Points of Discussion

- Today’s Runway Incursion Challenges
- Overview of Part 139 Electronic Inspection and Reporting Tools
- Spatially Enabled Record Keeping for Data Analysis and Preparation for SMS
- Airfield Maintenance Process Integration
- Benefits and Efficiencies Gained on Day-to-Day Basis and at Annual FAA Inspection Times
- Which Functions and Features Would be Important to My Airport?
- Open Discussion – Please Share Your Experiences
Runway Incursion Challenges

FAA Research and Evaluation of Airport Vehicle Runway Incursion Warning System Equipment

Today’s Runway Incursion Challenges

Source: Federal Aviation Administration
Data valid through February 25, 2015
Today’s Runway Incursion Challenges

### Runway Incursion Numbers by Type

<table>
<thead>
<tr>
<th>Year</th>
<th>OE/D</th>
<th>OTHER</th>
<th>PD</th>
<th>V.PD</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>164</td>
<td>637</td>
<td>208</td>
<td>1,009</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>153</td>
<td>599</td>
<td>199</td>
<td>951</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>156</td>
<td>629</td>
<td>181</td>
<td>966</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>178</td>
<td>593</td>
<td>183</td>
<td>954</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>228</td>
<td>2</td>
<td>722</td>
<td>1,150</td>
<td></td>
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<tr>
<td>2013</td>
<td>243</td>
<td>4</td>
<td>783</td>
<td>1,241</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>258</td>
<td>8</td>
<td>764</td>
<td>1,264</td>
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<tr>
<td>2015</td>
<td>98</td>
<td>0</td>
<td>305</td>
<td>498</td>
<td></td>
</tr>
</tbody>
</table>

Source: Federal Aviation Administration
Data valid through February 25, 2015

### Runway Incursions by Type (Percent of Total)

- 2008: OE/D 16%, OTHER 21%, PD 16%, V.PD 63%, TOTAL 63%
- 2009: OE/D 21%, OTHER 21%, PD 16%, V.PD 63%, TOTAL 63%
- 2010: OE/D 16%, OTHER 21%, PD 16%, V.PD 65%, TOTAL 63%
- 2011: OE/D 19%, OTHER 19%, PD 19%, V.PD 62%, TOTAL 63%
- 2012: OE/D 19%, OTHER 19%, PD 20%, V.PD 63%, TOTAL 63%
- 2013: OE/D 19%, OTHER 19%, PD 20%, V.PD 60%, TOTAL 60%
- 2014: OE/D 19%, OTHER 20%, PD 19%, V.PD 61%, TOTAL 61%
- 2015: OE/D 19%, OTHER 20%, PD 19%, V.PD 61%, TOTAL 61%

Source: Federal Aviation Administration
Data valid through February 25, 2015
GPS as a Runway Safety Tool

FAA Research and Evaluation
FAA Research and Evaluation

www.airporttech.tc.faa.gov/safety/downloads

FAA Advisory Circular 150/5210-25

www.faa.gov/airports/resources/advisory_circulars/
FAA Advisory Circular 150/5210-25

Runway Incursion Warning System (RIWS)

Provides Operational Performance Specifications

System AIP Eligible

Warning Distance Varies with Speed

<table>
<thead>
<tr>
<th>Speed</th>
<th>Proximity Alert Distance</th>
</tr>
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<tbody>
<tr>
<td>0-10 mph</td>
<td>60 ft</td>
</tr>
<tr>
<td>20 mph</td>
<td>120 ft</td>
</tr>
<tr>
<td>30 mph</td>
<td>180 ft</td>
</tr>
<tr>
<td>40 mph</td>
<td>240 ft</td>
</tr>
<tr>
<td>50 mph</td>
<td>300 ft</td>
</tr>
<tr>
<td>60 mph</td>
<td>360 ft</td>
</tr>
</tbody>
</table>

Example: Incursion Warning

Approach Warning
- Probe breaks the geofence
- Configurable warnings: audible & visual
- Geofence = RSA, NAVAID Clear Areas
- Configurable “probe” per AC distances

Entry Alert
- Vehicle breaks the geofence
- DIRECTIVES - audible & visual
- Can mute when approved inside RSA
From Clipboard to Keyboard

Overview of Part 139 Electronic Inspection and Reporting Tools

Electronic Inspection and Reporting Tools and Part 139 Challenges

Part 139 Basics – Record Keeping and Work Flow
- Daily Airfield Self-Inspections
- Most Airports Perform Multiple Times per Day
- Lighting/Electrical Inspections
- Special Inspections
- Wildlife
- Many Others
- Winter Operations and Field Conditions
- Track Discrepancies and Generate Work Orders
- Issue NOTAMs
- Records Kept for 12 Calendar Months

Most Airports Today Rely Solely on Paper!
Electronic Inspection and Reporting Tools to Part 139 Challenges

- Make the paper form electronic
  - Microsoft Word or Excel
  - PDF Editable Forms
- Create a database to track discrepancies
  - Microsoft Access (most popular)
- Web-based Tools
  - Easy to access across devices
- Geospatial Tools
  - Geographic Information Systems (GIS)
  - Moving map with discrepancy locations, lights, signs, markings
  - Navigation and Situational Awareness with RIWS
  - Geospatial Analysis and Reporting

Electronic Inspection and Reporting Tools and Part 139 Challenges

- Going “electronic” is a major paradigm changer
  - Change in processes and procedures is inevitable
  - Consider computer skill gap for staff across departments
  - Data transfer from legacy systems
  - Hardware considerations and IT Department Support
  - Availability of data on airfield assets (surveys of lights and signs, shape files of markings and areas of interest)
  - Obtain buy-in from FAA Inspectors to go “paperless”
Electronic Inspection and Reporting Tools and Part 139 Challenges

- System Considerations and Options
  - Which mobile hardware to use?
    - Laptops, tablets, smart phones, or a mix?
    - How will the vehicles be equipped?
  - System architecture
    - Hosted at the airport
    - Service provided by the vendor
    - Who owns the data?
  - Data communications
    - None
    - Cellular (most popular)
    - Airfield-Wide Wi-Fi
    - Proprietary Network Across the Airfield

Top Tier “Configurable” Systems

- AirportIQ
- AirOps

GCR, Inc.
Team Eagle

Airport Safety Manager
Woolpert
Web-Based and Mobile App Systems

Gatekeeper Systems

ProDIGIQ

Veoci

Mapping and GIS

Spatially Enabled Record Keeping for Data Analysis and Preparation for SMS
Mapping and GIS

Moving Map with Lots of Information
- Lights
- Signs
- Markings
- Locations of Discrepancies – no more confusion
- RSAs
- Critical Areas – Construction, NAVAID Protection

Vehicle Location Display on Map with Aid of GPS
- Improved situational awareness – most helpful in low visibility and at night
- Runway Incursion Warning System (RIWS) functionality

Woolpert – Airport Safety Manager

GCR, Inc. - ASOCS
Mapping and GIS

 análize Trends GeospaTially

- Valuable capability in addition to traditional “text only” reporting
- Save money by recognizing issues occurring on a particular surface or in an area of an airfield
  - Lighting/Electrical Issues
  - Bird and Wildlife Issues
  - Pavement Issues

Team Eagle - AIROps™

We Already have a CMMS
Airfield Maintenance Process Integration
Airfield Maintenance and CMMS Integration

- Computerized Maintenance Management System (CMMS)
- Most Inspection and Reporting Tools Include a Basic Work Order Management or a More Powerful CMMS
  - Part 139 Solutions not designed to replace a CMMS
- Integration with CMMS Package is critical
  - Get the most out of the moving map and Part 139 Reporting
  - Utilize CMMS features for Work Order and Maintenance Management airfield wide (airfield, terminals, landside)

Why Go Electronic?
Benefits and Efficiencies Gained on Day-to-Day Basis and at Annual FAA Inspection Times
General Benefits of Going Electronic

- Improve efficiency and accuracy of inspections
  - Navigate the airfield safer with increased situational awareness
- Reduce turnaround time to address deficiencies
  - Maintenance is notified of identified discrepancies in real time
  - No confusion on location
- Improve interdepartmental information exchange
- Increase data monitoring and safety awareness across all levels of management
- Trend analysis
- Ease of Part 139 compliance and record keeping

FAA Annual Inspection Benefits

- Records Review is a time consuming portion of the Annual Inspection
  - Tedious, manual process for FAA Inspectors
  - Records presented differently from airport to airport
- Electronic Inspection and Reporting Systems could standardize FAA airport records review nationwide
Determining Your Needs
Which Functions and Features Would be Important to My Airport

Key Functions and Features

- Moving Map Display
  - Runway Incursion Warning System (RIWS) – AC Compliant and AIP Eligible
  - Interact with airfield assets (signs, lights, markings, import shape files)
  - Geospatial reporting and data analysis
- Configurable and customizable forms, inspection process and work flows
- Compatibility across mobile devices
  - Laptops, tablets, smart phones
- Executive Dashboard
Key Functions and Features

→ CMMS integration
→ External systems integration
  - NOTAMs
  - Wildlife Tracking and Reporting
    - File Reports with FAA without duplication of effort
  - Weather
  - E-mail
  - Web (Field Condition Reporting)

Key Functions and Features

→ Powerful reporting, search, and trend analysis tools
→ Shift Log / Daily Log capability
→ Number of active users and licenses
  - Understand limitations and cost ramifications of various systems
→ Data storage and recovery
  - Storing the data locally and “owning” the data vs. stored by vendor off-site
→ Wireless communication strategy
Questions and Discussion

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