Performance Assessments of FOD Detection Systems

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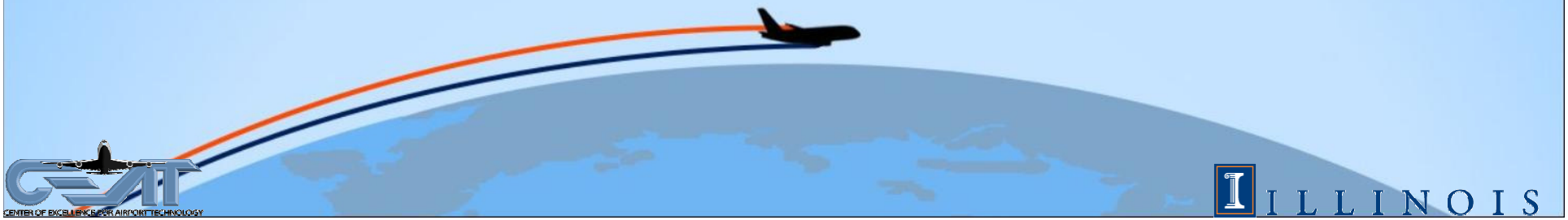

The performance assessments of FOD detection systems are part of the FAA Airport Safety Technology R&D Program at the William Hughes Technical Center, Atlantic City, NJ.

The University of Illinois Center of Excellence for Airport Technology (CEAT) is the performing partner working under a cooperative agreement with the FAA.

FOD Defined

Wikipedia Definition

Foreign Object Debris (FOD) is a substance, debris or article alien to a vehicle or system that has potential to cause damage[1]. Typically, FOD is an aviation term used to describe both the damage done to aircraft by foreign objects, and the foreign objects themselves (i.e. any object that has, or is likely to, cause damage.)

[1]According to the National Aerospace Standard 412, maintained by the National Association of FOD Prevention, Inc.

The FAA/CEAT Program

- FAA/CEAT is conducting the performance assessments for new technologies developed to detect FOD on airport surfaces.
- The assessments will develop an understanding of these new technologies and support the development of requirements and standards in an Advisory Circular.
- In this process CEAT is partnering with technology suppliers, coordinating local arrangements in the assessments at airports and conducting a science-based assessment.

History

- July 20, 2000 Air France 4590 crashed – the immediate cause was FOD on the runway.
- Late 2003 QinetiQ Inc. approached the FAA with a design for a continuous FOD monitoring system for runways
- June 2004 the *Tarsier™ FOD detection system was tested at Vancouver Airport*
- January 2005 the *Tarsier™ FOD detection system was tested at JFK*

History

- March 2006 performance assessment program initiated at Providence, T. F. Green International Airport testing an installed *Tarsier™ FOD* detection system.
- In 2006 and 2007 additional technologies were proposed for perfromance assessments.
- *September 2009 the FAA published Advisory Circular 150/5220-24, Airport Foreign Object Debris (FOD) Detection Equipment*

Performance Assessment Stages

Proposals from multiple technologies required a staged system for the determination of FAA interest in the technology. CEAT developed the following staged analysis for inclusion of a technology in the performance assessment program.

Stage 1: Initial technology review
Stage 2: Short term demonstration of technology
Stage 3: Long term technology performance assessment

Technologies Selected

Technologies selected for performance assessments demonstrated capability and used different sensors or operational modes.

Objective was not technology comparison rather the intent was development of an extensive technical analysis to support Advisory Circular Development.

Performance Assessment Elements

The performance assessment for each technology has four elements:

1. Inter Calibration
2. Testing detection performance with typical FOD items
3. Blind Testing
4. Operational Performance Analysis

Technologies

- Stationary
  - *Radar*
  - *Electro optical*
  - *Hybrid radar/electro optical*
- Mobile
  - *radar*

Stationary Systems

QinetiQ Tarsier™ radar system

Xsight FODdetect™ hybrid system

Stratech iFerret™ electro optical system

Mobile System

Trex FOD Finder™ mobile radar system

Status

Testing complete on QinetiQ's *Tarsier™* radar (installed at PVD and YVR)

Testing complete on Xsight's FODetect® hybrid system at BOS.

Testing ongoing of Stratech's *iFerret™* system at ORD and SIN

Testing ongoing of Trex Enterprises FOD Finder™ at ORD, HNL

Operational Integration

With demonstration of technology performance the next step will assessment of operational issues.

Operational experience is being gained as we speak at YVR, SIN (*Tarsier*™ and *iFerret*™) and HNL (FOD Finder™), while we learn from the installation at BOS (FODetect®).

The utility of continuous detection and improvement of operator capabilities is clear.

The Future

Each of the existing developers of FOD detection systems has a road map of developments for the future.

Advisory Circular on technology will be supplemented with updated guidance on FOD management at airports.

New companies will undoubtedly test the market with new technologies and new innovations!