NTSB National Transportation Safety Board

Collaboration

to Improve

Runway Safety

Presentation to: ALPA

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Runway Safety Accidents, 1995-2010

Event	No.	Fatal	%	Fatalities
Incursions	11	6	55	129
Excursions	652	65	10	1121
Confusions	6	4	67	136

Note: Of 1429 accidents involving major or substantial damage from 1995-2008, 431 (30%) were runway related
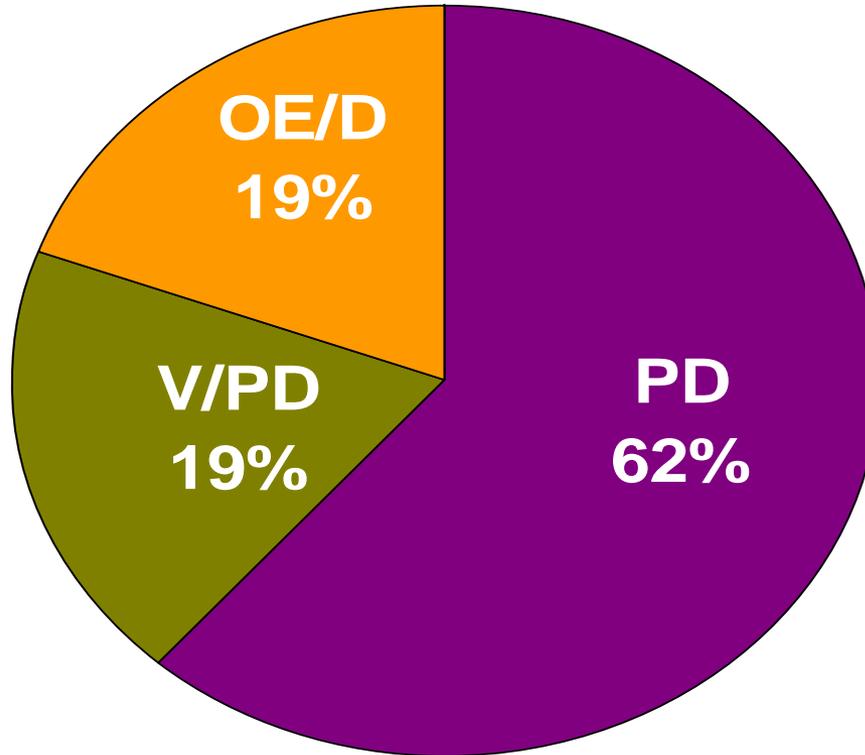
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Runway Incursions

- Previously defined by FAA as hazard created by airplane or vehicle on the runway when it should not have been

- Now generally defined as airplane or vehicle on the runway when it should not have been, whether or not hazard was created

- Runway incursion at Tenerife had most fatalities (583) of any accident in aviation history

Recent Examples

- – **December 31, 2010: A runway incursion occurred at the Denver International Airport involving a airport vehicle and an Embraer RJ-190**

- – **March 19, 2010: A runway incursion occurred at the Phoenix Sky Harbor International Airport (PHX) involving a Cessna 208 and a Boeing 737-700**

- – **January 31, 2011: A runway excursion led to a runway incursion at the Dayton International Airport involving an Embraer E145**
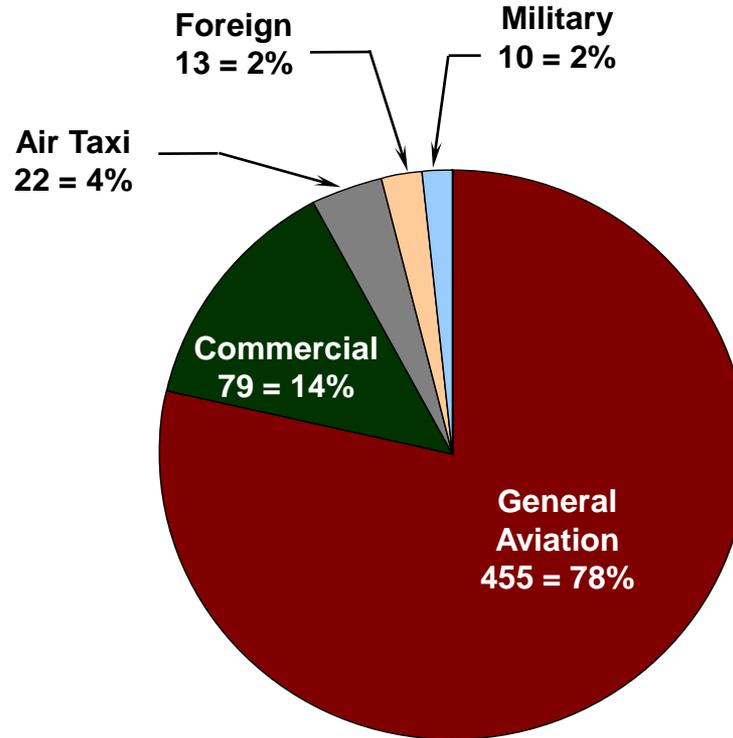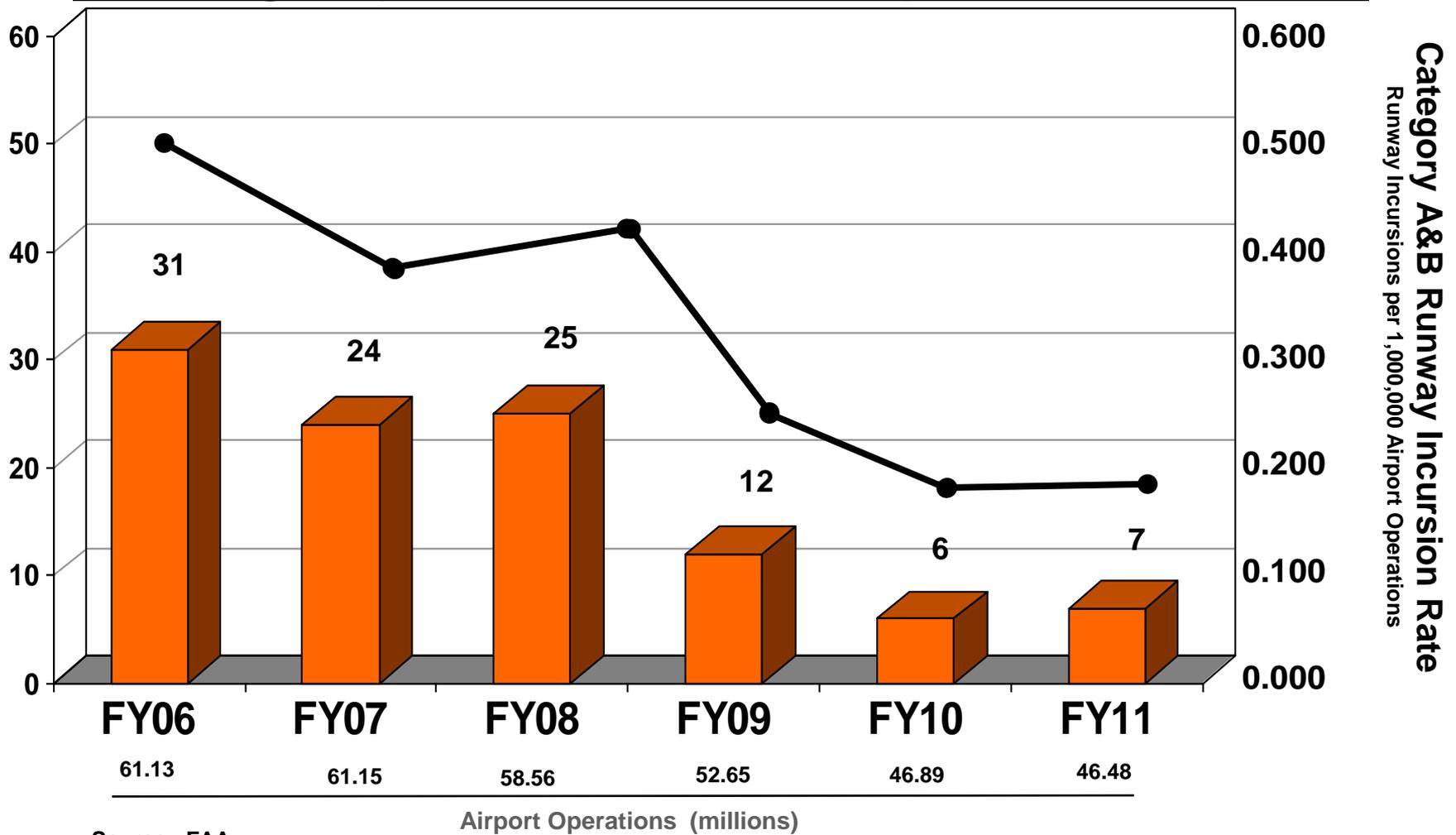
Type of Runway Incursions

FY 2006-2011

Source: FAA

Runway Incursion Pilot Deviations by Type of Operation

Foreign
13 = 2%

Military
10 = 2%

Air Taxi
22 = 4%

Commercial
79 = 14%

General Aviation
455 = 78%

579 Pilot Deviations

Source: FAA

Category A&B Runway Incursions

Source: FAA

NTSB Recommendations

- Immediate Collision/Incursion Warning in the Cockpit

- Specific Clearance for Each Runway Crossing

- Cockpit Moving Map Displays to Alert re Wrong Runway

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The Challenges

– **Many more airplanes, no more concrete**

– **Inadequate understanding of "Why"**

– **Incursions usually result from series of errors, many links in the chain**

– **System problems demand system solutions**

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Current Process

- ATC identifies type of problem

- Handling of problem depends largely on ATC's identification of who made the last mistake

- If ATC says ATC made last mistake: handled by ATC

- If ATC says pilot made last mistake: handled by FAA Flight Standards

Result

- **Selection bias**

- **Process created for enforcement, rather than for finding and fixing problem**

- **Each person says it was other person's fault, cannot get complete picture from one person**

- **Does not result in system solutions for system problems**

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Suggested Process

- **Process should not depend upon who made last mistake**

- **Bring all involved parties (pilots, controllers, vehicle drivers) together, find out what happened**

- **No enforcement action (absent criminal or intentional wrongdoing)**

- **Ascertain totality of circumstances**

Starting Out

– **Start with trouble spot locations**

– **Pick problems that NTSB will not investigate**

– **Target systemic issues, not just "Joe had a bad day"**

– **Try limited number as beta tests, then evaluate effectiveness**
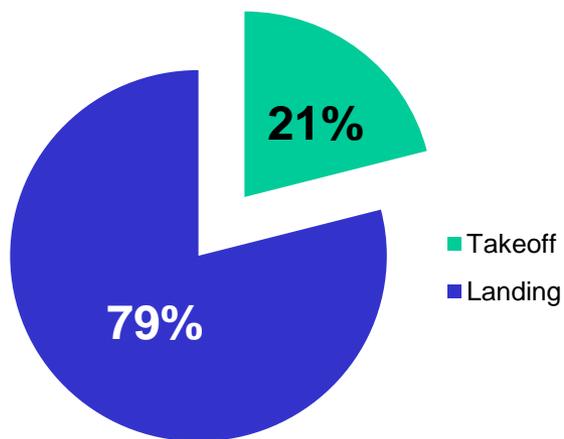
Runway Excursions

- **Includes takeoff overruns, landing overruns, and departing the runway laterally during takeoff or landing**

- **Does not include landing short**

- **Almost 60 times more excursion accidents than incursion accidents**

- **Almost 11 times more fatal excursion accidents than fatal incursion accidents**

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Recent Examples

- July 30, 2011: Caribbean Airlines Flight 523 overran the runway at Cheddi Jagan International Airport, Georgetown, Guyana

- April 4, 2011: United Airlines Flight 497 exited runway laterally at Louis Armstrong New Orleans International Airport after emergency landing due to warning of smoke in an equipment bay

- December 29, 2010: American Airlines Flight 2253 overran the runway at Jackson Hole Airport
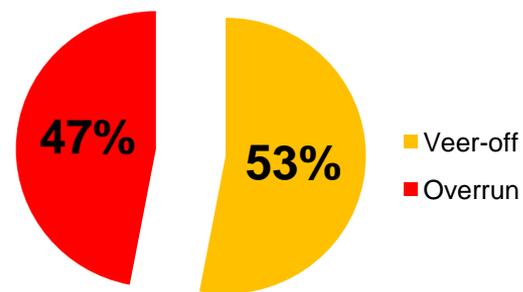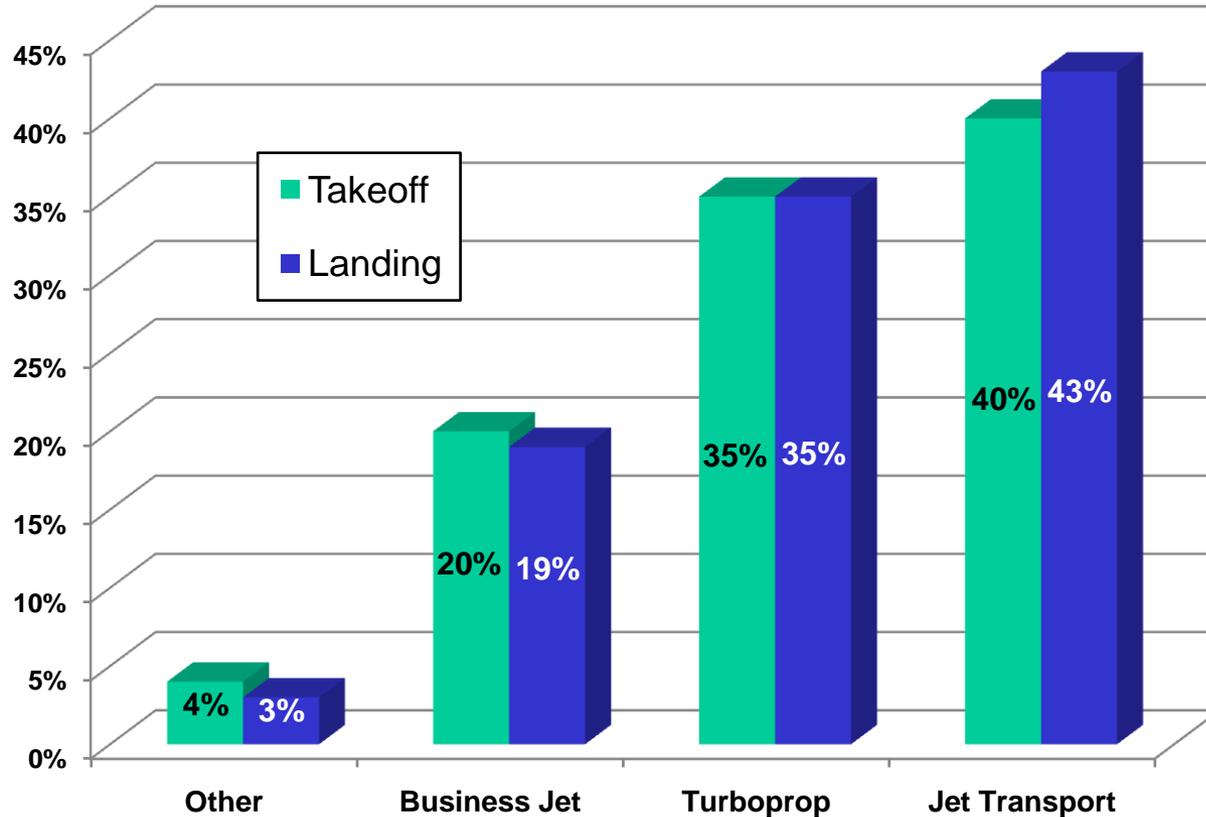
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Runway Excursions

Total Excursions

21% Takeoff

79% Landing

Takeoff Excursions

37% Veer-off

63% Overrun
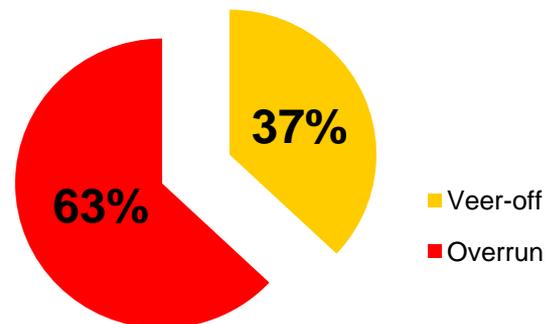
Landing Excursions

47% Overrun

53% Veer-off

Runway Excursions by Aircraft Type

NTSB Recommendations

- – **Owatonna, MN, 2008: Current information for landing distance assessments**

- – **Denver, CO, 2008: Gusty crosswinds**

- – **Chicago, IL, 2005: Landing distance assessments w/ 15% margin; braking condition reports; thrust reverser delay**

- – **Burbank, CA, 2000: Runway safety areas; arresting systems**

Collaborative Process?

– **Worth considering**

– **Not as likely to be helpful**

Runway Confusions

- **Includes using other than dedicated or assigned surface for takeoff or landing, e.g., taxiway other than runway, or wrong runway**

- **Less than 1% of runway related accidents**

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Recent Examples

– **Atlanta Hartsfield International Airport, 2009: Boeing 767, cleared to land on Runway 27R, landed on taxiway M**

– **Seattle-Tacoma International Airport, 2004: deHavilland DHC-8, cleared to land on Runway 16R, landed on Taxiway T**

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NTSB Recommendations

Atlanta

– **Determine if ASDE-X can detect improper operations such as landings on taxiways**

– **If so, implement modifications accordingly to provide alerts to air traffic controllers**

– **Amend FAA Order 7210.3, "Facility Operation and Administration," to help assure that airport lighting control panels create desired lighting intensities**

– **Revise AC 150/5345-56A, "Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS)" to help assure that airfield lighting meets FAA requirements**

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Recommendations (con't)

Seattle

- Conduct research to establish marking standards for use on taxiways at airports with a recurring taxiway landing problem

- Revise Advisory Circular 150/5340-1H, "Standards for Airport Markings," accordingly

- Meanwhile, allow Seattle-Tacoma International Airport, as an interim solution, to apply large nonstandard taxiway identification markings to taxiway T

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Collaborative Process?

- May be as helpful as with incursions

- Not as many opportunities

Conclusion

- Effective collaboration is why CAST has been so successful

- NTSB relies upon collaboration in accident investigations

- Collaboration can also help aviation community address runway incursions, confusions, and possibly also excursions

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Thank You!!!

Questions?