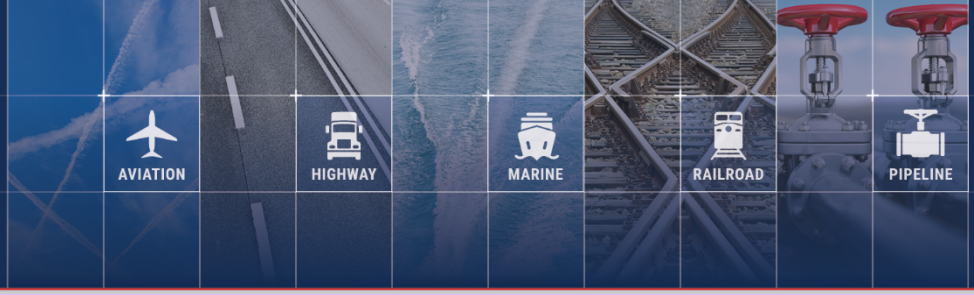

Aviation Investigation Final Report

Location:	Springfield, Missouri	**Incident Number:**	OPS18IA014
Date & Time:	June 27, 2018, 12:51 Local	**Registration:**	N655AE
Aircraft:	Embraer EMB145	**Aircraft Damage:**	None
Defining Event:	Air traffic event	**Injuries:**	
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

The runway incursion sequence began when the air traffic control (ATC) local controller (LC) cleared (ENY3660) for takeoff from an inactive runway that had been NOTAM'd closed for arrivals to accommodate airfield mowing in the underrun.

Interviews with controllers after the incident revealed SGF runway 14 had been NOTAM'd closed by SGF Airport Operations for arrivals but was available for departures. There were mowers in the underrun of runway 14 in the runway safety area (RSA) that prohibited an overflight by landing air traffic. The NOTAM was published and available to aircrew and air traffic control via the FAA website and covered the period from 1230 UTC to 2100 UTC.

Because runway 14/32 was closed to landing traffic, SGF standard operating procedures permitted the transfer of control for the runway to the ground controller (GC) position to use for runway crossings without the need for coordination with LC. Because GC now had operational control of the runway, the LC was required to request the use of the closed runway from the GC prior to issuing any clearances for takeoff.

The pilot of ENY3660 requested to use runway 14 for a departure, and the GC approved the request and issued taxi instructions to runway 14. While the airplane was taxiing to runway 14, VAN7 requested to cross runway 14 while GC maintained operational control of the runway. Because GC had control of the runway, there was no requirement to coordinate the closed runway vehicle crossing with LC.

When the pilot of ENY3660 called the LC ready for takeoff from runway 14, the LC issued a takeoff clearance without coordinating with GC.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this incident to be:

The local controller failing to follow established facility directives and issuing a clearance for takeoff from a runway not under his control.

Findings

Personnel issues	Decision making/judgment - ATC personnel

Factual Information

History of Flight

Takeoff	Runway incursion veh/AC/person
Takeoff	Air traffic event (Defining event)

On Wednesday June 27, 2018, about 1251 central daylight time (CDT), a runway incursion occurred at Springfield-Branson National Airport (SGF), Springfield, Missouri when an airport operations vehicle (VAN7) crossed runway 14 while an Embraer 145, N655AE, operated by Envoy Air as flight ENY3660, was on takeoff roll. Envoy Air 3660 was operating under the provisions of 14 *Code of Federal Regulations (CFR)* Part 121 from SGF to Chicago O'Hare International Airport, Chicago, Illinois (ORD). There was no reported damage to the aircraft or operations vehicle, and no reported injuries. Visual meteorological conditions prevailed.

History of Flight

At 12:44:07, the crew of ENY3660 contacted GC and reported at the "gate with information delta ready to taxi"; the GC instructed the pilot to taxi to runway 20. Information "delta" indicated the crew was in receipt of the Automatic Terminal Information Service (ATIS). The pilot responded and asked if runway 14 was available. The GC advised the pilot it was available and instructed the pilot to taxi to runway 14 via taxiways "foxtrot whiskey"; the pilot read back the taxi instructions.

At 12:50:14, the driver of VAN7 contacted GC and requested to proceed to the "firehouse". The GC responded "VAN7 cross runway two zero at Charlie and proceed Uniform Echo". The driver of VAN7 read back the instructions.

At 12:50:37, the LC transmitted "Envoy 3660 fly runway heading, runway 14 cleared for takeoff".

At 12:50:43, the pilot of ENY3660 responded "cleared for takeoff runway 14 fly the runway heading Envoy 3660".

At 12:51:06, the GC instructed the driver of VAN7 to proceed across runway 14; the driver of VAN7 read back the clearance.

At 12:51:21, an unidentified pilot transmitted on the LC frequency "truck, truck, truck" followed ten seconds later with "that was very close."

At 12:51:40, on the SGF LC frequency, an unidentified pilot stated "tower." The LC responded by transmitting "ah Ozark Tech, correction Envoy 3660 contact departure ah…very sorry". The pilot of ENY3660 responded "over to departure that was beyond ah…(unintelligible)".

There were no further transmissions between the LC and the pilot of ENY3660.

At 14:33:18, the chief pilot from Envoy Airlines contacted Springfield Terminal Radar Approach Control (TRACON) on a recorded telephone line and spoke with the Operations Supervisor regarding the runway incursion. During the conversation, the chief pilot reported the pilot of ENY3660 had reported that as the aircraft was abeam taxiway U, the vehicle was off the runway surface but between the runway edge marking and the hold short lines on taxiway U and that there was no overflight.

Airport and Video Data

The SGF airport was not served by any ground-based radar system to assist ATC personnel with surveillance of movement areas or runways. A recording of voice communications with associated time stamp was obtained from FAA and airport operations video was obtained from City of Springfield airport.

The SGF airport operations surveillance video was from a camera located on top of the control tower and captured the incident (see figure 1). The airport video showed VAN7 departing a hangar complex near taxiway N on the general aviation side of the airport and entering taxiway C. VAN7 held short of runway 20 at taxiway C for about 26 seconds and then proceeded across runway 20. After crossing runway 20, VAN7 turned left onto taxiway U. VAN7 then proceeded across runway 14. About 3 seconds after VAN7 crossed the southwest edge of runway 14, and still within the runway safety area (RSA), ENY3660 is seen on the video passing through the intersection of runway 14 and taxiway U. VAN7 continued down taxiway U and turned right onto taxiway E and to the KSGF fire station (see figure 2). The distance from the runway threshold of runway 14 to the intersection of taxiway U is about 5,900 feet.

Figure 1 - Screen grab from video of runway incursion incident.

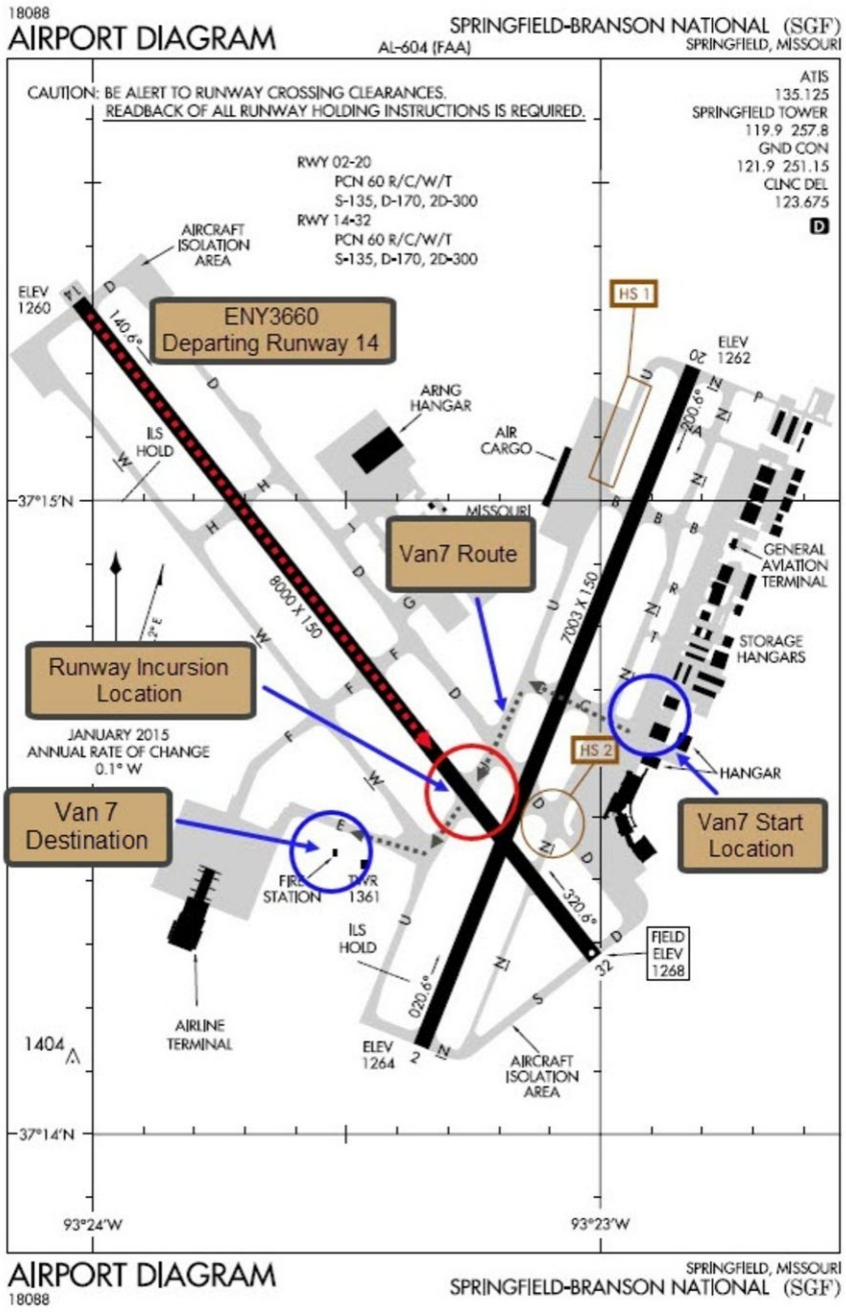

Figure 2 - Airport diagram showing VAN7 route of travel and ENY3660 departure runway.

Runway Incursion Device

The RID is a device designed to assist controllers to prevent runway incursions. It is part of the Memory Aid Toolbox (MAT) available to air traffic controllers to assist with tracking the status of runways in use. RIDs are normally used when there is something occurring such as a vehicle on the runway, an airplane taxiing, or runway closure, that will preclude its use for normal aircraft operation.

The RID is a piece of equipment that has 1 red push button associated with each runway on the airport. Each button has backlighting that flashes continuously 1/2 second on and 1/2 second off when activated. Depending on what runway(s) are occupied, the controller depresses the corresponding button on the RID to activate the system. The RID also has a speaker integrated into the system that broadcasts a user recorded aural "check runway" message when any button on the RID is activated and the controller's push to transmit (PTT) button is depressed at the position associated with that individual RID.

At SGF, the RID was installed at the local control and ground control positions. They are linked into the headset jack associated with each of those positions. The RIDs were interconnected and when one RID was activated, all the RIDs in the tower cab would flash in the same configuration. Only the RID that was activated would trigger an aural alert each time that position PTT was pressed.

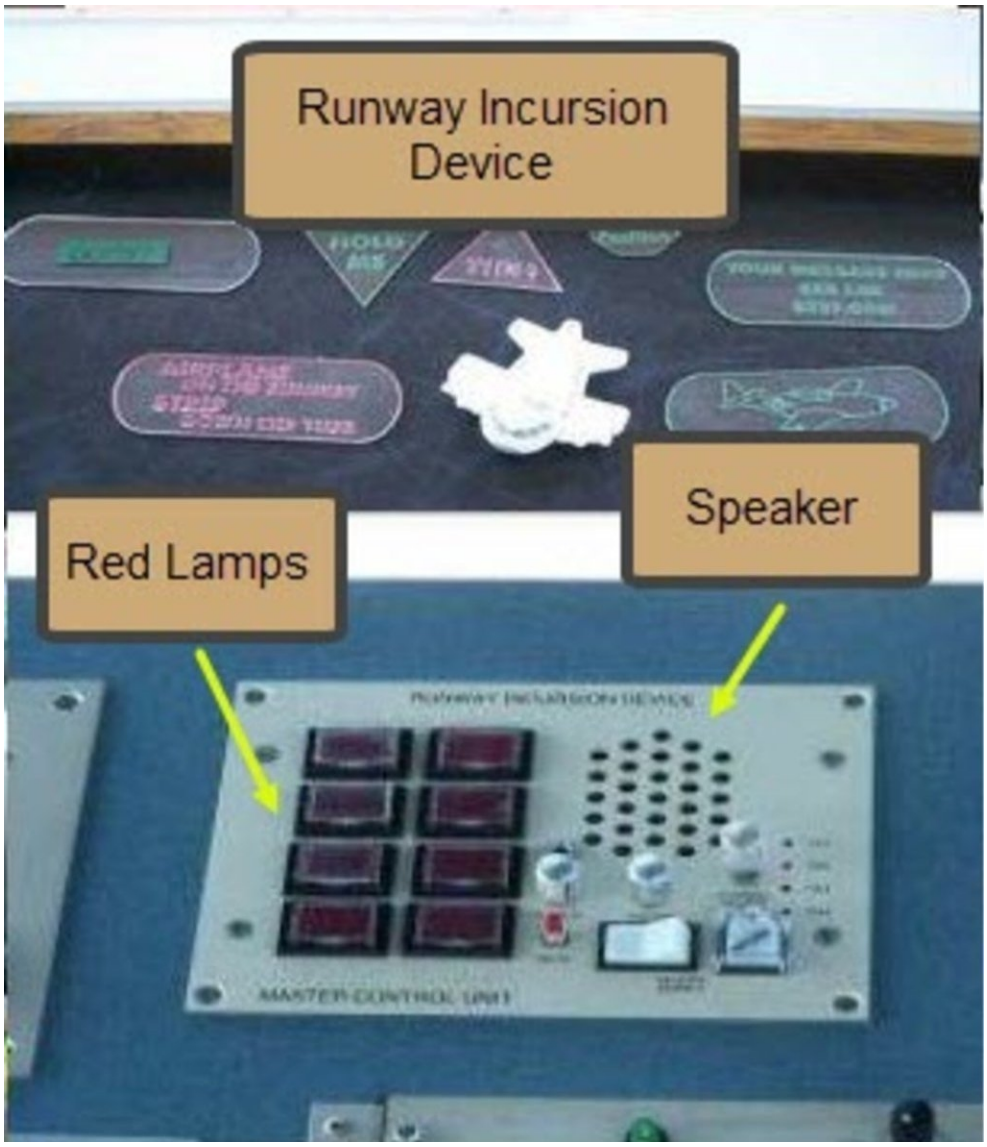

Figure 3 - Exemplar of the SGF Runway Incursion Device.

Weather Data

The runway incursion occurred at 1251 local. The SGF ATIS was current and advertising active runway 20 with wind at the time of the incident as 240 at 15 knots with gust to 22 knots, visibility 6 miles, and a few clouds at 6,000 feet.

The 1152 SGF Meteorological Aerodrome Report (METAR) was wind 230 degrees at 14 knots, 10 statute miles visibility or greater, clear sky conditions, temperature 32° Celsius, dew point 22° degrees Celsius, altimeter 29.90 inHg (1026 hPa).

METAR KSGF 271652Z 23014KT 10SM CLR 32/22 A2990 RMK AO2 LTG DSNT SE SLP108 T03220222=

The 1252 SGF METAR was wind 250 degrees at 9 knots, 10 statute miles visibility or greater, clear sky conditions, temperature 33° Celsius, dew point 23° degrees Celsius, altimeter 29.91 inHg (1027 hPa).

METAR KSGF 271752Z 25009KT 10SM CLR 33/23 A2991 RMK AO2 SLP112 T03280228 10333 20228 55003=

Notice to Airman (NOTAM)

A NOTAM is a notice containing information essential to personnel concerned with flight operations but not known far enough in advance to be publicized by other means. It states the abnormal status of a component of the National Airspace System (NAS) to include runway availability, not the normal status.

NOTAM 06/083 was published and in effect from 1230 UTC to 2100 UTC, and closed runway 14/32 to landing traffic.

Figure 4 - Screen capture of the NOTAM.

Air Traffic Control Personnel

Ground Controller (GC)

The GC began working for the FAA as air traffic control specialist in October 1991, reporting directly to the FAA Training Facility in Oklahoma City, Oklahoma. After graduating the training facility, he reported to Kodiak Airport (ADQ) ATCT in Kodiak, Alaska. In September 1997, he reported to SGF where he has remained. He was qualified on all operating positions at SGF and was designated as a controller in charge (CIC). He held a current medical certificate with a restriction for corrective lens which he was wearing during the incident. The GC was current on all operating positions He held no other aeronautical licenses.

Local Controller (LC) (Trainee)

The LC in training began with the FAA in November 2017 reporting directly to the FAA Training Facility in Oklahoma City, Oklahoma. After graduating from the training facility, he reported to SGF. He was qualified on clearance delivery (CD) and GC and was training on the LC position. His medical certificate was current with no restrictions. He was current on all operating positions he was qualified on. He held no other aeronautical licenses and had no other ATC experience.

Operations Supervisor (OS)

The OS began with the FAA in August 2008 reporting directly to the FAA Training Facility in Oklahoma City, Oklahoma. After graduating the training facility in October 2012, he reported to Kansas City Air Route Traffic Control Center (ZKC), Kansas City Missouri. In October 2012 he left ZKC and reported to Guam Air Route Traffic Control Center (ZUA) in Guam. In July 2015 he left ZUA and reported to SGF as a front-line manager (FLM). The OS was qualified on all operating positions at SGF and was current on all required operating positions he was responsible to maintain. He held a current medical certificate with no restrictions and held no other aeronautical licenses.

Local Controller (LC)

The LC began with the FAA in October of 1997 when he reported directly to Chino Airport (CNO) ATCT for work. In December 1999 he reported to SGF becoming facility certified and CIC qualified. He was current on all operating positions. He held a current medical certificate with no restrictions and held no other aeronautical licenses.

Airport Operations Personnel

VAN7 Operator

The driver of VAN7 had begun with the City of Springfield, Springfield Airport in December 2002. He began as a contract employee and converted to a full-time employee in January 2003. He was employed as a Lead Line Service Technician at the city owned fixed base operator (FBO) Midwest Premier Aviation. He was a private pilot who had not exercised those privileges for about 7 years and had received pilot training at SGF.

VAN7 Passenger

The front seat passenger began with the City of Springfield, Springfield Airport in February 2018 as a full-time Line Service Technician at the city owned FBO. He had previously worked as a collegiate intern at the airport during the 2017 academic year.

Air Traffic Directives

FAA JO 7110.65X, Air Traffic Control

Federal Aviation Administration Order JO 7110.65X (FAA JO 7110.65X) effective October 12, 2017, prescribed air traffic control procedures and phraseology for use by persons providing air traffic control services. Controllers are required to be familiar with the provisions of this order that pertain to their operational responsibilities and to exercise their best judgment if they encounter situations that are not covered by it.

FAA JO 7110.65X Chapter 3, Airport Traffic Control – Terminal, Section 1, paragraph 3-1-1 addressed the use of active runways by air traffic controllers and stated, in part:

3-1-3. USE OF ACTIVE RUNWAYS

The local controller has primary responsibility for operations conducted on the active runway and must control the use of those runways. Positive coordination and control is required as follows:

a. Ground control must obtain approval from local control before authorizing an aircraft or a vehicle to cross or use any portion of an active runway. The coordination must include the point/intersection at the runway where the operation will occur.

PHRASEOLOGY-

CROSS (runway) AT (point/intersection).

b. When the local controller authorizes another controller to cross an active runway, the local controller must verbally specify the runway to be crossed and the point/intersection at the runway where the operation will occur preceded by the word "cross."

c. The ground controller must advise the local controller when the coordinated runway operation is complete. This may be accomplished verbally or through visual aids as specified by a facility directive.

e. The local controller must coordinate with the ground controller before using a runway not previously designated as active.

FAA JO 7110.65X Chapter 3, Airport Traffic Control – Terminal, Section 1, paragraph 3-1-4 addressed required coordination between air traffic controllers and stated, in part:

3-1-4. COORDINATION BETWEEN LOCAL AND GROUND CONTROLLERS

Local and ground controllers must exchange information as necessary for the safe and efficient use of airport runways and movement areas. This may be accomplished via verbal means, flight progress strips, other written information, or automation displays. As a minimum, provide aircraft identification and applicable runway/intersection/taxiway information as follows:

a. Ground control must notify local control when a departing aircraft has been taxied to a runway other than one previously designated as active.

PHRASEOLOGY-

PROCEED AS REQUESTED; (and if necessary, additional instructions or information).

SGF 7110.2I Standard Operating Procedures (SOPs)

SOPs supplement operational and administrative procedures contained in FAA directives issued at the National Headquarters and Regional Office levels. ATC personnel should be familiar with the provisions of the facility SOP as it pertains to their supervisory and operational responsibilities. The SGF ATCT SOP covers local air traffic control procedures and address runway selection/use, and the use of memory aids to assist controllers in remembering unusual runway circumstances like closures.

The SGF 7110.2I Standard operating Procedures, Chapter 3, Airport Traffic Control, Section 1, Runway Utilization, paragraph 3-1 addressed runway designation by air traffic controllers and stated in part:

3-1 Runway Designation

a. With OS /CIC approval, the LC must designate the primary/secondary runways after completing coordination with all positions.

b. LC must coordinate with GC in a timely manner before clearing aircraft for operations on other than an active runway. This coordination is accomplished by advising GC that the runway is "hot", and the runway remains active until LC advises GC that the runway is "cold." GC must utilize the Runway Status Indicator (RSI) as a memory aid (Ref. 7-6.24)

c. GC must obtain specific approval from LC prior to authorizing an aircraft or vehicle to use any portion of an active runway and advise LC when clear of that runway.

The SGF 7110.2I Standard Operating Procedures, Chapter 3, Airport Traffic Control, Section 1, Runway Utilization, paragraph 3-4 addressed the use of the SGF RID and stated in part:

3-4 Runway Incursion Device (RID)

After approving and/or completing coordination for aircraft/vehicle/personnel/equipment, etc. to operate on an active/inactive runway, LC must activate the runway incursion device as follows:

a. For active runway(s) - both aural and visual alarm.

b. For inactive runway - visual alarm only.

c. If the RID is unavailable, LC must place the red-colored "RWY Occupied" memory aid strip on the console at the LC position until the vehicle, personnel and/or equipment is clear of an active runway.

NOTE: Use of the device for immediate runway crossing is at the discretion of the Local Controller. The device must be deactivated by LC as appropriate.

The SGF 7110.2I Standard Operating Procedures, Chapter 7, Facility Administration, Section 1 Facility Equipment, paragraph 7-6.21 addressed the RID and its use and stated in part:

7-6.21 Runway Incursion Device (RID)

a. The RID consists of a Master Unit located at LC.

b. Use the RID in accordance with Paragraph 3-3 of this order.

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:	Embraer	**Registration:**	N655AE
Model/Series:	EMB145 LR	**Aircraft Category:**	Airplane
Year of Manufacture:	2001	**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	145452
Landing Gear Type:	Tricycle	**Seats:**	53
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	
Time Since Last Inspection:		**Engines:**	2
Airframe Total Time:		**Engine Manufacturer:**	Rolls-Royc
ELT:	Installed, not activated	**Engine Model/Series:**	AE 3007A1P
Registered Owner:		**Rated Power:**	
Operator:		**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:	AMERICAN EAGLE AIRLINES INC	**Operator Designator Code:**	SIMA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KSGF,1260 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	17:52 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	250°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.9 inches Hg	**Temperature/Dew Point:**	33°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Springfield, MO (SGF)	**Type of Flight Plan Filed:**	IFR
Destination:	Chicago O'Hare, IL (ORD)	**Type of Clearance:**	IFR
Departure Time:	12:51 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Springfield-Branson National A SGF	**Runway Surface Type:**	Concrete
Airport Elevation:	1260 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	14	**IFR Approach:**	None
Runway Length/Width:	8000 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:		**Aircraft Damage:**	None
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:		**Latitude, Longitude:**	37.245555,-93.38861(est)

Administrative Information

Investigator In Charge (IIC):	Olvis, Charles		
Additional Participating Persons:	Eric West; Federal Aviation Administration		
Original Publish Date:	March 7, 2022	**Investigation Class:**	3
Note:	The NTSB did not travel to the scene of this incident.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97653		