Runway Safety

Presented to: RASG – Pan America Meeting
By: James White, Deputy Director
    Airport Safety and Standards, FAA
Date: November, 2009
Reducing Safety
Surface Operations Risk Factors

Minimal separation and rapid pace

High-speed operations with little margin for error

Complex environment

Low visibility in poor weather

Combination of Factors Minimizes Safety Margin
All Categories of Runway Incursions

- FY05: 779 runway incursions, rate 12.36 per 1,000,000 airport operations (63.01 per 1,000,000 estimated tower operations)
- FY06: 816 runway incursions, rate 13.34 per 1,000,000 airport operations (61.13 per 1,000,000 estimated tower operations)
- FY07: 892 runway incursions, rate 14.57 per 1,000,000 airport operations (61.15 per 1,000,000 estimated tower operations)
- FY08: 1009 runway incursions, rate 17.23 per 1,000,000 airport operations (58.56 per 1,000,000 estimated tower operations)
- FY09: 951 runway incursions, rate 18.09 per 1,000,000 airport operations (52.59 per 1,000,000 estimated tower operations)

Runway Incursion Rate

* Rates are based on Estimated Tower Operations

Rate est. 18.08* as of 09/30/09
Category A&B Runway Incursions

Runway Incursions per 1,000,000 Airport Operations

- FY05: 29, 0.460
- FY06: 31, 0.507
- FY07: 24, 0.392
- FY08: 25, 0.427
- FY09: 12, Rate est. 0.228 * as of 09/30/09

Performance Reference = 0.472 *

* Rates are based on Estimated Tower Operations

Airport Operations (millions)
- FY05: 63.01
- FY06: 61.13
- FY07: 61.15
- FY08: 58.56
- FY09: 52.59

November 2009
Participation in RSATs
The preliminary inspection of the movement area includes:

1. Identifying non-standard marking, lighting, and signs.

2. Examining problem intersections for potentially confusing visual aids.

3. Review any past RSAT recommendations related to pilot visual aids for proper implementation.
During the airfield tour, the Team noted that when exiting Runway 2 onto Taxiway Bravo, a destination sign blocked a taxiway direction sign for Taxiway November.
Some pilots mistakenly believe that the takeoff end of Runway 3 is straight ahead.

Taxiway Echo straight ahead is a dead end at Combat Air Museum and Army National Guard area.

Left turn to Runway 3.
Recommendation – Highlight the taxiway centerline from Alpha around the corner towards Runway 3 and install a surface painted destination sign for Runway 3.
Recommendation Implemented
Conduct recurrent ground vehicle training, especially for seasonal procedures.
Runway Safety Initiatives

• FAA Call to Action - Reducing Runway Incursions
  • Enhanced and Alternative Airport Markings
  • New Airfield Lighting Systems and Sources
• Runway End Safety Areas (RESAs)
  • Engineered Material Arresting Systems (EMAS)
• Wildlife Hazard Mitigation
• Safety Management Systems (SMS)
• FAA Airport Technology R&D
New Airport Markings

Enhanced Taxiway Centerline

Surface Holding Position Signs

http://www.faa.gov/airports_airtraffic/airports/airport_safety/signs_marking/
Runway Status Lights (RWSL) Configurations

Runway Entrance Lights (RELs)  Takeoff Hold Lights (THLs)
RWSL – Runway Entrance Lights (RELs)
RWSL – Take-Off Hold Lights (THLs)
RWSL Installation Plan

- RWSL will be installed at 22 ASDE-X airports
- Contract awarded fall 2008
- FAA owns, operates, and maintains entire system
- Complete installations end of 2012.
RUNWAY SAFETY AREAS

• RSAs HAVE EMERGED AS ONE OF THE MOST IMPORTANT INVESTMENTS AT OUR AIRPORTS.
LESSONS LEARNED

• BURBANK, CALIFORNIA
Burbank EMAS
Successful EMAS Capture

EMAS capture of a Boeing 747 at JFK International Airport, NY
January 2005

Courtesy: ESCO
Successful EMAS Capture

EMAS capture of a Falcon 900 at Greenville Downtown Airport, SC
July 17, 2006
Wildlife Hazard Mitigation
Wildlife Hazard Mitigation R&D (RPD 150)

- **Purpose:** Reduce Wildlife Strike Risk to Aircraft
Wildlife Hazard Management

• When air carrier experiences a multiple bird strike, engine ingestion, or damaging collision with wildlife other than birds, airport must do a Wildlife Hazard Assessment.

• If required then must develop a Wildlife Hazard Management Plan
Wildlife Hazard Management Plan

• Provide measures to alleviate or eliminate wildlife hazards.
• Identify persons who have authority for implementing the plan.
• Priorities for needed habitat modification.
• Identification of resources for the plan.
• Procedures to be followed during air carrier operations.
• Wildlife control measures.
Wildlife Hazard Mitigation

• Habitat modification
  – Grass height,
  – Type of grass,
  – Harrassment
    • Effigies
  – Relocation

• Wildlife alerting system
  – Portable radar
  – Airport GIS overlay

• DNA analysis at Smithsonian

• Strike database (wildlife-mitigation.tc.faa.gov)
Avian Radar
Examples of Commercial Systems
Deployment of Avian Radars

• Seattle – SEA TAC Airport
  – Permanent Installation completed June 2007

• Oak Harbor – Whidbey NAS
  – AR-1 installed February 2009

• New York – JFK Airport
  – AR-1 and AR-2 deployed Summer 2009

• Boston Logan
  – Negotiating for Merlin radar installation Fall 2009

• Chicago – ORD
  – AR-1 and AR-2 deployed Summer 2009, 2009
Aircraft Rescue and Firefighting

- Ongoing research
- New large aircraft mock-up
- Extendable reach turret
- Penetrating nozzle
Fire Research Mock-up Section
ARFF – Penetrating Nozzles
ARFF – High Reach Extendible Turret (HRET)

Current Generation
- 2nd level penetration possible, however, vehicle will be too close to burning aircraft and aircraft must be level.
- Penetrating nozzle should be as close to 90 deg. to skin as possible.
- Penetrating nozzle should be in-line with boom arm.
Next Generation High Reach Extendible Turret (HRET)

**Update:**
- Live Fire Testing – 80% Complete
- Timed system deployment – Completed
- Standoff distance during piercing operations - Completed

November 2009
National Pavement Test Facility

- Pavement test machine
NAPTF Test Vehicle

Instrumented Test Track at the NAPTF, FAA Technical Center
CC5 Gear Configuration
Automated FOD Detection

Why is the FAA Interested?

"It has become clearer that this was a unique accident caused by a one-off chance of a piece of metal lying on the runway".

-Concorde crash preliminary report

Federal Aviation Administration
Automated FOD Detection

Available Technologies:

• QinetiQ – Tarsier Radar – Providence, RI (PVD)
  – Milimeter Wave Radar
  – Mounted on Rigid Towers
• Stratech – iFerret – Chicago O’Hare (ORD)
  – High Resolution Camera
  – Mounted on Rigid Towers
• X-Sight – FODetect – Boston Logan (BOS)
  – High Resolution Camera and Millimeter Wave Radar
  – Mounted on Airport Lighting Fixtures
• Trex Enterprises – FOD Finder – Chicago Midway (MDW)
  – Milimeter Wave Radar and Infrared Cameras
  – Mounted on roof of Airport Vehicle
Automated FOD Detection

XSight - FODetect
Tarsier Camera in operation
Tarsier Camera in operation
Example FOD finds by the QinetiQ system.
FOD Detection Radar

- R&D evaluation completed 2009