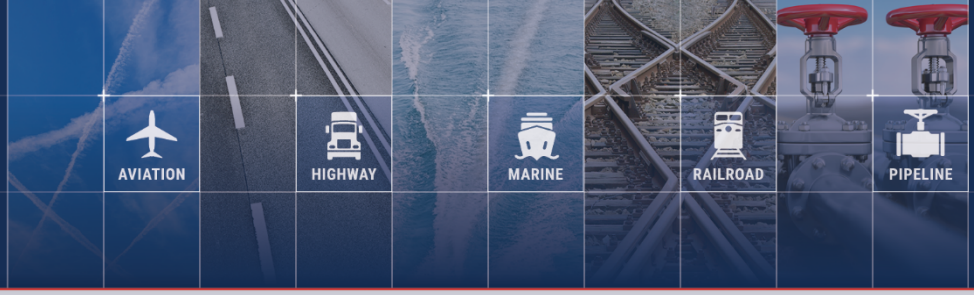

Aviation Investigation Final Report

Location:	CHARLESTON, South Carolina	**Accident Number:**	ATL00LA072
Date & Time:	July 28, 2000, 17:37 Local	**Registration:**	N364PA
Aircraft:	Boeing 727-200	**Aircraft Damage:**	Minor
Defining Event:		**Injuries:**	2 Serious, 14 Minor, 53 None
Flight Conducted Under:	Part 121: Air carrier - Scheduled		

Analysis

At 1703:55, the enroute control center, reported hazardous weather conditions for the southeast United States in a convective SIGMET several minutes before the flight encountered severe weather. At approximately 1730, while flying at flight level 330 the pilot deviated to avoid thunderstorm activity. At approximately the same time, the pilot turned on the fasten seat-belt sign, and advised the flight attendants to secure their stations. The flight encountered severe turbulence as the pilot maneuvered to avoid convective activity.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate evaluation of weather information, and his delay in taking remedial action that resulted in the in-flight encounter with severe weather.

Findings

Occurrence #1: IN FLIGHT ENCOUNTER WITH WEATHER
Phase of Operation: CRUISE

Findings
1. (C) WEATHER CONDITION - TURBULENCE
2. (C) WEATHER EVALUATION - INADEQUATE - PILOT IN COMMAND
3. (C) REMEDIAL ACTION - DELAYED - PILOT IN COMMAND

Factual Information

On July 28, 2000, at 1737 eastern daylight time, a Boeing B727-200, N364PA, operating as Pan Am Flight 164, encountered severe turbulence at flight level 330, 60 miles south of Columbia, South Carolina. The flight diverted into Charleston, South Carolina and landed without further incident. The scheduled domestic passenger flight was operated by Pan Am Airways Corporation under the provisions of Title 14 CFR Part 121 with an instrument flight plan filed. The aircraft was in instrument meteorological conditions at the time of the turbulence. The airplane was not damaged. One passenger and a flight attendant received serious injuries, 11 passengers and 3 flight attendants received minor injuries, and the air transport pilot with 4 crewmembers and 52 passengers were not injured. The air carrier flight departed Orlando Sanford Airport in Sanford, Florida at 1653.

The air carrier flight departed Orlando Sanford Airport in Sanford, Florida at 1653. At 1703:55, Jacksonville Center, St. Johns Radar Control Position (R57), reported hazardous weather information for the southeast United States in Convective Sigmet 85E. According to the pilot, at approximately 1730, while flying at flight level 330 he deviated to avoid thunderstorm activity. At approximately the same time, the pilot turned on the fasten seat-belt sign, and advised the flight attendants to secure their stations. About 60 miles south of Columbia, South Carolina, the flight encountered severe turbulence as the pilot maneuvered the airplane to avoid convective activity.

After departing the region of severe turbulence, the pilot was informed of injuries in the passenger cabin. The flight diverted to Charleston International Airport in Charleston, South Carolina, and the pilot requested medical assistance upon arrival. The flight terminated in Charleston, South Carolina at 1807. Severe turbulence notation was recorded in the aircraft log for required maintenance inspection. Reportedly, 16 persons from the flight, including four flight attendants, were transported to local hospitals for treatment. Several passengers were treated and released. However, a flight attendant and a passenger remained hospitalized with serious neck and back injuries.

The pilot held an airplane airline transport certificate and instrument rating. His had accumulated 20,400 flight hours, of which approximately 5,600 hours had been flown in the Boeing 727-200 airplane. The pilot held a first-class medical certificate, dated June 18, 2000.

The co-pilot held an airplane commercial pilot certificate, and a flight engineer certificate. His had accumulated a total of 613 flight hours, of which approximately 363 flight hours had been flown in the Boeing 727-200 airplane. The co-pilot held a second-class medical, dated October 22, 1999.

The Boeing 727-200, N364PA, was owned by Guilford Transportation of Portsmouth, New

Hampshire, and operated by Pan American Airways Corporation of Portsmouth, New Hampshire. The airplane was powered by three Pratt and Whitney JT8D-15 engines. The last continuous airworthiness inspection was completed on July 27, 2000. The airplane had flown 5 hours since the last inspection, and had accumulated a total time of 47,930 hours.

The Columbia Metropolitan Airport's weather observation at 1556, reported winds from 240 degrees at 5 knots, visibility 10 miles in thunderstorms, scattered clouds at 5,000 feet, ceiling broken at 13,000 feet, broken at 25,000 feet, temperature 27 degrees C (81 degrees F), dew point 20 degrees C (68 degrees F), altimeter 29.99 inches of mercury (Hg). Remarks; automated observation, stated thunderstorm activity north through south moving southeast, occasional lightning cloud-to-ground, precipitation recorded since last hourly observation less than 0.01 inch, temperature 27.2 degrees C, dew point 20.2 degrees C. At 1607, special weather observation indicated the thunderstorm ended at 1601.

Charleston International Airport's weather observation at 1656 indicated wind from 150 degrees at 11 knots, visibility 10 miles, sky clear below 12,000 feet, temperature 31 degrees C (88 degrees F), dew point temperature 22 degrees (72 degrees F), altimeter 29.98 inches of Hg.

The closest weather upper air reporting site was located at Charleston, South Carolina. The Charleston report stated that the Lifted Index showed severe thunderstorms probable. It also showed the wind at 32,684 feet was 232 degrees at 29 knots, and 265 degrees at 26 knots at 35,696 feet.

Composite reflectivity showed there was a broken line of echoes parallel to the coast in a northeast to the southeast across South Carolina into Georgia, and then south into northern Florida. Several clusters showed level five activity. According to the crew, they were circumnavigating around these echoes when the airplane penetrated the western edge of light precipitation and encountered the severe turbulence.

Convective SIGMET 85E was issued at 1656, and valid until 1855 on July 28,2000. The flight path was in the southern edge of the Convective SIGMET. The convective SIGMET was issued for an area of severe thunderstorms moving from 280 degrees at 20 knots, with tops to 43,000 feet. Hail to 1 inch and wind gusts to 50 knots possible.

AIRMET Tango update number 3 issued at 1531 on July 28, 2000, and valid until 2200, showed that no significant turbulence was expected in the vicinity of convective activity.

There were no SIGMETS or Severe Weather Forecast Alerts issued over South Carolina or Georgia from 1500 through 1900 on July 28, 2000.

The digital flight data recorder (FDR), a Lockheed model 209F (serial number 671), was removed from the airplane and transported to the National Transportation Safety Board's laboratory in Washington, D.C. for further readout. A successful readout was performed and it

determined approximately 29 minutes after take-off, the aircraft leveled off to a pressure altitude of 33,000 feet with an indicated airspeed of 298 knots. Shortly after level off, the airplane experienced vertical acceleration between -0.07 and 1.73 g's. During this time, altitude fluctuated between 32,563 feet and 33,410 feet.

Reportedly, 16 persons from the flight, including four flight attendants, were transported to local hospitals for treatment. Eleven passengers and three flight attendants were treated and released with minor injuries. However, a flight attendant and a passenger remained hospitalized with serious neck and back injuries.

Pan American Airways flight 164 was dispatched from Orlando Sanford Airport in Sanford, Florida, to Pittsburgh International Airport in Pittsburgh, Pennsylvania, with a destination alternate of Philadelphia International Airport in Philadelphia, Pennsylvania, at approximately 1349. The dispatch release noted that additional fuel was added for anticipated enroute deviations around thunderstorm activity.

The flight dispatcher issued a weather document to the flight crew at 1349, on July 28, 2000. Based on the statements made by the pilot, that was their only source of weather for this flight. The weather document included weather reports (METARS), forecasts (TAFS), and NOTAMS for the departure, destination, alternate and selected enroute airports, as well as the last 2 hours of Convective SIGMETS for the eastern and central region. The 1255 and 1155, Convective SIGMETS did not have any advisories current for thunderstorms or turbulence that impacted the route of flight.

There were no Center Weather Advisories, PIREPS, or other enroute forecasts included in the document issued to the flight crew. The pilot did not request any additional enroute weather information from the dispatcher. Nor, did the pilot inquire into the Convective SIGMET 85E, which was advised by Jacksonville ARTCC, St. Johns Radar Control Position (R57).

Pilot Information

Certificate:	Airline transport; Commercial; Flight engineer; Flight instructor	**Age:**	59,Male
Airplane Rating(s):	Single-engine land; 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 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	April 25, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	20400 hours (Total, all aircraft), 5600 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Boeing	**Registration:**	N364PA
Model/Series:	727-200 727-200	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Transport	**Serial Number:**	21107
Landing Gear Type:	Retractable - Tricycle	**Seats:**	154
Date/Type of Last Inspection:	July 27, 2000 Continuous airworthiness	**Certified Max Gross Wt.:**	197700 lbs
Time Since Last Inspection:	5 Hrs	**Engines:**	3 Turbo fan
Airframe Total Time:	47930 Hrs	**Engine Manufacturer:**	P&W
ELT:		**Engine Model/Series:**	JT8D-15
Registered Owner:	GUILFORD TRANSPORTATION	**Rated Power:**	15500 Lbs thrust
Operator:	PAN AM AIRWAYS CORP.	**Operating Certificate(s) Held:**	Flag carrier (121)
Operator Does Business As:		**Operator Designator Code:**	RIVA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	CHS ,45 ft msl	**Distance from Accident Site:**	
Observation Time:	16:56 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Scattered / 5000 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	Broken / 13000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	5 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	350°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30 inches Hg	**Temperature/Dew Point:**	26°C / 20°C
Precipitation and Obscuration:	Light - None - Rain		
Departure Point:	ORLANDO , FL (SFB)	**Type of Flight Plan Filed:**	IFR
Destination:	PITTSBURGH , PA (PIT)	**Type of Clearance:**	IFR
Departure Time:	16:53 Local	**Type of Airspace:**	Class A

Airport Information

Airport:		**Runway Surface Type:**	
Airport Elevation:		**Runway Surface Condition:**	
Runway Used:	0	**IFR Approach:**	
Runway Length/Width:		**VFR Approach/Landing:**	

Wreckage and Impact Information

Crew Injuries:	1 Serious, 3 Minor, 4 None	**Aircraft Damage:**	Minor
Passenger Injuries:	1 Serious, 11 Minor, 49 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious, 14 Minor, 53 None	**Latitude, Longitude:**	32.779781,-79.929992(est)

Administrative Information

Investigator In Charge (IIC):	Powell, Phillip
Additional Participating Persons:	CHARLIE HENDERSON;
Original Publish Date:	July 17, 2001
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=49870