

INNOVATION

FAIR

12

MARCH
2024

14



Session 3

Digitalization in aviation:
Tackling the challenges



Mr. Jarrod Morley

Senior Director – Strategy & Head of Innovation
Aéro Montréal

Panel Speakers



Mr. Jarrod Morley

Senior Director – Strategy & Head of Innovation,
Aéro Montréal



Ms. Simona Frankova

Founder & CEO, NG Aviation



Mrs. Anna Von Groote

Director General, EUROCAE



Ms. Tara Mulrooney

Chief Technology Officer & Vice President,
Innovation, Edmonton International Airport



Mr. Erick Ferrandez

Representative to ICAO and Canada, EASA

Panel Speakers



Mr. Getinet Tadesse

Chief Information Officer, Ethiopian Airlines



Ms. Virginie Collin-Banerji

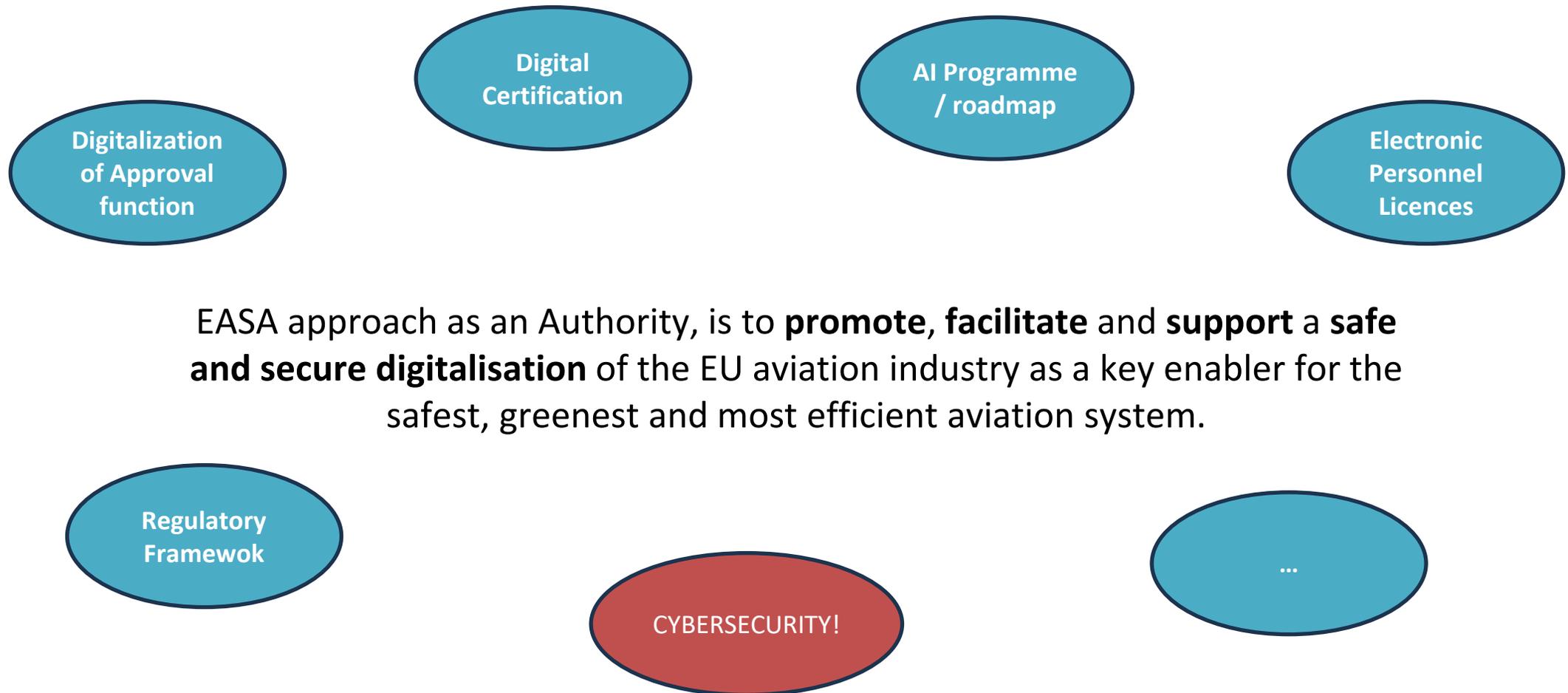
Head of IM Regional and Digital Initiatives,
Airbus America



Mr. Erick Ferrandez

Representative to ICAO and Canada
European Aviation Safety Agency (EASA)

What role for EASA in digitalization in aviation?



The Data4Safety Programme

Illustration of a collaborative initiative of digitalisation in the EU

out there!



objective

Expert Knowledge



Flight Data



Traffic data



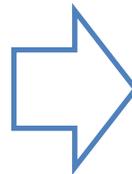
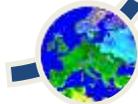
Data



Safety Reports



Weather, and more...



Know where to look

See it coming

Act!



The Data4Safety Programme

Benefits of a digitalization programme

- **Enhanced connectivity** of the aviation stakeholders by providing a **collaborative platform** to discuss systemic safety issues
- **Data-driven decision making on risk management** by taking vast amounts of data to the safety analysts and risk managers
- **Increased efficiency** for all the safety analysts of the EU aviation stakeholders by providing modern tools and analytical platform to analyse the data
- Systemic and comprehensive safety performance monitoring in support of **early identification and mitigation of safety risks.**



Mrs. Anna Von Groote

Director General
EUROCAE

EUROCAE

An international SDO

Address aviation stakeholder needs by developing high-quality standards

- Built upon state-of-the-art expertise
- Fit for purpose
- Adopted internationally
- Support operations, development and regulations
- Address emerging global aviation challenges

Membership

- 500+ members from 40+ countries worldwide



Robust processes

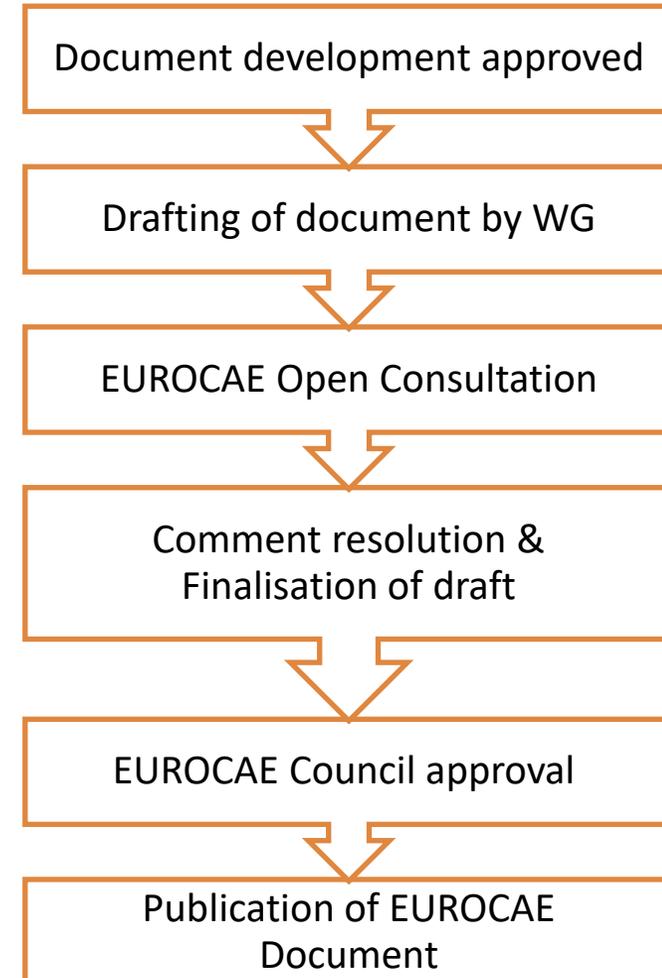
By the industry – for the industry

EUROCAE Process

- Transparent, open & inclusive
- Consensus driven
- Open consultation
- Efficient and continuously improved
- Systematic 5-year review
- Cooperation with partner organisations: RTCA, SAE, ...

EUROCAE Standards

- Worldwide recognition & application
- Worldwide participation



Standards & Regulations

International harmonisation and global interoperability

PB & RB regulations

- High level requirements & reference to industry standards
- MOPS, Environment, SW, HW, Cybersecurity

Standards complementing regulation

- Developed in reaction to regulation or in anticipation of regulatory requirements
- Offering a complete set to stakeholders

Industry – authority collaboration is key

- Efficient compliance demonstration methods
- Mutual understanding and common success



Strategic approach to standardisation

Addressing trends & innovation

Aligning with stakeholders' priorities

- Global industry needs
- R&D programmes
 - SESAR, NextGen, CARATS and others
- Regulators
 - EASA, FAA, JCAB ...
 - ICAO

Technical Work Programme TWP

- Current and future standardisation activities
- Strategic direction to respond to needs & challenges
- Capture innovation, technology evolutions



→ [TWP 2024 available here](#)



Mr. Getinet Tadesse

Chief Information Officer
Ethiopian Airlines

Digitalization in Aviation Industry

1

Operational efficiency



2

Safety



3

Passenger Experience



4

Sustainability



Challenges of Digitalization in Aviation

1

Digital Infrastructure



2

Legacy systems and protocols



3

Regulatory compliance



4

Interoperability and standardization



Tackling the Challenges of Digitalization in Aviation

1

Invest in digital infrastructure



2

Promote interoperability and standardization



3

Ensure Regulatory compliance



4

Implement robust cybersecurity measures

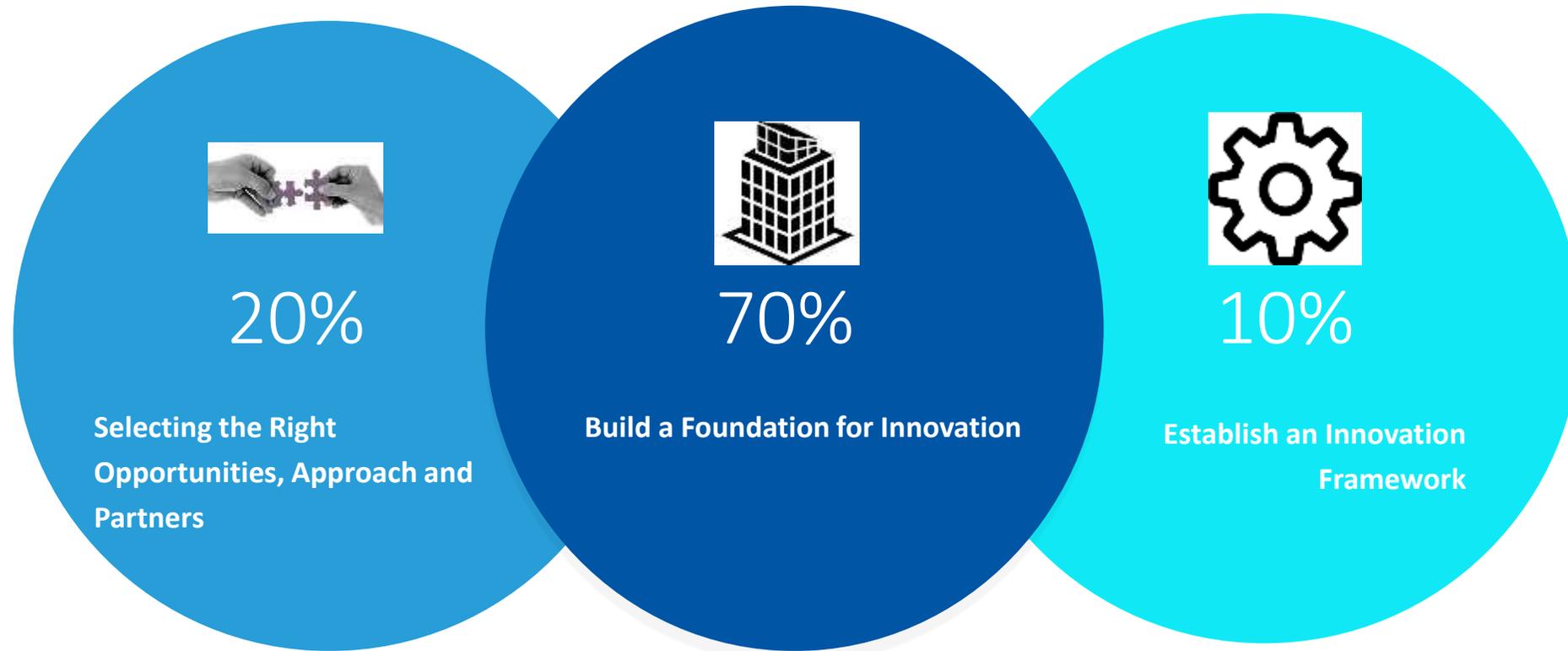




Ms. Tara Mulrooney

Chief Technology Officer & Vice President of Innovation
Edmonton International Airport

Role of an Airport in Navigating Digital Challenges & Fostering Innovation in Aviation



01 Foundation



Robust IT Infrastructure:

- Deploying advanced technology to support scalable, flexible operations.

Data Governance:

- Implementing policies for data integrity, privacy, and regulatory compliance.

Continuous Improvement Culture:

- Fostering a workplace ethos that encourages innovation and lean processes.

Security & Ethics:

- Prioritizing cybersecurity and ethical standards in all technological advancements.

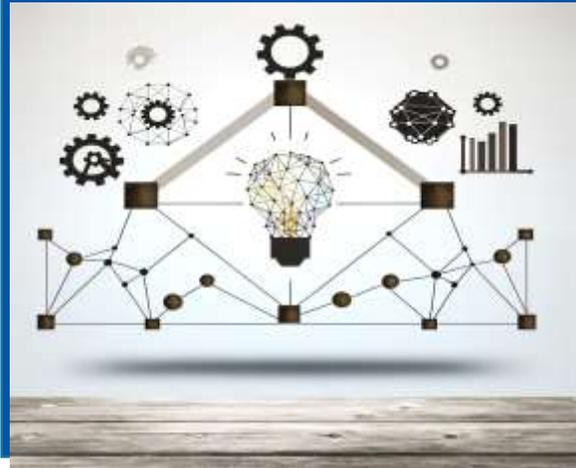
Capacity Building:

- Investing in workforce development to manage and utilize new technologies effectively.

According to an image generated by DALL·E, OpenAI's image-generation model

03

Innovation Frameworks



design thinking
innovation ambition matrix
creative problem solving
innovation frameworks
business model canvas
lean startup
horizon
business model navigator
blue ocean
jobs

01 Approach



Risk-Based Innovation:

- Implement innovations after thorough risk assessment, ensuring new technologies enhance safety and efficiency without introducing undue risks.

Contextual Adaptation:

- Tailor innovation initiatives to the unique operational, regulatory, and environmental contexts of the airport, ensuring relevance and effectiveness.

Value-Driven Decisions:

- Prioritize innovations that offer clear value in terms of passenger experience, operational efficiency, or sustainability, ensuring investments are justified.

Alignment with Strategic Priorities:

- Innovations must support and propel the airport's long-term strategic goals, such as enhancing global connectivity, customer satisfaction, or environmental stewardship.

Collaborative Progress:

- Foster partnerships and collaborations that leverage external expertise and technologies, driving forward with shared goals and resources.



Ms. Simona Frankova

Founder & CEO
NG Aviation

KHI



DXB

Airline ICAO

PIA

Airline IATA

PK

Airline Logo



Aircraft type

A320

Registration

AP-BLC

Flight Number

PK213

Track

289°

ICAO 24-bit address

760983

45 min 30 sec

N/A

45:29

N/A %

Total fuel consumption

N/A kg

Total CO emissions

N/A g

Total HC emissions

N/A g

Total NOx emissions

N/A g

Thrust (%)



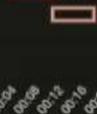
Fuel (kg)



CO (g)



HC (g)



NOx (g)

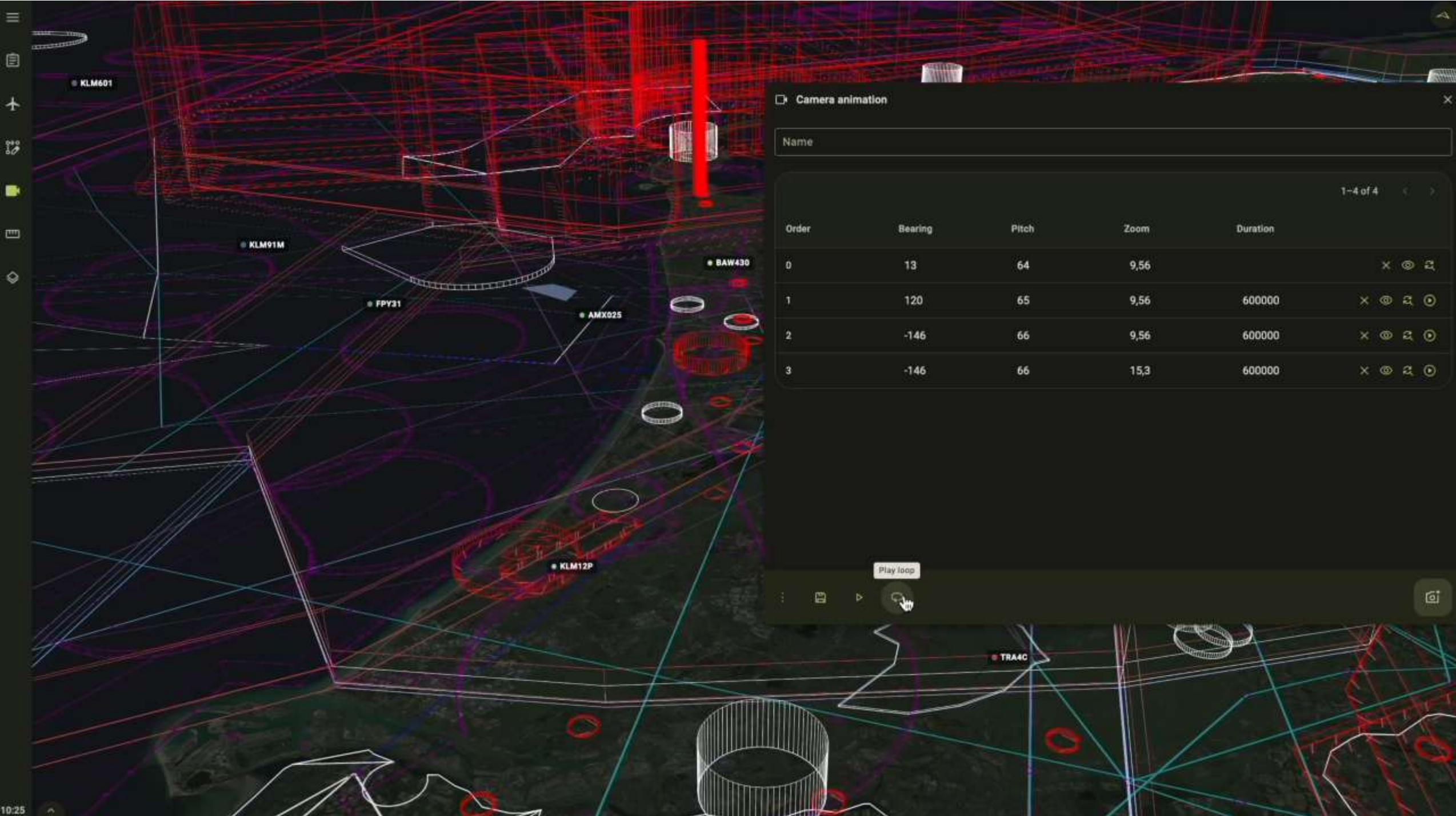


Play



Exit





Camera animation

Name

1-4 of 4

Order	Bearing	Pitch	Zoom	Duration	
0	13	64	9,56		X [icon] [icon]
1	120	65	9,56	600000	X [icon] [icon] [icon]
2	-146	66	9,56	600000	X [icon] [icon] [icon]
3	-146	66	15,3	600000	X [icon] [icon] [icon]

Play locs



Ms. Virginie Collin-Banerji

Head of North America Information Management (IM)
Regional and Digital Initiatives

Airbus America

Airbus North America

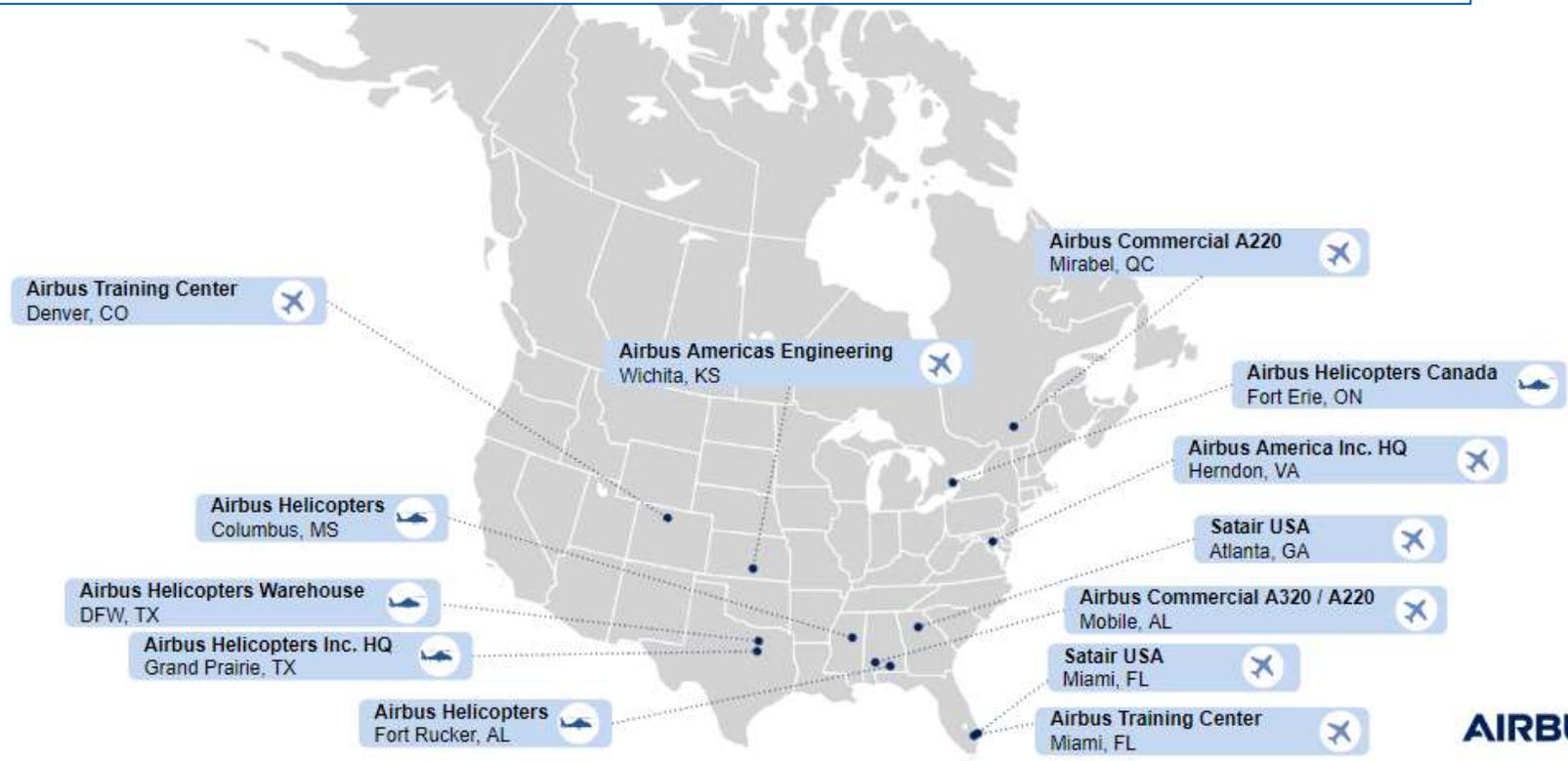
3 divisions

8000+ users using 1500+ applications

30+ locations

3 Airbus Final Assembly Lines in North America:

- Commercial Airliners in **Mobile**, AL, USA: A220 and A320
- Commercial Airliners in **Mirabel**, QB, Canada: A220
- Commercial Helicopters in **Columbus**, MS, USA: H125 and H145



Digitalization in Aviation

What is Digitalization in Aviation?

- **From** IT upgrade ... **To** introduction of emerging technology such as AI, Computer Vision, Quantum Computing, Digital Twins, etc...
- Keeping pace with constant **Innovation & Evolution in a Digital World** while **safeguarding our aviation ecosystem**
- **Company digitalization** (looking inward at the way our company operates) AND **Product digitalization** (connected aircraft, ATM, ...)



TRANSFORM TOOLS

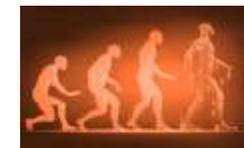
Implement new set of tools and technologies. Those tools allow better automation of processes, manual workload reduction, data analysis, ...



TRANSFORM DATA

We need to change the relationship of our employees with data...

Better showcase the value of data, better leverage data analytics, and simplify access to data



TRANSFORM PEOPLE

To meet our digital ambitions, we need to improve and refine our methods of execution and explore new ways to attract and retain the best talents

Challenges and Role of the organization

“Digitalization is not a destination, it is a means...”

Challenges....

- Safety
- Cybersecurity
- Scalability
- Adaptability
- Reliability / robustness
- Environmental impact
- Speed of Innovation (and associated speed of standards & regulations)

... and opportunities

- Industry growth
 - end-user centricity
 - competitiveness
- Operational excellence
 - quality
 - efficiency
- Sustainability
 - business resilience
 - reduced emissions

Transform * Inform * Inspire * Influence



AHY900

FDB700

THY144

WZZ666

WZZ445

AZQ776

AZQ454

How Does YEG Leverage Technology for Operational Efficiency, Balancing Safety?

Establish Risk Context

- Define the scope of OT systems.
- Assess existing security and reliability measures.
- Consider the airport's operational environment and threat landscape.

Identify Innovation Opportunities

- Spot OT systems areas posing low risk.
- Explore innovation in low-impact areas for enhanced efficiency.



Create a Risk Profile

- Conduct a comprehensive risk assessment for each OT system.
- Prioritize risks based on their impact on safety and operational continuity.
- Document the risk thresholds acceptable to the airport.

Define Segmented Risk Architecture

- Design a segmented network architecture for critical OT systems to contain risks.
- Establish security layers to protect against unauthorized access and cyber threats.
- Ensure system architecture supports both current operational needs and future scalability.

Challenges in Adoption



Aging Infrastructure:

- Systematic modernization targeting critical system upgrades to reduce legacy constraints.

Selecting the Best Approach for Each Opportunity:

- Partnering with the right organizations and recognizing technology firms are not a silver bullet.

Strategic Tech Investment

- Ensuring that investments match measurable business benefits.

Collaborative Dynamics:

- Promoting a culture of unity, creativity and shared objectives to harness the strengths of diverse teams.

Innovation Ecosystem:

- Establishing a disciplined, risk-aware innovation environment transcending organizational boundaries for broader, impact-driven results.

Integration of digital technologies into aircraft design and manufacturing processes

Accelerate with Digital: From Network of Platforms to Connected aircrafts, via...

- **Digital Twins** with DDMS (Digital Design, Manufacturing & Services): a digital-first approach to the way aerospace products are designed, manufactured and operated
- **Pilots for innovative technologies**: prepare the future with AI, chatbots, CV, MR, ...

Digital to enable the transformation of Airbus' operations:

- **Simplification**: Accelerate processes **standardization** & application **rationalization**
- **Efficiency**: Deploy **additional automation** (time-saving, improved quality, enhanced reactivity) and focus on **Hyper-automation** (connect individual digital solutions for an end-to-end approach)
- **Speed of decisions**: Expand **Analytics** from data visualization to **data-driven** decision-making
- **Sustainability**: Enable a **paperless shop-floor** by 2028
- **Delivery**: Execute our roadmaps to support the **North America ramp-up for A320 & A220, and Helicopters**

Grow the Digital skills of our employees:

- Expose our employees to emerging technology; and **expand the digital culture and savviness** of our employees to **ease the adoption of new digital solutions**

**More
interoperability
between the
main
stakeholders in
the aviation
ecosystem**

skywise. The beating
heart of aviation

- Launched in 2017, Skywise is an **aviation data platform** that is a part of our Airbus Services offer and is a key differentiator for Airbus
- Skywise aims to be the **platform of reference** used by all major aerospace players to **improve operational performance and business results**, as well as to support their own digital transformation
- Skywise is able to **connect and enable the complete digital aviation ecosystem**: from Aircraft equipment suppliers; to Original Equipment Manufacturers (OEMs); and Operators and owners:
 - Collect and **share quality data**
 - Enable **collaboration and co-creation** to address topics such as safety, security, and environmental priorities

=> **Skywise** is the digital platform which **prepares the aviation of tomorrow** by connecting the rapid evolution of technologies with the industry standards and regulations



ADSS SIMULATION

START POINT
Lat: N/A
Lng: N/A

END POINT
Lat: N/A
Lng: N/A

Evaluating Method
Evaluate Length

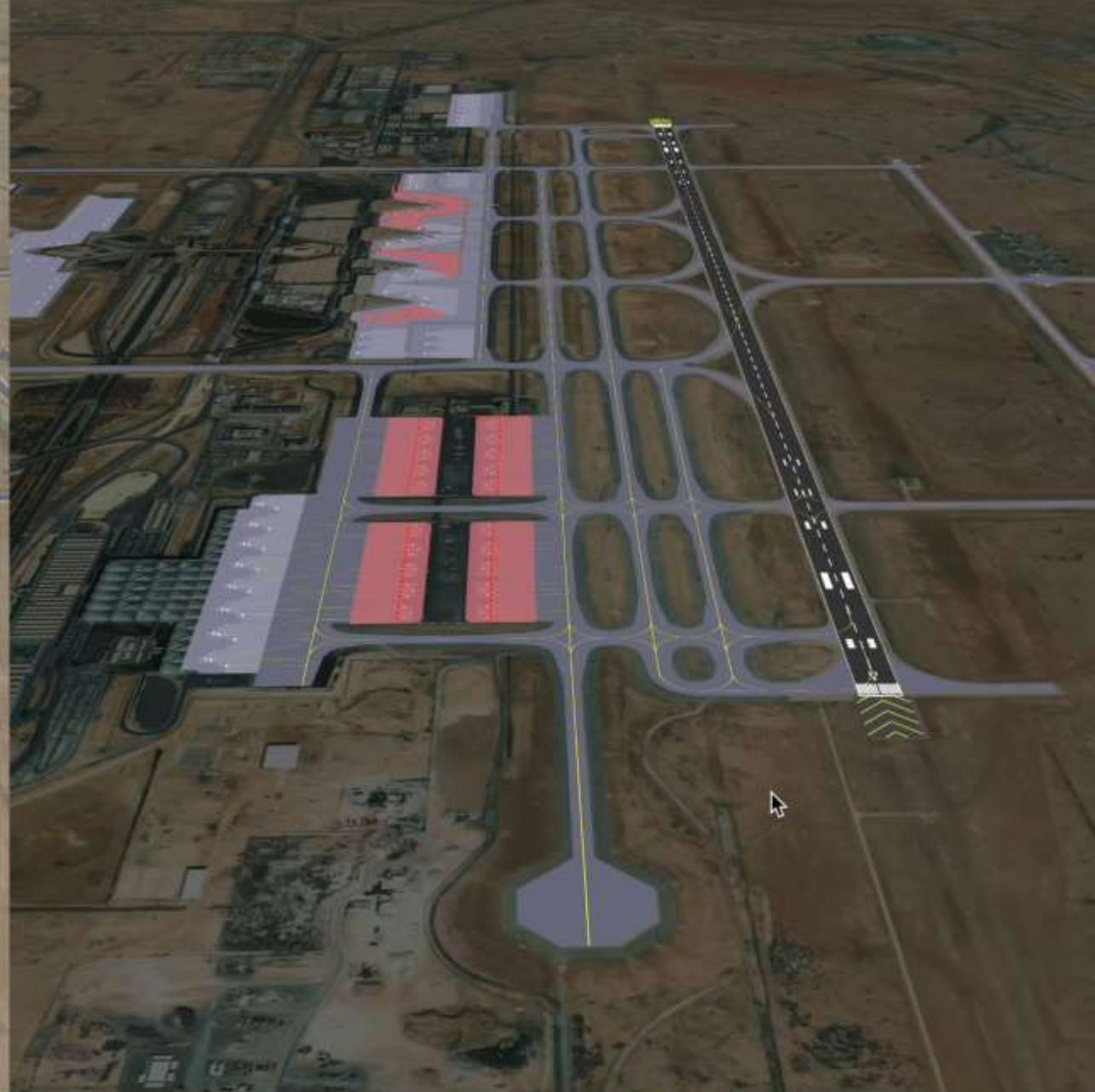
Send to Generator Upload Simulation

TOTAL TAXI TIME:
AVERAGE THRUST:

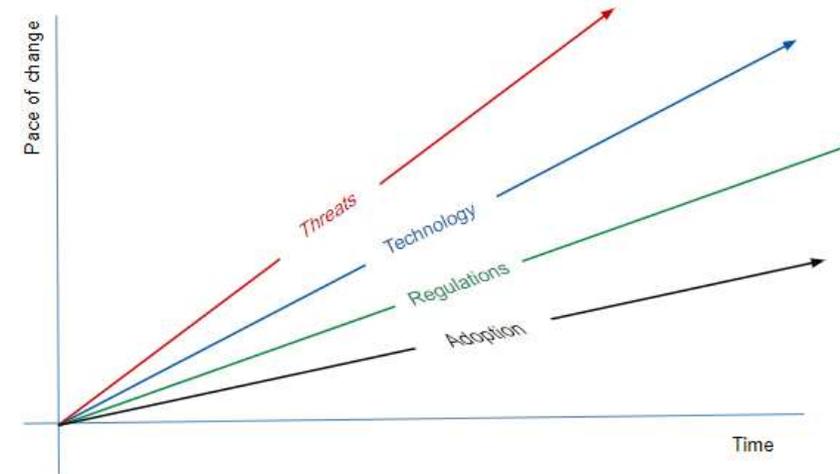
Cumulative graph

TOTAL FUEL CONSUMPTION:

Back to List Draw Generate by All Erase



Coping with the pace of change



- **Encourage further exchanges** between the ICAO Council and industry (i.e. the Industry Consultative Forum) and share a **common technology roadmap**
- Identify and deploy **appropriate regulations in a timely manner** based on this common technology roadmap
- **Identify potential risks** associated with new technologies, then measure and mitigate their impacts by **carrying out corrective actions on existing regulations and standards**
- Involve all players in the aviation ecosystem to **enable this technological evolution**: Let's not only manage the change; Rather let's **lead the change!**

Main digitalization priorities

&

Call for action

Top 2 Priorities:

- 1- Embed **digital DNA** in our products & services: **Digital by design**
- 2- Contribute to the transformation of the aerospace industry by raising and shifting our standards to **new paradigms**, embedding **sustainability in all our practices**

Call for action:

- Keep **Safety First**, anticipate risks for our aviation ecosystem, from suppliers to airlines and maintenance actors
- **Collaboration** on cybersecurity, data quality and data exchange

Innovation Case Study – Virtual Queuing

Collaborative Innovation at Scale

Case Study - Virtual Queuing

A National Collaborative Innovation



Challenge

Long Waits at Security Lines:
Affecting passenger satisfaction negatively



Solution

Virtual Queuing: A system allowing passengers to book a slot for security screening in advance or join a digital queue, reducing physical waiting times



Approach

Foundation: Leveraging an ACI workgroup for expertise.

Partnership: Uniting with the five major airports in Canada and the FlyCanada CIO team.

Strategy: Driving support through shared branding, achieving economies of scale.

Thank You

