Runway Incursion
Preventive measures at aircraft level

EAPPRI v3.0 Runway Safety Seminar
Lisbon, 18 October 2018

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1. Introduction
2. Currently available technologies
3. In-development technologies
4. Conclusions
Statistics

**EASA Safety Review 2018**
- Despite low rate, real risk

**IATA Safety Report 2017**
- “Accidents continue to occur on runways, and the rate and number of runway incursions **remain steady.**”
- **1 runway incursion event every day** average reported during period 2012 – 2016

**Runway Incursions & Collisions**
- Runway Incursions & Collisions remain a reality
- Steady rates
- Mid - high risk occurrences
Statistics

Events reported to Airbus

- Mainly linked to Annex 13 investigations
- Could be classified as being A to C category
Reported RI event example

A330 RI during A320 T/O

- A320 cleared T/O on RWY 36L.
- 37” later: A320 initiating T/O & A330 cleared to cross 36L via H3
- 160kt GS, RTO initiated by FO: brakes for 9”
- Then TOGA & rotation by CAPT
- A320 crossed 36L/H3 at [86ft - 119ft]
- Flight continued uneventfully

11 October 2016 Shanghai airport A320-214 & A330-343
EAPPRI v3.0 recommendations

1.4.16 (Aircraft Operator)
Aerodrome charts or an equivalent electronic device should be displayed on the flight deck during taxi. This includes when operating at the home aerodrome.

1.9.1 (Technology)
Improve situational awareness by adopting the use of technologies that enable operational staff on the manoeuvring area to confirm their location in relation to the runway e.g. via GPS with transponder or airport moving maps, visual aids, signs etc.

1.9.2 (Technology)
Promote the integration of safety nets to provide immediate and simultaneous runway and traffic proximity alerts for pilots, air traffic controllers and manoeuvring area vehicle drivers.
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Airport Navigation

Airport Moving Map

- Moving airport navigation map with aircraft location
- Improves situational awareness
- Prevents navigation errors on airports
- Reduces Runway Incursion risk

ROSE-NAV mode – 1 NM

PLAN mode – FMS selected runway highlighted
Airport Navigation
Approaching Runway Advisory

- Complements Airport Moving Map
- Visual advisory when approaching a runway
- Indication in Moving Map, Primary Flight Display & Head Up Display
Runway Awareness & Advisory System
Honeywell RAAS

Audio advisories available on ground:

- **Approaching 34 L**:
  - Ground speed < 40kt
  - Aircraft within a specific runway distance

- **On Runway 34 L**:  
  - Aircraft enters the runway
  - Aircraft heading within ±20°

- Function implemented in Honeywell EGPWS
- Routine Advisories “Approaching Runway” and “On Runway”
- Certified on A320 & A330 aircraft
Surface Alerting (SURF-A)

Purpose
- Provide an additional on board safety net for prevention of aircraft collision in the runway.
- Complements ground safety nets such as Runway Status Lights.

Principles
- Non Directive alerting function.
- Real time computation of runway collision risk with ADS-B capable aircraft within – or about to enter – the Runway Alerting zone.
Surface Alerting (SURF-A)

Take-Off

- Take-off detection through Throttle position
- Look ahead: entire runway
- In case of conflict: Warning
- RTO expected

Operational Scenarios: Take-Off

- Traffic Alerting Area
- Own A/C Alerting Area
- TRAFFIC ON RUNWAY

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Surface Alerting (SURF-A)

Approach & Landing

- **Look ahead:** 30"
- **In case of conflict:**
  - > 200ft RA: Caution
  - < 200ft RA: Warning
- **GA expected**
Surface Alerting (SURF-A)

Operational Scenarios: Taxi

- Look ahead: 30"
- In case of conflict: Warning
- Stop or expedite runway crossing

Traffic Alerting Area

TRAFFIC ON RUNWAY
Surface Alerting (SURF-A)

Current Schedule

- Validation:
  - Desktop simulations
  - Simulator & Flight tests
- Certification target 2021
- Very Large Demonstrator under SESAR WAVE 2

Feasibility

Development & Certification

Very Large Demonstrator

Prototype development

ADS-B data collection

2017 2018 2019 2020 2021 2022

ADS-B OUT mandate US/EU

AIRBUS Honeywell Simulator

Flight Tests

AIRBUS DASSAULT Honeywell

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Taxi Routing

- Easier taxiing
- Increased situation awareness
- Runway incursion risk alleviation
- Currently under development & testing

EFB solution
Airbus & NAVBLUE
1. Introduction
2. Currently available technologies
3. In-development technologies
4. Conclusions
- Runway Incursion & Collision: risk with steady rates

- Technologies at aircraft level to mitigate the risk

- Airport Navigation, RAAS & Taxi Routing: reduce RI risk by improving situational awareness & preventing navigation errors on airports.

- SURF-A: on board safety net for prevention of aircraft collision in the runway through ADS-B data