



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	Roswell, NM	<b>Accident Number:</b>	DCA11MA076
<b>Date &amp; Time:</b>	04/02/2011, 0934 MDT	<b>Registration:</b>	N652GD
<b>Aircraft:</b>	GULFSTREAM GVI	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Aerodynamic stall/spin	<b>Injuries:</b>	4 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Flight Test		

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## Analysis

The Safety Board's full report is available at [http://www.nts.gov/investigations/reports\\_aviation.html](http://www.nts.gov/investigations/reports_aviation.html). The Aircraft Accident Report number is NTSB/AAR-12-02.

On April 2, 2011, about 0934 mountain daylight time, an experimental Gulfstream Aerospace Corporation GVI (G650), N652GD, crashed during takeoff from runway 21 at Roswell International Air Center Airport, Roswell, New Mexico. The two pilots and the two flight test engineers were fatally injured, and the airplane was substantially damaged by impact forces and a postcrash fire. The airplane was registered to and operated by Gulfstream as part of its G650 flight test program. The flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed at the time of the accident.

## Probable Cause and Findings

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

an aerodynamic stall and subsequent uncommanded roll during a one engine-inoperative takeoff flight test, which were the result of (1) Gulfstream's failure to properly develop and validate takeoff speeds for the flight tests and recognize and correct the takeoff safety speed (V<sub>2</sub>) error during previous G650 flight tests, (2) the G650 flight test team's persistent and increasingly aggressive attempts to achieve V<sub>2</sub> speeds that were erroneously low, and (3) Gulfstream's inadequate investigation of previous G650 uncommanded roll events, which indicated that the company's estimated stall angle of attack while the airplane was in ground effect was too high. Contributing to the accident was Gulfstream's failure to effectively manage the G650 flight test program by pursuing an aggressive program schedule without ensuring that the roles and responsibilities of team members had been appropriately defined and implemented, engineering processes had received sufficient technical planning and oversight, potential hazards had been fully identified, and appropriate risk controls had been

implemented and were functioning as intended.

## Findings

Aircraft	Airspeed - Related operating info (Cause)
	Engine out capability - Related operating info (Cause)
	Angle of attack - Related operating info (Cause)
Personnel issues	Use of equip/system - Flight crew (Cause)
Organizational issues	Equip certification/testing - Manufacturer (Cause)
	Task scheduling/workload - Manufacturer (Cause)
	Oversight of operation - Manufacturer (Cause)
	Policy/procedure development - Manufacturer (Cause)

## Factual Information

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### History of Flight

Prior to flight	Preflight or dispatch event
Takeoff	Simulated/training event Aerodynamic stall/spin (Defining event)
Post-impact	Fire/smoke (post-impact)

### Pilot Information

Certificate:	Airline Transport; Flight Instructor; Commercial	Age:	64
Airplane Rating(s):	Multi-engine Land; Single-engine Land	Seat Occupied:	Left
Other Aircraft Rating(s):	Glider	Restraint Used:	
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Glider	Toxicology Performed:	
Medical Certification:	Class 1 With Waivers/Limitations	Last Medical Exam:	01/18/2011
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	
Flight Time:	11237 hours (Total, all aircraft), 263 hours (Total, this make and model)		

## Co-Pilot Information

<b>Certificate:</b>	Airline Transport; Commercial	<b>Age:</b>	51
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	
<b>Medical Certification:</b>	Class 1 With Waivers/Limitations	<b>Last Medical Exam:</b>	
<b>Occupational Pilot:</b>	Yes	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	3940 hours (Total, all aircraft), 140 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	GULFSTREAM	<b>Registration:</b>	N652GD
<b>Model/Series:</b>	GVI G650	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Experimental	<b>Serial Number:</b>	6002
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	8
<b>Date/Type of Last Inspection:</b>		<b>Certified Max Gross Wt.:</b>	100000 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Turbo Fan
<b>Airframe Total Time:</b>	434 Hours	<b>Engine Manufacturer:</b>	Rolls-Royce Deutschland
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	BR700-725A1
<b>Registered Owner:</b>	GULFSTREAM AEROSPACE CORPORATION	<b>Rated Power:</b>	16100 lbs
<b>Operator:</b>	GULFSTREAM AEROSPACE CORPORATION	<b>Air Carrier Operating Certificate:</b>	None

## Meteorological Information and Flight Plan

Observation Facility, Elevation:	KROW, 3671 ft msl	Observation Time:	0851 MDT
Distance from Accident Site:	0 Nautical Miles	Condition of Light:	Day
Direction from Accident Site:	360°	Conditions at Accident Site:	Visual Conditions
Lowest Cloud Condition:	Clear	Temperature/Dew Point:	17° C / -4° C
Lowest Ceiling:	None	Visibility	10 Miles
Wind Speed/Gusts, Direction:	4 knots, 210°	Visibility (RVR):	
Altimeter Setting:	30.01 inches Hg	Visibility (RVV):	
Precipitation and Obscuration:			
Departure Point:	ROSWELL, NM (ROW)	Type of Flight Plan Filed:	None
Destination:	ROSWELL, NM (ROW)	Type of Clearance:	VFR
Departure Time:	0700 MDT	Type of Airspace:	Class C

## Airport Information

Airport:	Roswell Intl Air Center Airpor (ROW)	Runway Surface Type:	Asphalt; Concrete
Airport Elevation:	3671 ft	Runway Surface Condition:	Dry
Runway Used:	21	IFR Approach:	None
Runway Length/Width:	13001 ft / 150 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	4 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	4 Fatal		

## Administrative Information

Investigator In Charge (IIC):	Effie Lorenda Ward	Adopted Date:	09/24/2013
Additional Participating Persons:	T R Proven; FAA AVP-100; Washington, DC		
Publish Date:	09/24/2013		
Investigation Docket:	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=78738">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=78738</a>		

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