



National Transportation Safety Board Aviation Accident Final Report

Location:	SAN JUAN, PR	Accident Number:	MIA99FA012
Date & Time:	10/25/1998, 1321 AST	Registration:	N143DD
Aircraft:	Aerospatiale ATR-42-300	Aircraft Damage:	Substantial
Defining Event:		Injuries:	4 Minor, 24 None
Flight Conducted Under:	Part 121: Air Carrier - Scheduled		

Analysis

The pilot gave the ground marshaller the hand signals to disconnect ground power and to pull the chocks after a normal start of No. 2 engine. The ground marshaller disconnected the power cord and secured it to the ground power cart, and when she pulled the nose wheel chocks, the nose tire ran over her foot. The airplane taxied forward until the No. 2 propeller collided with the ground power cart and ignited a fire in the No. 2 engine that spread to the ground and under the aircraft. The flight attendant commanded a passenger emergency evacuation, absent any communications from the cockpit, and three passengers received minor injuries from tripping and falling on the tarmac. The airport fire department extinguished the fire 3 minutes after its initiation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to verify that the parking brake was applied prior to engine start, and the resultant inadvertent movement of the aircraft and collision with the ground power cart once No. 2 was started.

Findings

Occurrence #1: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: STANDING - ENGINE(S) OPERATING

Findings

1. OBJECT - VEHICLE
2. (C) PARKING BRAKES - NOT VERIFIED - PILOT IN COMMAND

Occurrence #2: FIRE
Phase of Operation: STANDING - ENGINE(S) OPERATING

Factual Information

HISTORY OF FLIGHT

On October 25, about 1321 Atlantic standard time, an Aerospatiale ATR-42, N143DD, registered to Wilmington Trust Company, operated by American Eagle Airlines, Inc., dba Executive Airlines, Inc., as a 14 CFR Part 121 scheduled air carrier flight number 5404, collided with a ground power unit, (GPU) after starting No. 2 engine, initiating a ground fire. The ATP-rated pilot, ATP-rated copilot, and the flight attendant were not injured and a ramp worker and 3 of 24 passengers received minor injuries. Visual meteorological conditions prevailed and an instrument flight plan was filed. The airplane sustained substantial damage. The flight was originating at the time of the accident.

According to the pilot's statement, when he arrived at the airplane at about 1240 for a 1303 departure, he noticed that two previous maintenance write-ups had not been cleared. He radioed the company's maintenance control, and while waiting for the mechanic's arrival, called for and completed the, "Before Start Checklist" with his first officer, except for the item, "AML and Release", (aircraft maintenance log and release). The write-ups were cleared and signed off by maintenance at about 1315. At this time, he called for the "Engine Start Checklist" and gave the ground marshaller the hand signal for engine start. Following a normal No. 2 engine start, he gave the ground marshaller two hand signals in succession, (1) disconnect the GPU, and (2) remove the chocks. He left No. 2 in feather for about 15 seconds while monitoring engine instruments and then moved the condition lever to high rpm. His first officer was computing weight and balance, and was not looking outside. The first realization that either crewmember had that the airplane moved after No. 2 engine start was the collision.

There were actually two NTSB forms 6120.1/2, (Pilot/Operator Aircraft Accident Report) submitted by the pilot, one was received at the NTSB Southeast Regional Office on November 25, 1998, and was signed by the pilot; the other was received at the same office on December 30, 1998, and was written by the Director of Safety for the airline. Both forms are attached.

The copilot's statement confirmed the facts as stated by the pilot, and added that, once the mechanic gave the flight crew the signal that No. 2 was on fire, the pilot followed with the, "Engine Fire On Ground" procedures. Once this was accomplished, the copilot proceeded to the cabin to help with the passenger evacuation.

According to the flight attendant's statement, the passenger emergency evacuation was commanded and accomplished by she when she could not establish communications with the cockpit. She received no notification from the cockpit of an emergency, or of any evacuation signals.

According to statements by the two-person ground marshalling crew, after starting the No. 2 engine, the pilot gave two hand signals to the forward stationed ground handler in succession; (1) to disconnect electrical power, and (2) to pull the chocks. The ground handler disconnected the electrical cable, closed the airplane's ground service access door, wound the cable and stored it on its GPU mounted rack. She then proceeded directly to the right side nose area, made eye contact with the first officer, and bent down to pull the nose wheel chocks. When she pulled the forward chock, the right nose tire passed over her foot, and the aircraft rolled forward. Observing the mishap, the second ground handler ran over to pick her off the

ground and they both ran forward trying to give the flight crew the emergency stop signal. The airplane continued forward about 10 to 15 feet until collision by the No. 2 propeller with the top of the GPU. The propeller was in high rpm at the time of the propeller strike.

According to a statement by a company line mechanic who observed the accident from behind the airplane during the engine start, he confirmed that he observed the sequence of events as stated by the marshalling crew and added that he ran to the front of the airplane to confirm the damage. He stated that fuel was pouring from the engine, that a small fire had ignited in the engine intake, and that he signaled the flight crew to pull the T-handle, (engine emergency shutdown handle) and shoot the extinguisher. He stated he saw the copilot reach for and activate the emergency shutdown handle and fire the extinguisher. When fire developed under the airplane, he ran to the left side main passenger loading door, and he and the flight attendant got the door open and assisted the passenger deplanement. The three passenger injuries were sustained from falling off the steps of the rear main passenger loading door during deplanement. He saw a girl and an older woman trip and fall onto the tarmac, suffering minor scrapes. He saw the pilot exit out the left fuselage emergency exit. He stated that two large cart extinguishers were wheeled to the area of the fire before the airport fire crew's arrival, but could not confirm that they were used.

A statement from one of the airport fire crew who responded to the airplane fire mentioned that after the fire was extinguished, he asked the pilot to reenter the cockpit with him to verify that the airplane's battery switch(s) were positioned to "off". He observed the pilot actuate two switches that were described to him as air conditioning switches. He observed the pilot move two "shift stick" type controls on the right-center console aft, and he further stated he observed the pilot, ".. put his hands on the brake handle and apparently he shift it back".

According to FAA tower logs, the airport fire rescue unit was notified at 1320, and the fire was declared under control at 1324.

PERSONNEL INFORMATION

Information on the pilot and copilot is included in this report in the attached Pilot/Operator Aircraft Accident Report, and Supplement E.

AIRCRAFT INFORMATION

The airplane had completed a San Juan to St. Thomas round trip previously with the same flight and cabin crew, returning to San Juan at 1003. The crew entered two maintenance items in the logbook on their return, and planned to finished their work day with a Ponce round trip, departing at 1303. The two items were, (1) first officer's radio microphone producing feedback, and (2) some escape path lights out.

METEOROLOGICAL INFORMATION

Visual meteorological conditions prevailed at the time of the accident. For additional information, see Weather Information included in this report.

FLIGHT RECORDERS

The cockpit voice recorder, (CVR) was a Fairchild model A-100A, SN 61860. It was removed and sent to the NTSB Vehicle Recorders Laboratory, Washington, DC, on October 28, 1998, for readout. The recording consisted of four channels of excellent quality audio

information from the pilot's and copilot's hot microphone/radio/intercom selector panels, cockpit area microphone, and from the aircraft's public address system. A transcript of about the last 5 minutes of CVR tape recording, representing the cockpit and cabin crew conversation before and during the accident was made and is attached. That portion of recording applicable to the accident flight begins with the reading and response to the, "Before Engine Start Checklist" and ends with the flight attendant's attempts to communicate with the cockpit before she commands the passenger emergency evacuation.

WRECKAGE AND IMPACT INFORMATION

The airplane and GPU were towed to the company's hangar facilities on the San Juan airport soon after the accident, and was the location for the NTSB examination. The accident occurred as the airplane was starting engines near gate C-7 on a painted centerline at about a 45 degree angle from the centerline of the concourse, with the tail toward the concourse and the main terminal in accordance with company procedure. The GPU had been parked forward of the No. 2 engine, per company procedure. After passenger enplanement and start of the first engine, No. 2, when chocks were pulled, the airplane's right nose tire ran over the ground marshaller's right foot, and the airplane taxied forward 10 to 15 feet until collision between the No. 2 propeller and the top of the GPU. Fragments of propeller blade impacted the right side fuselage and the sudden stoppage fractured the No. 2 engine case, causing a fuel leak. A fire was ignited by flame droplets falling from the No. 2 engine intake to puddled up jet fuel under the engine and main landing gear area developed. One of the four propeller blades separated from its hub and all four blades sustained tip damage. The spinner was torn as a result of the blade separation. The propeller collision caused metal and composite fragments to impact and dent the right side fuselage. Shrapnel damage was limited to fuselage skin denting, except for a single penetration of the right fuselage skin into a fuselage frame. The sudden propeller stoppage caused the engine outer case to fracture, causing the engine front section to droop and leak fuel. Fire damage was limited to burning and blistering of the composite honeycomb of the main landing gear wheel wells and access panels, paint and outer coat blistering of the composite right wing root leading edge fillet, the No. 2 engine nacelle, the propeller spinner, and some scorching of the wing leading edge and deicing boot adjacent to the No. 2 nacelle. Heat crazing of six cabin windows on the right side was sustained. The GPU sustained heavy propeller collision damage to its top side and fire damage to its control panel and power cords.

TESTS AND RESEARCH

The brakes were tested post accident, and found to operate satisfactorily, including setting and releasing of the parking brake. The company maintenance representative stated that no person had touched the brake system since the accident. Post accident examination of the aircraft maintenance logs for previous parking brake write-ups revealed that no discrepancies were found in the current or the previous logbook.

ADDITIONAL INFORMATION

The aircraft, except the cockpit voice recorder, was released to Executive Airlines on October 27, 1998. The recorder was returned to American Eagle/Executive on December 24, 1998. The CVR tape was returned to the airline on June 23, 1999.

Pilot Information

Certificate:	Airline Transport	Age:	54
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
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 Medical Exam:	07/29/1998
Occupational Pilot:		Last Flight Review or Equivalent:	
Flight Time:	5053 hours (Total, this make and model), 127 hours (Last 90 days, all aircraft), 22 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	Aerospatiale	Registration:	N143DD
Model/Series:	ATR-42-300 ATR-42-300	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	056
Landing Gear Type:	Retractable - Tricycle	Seats:	50
Date/Type of Last Inspection:	09/30/1998, Continuous Airworthiness	Certified Max Gross Wt.:	36825 lbs
Time Since Last Inspection:	127 Hours	Engines:	2 Turbo Prop
Airframe Total Time:	22818 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	PW-120
Registered Owner:	WILMINGTON TRUST CO.	Rated Power:	1800 hp
Operator:	EXECUTIVE AIRLINES, INC.	Air Carrier Operating Certificate:	Flag carrier (121)
Operator Does Business As:	AMERICAL EAGLE AIRLINES	Operator Designator Code:	TRBA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	SJU, 10 ft msl	Observation Time:	1254 AST
Distance from Accident Site:	0 Nautical Miles	Direction from Accident Site:	0°
Lowest Cloud Condition:	Clear / 0 ft agl	Temperature/Dew Point:	32° C / 26° C
Lowest Ceiling:	None / 0 ft agl	Visibility	10 Miles
Wind Speed/Gusts, Direction:	11 knots, 50°	Visibility (RVR):	0 ft
Altimeter Setting:	29 inches Hg	Visibility (RVV):	0 Miles
Precipitation and Obscuration:			
Departure Point:	(SJU)	Type of Flight Plan Filed:	IFR
Destination:	PONCE, PR (PSE)	Type of Clearance:	IFR
Departure Time:	1321 AST	Type of Airspace:	Class C

Airport Information

Airport:	LUIS MUNOZ MARIN INTL (SJU)	Runway Surface Type:	
Airport Elevation:	10 ft	Runway Surface Condition:	
Runway Used:	0	IFR Approach:	
Runway Length/Width:		VFR Approach/Landing:	

Wreckage and Impact Information

Crew Injuries:	3 None	Aircraft Damage:	Substantial
Passenger Injuries:	3 Minor, 21 None	Aircraft Fire:	On-Ground
Ground Injuries:	1 Minor	Aircraft Explosion:	None
Total Injuries:	4 Minor, 24 None	Latitude, Longitude:	

Administrative Information

Investigator In Charge (IIC):	ALAN C STONE	Adopted Date:	02/11/2000
Additional Participating Persons:	LUIS LEON; SAN JUAN, PR JOSE MACHADO; SAN JUAN, PR JOE BRACKEN; HERNDON, VA MARGIE PETERSON; DES PLAINES, IL		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov , or at 800-877-6799. Dockets released after this date are available at http://dms.nts.gov/pubdms/ .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report.