Aviation Investigation Final Report

Location:	SUNNS intersection, Osaka,	**Accident Number:**	DCA19CA034
Date & Time:	December 4, 2018, 18:00 UTC	**Registration:**	N193DN
Aircraft:	Boeing 767	**Aircraft Damage:**	None
Defining Event:	Turbulence encounter	**Injuries:**	1 Serious, 2 Minor, 92 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

On December 4, 2018, about 2130 Japan standard time, Delta Air Lines flight 278, N193DN, a Boeing 767-300ER, encountered severe turbulence during cruise. Of the 95 passengers and crew onboard, one flight attendant received serious injuries and two flight attendants received minor injuries. The airplane was not damaged. The regularly scheduled international passenger flight was operating under the provisions of 14 *Code of Federal Regulations* Part 121 from Kansai International Airport (RJBB), Osaka, Japan, to Honolulu International Airport (PHNL), Honolulu, Hawaii.

The first officer was the pilot flying, and the captain was pilot monitoring. According to the captain, the flight had experienced continuous light turbulence during the climb. Upon reaching FL350, in the moonless night, and in smooth air, the captain said that he deactivated the seat belt sign, and released the flight attendants to begin cabin service, while also giving a precautionary notice on the interphone to remain seated with the seatbelts fastened as much as possible. He added that the weather radar was set with the Gain on AUTO, and it was depicting green radar returns on its display.

He said that they were approaching SUNNS intersection and noted that the radar showed a light green return. He said he discussed it with the first officer, and they both agreed to request a turn and a climb to avoid the depicted weather. After clearance was given to make the turn, the captain said that he turned the seatbelt sign ON, and made an announcement for everyone, including the flight attendants, to be seated.

As the flight made the course deviation to avoid the weather, the captain indicated that the radar gave more definition in its depiction, and the lightning illumination emanating from the cloud showed that the cloud extended about 1,000 feet above their flight level, so they continued the turn to remain outside the green weather return depiction. He said that the radar depiction suddenly showed a faint dot of red at its center, and at that time the ride went immediately from smooth to severe turbulence, without any intervening intermediate intensities being noted.

He said the airplane climbed about a few hundred feet and a momentary engine indicating and crew alerting system (EICAS) overspeed message occurred. He further stated that the turbulence came in two waves, and it lasted less than 30 seconds. The airplane then recovered back to FL350, and light chop continued.

During the turbulence encounter, the flight attendants were in the middle of meal service. As a result, two flight attendants sustained minor injuries and one flight attendant fractured an ankle.

Probable Cause and Findings

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

The airplane's encounter with severe turbulence.

Findings

Environmental issues	Convective turbulence - Effect on operation

Factual Information

History of Flight

Enroute-cruise	Turbulence encounter (Defining event)

Pilot Information

Certificate:	Airline transport	**Age:**	59,Male
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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Unknown	**Last FAA Medical Exam:**	September 24, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	February 15, 2018
Flight Time:	19433 hours (Total, all aircraft), 4621 hours (Total, this make and model), 15172 hours (Pilot In Command, all aircraft), 155 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	**Age:**	58,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Unknown	**Last FAA Medical Exam:**	August 22, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 28, 2018
Flight Time:	12814 hours (Total, all aircraft), 9654 hours (Total, this make and model), 167 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N193DN
Model/Series:	767 332	**Aircraft Category:**	Airplane
Year of Manufacture:	1997	**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	28450
Landing Gear Type:	Retractable - Tricycle	**Seats:**	
Date/Type of Last Inspection:		**Certified Max Gross Wt.:**	348220 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:		**Engine Manufacturer:**	Pratt & Whitney
ELT:		**Engine Model/Series:**	PW4060
Registered Owner:		**Rated Power:**	24900 Horsepower
Operator:		**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	DALA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Unknown	**Condition of Light:**	Night
Observation Facility, Elevation:		**Distance from Accident Site:**	
Observation Time:		**Direction from Accident Site:**	
Lowest Cloud Condition:		**Visibility**	
Lowest Ceiling:		**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	Convective / Convective
Wind Direction:		**Turbulence Severity Forecast/Actual:**	Moderate / Severe
Altimeter Setting:		**Temperature/Dew Point:**	
Precipitation and Obscuration:			
Departure Point:	Osaka, OF (RJBB)	**Type of Flight Plan Filed:**	IFR
Destination:	Honolulu, HI (KHNO)	**Type of Clearance:**	IFR
Departure Time:	21:00 Local	**Type of Airspace:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 2 Minor, 7 None	**Aircraft Damage:**	None
Passenger Injuries:	85 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 2 Minor, 92 None	**Latitude, Longitude:**	34.804721,141.738327

Administrative Information

Investigator In Charge (IIC):	Lovell, John		
Additional Participating Persons:			
Original Publish Date:	March 1, 2022	**Investigation Class:**	4
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98733		