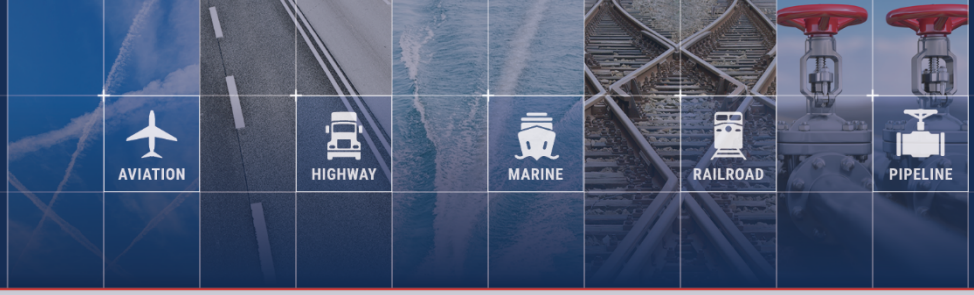

Aviation Investigation Final Report

Location:	Culebra, Puerto Rico	**Accident Number:**	ERA22LA123
Date & Time:	February 15, 2022, 09:55 Local	**Registration:**	N821RR
Aircraft:	BRITTEN-NORMAN BN-2A-9	**Aircraft Damage:**	Substantial
Defining Event:	Hard landing	**Injuries:**	3 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The pilot was receiving flight training as a new hire, and the accident occurred during his first flight in the airplane and the first landing. The pilot stated the approach was flown at the upper end of the allowable approach speed, and about 100 ft above the normal glidepath. During the landing, all three of the airplane's landing gear touched down at the same time, the airplane immediately veered right, and continued off the right side of the runway. The airplane sustained substantial damage to the right-wing structure.

The flight instructor chose an airport with a challenging approach that required a special training program prior to the first landing. The approach procedure requires a left 40° turn then rolling wings level just before touchdown. It is likely that the airplane's descent rate during landing exceeded the airplane's capability, which resulted in a hard landing and failure of the right-wing structure.

Probable Cause and Findings

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

The flight crew's failure to arrest the descent rate during the non-standard approach, which resulted in a hard landing and failure of the right-wing structure. Contributing was the flight instructor's selection of a challenging approach for initial training.

Findings

Aircraft	Landing flare - Capability exceeded
Personnel issues	Use of equip/system - Flight crew
Personnel issues	Aircraft control - Flight crew
Personnel issues	Unnecessary action - Instructor/check pilot

Factual Information

History of Flight

Landing	Hard landing (Defining event)
Landing	Loss of control on ground
Landing	Aircraft structural failure

On February 15, 2022, about 0955 Atlantic standard time, a Britten-Norman BN-2A-9 airplane, N821RR, was substantially damaged when it was involved in an accident at Benjamin Rivera Noriega Airport (CPX), near Isla de Culebra, Puerto Rico. The pilot receiving instruction, flight instructor, and pilot-rated passenger were not injured. The airplane was operated by Air Flamenco conducted as a Title 14 *Code of Federal Regulations* Part 91 instructional flight.

According to the pilot, he had recently retired from flying large transport-category airplanes. He was recently hired by Air Flamenco and had received some ground school training on the BN-2A-9, the company mission, routes, and
destinations. The accident occurred on the first landing of his first flight, and it was his first ever landing at the accident airport. The pilot stated that he entered a left downwind for landing on runway 13, and the estimated wind conditions were 090° at 15 to 16 knots. The instructor advised him that his aiming point should be the grass area that preceded the landing threshold. The approach was flown about 80 knots and about 100 ft above the normal flightpath. The pilot reported that the wind was not a factor. After touchdown the airplane "leaned to the right" and veered off the right side of the runway.

In an interview with a Federal Aviation Administration (FAA) aviation safety inspector, the flight instructor confirmed this was the first flight with the pilot. Air Flamenco considered CPX a "special airport" because of the short runway and challenging runway environment and company pilots who flew there participated in a "special" training program. Typically, pilots would have completed the other phases of flight training and additional training specific to CPX before landing at CPX for the first time.

The instructor described a stabilized approach at 70 knots. He said the pilot made a three-point, flat landing (all three of the airplane's landing gear contacting the runway at the same time), and the airplane turned right almost immediately. When asked, the instructor said it was not a hard landing. In the company flight log for the accident flight, he reported the airplane "experienced strong wind conditions sliding the aircraft off of the runway." In another company incident report, the instructor stated that because it's free castering, the nosewheel turned 90° to the right at touchdown, causing the aircraft to drift right of the runway and "making it very hard to regain directional control."

The commercial pilot seated in the back stated it was not a hard landing, but it was “harder than anything he had experienced before at that airport.”

The FAA inspector who responded to the accident site photographed witness marks on the runway, in the grass apron along the wreckage path, and the wreckage itself. The inspector described and his photographs illustrated witness marks consistent with propeller strikes and orange paint transfer marks on the runway. The right propeller blades displayed tip curling and the orange-painted wingtip displayed impact damage, scraping, and asphalt transfer. The distance between the scars on the runway were consistent with the distance between the propeller spinner and the wingtip. The right main landing gear was mounted to the aft portion of the right engine. The right wing was twisted downward and the aft portion of the right wing was deformed upward at the wing root, which resulted in substantial damage to the right wing.

After the accident, there was some discussion between the flight crew and company mechanics about the nosewheel free-castering system. Postaccident examination of the airplane at the airport by the FAA revealed no evidence of preimpact mechanical anomalies with the nosewheel that would have prevented normal operation.

A detailed examination of the wing revealed the right half of the wing was deformed aft and the leading edge was twisted down. The right wing lower spar cap was deformed upward. The forward spar cap was bent aft. The rear spar upper and lower spar caps were deformed upward significantly. The rear spar upper and lower caps were deformed down and aft. The right wing front and rear spars, ribs, and stringers were damaged. There were abrasions present on the lower portion of the right wing tip, and yellow paint transfers were observed on the runway surface. There was no appreciable corrosion noted in any of the interior or exterior areas of the wing examined, or on the fuselage structure. All the fracture surfaces examined had a dull, grainy appearance consistent with overstress separation

The approach into CPX involves some maneuvering prior to touchdown due to terrain west of the airport. The initial approach begins at 800 ft mean sea level (msl) and 80 kts over Flamenco Lagoon northwest of the airport on a heading aligned about 40° right of runway heading. While over Flamenco Lagoon, the instructions call for flaps at 56°, completion of the before landing checklist, and maintaining a positive rate of descent. The approach continues the same heading to a descent to 400 feet msl to a saddle in the terrain located about 2,000 ft northwest of the runway 13 threshold. The approach necessitates a continued descent to the runway from the saddle while making a left 40° turn to align with the runway. Just before touchdown the airplane must roll right from the left turn to a wings level attitude. The recommended speed remains 80 knots for the final approach and the instructions warn not to overshoot the runway. The note in the training materials states “If you do not land in the first 1,300 feet of RWY 13 or you are above 80 kts, a go-around procedure must be executed. Turbulence may be experienced when the wind is from the north.”

Britten-Norman Aircraft Limited provided information on the certification landing loads for the airplane. They stated that the rear spar web would be expected to fracture first followed by bending of the upper and lower spar caps near the location noted on the accident airplane under a hard landing condition that exceeded the design limit load by about 20% to 50%. They noted that typical hard landing events that do not exceed the design limits would result in damage to the lower part of the nacelle where the lower main landing gear mount point is located and the upper wing skin above the main landing gear.

Pilot Information

Certificate:	Airline transport	**Age:**	64,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	July 22, 2021
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 22, 2021
Flight Time:	16550 hours (Total, all aircraft), 0 hours (Total, this make and model), 7346 hours (Pilot In Command, all aircraft)		

Flight instructor Information

Certificate:	Airline transport; Commercial; Flight instructor	**Age:**	48,Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane single-engine	**Toxicology Performed:**	
Medical Certification:	Class 1 With waivers/limitations	**Last FAA Medical Exam:**	May 31, 2022
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	November 15, 2021
Flight Time:	6000 hours (Total, all aircraft), 5000 hours (Total, this make and model), 5700 hours (Pilot In Command, all aircraft), 44 hours (Last 90 days, all aircraft), 12 hours (Last 30 days, all aircraft)		

Passenger Information

Certificate:		**Age:**	
Airplane Rating(s):		**Seat Occupied:**	Unknown
Other Aircraft Rating(s):		**Restraint Used:**	Lap only
Instrument Rating(s):		**Second Pilot Present:**	Yes
Instructor Rating(s):		**Toxicology Performed:**	
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	BRITTEN-NORMAN	**Registration:**	N821RR
Model/Series:	BN-2A-9	**Aircraft Category:**	Airplane
Year of Manufacture:	1973	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	338
Landing Gear Type:	Tricycle	**Seats:**	10
Date/Type of Last Inspection:	January 27, 2022 AAIP	**Certified Max Gross Wt.:**	6300 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	2864.2 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	C91 installed, not activated	**Engine Model/Series:**	O-540-E4C5
Registered Owner:	AIR CHARTER INC DBA	**Rated Power:**	260 Horsepower
Operator:	AIR CHARTER INC DBA	**Operating Certificate(s) Held:**	Commuter air carrier (135), On-demand air taxi (135)
Operator Does Business As:	Air Flamenco	**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	JNR,38 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	09:53 Local	**Direction from Accident Site:**	260°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Overcast / 10000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	9 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	50°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.16 inches Hg	**Temperature/Dew Point:**	27°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	San Juan, PR (TJIG)	**Type of Flight Plan Filed:**	None
Destination:	Culebra, PR	**Type of Clearance:**	VFR
Departure Time:	09:15 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	BENJAMIN RIVERA NORIEGA CPX	**Runway Surface Type:**	Asphalt
Airport Elevation:	49 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	13	**IFR Approach:**	None
Runway Length/Width:	2600 ft / 60 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 None	**Aircraft Fire:**	None
Ground Injuries:		**Aircraft Explosion:**	None
Total Injuries:	3 None	**Latitude, Longitude:**	18.313276,-65.304068(est)

Administrative Information

Investigator In Charge (IIC):	Hill, Millicent
Additional Participating Persons:	Dennis Ortiz; FAA/FSDO; San Juan, PR
Original Publish Date:	June 28, 2023
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=104644