



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Aviation Investigation Final Report

<b>Location:</b>	Cleveland, Ohio	<b>Incident Number:</b>	OPS09IA007
<b>Date &amp; Time:</b>	June 3, 2009, 15:15 Local	<b>Registration:</b>	N299WN
<b>Aircraft:</b>	Boeing 737-7H4	<b>Aircraft Damage:</b>	None
<b>Defining Event:</b>	Runway incursion veh/AC/person	<b>Injuries:</b>	116 None
<b>Flight Conducted Under:</b>	Part 121: Air carrier - Scheduled		

## Analysis

On Wednesday, June 3, 2009 at 3:15 p.m., a runway incursion occurred at CLE when SWA1080 was directed to taxi into position and hold on runway 6L prior to the departure of BTA2491 that had been previously cleared for takeoff from the same runway. BTA2491 queried the ATCT with "Hey tower, I thought we were cleared to go". The ATCS immediately directed SWA1080 to hold short of runway 6R and corrected the location to runway 6L followed by directions to BTA2491 to hold present position. According to the airport movement and surveillance system (AMASS) playback, both aircraft had entered runway 6L, BTA2491 at the approach end and SWA1080 at the intersection of taxiway T and runway 6L. Taxiway T intersected runway 6L 1,475 feet from the approach end of runway 6L.

CLE was in a north flow configuration, departing runway 6L, arriving runway 6R.

Reported weather at CLE at 2:51 p.m. EDT/1851 UTC was: wind 350 degrees at 6 knots, visibility 6 statute miles in light rain showers. Few clouds at 1,200 feet, scattered clouds at 1,800 feet, overcast at 8500 feet. The temperature was 14 degrees Celsius, dew point 12 degrees Celsius. The altimeter was 30.11 inches of mercury.

Air traffic control tower (ATCT) staffing included 1 front line manager (FLM) on position with a developmental, local control (LC) 1 and 2 combined with a developmental, Ground Control (GC) 1 and 2 combined, and flight data (FD)/clearance delivery (CD) combined on position.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The ground controller did not issue taxi instructions in accordance with FAA Order 7110.65, paragraph 3-7-2. The local controller did not scan the runways prior to issuing a taxi into position and hold instruction to SWA1080 as required by FAA Order 7110.65 paragraph 3-1-12. The local controller did not cancel takeoff clearance for BTA2941 as required by FAA Order 7110.65, paragraph 3-9-10.

### Findings

Personnel issues	Decision making/judgment - ATC personnel
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## Factual Information

### History of Flight

Initial climb	Runway incursion veh/AC/person
Taxi-to runway	Runway incursion veh/AC/person (Defining event)

On June 3, 2009 at approximately 3:15 pm, Southwest Airlines (SWA) flight 1080, a Boeing 737, aircraft number N299WN, and Continental Express (BTA) flight 2491, call sign Jetlink 2491, an Embraer 145, aircraft number N16963, were involved in a runway incursion at Cleveland/Hopkins International Airport (CLE), Cleveland, Ohio. The incident occurred during daytime visual meteorological conditions.

SWA1080 was on a scheduled part 121 flight from CLE to Chicago Midway International Airport (MDW) Chicago, Illinois. SWA1080 had a crew of 5 which included the pilot, first officer, 3 flight attendants, and 111 passengers on board.

BTA2491 was on a scheduled part 121 flight from CLE to Chicago O'Hare International Airport (ORD) Chicago, Illinois. BTA2491 had a crew of 3 which included the pilot, first officer, one flight attendant and 44 passengers on board.

At the time of the incident, there was a developmental controller on the local control position being monitored by a certified controller.

At approximately 3:00 pm, SWA1080 requested taxi instructions from the CLE air terminal. The CLE tower ground controller issued progressive taxi instructions to SWA1080 to taxiway N at runway 6R and did not advise the crew they would be departing from runway 6L. After reaching taxiway N, the ground controller directed SWA1080 to monitor the tower local control frequency. This was the standard taxi procedure when departing runway 6L at CLE with 6R also an active runway. The local controller was responsible for all aircraft and vehicle movement on runways 6R and 6L and all taxiways in between the runways. The traditional taxi route for aircraft departing runway 6L was the ground controller directed aircraft to taxi via taxiway L, to taxiway N and then the local controller directed across runway 6R on taxiway N to a left turn on taxiway G to the approach end of runway 6L.

The developmental local controller directed BTA2941 to taxi up to and hold short of runway 6R at taxiway N. The local controller directed SWA1080, waiting at taxiway N behind BTA2941 at runway 6R, to taxi to taxiway T at runway 6R. The controller then instructed BTA2941 to cross runway 6R at taxiway N. After a B773 crossed the landing threshold for runway 6R, the developmental controller directed SWA1080 to cross runway 6R at taxiway T.

Thirty seconds after directing BTA2941 to cross runway 6R at taxiway N, the developmental controller transmitted "Jetlink 2941 wheels up in 1 minute sir. Turn left heading 360 runway

six left cleared for takeoff.” BTA2941 acknowledged the clearance. One minute and 15 seconds after clearing BTA2941 for takeoff, the developmental controller directed SWA1080, who was still on taxiway T, to taxi into position and hold on runway 6L. SWA1080 taxied onto runway 6L at taxiway T when BTA2941, on runway 6L at the approach end, queried the developmental controller, “hey tower, 2941, I thought we were cleared to go”. The developmental controller stated he was writing down the call sign of an inbound flight and did not see SWA1080 go into position on the runway. The local controller responded with “SWA1080 hold short of [runway] six right, I’m sorry hold short of [runway] six left”. SWA1080 responded immediately with “we were told to position and hold”. Local controller directed BTA2941 to hold his position. SWA1080 asked the tower “what do you want us to do, SWA1080”. The local controller directed SWA1080 to make a 180 degree turn and turn right on taxiway G. The local controller then re-cleared BTA2941 for takeoff. SWA1080 called the tower to clarify that they had been directed to position and hold. The local controller responded affirmatively but added “not from the intersection”. SWA1080 was sequenced with two other aircraft waiting to depart and departed from the approach end of runway 6L without further incident.

## 2. ATC Facility Information

CLE was a level 10 ATC tower and radar facility responsible for ATC services for aircraft arriving and departing CLE and for aircraft overflying and transiting through CLE airspace that operated 24 hours a day, seven days a week. CLE conducted 245,000 tower operations in 2007, 240,000 tower operations in 2008 and 67,000 tower operations in 2009 as of June 1, 2009.

CLE had three runways: 6L/24R, 6R/24L and 10/28. Runway 6L/24R was 9000 feet long by 150 feet wide. Runway 6R/24L was 9955 feet long by 150 feet wide with a displaced landing threshold on runway 6L 2000 feet from the approach end. Runway 10/28 was 6017 feet long and 150 feet wide. Runway 6L/24R and 6R/24L were separated by 1241 feet between centerlines.

## 3. ATC Equipment

CLE was equipped with airport movement and surveillance system (AMASS). The AMASS was designed to provide a visual indication when a runway is unusable due to other aircraft arriving or departing the runway. AMASS will also provide a visual and aural alarm when the system logic senses a potential collision on a runway. To prevent nuisance alerts, the AMASS will alarm if conflict aircraft and/or vehicles are moving a speed of approximately 44 miles per hour or greater. In both runway incursions discussed in this report, the AMASS did not alarm. CLE ATCT was equipped with three AMASS displays, one each suspended above the LC1 and LC2 positions and a tabletop display at the GC position.

## Information

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

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Boeing	<b>Registration:</b>	N299WN
<b>Model/Series:</b>	737-7H4	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	36614
<b>Landing Gear Type:</b>	Retractable -	<b>Seats:</b>	140
<b>Date/Type of Last Inspection:</b>		<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo fan
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	
<b>Registered Owner:</b>	SOUTHWEST AIRLINES CO	<b>Rated Power:</b>	
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	SWAA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCLE	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	14:51 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Few / 1200 ft AGL	<b>Visibility</b>	6 miles
<b>Lowest Ceiling:</b>	Overcast / 8500 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	350°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.11 inches Hg	<b>Temperature/Dew Point:</b>	14°C / 12°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Cleveland, OH (CLE )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Chicago, IL (MDW )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class B

## Airport Information

<b>Airport:</b>	Cleveland Hopkins Intl Airport CLE	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	791 ft msl	<b>Runway Surface Condition:</b>	Dry;Wet
<b>Runway Used:</b>	06L	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	9000 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	5 None	<b>Aircraft Damage:</b>	None
<b>Passenger Injuries:</b>	111 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	
<b>Total Injuries:</b>	116 None	<b>Latitude, Longitude:</b>	41.489887,-81.66983(est)

## Administrative Information

**Investigator In Charge (IIC):** Bartlett, Daniel

**Additional Participating Persons:**

**Original Publish Date:** May 6, 2010

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=74026>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).



# Aviation Investigation Final Report

<b>Location:</b>	Cleveland, Ohio	<b>Incident Number:</b>	OPS09IA007
<b>Date &amp; Time:</b>	June 3, 2009, 15:15 Local	<b>Registration:</b>	N16963
<b>Aircraft:</b>	Embraer EMB-145LR	<b>Aircraft Damage:</b>	None
<b>Defining Event:</b>	Runway incursion veh/AC/person	<b>Injuries:</b>	47 None
<b>Flight Conducted Under:</b>	Part 135: Air taxi & commuter - Scheduled		

## Analysis

On Wednesday, June 3, 2009 at 3:15 p.m., a runway incursion occurred at CLE when SWA1080 was directed to taxi into position and hold on runway 6L prior to the departure of BTA2491 that had been previously cleared for takeoff from the same runway. BTA2491 queried the ATCT with "Hey tower, I thought we were cleared to go". The ATCS immediately directed SWA1080 to hold short of runway 6R and corrected the location to runway 6L followed by directions to BTA2491 to hold present position. According to the airport movement and surveillance system (AMASS) playback, both aircraft had entered runway 6L, BTA2491 at the approach end and SWA1080 at the intersection of taxiway T and runway 6L. Taxiway T intersected runway 6L 1,475 feet from the approach end of runway 6L.

CLE was in a north flow configuration, departing runway 6L, arriving runway 6R.

Reported weather at CLE at 2:51 p.m. EDT/1851 UTC was: wind 350 degrees at 6 knots, visibility 6 statute miles in light rain showers. Few clouds at 1,200 feet, scattered clouds at 1,800 feet, overcast at 8500 feet. The temperature was 14 degrees Celsius, dew point 12 degrees Celsius. The altimeter was 30.11 inches of mercury.

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## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The ground controller did not issue taxi instructions in accordance with FAA Order 7110.65, paragraph 3-7-2. The local controller did not scan the runways prior to issuing a taxi into position and hold instruction to SWA1080 as required by FAA Order 7110.65 paragraph 3-1-12. The local controller did not cancel takeoff clearance for BTA2941 as required by FAA Order 7110.65, paragraph 3-9-10.

### Findings

Personnel issues	Decision making/judgment - ATC personnel
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# Factual Information

## History of Flight

Taxi-into takeoff position	Runway incursion veh/AC/person
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On June 3, 2009 at approximately 3:15 pm, Southwest Airlines (SWA) flight 1080, a Boeing 737, aircraft number N299WN, and Continental Express (BTA) flight 2491, call sign Jetlink 2491, an Embraer 145, aircraft number N16963, were involved in a runway incursion at Cleveland/Hopkins International Airport (CLE), Cleveland, Ohio. The incident occurred during daytime visual meteorological conditions.

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At approximately 3:00 pm, SWA1080 requested taxi instructions from the CLE air terminal. The CLE tower ground controller issued progressive taxi instructions to SWA1080 to taxiway N at runway 6R and did not advise the crew they would be departing from runway 6L. After reaching taxiway N, the ground controller directed SWA1080 to monitor the tower local control frequency. This was the standard taxi procedure when departing runway 6L at CLE with 6R also an active runway. The local controller was responsible for all aircraft and vehicle movement on runways 6R and 6L and all taxiways in between the runways. The traditional taxi route for aircraft departing runway 6L was the ground controller directed aircraft to taxi via taxiway L, to taxiway N and then the local controller directed across runway 6R on taxiway N to a left turn on taxiway G to the approach end of runway 6L.

The developmental local controller directed BTA2941 to taxi up to and hold short of runway 6R at taxiway N. The local controller directed SWA1080, waiting at taxiway N behind BTA2941 at runway 6R, to taxi to taxiway T at runway 6R. The controller then instructed BTA2941 to cross runway 6R at taxiway N. After a B773 crossed the landing threshold for runway 6R, the developmental controller directed SWA1080 to cross runway 6R at taxiway T.

Thirty seconds after directing BTA2941 to cross runway 6R at taxiway N, the developmental

controller transmitted "Jetlink 2941 wheels up in 1 minute sir. Turn left heading 360 runway six left cleared for takeoff." BTA2941 acknowledged the clearance. One minute and 15 seconds after clearing BTA2941 for takeoff, the developmental controller directed SWA1080, who was still on taxiway T, to taxi into position and hold on runway 6L. SWA1080 taxied onto runway 6L at taxiway T when BTA2941, on runway 6L at the approach end, queried the developmental controller, "hey tower, 2941, I thought we were cleared to go". The developmental controller stated he was writing down the call sign of an inbound flight and did not see SWA1080 go into position on the runway. The local controller responded with "SWA1080 hold short of [runway] six right, I'm sorry hold short of [runway] six left". SWA1080 responded immediately with "we were told to position and hold". Local controller directed BTA2941 to hold his position. SWA1080 asked the tower "what do you want us to do, SWA1080". The local controller directed SWA1080 to make a 180 degree turn and turn right on taxiway G. The local controller then re-cleared BTA2941 for takeoff. SWA1080 called the tower to clarify that they had been directed to position and hold. The local controller responded affirmatively but added "not from the intersection". SWA1080 was sequenced with two other aircraft waiting to depart and departed from the approach end of runway 6L without further incident.

## 2. ATC Facility Information

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## 3. ATC Equipment

CLE was equipped with airport movement and surveillance system (AMASS). The AMASS was designed to provide a visual indication when a runway is unusable due to other aircraft arriving or departing the runway. AMASS will also provide a visual and aural alarm when the system logic senses a potential collision on a runway. To prevent nuisance alerts, the AMASS will alarm if conflict aircraft and/or vehicles are moving a speed of approximately 44 miles per hour or greater. In both runway incursions discussed in this report, the AMASS did not alarm. CLE ATCT was equipped with three AMASS displays, one each suspended above the LC1 and LC2 positions and a tabletop display at the GC position.

## Information

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

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Embraer	<b>Registration:</b>	N16963
<b>Model/Series:</b>	EMB-145LR	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>		<b>Serial Number:</b>	145116
<b>Landing Gear Type:</b>	Retractable -	<b>Seats:</b>	55
<b>Date/Type of Last Inspection:</b>		<b>Certified Max Gross Wt.:</b>	
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo fan
<b>Airframe Total Time:</b>		<b>Engine Manufacturer:</b>	ALLISON
<b>ELT:</b>		<b>Engine Model/Series:</b>	AE3007C SER
<b>Registered Owner:</b>	WELLS FARGO BANK NORTHWEST NA TRUSTEE	<b>Rated Power:</b>	6442 Lbs thrust
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	Flag carrier (121)
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	C2XA

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	KCLE	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	14:51 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Few / 1200 ft AGL	<b>Visibility</b>	6 miles
<b>Lowest Ceiling:</b>	Overcast / 8500 ft AGL	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	6 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	350°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.11 inches Hg	<b>Temperature/Dew Point:</b>	14°C / 12°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Cleveland, OH (CLE )	<b>Type of Flight Plan Filed:</b>	IFR
<b>Destination:</b>	Chicago, IL (ORD )	<b>Type of Clearance:</b>	IFR
<b>Departure Time:</b>		<b>Type of Airspace:</b>	Class B

## Airport Information

<b>Airport:</b>	Cleveland Hopkins Intl Airport CLE	<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>	791 ft msl	<b>Runway Surface Condition:</b>	Dry;Wet
<b>Runway Used:</b>	06L	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	9000 ft / 150 ft	<b>VFR Approach/Landing:</b>	None

## Wreckage and Impact Information

<b>Crew Injuries:</b>	3 None	<b>Aircraft Damage:</b>	None
<b>Passenger Injuries:</b>	44 None	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	47 None	<b>Latitude, Longitude:</b>	41.489887,-81.66983(est)

## Administrative Information

**Investigator In Charge (IIC):** Bartlett, Daniel

**Additional Participating Persons:**

**Original Publish Date:** May 6, 2010

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=74026>

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