Aviation Investigation Final Report

Location:	Inverness, Florida	**Accident Number:**	DCA23LA378
Date & Time:	July 12, 2023, 15:10 Local	**Registration:**	N249NV
Aircraft:	Airbus A320-214	**Aircraft Damage:**	None
Defining Event:	Turbulence encounter	**Injuries:**	2 Serious, 4 Minor, 179 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

Allegiant Airlines flight 227 (AAY227), which originated fromAsheville Regional Airport (AVL), Asheville, North Carolina, encountered convective-induced turbulence while descending to 13,000 ft during the approach into St. Petersburg-Clearwater International Airport (PIE), Clearwater, Florida. The captain was a check pilot, and the first officer was the pilot flying.

AAY227 established communication with air traffic control (ATC) and reported that the airplane was descending to cross the CAPOH intersection at flight level (FL) 270. The controller notified the flight crew of an area of moderate to heavy precipitation at the airplane's 12:00 position which was 45 miles away and advised the crew to anticipate deviations to the right of the airplane's course. The controller instructed AAY227 to descend and maintain FL 190, deviate to the right of course upon leaving FL 260, and proceed directly to the OLENE intersection when able. AAY227 was descending from FL 230 when the controller instructed the crew to cross OLENE at 13,000 ft and 250 knots.

The flight crewmembers reported that when they started the descent the airplane was in clear air and the ride was relatively smooth. The crewmembers also indicated that the initial crossing restriction for OLENE was given late by ATC and that the airplane was about 4,500 ft high on the descent profile, so they deployed the speed brakes and turned off the autopilot to meet the altitude and speed restrictions. The flight crew stated that no pilot reports (PIREPS) were conveyed during the flight and airborne weather radar did not show any significant precipitation returns. The cabin crewmembers stated that, although the seatbelt sign was on, they had not received the chimes that indicate final descent preparation should begin because the airplane had not yet descended through 10,000 ft.

As AAY227 approached its level-off altitude, the flight crewmembers observed a small cumulus buildup at an altitude of about 13,000 ft that was unavoidable. According to the first officer, the clouds were not dark and looked no different than the clouds that the airplane had previously flown through. As the airplane entered the clouds, it encountered some minor expected jolts, and just before exiting, a severe jolt of turbulence occurred that lasted about 1.5 seconds. After the turbulence encounter, the captain immediately called the cabin crew and was informed of multiple injuries. The captain declared an emergency and asked for priority handling direct to PIE. The airplane subsequently made an uneventful landing.

There were four flight attendants (FA) working the flight and they stated that just after the initial descent announcements, the lead FA (FA 1) was in the forward galley, FA 4 was in the aft galley, and FA 2 and FA 3 were walking through the cabin conducting seatbelt compliance checks. As the FAs were completing their checks, the airplane encountered turbulence, and all four flight attendants contacted the ceiling and then the cabin floor.

After landing, FA 2 and 4 were provided medical assistance for serious injuries. Four passengers received minor injuries. FA 1 and FA 3 were not injured.

A postaccident review of the radar and satellite imagery indicated that several low-level gust fronts had merged near the accident site, resulting in convective buildup where the airplane had been operating. The National Weather Service issued a convective SIGMET (Significant Meteorological Information) for the area about 15 minutes prior to the encounter, of thunderstorms moving eastward at 10 knots, with implied potential for severe turbulence in and near convective cells. The Tampa WSR-88D detected a developing cell in the immediate vicinity of the turbulence event with echoes between 15 – 45 dBZ, however, cockpit weather radar does not typically pick up echoes less than 20 dBZ. Therefore, it is unlikely the flight crew were aware that they were entering into a larger area of convection that included higher intensity echoes located east of their flight path and encountered moderate or greater convectively induced turbulence (CIT) within the clouds.

Probable Cause and Findings

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

An inadvertent encounter with convectively induced turbulence during descent.

Findings

Environmental issues	Convective turbulence - Effect on personnel
Environmental issues	Convective turbulence - Awareness of condition

Factual Information

History of Flight

Enroute-cruise	Turbulence encounter (Defining event)

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	41,
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	March 14, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	13612 hours (Total, all aircraft), 5224 hours (Total, this make and model), 9245 hours (Pilot In Command, all aircraft), 205 hours (Last 90 days, all aircraft), 67 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport; Commercial; Private	**Age:**	38,
Airplane Rating(s):	Single-engine land; Multi-engine sea	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	February 28, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	1144 hours (Total, all aircraft), 15 hours (Total, this make and model), 600 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 15 hours (Last 30 days, all aircraft), 5 hours (Last 24 hours, all aircraft)		

Cabin crew Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	None
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Cabin crew Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	None
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Cabin crew Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	None
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Cabin crew Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	None
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	Airbus	**Registration:**	N249NV
Model/Series:	A320-214	**Aircraft Category:**	Airplane
Year of Manufacture:	2017	**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	7766
Landing Gear Type:	Retractable - Tricycle	**Seats:**	196
Date/Type of Last Inspection:	July 11, 2023 Continuous airworthiness	**Certified Max Gross Wt.:**	170637 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:	15025.1 Hrs as of last inspection	**Engine Manufacturer:**	CFM INTL
ELT:	C126 installed, not activated	**Engine Model/Series:**	CFM56-5B4/3
Registered Owner:	SUNRISE ASSET MANAGEMENT LLC	**Rated Power:**	27000 Lbs thrust
Operator:	Allegiant Air, LLC	**Operating Certificate(s) Held:**	Flag carrier (121), Supplemental

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KPIE	**Distance from Accident Site:**	56 Nautical Miles
Observation Time:	14:51 Local	**Direction from Accident Site:**	210°
Lowest Cloud Condition:	Few / 3600 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	None / Convective
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	Unknown / Severe
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	33°C / 24°C
Precipitation and Obscuration:			
Departure Point:	Ashville, NC (KAVL)	**Type of Flight Plan Filed:**	IFR
Destination:	St. Petersburg, FL (KPIE)	**Type of Clearance:**	IFR
Departure Time:	14:14 Local	**Type of Airspace:**	Class E

Wreckage and Impact Information

Crew Injuries:	2 Serious, 4 None	**Aircraft Damage:**	None
Passenger Injuries:	4 Minor, 175 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 4 Minor, 179 None	**Latitude, Longitude:**	27.9102,-82.687401

Administrative Information

Investigator In Charge (IIC):	Hauf, Michael
Additional Participating Persons:	Travis Schwieder; Allegiant Air; Las Vegas Patrick D. Lusch; FAA; DC
Original Publish Date:	October 19, 2023
Last Revision Date:	
Investigation Class:	Class 4
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=192698