airport from the BASKN fix at 2300 feet msl.

[2] PIREP – Pilot Weather Report - A report of meteorological phenomena encountered by aircraft in flight.

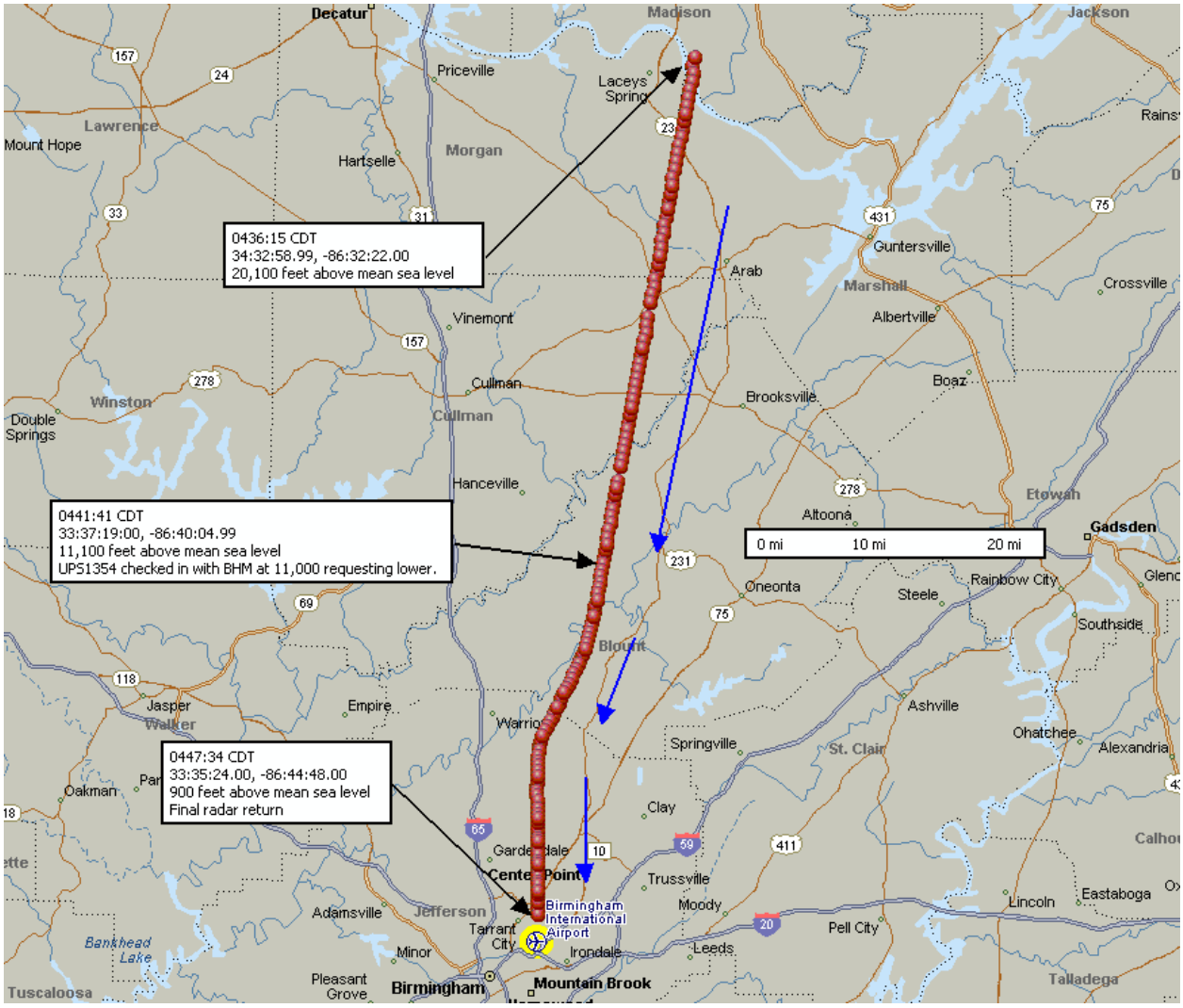

Figure 1 – UPS1354 route of flight indicated by red dots. Direction of flight is indicated by blue arrows.

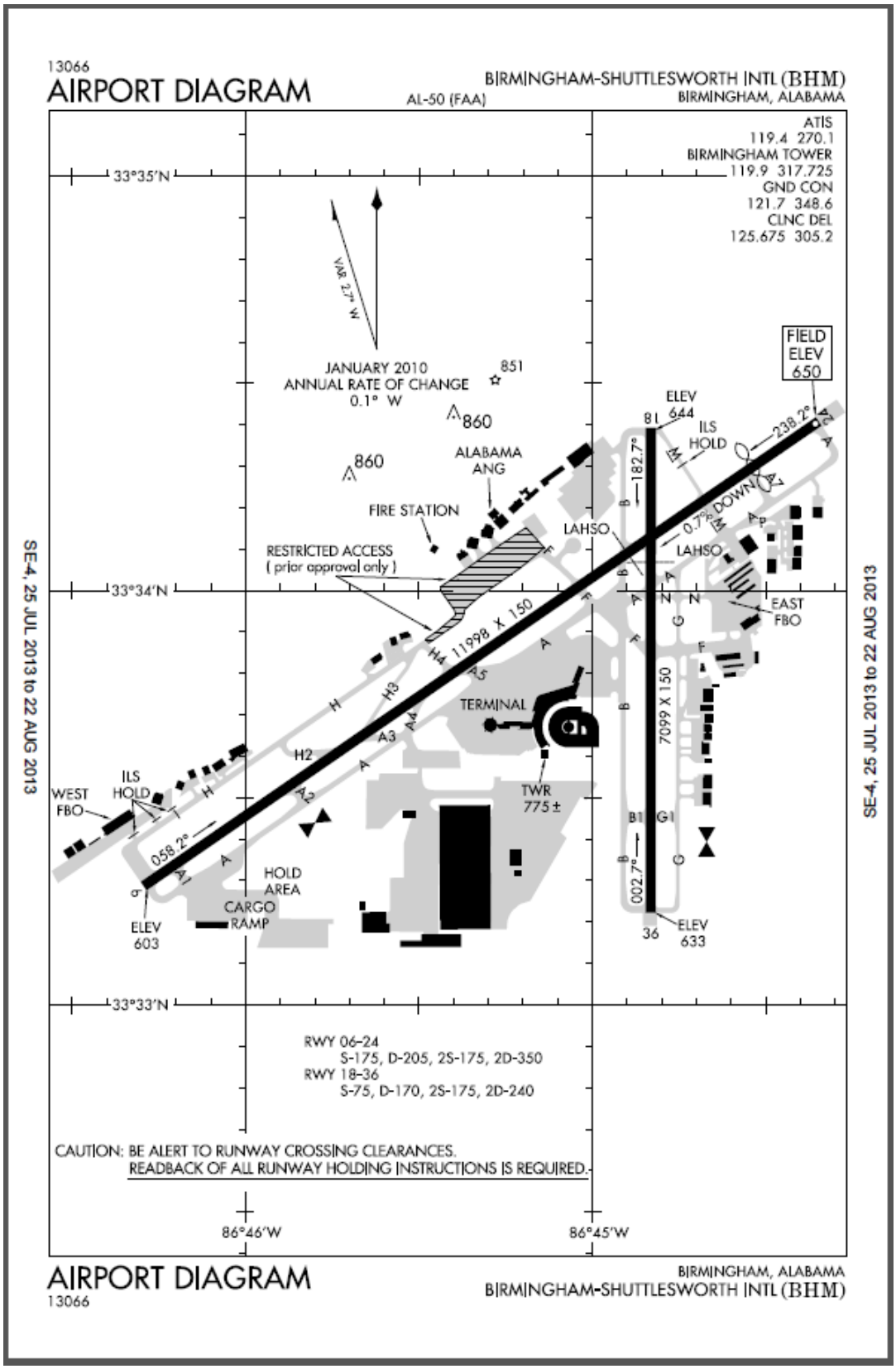

Figure 2 – Birmingham-Shuttlesworth International Airport (BHM) Diagram

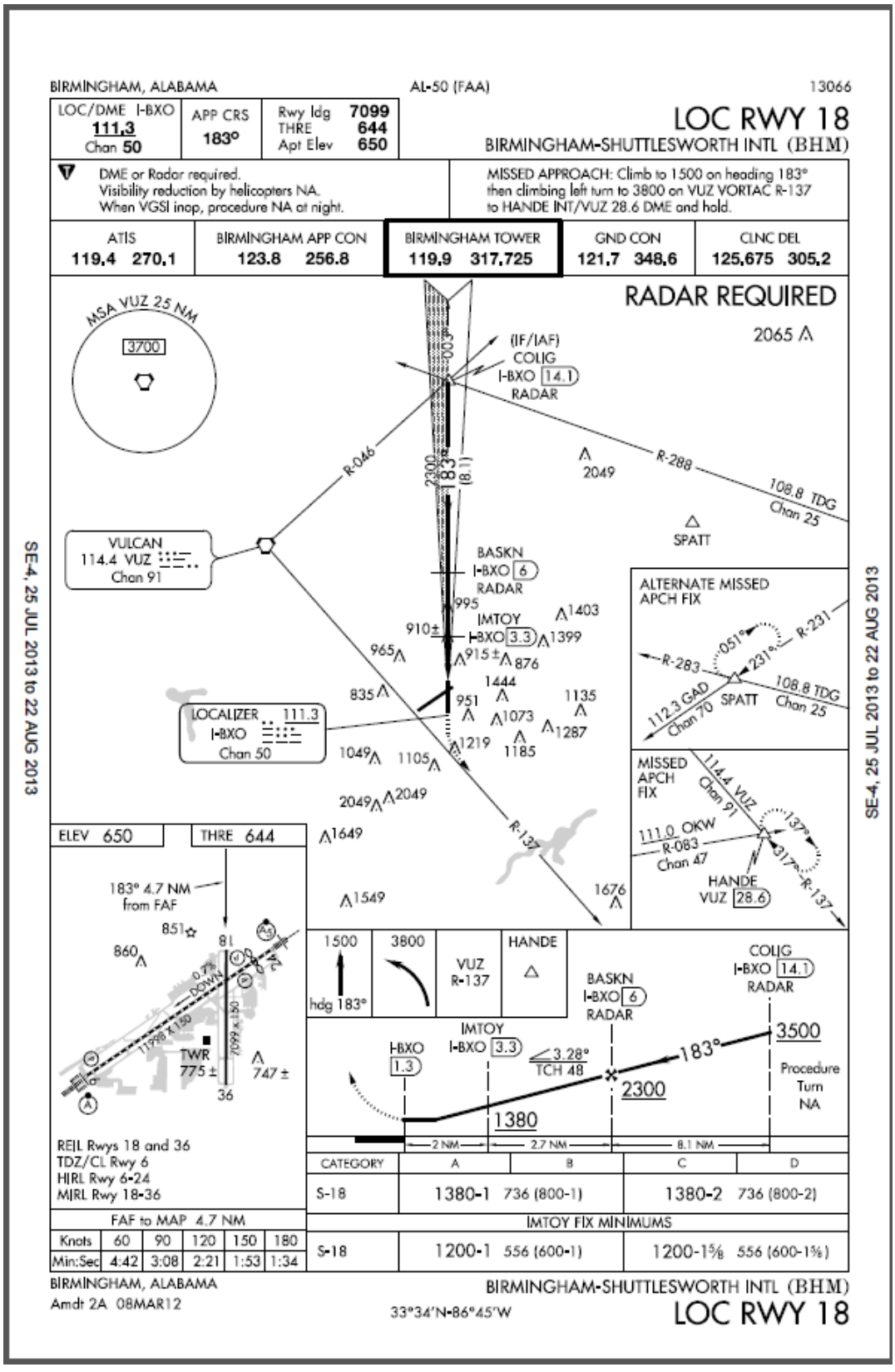

Figure 3 – Localizer Runway 18 Approach Procedure to BHM

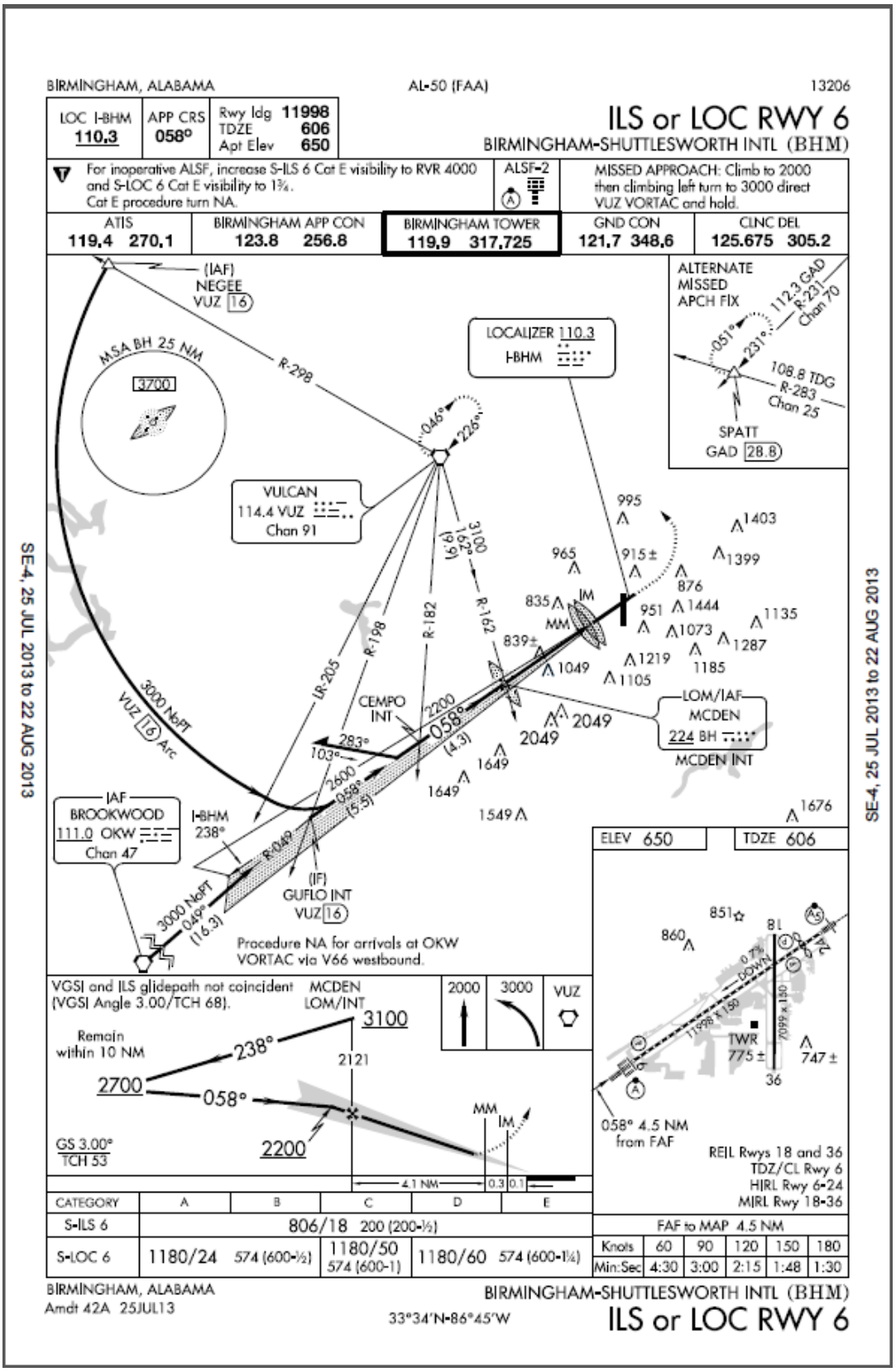

Figure 4 – ILS Runway 6 Approach Procedure to BHM

3. Air Traffic Control

The BHM ATC facility was an FAA level 8 facility that operated 24 hours a day, seven days a week, comprising an air traffic control tower (ATCT) and terminal radar approach control (TRACON). During the midnight shift, TRACON services were provided by the ATCT, which required certain TRACON capabilities to be transferred to the tower. This included radio frequencies on the enhanced terminal voice switch (ETVS) and reconfiguration of the tower radar display.

Runway 6/24 was closed from 0400 to 0500 on August 14, 2013, for construction work and a NOTAM[3] had been issued. During the closure of runway 6/24, runway 18 was active for departures and arrivals and the localizer runway 18 approach was in use for arrivals.

At the time of the accident, two fully certified air traffic controllers were assigned to the midnight shift in the ATCT. The approach control function had been transferred to the tower as was normal practice. Local controller 1 (LCL1) was in the tower, responsible for all ATC positions and frequencies. Local controller 2 (LCL2) was on a break.

After the accident occurred, LCL1 paged LCL2 to return to the ATCT. After arriving in the ATCT, LCL2 began completing required accident notification procedures. The LCL1 controller continued to provide ATC services to arriving and departing aircraft, and was relieved from the local control position by LCL2 after approximately 20 minutes.

3.1 Automatic Terminal Information Service

The ATIS recordings were manually prepared by the controllers in the BHM ATCT. To accomplish this, controllers reviewed METAR information displayed on the automated surface observing system (ASOS) display (See figure 5) and, along with other information appropriate to an ATIS transmission, manually recorded each ATIS broadcast. (See figure 6.)

ATIS information "Papa" was prepared based on the 0353 ASOS observation, but did not include the METAR remarks about the observed ceiling being variable between 600 and 1300 feet.

[3] NOTAM – Notice to Airmen -A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

FAA Order JO7110.65, *Air Traffic Control*, paragraph 2-9-3a, states that the following elements should be included in an ATIS broadcast;

> *Airport/facility name, phonetic letter code, time of weather sequence (UTC). Weather information consisting of wind direction and velocity, visibility, obstructions to vision, present weather, sky condition, temperature, dew point, altimeter, a density altitude advisory when appropriate and other pertinent remarks included in the official weather observation…*

FAA Order JO7110.65, Air Traffic Control, paragraph 2-9-2a, referring to ATIS operating procedures, requires that ATC make a new ATIS recording that upon receipt of any new official weather regardless of whether there is or is not a change in values. Birmingham Tower Standard Operating Procedures, BHM Order 7232.3 J, paragraph 2-2-4J1a, directs that a new ATIS recording be made with the receipt of new official weather regardless of whether there is or is not a change involved. The ASOS produced a special weather observation at 0404 that constituted new official weather, but the tower controller did not revise the ATIS broadcast to reflect the updated conditions.

Figure 5 – BHM ASOS Monitor located in the BHM ATCT

Figure 6 – BHM ATIS recording equipment.

3.2 Emergency Response Notification

The BHM air traffic control tower was equipped with an ETVS communications system (See figure 7) that provided access to various communications circuits including the airport "crash phone." The crash phone was the primary method for immediate notification to the airport's first responders of an on or near airport accident or incident. The crash phone circuit connected the tower, the airport rescue and fire fighting (ARFF) station, Air National Guard operations, the Kaiser/Pemco maintenance facility, and the Birmingham airport authority operations office, and was the primary means for alerting BHM emergency services of an accident or serious incident on or near the airport.

The crash phone was activated at 0449:22; 1 minute and 17 seconds after Airport 12 had observed the accident. The LCL1 controller initially reported the crash location as 3 miles north of runway 18, which would have been off the airport. The actual location proved to be about 1.2 miles north of the runway and within the airport boundary.

When interviewed, the LCL1 controller said that the notification call was delayed for two reasons: first, because he was not immediately able to determine exactly where the aircraft had crashed, and second, because he had difficulty locating the correct button to activate the crash phone circuit on the ETVS display panel.

Once the LCL1 controller determined that the downed aircraft was located on airport property, he correctly elected to contact ARFF to respond rather than calling 911 to report an off-airport accident.

The ETVS communication system in the air traffic control tower had been reconfigured to accommodate consolidation of the tower and TRACON functions for the midnight shift. The reconfiguration resulted in various selection buttons on the ETVS display being displaced from their expected positions during day and evening operations. The LCL1 controller scrolled through several pages of frequency information before locating the correct button, which was on the first page but a different location that the daytime configuration, and notified the parties on the circuit of the accident. Following the accident, the tower and TRACON changed their procedures to ensure that the location of the crash phone button remained unchanged regardless of facility status.

When the crash phone notification was made, the phones at all four airport emergency response locations rang simultaneously. At least one of the locations answered the line before the ARFF station, and the controller immediately began to describe the nature and location of the emergency. ARFF acknowledged the notification but missed the initial part of the call, and consequently did not receive all the necessary emergency information in a timely manner. This resulted in initial confusion about the location and nature of the accident. When the ARFF units responded at 0453, they asked to go to their airport standby positions instead of proceeding to the accident site.

Crash phone notification procedures outlined in the Birmingham Airport Authority (BAA) and FAA Air Traffic Control Tower – BHM Letter of Agreement dated January 1, 2010, specified that other parties on the emergency phone circuit shall refrain from interfering with communication between the tower and ARFF and shall ask for clarification only after ARFF has acknowledged receipt of all information. After the accident occurred and the tower controller activated the crash phone, one of the non-ARFF participants answered the line first and the controller began reciting the required information before the ARFF units were on the call. This resulted in the ARFF units missing part of the critical communications, and therefore unintentionally caused interference with tower-ARFF communications. The BHM airport authority has addressed this issue with all parties and reiterated the correct communications procedures for aircraft accident and incident notification. Specifically, parties on the crash phone circuit are to answer the crash phone immediately after it ceases ringing or after counting to 3 (one one thousand, two one thousand, three one thousand) noting that if any station other than ARFF answers the crash phone first, ARFF's ability to get all of the initial information in a timely manner will be adversely affected. A modification to the LOA to better define these procedures is being considered to address crash phone communication between the ATCT, ARFF and BAA. The remaining parties on the circuit have been asked to comply with the reiterated procedures. Additionally, the BAA is in the process of installing a computer controlled crash phone circuit which would not be susceptible to a party answering that circuit causing other stations on the circuit to stop ringing.

Figure 7 – BHM ATC ETVS

3.3 Minimum Safe Altitude Warning Functions

The radar data processing system at BHM provides MSAW functionality designed to warn controllers when an aircraft with altitude reporting capability is at or predicted to be at an unsafe altitude. MSAW monitors aircraft trajectories for terrain and obstacle separation and will generate aural and visual alarms when appropriate.

MSAW has two principal modes, approach path monitoring and general terrain monitoring. Approach path monitoring is applied to aircraft executing instrument approaches and will produce an alert for aircraft that are either currently below an established warning slope or are projected to soon descend below a separate predicted warning slope. General terrain monitoring is applied to aircraft outside the areas designated for approach monitoring, and is not pertinent to this accident. This report will address approach path monitoring relative to BHM and UPS1354.

Approach path monitoring occurs in defined areas along the runway and the extended runway centerline. A rectangle known as a “Type 1 area” encompasses the runway and extends to a defined distance, typically 1 to 2 miles, from the threshold outward along the final approach course. All MSAW alerts are suppressed within Type 1 areas. Type 2 areas extend from the end of the associated Type 1 area outward to a variable distance depending on the requirements of the particular airport and approach procedures. The specific boundaries of these areas are site

unique and configured according to various parameters such as topography, nuisance alert mitigation, etc. (See figure 8.)

MSAW Vertical: The MSAW current initiate monitor altitude, also referred to as the warning slope, begins where the type I and type II areas intersect at an altitude based on the airfield elevation plus 500 feet plus the distance from the runway end to the beginning of the warning slope in nautical miles time 100 feet. The predicted initiate monitor altitude, also known as the predicted slope, is nominally set 100 feet below the warning slope. If the slope created by this equation exceeds 100 feet per NM, the current initiate altitude may be lowered to obtain any slope of at least 100 feet per NM. All obstacles and terrain must be at least 200 feet below the adapted current warning slope generated by the beginning and ending of the current warning slope settings.

The MSAW warning and predictive slopes are independent of each other: however most will be coincidental. Exceptions to coincidental slopes are usually associated with nuisance alarm mitigation.

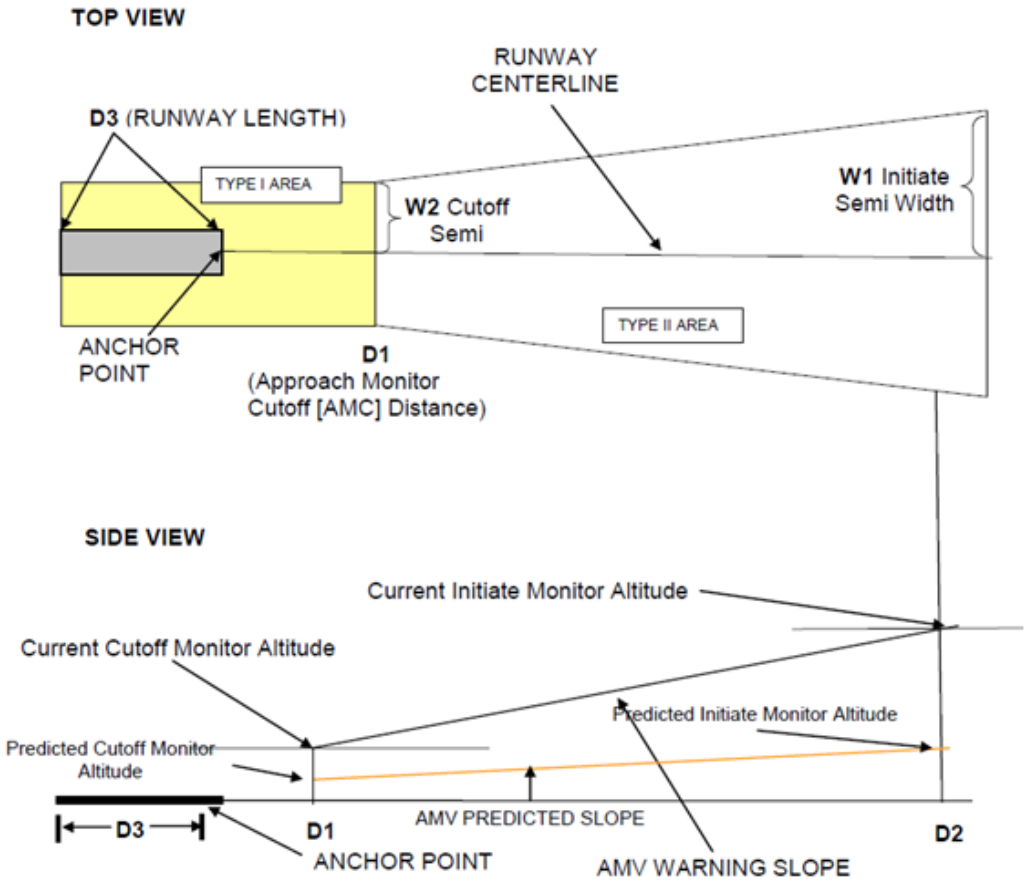

Figure 8 - MSAW Top and Side View Example

The current initiate monitor altitude was a two part adaptation configuration. with the first starting at 1084 feet MSL 1.99 NM from the approach end of runway 18 extending to 1170 feet MSL 3.0 NM from the approach end of runway 18 with the second portion beginning at 1200 feet MSL 2.99 NM from the approach end of runway 18 extending to 1202 feet MSL 5.9 NM from the approach end of runway 18. The predicted monitor altitude is 100 feet below the current initiate monitor altitude for both segments. (See figure 9)

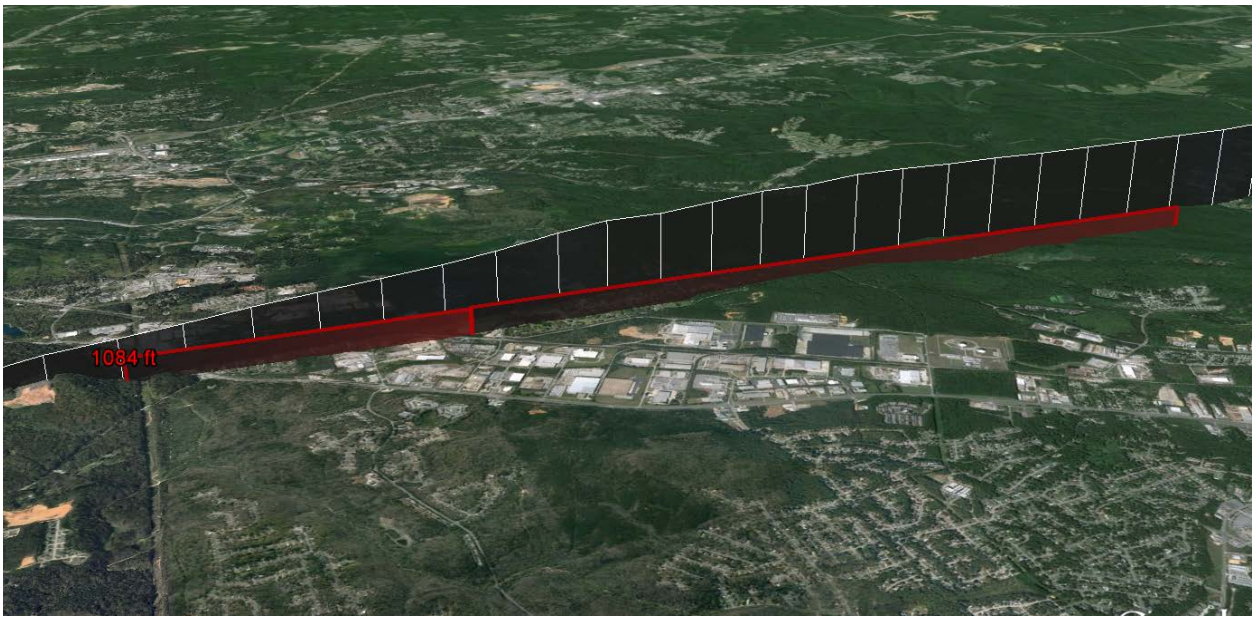

Figure 9 – The UPS1354 radar flight path is indicated by the white line and the 2 segment MSAW type II area current initiate monitor altitude is indicated by a red line.

The final radar return for UPS1354 was at 04:47:34 at 900 feet MSL approximately 1.3 NM from the approach end of runway 18. (See figure 10) UPS1354's altitude profile on approach to runway 18 did not result in an MSAW alert. The flight path of the aircraft was above the current initiate monitor slope until intercepting the type I area.

According to the FAA MSAW Board, there is currently no plan to modify the existing parameters for the MSAW configuration for runway 18 at BHM.

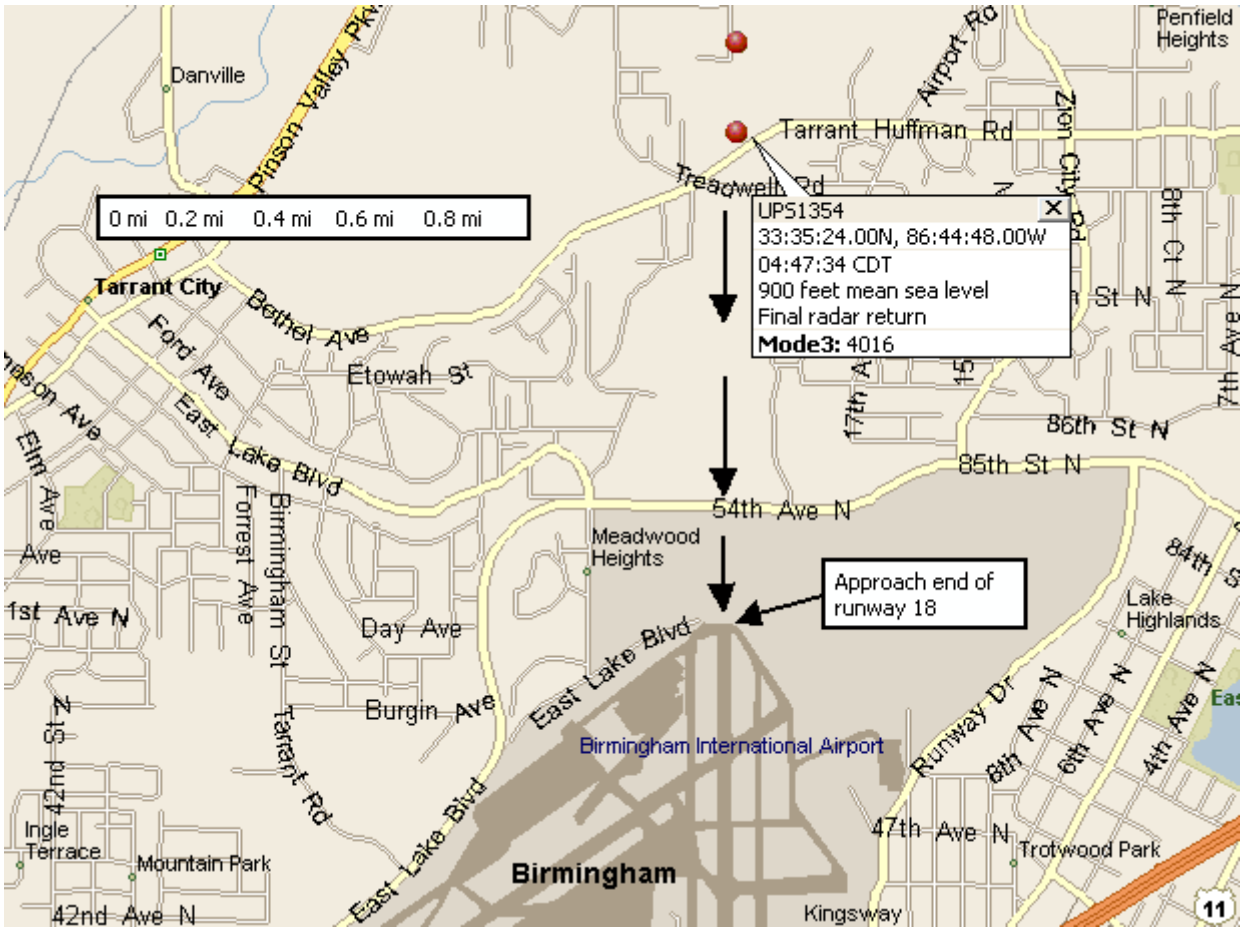

Figure 10 – Radar flight track of UPS1354 showing final radar return

3.4 Air Traffic Controller Interviews

3.4.1 Cedric Brown - Certified Professional Controller/Controller-in-Charge (CPC/CIC)

Mr. Brown was the lone controller in the ATCT at the time of the accident. He was qualified on all positions in the facility and was working all tower/radar positions combined. His operating initials were CB.

The ATC group interviewed Mr. Brown on August 15 and 16, and again on September 19. Mr. Brown was represented by Mr. Brooke Lewis, FAA general counsel, AGC 400, Washington, D.C. In response to questions presented by the group, Mr. Brown provided the following information:

Mr. Brown started his employment with the FAA in 1983 at the BHM flight service station. After four years there, he transferred to Ronald Reagan Washington National Airport (DCA) as an air traffic assistant. While employed at DCA, he attended ATC training at the FAA academy in Oklahoma City and returned to DCA as a controller, remaining there until 1993. Mr. Brown then spent a year at Newcastle, Delaware (ILG) before transferring to Andrews Air Force Base

(ADW), where he remained until October 1996. He returned to DCA until 2001, then transferring to BHM where he has been employed since. Besides his FAA ATC certification, Mr. Brown was a certified and current Limited Aviation Weather Reporting Station (LAWRS) observer. His supervisor for the last year was Greg Stephens.

Mr. Brown's work schedule consisted of regular days off on Thursday and Friday. His schedule for Saturday was 1600 to 2400, Sunday from 1300 to 2100, Monday from 0700 to 1500, Tuesday from 0500 to 1300 and Wednesday from 2215 to 0615. Wednesday, August 14, the day of the accident, was a regularly scheduled mid-shift from 2215 to 0615. Mr. Brown stated that overtime is not optional at BHM. If he answered the phone, he was expected to report for duty. He worked two overtime midnight shifts during the previous month.

Mr. Brown's Class II medical certificate was current, issued with special consideration and no limitations.

When asked to describe the accident, Mr. Brown stated that UPS1354 checked in on frequency requesting a lower altitude and was issued the lower altitude immediately. It was unusual for a large aircraft such as UPS1354 to utilize runway 18. Mr. Brown asked the pilot if an approach to runway 18 would be acceptable. Although he expected the pilot to ask about options other than using runway 18, the pilot said that runway 18 would be fine. Large aircraft never use runway 18 when the longer runway, 6/24, is available.

Based on the position of the aircraft, Mr. Brown felt that a 10 degree right turn would be sufficient to give the aircraft a "nice approach." The BHM letter of agreement with Atlanta Center allows BHM controllers to vector aircraft 15 degrees right or left of course when the arriving aircraft is between 11,000 and 10,000 feet. Aircraft normally enter BHM airspace proceeding direct to the Vulcan VOR or sometimes during the midnight shift direct to BHM. When the aircraft got closer to the localizer Mr. Brown directed UPS1354 to descend to 2,500 feet and cleared the aircraft for approach. When the aircraft got closer on final he switched the aircraft to the local control frequency and issued a landing clearance to the pilot.

Mr. Brown observed the approach path of UPS1354 to see when the aircraft came out of the clouds so he would know what the cloud base was. As he was looking out towards the final for runway 18, he noticed what appeared to be an electrical spark that he associated with a power line. Almost immediately he thought he saw aircraft lights, possibly landing lights, as the aircraft came out of the clouds. It appeared the lights came on then went off. Mr. Brown thought that the reflection of the landing lights off the clouds was blinding the pilots, so the pilots turned the landing lights off until clear of the clouds. While processing what he was seeing, he saw a bright reddish orange glow. As he was observing the sequence of events, he saw the explosion and mentally questioned if what he was seeing was actually an aircraft crash. The explosion lit up the sky enough for him to see the airplane do a cartwheel and roll to the left. He still wasn't sure in his mind if the aircraft had crashed or not. He did not recall hearing or seeing a minimum safe altitude warning (MSAW) alert. He said he did not recall the last time he had heard an MSAW alert associated with runway 18, as runway 18 was used so infrequently.

He recalled hearing Airport 12, an airport authority employee on the airport, ask, "did you see that tower?" The airport authority had four vehicles on the airport repairing lights on runway 6/24. Mr. Brown had coordinated with the airport authority to close runway 6/24 about 10 minutes before the published NOTAM closure time of 0400 to allow the runway work to be completed before 0500, because he know that cargo jets were due to arrive later in the morning.

Not sure whether the aircraft had crashed on or off the airport, Mr. Brown hesitated in activating the crash phone and considered calling 911 to report an off-airport accident, but then decided to follow protocol and notify BHM ARFF via the crash phone circuit. When attempting to activate the crash phone circuit on the ETVS, Mr. Brown noticed that the push button location was not where he expected it to be. He had to page through various options on the ETVS to locate the proper push button. After finally locating the crash phone button in a location on the first page of the multi-page ETVS different from the normal daytime configuration, he announced that an aircraft had crashed. The crash phone alerted the fire department, airport, National Guard, and Kaiser Industries. Kaiser was on the circuit because they have a fire truck. During the initial notification, Mr. Brown did not hear the ARFF unit (callsign "Redbird") respond to the notification, so he checked to make sure they were on the call. He wanted to ensure that Redbird had the information as ARFF is the priority during accident notification.

After the initial crash notification, Mr. Brown continued to respond to radio calls from airport 11, 12, 15, and Redbird 27, who was the lead fire and rescue responder. One of the follow-on radio calls was from Redbird wanting to go to his standby position. After he considered the initial notifications complete, Mr. Brown paged Mr. Downie, who was on a break to report to the tower immediately. Mr. Brown recalled stating "Dean, (Mr. Downie) I need you in the tower now." Mr. Downie reported to the tower alert, aware and ready to go about three minutes later.

Mr. Downie obtained the packet for notifications and completed the accident/incident notification checklist.

Mr. Brown remained on the local control position and continued to work traffic. Shortly after the accident, the airport authority completed scheduled maintenance on runway 6/24 and the runway was opened. The opening was not logged due to all the other things going on. Mr. Brown considered runway 18 closed and put the closure on the ATIS, but did not recall an official instruction from the airport authority to close the runway.

FEDEX 1488, a Boeing 757, was inbound and Mr. Brown set up the approach and other lights for runway 6, the runway they were landing on. FEDEX 1488 asked to be routed direct via the CENPO fix on the ILS Runway 6 approach. However, prior to arriving at the CENPO fix, Mr. Brown vectored FEDEX 1488 off the approach course to allow for additional time to allow things on the airport to settle down and to allow for FEDEX 1488 to have a better line-up for the approach. He set FEDEX 1488 up for a final about 10 miles outside the fix. He stated the pilot appreciated his assistance. FEDEX 1488 landed and taxied to the ramp uneventfully. Mr. Brown continued to field calls from vehicles operating on the field.

About this time, Mr. Dworek, the NATCA union representative, came to the tower after being notified of the accident via the accident notification checklist. He assisted Mr. Downie and

ultimately was able to provide position relief to get Mr. Brown off position. Mr. Brown stated that he been on position for approximately two hours when the accident occurred, and remained on position for another 15 to 20 minutes after the accident before being relieved by Mr. Downie. The morning controller, Ms. Rowe, arrived at 0500 and Mr. Brown asked her to open the TRACON in the radar room instead of the tower. He said it was his decision to move the TRACON downstairs and split from the tower because he was still the CIC.

Mr. Brown recalled that he stayed in the tower updating Mr. Dworek about the accident until someone relieved Mr. Downie about 10 minutes later.

Mr. Brown then left the tower cab but remained at the facility for debrief and written statements. Mr. Brown did not file an Air Traffic Safety Action Program (ATSAP) report and to the best of his knowledge, neither did Mr. Downie. Mr. Brown left the facility about 1015 and said that he received overtime for his hours of duty beyond his normal schedule.

Mr. Brown said that a crash phone test is accomplished three times daily with each watch turnover to verify the system works. The test requires a response from Redbird, Air Guard, Kaiser, and the airport authority. Mr. Brown recalled receiving crash phone training during his initial training on clearance delivery at BHM in 2002 and may have had additional training as a controller-in-charge, but otherwise did not recall refresher training on crash phone procedures. Mr. Brown stated that should the crash phone system fail, he could communicate via the telephone or the radios using the tower frequencies as ARFF monitored the tower frequencies.

During discussion regarding aviation weather and the ATIS, Mr. Brown stated he was a certified and current LAWRS observer. He stated that all the controllers had to complete LAWRS certification after FAA funding issues resulted in the weather observer contract being cancelled. The contract issue had since been resolved, but all the controllers in the facility still had current LAWRS certifications.

BHM tower had a manual system where controllers were required to make a new ATIS recording when needed. The ASOS provided an audible alarm at 47 minutes after the hour advising that a new observation was pending and at 53 minutes after the hour a new weather sequence was posted. Mr. Brown assumed that as a LAWRS observer, he had the option to leave a previous observation on the ATIS even if a new observation had been posted. This was the case on the evening of August 14. ATIS information "Papa" reflected the 0353 ASOS observation, and the new 0404 observation showed improved weather and cloud conditions. Because the weather was clearing, he felt it was more favorable to leave the worse conditions on the ATIS rather than broadcast the improved report. He elected to keep the more restrictive observation on the ATIS to provide a margin of safety to pilots.

Mr. Brown was familiar with the requirement to take a special weather observation after an accident, but it didn't occur to him to do one with everything going on.

Mr. Brown stated that it was difficult to determine the ceiling at night and he had to depend on the ASOS. About 40 minutes before UPS1354 arrived, Mr. Brown was able to see a "MTN" ATR at 2300 feet over the final approach fix for runway 6 and asked the pilot about the cloud

layer. The pilot said he was in between layers, but Mr. Brown found that to be an odd statement because he never saw the aircraft enter the clouds again while on approach. The fact that the ATR was visible at 2300 feet over the final approach fix to runway 6 led Mr. Brown to feel that the localizer approach to runway 18 would not be restricted due to ceilings.

Mr. Brown said that the PAPI lights for runway 18 and runway 6 were on. He said that if the PAPI lights had been inoperative for runway 18, he would have put that information on the ATIS and the outage would have made the localizer runway 18 approach unusable. Before the accident, the runway 18 edge lights were set on step 2 of 3. Mr. Brown said that he usually set airport lighting in accordance with FAA Order 7110.65. Mr. Brown stated that on occasion, he would bring the runway lights up to a higher level that called for in the 7110.65 based on what he thought was necessary for the pilots to get the airport in sight. He stated that there are a lot of lights in the vicinity of BHM and sometimes pilots had difficulty getting the airport in sight at night. Mr. Brown said that the 7110.65 allowed controllers adequate flexibility to adjust lighting as the situation required.

He stated he was the CIC and had all the positions. Mr. Brown was unsure whether he continued to be the CIC after Mr. Downie returned to the tower cab.

3.4.2 John Roberts - Certified Professional Controller (CPC)

Mr. Roberts was not working at the time of the accident. He was qualified and current on all positions in the facility and was working a temporary staff position assisting with training and other duties as assigned by the ATM. His operating initials were JR.

The ATC group interviewed Mr. Roberts on August 15. Mr. Roberts was represented by Mr. Brooke Lewis, FAA general counsel, AGC 400, Washington, D.C. In response to questions presented by the group, Mr. Roberts provided the following information:

Mr. Roberts started his career in air traffic control with the US Marine Corps as a controller at Marine Corps Air Station (MCAS) New River, NC, in 1981, followed by a tour at MCAS Futenma, Japan in 1984. In 1985 he transferred to MCAS Beaufort, NC, (NBC) until 1989. In 1989 he became a Department of Defense (DoD) controller at NBC. Mr. Roberts was hired by the FAA in 1998 and has worked at BHM since 1998. ATC was his only FAA certification.

Mr. Roberts work schedule consisted of Monday through Friday, his choice of 8.5 hours between the hours of 0600 and 1800. He rarely worked overtime. His duties as training specialist included maintaining training records, completing training paperwork, conducting facility ATC training, and other duties as assigned by the ATM.

Mr. Roberts was a certified professional controller qualified and current on all positions in the facility and as controller-in-charge. He was on a one year temporary detail supporting facility training and had 2.5 months remaining on his detail. He supervisor since he began his detail was Dan Alexander.

He said his class II medical was current with a restriction to have corrective lenses in his possession while performing ATC duties.

When asked about airport lighting, Mr. Roberts stated that after the last flight came in he would turn off every light on the airport. Describing the airport lighting control panel, he stated there was a touch screen with an airport diagram associated with it. Controllers go to the runway lighting page, touch what they want lit, and then touch again to set the intensity. Then a message comes up with "confirm or reject." If the controller is satisfied they confirm it – otherwise they reject it. All lights the tower is responsible for (runway lights, taxiway lights, centerline lights, touchdown zone lighting, and the rotating beacon) are managed through the lighting panel. He stated the PAPI was not controlled by the tower and as far as he knew, the airport authority was responsible for the PAPI. He was aware that there had been PAPI outages and notification of the outage varied. Sometimes the outage was report by airport authorities, sometimes by pilots and sometimes it was annotated on the equipment page of the information display system.

Mr. Roberts stated that he performed a crash phone test every morning at 0800 via the ETVS. This was accomplished by activating the crash phone via the "ARFF" button on the ETVS. The agencies on the circuit were Redbird (ARFF), the airport authority, the Alabama National Guard, and Kaiser. He did not recall crash phone training on unusual situations or specific training on how to handle an alert 3, aircraft accident.

Mr. Roberts could not specifically speak to MSAW alerts for runway 18.

Mr. Roberts was unaware of any requirement to advise Atlanta ARTCC when BHM was on single runway operations.

Mr. Roberts knew of no specific checklist for use regarding runway closures at the airport.

3.4.3 Holly Roe – Certified Professional Controller (CPC)

Ms. Roe was not working at the time of the accident. She was qualified and current on all operating positions. She arrived at the facility shortly after the accident and opened up the TRACON as part of normally scheduled operations. Her operating initials were HR.

The ATC group interviewed Ms. Roe on August 16. Ms. Roe was represented by Mr. Brooke Lewis, FAA general counsel, AGC 400, Washington, D.C. In response to questions presented by the group, Ms. Rowe provided the following information:

Ms. Roe began her ATC career at Dekalb Peachtree airport (PDK) in July 1987. She transferred to BHM in 1991.

Ms. Roe's work schedule consisted of regular days off on Friday and Saturday. Her schedule for Sunday was 1500 to 2300, Monday from 1300 to 2100, Tuesday from 1100 to 1900, Wednesday from 0500 to 1300 and Wednesday night/Thursday morning from 2215 to 0615. She worked

overtime occasionally. She was on a regularly scheduled 0500 shift on the morning of the accident.

Ms. Roe's Class II medical certificate was current with special consideration and a limitation to possess corrective lenses while performing ATC duties. Ms. Roe stated she had corrective lenses with her on August 14.

Ms. Roe's supervisor was Greg Stevens, but she could not recall how long he had been her supervisor.

When asked to describe the accident, Ms. Roe said that she arrived at the facility at about 0450 for a 0500 shift. She was not aware of the accident. After putting her lunch and purse away, she went into the TRACON, reviewed current information on the IDS, and started to familiarize herself with the current weather situation. She called the tower for a briefing and advised she was ready to open the TRACON. She heard Mr. Brown direct a FEDEX flight to switch to tower frequency and Mr. Brown then said that he would call on the phone with the rest of the briefing. Ms. Roe expected another controller to arrive around 0500, but was not aware that the controller had called in sick. She was surprised that he was not at work.

Mr. Brown called on the phone and advised that UPS1354 had crashed short of runway 18 and that runway 18 was closed. She offered to come up to the tower to relieve Mr. Brown but he stated that the other mid-shift controller (Mr. Downie) was already in the tower and it would be better if she opened up the TRACON in the radar room. She opened the TRACON and fielded several telephone calls from the FAA Washington Operations Center and various other agencies inquiring about the accident. Aside from the accident, everything was normal.

When asked about crash phone procedures, Ms. Roe stated that the crash phone is tested daily at 0800 as part of the watch checklist. She was familiar with crash phone procedures and conducted crash phone procedure training as an on the job training instructor. She recalled working an "alert 3," (aircraft accident on the airport) at some point, but could not recall if it was while she was assigned to BHM or at another airport.

Ms. Roe said that air carriers prefer the longer runway 6/24, but that runway 18/36 was used "a good bit" by corporate and general aviation aircraft. Ms. Roe stated that in the event of the closure of runway 6/24, she would make sure the runway closure was on the ATIS and place memory joggers at the local control position to alert of the closure.

Regarding airport lighting at BHM, Ms. Roe stated that she could turn off the runway lights for a closed runway, but she tends not to. She reduces the runway lights to their lowest intensity because in the past, she has turned off the runway lights only to have them not come back on when she needed them. She did not recall this happening recently. She could select airport lighting settings based on the visibility, and there was also a cheat sheet on the lighting panel itself that showed what setting was required under what conditions. She stated that the PAPIs were always on for the runway in use. She did recall shutting the PAPIs off when not using the runway.

Ms. Roe said that it could be difficult for pilots to visually acquire the runways at BHM because the geography puts BHM in a depression. Flight crews coming from the north or northwest have a hard time seeing the airport.

When asked about the facility log entries on the day of the accident, Ms. Roe said that the facility CIC is responsible for making entries in the facility log. Mr. Brown was the CIC and was probably responsible for completing the log.

3.4.4 Dean Downie – Certified Professional Controller (CPC)

Mr. Downie was assigned to the tower on the evening of the accident. At the time of the accident, he was on a recuperative break and returned to the tower after being paged by Mr. Brown. Mr. Downie was qualified and current on all operating positions in the facility, as well as an on the job training instructor and controller-in-charge. His operating initials were DD.

The ATC group interviewed Mr. Downie on August 17 and September 18. Mr. Downie was represented by Mr. David Dworek, NATCA facility representative for BHM. In response to questions presented by the group, Mr. Downie provided the following information:

Mr. Downie's career in ATC started in 1985 with the US Navy as a controller aboard USS Forrestal, CV-59, until he transferred to Naval Air Station Patuxent River in in 1988. In 1994, he transferred to USS Wasp, LHD-1, leaving the Navy in 1995. After his military ATC career, Mr. Downie worked as a contract air traffic controller at Bloomington, IN, (BMG) until 1997, followed by duties as a contract weather observer at New Bern, NC, (EWN) until 2001. Mr Downie started his career with the FAA at the Raleigh Flight Service Station (FSS). After the FAA FSS consolidation in 2005, he was assigned to BHM. He has been at BHM since 2005. In addition to his FAA ATC certification, Mr. Downie held a private pilot license, single engine, land but was not current. His supervisor was Greg Stephens.

Mr. Downie's Class II medical certificate was current/qualified with special consideration and no limitations.

Mr. Downie's work schedule consisted of regular days off on Thursday and Friday. His schedule for Saturday was 1500 to 2300, Sunday from 1300 to 2100, Monday from 0700 to 1500, Tuesday from 0500 to 1300 and Wednesday from 2215 to 0615. Wednesday, August 14, the day of the accident, was the last day of his work week, and he was on a regularly scheduled midnight shift from 2215 to 0615. He worked overtime when assigned and did not consider overtime a problem.

Mr. Downie stated that he was on a recuperative break when the accident occurred. While on break, he was paged by Mr. Brown to come to the tower right away or something similar. He called the tower and was advised by Mr. Brown that UPS had just crashed.

Arriving in the tower shortly thereafter, he observed the burning wreckage of UPS1354 and was advised by Mr. Brown that UPS was on the localizer to runway 18 and had hit the ground.

Assessing Mr. Brown's emotional state, Mr. Downie said that he appeared very concerned but was doing fine. Mr. Downie offered to relieve Mr. Brown from position, but he declined and asked Mr. Downie to start the accident notification process. Mr. Downie pulled the accident notification folder from under the local control position and began the notification process.

Only Mr. Brown and Mr. Downie were in the tower. There were numerous radio calls coming over the speakers and there continued to be numerous concussive explosions from the crash site that shook the tower windows. He was not overly concerned about hazards presented by the explosions because of the distance between the tower and the crash site.

As he was completing the notification checklist, Mr. Downie continued to check with Mr. Brown to make sure he was all right while observing his performance on position. Mr. Downie was satisfied that Mr. Brown was doing fine. Mr. Downie relieved Mr. Brown of all positions except CIC within 30-40 minutes after arriving in the tower. Mr. Downie did not recall making any entries in the facility log or updating position logs during the accident sequence. Mr. Downie recalled that Ms. Roe called up to the tower to open the TRACON. She was provided a briefing by Mr. Brown, and Mr. Downie thought that she had assumed duties as CIC.

Mr. Downie and Mr. Brown were relieved and left the tower to debrief and write statements. Neither controller was concerned about controller error or involvement.

During follow on discussion, Mr. Downie said that the crash phone had been in place since his arrival at BHM. Anyone on the crash phone circuit can activate the crash phone, and it will ring to the other four facilities on the circuit. During a midnight shift operation, the ETVS was reconfigured to forward the approach frequencies to the tower. This changed the position of the ARFF button on the ETVS. He stated that typically the ARFF button was in lower right corner of the ETVS display, but during the midnight shift configuration the whole panel rotated about 90 degrees and the ARFF button was then located near the upper right quadrant. There were five pages of communications frequencies and other communication capabilities on the ETVS. Mr. Downie stated that the crash phone test was usually conducted between 0800 and 0830 because it was a watch checklist requirement in the SOP, but he was not aware of an LOA between ATC and the airport operator regarding crash phone procedures.

Regarding weather procedures, Mr. Downie stated that he would solicit PIREPs when weather was at or below 5,000 feet or 5 miles visibility and/or in the presence of thunderstorms, tornadoes and other significant weather. When he prepared an ATIS, he would put everything in the remarks section of the weather observation in the ATIS broadcast. He acknowledged that he was required to update the ATIS during any significant weather change.

Mr. Downie was LAWRS certified, and because of this certification he was able to determine ceiling/visibility. It was easier at night to determine visibility than the ceiling. He used the tower visibility chart for visibility at night and had to depend on the ASOS for ceilings, but could augment the ceiling information using pilot reports and moonlight.

Mr. Downie set the airport lighting based on ceiling and visibility. The lighting control panel allowed controllers to enter the visibility and then the airport lighting system sets itself accordingly.

Mr. Downie stated that MSAW alarmed sometimes when aircraft were on approach and he provided a safety alert when this occurred.

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AS-30