



NTSB National Transportation Safety Board

Benefits of an Independent Investigative Process

Global Food Safety Conference
BREAKOUT 6:
Global Supply Chain Best Practices
February 27, 2014

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NTSB Board Member

Who We Are



The National Transportation Safety Board (NTSB) is an independent Federal agency created by the U.S. Congress to investigate **every civil aviation accident** in the United States and **significant accidents in the other modes** of transportation, namely – railroad, highway, marine and pipeline.



What We Do

Investigate the accident.



Determine the probable cause of the accident.

Propose corrective action to reduce the likelihood of a recurrence of the accident - through formal “recommendations”.



The Investigative Process – Major Investigations

- Decision to launch a “Go-Team”
- Arrival On-Scene
- Organizational Meeting
- Briefings and on-scene activities (i.e. fact gathering)
- Post on-scene fact gathering
- Analysis
- Report preparation – recommendation development
- Board Approval
- Advocacy

Go-Team Launch



- An NTSB “Go-Team” is dispatched from Washington headquarters to the site of major transportation accidents.

- Go-Team for a major accident typically includes:
 - Board Member
 - Investigative-In-Charge (IIC)
 - Technical specialists
 - Public Affairs Officers
 - Family Affairs Specialists



Arrival On-scene

- Coordinate with local law enforcement authorities.
- Establish our investigative resources at the accident site.
- Gather evidence.



- Establish an NTSB Operations Center.
- Confirm security arrangements.
- Ensure precautions for bio- and environmental hazards.

Organizational Meeting

- Review NTSB Rules of participation
- Implement the Party Process
- Identify parties and party representatives
- Establish Working groups
- Outline on-scene investigation schedule



Briefings



- The NTSB Board Member On-Scene or the IIC, is the sole spokesperson.
- Provide factual information only.

- Family briefings
- Media briefings



Post On-Scene



- Issue Preliminary Report
 - Additional fact finding
 - Examination of evidence
 - Investigative hearing (optional)
- Various Laboratories on premises to assist
 - Two campuses – HQ and Ashburn (storage and training facility)

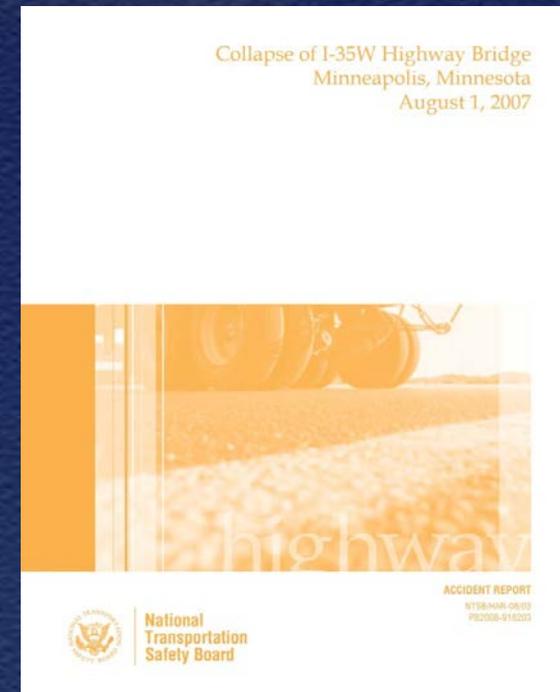


Analysis and Final Report Development

- Working group reports – “Chairman Reports”
- Docket opened



- Factual statement – party review/collaboration
- Development of statement of analysis – NTSB only



Board Meeting

The Board Members conduct a public meeting to discuss and approve the final report on the accident. The report includes conclusions, a statement of probable cause, and recommendations.



Recommendations

- Safety recommendations – most recognized product of the NTSB.
 - State the safety need to be satisfied
 - Describe the recommended action to be taken
 - Designate the party or person expected to take action



National Transportation Safety Board
Washington, DC 20594

Safety Recommendation

Date: March 8, 2013
In reply refer to: R-13-16

Mr. David Starling
President and CEO
Kansas City Southern Railway Company
Post Office Box 219335
Kansas City, Missouri 64121-9335

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 accidents in other modes of transportation—railroad, highway, marine, and pipeline.

The NTSB aimed at j concerning other organ transportati Southern K letter.

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As i reiterated d Railroad A Railway L Association

¹ For mo l/monstric 3 Transportation

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National Transportation Safety Board
Washington, DC 20594

Safety Recommendation

Date: January 15, 2014
In reply refer to: A-14-001

The Honorable Michael P. Huerta
Administrator
Federal Aviation Administration
Washington, DC 20591

We are providing the following information to urge the Federal Aviation Administration (FAA) to take action on the safety recommendation issued in this letter. This recommendation addresses the need to require the retrofit of existing Robinson R44 helicopters with improved fuel tanks. The recommendation is derived from the National Transportation Safety Board's (NTSB) and the Australian Transport Safety Bureau's (ATSB) investigations of R44 accidents in which the impact forces were survivable for the occupants, but fatal or serious injuries occurred because of a postcrash fire that resulted from an impact-related breach in the fuel tanks. Information supporting this recommendation is discussed below.

On November 25, 2012, a Robinson R44 II helicopter, N4204A, collided with a structure at Corona Municipal Airport, Corona, California. The pilot/owner, who was operating the helicopter under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91, died as a result of his injuries. The helicopter was substantially damaged from impact forces and a postcrash fire. Although this accident is still under investigation, preliminary evidence indicates that the accident was survivable and that the pilot succumbed to injuries related to the postcrash fire.¹

The NTSB has investigated, since 2008, three other R44 helicopter accidents in which the fuel tanks were breached, resulting in leaking fuel and a postcrash fire.² In addition, since 2011, three similarly equipped R44 helicopters were involved in accidents in Australia.³ Analysis of data from the US and Australian accidents showed that they should all have been survivable with minor or no injuries to the occupants.⁴ However, the accidents in the United States, including the Corona accident, resulted in two fatalities and two serious thermal injuries, and the accidents in

¹ Additional information about this accident, WPR13FA054, can be found at the [NTSB's website](http://www.ntsb.gov), which can be accessed at <http://www.ntsb.gov>.

² For more information, see DFW08LA122, WPR10LA458, and CEN12CA643 at the [NTSB's website](http://www.ntsb.gov).

³ For more information, see AO-2011-016, AO-2012-021, and AO-2013-055 at the [NTSB's website](http://www.ntsb.gov), which can be accessed at <http://www.ntsb.gov>.

⁴ Two of the occupants involved in these accidents survived with minor or no injuries. For DFW08LA122, the pilot received minor injuries (but the passenger received fatal injuries). For CEN12CA643, the pilot (the only occupant) was not injured.

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NTSB Case Study:

*Crash During
Test Flight
Gulfstream GVI
(G650)
Roswell, NM,
USA
April 2, 2011*



History of Flight

- April 2, 2011.
- 0934 mountain daylight time.
- Experimental Gulfstream G650
- Crashed during takeoff at airport testing site in Roswell, New Mexico, USA.
- Two pilots and two flight test engineers fatally injured.
- Planned Flight Test: one-engine-inoperative continued takeoff.
- Flight crew tried to achieve takeoff safety speed.
- Plane stalled below minimum to activate stall warning system.
- Right wing contacted runway.

Airplane path



Right wing contact





Main landing gear

Concrete structure

ATC tower

Factors Leading to Accident

- Used flawed assumption to determine takeoff speeds.
- Made persistent attempts to adjust pilot technique to achieve erroneously low take-off speed.
- Failed to fully investigate two previous uncommanded roll events.

Factors Leading to Accident

- Did not properly calculate estimate for stall angle of attack and algorithms for stall warning mechanisms.
- Failed to establish adequate flight test operating procedures.
- Did not adjust flight test schedule to account for program delays.
- Failed to develop effective flight test safety management program.

Uncommanded Roll Events

- Two uncommanded roll events occurred before accident flight, in November 2010 and March 2011.
- Gulfstream failed to follow its established procedure, to convene a review board, in wake of these events.
- Testing should have stopped because uncommanded roll events were unexpected test result.

First Uncommanded Roll Event



Second Uncommanded Roll Event



Liftoff (09:33:50.6)



First Stick Shaker Activation (09:33:52.3)



Second Stick Shaker Activation (09:33:53.6)



Airplane Departing Runway (09:33:54.7)



Board Meeting

- Board met on October 12, 2012 to consider accident report.
- Board approved final accident report, along with findings and probable cause statement.
- Board also approved issuance of 12 recommendations to address safety concerns.



Probable Cause

An aerodynamic stall and subsequent uncommanded roll due to:

(1) Gulfstream's failure to properly develop/validate takeoff speeds for the flight tests;

(2) the flight test team's continued attempts to achieve erroneously derived take-off speeds;

(3) Gulfstream's failure to adequately investigate previous uncommanded roll events, which would have identified calculation errors for estimating aerodynamic stall angle of attack.

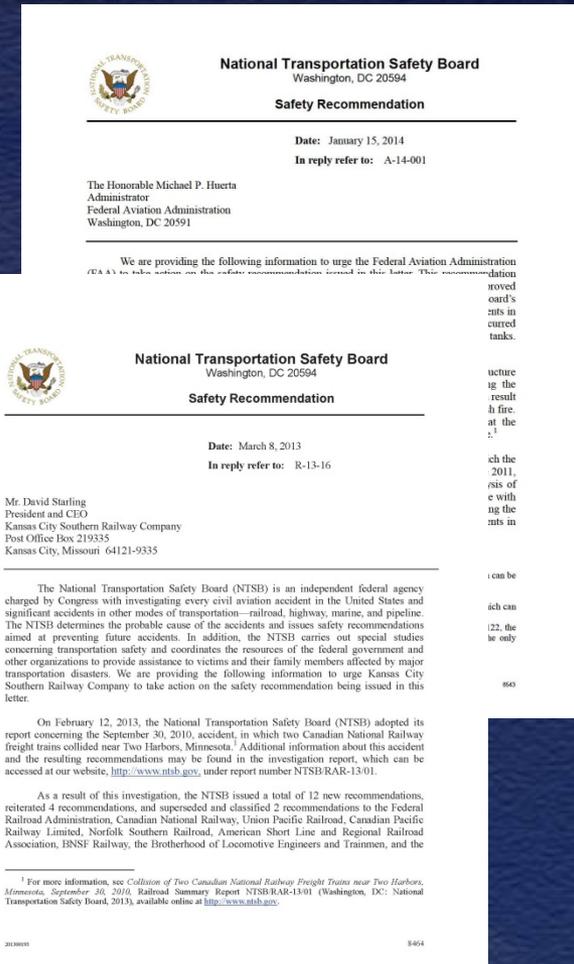
Probable Cause - Contributing Factors

- Company's failure to effectively manage its flight test program; it pursued an aggressive program schedule, without properly defining and implementing roles and responsibilities of team members.
- Lack of proper technical planning and oversight of engineering processes.
- Insufficient identification and mitigation of potential hazards and risks.

Recommendations

12 recommendations issued

- Federal Aviation Administration (FAA) (7)
- Gulfstream (2)
- Flight Test Safety Committee (FTSC) (3)



Recommendation A-12-54 to FAA

Inform domestic & foreign manufacturers of accident circumstances; and advise manufacturers to be cognizant of perils in calculating an aircraft's estimated stall angle of attack.

FAA Response:

- Issued a “Special Airworthiness Information Bulletin” (SAIB) – to advise manufacturers of perils involved in calculating estimated stall angle of attack, and included link to NTSB accident report.
- Advised foreign civil aviation authorities of the recommendation and requested they inform manufacturers under their authority.

NTSB: classified CLOSE-ACCEPTABLE ACTION, March 26, 2013.

Recommendation A-12-62 to Gulfstream

Commission an audit by independent safety experts before start of next major flight test program, to evaluate company's flight test safety management system, as identified in NTSB report, and address areas of concern identified by the audit.

Gulfstream Response:

- Re-commissioned an independent safety review team initially commissioned in wake of the accident, which reviewed the safety management system put in place following the accident, with particular focus on the issues raised in the NTSB report, as well as program management.
- Plans to conduct a third audit in spring 2014, to ensure all recommendations are satisfied.

NTSB: classified CLOSED – ACCEPTABLE ACTION, December 3, 2013.

Recommendation A-12-59 to FTSC

In collaboration with FAA, develop and issue flight test operating guidance for manufacturers, to address deficiencies identified by NTSB regarding flight test operating policies and procedures and their implementation; encourage manufacturers to conduct flights in accordance with the guidance.

FTSC Response:

FAA, issued a similar recommendation, indicates FAA is in discussions with FTSC to develop the guidance, and expects FTSC to complete the action by September 2013.

NTSB: classified OPEN – AWAIT RESPONSE, December 3, 2013.

Communication



ACCIDENT SPECIFIC

- Media briefings/press releases/
social media
- Preliminary Reports
- Public Docket
- Investigative Hearing
- Board Meeting
- Final Report
- Recommendations and follow up

ADVOCACY

- Most Wanted List
- Forums/Symposiums
- Safety Reports
- Safety Alerts
- Speeches/outreach



Benefits

- Independent board and process provides an objective review of facts and analyses.
- Collaborative approach ensures all appropriate entities involved in an accident can contribute to the investigation, and encourages government-industry resolution to safety issues.
- Objective and collaborative process yields credible recommendations that result in safety improvements.
- Recommendations provide basis for safety advocacy.



NTSB

Recommendation A-12-58 to FAA

Inform airports that permit flight test activity of importance to coordinate high-risk flight tests with test operators, to ensure adequate emergency response resources available for such activities.

FAA Response:

- Issued a Certification Alert bulletin to airport authorities, May 5, 2013.
- Bulletin highlights risks associated with high-risk flight test activities; and strongly encourages airport operators to conduct advance coordination with test operators to ensure testing is conducted when adequate emergency response resources are available.

NTSB: classified CLOSED – ACCEPTABLE ACTION,
July 16, 2013.