NTSB Board Meeting
AA Flight 587

Operational Factors

Captain David J. Ivey

Training Issues

Training Issues

- American Airlines Advanced Aircraft Maneuvering Program (AAMP)

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- Lack of flight crew training about the A300-600 rudder system

Training Issues

- American Airlines Advanced Aircraft Maneuvering Program (AAMP)
- Lack of pilot training about the A300-600 rudder system
  - Changes in rudder pedal sensitivity
  - Changes in rudder pedal travel limits
  - Airplane response to rudder inputs
  - Design maneuver speed

American Airlines Advanced Aircraft Maneuvering Program

- Ground School Training
- Simulator Flight Training

AAMP Ground School Training

AAMP Ground School Training

- Unusual attitudes and recovery strategies

AAMP Ground School Training

- Unusual attitudes and recovery strategies
- Aerodynamics and use of flight controls, including rudder, during recovery

AAMP Ground School Training

- Did not fully explain airplane response to rudder inputs

AAMP Ground School Training

- Did not fully explain airplane response to rudder inputs
- Did not explain rudder pedal characteristics at higher airspeeds

AAMP Simulator Flight Training

Excessive Bank Angle Exercise

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- Wake turbulence scenario

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- Roll 10 degrees in one direction

Excessive Bank Angle Exercise

- Wake turbulence scenario
- Roll 10 degrees in one direction
- Roll past 90 degrees in the opposite direction

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Excessive Bank Angle Exercise

- Wake turbulence scenario
- Roll 10 degrees in one direction
- Roll past 90 degrees in the opposite direction
- Flight controls initially inhibited
- Pilots unaware that flight controls were initially inhibited

Simulator Flight Training Deficiencies

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- Unrealistic wake turbulence encounter

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- Flight control inhibition may have conditioned use of rudder

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- Potentially masked movement of rudder pedal stops

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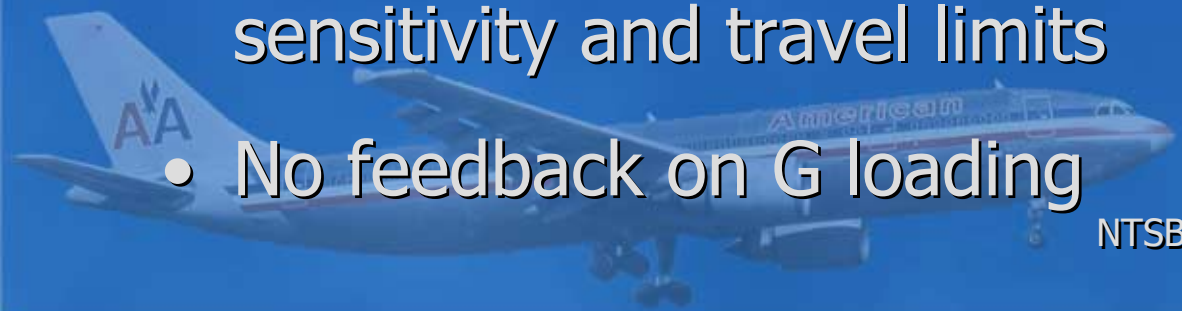
Simulator Flight Training Deficiencies

- Unrealistic wake turbulence encounter
- Flight control inhibition may have conditioned use of rudder
- Potentially masked movement of rudder pedal stops
- Pilots not informed of changing rudder pedal sensitivity and travel limits
- No feedback on G loading



Flight Crews Lack Experience in Rudder Use at High Airspeeds

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- Pilots may not have experienced airplane response resulting from rudder use at high airspeeds.

Flight Crews Lack Experience in Rudder Use at High Airspeeds

- Pilots are experienced in using control column and wheel at all airspeeds.
- Pilots primarily use rudder controls at low airspeeds.
- Pilots have not experienced airplane response resulting from rudder use at high airspeeds.
- Lack of experience is typical of pilots throughout the industry.

Additional Flight Crew Misconceptions

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- The rudder limiting system would protect the structure from pilot inputs.
- The rudder pedal travel and rudder pedal forces were thought to be unchanged.

Conclusion

- AAMP did not address rudder pedal forces at high airspeeds.
- Simulator training did not present realistic wake turbulence scenarios.
- Operating manuals did not provide useful information.

National Transportation Safety Board

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

NTSB Board Meeting
October 26, 2004