



Aviation Investigation Final Report

Location:	Oklahoma City, Oklahoma	Accident Number:	CEN15TA019
Date & Time:	October 18, 2014, 12:15 Local	Registration:	N509XX
Aircraft:	BAE SYSTEMS HAWK MK 67	Aircraft Damage:	Substantial
Defining Event:	Runway excursion	Injuries:	1 None
Flight Conducted Under:	Public aircraft		

Analysis

The pilot was on a cross-country flight in a single-engine jet trainer and had stopped en route for refueling. The pilot reported that, during the takeoff roll, as the airspeed reached about 90 knots, the airplane made a hard left turn. He applied the right rudder and brake to stop the left turn; however, the airplane continued left off the runway surface and then came to rest upright.

Examinations of the tires, wheel brakes, and rudder did not reveal any abnormalities. The nosewheel steering control unit was bench tested. During the test, the unit's power supply module failed; however, it was determined that a supply failure would cause a castering nosewheel rather than an uncommanded steering input. The reason for the uncommanded turn could not be determined.

Probable Cause and Findings

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

The loss of directional control during the takeoff roll for reasons that could not be determined during postaccident examinations and testing.

Findings

Not determined	(general) - Unknown/Not determined
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Factual Information

History of Flight

Unknown	Unknown or undetermined
Takeoff	Runway excursion (Defining event)

On October 18, 2014, about 1215 central daylight time, a BAE Hawk Mk 67 airplane, N509XX, departed off the side of the runway at the Tinker Air Force Base (KTIK), Oklahoma City, Oklahoma. The airline transport rated pilot was not injured, and the airplane sustained substantial damage. The airplane was registered to and operated by Air USA, Inc., Henderson, Nevada, under the provisions of 14 Code of Federal Regulations Part 91 as a public airplane flight. Visual meteorological conditions prevailed, and an instrument flight plan had been filed. The flight was originating at the time of the accident and was en route to Cherry Point Marine Corps Air Station, (KNKT) Cherry Point, North Carolina.

The pilot landed at KTIK for a refueling stop, and the airplane was fueled to a full load of 747 gallons. The pilot reported that during the takeoff roll, as he reached about 90 knots, the airplane made a hard left turn. He applied right rudder and brake to stop the left turn; however, the airplane continued left, off the runway surface. The airplane came to rest in the grass in an upright position. Examination of the airplane revealed the airplane landing gear had collapsed, with the left landing gear strut penetrating the wing. The airplane was configured with two external fuel tanks and two CBL5-200 bomb racks.

The airplane and landing gear was inspected by engineers from BAE Systems. The airplane tires, wheel brakes, and anti-skid systems were visually inspected and then disassembled. The airplane rudder system was also inspected; the inspections did not identify any abnormalities that would have accounted for the airplane's departure from the runway.

The Nose Wheel Steering Digital Control Unit (DCU) was sent to the manufacturer, SAFRAN Electronics, facility in Canada for further investigation. The DCU showed no faults when run through the automated test program. During environmental testing, the unit failed 2 hours into the test at minus 40 deg C. The unit was disassembled and the fault was identified as a short in the power supply module. It was determined that the power supply failure would cause a system shut down, resulting in a castering nose wheel, rather than un-commanded steering input.

Examination of the airplane did not find any abnormalities that would account for the un-commanded turn

Pilot Information

Certificate:	Airline transport	Age:	73
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Front
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 3 With waivers/limitations	Last FAA Medical Exam:	August 14, 2013
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	27100 hours (Total, all aircraft), 17.5 hours (Total, this make and model), 19100 hours (Pilot In Command, all aircraft), 22.3 hours (Last 90 days, all aircraft), 7.3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	BAE SYSTEMS	Registration:	N509XX
Model/Series:	HAWK MK 67	Aircraft Category:	Airplane
Year of Manufacture:	1993	Amateur Built:	
Airworthiness Certificate:	Experimental (Special)	Serial Number:	67-509
Landing Gear Type:	Retractable - Tricycle	Seats:	
Date/Type of Last Inspection:		Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	Turbo fan
Airframe Total Time:		Engine Manufacturer:	Rolls Royce
ELT:		Engine Model/Series:	
Registered Owner:	AIR USA INC	Rated Power:	
Operator:	AIR USA INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KTIK	Distance from Accident Site:	
Observation Time:	11:58 Local	Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:		Visibility (RVR):	
Wind Speed/Gusts:	10 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	60°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.2 inches Hg	Temperature/Dew Point:	19°C / 8°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Oklahoma City, OK (KTIK)	Type of Flight Plan Filed:	IFR
Destination:	Cherry Point, NC	Type of Clearance:	IFR
Departure Time:	12:15 Local	Type of Airspace:	

Airport Information

Airport:	Tinker AFB KTIK	Runway Surface Type:	Concrete
Airport Elevation:	1290 ft msl	Runway Surface Condition:	Dry
Runway Used:	36	IFR Approach:	None
Runway Length/Width:	11101 ft / 200 ft	VFR Approach/Landing:	None

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	35.416667,-97.392776

Administrative Information

Investigator In Charge (IIC):	Hatch, Craig
Additional Participating Persons:	Dan Donnelly; FAA FSDO; Oklahoma City, OK
Original Publish Date:	November 30, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=90277

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).