National Transportation Safety Board

Bagram, Afghanistan: Issues Regarding Special Cargo

ALPA Air Cargo Safety Symposium
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National Transportation Safety Board

Outline

- NTSB Basics
- Issues From This Investigation re Special Cargo Loads

NTSB 101

- Independent federal agency, investigate transportation mishaps, all modes
- Determine probable cause(s) and make recommendations to prevent recurrences
- Primary product: Safety recommendations
  - Favorable response > 80%
- *SINGLE FOCUS IS SAFETY*
- Independence
  - Political: Findings and recommendations based upon evidence rather than politics
  - Functional: No “dog in the fight”

The Challenges: Large Special Cargo

- Nonstandard, odd-sized cargo
- No unit load devices (ULD) used
- Free-floating pallets loaded along the centerline of the cargo deck
- Pallets did not lock into cargo handling system restraint devices

Accident Flight

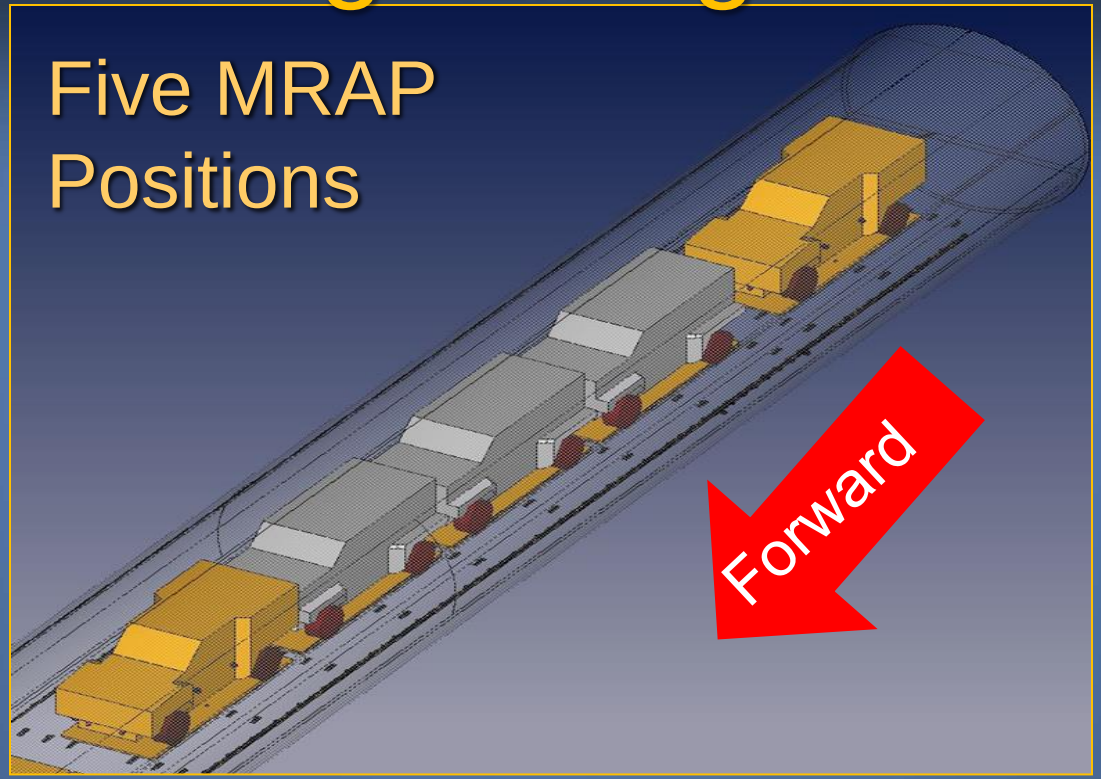
- April 29, 2013
- Boeing 747-400 BCF
- Departing Bagram, Afghanistan
- Carrying Five MRAPs

Five Mine Resistant Ambush-Protected (MRAP) Vehicles

Two 12-ton M-ATVs

Three 18-ton Cougars

Loading Configuration



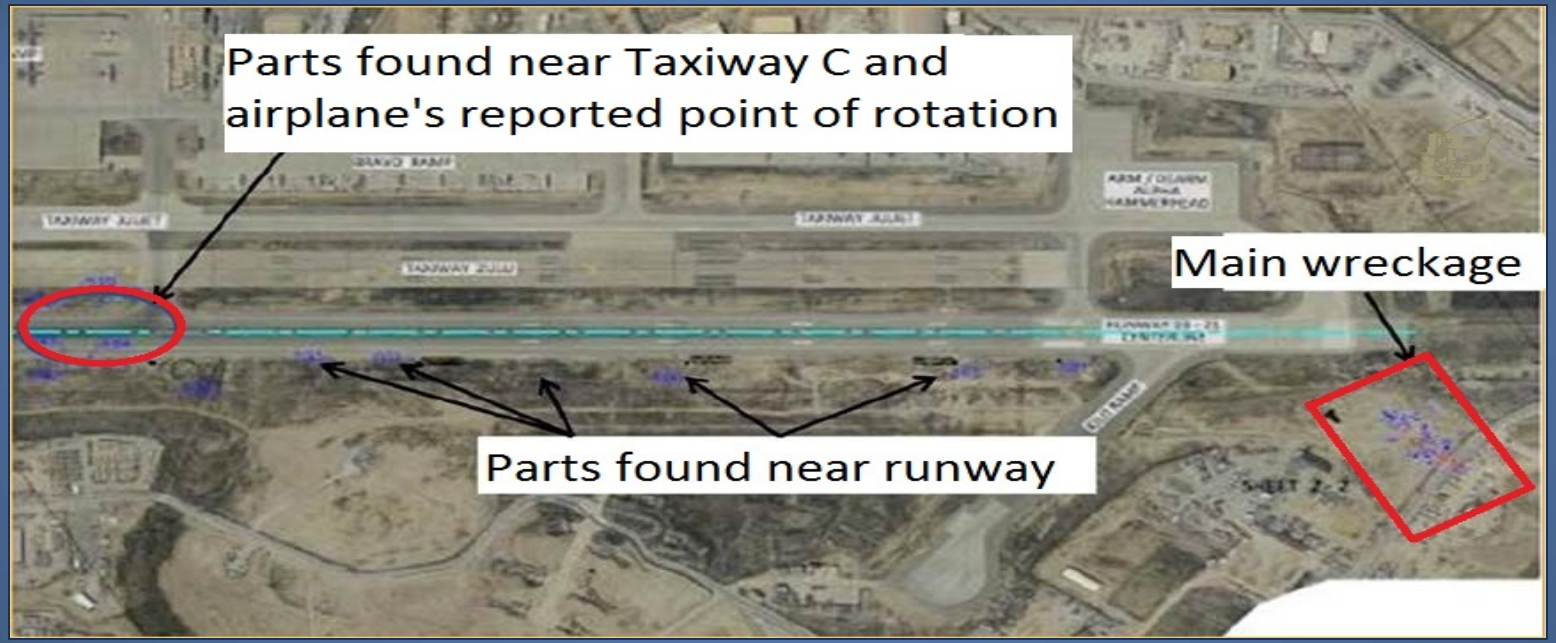
Crew Observations in Bagram

- Cargo had moved “a couple inches” during previous 1.7 hour flight
- Straps keeping load from moving backward were loose
- One strap had broken
- Straps were being “cinched down”

Accident Sequence

- “Gear up” call immediately after takeoff
- CVR and FDR stopped recording
  - Event was recorded on a nearby dash-cam
- Airplane entered steep climb with high pitch attitude
- Aerodynamic stall, rolled right, rapid descent
- Impacted nose down, nearly wings level, about 30 seconds after CVR/FDR ceased
- Aircraft destroyed, fatal to all seven crew

Airplane, MRAP Debris on Runway



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Runway Area Debris

- Aircraft pieces
  - Two small pieces of fuselage skin
  - Segment of hydraulic return tubing
  - Section of the E8 rack support stanchion
  - Reinforcement bracket for a hydraulic line pass-through a fuselage frame
- MRAC piece
  - Part of a M-ATV antenna assembly

M-ATV, FDR, and CVR Damage

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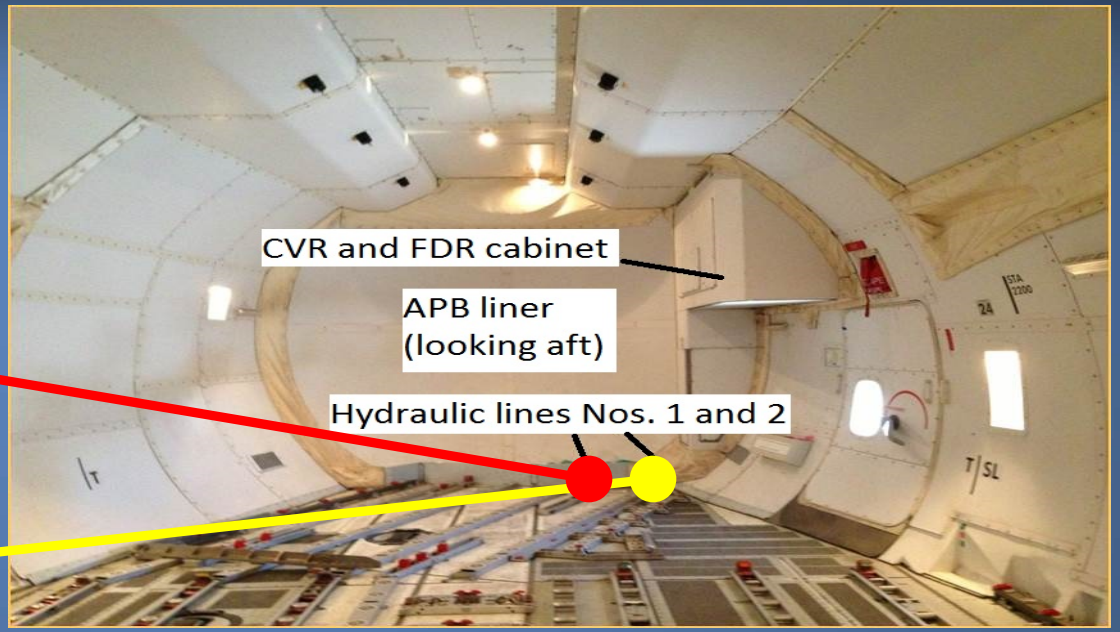
Aft Pressure Bulkhead and Tire Witness Marks

Hydraulic System Failures



Airplane Performance Study

- Evidence: Rear M-ATV moved aft
- Performance simulation
  - Available FDR data
  - Aerodynamic modeling
- Simulation matched rotation, initial climb data with one M-ATV shifted aft

Performance Study (con't)

- Scenario: Hydraulic Nos. 1 & 2 failed
  - Uncontrollable if 4 or 5 vehicles moved aft
  - No direct evidence that more than one vehicle moved aft
  - Uncontrollable if horizontal stabilizer displaced at least 5 degrees due to damage from M-ATV

Safety Issues

- Deficient procedures for securing special cargo loads
- Inadequate guidance regarding use of FAA-approved data
- Lack of certification for cargo handling personnel

Safety Issues (con't)

- Inadequate FAA oversight of cargo operator manuals
- Unclear FAA inspector responsibilities
- Inadequate FAA inspector training
- Unlimited deferral of surveillance

Loadmaster Role

- Loadmaster responsible for ensuring cargo properly loaded and secured
- Loadmasters who are responsible for special cargo travel with airplane
- Pilots rely on loadmaster to ensure cargo properly loaded and secured

Loadmaster Position

- Originated in the military
  - Required crewmember
  - Extensive training
- Civilian:
  - No training requirements
  - Not FAA-certified
- No definition of “qualified loadmaster” in SAFO 13005

Probable Cause

- . . . [I]nadequate procedures for restraining special cargo loads, which resulted in the loadmaster's improper restraint of the cargo, which moved aft and damaged hydraulic systems Nos. 1 and 2 and horizontal stabilizer drive mechanism components, rendering the airplane uncontrollable. Contributing to the accident was the FAA's inadequate oversight of National Airlines' handling of special cargo loads.

Recommendations to FAA

- Revise AC120-85, “Air Cargo Operations,” to specify that operators should use FAA-approved data, and only FAA-approved data, regarding restraining special cargo
- Create a certification for personnel who are responsible for the loading, restraint, and documentation of special cargo
- Add a special emphasis item to FAA Order 1800.56O, “National Flight Standards Work Program Guidelines,” for inspectors of Part 121 cargo operators to ensure that the procedures, documents, and support in the areas of loading and restraint of special cargo are based on relevant FAA-approved data

Recommendations (con't)

- Include guidance in the FAA inspector handbook that defines responsibilities for principal inspectors for the oversight of an operator's loading, restraint, and documentation of special cargo
- Provide training for principal inspectors who have oversight responsibilities for air carrier cargo handling operations that specifically addresses special cargo
- Implement temporary risk-reduction methods any time that required surveillance items for Part 121 and 135 operators are deferred, and establish appropriate limitations on surveillance deferrals

Conclusion

– Accidents related to special cargo are rare

- but -

– Increased attention is needed for special cargo operations regarding operators and the FAA

Thank You!!

Questions?