Aviation Investigation Final Report

Location:	Boston, Massachusetts	**Incident Number:**	NYC05IA095
Date & Time:	June 9, 2005, 19:40 Local	**Registration:**	EI-ORD
Aircraft:	Airbus Industrie A330-301	**Aircraft Damage:**	None
Defining Event:		**Injuries:**	340 None
Flight Conducted Under:	Part 129: Foreign		

Analysis

The airport was conducting operations on intersecting runways. The local east controller (LCE) was responsible for aircraft operating on runways 4R and 9, and the local west controller (LCW) was responsible for aircraft operating on runways 15R and 4L. Runway 15R intersected three active runways: 4L, 4R, and 9. The LCW was responsible for an Airbus A330, and the LCE was responsible for a Boeing 737. Both controllers were utilizing different frequencies. At 1927:51, the Airbus was instructed to taxi into position and hold on runway 15R. At 1938:24, the LCE contacted the LCW, and reported that he "observed and released" the Airbus. At 1939:10, the LCW cleared the Airbus for takeoff. Five seconds later, the LCE cleared the Boeing for takeoff from runway 9, which resulted in a runway incursion. Boston Tower Order 7110.11J, "Standard Operating Procedures" required the LCW to obtain a release from LCE in order to depart airplanes from runway 15R. Once the release was issued, LCE was required to stop operations on runways 4R and 9 until the airplane departed. Federal Aviation Administration Order 7110.65, Air Traffic Control, paragraph 3-9-8, Intersecting Runway Separation, stated in part: "Separate departing aircraft from an aircraft using an intersecting runway, or nonintersecting runways when the flight paths intersect, by ensuring that the departure does not begin takeoff roll until one of the following exists: a. The preceding aircraft has departed and passed the intersection, has crossed the departure runway, or is turning to avert any conflict... ."

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The local east controller's failure to follow FAA Order 7110.65, para 3-9-8 and Boston Tower Order 7110.11, Standard Operating Procedures, which resulted in a runway incursion during takeoff involving two transport category airplanes.

Findings

Occurrence #1: MISCELLANEOUS/OTHER
Phase of Operation: TAKEOFF - ROLL/RUN

Findings
1. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - ATC PERSONNEL(LCL/GND/CLNC)
2. TERRAIN CONDITION - RUNWAY

Factual Information

On June 9, 2005, about 1940 eastern daylight time, an Airbus A330-301, Irish registration EI-ORD, operated by Aer Lingus as flight 132 (EIN132), and a Boeing 737-3B7, N394US, operated by US Airways as flight 1170 (USA1170) were involved in a runway incursion at General Edward Lawrence Logan International Airport (BOS), Boston, Massachusetts. There were no injures to the 12 crew members, and 328 passengers on the Airbus, or the 5 crew members, and 103 passengers on the Boeing. Neither airplane was damaged. Visual meteorological conditions prevailed and an instrument flight rules flight plan had been filed for both flights. Aer Lingus flight 132 was conducted under the provisions of 14 CFR Part 129, and was destined for Shannon, Ireland. US Airways flight 1170 was conducted under the provisions of 14 CFR Part 121, and was destined for Philadelphia, Pennsylvania.

According to information obtained from the Federal Aviation Administration (FAA), both airplanes were under control of the BOS Air Traffic Control Tower. At the time of the incident, aircraft operating at BOS were landing on runways 4R and 4L, and departing from runways 15R and 9. The BOS Local East Controller (LCE) was responsible for aircraft operating on runways 4R and 9, and the BOS Local West Controller (LCW) was responsible for aircraft operating on runways 15R and 4L. Runway 15R intersected 3 active runways: 4L, 4R, and 9. Because runways 4R and 9 were under the control of the LCE, the LCW was required to obtain a release from the LCE before authorizing departures from runway 15R.

The LCW was responsible for EIN132 and the LCE was responsible for USA1170. Both controllers were utilizing different frequencies. At 1927:51, EIN132 was instructed to taxi into position and hold on runway 15R, a 10,083 foot-long, 150 foot-wide, asphalt runway. At 1938:24, the LCE contacted the LCW and said, "observed and released fifteen right [EIN132]..." At 1939:10, the LCW cleared EIN132 for takeoff from runway 15R. Five seconds later, the LCE cleared USA1170 for departure from runway 9, a 7,000 foot-long, 150 foot-wide, asphalt runway.

The co-pilot of US Airways flight 1170 reported that he had called "V1," and then noticed the Aer Lingus A330 rotating just prior to the intersection of runways 15R and 9. He told the captain to "keep it down," and pushed the control column forward. He further stated:

"The Airbus passed overhead our aircraft with very little separation, and once clear of the intersection, the captain rotated, and we lifted off towards the end of the runway. I reported to departure control that we had a near miss at which time Aer Lingus reported 'we concur.'"

Both airplanes proceeded to their respective destinations without further incident.

Both airplanes were equipped with flight data recorders, which were removed and forwarded to

the Safety Board's Vehicle Recorders Division, Washington, D.C. (Information pertaining to the flight data recorder from each airplane, can be found in the associated Flight Data Recorder Specialist's Factual Report, located in the public docket.)

During an interview with a Safety Board air traffic control specialist, the LCE stated he was very busy coordinating with airplanes and other controllers at the time of the incident. After releasing EIN132, he noticed the airplane begin the takeoff roll about 1 minute later. At that same time, he received a release for a Delta Shuttle airplane; however, USA1170 was in front of the Delta airplane, and needed to depart first in order for the Delta flight to get on the runway. He further stated that he cleared USA1170 for takeoff to get the Delta airplane in position for departure, and forgot that he had given the LCW the release for EIN132. (For further information pertaining to Air Traffic Control, please see the Air Traffic Control Group Factual Report, located in the public docket.)

The FAA Runway Safety Office categorized the incursion as a "Category A," which was defined as "Separation decreases to the point that participants take extreme action to narrowly avoid a collision, or the event results in a collision."

Boston Air Traffic Control Tower Standard Operating Procedures (SOPs), required the LCW to utilize the interphone to coordinate the release with the LCE. The SOPs indicated that the LCW will say: "Request release runway 15R, (CALL SIGN)." The LCE should respond: "(CALL SIGN) observed and released runway 15R." Once the aircraft departed 15R, the LCE could resume normal operations without further coordination.

Federal Aviation Administration Order 7110.65, Air Traffic Control, paragraph 3-9-8, Intersecting Runway Separation, stated in part:

"Separate departing aircraft from an aircraft using an intersecting runway, or nonintersecting runways when the flight paths intersect, by ensuring that the departure does not begin takeoff roll until one of the following exists:

a. The preceding aircraft has departed and passed the intersection, has crossed the departure runway, or is turning to avert any conflict.

b. A preceding arriving aircraft is clear of the landing runway, completed the landing roll and will hold short of the intersection, passed the intersection, or has crossed over the departure runway.

c. Separate IFR/VFR aircraft taking off behind a heavy jet/B757 departure by 2 minutes when departing:

NOTE- Takeoff clearance to the following aircraft should not be issued until 2 minutes after the heavy jet/B757 begins takeoff roll.

1. Crossing runways if projected flight paths will cross...."

POST INCIDENT ACTIONS

On June 29, 2005, Boston Tower implemented Notice 7110.6, "Aircraft Releases on Non-Standard Runways." The notice:

A. Reiterated timely release coordination for non-standard runway departures and prohibited the use of any other intersecting runway until the departure from the non-standard runway was no longer a factor.

B. Required that once a release had been authorized, the departure strip(s) of the number one/first aircraft to depart on any intersection runway shall be flipped over and placed upside down in the strip bay until the departure from the non-standard runway is no longer a factor.

C. Required a recorded "Rolling Report" on the aircraft departing the non-standard runway.

On July 19, 2006, Boston Tower Notice 7110.6, was superceded by Boston Tower Notice N7110.17, which stated in part:

"7. Procedures.

a. Only Local Control West (LCW) may initiate a release request for a runway 15R departure.

b. The runway 15R departure must be cleared for takeoff within 5 seconds of release or the release is void.

c. Local Control East (LCE) must not have an aircraft holding in position on Runway 9 when a release is given to LCW.

d. LCW must advise LCE when the Runway 15R departure has passed Runway 9. For example: 'Runway 15R Operation Complete.'...

In addition, BOS airport management established a facility workgroup to explore potential changes to control position jurisdiction to minimize/eliminate distractions caused by multiple aircraft on the movement areas waiting for release times.

Pilot Information

Certificate:	Airline transport	**Age:**	Male
Airplane Rating(s):	Multi-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:			

Co-pilot Information

Certificate:	Airline transport	**Age:**	34,Male
Airplane Rating(s):	Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	October 1, 2004
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus Industrie	**Registration:**	EI-ORD
Model/Series:	A330-301	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	0059
Landing Gear Type:	Retractable - Tricycle	**Seats:**	320
Date/Type of Last Inspection:	Continuous airworthiness	**Certified Max Gross Wt.:**	509000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:		**Engine Manufacturer:**	General Electric
ELT:	Installed, not activated	**Engine Model/Series:**	CF6-80E1
Registered Owner:	AER LINGUS IRISH INTERNATIONAL AIRL	**Rated Power:**	68000 Lbs thrust
Operator:		**Operating Certificate(s) Held:**	
Operator Does Business As:	Aer Lingus	**Operator Designator Code:**	MEDF

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BOS,19 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:54 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Few / 1500 ft AGL	**Visibility**	8 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	80°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	17°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boston, MA (BOS)	**Type of Flight Plan Filed:**	IFR
Destination:	Shannon (EINN)	**Type of Clearance:**	IFR
Departure Time:	19:40 Local	**Type of Airspace:**	Class B

Airport Information

Airport:	Logan International BOS	**Runway Surface Type:**	Asphalt
Airport Elevation:	15 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	15R	**IFR Approach:**	Unknown
Runway Length/Width:	10083 ft / 150 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	12 None	**Aircraft Damage:**	None
Passenger Injuries:	328 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	340 None	**Latitude, Longitude:**	42.364166,-71.004997

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	Robert Barnes; FAA Boston FSDO; Burlington, MA Jurgen Whyte; AAIU; Dublin, Ireland Stephen Behr; US Airways; Pittsburg, PA Tom Curran; Aer Lingus; Dublin, Ireland, DC Dan Sicchio; ALPA; Washington, DC John Haley; NATCA; Oklahoma City, OK
Original Publish Date:	May 29, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=61662

Aviation Investigation Final Report

Location:	Boston, Massachusetts	**Incident Number:**	NYC05IA095
Date & Time:	June 9, 2005, 19:40 Local	**Registration:**	N394US
Aircraft:	Boeing 737-3B7	**Aircraft Damage:**	None
Defining Event:		**Injuries:**	108 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

The airport was conducting operations on intersecting runways. The local east controller (LCE) was responsible for aircraft operating on runways 4R and 9, and the local west controller (LCW) was responsible for aircraft operating on runways 15R and 4L. Runway 15R intersected three active runways: 4L, 4R, and 9. The LCW was responsible for an Airbus A330, and the LCE was responsible for a Boeing 737. Both controllers were utilizing different frequencies. At 1927:51, the Airbus was instructed to taxi into position and hold on runway 15R. At 1938:24, the LCE contacted the LCW, and reported that he "observed and released" the Airbus. At 1939:10, the LCW cleared the Airbus for takeoff. Five seconds later, the LCE cleared the Boeing for takeoff from runway 9, which resulted in a runway incursion. Boston Tower Order 7110.11J, "Standard Operating Procedures" required the LCW to obtain a release from LCE in order to depart airplanes from runway 15R. Once the release was issued, LCE was required to stop operations on runways 4R and 9 until the airplane departed. Federal Aviation Administration Order 7110.65, Air Traffic Control, paragraph 3-9-8, Intersecting Runway Separation, stated in part: "Separate departing aircraft from an aircraft using an intersecting runway, or nonintersecting runways when the flight paths intersect, by ensuring that the departure does not begin takeoff roll until one of the following exists: a. The preceding aircraft has departed and passed the intersection, has crossed the departure runway, or is turning to avert any conflict... ."

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"The Airbus passed overhead our aircraft with very little separation, and once clear of the intersection, the captain rotated, and we lifted off towards the end of the runway. I reported to departure control that we had a near miss at which time Aer Lingus reported 'we concur.'"

Both airplanes proceeded to their respective destinations without further incident.

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The FAA Runway Safety Office categorized the incursion as a "Category A," which was defined as "Separation decreases to the point that participants take extreme action to narrowly avoid a collision, or the event results in a collision."

Boston Air Traffic Control Tower Standard Operating Procedures (SOPs), required the LCW to utilize the interphone to coordinate the release with the LCE. The SOPs indicated that the LCW will say: "Request release runway 15R, (CALL SIGN)." The LCE should respond: "(CALL SIGN) observed and released runway 15R." Once the aircraft departed 15R, the LCE could resume normal operations without further coordination.

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b. A preceding arriving aircraft is clear of the landing runway, completed the landing roll and will hold short of the intersection, passed the intersection, or has crossed over the departure runway.

c. Separate IFR/VFR aircraft taking off behind a heavy jet/B757 departure by 2 minutes when departing:

NOTE- Takeoff clearance to the following aircraft should not be issued until 2 minutes after the heavy jet/B757 begins takeoff roll.

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POST INCIDENT ACTIONS

On June 29, 2005, Boston Tower implemented Notice 7110.6, "Aircraft Releases on Non-Standard Runways." The notice:

A. Reiterated timely release coordination for non-standard runway departures and prohibited the use of any other intersecting runway until the departure from the non-standard runway was no longer a factor.

B. Required that once a release had been authorized, the departure strip(s) of the number one/first aircraft to depart on any intersection runway shall be flipped over and placed upside down in the strip bay until the departure from the non-standard runway is no longer a factor.

C. Required a recorded "Rolling Report" on the aircraft departing the non-standard runway.

On July 19, 2006, Boston Tower Notice 7110.6, was superceded by Boston Tower Notice N7110.17, which stated in part:

"7. Procedures.

a. Only Local Control West (LCW) may initiate a release request for a runway 15R departure.

b. The runway 15R departure must be cleared for takeoff within 5 seconds of release or the release is void.

c. Local Control East (LCE) must not have an aircraft holding in position on Runway 9 when a release is given to LCW.

d. LCW must advise LCE when the Runway 15R departure has passed Runway 9. For example: 'Runway 15R Operation Complete.'...

In addition, BOS airport management established a facility workgroup to explore potential changes to control position jurisdiction to minimize/eliminate distractions caused by multiple aircraft on the movement areas waiting for release times.

Pilot Information

Certificate:	Airline transport	**Age:**	49,Male
Airplane Rating(s):	Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	December 1, 2004
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 1, 2004
Flight Time:	16500 hours (Total, all aircraft), 10800 hours (Total, this make and model), 267 hours (Last 90 days, all aircraft), 89 hours (Last 30 days, all aircraft), 11 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	**Age:**	49,Male
Airplane Rating(s):	Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	April 1, 2005
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	April 1, 2005
Flight Time:	17800 hours (Total, all aircraft), 1200 hours (Total, this make and model), 202 hours (Last 90 days, all aircraft), 73 hours (Last 30 days, all aircraft), 11 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N394US
Model/Series:	737-3B7	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	23316
Landing Gear Type:	Retractable - Tricycle	**Seats:**	132
Date/Type of Last Inspection:	April 1, 2004 Continuous airworthiness	**Certified Max Gross Wt.:**	135000 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:	54048 Hrs at time of accident	**Engine Manufacturer:**	General Electric
ELT:	Not installed	**Engine Model/Series:**	CFM56-3-B1
Registered Owner:	US AIRWAYS INC	**Rated Power:**	20000 Lbs thrust
Operator:		**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	USA4

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BOS,19 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	19:54 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Few / 1500 ft AGL	**Visibility**	8 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	80°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.1 inches Hg	**Temperature/Dew Point:**	17°C / 15°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Boston, MA (BOS)	**Type of Flight Plan Filed:**	IFR
Destination:	Philadephia, PA (PHL)	**Type of Clearance:**	IFR
Departure Time:	19:40 Local	**Type of Airspace:**	Class B

Airport Information

Airport:	Logan International BOS	**Runway Surface Type:**	Asphalt
Airport Elevation:	15 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	15R	**IFR Approach:**	Unknown
Runway Length/Width:	10083 ft / 150 ft	**VFR Approach/Landing:**	Unknown

Wreckage and Impact Information

Crew Injuries:	5 None	**Aircraft Damage:**	None
Passenger Injuries:	103 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	108 None	**Latitude, Longitude:**	42.364166,-71.004997

Administrative Information

Investigator In Charge (IIC):	Schiada, Luke
Additional Participating Persons:	Robert Barnes; FAA Boston FSDO; Burlington, MA Jurgen Whyte; AAIU; Dublin, Ireland Stephen Behr; US Airways; Pittsburg, PA Tom Curran; Aer Lingus; Dublin, Ireland, DC Dan Sicchio; ALPA; Washington, DC John Haley; NATCA; Oklahoma City, OK
Original Publish Date:	May 29, 2007
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=61662