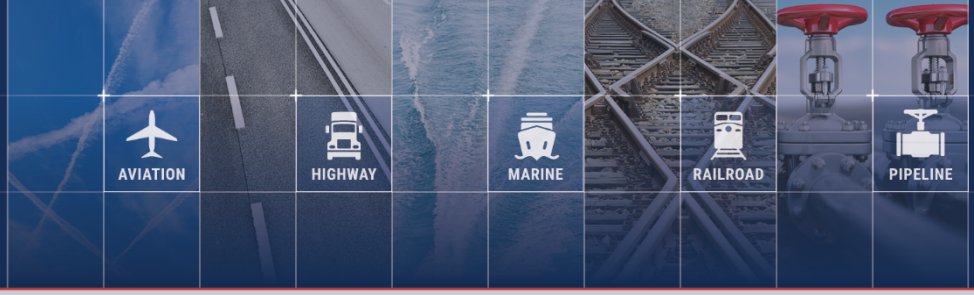


Aviation Investigation Final Report

Location:	Minneapolis, Minnesota	**Incident Number:**	OPS10IA574
Date & Time:	September 16, 2010, 06:49 Local	**Registration:**	N122US
Aircraft:	AIRBUS INDUSTRIE A320-214	**Aircraft Damage:**	None
Defining Event:	Near midair/TCAS alert/loss of separation	**Injuries:**	95 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

An Airbus 320, operating as US Airways flight 1848, a scheduled 14 Code of Federal Regulations (CFR) Part 121 passenger flight, departed Minneapolis from runway 30R and was instructed by the Local North Controller to turn left to a heading of 260. A Beech 99, operating as Bemidji Aviation Services flight 46, a 14 CFR Part 135 cargo flight, was cleared for takeoff from runway 30L by the Local South Controller and was instructed to fly a heading of 180 after departure. The pilot had not yet initiated the turn when the two aircraft crossed paths about 1/2 mile northwest of the end of runway 30L, with an estimated separation of zero feet laterally and 50 feet vertically. The Local South Controller later stated that he became distracted in dealing with a ground operation and did not notice that the Beech was not turning as soon as he expected. An operational error occurred when the aircraft continued straight out from runway 30L and conflicted with the Airbus. No injuries or damage were reported and both aircraft continued to their destinations. The reported ceiling at the time was 900 feet and the visibility was 10 miles.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The Local North Controller's issuance of a left-turn heading to the Airbus without establishing the position and heading of the Beech. Contributing to the incident was the Local South Controller's distraction with a ground movement operation and lack of awareness of the Beech's heading and the impending conflict. Also contributing to the incident was the Beech's delayed turn to the assigned departure heading.

Findings

Personnel issues	Identification/recognition - ATC personnel
Personnel issues	Task scheduling - ATC personnel
Organizational issues	Adequacy of policy/proc - ATC
Personnel issues	Expectation/assumption - ATC personnel
Personnel issues	Incorrect action sequence - ATC personnel
Personnel issues	Delayed action - Pilot of other aircraft

Factual Information

History of Flight

Initial climb	Near midair/TCAS alert/loss of separation (Defining event)

On September 16, 2010, about 6:49 a.m. CDT, an air traffic control operational error resulted in a near-midair-collision between US Airways flight 1848 (AWE 1848), an Airbus 320, operating as a scheduled 14 Code of Federal Regulations (CFR) part 121 passenger flight en route to Philadelphia, Pennsylvania, carrying five crewmembers and 90 passengers, and Bemidji Aviation Services flight 46 (BMJ46), a Beech 99 cargo flight with only the pilot aboard, operating as a 14 CFR part 135 cargo flight en route to LaCrosse, Wisconsin. Weather conditions at the time were reported ceiling 900 feet and visibility 10 miles.

The local north controller (LCN) cleared AWE1848 into position and hold on runway 30R at 0647:50. At 0648:02, the LCN controller instructed the pilot to fly runway heading and cleared AWE1848 for takeoff. At 0649:26, the LCN controller instructed AWE1848 to turn left heading 260 and contact departure control. The pilot acknowledged.

At 0648:15, the local south controller (LCS) contacted the E position radar controller at Minneapolis departure control to obtain approval to assign Bemidji 46 (BMJ46) heading 180 degrees after takeoff. The radar controller approved the request. At 0648:31, the LCS controller instructed BMJ46 to turn left heading 180 after departure, and cleared the pilot for takeoff on runway 30L. The pilot acknowledged. The aircraft departed and continued straight out from runway 30L for about 2 miles. At 0650:26, the LCS controller asked, "Bemidji 46 are you in the turn?" The pilot replied, "46 say again the turn?" The LCS controller transmitted, "Bemidji 46 heading 180." The pilot of BMJ 46 replied, "46 left to 180." At 0650:54, the LCS controller transmitted, "Bemidji 46 remain this frequency maintain 4000 heading 180." At 0651:00, the pilot of Bemidji 46 responded, "4000 180 and I've got traffic." At 0651:41, Bemidji 46 transmitted, "Bemidji 46 going to departure." At 0651:44, the LCS controller transmitted, "Bemidji 46 now contact departure." At 0651:47, Bemidji 46 transmitted, "46 has that traffic up ahead there I wasn't notified about that." The LCS controller replied, "okay why didn't you start the turn once you were airborne?"The pilot replied, "all right okay I'm going to departure sorry about that."

At 0649:49, AWE1848 made a partial transmission to departure control, stating "1848 is...". At 0649:55, the pilot of AWE1848 transmitted, "1848 we're with you what's this guy doing off the left side?" The departure controller replied, "cactus 1848 Minneapolis departure radar contact it looks like he's possibly straight out." The pilot responded, "okay we just had a we just we heard the guy go by." The departure controller responded, "Cactus 1848 I'll tell the tower, radar contact climb and maintain 17,000." The pilot acknowledged the clearance, and at 0650:24 continued, "yet he gave us a left turn ah coming out of there." At 0650:28, the departure

controller stated, "yeah I think the 99 that was off your right was straight out off the same runway I'm not really sure but I'll ask him for you." The pilot responded, "yeah he was on the left side we got an RA on it and we responded we did hear the aircraft go by." At 0651:27, the pilot of AWE 1848 transmitted, "... advised me that that controller's been relieved of duty at the moment." The departure controller responded, "... we are working on it right now stand by."

On September 17, US Airways filed a traffic alerting and collision avoidance system (TCAS) report regarding this incident:

"...At 0649 we were cleared for takeoff to fly runway heading (299deg). At 400ft AGL [above ground level] the first officer (pilot flying) called for runway heading, at the same time KMSP tower told us to turn left to a heading of 260 and call departure at 124.7. (from the original of 125.75) We turned to heading 260 and at that time we received a TCAS R/A [resolution advisory]. We were in a normal takeoff climb rate when the TCAS commanded a much greater climb to clear the conflicting traffic. The first officer responded with a swift pull-up. During this time I observed a red target on the TCAS display to our immediate left, that showed a -100ft [100 feet below]. (We were in the clouds at about 500ft and could not see the aircraft.) Within just a few seconds I heard the whine of turboprops go under our aircraft from left to right. After this the TCAS gave a "clear of conflict" and we returned to normal flight. After the flight I consulted with KMSP ATC and learned that the tower controller on 30R turned us into the path of a Beechcraft 99 departing from 30L."

Review of recorded radar data showed that the paths of the two aircraft crossed at 0649:58. Plots of the radar data for the two aircraft have been placed in the docket.

While the initial operational error was being reviewed, a second error involving AWE1848 and BMJ46 was found. The second error occurred after the LCS controller instructed BMJ46 to turn left to heading 180 when the aircraft was about two miles northwest of the airport. This instruction again put the two aircraft into conflict, with separation of 500 feet and 1.23 miles. Minimum required separation was 1000 feet or 3 miles.

PERSONNEL STATEMENTS

When the incident occurred, there were two supervisors on duty at the tower. One was working in the tower cab and was responsible for the overall operation. The second supervisor was performing administrative duties in the office area downstairs from the tower cab, but was available to provide assistance if needed. There were two local controllers on duty. The Local Control North (LCN) controller was responsible for operations on runway 30R, and the Local Control South (LCS) controller was responsible for operations on runway 30L as well as runway 17/35, although that runway was not in use at the time. Immediately before the incident, the LCS controller was working the LCS, LCN, and LCW positions combined, and the LCN controller was working a ground control position. Their position assignments were changed by the tower supervisor to accommodate existing and expected traffic conditions.

Local Control South (LCS)

The LCS controller began working for the FAA in 1982 and came to MSP ATCT in September 2005.

The incident occurred on the last day of his work week, and he was working a 0600-1400 shift. He reported going to bed around 10 or 11 pm the previous evening and awakening at 4:45 am. This is a normal amount of sleep for him. He arrived at the tower at 0600, and stated that he "felt good" that morning.

Initially, the LCS controller was responsible for the LCN, LCS, and LCW positions, which is typical for very early morning operations. Runway 17/35 was inactive because of the low ceilings and the winds. The LCS controller stated that when he took over the position he noted that there were low ceilings in the area, and he obtained a pilot report off the departure end of runways 30L/R stating that the cloud bases were at 1900 feet above sea level. The visibility was good below the cloud deck, and it was a cool morning so aircraft were climbing well.

The morning Bemidji flights [contract cargo carriers] began taxiing out from the freight ramp around 0630 or 0635. At that time the ground control positions were combined at Ground Control South. About 0630, the controllers began to split the ground control positions. One of the controllers that had been working ground control was assigned to take over the LCN position about 0645. The LCS controller gave the new LCN controller a position relief briefing and gave him the LCN flight strips. The LCS controller then relinquished control of the LCN frequency. The LCS controller informed the new LCN controller that he had not had time to coordinate with the TRACON for a southbound departure for AWE1848. This would not have been the normal route for AWE1848 to follow. The change was necessary to avoid a conflict between the faster jet and preceding slow traffic that had just departed from runway 30R and was still north of the airport.

After the LCN position was split from LCS, the LCS controller remained responsible for runway 30L and runway 35. However, runway 35 was inactive. Air Transport 808, a heavy DC-8, landed on runway 30L and asked to roll to the end. A Learjet landed shortly afterward. During this time, the LCS controller coordinated a southbound heading for BMJ46 with the departure radar controller. The radar controller approved the heading, so the LCS controller instructed BMJ46 to fly heading 180 degrees after departure and cleared the aircraft for takeoff.

While BMJ46 was departing, Air Transport 808 began asking questions about his taxi route. The LCS controller stated that he became distracted in dealing with Air Transport 808 and was not watching BMJ46. He did not notice that BMJ46 was not turning as soon as he expected. The aircraft continued straight out from runway 30L and conflicted with AWE1848.

After dealing with Air Transport 808, the LCS controller stated that he looked at the radar display and saw the two targets for AWE1848 and BMJ46 merging just as the conflict alert alarm went off. He kept working traffic at LCS until relieved from the position about five

minutes later. After he left the position, he went to the break room. Shortly afterward he was called to the quality assurance office where he met with the administrative supervisor, the air traffic manager, and several other members of the quality assurance staff. He was in the quality assurance office for several hours. He and the LCN controller did not complete controller statements until about 1230, or possibly later. The group reviewed a replay and listen to the audio recordings as part of the initial investigation. That afternoon, there was a roundtable discussion that reviewed what had taken place and attempted to put the events in chronological order.

Asked about his initial plan for separating AWE1848 and BMJ46, the LCS controller stated that the US Airways flight was going to be assigned a 260° heading off runway 30R, and BMJ46 would be turning southbound after departure. BMJ46 was departing from the full length of a 10,000 foot runway. The LCS controller expected that BMJ46 would become airborne between taxiway W5 and W7, begin turning southbound well before the end of runway 30L, and cross midfield over runway 35, possibly completing the southbound turn before crossing runway 22. The LCS controller stated that he did not specifically coordinate anything about BMJ46 with LCN because he never believed that the aircraft would be a concern for LCN. BMJ46 was not given any restrictions. The aircraft was issued a departure heading and cleared for takeoff.

Asked what separation was being applied between the two aircraft, and by whom, the LCS controller stated that he approved the westbound turn for AWE1848, the incident occurred in his airspace, and therefore separation was his responsibility. He became distracted in dealing with ground movements, and was not watching BMJ46. He was anticipating that the aircraft would be separated because they would become established on diverging courses. The LCS controller stated that he saw the US Airways aircraft climbing into the clouds. The normal procedure would be for the LCN controller to leave the 30R departure on runway heading until the conflict was resolved, typically by observing the other traffic turning as directed before turning the 30R departure toward the west.

Asked about automatic acquisition of data tags on radar targets, and whether the process seemed abnormally slow, the LCS controller stated that aircraft are typically tagged within 1/2 to 1 mile of the end of the runway. Asked if the Bemidji departure flights left earlier than usual, possibly causing an unexpected spike in workload, he stated, "not really - the LCN position is normally split off by 0630."

The LCS controller did file an Air Traffic Safety Action Program (ATSAP) report on the incident. Asked if he could provide any "lessons learned" after this event, he said that it was wrong to assume that the Bemidji aircraft would do what they "always" do. His responsibility is to separate aircraft. In this case, with AWE1848 turning across his runway, he needed to go 3 miles behind the aircraft.

There is a memory jogger strip available at the position for use when headings have been approved such as that followed by AWE1848, but the LCS controller stated that it would not have been helpful because he was well aware of the 30R traffic. He had authorized the turn for

AWE1848, and there was coordination between the LCS and LCN controllers.

The LCS controller had earlier stated that he expected BMJ46 to be in the air by taxiway W5 to taxiway W7, which are approximately 4500 to 5000 feet down the runway from the threshold. From his prior experience, Bemidji aircraft usually begin their turn "a few hundred feet up." The plan in this case was to establish course divergence between BMJ46 and AWE1848. Asked how he would have handled the same situation if the weather conditions were 500 feet overcast and 1 mile visibility, he said that he probably would have waited until the Learjet aircraft landed on runway 30L before releasing BMJ46. In this situation, he believed that BMJ46 would be airborne and turning well before any possible conflict with AWE1848. When he issued the takeoff clearance, he had no concerns about separation between the two aircraft. If the weather conditions had been substantially worse, the LCS controller would have waited until AWE1848 tagged up on the radar display, and then departed BMJ46. Runway 30L is two miles long, so by waiting he would have readily established radar separation. He noted that aircraft tag up more quickly when they depart runways 12L/R as opposed to runways 30L/R.

The LCS controller stated that AWE1848 may have been somewhat heavier than normal because the aircraft did not initially climb as well as Airbus aircraft usually do. BMJ46 climbed very well compared to his past experience. The LCS controller last saw AWE1848 as it entered the clouds, making a left turn just off the departure end of runway 30R.

LCN Controller

The LCN controller entered on duty with the FAA in 1982 and came to MSP in May 2001.

He reported for duty at 0600, and by 0605 he was working the Ground Control South position. About 0630, the supervisor directed him to split the ground control positions and then take over the LCN position. As he was already standing next to the LCS controller at ground control, the LCN controller received a face-to-face position relief briefing, took the flight strips for aircraft that would be controlled by the LCN position from LCS and then moved to the LCN position to begin working.

When AWE1848 was ready for departure, there were other Bemidji aircraft north of the airport that had also departed from runway 30R. The LCN controller decided that AWE1848 should turn left off the runway and depart toward the south to avoid the slower Bemidji traffic to the north. He coordinated that route with the departure radar controller, instructed AWE1848 to fly runway heading, and cleared the flight for takeoff. After AWE1848 departed, the LCN controller said that he scanned for traffic, did not see anything visually or on the radar that would be a conflict, and instructed AWE1848 to turn left heading 260° and contact departure. He did not think anything was wrong when he heard the LCS controller clear BMJ46 for takeoff and to fly heading 180. Shortly afterward he noticed that there was another radar target near AWE1848, and asked the ground controller standing next to him if there was a false target or if the

aircraft was transmitting two transponder codes. He was unsure who the other aircraft was, if there was another aircraft. Shortly afterward, a data tag appeared indicating that the second target was BMJ46. He then realized that BMJ46 had stayed on runway heading rather than turning to heading 180. At no time before this had he thought that BMJ46 would be traffic for AWE1848. He stated that 99.9% of the time, Bemidji aircraft given a similar clearance turn before reaching runway 22, and never cross the end of runway 30L. The LCN controller stated that he had erred by not ensuring that BMJ46 was airborne and turning as expected.

After the incident, the supervisor had him relieved from position. He overheard her speaking to someone about AWE1848 and BMJ46, so he asked her if she needed more information. She said that she did not, and sent him downstairs.

After leaving the cab, the LCN controller participated in the quality assurance investigation by reviewing audio recordings and watching the replay. He saw what had gone wrong on the replay, noting that BMJ46 did not turn as soon as expected after departure.

Asked how he would handle the situation differently or better now, he stated that when he trains other controllers, he tells them they should always scan the other runway for traffic in situations such as this. In the situation he did not scan runway 30L thoroughly enough and missed the traffic. When working LCN, it is important to know where traffic being handled by the LCS controller is as well, and that did not occur.

The typical practice is to use visual separation when handling parallel departures in visual conditions. In instrument conditions where visual separation cannot be used, controllers are required to establish and maintain at least three miles radar separation.

The LCN controller was 3 to 4 feet from the tower radar display when he scanned it for potential traffic conflicts, and had no difficulty in seeing the display. He recalled that the time of the incident he was using an 11 mile range, and stated that he typically sets the altitude filter parameter to 17,500 feet. There is no local facility requirement directing a particular setting. It is common for MSP tower controllers to watch for aircraft on downwind being handled by the TRACON.

The LCN controller stated that radar targets typically auto acquire 1 to 1 1/2 miles from the runway. There is no mandatory requirement to ensure that aircraft tag up before being transferred to the departure controller: the local facility directives state that controlers "should", not "shall," ensure that aircraft are tagged before transfer of communications.

Asked about "lessons learned," The LCN controller stated "don't assume." He should have ensured that BMJ46 had turned to the 180 degree heading. He said that the Bemidji aircraft usually “turn on a dime,” but in this case did not do so.

The LCN controller said that he was not surprised when he heard the LCS controller coordinating for BMJ46 to follow a 180 heading. Asked if he was concerned that, when he

made his traffic scan, he did not see BMJ46 anywhere despite having heard LCS clearing the aircraft for takeoff, the LCN controller stated that he was not concerned about the aircraft as traffic because the assigned heading he overheard should have prevented any problems. He had no perception of a possible conflict.

Tower Supervisor

The tower supervisor came into the tower cab about 0640. She retrieved her headset and plugged into the Cab Coordinator position to receive a position relief briefing from the traffic management coordinator, who had arrived earlier and was acting as the supervisor. The tower supervisor noticed that the LCS controller (who at that point was also handling the LCN position as well as LCS) was getting busy, so she directed one of the other controllers present to open the LCN position. After a few minutes, the Terminal Radar Approach Control (TRACON) supervisor called to report that there was a problem with BMJ46 and AWE1848. He recommended that she review the ATC recordings to evaluate the incident. The tower supervisor contacted the administrative supervisor downstairs, passed along the information about the possible incident, and asked her to review it. The tower supervisor had both the LCS and LCN controllers relieved from their positions so they could participate in the review, and they left the cab. She stated that when the TRACON supervisor called, she "... didn't really know what had happened." Neither controller discussed the incident with her before leaving the cab. The initial investigation of the incident was handled by the administrative supervisor in conjunction with the operations manager and the two controllers. She did not see the controllers again until a "roundtable" discussion was held later in the day regarding the incident. Present at the roundtable discussion were the two supervisors, the local union representative, the operations manager, and the two controllers. Part of the discussion revealed that both controllers had assumed that BMJ46 would turn sooner than it actually did.

Asked to describe how the operation should have gone if handled correctly, She stated that the LCS controller should have conducted a more thorough position relief briefing, and the LCS controller should have told the LCN controller that BMJ46 was going to turn inside AWE1848. The LCS controller should also have let the ground controller handle the taxi issue with the Air Transport flight, which would have been allowed the LCS controller to better monitor the flight track of BMJ46 and ensure that the aircraft turned to the assigned 180 heading. She also noted that there is a memory aid strip available at the LCS position to be used when headings such as that assigned to AWE1848 are approved for use by the LCN controller.

Asked about the three notices issued by the tower management following the incident, she stated that she believed they would be effective. They would increase awareness of possible traffic conflicts by the local controllers, and will reduce possible distractions of the local control positions.

Asked how IFR departures from runways 30L and 30R are normally handled, the tower supervisor stated that it is unusual for simultaneous departures to occur when the weather is IFR at the airport. Under those circumstances, aircraft landing on the two runways are

staggered by the approach control, which essentially prevents simultaneous departures. However, if simultaneous departures occur, it is normal for traffic departing runway 30R to be assigned runway heading, and departures from runway 30L to be assigned heading 260.

Administrative Supervisor

The administrative supervisor entered on duty with the FAA in July 1988, came to MSP ATCT in 2001, and became a supervisor in March 2008.

On the day of the incident, she was performing administrative duties outside the tower cab. She came to work at 0630, briefly visited the cab to check on staffing, and then began working in a downstairs office at 0635. About 20 minutes later, the tower supervisor called from the tower cab to ask her to review a possible incident involving AWE1848 and BMJ46. She reviewed the audio recordings of the incident, but was unable to determine what had occurred. She was returning to her office to review radar data, but as she passed the quality assurance office, members of the quality assurance staff advised her that she, "... needed to look at something." She asked if they were reviewing an incident involving AWE1848 and BMJ46, and they said that they were. She then began participating in the review, watching the replay twice along with the quality assurance staff and listening to the audio recordings. The air traffic manager was present along with several others. Shortly afterward, the LCS controller and LCN controllers began to help with the review, and continued to participate in the investigation of the incident for the remainder of the day.

The administrative supervisor did not have any further involvement with the investigation until the roundtable discussion held in the afternoon. She stated that during the discussion everyone gave their perspective about what had happened, and basically reiterated what was on the audio recording. Both controllers were very remorseful about the incident.

Asked about the three directives issued by the Air Traffic Manager following the incident, the administrative supervisor stated that she believed the revised procedures would be effective in reducing the likelihood of a repeat occurrence. The first thing she noticed when she reviewed the recording of the incident was that the LCS controller was handling an aircraft taxiing on the airport, which was a distraction and should have been handled by a ground controller. Asked about the practical effect of the directive requiring controllers to “point out” traffic, she stated that the LCS controller will have to tell the LCN controller what their plan is, and will also have to advise the LCN controller of the specific location of traffic.

Asked what she believed that caused the incident, the administrative supervisor stated that there were many things that happened at that moment. The LCS controller became distracted by the ground operation. The Bemidji flight did not follow their usual pattern of a short ground roll followed by an immediate turn. The simultaneous departures were unusual because the airport typically has staggered arrivals when IFR conditions exist, which prevents simultaneous departures That would have likely prevented this situation. She noted that the LCS controller

is typically a very vigilant controller.

CORRECTIVE ACTIONS

Following this incident, MSP ATCT management directed several procedural changes in tower operations. All controllers received a face-to-face briefing from the operations manager including an audio/video replay of the incident, a review of the proper application of positive separation using diverging headings and standard radar separation procedures, a "best practices" discussion of position relief procedures, required use of memory aids when delegating control of airspace or approving non-standard departure headings, and correct application of runway crossing clearances. In addition, ATCT management issued three local directives (MSP ATCT Notices N7110.337, N7110.338, and N7110.339) involving runway crossing responsibilities, position relief procedures, and procedures for delegation of airspace. Documentation of these actions has been placed in the docket.

On November 11, 2010, MSP ATCT experienced another loss of separation between aircraft departing runways 30L and 30R. South Local Control cleared Delta Airlines flight 1975 (DAL1975), an Airbus 320, to depart Runway 30L and fly heading 260. North Local Control coordinated with SLC to clear Mesaba Airlines flight 3230 (MES3230), an SF34 turboprop, to depart runway 30R and fly heading 260 to follow the Airbus. Mesaba 3230 was instructed to turn left heading 260 without ensuring adequate separation from Delta 1975. The closest proximity between the two aircraft was 1.84 miles instead of the required 3 miles, and the incident was classified as a category B operational error.

Contributory to both the original incident involving AWE1848/BMJ46 and the subsequent incident involving DAL1975/MES3230 was lack of awareness between the North and South local controllers. MSP ATCT management addressed the apparent coordination issues between NLC and SLC by issuing two additional procedural notices. MSP ATCT Notice 7110.345, Ground Control Departure Taxi Procedures, established procedures to facilitate independent Local Control operation during periods of parallel runway configuration. It specifically defined runway assignments by fix and/or direction of flight and identified the cross-over restrictions and approval requirement.

MSP ATCT Notice 7110.346, Local Control Delegation of Airspace, was issued to supersede MSP ATCT Notice 7110.339, Local Control Delegation of Airspace, dated September 27, 2010. Notice 7110.346 established a new chapter in the local Standard Operating Procedures manual that provided additional requirements for closely spaced departures. Both notices were briefed to tower personnel with an effective date of December 31, 2010.

In addition, FAA Headquarters quality assurance staff will provide 30, 60, and 90-day followup oversight to monitor implementation, compliance, and effectiveness of the revised procudures in ensuring traffic awareness between the North and South local controllers.

Information

Certificate:	**Age:**
Airplane Rating(s):	**Seat Occupied:**
Other Aircraft Rating(s):	**Restraint Used:**
Instrument Rating(s):	**Second Pilot Present:**
Instructor Rating(s):	**Toxicology Performed:**
Medical Certification:	**Last FAA Medical Exam:**
Occupational Pilot:	**Last Flight Review or Equivalent:**
Flight Time:	

Aircraft and Owner/Operator Information

Aircraft Make:	AIRBUS INDUSTRIE	**Registration:**	N122US
Model/Series:	A320-214	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	1298
Landing Gear Type:	Tricycle	**Seats:**	182
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:		**Engine Manufacturer:**	CFM INTL.
ELT:		**Engine Model/Series:**	CFM56 SERIES
Registered Owner:	WELLS FARGO BANK NORTHWEST NA TRUSTEE	**Rated Power:**	2200 Horsepower
Operator:	US AIRWAYS INC	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	USAA

Meteorological Information and Flight Plan

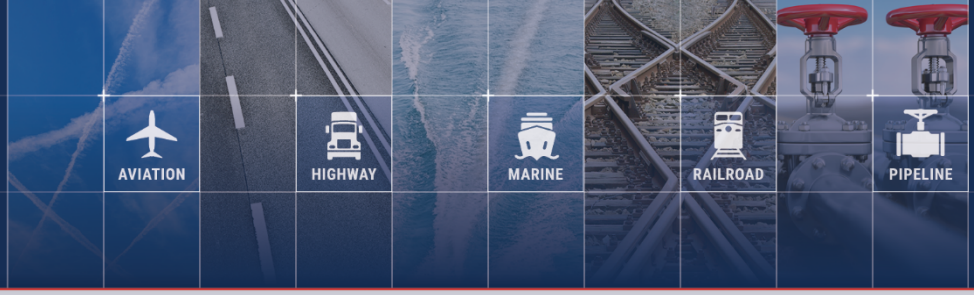
Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	msp,850 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	10°C / 8°C
Precipitation and Obscuration:			
Departure Point:	Minneapolis, MN	**Type of Flight Plan Filed:**	IFR
Destination:	Charlotte, NC (CLT)	**Type of Clearance:**	IFR
Departure Time:	11:49 UTC	**Type of Airspace:**	Air traffic control;Class B

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	90 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	95 None	**Latitude, Longitude:**	44.900077,-93.230346(est)

Administrative Information

Investigator In Charge (IIC):	Dunham, Scott
Additional Participating Persons:	
Original Publish Date:	May 19, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=77318



Aviation Investigation Final Report

Location:	Minneapolis, Minnesota	**Incident Number:**	OPS10IA574
Date & Time:	September 16, 2010, 06:49 Local	**Registration:**	N7212P
Aircraft:	Beech C-99	**Aircraft Damage:**	None
Defining Event:	Near midair/TCAS alert/loss of separation	**Injuries:**	95 None
Flight Conducted Under:	Part 135: Air taxi & commuter - Non-scheduled		

Analysis

An Airbus 320, operating as US Airways flight 1848, a scheduled 14 Code of Federal Regulations (CFR) Part 121 passenger flight, departed Minneapolis from runway 30R and was instructed by the Local North Controller to turn left to a heading of 260. A Beech 99, operating as Bemidji Aviation Services flight 46, a 14 CFR Part 135 cargo flight, was cleared for takeoff from runway 30L by the Local South Controller and was instructed to fly a heading of 180 after departure. The pilot had not yet initiated the turn when the two aircraft crossed paths about 1/2 mile northwest of the end of runway 30L, with an estimated separation of zero feet laterally and 50 feet vertically. The Local South Controller later stated that he became distracted in dealing with a ground operation and did not notice that the Beech was not turning as soon as he expected. An operational error occurred when the aircraft continued straight out from runway 30L and conflicted with the Airbus. No injuries or damage were reported and both aircraft continued to their destinations. The reported ceiling at the time was 900 feet and the visibility was 10 miles.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The Local North Controller's issuance of a left-turn heading to the Airbus without establishing the position and heading of the Beech. Contributing to the incident was the Local South Controller's distraction with a ground movement operation and lack of awareness of the Beech's heading and the impending conflict. Also contributing to the incident was the Beech's delayed turn to the assigned departure heading.

Findings

Personnel issues	Incorrect action sequence - ATC personnel
Personnel issues	Task scheduling - ATC personnel
Personnel issues	Identification/recognition - ATC personnel
Personnel issues	Expectation/assumption - ATC personnel
Organizational issues	Adequacy of policy/proc - ATC
Personnel issues	Delayed action - Pilot

Factual Information

History of Flight

Initial climb	Near midair/TCAS alert/loss of separation

On September 16, 2010, about 6:49 a.m. CDT, an air traffic control operational error resulted in a near-midair-collision between US Airways flight 1848 (AWE 1848), an Airbus 320, operating as a scheduled 14 Code of Federal Regulations (CFR) part 121 passenger flight en route to Philadelphia, Pennsylvania, carrying five crewmembers and 90 passengers, and Bemidji Aviation Services flight 46 (BMJ46), a Beech 99 cargo flight with only the pilot aboard,operating as a 14 CFR part 135 cargo flight en route to LaCrosse, Wisconsin. Weather conditions at the time were reported ceiling 900 feet and visibility 10 miles.

The local north controller (LCN) cleared AWE1848 into position and hold on runway 30R at 0647:50. At 0648:02, the LCN controller instructed the pilot to fly runway heading and cleared AWE1848 for takeoff. At 0649:26, the LCN controller instructed AWE1848 to turn left heading 260 and contact departure control. The pilot acknowledged.

At 0648:15, the local south controller (LCS) contacted the E position radar controller at Minneapolis departure control to obtain approval to assign Bemidji 46 (BMJ46) heading 180 degrees after takeoff. The radar controller approved the request. At 0648:31, the LCS controller instructed BMJ46 to turn left heading 180 after departure, and cleared the pilot for takeoff on runway 30L. The pilot acknowledged. The aircraft departed and continued straight out from runway 30L for about 2 miles. At 0650:26, the LCS controller asked, "Bemidji 46 are you in the turn?" The pilot replied, "46 say again the turn?" The LCS controller transmitted, "Bemidji 46 heading 180." The pilot of BMJ 46 replied, "46 left to 180." At 0650:54, the LCS controller transmitted, "Bemidji 46 remain this frequency maintain 4000 heading 180." At 0651:00, the pilot of Bemidji 46 responded, "4000 180 and I've got traffic." At 0651:41, Bemidji 46 transmitted, "Bemidji 46 going to departure." At 0651:44, the LCS controller transmitted, "Bemidji 46 now contact departure." At 0651:47, Bemidji 46 transmitted, "46 has that traffic up ahead there I wasn't notified about that." The LCS controller replied, "okay why didn't you start the turn once you were airborne?"The pilot replied, "all right okay I'm going to departure sorry about that."

At 0649:49, AWE1848 made a partial transmission to departure control, stating "1848 is...". At 0649:55, the pilot of AWE1848 transmitted, "1848 we're with you what's this guy doing off the left side?" The departure controller replied, "cactus 1848 Minneapolis departure radar contact it looks like he's possibly straight out." The pilot responded, "okay we just had a we just we heard the guy go by." The departure controller responded, "Cactus 1848 I'll tell the tower, radar contact climb and maintain 17,000." The pilot acknowledged the clearance, and at 0650:24 continued, "yet he gave us a left turn ah coming out of there." At 0650:28, the departure

controller stated, "yeah I think the 99 that was off your right was straight out off the same runway I'm not really sure but I'll ask him for you." The pilot responded, "yeah he was on the left side we got an RA on it and we responded we did hear the aircraft go by." At 0651:27, the pilot of AWE 1848 transmitted, "... advised me that that controller's been relieved of duty at the moment." The departure controller responded, "... we are working on it right now stand by."

On September 17, US Airways filed a traffic alerting and collision avoidance system (TCAS) report regarding this incident:

"...At 0649 we were cleared for takeoff to fly runway heading (299deg). At 400ft AGL [above ground level] the first officer (pilot flying) called for runway heading, at the same time KMSP tower told us to turn left to a heading of 260 and call departure at 124.7. (from the original of 125.75) We turned to heading 260 and at that time we received a TCAS R/A [resolution advisory]. We were in a normal takeoff climb rate when the TCAS commanded a much greater climb to clear the conflicting traffic. The first officer responded with a swift pull-up. During this time I observed a red target on the TCAS display to our immediate left, that showed a -100ft [100 feet below]. (We were in the clouds at about 500ft and could not see the aircraft.) Within just a few seconds I heard the whine of turboprops go under our aircraft from left to right. After this the TCAS gave a "clear of conflict" and we returned to normal flight. After the flight I consulted with KMSP ATC and learned that the tower controller on 30R turned us into the path of a Beechcraft 99 departing from 30L."

Review of recorded radar data showed that the paths of the two aircraft crossed at 0649:58. Plots of the radar data for the two aircraft have been placed in the docket.

While the initial operational error was being reviewed, a second error involving AWE1848 and BMJ46 was found. The second error occurred after the LCS controller instructed BMJ46 to turn left to heading 180 when the aircraft was about two miles northwest of the airport. This instruction again put the two aircraft into conflict, with separation of 500 feet and 1.23 miles. Minimum required separation was 1000 feet or 3 miles.

PERSONNEL STATEMENTS

When the incident occurred, there were two supervisors on duty at the tower. One was working in the tower cab and was responsible for the overall operation. The second supervisor was performing administrative duties in the office area downstairs from the tower cab, but was available to provide assistance if needed. There were two local controllers on duty. The Local Control North (LCN) controller was responsible for operations on runway 30R, and the Local Control South (LCS) controller was responsible for operations on runway 30L as well as runway 17/35, although that runway was not in use at the time. Immediately before the incident, the LCS controller was working the LCS, LCN, and LCW positions combined, and the LCN controller was working a ground control position. Their position assignments were changed by the tower supervisor to accommodate existing and expected traffic conditions.

Local Control South (LCS)

The LCS controller began working for the FAA in 1982 and came to MSP ATCT in September 2005.

The incident occurred on the last day of his work week, and he was working a 0600-1400 shift. He reported going to bed around 10 or 11 pm the previous evening and awakening at 4:45 am. This is a normal amount of sleep for him. He arrived at the tower at 0600, and stated that he "felt good" that morning.

Initially, the LCS controller was responsible for the LCN, LCS, and LCW positions, which is typical for very early morning operations. Runway 17/35 was inactive because of the low ceilings and the winds. The LCS controller stated that when he took over the position he noted that there were low ceilings in the area, and he obtained a pilot report off the departure end of runways 30L/R stating that the cloud bases were at 1900 feet above sea level. The visibility was good below the cloud deck, and it was a cool morning so aircraft were climbing well.

The morning Bemidji flights [contract cargo carriers] began taxiing out from the freight ramp around 0630 or 0635. At that time the ground control positions were combined at Ground Control South. About 0630, the controllers began to split the ground control positions. One of the controllers that had been working ground control was assigned to take over the LCN position about 0645. The LCS controller gave the new LCN controller a position relief briefing and gave him the LCN flight strips. The LCS controller then relinquished control of the LCN frequency. The LCS controller informed the new LCN controller that he had not had time to coordinate with the TRACON for a southbound departure for AWE1848. This would not have been the normal route for AWE1848 to follow. The change was necessary to avoid a conflict between the faster jet and preceding slow traffic that had just departed from runway 30R and was still north of the airport.

After the LCN position was split from LCS, the LCS controller remained responsible for runway 30L and runway 35. However, runway 35 was inactive. Air Transport 808, a heavy DC-8, landed on runway 30L and asked to roll to the end. A Learjet landed shortly afterward. During this time, the LCS controller coordinated a southbound heading for BMJ46 with the departure radar controller. The radar controller approved the heading, so the LCS controller instructed BMJ46 to fly heading 180 degrees after departure and cleared the aircraft for takeoff.

While BMJ46 was departing, Air Transport 808 began asking questions about his taxi route. The LCS controller stated that he became distracted in dealing with Air Transport 808 and was not watching BMJ46. He did not notice that BMJ46 was not turning as soon as he expected. The aircraft continued straight out from runway 30L and conflicted with AWE1848.

After dealing with Air Transport 808, the LCS controller stated that he looked at the radar display and saw the two targets for AWE1848 and BMJ46 merging just as the conflict alert alarm went off. He kept working traffic at LCS until relieved from the position about five

minutes later. After he left the position, he went to the break room. Shortly afterward he was called to the quality assurance office where he met with the administrative supervisor, the air traffic manager, and several other members of the quality assurance staff. He was in the quality assurance office for several hours. He and the LCN controller did not complete controller statements until about 1230, or possibly later. The group reviewed a replay and listen to the audio recordings as part of the initial investigation. That afternoon, there was a roundtable discussion that reviewed what had taken place and attempted to put the events in chronological order.

Asked about his initial plan for separating AWE1848 and BMJ46, the LCS controller stated that the US Airways flight was going to be assigned a 260° heading off runway 30R, and BMJ46 would be turning southbound after departure. BMJ46 was departing from the full length of a 10,000 foot runway. The LCS controller expected that BMJ46 would become airborne between taxiway W5 and W7, begin turning southbound well before the end of runway 30L, and cross midfield over runway 35, possibly completing the southbound turn before crossing runway 22. The LCS controller stated that he did not specifically coordinate anything about BMJ46 with LCN because he never believed that the aircraft would be a concern for LCN. BMJ46 was not given any restrictions. The aircraft was issued a departure heading and cleared for takeoff.

Asked what separation was being applied between the two aircraft, and by whom, the LCS controller stated that he approved the westbound turn for AWE1848, the incident occurred in his airspace, and therefore separation was his responsibility. He became distracted in dealing with ground movements, and was not watching BMJ46. He was anticipating that the aircraft would be separated because they would become established on diverging courses. The LCS controller stated that he saw the US Airways aircraft climbing into the clouds. The normal procedure would be for the LCN controller to leave the 30R departure on runway heading until the conflict was resolved, typically by observing the other traffic turning as directed before turning the 30R departure toward the west.

Asked about automatic acquisition of data tags on radar targets, and whether the process seemed abnormally slow, the LCS controller stated that aircraft are typically tagged within 1/2 to 1 mile of the end of the runway. Asked if the Bemidji departure flights left earlier than usual, possibly causing an unexpected spike in workload, he stated, "not really - the LCN position is normally split off by 0630."

The LCS controller did file an Air Traffic Safety Action Program (ATSAP) report on the incident. Asked if he could provide any "lessons learned" after this event, he said that it was wrong to assume that the Bemidji aircraft would do what they "always" do. His responsibility is to separate aircraft. In this case, with AWE1848 turning across his runway, he needed to go 3 miles behind the aircraft.

There is a memory jogger strip available at the position for use when headings have been approved such as that followed by AWE1848, but the LCS controller stated that it would not have been helpful because he was well aware of the 30R traffic. He had authorized the turn for

AWE1848, and there was coordination between the LCS and LCN controllers.

The LCS controller had earlier stated that he expected BMJ46 to be in the air by taxiway W5 to taxiway W7, which are approximately 4500 to 5000 feet down the runway from the threshold. From his prior experience, Bemidji aircraft usually begin their turn "a few hundred feet up." The plan in this case was to establish course divergence between BMJ46 and AWE1848. Asked how he would have handled the same situation if the weather conditions were 500 feet overcast and 1 mile visibility, he said that he probably would have waited until the Learjet aircraft landed on runway 30L before releasing BMJ46. In this situation, he believed that BMJ46 would be airborne and turning well before any possible conflict with AWE1848. When he issued the takeoff clearance, he had no concerns about separation between the two aircraft. If the weather conditions had been substantially worse, the LCS controller would have waited until AWE1848 tagged up on the radar display, and then departed BMJ46. Runway 30L is two miles long, so by waiting he would have readily established radar separation. He noted that aircraft tag up more quickly when they depart runways 12L/R as opposed to runways 30L/R.

The LCS controller stated that AWE1848 may have been somewhat heavier than normal because the aircraft did not initially climb as well as Airbus aircraft usually do. BMJ46 climbed very well compared to his past experience. The LCS controller last saw AWE1848 as it entered the clouds, making a left turn just off the departure end of runway 30R.

LCN Controller

The LCN controller entered on duty with the FAA in 1982 and came to MSP in May 2001.

He reported for duty at 0600, and by 0605 he was working the Ground Control South position. About 0630, the supervisor directed him to split the ground control positions and then take over the LCN position. As he was already standing next to the LCS controller at ground control, the LCN controller received a face-to-face position relief briefing, took the flight strips for aircraft that would be controlled by the LCN position from LCS and then moved to the LCN position to begin working.

When AWE1848 was ready for departure, there were other Bemidji aircraft north of the airport that had also departed from runway 30R. The LCN controller decided that AWE1848 should turn left off the runway and depart toward the south to avoid the slower Bemidji traffic to the north. He coordinated that route with the departure radar controller, instructed AWE1848 to fly runway heading, and cleared the flight for takeoff. After AWE1848 departed, the LCN controller said that he scanned for traffic, did not see anything visually or on the radar that would be a conflict, and instructed AWE1848 to turn left heading 260° and contact departure. He did not think anything was wrong when he heard the LCS controller clear BMJ46 for takeoff and to fly heading 180. Shortly afterward he noticed that there was another radar target near AWE1848, and asked the ground controller standing next to him if there was a false target or if the

aircraft was transmitting two transponder codes. He was unsure who the other aircraft was, if there was another aircraft. Shortly afterward, a data tag appeared indicating that the second target was BMJ46. He then realized that BMJ46 had stayed on runway heading rather than turning to heading 180. At no time before this had he thought that BMJ46 would be traffic for AWE1848. He stated that 99.9% of the time, Bemidji aircraft given a similar clearance turn before reaching runway 22, and never cross the end of runway 30L. The LCN controller stated that he had erred by not ensuring that BMJ46 was airborne and turning as expected.

After the incident, the supervisor had him relieved from position. He overheard her speaking to someone about AWE1848 and BMJ46, so he asked her if she needed more information. She said that she did not, and sent him downstairs.

After leaving the cab, the LCN controller participated in the quality assurance investigation by reviewing audio recordings and watching the replay. He saw what had gone wrong on the replay, noting that BMJ46 did not turn as soon as expected after departure.

Asked how he would handle the situation differently or better now, he stated that when he trains other controllers, he tells them they should always scan the other runway for traffic in situations such as this. In the situation he did not scan runway 30L thoroughly enough and missed the traffic. When working LCN, it is important to know where traffic being handled by the LCS controller is as well, and that did not occur.

The typical practice is to use visual separation when handling parallel departures in visual conditions. In instrument conditions where visual separation cannot be used, controllers are required to establish and maintain at least three miles radar separation.

The LCN controller was 3 to 4 feet from the tower radar display when he scanned it for potential traffic conflicts, and had no difficulty in seeing the display. He recalled that the time of the incident he was using an 11 mile range, and stated that he typically sets the altitude filter parameter to 17,500 feet. There is no local facility requirement directing a particular setting. It is common for MSP tower controllers to watch for aircraft on downwind being handled by the TRACON.

The LCN controller stated that radar targets typically auto acquire 1 to 1 1/2 miles from the runway. There is no mandatory requirement to ensure that aircraft tag up before being transferred to the departure controller: the local facility directives state that controlers "should", not "shall," ensure that aircraft are tagged before transfer of communications.

Asked about "lessons learned," The LCN controller stated "don't assume." He should have ensured that BMJ46 had turned to the 180 degree heading. He said that the Bemidji aircraft usually “turn on a dime,” but in this case did not do so.

The LCN controller said that he was not surprised when he heard the LCS controller coordinating for BMJ46 to follow a 180 heading. Asked if he was concerned that, when he

made his traffic scan, he did not see BMJ46 anywhere despite having heard LCS clearing the aircraft for takeoff, the LCN controller stated that he was not concerned about the aircraft as traffic because the assigned heading he overheard should have prevented any problems. He had no perception of a possible conflict.

Tower Supervisor

The tower supervisor came into the tower cab about 0640. She retrieved her headset and plugged into the Cab Coordinator position to receive a position relief briefing from the traffic management coordinator, who had arrived earlier and was acting as the supervisor. The tower supervisor noticed that the LCS controller (who at that point was also handling the LCN position as well as LCS) was getting busy, so she directed one of the other controllers present to open the LCN position. After a few minutes, the Terminal Radar Approach Control (TRACON) supervisor called to report that there was a problem with BMJ46 and AWE1848. He recommended that she review the ATC recordings to evaluate the incident. The tower supervisor contacted the administrative supervisor downstairs, passed along the information about the possible incident, and asked her to review it. The tower supervisor had both the LCS and LCN controllers relieved from their positions so they could participate in the review, and they left the cab. She stated that when the TRACON supervisor called, she "... didn't really know what had happened." Neither controller discussed the incident with her before leaving the cab. The initial investigation of the incident was handled by the administrative supervisor in conjunction with the operations manager and the two controllers. She did not see the controllers again until a "roundtable" discussion was held later in the day regarding the incident. Present at the roundtable discussion were the two supervisors, the local union representative, the operations manager, and the two controllers. Part of the discussion revealed that both controllers had assumed that BMJ46 would turn sooner than it actually did.

Asked to describe how the operation should have gone if handled correctly, She stated that the LCS controller should have conducted a more thorough position relief briefing, and the LCS controller should have told the LCN controller that BMJ46 was going to turn inside AWE1848. The LCS controller should also have let the ground controller handle the taxi issue with the Air Transport flight, which would have been allowed the LCS controller to better monitor the flight track of BMJ46 and ensure that the aircraft turned to the assigned 180 heading. She also noted that there is a memory aid strip available at the LCS position to be used when headings such as that assigned to AWE1848 are approved for use by the LCN controller.

Asked about the three notices issued by the tower management following the incident, she stated that she believed they would be effective. They would increase awareness of possible traffic conflicts by the local controllers, and will reduce possible distractions of the local control positions.

Asked how IFR departures from runways 30L and 30R are normally handled, the tower supervisor stated that it is unusual for simultaneous departures to occur when the weather is IFR at the airport. Under those circumstances, aircraft landing on the two runways are

staggered by the approach control, which essentially prevents simultaneous departures. However, if simultaneous departures occur, it is normal for traffic departing runway 30R to be assigned runway heading, and departures from runway 30L to be assigned heading 260.

Administrative Supervisor

The administrative supervisor entered on duty with the FAA in July 1988, came to MSP ATCT in 2001, and became a supervisor in March 2008.

On the day of the incident, she was performing administrative duties outside the tower cab. She came to work at 0630, briefly visited the cab to check on staffing, and then began working in a downstairs office at 0635. About 20 minutes later, the tower supervisor called from the tower cab to ask her to review a possible incident involving AWE1848 and BMJ46. She reviewed the audio recordings of the incident, but was unable to determine what had occurred. She was returning to her office to review radar data, but as she passed the quality assurance office, members of the quality assurance staff advised her that she, "... needed to look at something." She asked if they were reviewing an incident involving AWE1848 and BMJ46, and they said that they were. She then began participating in the review, watching the replay twice along with the quality assurance staff and listening to the audio recordings. The air traffic manager was present along with several others. Shortly afterward, the LCS controller and LCN controllers began to help with the review, and continued to participate in the investigation of the incident for the remainder of the day.

The administrative supervisor did not have any further involvement with the investigation until the roundtable discussion held in the afternoon. She stated that during the discussion everyone gave their perspective about what had happened, and basically reiterated what was on the audio recording. Both controllers were very remorseful about the incident.

Asked about the three directives issued by the Air Traffic Manager following the incident, the administrative supervisor stated that she believed the revised procedures would be effective in reducing the likelihood of a repeat occurrence. The first thing she noticed when she reviewed the recording of the incident was that the LCS controller was handling an aircraft taxiing on the airport, which was a distraction and should have been handled by a ground controller. Asked about the practical effect of the directive requiring controllers to “point out” traffic, she stated that the LCS controller will have to tell the LCN controller what their plan is, and will also have to advise the LCN controller of the specific location of traffic.

Asked what she believed that caused the incident, the administrative supervisor stated that there were many things that happened at that moment. The LCS controller became distracted by the ground operation. The Bemidji flight did not follow their usual pattern of a short ground roll followed by an immediate turn. The simultaneous departures were unusual because the airport typically has staggered arrivals when IFR conditions exist, which prevents simultaneous departures That would have likely prevented this situation. She noted that the LCS controller

is typically a very vigilant controller.

CORRECTIVE ACTIONS

Following this incident, MSP ATCT management directed several procedural changes in tower operations. All controllers received a face-to-face briefing from the operations manager including an audio/video replay of the incident, a review of the proper application of positive separation using diverging headings and standard radar separation procedures, a "best practices" discussion of position relief procedures, required use of memory aids when delegating control of airspace or approving non-standard departure headings, and correct application of runway crossing clearances. In addition, ATCT management issued three local directives (MSP ATCT Notices N7110.337, N7110.338, and N7110.339) involving runway crossing responsibilities, position relief procedures, and procedures for delegation of airspace. Documentation of these actions has been placed in the docket.

On November 11, 2010, MSP ATCT experienced another loss of separation between aircraft departing runways 30L and 30R. South Local Control cleared Delta Airlines flight 1975 (DAL1975), an Airbus 320, to depart Runway 30L and fly heading 260. North Local Control coordinated with SLC to clear Mesaba Airlines flight 3230 (MES3230), an SF34 turboprop, to depart runway 30R and fly heading 260 to follow the Airbus. Mesaba 3230 was instructed to turn left heading 260 without ensuring adequate separation from Delta 1975. The closest proximity between the two aircraft was 1.84 miles instead of the required 3 miles, and the incident was classified as a category B operational error.

Contributory to both the original incident involving AWE1848/BMJ46 and the subsequent incident involving DAL1975/MES3230 was lack of awareness between the North and South local controllers. MSP ATCT management addressed the apparent coordination issues between NLC and SLC by issuing two additional procedural notices. MSP ATCT Notice 7110.345, Ground Control Departure Taxi Procedures, established procedures to facilitate independent Local Control operation during periods of parallel runway configuration. It specifically defined runway assignments by fix and/or direction of flight and identified the cross-over restrictions and approval requirement.

MSP ATCT Notice 7110.346, Local Control Delegation of Airspace, was issued to supersede MSP ATCT Notice 7110.339, Local Control Delegation of Airspace, dated September 27, 2010. Notice 7110.346 established a new chapter in the local Standard Operating Procedures manual that provided additional requirements for closely spaced departures. Both notices were briefed to tower personnel with an effective date of December 31, 2010.

In addition, FAA Headquarters quality assurance staff will provide 30, 60, and 90-day followup oversight to monitor implementation, compliance, and effectiveness of the revised procudures in ensuring traffic awareness between the North and South local controllers.

Information

Certificate:	**Age:**
Airplane Rating(s):	**Seat Occupied:**
Other Aircraft Rating(s):	**Restraint Used:**
Instrument Rating(s):	**Second Pilot Present:**
Instructor Rating(s):	**Toxicology Performed:**
Medical Certification:	**Last FAA Medical Exam:**
Occupational Pilot:	**Last Flight Review or Equivalent:**
Flight Time:	

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N7212P
Model/Series:	C-99	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	U-220
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2 Turbo prop
Airframe Total Time:		**Engine Manufacturer:**	P&W CANADA
ELT:		**Engine Model/Series:**	PT6A-60A
Registered Owner:	BEMIDJI AVIATION SERVICES INC	**Rated Power:**	1050 Horsepower
Operator:	BEMIDJI AVIATION SERVICES INC	**Operating Certificate(s) Held:**	On-demand air taxi (135)
Operator Does Business As:		**Operator Designator Code:**	BEMA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	msp,850 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 900 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.98 inches Hg	**Temperature/Dew Point:**	10°C / 8°C
Precipitation and Obscuration:			
Departure Point:	Minneapolis, MN	**Type of Flight Plan Filed:**	Unknown
Destination:		**Type of Clearance:**	IFR
Departure Time:	11:49 UTC	**Type of Airspace:**	Air traffic control;Class B

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	90 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	95 None	**Latitude, Longitude:**	44.900077,-93.230346(est)

Administrative Information

Investigator In Charge (IIC):	Dunham, Scott
Additional Participating Persons:	
Original Publish Date:	May 19, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=77318