OPS11IA401

On March 23, 2011, between approximately 0004 and 0028 Eastern daylight time, an air traffic control service interruption occurred at the Ronald Reagan Washington National Airport (DCA) when two air carrier aircraft, a helicopter, an airport operations vehicle and controllers at the FAA's Potomac Terminal Radar Approach Control (PCT) were unable to establish contact with the supervisory controller working alone in the control tower. Two air carrier aircraft landed during the period without tower contact.

1. History of Flight

American Airlines flight 1012 (AAL1012) first contacted PCT at 2356 and was cleared direct to DCA after passing the OJAAY intersection. Further approach handling was routine. At 0003:49, the controller cleared AAL1012 to fly the Mount Vernon Visual Approach, a charted visual approach procedure to DCA. At 0004, the PCT controller instructed the pilot to contact DCA tower on frequency 119.1. At 0005, AAL1912 again contacted the PCT controller and reported that there had been no response from DCA. The controller responded, "that doesn't sound good...hold on, let me give them a call." AAL1012 continued toward DCA from the south, approximately straight-in to runway 1. The controller made two attempts to contact DCA on the phone line connecting the facilities, without success. At 0006, he instructed AAL1012 to attempt contact again on frequency 119.1. AAL1012 did so, and also attempted to contact the tower on frequency 121.5, which is an emergency frequency monitored by many air traffic control facilities.

Again receiving no response, AAL1012 executed a go-around and notified PCT that they were still unable to contact the tower. The PCT controller instructed the pilot to fly heading 270 and climb to 3,000 feet. He advised the pilot that, "...we're making some phone calls here to see what we can find out." At 0008, the controller instructed the pilot to fly heading 190, and at 0010 he advised the pilot, "...[we] called a couple of times on the landline and the supervisor called on the commercial line and there's no answer." The pilot replied, "...we've got a little bit more gas we'd like to wait it out and see if we can get something worked out before we divert." The controller responded, "...[I] remember a while back uh a year or so ago a controller got locked out of the tower and the aircraft went in on uh taking it as an uncontrolled airport so you might want to uh think that over." The pilot responded, "OK we'd like to go in as an uncontrolled airport."

The PCT controller told the pilot to fly heading 090 and descend to 2,000 feet. After confirming that the pilot had the (Potomac) river in sight, a requirement for aircraft flying the Mount Vernon procedure, the controller instructed the pilot to change to advisory frequency 119.1. However, the controller did not issue a new approach clearance. AAL1012 changed frequencies and began descending for landing.

During the period that AAL1012 was approaching the airport, the PCT controller had activated a tunable transmitter/receiver site located in Suitland, Maryland, about 5 miles east of DCA. Using that site, he was able to transmit and receive on the DCA tower frequency. At 0015, AAL1012 reported on tower frequency that the flight was on 2 mile final. At 0018, AAL1012 reported having landed during the first of 2 unsuccessful attempts to contact DCA on 119.1. The crew continued making repeated attempts to contact the tower on ground, local, and clearance delivery frequencies without success, and also engaged in an extended discussion with an AAL maintenance crew aboard an aircraft occupying gate 32, which was assigned for use by AAL1012. At 0028, AAL1012 was able to get a response from the tower controller, and tower ATC services resumed.

United Airlines flight 628 (UAL628T) first contacted PCT at 0010, and was instructed to descend via the ELDEE 5 terminal arrival route at 0011. At 0016, the PCT controller cleared UAL628T to proceed direct to DCA and advised the pilot, "...just so you're aware, we just had one aircraft go into DCA...the tower is apparently unmanned, we called on the phones and...nobody's answering so that aircraft (unintelligible.) The pilot responded, "that's interesting."

UAL628T continued turning and descending toward the airport, and at 0020 the PCT controller transmitted, "United 628T you can plan on just going inbound to runway 1 uh with the airport being uncontrolled I'll switch you over to advisory on about a 5 mile final." The pilot responded, "OK - thank you." At 0021, UAL628T requested and was given the local altimeter setting, 29.96 inches of mercury, and at 0021:35 reported the (Potomac) river in sight. The PCT controller cleared UAL628T for the Mount Vernon Visual Approach to runway 1, and instructed the pilot to change to advisory frequency 119.1. He also told the pilot to report clear of the runway, and advised that he would be monitoring frequency 119.1. The pilot acknowledged.

After changing to 119.1, UAL628T reported turning base for runway 1, 5-mile final for runway 1, and clear of the runway at 0026. DCA tower resumed service about 2 minutes later and UAL628T taxied to the gate.

Radar Data

The PCT approach controller used radar sites located at Washington Dulles International Airport (IAD) and DCA to monitor the progress of AAL1012 and UAL628T. After landing, the aircraft were tracked by an Airport Surface Detection Radar-X (ASDE-X) ground movement radar system. Graphics depicting AAL1012's first and second approaches, and UAL628's approach, have been entered in the docket for this case along with the Mount Vernon Visual Approach chart and the DCA airport diagram.

Personnel Statements

NTSB investigators interviewed the PCT supervisor and the radar controller on duty at the PCT KRANT position during the incident, as well as the DCA midnight shift supervisor (who was alone and working as a controller at the time of the incident), an evening-shift DCA controller and a supervisor who interacted with the midnight shift supervisor after he arrived in the tower cab, and the day shift controller who relieved the DCA midnight shift supervisor on the morning after the incident.

PCT Radar Controller

The PCT radar controller stated that there were no unusual conditions affecting operations when the midnight shift started. He had worked a day shift earlier, going off duty at 1345. He slept from 1500 until 2000, which was his normal practice for the midnight shift. His work schedule typically included two evening shifts, two day shifts, and either another day shift or a midnight shift.

The PCT radar controller first realized that something was wrong when AAL1012 reported being unable to establish contact with DCA tower. He then attempted to contact the DCA controller using the phone lines at the KRANT position but was unable to do so. He suggested that AAL1012 reattempt contact, but the pilot was unsuccessful and executed a go-around. The PCT radar controller began following the normal procedures for handling a go-around, and once

AAL1012 was reestablished on downwind he advised the supervisor, who was also qualified on the KRANT sector, about the aircraft's lack of contact with the tower and the go-around, adding that it seemed that there was no one in the tower.

The PCT radar controller advised AAL1012 that PCT was unable to contact DCA, and suggested to the pilot that he might want to continue to the airport but handle the approach and landing as an uncontrolled airport. The PCT radar controller stated that this came to mind because of an earlier incident that occurred in 2007, where the DCA tower controller locked himself out of the tower cab. The PCT radar controller recalled that aircraft landed under uncontrolled airport procedures in that event also.

After vectoring AAL1012 from downwind to base leg, the PCT radar controller again instructed the pilot to change to DCA tower frequency. The PCT radar controller stated that he set the tunable radio available at the KRANT position to the DCA tower frequency so he could monitor the aircraft.

After AAL1012 landed, the PCT radar controller heard AAL1012 on the ground calling AAL maintenance to discuss gate information. The maintenance crew was also apparently having difficulty getting in contact with the tower. The PCT radar controller stated that he assumed AAL1012 was off the runway because, "... that's what they're supposed to do, and I heard the pilot talking to the maintenance people."

The next arrival was UAL628T, who at the time was descending through 15,000 feet west of DCA. The PCT radar controller cleared UAL628T for the ELDEE standard terminal arrival. The pilot subsequently asked to deviate around some precipitation, which took the aircraft off the arrival route. The PCT radar controller then assigned the pilot a descent to 8000 feet, followed by a descent to 4000 feet. He advised the pilot of the communication difficulties being experienced with DCA and the possibility of treating it as an uncontrolled airport. Once UAL628T descended below the clouds and reported the river in sight, the PCT radar controller cleared the flight for the charted Mount Vernon Visual Approach. He stated that he would not have cleared UAL628T for approach if he thought that AAL1012 was still on the runway. Asked why he specifically instructed UAL628T to report clear of the runway but did not do so for AAL1012, the PCT radar controller replied that he didn't know.

After AAL1012 had landed, but before UAL628T arrived, the PCT supervisor came to the KRANT position to find out what was happening. The radar controller informed the supervisor that AAL1012 had landed, UAL628T was cleared for approach, and as far as he could tell there was no one in the tower. The PCT radar controller noted that he had earlier asked the supervisor if anyone else was trying to reestablish communications, and the supervisor responded that he and the FAA technical operations staff had both been trying to contact the tower.

The PCT radar controller stated that he first became aware that DCA tower was back in service when he heard, via the tunable radio, AAL1012 talking to somebody, possibly the tower. He then heard UAL628T definitely talking to the tower controller. At that point, he called the tower on the "shout line" to confirm that they were back in service. The PCT radar controller did not have any other conversations with the tower controller about what had occurred, but may have had some coordination exchanges during the night.

After the situation apparently returned to normal, the PCT radar controller walked over to the PCT supervisor's position to inquire about the incident. By then, the PCT supervisor had spoken to the DCA midnight shift supervisor, who had reported that, "he didn't know what happened." At

0105, the PCT supervisor instructed the PCT radar controller to fill out a controller statement, adding that "...this was going to be a big deal."

Asked to explain his decision to treat DCA as an uncontrolled airport, the PCT radar controller stated that under the circumstances it fit the definition of uncontrolled and that the tower appeared to be out of service. He specifically noted that he didn't tell AAL1012 to do anything, but simply provided information relevant to a situation that was similar to the previous 2007 incident. The PCT radar controller thought that the pilot should make the decision on how to handle the situation. To the controller's knowledge, there was nothing prohibiting an aircraft from landing at DCA with the tower out of service.

Investigators reviewed a replay of the approach conducted by AAL1012, and noted that radar contact was lost with AAL1012 on final approach, just before the aircraft landed. Asked how he handles that, the PCT radar controller stated that he would sometimes change radar sites when aircraft are conducting instrument approaches in order to provide better monitoring and ensure the availability of minimum safe altitude warning service. He would not necessarily do that for aircraft conducting visual approaches.

PCT Supervisor

The PCT supervisor reported no unusual operational or equipment issues when he assumed responsibility for the shift. He first realized something was wrong when the KRANT radar controller reported that he could not contact DCA tower. The supervisor then tried to reach the tower through the commercial administrative phone and also by using the direct "shout" line. Neither attempt worked.

While the supervisor was attempting to make contact with DCA, a technical operations technician reported that they were trying to coordinate a "cold start" of the radar data processing system (which requires coordination with all affected facilities) but could not contact DCA tower.

The supervisor then called DCA airport operations to see if they could assist. The airport operations staff had unsuccessfully been trying to contact the tower for their own purposes. After some discussion, the airport operations staff stated that they would send emergency responders to the tower. The supervisor requested that they advise him of their findings.

The supervisor continued attempting to contact the tower. He consulted with technical operations to see if they were aware of any equipment issues that might have been affecting communications with DCA. The technical operations staff reported that to their knowledge all equipment was operating normally. The supervisor stated that because it was so early in the shift he wasn't really considering the possibility that someone had fallen asleep. He considered an equipment issue to be a more likely explanation.

About 20 minutes after their initial conversation, DCA airport operations called to report that the tower was back in normal operation. The PCT supervisor then contacted the DCA supervisor on the phone, and was told, "We've been here the whole time." The DCA supervisor did not comment further about what had happened to cause the loss of contact. The call was conducted on an unrecorded line. The PCT supervisor had no further contacts with DCA tower during the shift, and was not aware of any other PCT personnel discussing the incident with the DCA supervisor during the remainder of the shift.

About 0230, he notified the Regional Operations Center and the PCT air traffic manager about

what had occurred. Following the notifications, the PCT supervisor began receiving phone calls from FAA management and others requesting information on the incident.

Asked to provide an evaluation of how the situation was handled, the PCT supervisor stated that in hindsight he could have provided more direction. At the time, he neither approved nor disapproved of the KRANT controller's plan, but should have "vetoed or co-signed" the decisions made. He thinks the situation was handled as safely as it possibly could have been, but under the circumstances, the KRANT controller was left to operate in "sketchy, uncharted territory." In retrospect, the PCT supervisor thought that perhaps the situation could have been handled differently, for example by holding the flight instead of letting it land. He said the plane would likely have diverted within 10 minutes.

The PCT supervisor stated that he had no training about what to do in the event of losing contact with a major tower. He was not familiar with the 2007 loss of communications with DCA tower.

DCA Evening Shift Supervisor

The DCA evening shift supervisor stated that on the evening of the incident, the midnight shift supervisor came to the cab about 2145 and had a brief discussion with the controller working the local control position. After that discussion ended, the two supervisors had a conversation about a personnel issue. That discussion continued until about 2220. The DCA evening shift supervisor was within 5 to 10 feet of the midnight shift supervisor, and noticed nothing unusual about him that would indicate fatigue or a medical issue. The midnight shift supervisor did not discuss his daily activities or make any references to how he was feeling during the conversation with the evening shift supervisor. The evening shift supervisor has known the midnight shift supervisor for almost 2 years. The DCA evening shift supervisor left the cab at 2220, and last saw the midnight shift supervisor talking to the local controller.

Asked about his personal preference for tower cab position when working the midnight shift, the DCA evening shift supervisor noted that the exact location depends on the configuration of the airport. However, he stated that controllers are required to work from the local control position. He would not personally work the midnight shift operation from the clearance delivery position. His standard practice was to use a headset for communications until the last aircraft arrived, and then switch over to using a handset. Facility directives require that the local control position audio be audible on the speaker system in the tower cab.

The evening shift supervisor stated that the normal schedule for supervisors at DCA is to work a mixture of day, evening, and midnight shifts in one week blocks. Each supervisor works a week of midnight shifts about one week out of every four or five weeks.

The evening shift supervisor also saw the midnight shift supervisor on the night before the incident occurred (the beginning of the Monday night/Tuesday morning midnight shift) and stated that he looked fine then.

Asked about his personal practices are for maintaining alertness on the midnight shift, the DCA evening shift supervisor stated that he drank lots of coffee, did exercises, and turned the air-conditioning down and the lights up. His standard pattern between shifts was to arrive home at 0630, go to bed, wake up at 1330, have lunch, return to bed at 1730, and wake up at 2000.

DCA Local Controller

The DCA local controller had worked the evening shift and was on duty when the midnight shift supervisor arrived for work. The midnight shift supervisor was the local controller's supervisor of record, and the local controller had been assigned to his crew since December 2009. The local controller was unaware of any equipment or operational issues that may have carried over to affect operations on the midnight shift.

After the midnight shift supervisor arrived at work, he and the local controller had a lengthy conversation about personal development and career issues. The local controller stated that the midnight shift supervisor, looked and sounded perfectly normal during the conversation. The local controller stated that when he left for the evening, everything seemed normal.

DCA Day Shift Controller

The DCA day shift controller interviewed for this report was assigned a 0530 shift on March 23, and relieved the midnight shift supervisor at the end of his shift.

The day shift controller stated that when he arrived in the cab, the supervisor was sitting at the Local North position. Nothing appeared unusual. The day shift controller signed in and went to the local control position to relieve him. He and the supervisor completed a recorded position relief briefing. The day shift controller was standing next to the supervisor, and stated that he looked normal. The day shift controller stated that the supervisor made a statement to the effect of, "I guess I fell asleep and United went around." He sounded concerned, and then added, "and then he came back and landed without a clearance." The day shift controller said that the supervisor did not go into great detail, and he did not ask about it further. Asked what he meant by describing the supervisor as "seeming concerned," the day shift controller said that he let out a big sigh, and then proceeded with the relief briefing for the position. There were no unusual equipment or operational conditions noted in the briefing.

Asked if the supervisor had offered any information about how the incident happened, the controller said only that, "he thought he'd fallen asleep." The day shift controller noted nothing unusual in the supervisor's appearance. He has known the supervisor since 1994.

The day shift controller noted that he had also relieved the supervisor at the end of the previous midnight shift, and that the supervisor looked the same both days.

The day shift controller stated that he had not bid on supervisor positions in his time at DCA because of the difficult work schedule for supervisors there.

DCA Midnight Shift Supervisor

The DCA midnight shift supervisor entered on duty with the FAA in 1990 at Andrews Air Force Base ATCT. He transferred to DCA in June, 1994, and completed training there on April 17, 1996. He had no history of poor performance or disciplinary actions. He became a supervisor/front line manager in October 2005. On the night of the event, he arrived at the tower about 2130, and signed in at 2145.

His normal pattern was to take a nap about 45 minutes before going to work on a midnight shift. At 2000, he tried to get some sleep, but remained awake. After 20 or 30 minutes of trying to sleep, he got up and prepared for work. His residence is about 5 minutes from the tower.

When he arrived, he went straight to the tower cab. He had a conversation with the evening shift

supervisor about some personnel issues. When that discussion concluded, the two supervisors completed a position relief briefing and the evening shift supervisor departed. There were no unusual conditions or equipment issues noted in the briefing.

The supervisor then went to the local control position and began talking with the local controller on duty about career-related issues. They were alone in the tower cab. During the conversation, the supervisor took over the local control position, and the conversation continued until about 2300 when the local controller departed. For the remainder of the shift, the DCA midnight shift supervisor was alone. [Note: this was confirmed by review of tower security video.]

His normal routine at the beginning of a midnight shift was to go to the traffic management position and extract a list of inbound aircraft for planning purposes. There had been maintenance activities scheduled on the airport beginning at 0100, and there was a Notice to Airmen out to that effect. He contacted airport operations to confirm that the work was still going to occur. His concern was to ensure that the arrivals all landed before the maintenance work began to affect the airport.

The supervisor remained at the local control position until 2330 or 2345, when he moved back to the clearance delivery (CD) position in the back of the cab. This was his usual practice when working midnight shifts. He stated that working from the CD position was advantageous for midnight operations because it was "a better perch to see the airport," close to the telephones and Traffic Situation Display (TSD), and also had an ASDE-X display for monitoring the field so there was less need to move around the cab to do what needed to be done. There was a handset plugged in to the CD position and also a wireless remote headset plugged in to the local control position because there was a local requirement to record midnight shift radio traffic at the LC position. The audio for the radios was set to be heard through speakers in the cab.

The supervisor said that it started off being a relatively normal night, with "...a bit more helicopter traffic than normal." He said that he was, "...beat, worn out," which for him was not unusual for the fourth midnight shift of the week. He approached working the shift like he always had, but noted that the last two overnight shifts of the week were always the most difficult for him.

The Automatic Terminal Information Service (ATIS) was updated from the CD position. The process was that the weather update was received in the tower at 52 minutes past the hour. The supervisor was then required to review the weather and make the appropriate computer entries to add the weather to the ATIS broadcast, update the ATIS code, and update the Information Display System (IDS-5). The supervisor said that he had updated the ATIS when new weather was received, but added that he had difficulty specifically recalling events around the time he became nonresponsive.

The supervisor said that his normal procedure for configuring the cab for midnight operations is to turn up the lights in the rear of the cab (around the CD, traffic management, and supervisor positions) and leave the lights off in the front. He also raised the temperature from the usual day shift setting of about 70 degrees to about 73 or 74 degrees. He brought in a magazine to help keep going during the shift. His cell phone was on, but was left in his coat pocket and he did not use it during the shift. There were no other unusual environmental conditions or distractions.

He described the shift workload as light to moderate with the positions combined. It was about the same as the previous nights had been. Regarding his becoming unresponsive, the supervisor stated that at the time he didn't know what happened. The last activity he clearly recalled was

issuing a clearance to Brickyard 1319. At that time, he recalled thinking, "...I need to throw some water on my face." He noted AAL1012, UAL628T, and AAL1900 inbound on the TSD, but did not recall anything else clearly until waking up later. He said he could, "...tell I was slipping, struggling," and was trying to remain alert by stretching and moving around. He did not experience any feelings of anxiety, numbness, tingling, or shortness of breath. He remembered being exhausted, and "...knew he was dragging." When his awareness returned, he thought he had only been out for a couple of minutes. He heard AAL1012 calling in a "forceful voice," and shortly afterward the pilot of UAL628T was asking for the tower's phone number. That was when he realized he had missed quite a bit. The supervisor said that he knew he wasn't coherent, and now believes that he had been asleep.

After the event, the supervisor talked to airport operations at least twice, and to PCT on the commercial phone. While this was going on, he was trying to piece together what happened. He recalled talking to the United pilot on the phone, but did not recall the specific content of the call except that the pilot was upset and described it as "a bad situation." The supervisor was unsure if the phone lines used were recorded. The phone lines through the tower Integrated Communications Switching System (ICSS) were definitely recorded, but only one of the commercial lines was recorded.

When he "came out of the haze," the supervisor recalled feeling the sensation of a 50-pound weight on his head and shoulders. It was a struggle to talk, which he described as a "bizarre feeling." The fogginess he felt continued for at least 3 or 4 minutes. After 10 or so transmissions during that first 5 minutes, he felt that he was returning to "tired," no longer "exhausted." He did not recall any feelings of headache or nausea. He said that after he woke, "...the adrenaline was pumping," and he managed to get through the shift. The support manager for the tower, the operations manager, and the air traffic manager all called beginning around 0345 to check up on him and make sure everything was OK.

The first two day shift controllers came in around 0530 and 0535. He briefed them and turned over responsibility for the operation, and then went downstairs to review tower recordings with the operations manager and the air traffic manager. As he reviewed what had happened with the managers, the supervisor described his feelings as "professionally embarrassed, shocked, panicked, ashamed." He did not realize that two aircraft had landed without contact until after listening to the recordings. He was held over until the drug and alcohol testing technician arrived, and completed the test procedures before going home.

Because of his own concern over the incident, the supervisor visited his personal physician the day after the event for an examination. The doctor was unable to identify evidence of medical issues such as a seizure or mini-stroke that could have contributed to this event, but recommended further testing. The doctor thought the supervisor's sleep pattern over the 5 days preceding the incident may have played a role.

DCA Midnight Shift Supervisor's Recent Activities

The supervisor described his normal daily routine while working midnight shifts. After work on school days, he normally went home, got his children off to school, had breakfast, and slept from about 0830 or 0845 until 1430. After family activities and dinner, he then usually took a 35 to 60 minute nap at 2000, and left for work between 2115 and 2125. Under normal circumstances when he is not working midnight shifts, he slept from 2200 or 2300 until 0630, and said that 7 hours of sleep was enough for him to feel "pretty good."

The supervisor reported that he was on leave and in Switzerland from March 8 until March 13. He said that he was up several long days during his 7-day Switzerland trip, and he felt that the time zone adjustment upon his return was "relatively routine," as he did not find the westbound transition as difficult as the eastbound transition.

He had the 14th off, and returned to work on the 15th for a 0800-1600 shift.

On March 17 he got off shift at 2200 and was in bed by 2300.

On March 18 he awoke about 0545. After getting his children to school he engaged in some personal activities. About 1600 he returned to DCA to do a facility tour for about an hour. The children had an activity in the evening, and he reported being in bed at or before 2230.

On March 19 the supervisor awoke around 0630-0700. He felt that he got 8 to 8 1/2 hours of uninterrupted and good quality sleep. Saturday was spent doing various family activities. At 2000, he took a 30 minute nap and then handled some medical issues with one of his children. He did not take any other naps during the day. He stated that for his first midnight shift of a week he found it best to take a pre-shift nap, but otherwise stay up and wait to go to sleep the next morning. He normally only had granola or toast for breakfast, waiting until 1400 or so before eating anything more substantial. He then usually had dinner with his family around 1800. He did not normally snack before coming to work. He drank caffeinated beverages only on day shifts, not on midnight shifts, and limited his consumption to 2 cups.

On March 20, the supervisor's shift ended at 0600. He got home about 0615 and went to bed about 0700. He slept from about 0730 until 1300, but was awake up from about 1100-1130 because of household noise issues. He felt short of sleep and was a bit groggy when he woke up. He did not recall specific activities on Sunday except that it was a quiet day at home with the family. He did take a 30 to 45 minute nap before going to work, and he described the Sunday night midnight shift as unremarkable. He did not fall asleep during the shift, and said that he felt OK.

On March 21, he got off duty at 0600, went home, and got the children off to school. He was unable to go to bed until about 0900 because of a household cleaning crew's visit. Under the circumstances, he felt relatively tired. Looking back, he believed that this may have been where he started to get off track. He slept from 0900 until 1600-1630, and felt "good" when he woke up. The sleep was good quality and continuous except for possibly one interruption for personal needs around 1400-1430. After awakening, he worked about an hour and 45 minutes on the tower schedule from home.

Dinner was the first meal he ate on March 21, and he took some leftovers into work that night. He took a 45 minute nap around 1930, left for work about 2120, and went on duty at 2145. The Monday night shift was normal, except for heavier than usual helicopter traffic that ran into Tuesday morning.

On March 22, he got off work at 0600, went home, and dropped his children off at school. Afterwards he felt "...a bit keyed up." and then went to bed about 1000. He had trouble falling asleep, and woke up around 1330. He couldn't go back to sleep, so he got up and started running errands. He got home around 1800, but didn't have much for dinner. Later in the evening, one of the children had trouble breathing and was coughing a lot. He attempted to get in a nap around 2000, but the medical issue with the child was disruptive and he did not get any sleep. About 2030 he got up and showered, then left for work early - arriving about 2120 or 2130.

The supervisor described the week of the event as busier than normal and noted that he felt rushed most of the time. He recalled that his sleep on Sunday was shorter than normal and interrupted, but he thought he had gotten over that with the longer sleep period on Monday. Even so, he said that he felt "off" for all the midnight shifts that week.

He described his current health as good. He was dieting using portion control, and had lost 13 or 14 pounds. He said he had recently been feeling the best he has for a while, and had not been experiencing any cold or flu symptoms.

The supervisor reported no previous history of unexplained loss of consciousness, seizures, or sleep disorders. His wife had told him that he sleeps heavily and snores, but that he did not appear to experience interruptions in breathing. He said he occasionally had difficulty falling asleep, but he believed that was the result of changing shift patterns, saying it "...sometimes takes a couple of days to get oriented." His medical certificate requires him to wear corrective lenses while performing ATC duties, and he wore glasses on the midnight shift instead of his usual contact lenses. He reported no hearing disorders.

The supervisor stated that he accommodated shift changes by forcing himself to stay within the sleep hours that work for that shift. He maintained alertness on midnight shifts with physical activity. He did not drink coffee on those shifts because it doesn't agree with him on an empty stomach. He occasionally snacks during the night.

The supervisor described the frequency of midnight shifts assigned to the supervisors as "insane," with respect to their cumulative effect. The supervisors each work a week of midnight shifts about once a month, which he finds extremely difficult. [Review of schedule records showed that he last worked a week of midnight shifts between February 19 and February 23.] He speculated that perhaps the combination of the time change after his leave and the schedule change to the week of midnight shifts may have had some contributory effect.

The supervisor stated that an additional person on the midnight shift would be helpful, as even getting relieved for an hour would be welcome. The supervisors have been working alone on the midnight shift since the DCA approach control function was consolidated at PCT in 2002. The facility currently has 32 controllers and 6 supervisors.

Pilot Statements

Flight Operations Information

The flight crew of AAL1012 provided written statements indicating that during approach, they had attempted to contact DCA control tower on the tower frequency, and also on the ground frequency. They were unable to make contact with the tower, executed a missed approach, and contacted PCT.

Both pilots indicated that the approach controller had advised them of a previous occurrence in which a controller had been locked out of the tower, and aircrews had decided to land using "uncontrolled airfield procedures." The captain stated that based on the information provided by the PCT controller, he opted to treat the airfield as uncontrolled.

The first officer stated that they scanned the tower for evidence of light gun signals, but did not see any. The pilots stated that they made "advisory calls" on tower frequency while on final

approach, when clearing the runway after landing, and also to convey their taxi intentions after clearing the runway.

The flight crew of UAL628T provided written statements indicating that the PCT controller had advised them that the DCA tower was unmanned. The crew stated that they checked a list of NOTAMS (Notices to Airmen) on board but could not find any mention of tower, runway, or airport closure at DCA.

The captain stated that the approach controller told them to use uncontrolled airport position reports on the tower frequency. He attempted to obtain visual indication of green light signals from the tower on final approach, and thought that he had seen them.

The first officer stated that he made position reports on the tower frequency and that he was unable to confirm seeing any light signal from the tower due to the visibility and the lighting around the airport vicinity. He also made position reports on the ground when clearing the runway.

Flight crew statements for the crews of both AAL1012 and UAL628T have been placed in the docket.

Company Procedures

American Airlines and United Airlines both included guidance in their respective company manuals for pilots to operate in the event of a radio communications failure. The guidance identified alternate means of communication such as ACARS (Automated Crew Addressing and Reporting System) and satellite phone.

Both companies also included guidance in company manuals for conducting operations into airports without an operating control tower. The manuals included guidance on obtaining airport weather conditions, traffic advisories, and the status of airport facilities and services.
The United Airlines Flight Operations Manual, volume 1 - Policies and Procedures, page 9.120.2 stated in part:

"Airfield status must be checked prior to initiating the approach; possible sources include FSS, UNICOM, arriving and departing airplanes, and local Station Operations."

American Airlines and United Airlines were issued Operations Specifications C080 by the Federal Aviation Administration. Operations Specifications paragraph C080 stated in part:

a. The certificate holder is authorized to conduct scheduled passenger terminal area IFR operations in Class G airspace or at airports without an operating control tower, provided that the certificate holder determines that:
(1) The airport is served by an authorized instrument approach procedure.
(2) The airport has an approved source of weather.
(3) The airport has a suitable means for the pilot-in-command to acquire air traffic advisories and the status of airport services and facilities.
(4) The facilities and services necessary to safely conduct IFR operations are available and operational at the time of the particular operation.

The Operations Specifications paragraph C080 issued to each company included a list of airports, and the required facilities and services, at which they were authorized to conduct scheduled

passenger terminal area IFR operations without an operating control tower. DCA was not included on the list for either company.

DCA Tower Corrective Actions

Following the incident, the manager of the Washington District (which includes DCA) took the following actions in response to FAA directives issued following the incident:

1. The District began scheduling a second person on the midnight shift at DCA (on March 24, 2011), and RIC [Richmond Tower] and ADW [Andrews Tower] (on April 14, 2011).

2. Ensuring 9 hours scheduled time off following the midnight shift for all operational personnel

3. District-wide, facilities have begun to spread management coverage earlier on morning shifts and later on evening shifts to enhance the midnight shift coverage as appropriate. At DCA, no adjustment was made because they already had a front line manager assigned to work the mid-shift.

4. Disallowing controllers the ability to swap into a midnight shift while on their Regular Days Off (RDO) effective on April 22, 2011.

5. The District has directed its facilities to make appropriate Comm Check coordination with PCT on the hour and half hours as required. In addition, ATIS coordination will be verbally made during the top of the hour coordination.

6. At ORF [Norfolk] and ROA [Roanoke] where there is one controller in the Tower and another one in the TRACON for the entire mid-shift, the District has directed these facilities to utilize the single controller continuity checks for the entire mid-shift.

The District has addressed the contingency of only one (of the two) scheduled controllers showing up for a mid-shift by requiring the facility to call in overtime. During the period where only one person is in the facility during the mid-shift (while awaiting the arrival of the second), the facilities have been instructed to utilize the single controller continuity check procedures.

Documentation of additional FAA-wide corrective actions has been entered into the docket.