Panel 2: Smart Airport Safety Solutions

Annual Safety Conference 2022

EASA Airport Safety & Environmental
Sustainability through Innovation

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EASA
European Union Aviation Safety Agency

Your safety is our mission

PANEL 2: SMART AIRPORT SAFETY SOLUTIONS

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Runway Condition Awareness and Monitoring System - RCAMS

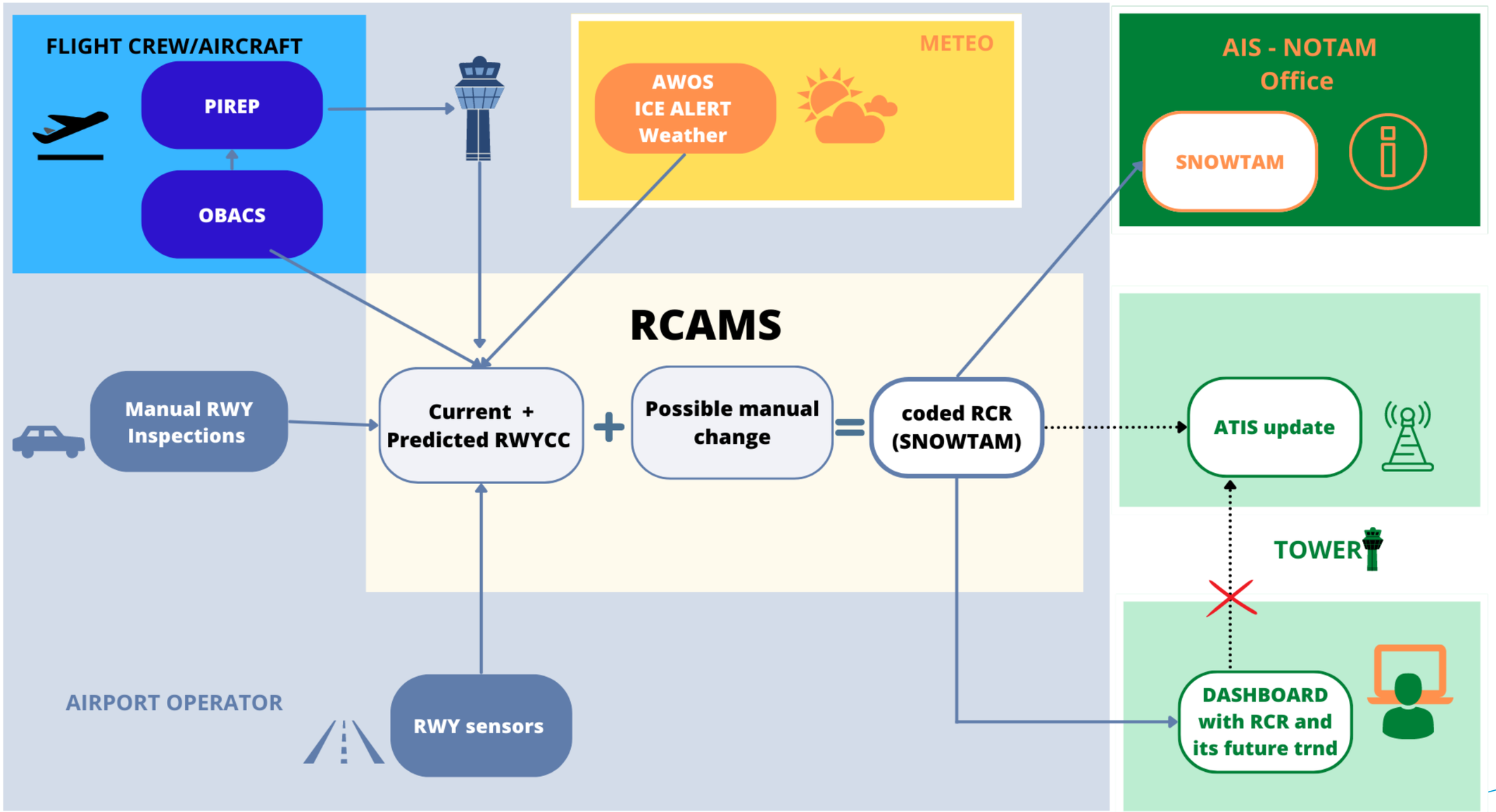
Emilia Kosińska, Jan Malawko

Prague, 30 November 2022

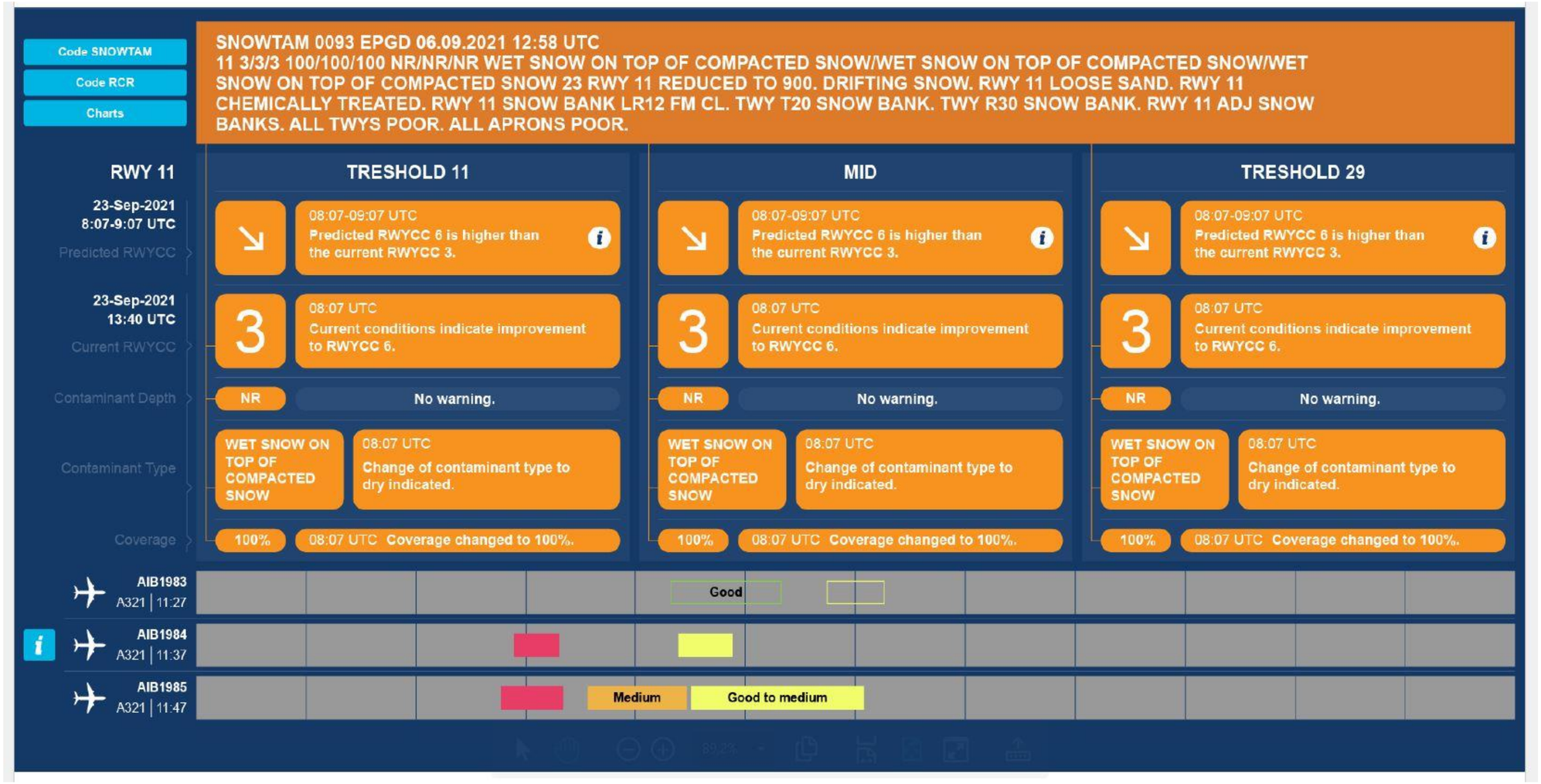
EUROPEAN PARTNERSHIP

Co-funded by the European Union

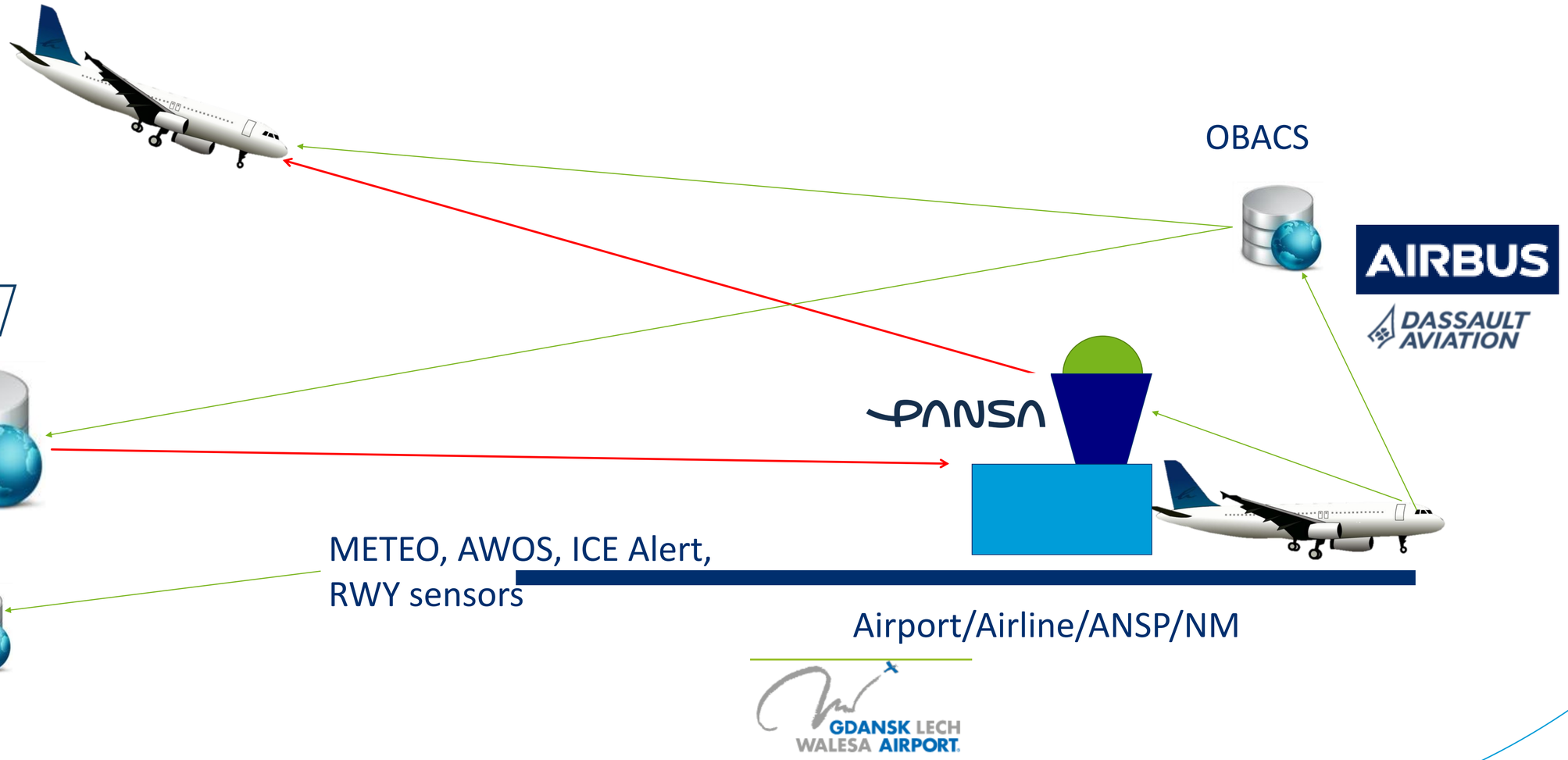
RCAMS


FLIGHT CREW/AIRCRAFT
PIREP
OBACS
METEO
AWOS
ICE ALERT
Weather
AIS - NOTAM
Office
SNOWTAM
RCAMS
Manual RWY
Inspections
Current +
Predicted RWYCC
Possible manual
change
coded RCR
(SNOWTAM)
ATIS update
TOWER
AIRPORT OPERATOR
RWY sensors
DASHBOARD
with RCR and
its future trnd

Duty Officer’s Dashboard



Data processing



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 extention to RET evaluation)

THANK YOU FOR YOUR ATTENTION

Co-funded by the European Union

Monika Mejstrikova

Director Ground Operations, IATA

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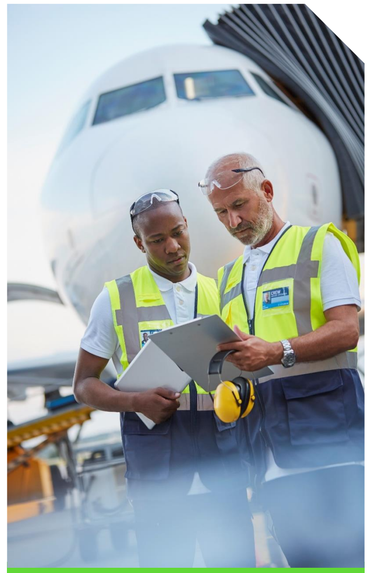
IATA Ground Operations

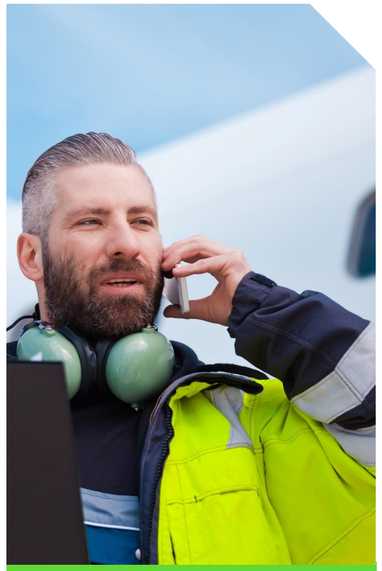
Focus on Innovation, Digitalization and Automation

19 December 2022

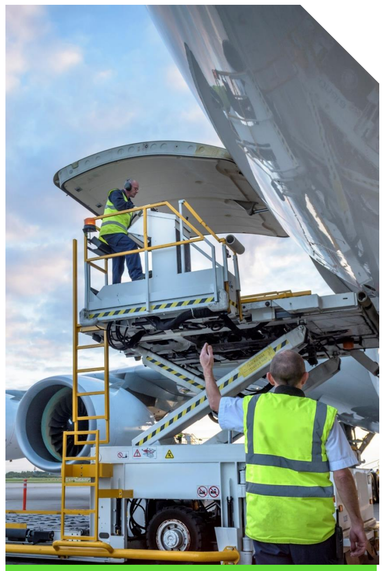
What we want to change



Paper documents

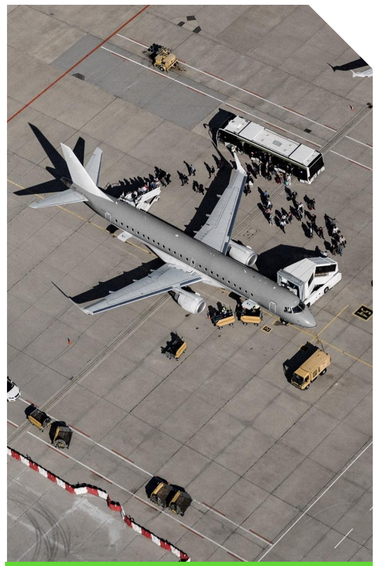


Poor comunication tools

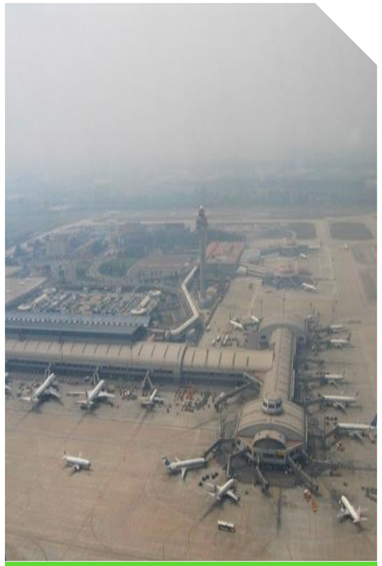


Old GSE design

No information in real time

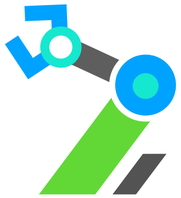


Inadequate infrastructure



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

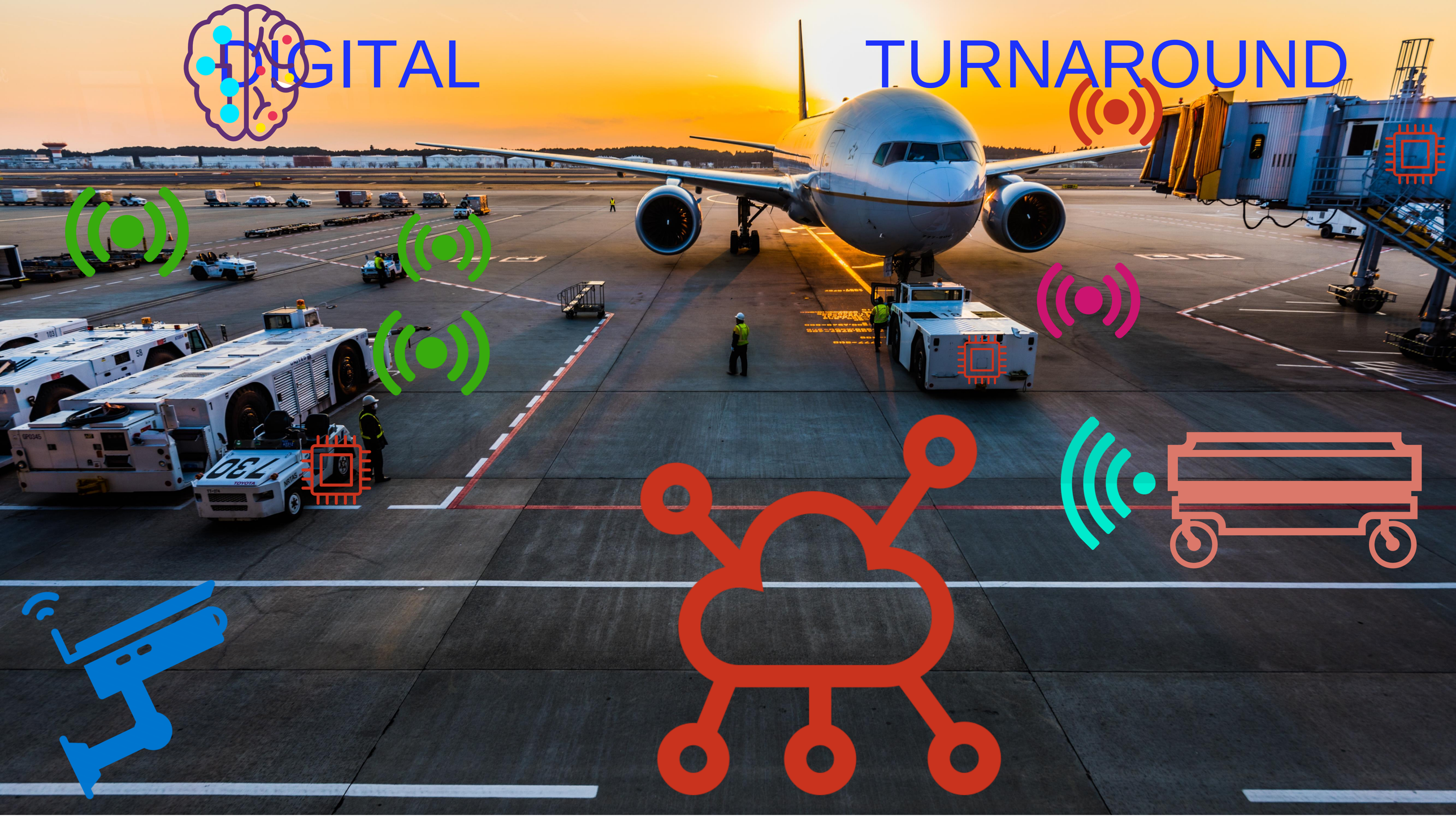
Artificial Intelligence

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


TURNAROUND
TODAY


DIGITAL
TURNAROUND

Øyvind Hallquist

Senior Advisor Strategy and International Affairs, Avinor

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Autonomous Snow Removal at Oslo Airport

Prague, 30 November 2022

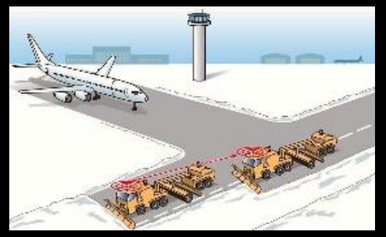
Øyvind Hallquist, Senior Advisor Strategy and International Affairs, Avinor

The idea behind autonomous snow removal has been a long time in the making

2010

The beginning

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



2015

Think big, start small

Avinor worked with several partners to develop the concept. In 2015 scale models of autonomous snow removal sweepers were tested

2018

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

2019

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

2021

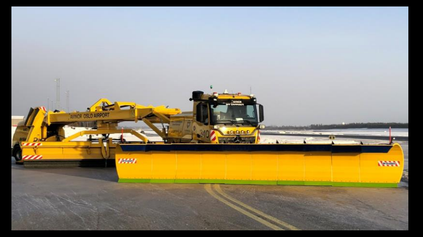
The decision

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

2022

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



AVINOR

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

AVINOR

Benefits of autonomous technology in winter operations

- Higher accuracy
- Increased efficiency
- Enhanced safety
- Increased predictability and monitoring
- Reduced costs
- Increased comfort

OSLO LUFTHAVN

AVINOR

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

AVINOR

Marcus Schnabel

Senior Vice President Operations
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