

Runway Safety Trends *and* Runway Incursion Analysis

Presented at:
NTSB Forum on Runway Incursion
Safety Issues

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FAA Runway Safety Group



The Runway Safety Group serves as the focal point for all FAA runway safety efforts as well as the agency's primary representative to industry, national and international aviation entities on runway safety.



In our efforts to provide more insight into the effectiveness of the Runway Safety Program in reducing risk in the NAS, this presentation will be provided as it relates to one or more of the core Runway Safety Program activities:



Data Monitoring and Analysis (Safety Assurance)

Mitigation Plan Development (Safety Risk Assessment)

Safety Policy Changes

Outreach and Education (Safety Promotion)

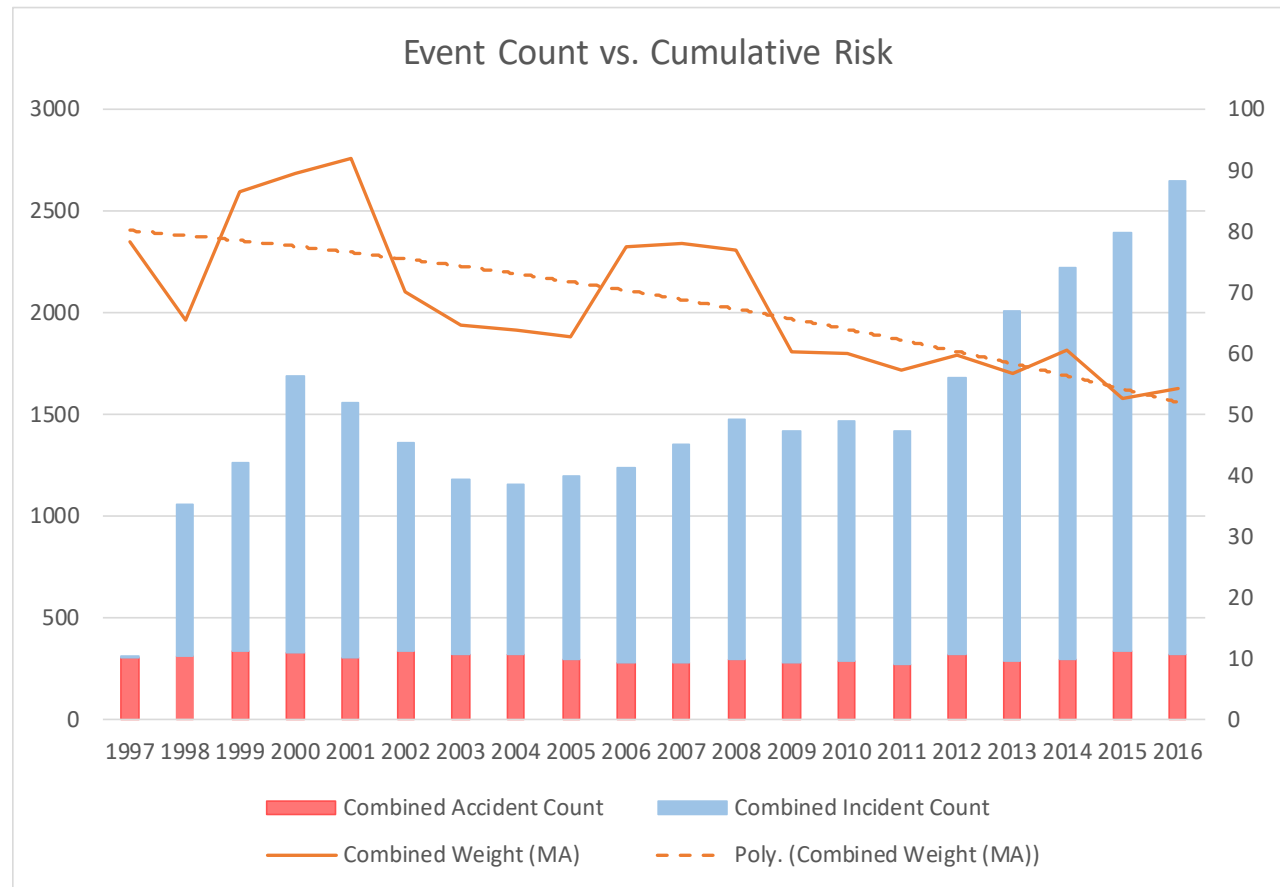


Safety Assurance:

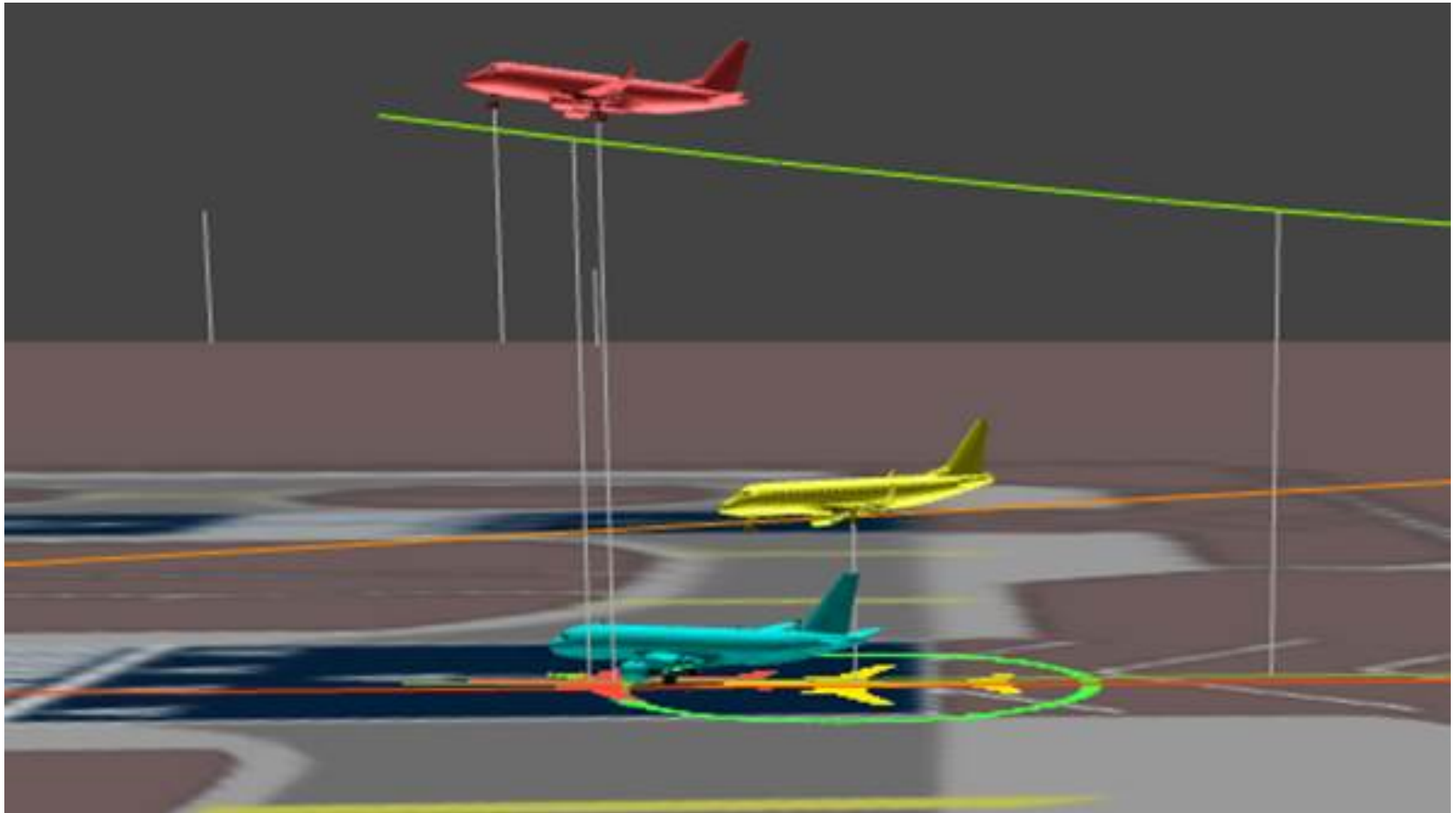
Combined Risk & Event Count

Observations:

- Risk decreased
- Reports increased
- Accidents relatively constant over time



Safety Risk Management: Reducing the Severity of Runway Incursions



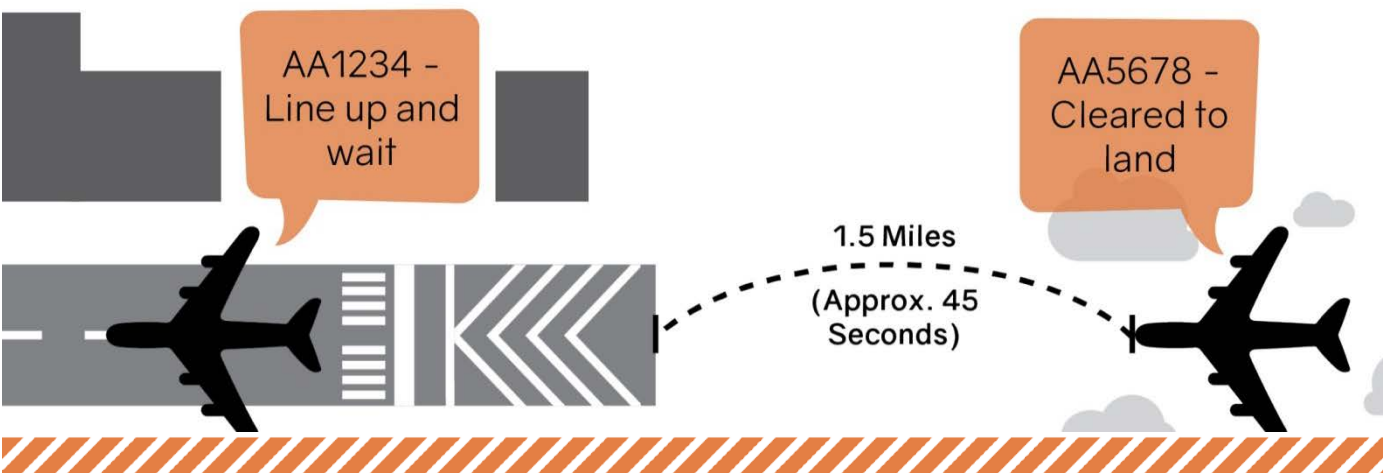
Safety Risk Management: Reducing the Severity of Runway Excursions



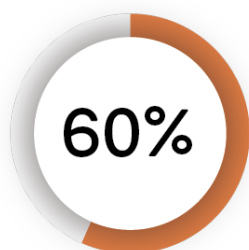
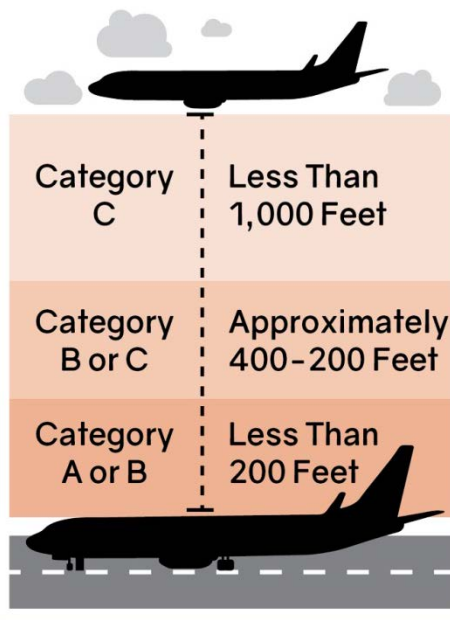
Safety Promotion: Providing Actionable Information

SAFETY IN SECONDS

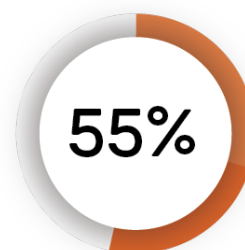
YOU HAVE LESS THAN A MINUTE TO DO THE RIGHT THING



What Is A Flyover Runway Incursion?



Category A or B runway incursions in FY15 were flyover events



Category A or B runway incursions in FY16 were flyover events



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Runway Incursion Definitions

A Runway Incursion is... “Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.” (ICAO Doc 4444 - PANS-ATM)

Severity Categories:

A

Serious incident in which a collision is **narrowly avoided**

B

Incident in which separation decreased and there is a **significant potential for collision**, which may result in a time critical corrective/evasive response to avoid a collision

C

Incident characterized by **ample time and/or distance** to avoid a collision

D

Incident that **meets definition of a runway incursion** but with no immediate safety consequences



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Runway Incursions By The Numbers

12,857

Runway
Incursions

6,150

FY12 - FY16

OVER
10 YEARS



Pilot
Deviation



Vehicle/
Pedestrian



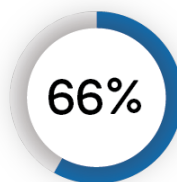
ATC
Incident

80% Involved General
Aviation Aircraft

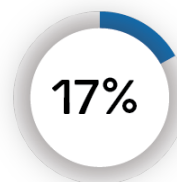


FY17 RUNWAY INCURSIONS

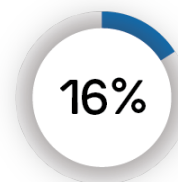
1,341
RUNWAY
INCURSIONS



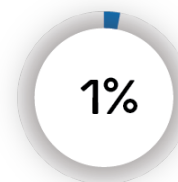
Pilot
Deviation



Vehicle/
Pedestrian

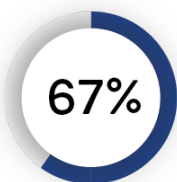


ATC
Incident

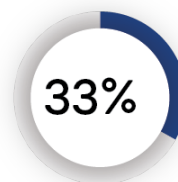


Other

6
A&B
EVENTS



ATC
Incident



Pilot
Deviation



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Runway Safety Mitigation Plan Development (Safety Risk Assessment)

- ▶ Identified Runway Incursions as one of the agency's priority Safety Issues for FY17
- ▶ Conducted assessment of all FY16 category A, B, and C runway incursions to identify new or improve existing mitigations
- ▶ Assessed more than 770 runway incursion events based on type to determine primary causal and contributing factors and barriers in place intended to mitigate the severity of the event

While many events could have been assigned several contributing factors and barriers, the primary factor or barrier was identified for purposes of understanding and analyzing these events.



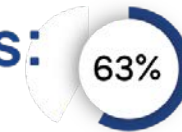
Assessment of A, B, & C Runway Incursion Data

As a result of the annual increase in the number of reported RIs of all Categories, the FAA identified runway incursions as a safety issue in FY17.

To identify the contributing factors and mitigations, Subject Matter Experts (SMEs) and panel members from Lines of Business (LOBs) across the agency, along with three representatives from various pilot organizations (e.g., Aircraft Owners and Pilots Association, the Air Line Pilots Association (ALPA), and the National Business Aviation Association) reviewed the data.

Reviewed 265 OIs

Causes:

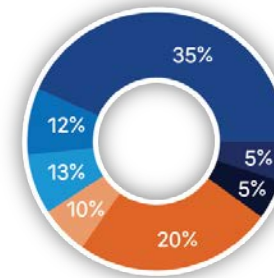


ATC cleared aircraft to land/depart on an occupied runway



ATC did not monitor aircraft position on approach to intersecting runway

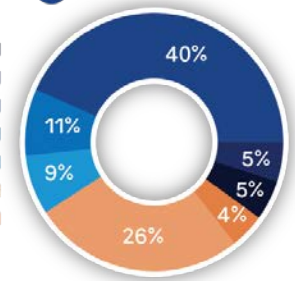
Contributing Factor:



- Distraction By Other Aircraft
- ATC Did Not Comply With 7110.65 Requirements
- Misjudge (Optimistic Expectations)
- Anticipated Separation Rule (Tower Only)
- ATC Overlooked Traffic Due to Ineffective Runway Scan
- ATC Was Unaware Aircraft/Vehicle Location
- Other

Barriers or Mitigations:

- ASDE-X
- Corrective Action by Controller or Pilot
- Unknown
- Canceled Takeoff Clearance
- Traffic Call
- Go Around
- Other



Analysis Summary 361 FY16 Pilot Deviations (PD)

Causes:



Pilot Failed to Hold Short of Runway as Instructed



Pilot Failed to Hold Short of Runway

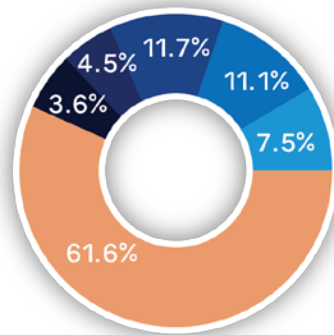


Pilot Did Not Follow ATC Clearance



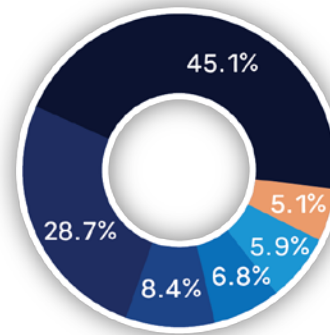
Pilot Departed Without Departure Clearance

Contributing Factor:



- Training
- Expectation Bias
- Distraction
- Inattention
- Confusion
- Communication

Barriers or Mitigations:



- Unknown
- Go Around
- Traffic Advisory
- Canceled Takeoff Clearance
- Corrective Action by Controller or Pilot
- ASDE-X



Analysis Summary of 74 FY16 Vehicle/Pedestrian Deviations (VPD)

Causes:

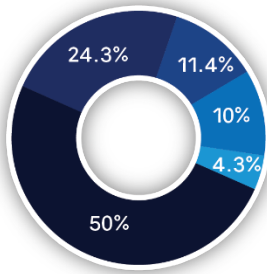


Driver Entered the Runway Without ATC Authorization



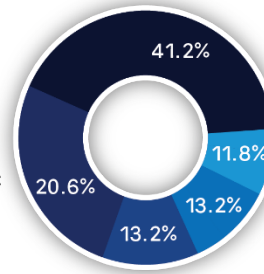
Driver Failed to Hold Short of Runway

Contributing Factor:



- Vehicle Driver Confusion
- ATC Unaware of Location of Vehicle
- Driver Failed to Follow Taxi Instructions
- ATC Did Not Ensure Correct Readback
- Incorrect/Inadequate Phraseology (ATC Speech)

Barriers or Mitigations:



- ATC Instructions to Aircraft
- ATC Instructions to Vehicle
- Airport Signs and Markings
- Vehicle Driver Training
- Surface Surveillance Technology, ASDE-X



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