

# National Transportation Safety Board



American Airlines Flight 587  
Belle Harbor, New York  
November 12, 2001

NTSB Board Meeting  
October 26, 2004



# NTSB Board Meeting AA Flight 587



## Opening Remarks

Robert Benzon



# Accident Summary

- American Airlines Flight 587
- Airbus A300-605R, N14053
- November 12, 2001, 0916 EST
- Belle Harbor, New York
- JFK to Santo Domingo, Dominican Republic



NTSB Board Meeting AA Flight 587



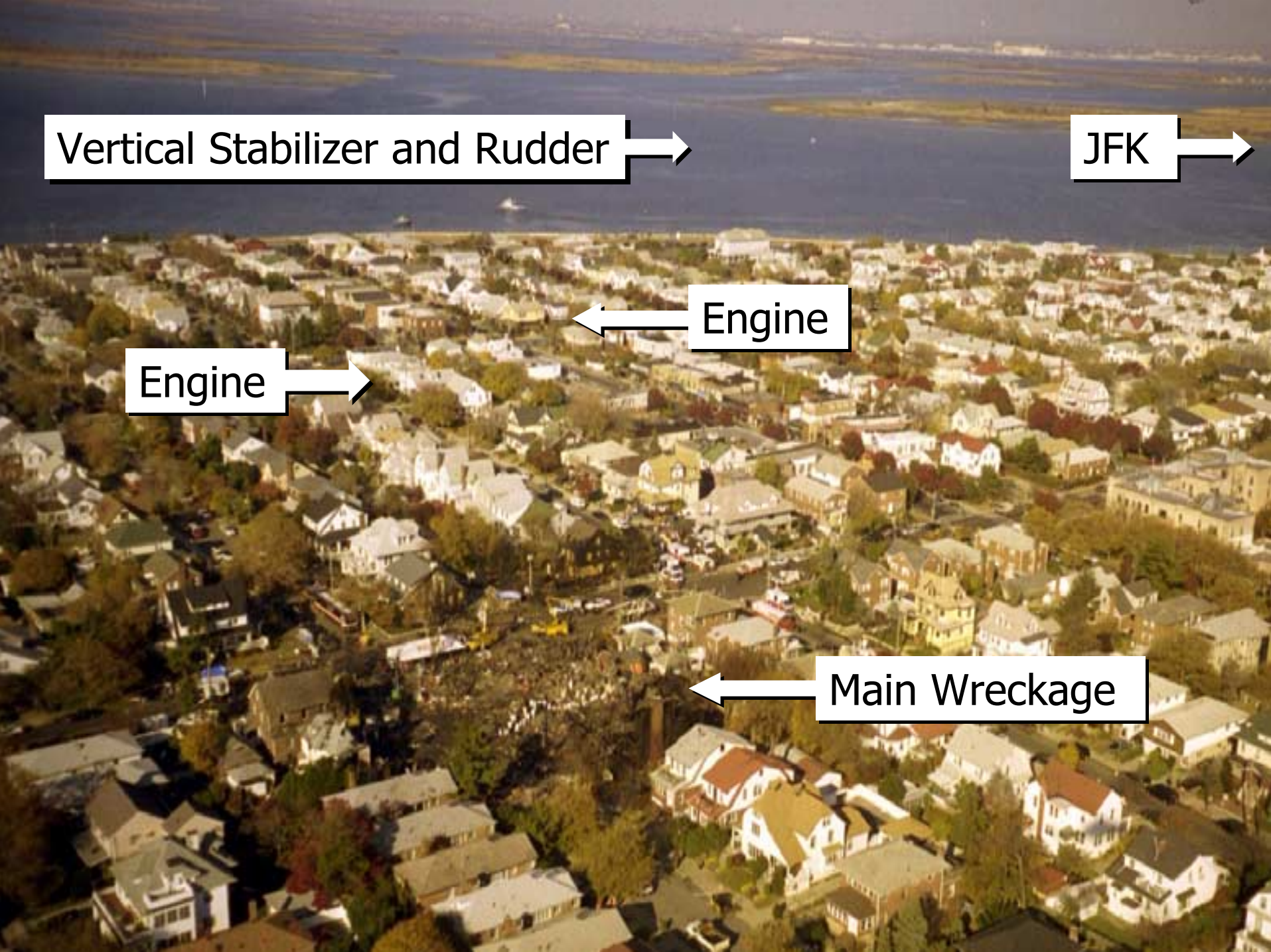
Vertical Stabilizer and Rudder

JFK

Engine

Engine

Main Wreckage



# Investigative Teams

- Operations
- Human Performance
- Aircraft Performance
- Aircraft Structures
- Aircraft Systems
- Witnesses
- Air Traffic Control
- Powerplants



NTSB Board Meeting AA Flight 587



# Investigative Teams

- Video Analysis
- Cockpit Voice Recorder
- Maintenance Records
- Flight Data Recorder
- Sound Spectrum Analysis
- Fault Tree Analysis
- Materials Analysis
- Weather



NTSB Board Meeting AA Flight 587



# On-Scene Investigation



# Engine Teardown Examination





# Removal of Vertical Stabilizer from Jamaica Bay



# Test and Research Activity

- Airbus facilities in Bremen, Hamburg, and Stade, Germany, and in Toulouse, France
- NASA Langley and Ames Research Centers
- Sandia National Laboratory
- Ford Motor Company
- U.S. Army Research Center
- American Airlines Training Academy
- Goodrich Actuation Systems
- Iowa State University
- Wayne State University



NTSB Board Meeting AA Flight 587



# Investigation Activity

## Public Hearing

October 29 through November 1, 2002

## Technical Review Meeting

January 21, 2003

## Nine Recommendations

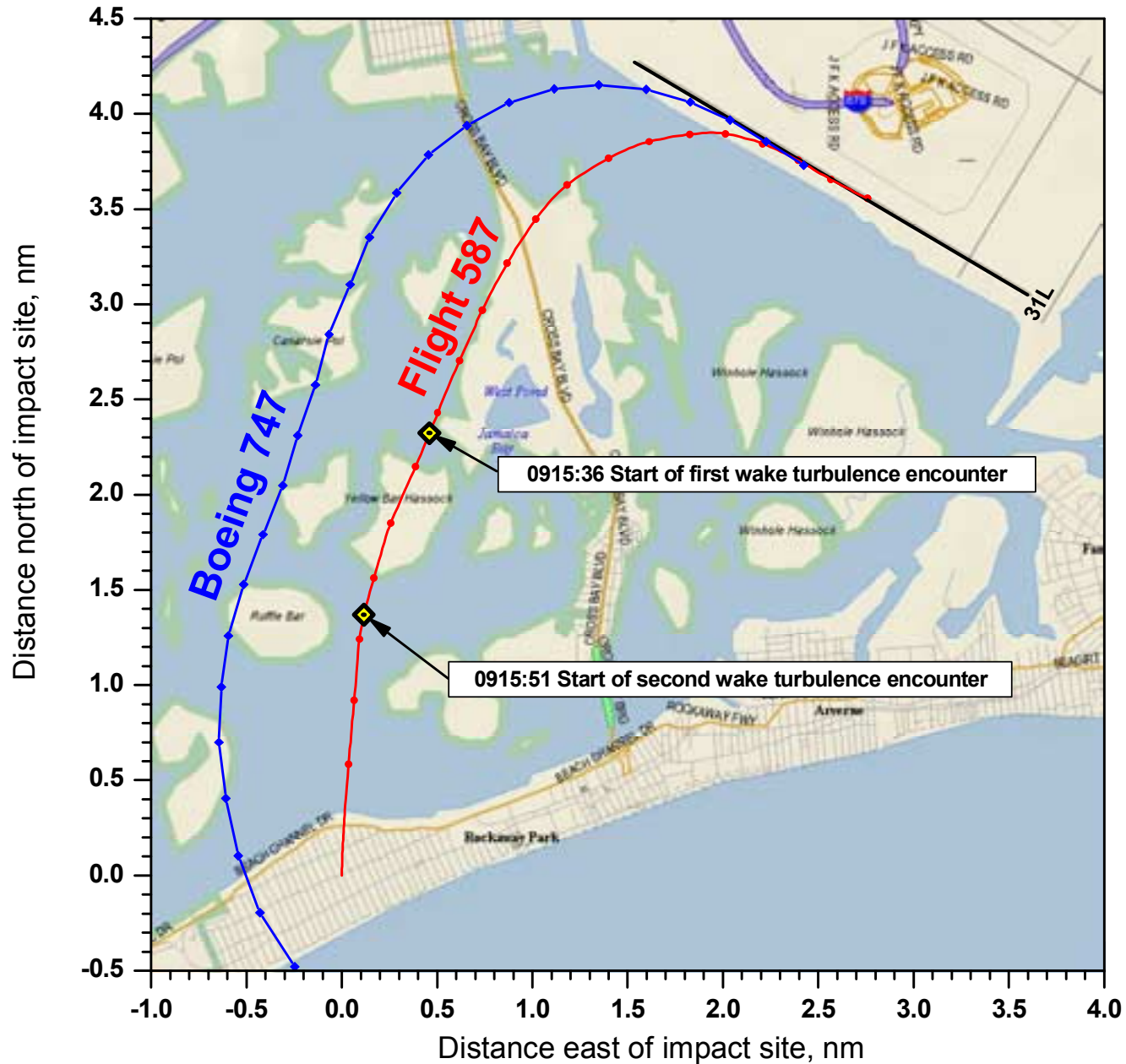
February 2002, September 2003,  
November 2003, May 2004



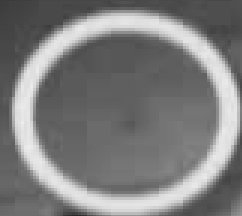
NTSB Board Meeting AA Flight 587



# Flight 587 Wake Encounters



LANE 1 EXT



11/12/81  
08:45:39  
F21T 1005

TWR

... turn left, fly the bridge climb...



09:14:43

545 FT 175 KTS

NTSB

VERTICAL ACCEL

RUDDER: PEDAL SURFACE LATERAL ACCEL

TAIL SECTION

A detailed view of a cockpit instrument panel. The panel is black with various gauges and indicators. The time '09:14:43' is displayed in green on the left. The altitude '545 FT' and speed '175 KTS' are shown in green in the upper middle. The text 'NTSB' is on the far left. The 'VERTICAL ACCEL' gauge is a vertical scale with a needle. The 'RUDDER: PEDAL SURFACE LATERAL ACCEL' section contains three horizontal gauges with needles and scales. The 'TAIL SECTION' gauge shows a diagram of an aircraft tail with red and green lights. Several orange circles are drawn over the panel, highlighting the time, altitude, speed, vertical acceleration, rudder pedal, surface, lateral acceleration, and tail section gauges.

TWR

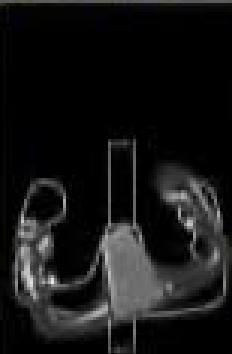
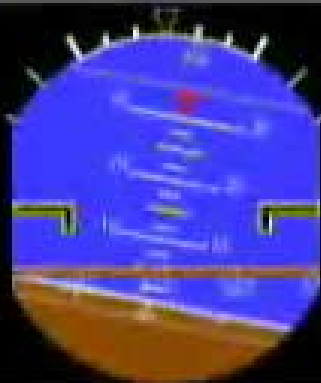
... turn left, fly the bridge climb...



09:14:43

545 FT 175 KTS

NTSB



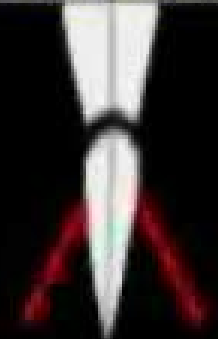
VERTICAL  
ACCEL

RUDDER:  
PEDAL

SURFACE

LATERAL ACCEL

TAIL  
SECTION



# Significant Findings

- First officer's control wheel and rudder inputs during the second wake encounter were unnecessary and too aggressive.
- The American Airlines Advanced Aircraft Maneuvering Program (AAMP) ground school encouraged pilots to use rudder during upset recovery.





# Significant Findings

- AA AAMP excessive bank angle simulator exercise could have provided negative training.
- The A300-600 rudder control system is susceptible to potentially hazardous rudder pedal inputs at higher airspeed.



NTSB Board Meeting AA Flight 587



# NTSB Investigative Effort

- 100,000 man hours
- 1,079 days
- 8,000+ pages of documentation
- 200+ concurrent investigations
- About \$3,725,000 in direct cost to NTSB



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Operations: D. Ivey
- Human Performance: M. Brenner
- Human Performance: K. Poland
- Aircraft Performance: J. O'Callaghan
- Structures: B. Murphy
- Materials: M. Fox



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Systems: S. Magladry
- Witnesses: L. Schiada
- Air Traffic Control: S. Dunham
- Powerplants: J. Hookey
- Weather: G. Salottolo
- Ground Test Coordinator: S. Warren



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Video: D. Brazy
- CVR: A. Reitan
- Maintenance Records: F. McGill
- FDR: C. Johnson
- FDR: D. Grossi



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Writer: J. DeLisi
- Writer: K. Lanier
- Writer: K. Stein
- Editor: N. Coleman
- Administration: E. Bellinger
- Administration: V. Corbett



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Hearing Officer: L. Ward
- Sound Spectrum: J. Cash
- Fault Tree: D. Schulze
- Materials: C. Schultheisz
- Animations: A. Park
- Animations: C. Spangler
- Graphics: G. John
- Graphics: W. Skolochenko



NTSB Board Meeting AA Flight 587



# AA 587 NTSB Staff

- Trans. Disaster Assistance: S. Bryson
- Trans. Disaster Assistance: E. Groszof
- Trans. Disaster Assistance: B. Fiffick
- Trans. Disaster Assistance: D. Chupp



NTSB Board Meeting AA Flight 587





# AA 587 NTSB Staff

- Public Affairs: T. Lopatkiewicz
- Public Affairs: P. Schlamm
- Public Affairs: K. Holloway
- Public Affairs: T. Williams
- Recommendations: J. Marcus



NTSB Board Meeting AA Flight 587



# Participants to the Investigation

## Federal Aviation Administration

Coordinator: T.R. Proven

## The Bureau d'Enquetes et d'Analyses pour la Securite de l'Aviation Civile

Accredited Representative: P. Jouniaux

Accredited Representative: B. Bourdon



NTSB Board Meeting AA Flight 587



# Participants to the Investigation

## Airbus

Advisor: T. Thoreau

## American Airlines

Coordinator: C. Lewis

## Allied Pilots Association

Coordinator: J. David

## National Air Traffic Controllers Association

Coordinator: J. Haley



NTSB Board Meeting AA Flight 587



# Participants to the Investigation

## Association of Professional Flight Attendants

Coordinator: J. Matley

## GE Aircraft Engines

Coordinator: K. Wolski

## Honeywell Engines and Systems

Coordinator: P. Baker



NTSB Board Meeting AA Flight 587



# Organization of This Meeting



NTSB Board Meeting AA Flight 587



# Organization of This Meeting

## Technical Issues

- Airplane Performance



NTSB Board Meeting AA Flight 587



# Organization of This Meeting

## Technical Issues

- Airplane Performance
- Airplane Structures



NTSB Board Meeting AA Flight 587



# Organization of This Meeting

## Technical Issues

- Airplane Performance
- Airplane Structures
- Composite Material and Wreckage Examination



NTSB Board Meeting AA Flight 587





# Organization of This Meeting

## Factors

- Design characteristics of the A300-600 rudder system
- Pilot inputs to the rudder control system
  - Experience
  - Training factors

## Accident Sequence



NTSB Board Meeting AA Flight 587



# National Transportation Safety Board



American Airlines Flight 587  
Belle Harbor, New York  
November 12, 2001

NTSB Board Meeting  
October 26, 2004

