Panel 2: Smart Airport Safety Solutions

Annual Safety Conference 2022

EASA Airport Safety & Environmental Sustainability through Innovation

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PANEL 2: SMART AIRPORT SAFETY SOLUTIONS

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Your safety is our mission
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Runway Condition Awareness and Monitoring System - RCAMS

Emilia Kosińska, Jan Malawko
Prague, 30 November 2022
Duty Officer’s Dashboard
Data processing

MicroStep - MIS

DATA REPOSITORY & PROCESSING

METEO, AWOS, ICE Alert, RWY sensors

Airport/Airline/ANSP/NM

OBACS

AIRBUS

DASSAULT AVIATION
Unique solution value

- The solution based on advanced machine learning ML algorithms
- Has met the challenge of high dispersion of runway contamination due to changing weather conditions
- Customized model for different airports locations, layout, met characteristics.
- Accurate know casting prediction (up to 1 hr. with 10 mins intervals)
- Resulted in the systematization of the creation of database files based on a Global Reporting Format (GRF)
- Alternative output options (Optimized dashboard ergonomics/Automatic ATIS generation)
- Safety assessment validated procedures for abnormal conditions/scenarios.
- It can be the basis and inspiration for other projects of a similar nature (i.e. with possible extension to RET evaluation)
THANK YOU FOR YOUR ATTENTION
Monika Mejstriková
Director Ground Operations, IATA

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IATA Ground Operations

Focus on Innovation, Digitalization and Automation

19 December 2022
What we want to change

- Paper documents
- Poor communication tools
- Old GSE design
- No information in real time
- Inadequate infrastructure
- Pollution
Technology on the Ramp

**Robotics**
Use un-manned vehicles, automated storage/retrieval, drones, 3D technologies, and human augmentation capabilities to improve processes carried out by humans.

**Employees & Vehicles, Tracking and Mobility**
Use systems and handhelds, mobile, wearable devices to enable real-time work force and task management.

**Artificial Intelligence**
Develop computer systems able to perform tasks normally requiring human intelligence (visual reception, speech recognition, decision-making, translation).

**Data Standard Format**
Develop data streams elements that are standardized and can be exchanged by different hardware and users.
Øyvind Hallquist
Senior Advisor Strategy and International Affairs, Avinor

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Your safety is our mission
Autonomous Snow Removal at Oslo Airport

Prague, 30 November 2022

Øyvind Hallquist, Senior Advisor Strategy and International Affairs, Avinor
The idea behind autonomous snow removal has been a long time in the making.

**The beginning**
The vision of autonomous vehicles was presented at an Avinor conference in 2010. This commenced several feasibility studies.

**2010**

**Think big, start small**
Avinor worked with several partners to develop the concept. In 2015 scale models of autonomous snow removal sweepers were tested.

**2015**

**Full scale testing**
The first full scale tests were conducted at Leirin Airport, two hours north of OSL. The minister of transportation recognized the opportunity for Norway to take a leading role in the development of the technology.

**2018**

**Testing at OSL**
Two sweeper vehicles were tested by Avinor with focus on both modernizing winter operations at the airport and doing so in a safe way to avoid undesirable incidents. Safety was essential in all testing at the airport.

**2019**

**The decision**
Avinor entered into a framework agreement with Øveraasen AS and YetiMove AS for the delivery of new autonomous sweeper vehicles and an autonomous service platform for operating a fleet of vehicles in an operative airport.

**2021**

**Delivery**
The 12 autonomous vehicles (RS600) were delivered. The new technology will in the future enable OSL to perform winter operations with increased efficiency, enhanced safety and reduced emissions.
Introducing the Avinor “Wide” sweeper concept

Previous operational concept with the RS 400:
• 8 runway sweepers gave a 45 m clearing width
• 5.5 m clearing width per machine

The new operational concept with the new RS 600:
• Each machine has a clearing width of 7.5 m
• This allows us to reduce the number of sweepers to 6 pcs. per clearing group
• Shorter time for entering and leaving the runway
Benefits of autonomous technology in winter operations

- Higher accuracy
- Increased efficiency
- Enhanced safety
- Increased predictability and monitoring
- Reduced costs
- Increased comfort
Safety aspects – gains, threats and mitigations

Concretely, what makes autonomous plow trains safer?

a. Automated authorization points
b. Monitoring from the tower is supported by digital, "live" plowing plans → provides better predictability and decision support
c. Safety barriers that are predictable and not person-dependent
d. High repeatability of implementations
e. Remote emergency stop

What are the challenges with autonomous plow trains?

a. Makes other demands on the operator, who must go from passive/observant to active in the event of any incidents. It can be demanding to sit passively but focus over time.
b. Planning / preparedness in the event of failure of supporting systems or machine breakdown of a driverless machine

Mitigations

a. Establish ASR support team and routines for manual operational operation
b. Functional risks in software must be identified and handled during the test period