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Madrid, Spain
24 – 25 June 2026
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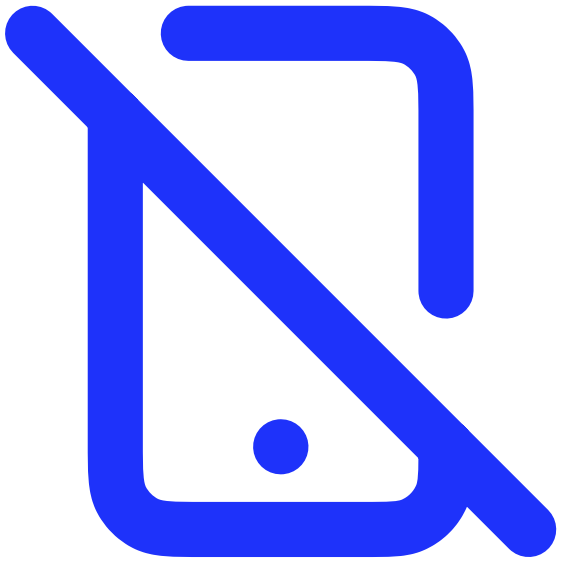
Silence your phone



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Event ID: **IATAWMES2026**

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WMES App, Q&A &Survey.

Sessions

Speakers

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Announcements

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Central Europe Time Adjust

Before Event

Tuesday 23 June

18:00 - 19:00 CET (1 hour)
Networking Cocktail Reception

Wednesday 24 June

08:00 - 09:00 CET (1 hour)
Welcome Coffee

09:00 - 09:10 CET (10 minutes)
Opening and Welcome
Milan-Venecia

From crisis to constraint: The new normal for the aviation supply chain

Wed 24/06, 09:10 - 09:30 CET
20 minutes

Milan-Venecia

Add to calendar

Add session

Speakers

Stuart Fox
Director Flight and Technical Operations, IATA

About this session

Plenary Session

Add session to calendar and scroll down to access Q&A and Survey.

About this session

Plenary Session

Live Q&A Hasn't started

Survey

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Event hashtag

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Introduction

Iryna Khomenko,

Senior Manager Technical Operations and Supply Chain, IATA

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Korean Air's PdM Journey: A Real Airline Perspective

Jonghoon Oh,

General Manager, Head of Predictive Maintenance, Korean Air

#IATAWMES

World Maintenance Engineering Symposium (WMES)
Madrid, Spain
June 2026

Next-Generation M&E:

Predictive Maintenance and AI Digitalization at Korean Air

Presenter: Jonghoon OH, GM / Head of Predictive Maintenance, Korean Air

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About Us.

Founding Date

MAR 1, 1969

Employees

19,425

Engineering : 4,743 (24%)

Operating Fleet

163 A/C

PAX : 140 / CGO : 23

Destinations

40 Countries
111 Cities

PAX Traffic

23M PAX

Cargo Traffic

1.5M Tons

Journey Together

KOREAN AIR × ASIANA AIRLINES

163 A/C → 200+ A/C

About Us.

Total Integration

Beyond the FSC merger, our LCC subsidiaries—Jin Air, Air Busan, and Air Seoul—will also integrate into a single powerful LCC platform.

Market Leadership

This consolidation will create Korea's largest LCC, providing a comprehensive network that covers both premium and budget segments.

Operational Synergy

A unified fleet and shared infrastructure will maximize efficiency and set a new standard for operational reliability across the entire group.

Setting the Stage: Airline Workshop - April 2026

- **Focusing on Operational Reality** : Shifting the conversation from standard product features to sharing real-world experiences from airline operators.
- **Global Collaboration** : Over 80 industry experts from several global airlines came together in Seoul to share insights and build consensus. (22 Airlines Registered)
- **A Paradigm Shift** : Recognizing that Predictive Maintenance is more than a technology upgrade—it requires a fundamental transformation in how we operate and maintain aircraft.
- **Collective Goal** : Building transparent partnerships across the industry, sharing both our successes and valuable lessons learned.

Operationalizing PdM: The KE Journey

2023 - The Task Force

Launched with 7 members from Engineering, MCC, and Reliability. Focused on benchmarking, breaking data silos, and securing C-Level support.

2023 - IT Integration

Expanded the team. Critical addition of IT and Data Engineering experts to build data pipelines and infrastructure for in-house modeling.

2024 - KE PrediX Launch

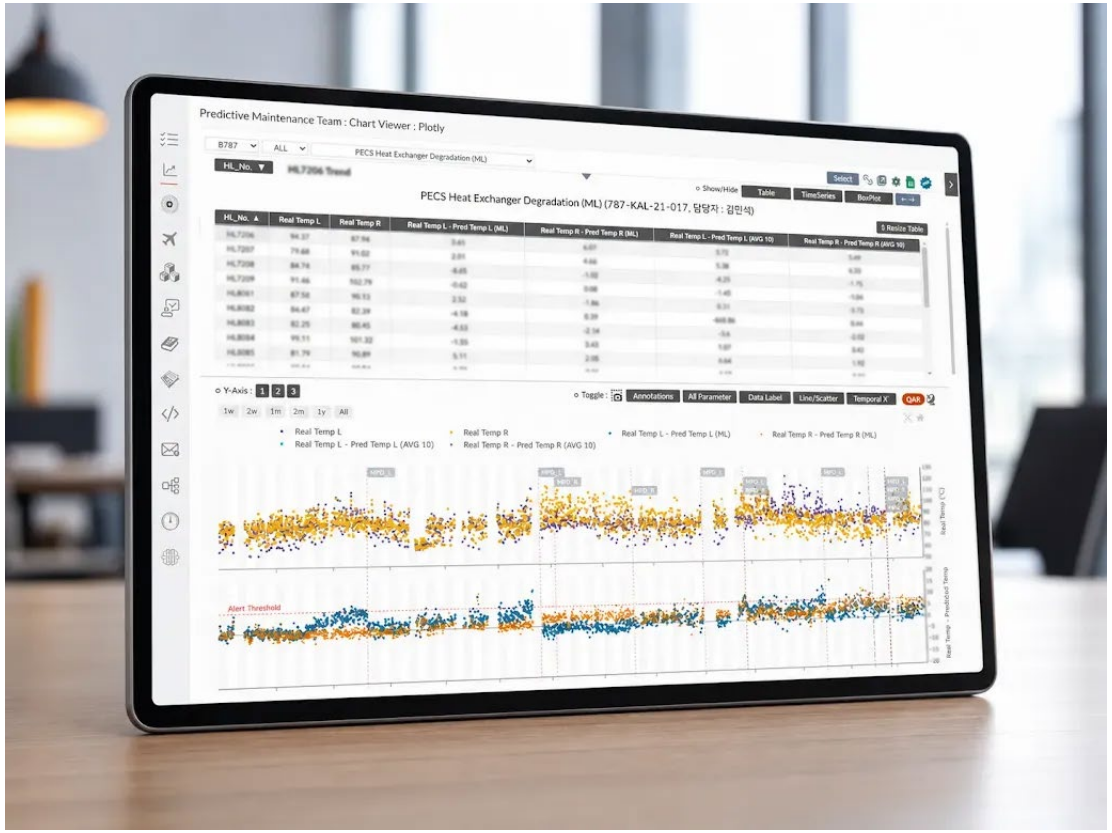
Successfully launched our in-house, no-code platform. Enabled custom alert modules, trend visualization, and unified alert management.

2025/26 - Scaling Up

Expanded OEM coverage across all fleets (Boeing & Airbus) while refining in-house models. Achieved over 120 prevented Operational Interruptions in 2025.

In-House Innovation: KEPrediX

- **Chart Builder** : A no-code based interface allows engineers to easily create custom model trend charts tailored to specific failure modes.
- **Custom Alerts** : Empowers the team to set distinct thresholds and trigger customized email alerts based on their domain expertise.
- **Alert Management** : A single pane of glass for processing engineering reviews, issuing work orders, and recording shop findings.
- **Performance Management** : Integrates comprehensive alert statistics, KPI tracking, and cost evaluation to continuously measure and optimize the true operational value of our PdM strategies.



Redefining Success: From Alerts to ROI

Shifting KPIs

We are no longer just counting alerts. Leading carriers have moved away from traditional lagging metrics like IRRE and Turnaround Time, toward proactive indicators.

Measuring "Cost Avoidance"

The true metric of success is quantifiable cost savings, measured primarily through prevented AOGs (Aircraft on Ground).

The Dual-Layer Framework

Balancing Operational Efficiency (Alert Acceptance Rate & Precision) with Direct Business Impact ensures model performance translates to the bottom line.

Cross-Functional Synergy

Proving ROI requires seamless integration between "Domain Experts" (Engineers) and "Data Experts" (Data Scientists). A dedicated PdM organization is essential.

Beyond Technology: Culture & Trust

Building Trust on the Hangar Floor

Beyond Algorithms

True breakthroughs happen on the hangar floor. Breaking down silos is the foundation of PdM success.

Targeting "Quick Wins"

Focusing on high-impact systems first to prove the technology's value to frontline mechanics early.

High Explainability

Mechanics must understand the 'why' behind an alert. Technology must be a trusted partner, not a black box.

AI in M&E (1): Upgrading Predictive Analytics

Overcoming Limitations

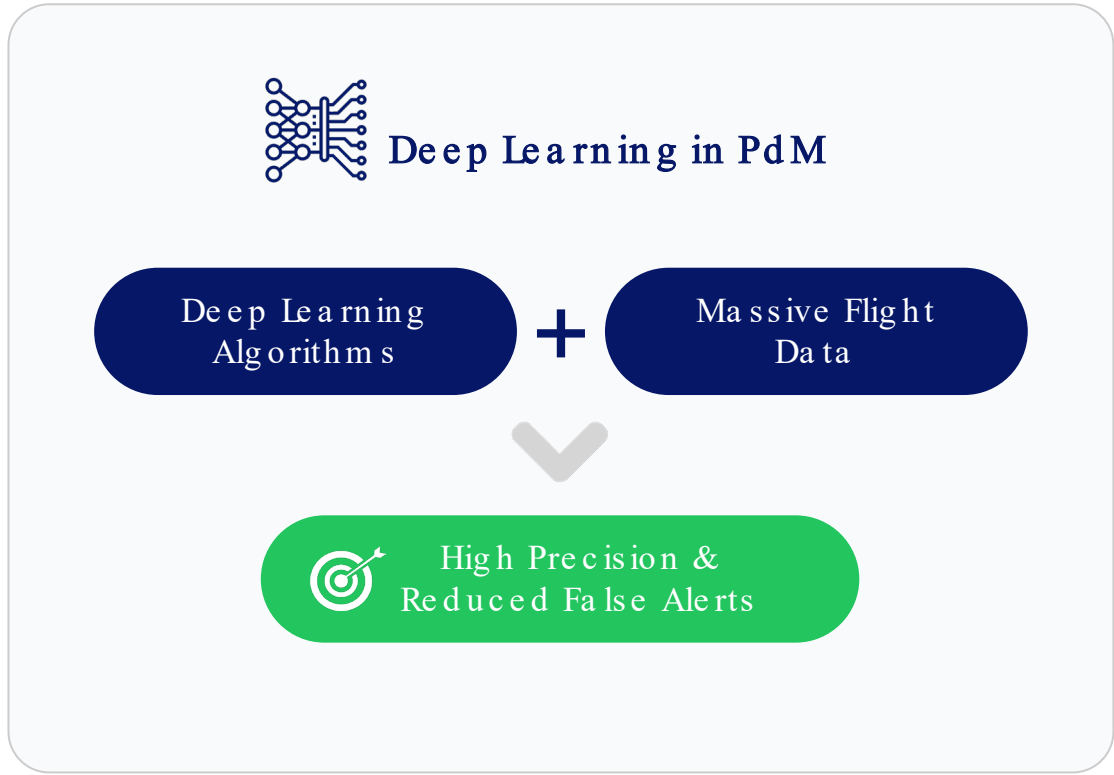
Moving beyond the rigid constraints of traditional physics-based models and standard rule-based algorithms.

Deep Learning Models

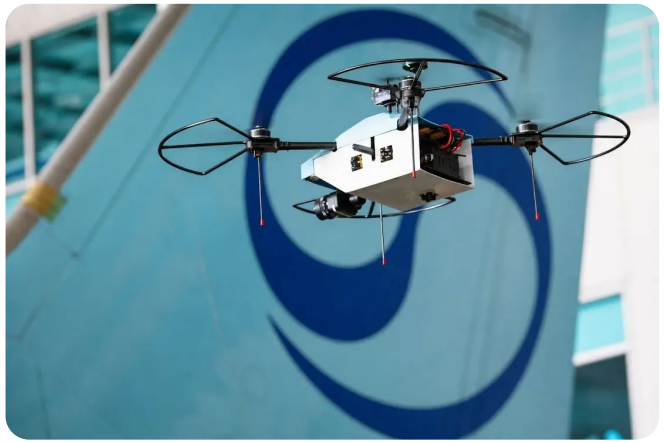
Applying advanced AI neural networks to discover complex, hidden patterns within massive datasets of historical flight data.

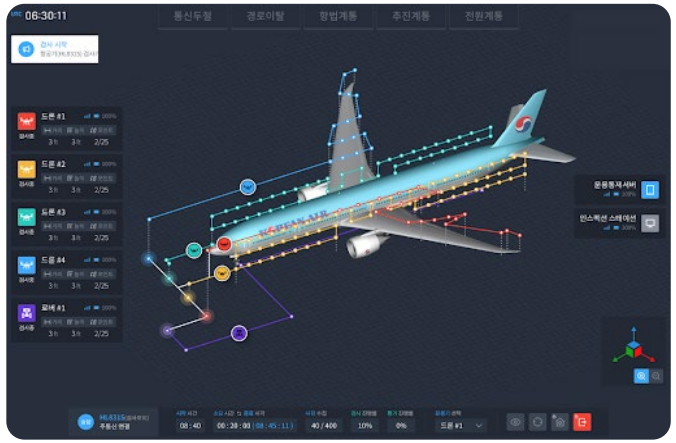
Operational Impact

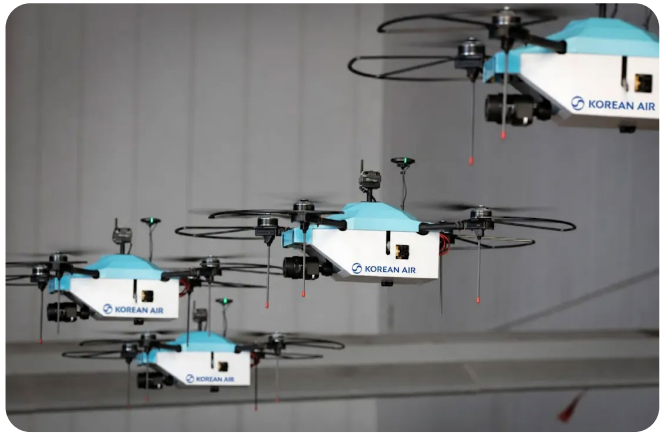
Achieving significantly higher alert precision, predicting failures earlier, and drastically reducing false positives on the hangar floor.

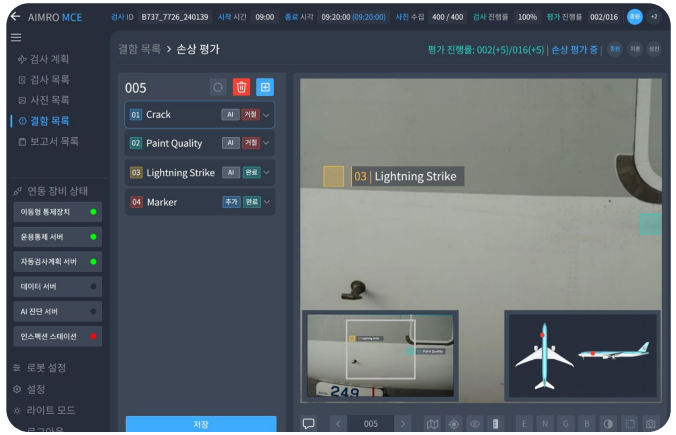


AI in M&E(2): Autonomous Visual Inspections









Target: H2 2026

1

Autonomous Robots

Deploying advanced drones and rovers to execute self-driving exterior aircraft scans.

2

Swarm Control System

Operating a centralized system to seamlessly command and coordinate multiple robot swarms.

3

AI Defect Analysis

Utilizing computer vision to automatically analyze scan graphics, detect structural defects, and instantly alert mechanics.

Redefining Component Support Partnerships

As predictive maintenance evolves, the industry faces a critical two-step challenge regarding PBH repair coverage.

Step 1: Guarantee Vendor PdM

Vendor PdM Alert Triggered

Part Removed & Sent

Officially guarantee PBH coverage for vendor-generated alerts.

Step 2: Cover All PdM Alerts

Early Degradation Detected

Preemptive Removal

Accept removals based on shared criteria for early degradation.

Questions?

Thank you for joining Korean Air's PdM Journey.

Predictive Maintenance Team

KOREAN AIR

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Korean Air's PdM Journey: A Real Airline Perspective

Jonghoon Oh,

General Manager, Head of Predictive Maintenance, Korean Air

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The Endeavor and Vision: Advancing Maintenance through Innovation

Takuma Koga,
Assistant Manager, Engineering Planning & Administration,
All Nippon Airways

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The Endeavor and Vision

Advancing Maintenance through Innovation

ANA

UNITING the WORLD in WONDER

1. Introduction
2. Current Status
3. Future Vision
4. Conclusions

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Takuma KOGA
All Nippon Airways Co., Ltd.
Tokyo Haneda, Japan (HND)

Engineering
Planning & Administration

Role:
Leading predictive maintenance initiatives in ANA

Background:
Powerplant mechanic
Powerplant engineer

About ANA: Company Introduction

Corporate Name ALL NIPPON AIRWAYS CO., LTD.

Date of Foundation December 27, 1952

Number of Employees 14,983 employees
(47,826 employees, consolidated basis)

Principle Purpose
- Air transportation business
- Aircraft and aircraft parts sales, leasing and maintenance
- Airport ground handling services

Flights (as of August 1, 2025)

	Routes	Destinations
Domestic	142 (25*)	61 (15*)
International	55 (18*)	41 (11*)

Number of Aircraft 240 (38*) including 88 Boeing 787
(as of June 2025)

-Launch customer of the Boeing 787
-Major fleet in ANA with all variants
(Rolls-Royce and GE engine powered)

*Peach Aviation and Air Japan

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3. Future Vision
4. Conclusions

Corrective Maintenance vs. Predictive Maintenance

- **Corrective maintenance** remains inherently **unscheduled**, heavily consuming additional cost and resources
- **Predictive maintenance** minimizes flight disruptions by **converting unplanned events into scheduled tasks**
- Transitioning to predictive maintenance demands robust big data infrastructure and advanced analytics

Corrective Maintenance

- Unplanned Maintenance
- Flight Disruptions

Preventive Maintenance

Time-Based

- Hard Time
- On Condition

Condition-Based

- Rule Based Monitoring

Predictive Maintenance
Big Data x Analytics

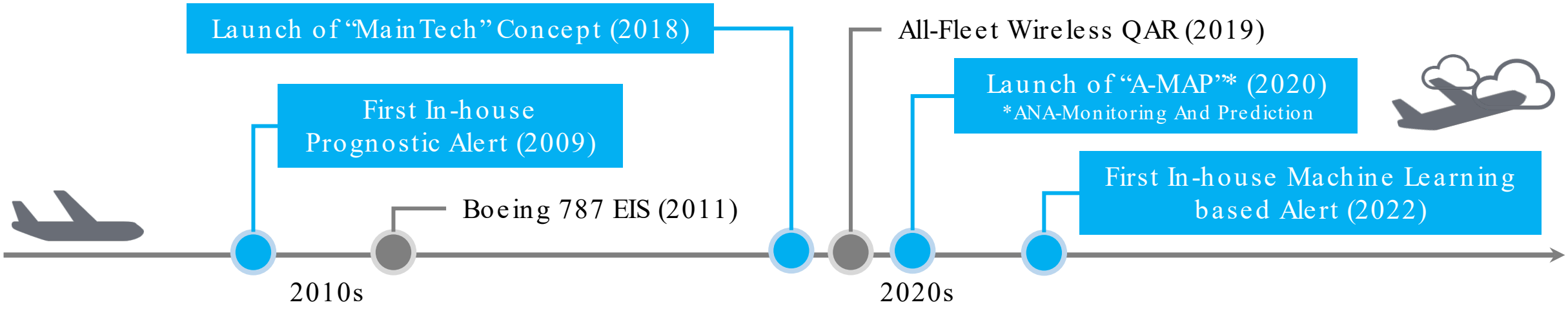
- Multivariable Anomaly Detection
- Remaining Useful Life Estimation

Maintenance Cost
- Labor, Parts, Equipment ,etc.

Necessary Data

ANA's Journey: From Monitoring to Predictive Maintenance

- **Early 2000s:** Consistent utilization of onboard ACMS for data monitoring
- **Boeing 787 EIS:** Exponential growth in data volume, surpassing traditional spreadsheet capacity
- **A-MAP Launch:** Initiated a dedicated project to accelerate predictive maintenance at ANA



ACMS* based Condition Monitoring

*Aircraft Condition Monitoring System

- In-house ACMS Logic/Report Development
- Rule-based Alerts

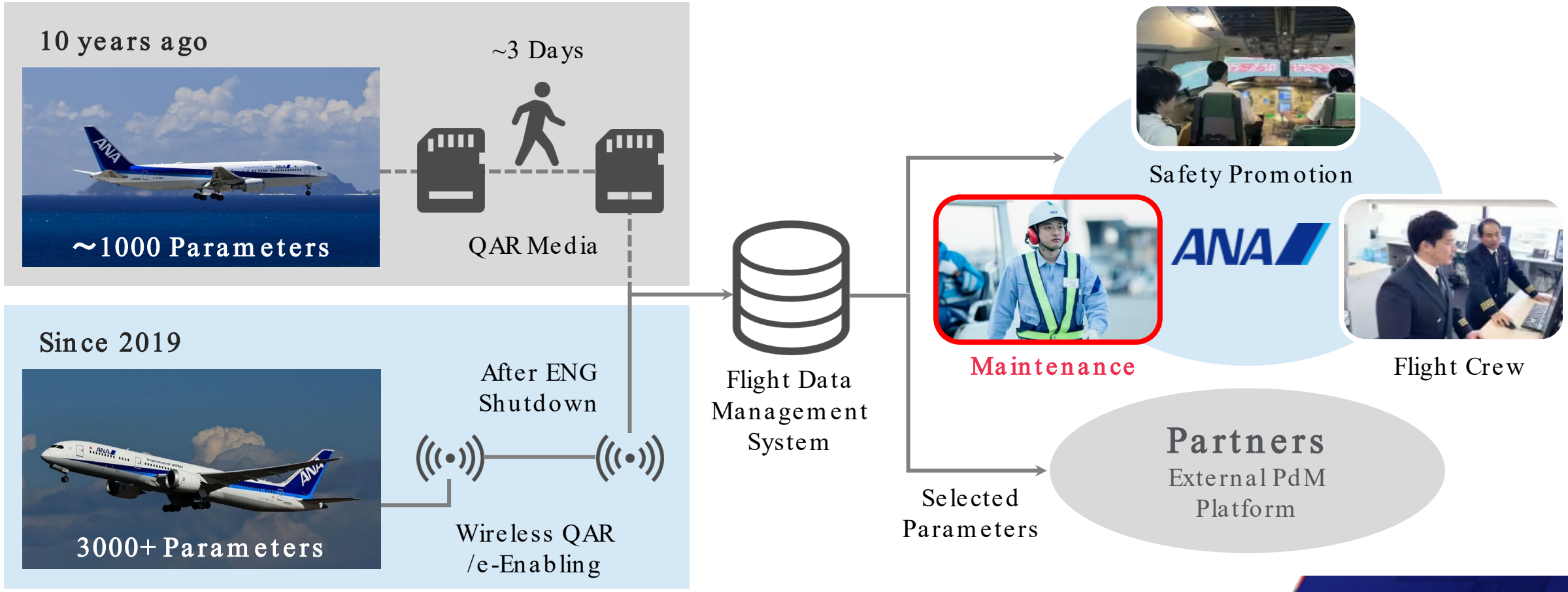
Flight Data based Predictive Maintenance

- Multivariable Anomaly Detection
- Machine Learning

ANA UNITING the WORLD in WONDER

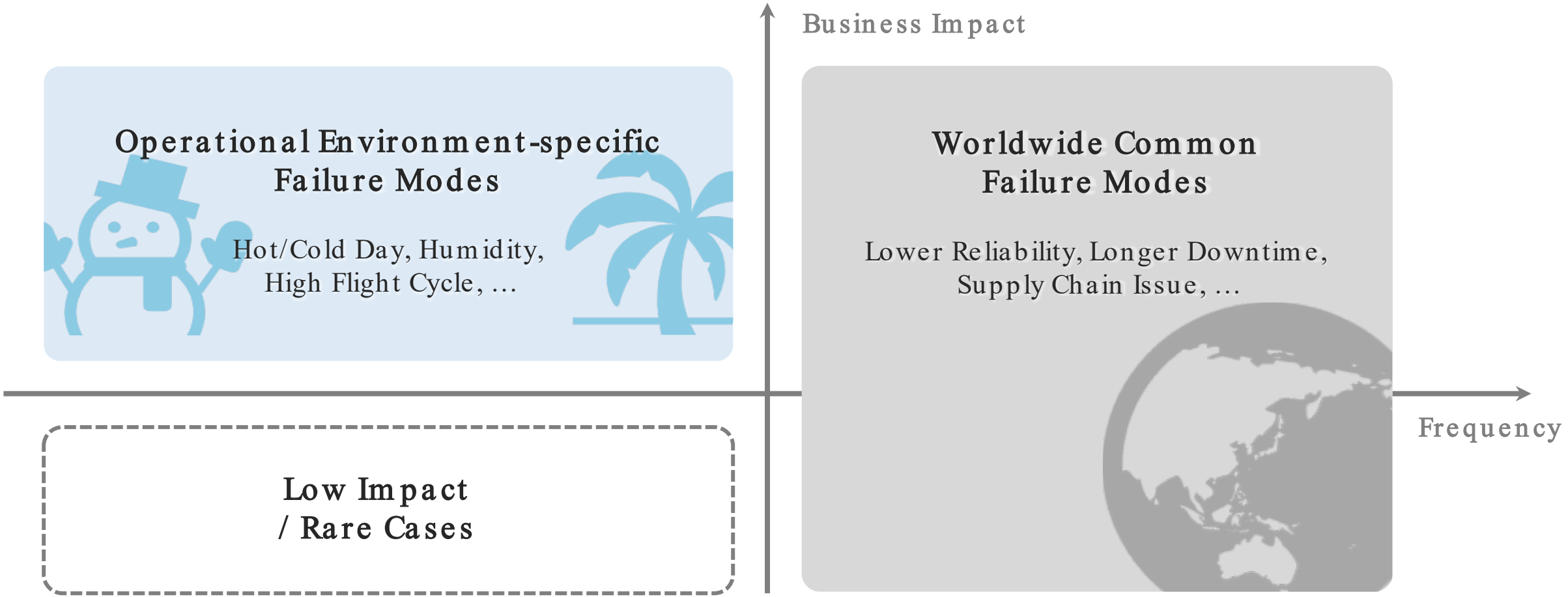
Flight Data Processing / Data Pipeline

- **Legacy System:** High-latency data uploads via physical card media (every few days)
- **2019 Upgrade:** Fleet-wide transition to wireless QAR systems via aircraft retrofits
- **New Capabilities:** Dramatic data growth unlocking advanced analytical applications



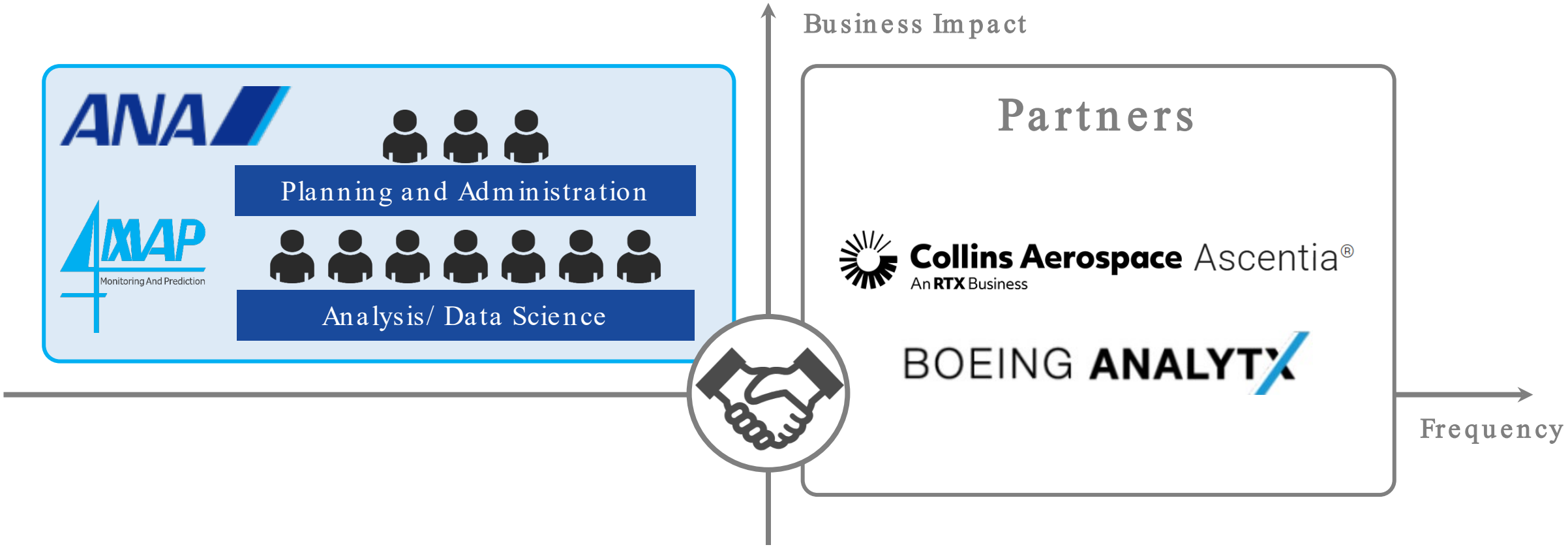
Mapping Airline Failure Modes

- Airlines face various failure modes that can be classified by **frequency and business impact**
- These include operational environment-specific failures and worldwide common failure modes



Resource Focus: ANA and Partners

- **In-House Focus:** Targeting internal resources toward **unique, operational environment-specific** challenges
- **Partner Synergy:** Leveraging external solutions for **high-impact, high-frequency** failure modes



Collaboration through data exchange / idea exchange

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Mid-Term Corporate Strategy

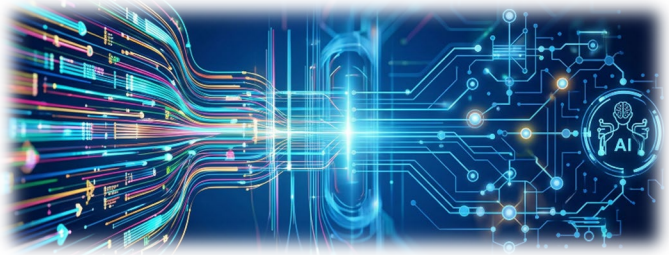
The core policy of the ANA brand's Mid-Term Corporate Strategy sets forth the vision of

"Digital by Default × Human Premium"

Digital by Default

Comprehensive Digitization:
Fundamentally redesign business processes to transition manual operations to digital.

The Prerequisite for Growth:
Moving beyond basic efficiency by leveraging technology to boost quality and cross-functional synergy, setting the stage for our next leap forward.



Human Premium

Uniquely Human Value Creation:
Driving future-oriented business transformation and the relentless pursuit of safety and quality that only human can achieve.

The Extra Human Touch:
Leveraging deep aviation expertise for advanced judgment, fostering trust-building communication, and delivering that final, thoughtful care to inspire.

The Ultimate Goal

ANA's ULTIMATE GOAL

Maximum Aircraft Utilization with Minimum Effort

TRANSFORM the process

Diagnosing the unseen:
Visualizing the invisible
with advanced technology

REDEFINE the program

From Calendar to Condition:
Scheduled routine
to on-demand maintenance actions

SHIFT the main player

From Manual to Automated:
Offloading routine tasks
to machines

ANA UNITING the WORLD in WONDER

Next-Gen Aircraft Maintenance

TRANSFORM
the process

Diagnosing the unseen:
Visualizing the invisible
with advanced technology

REDEFINE
the program

From Calendar to Condition:
Scheduled routine
to on-demand maintenance actions

SHIFT
the main player

From Manual to Automated:
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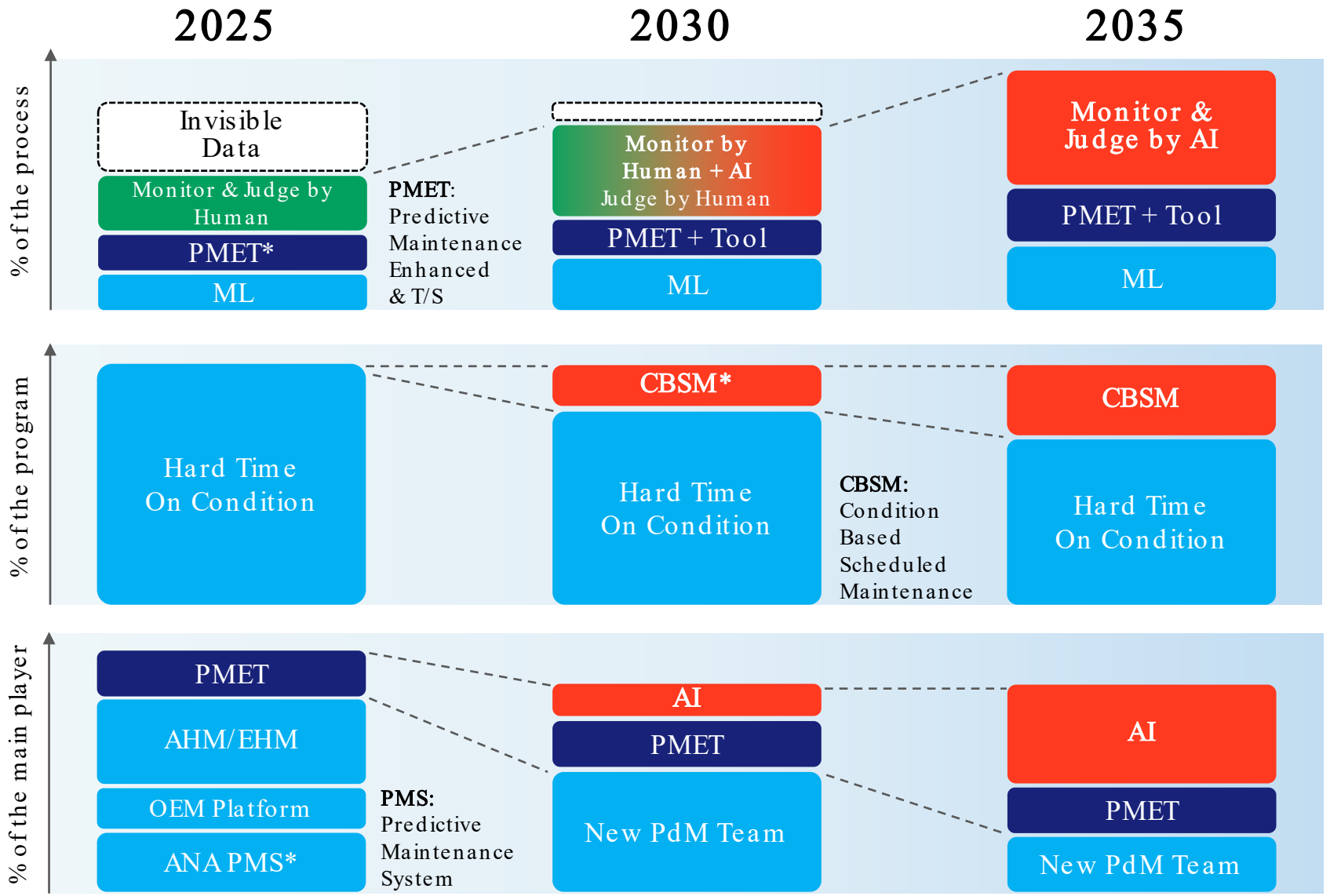

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Transformation Roadmap (2026-2029)

Digital Transformation

2026: Collins
June 2026
Ascentia
Repeaters Trial

2026: Boeing Global Services
October 2026
Insight Accelerator Trial

2026: Collins
October 2026
Ascentia
AOG Management Trial

2026: Lufthansa Technik
2H 2026
Survey of Aviatar

2027: PdM Team
April 2027
New PdM Team
Establishment in ANA

2028: AMOS (TRITON)
January 2028
Full Deployment of the
Next-gen MIS AMOS (TRITON)

Fleet Expansion

2026: 737-8
September 2026
Delivery of the 737-8

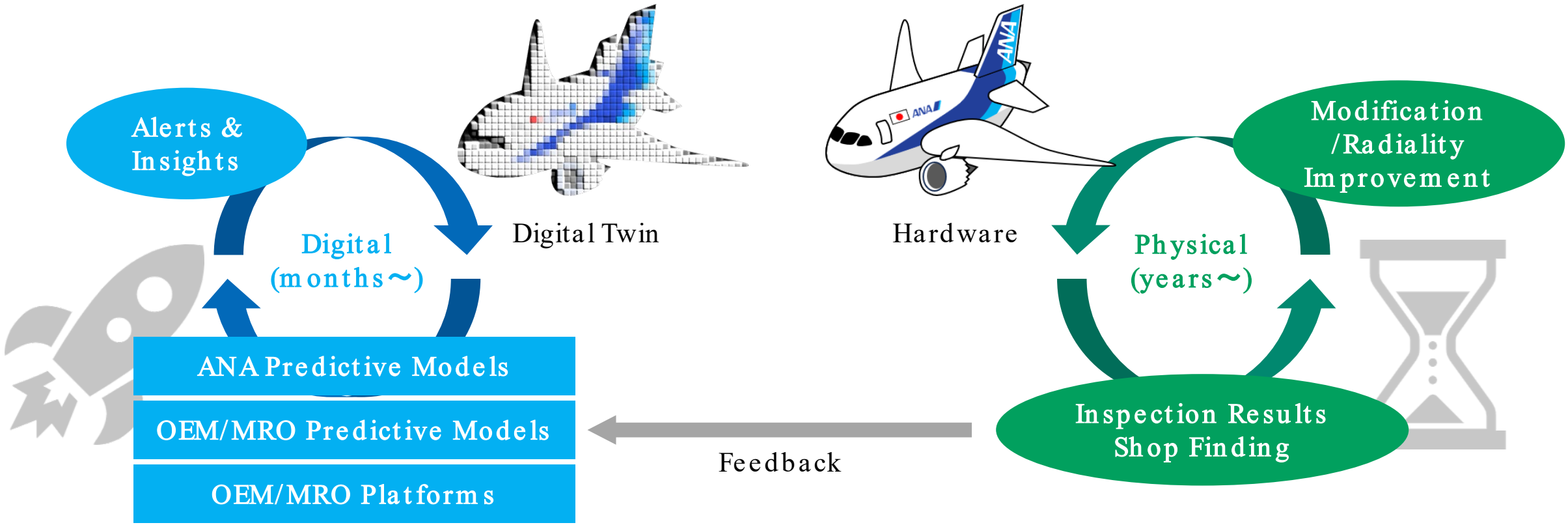
2027: 777-9
1H 2027
Delivery of the 777-9

2028: E190-E2
2H 2028
Delivery of the E190-E2

2029: 777-8F
1H 2029
Delivery of the 777-8 Freighter

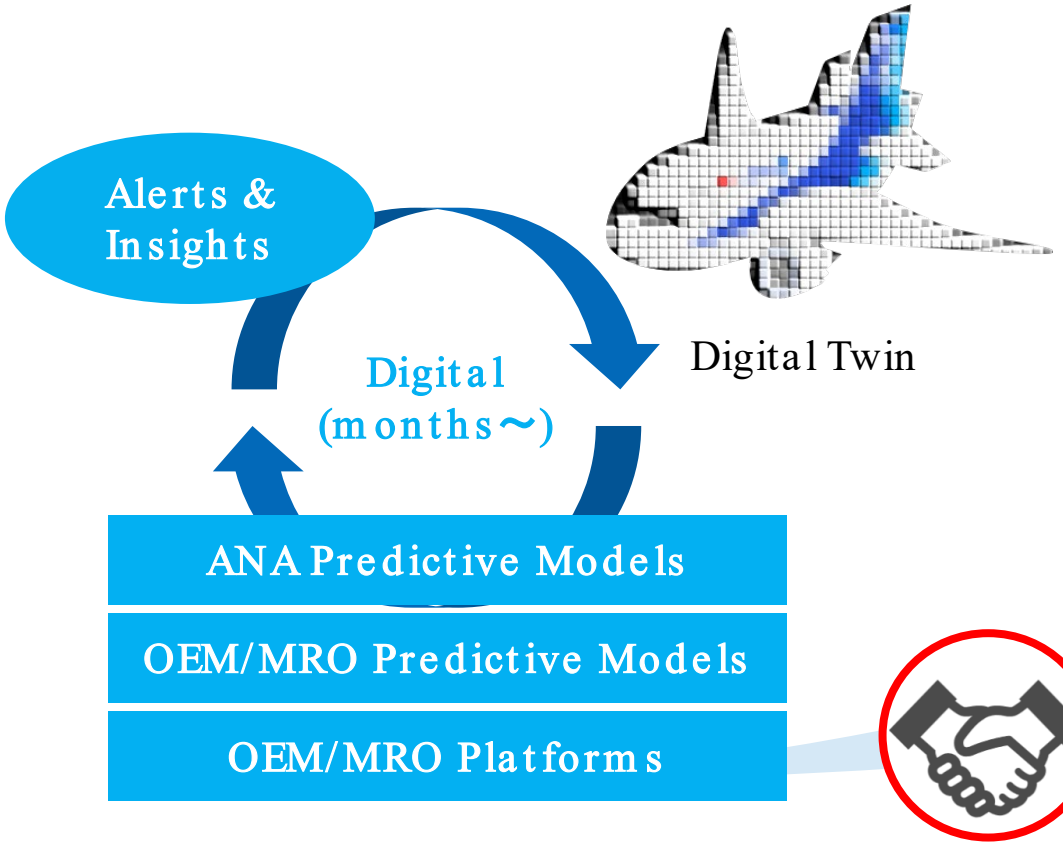
Future Vision of Our Predictive Maintenance

- **Industry Bottlenecks:** OEM and supply chain resource constraints significantly delay component modifications
- **Agile Mitigation:** Predictive maintenance offers rapid interim solutions, delivering operational speed as an advantage
- **Future Vision:** Accelerating optimization through digital twins to simulate, predict, and refine maintenance actions



Drivers of the Growth

- **Actionable Insights:** Developing **transparent and actionable** alerts is critical for driving actual PdM utilization
- **True Partnerships:** Moving **beyond mere data exchange** to build mutual understanding with external partners
- **Standardized API Integration:** Enables **seamless data flow** between PdM platforms and MIS
- **Stakeholder Alignment:** Continuously advocating the value of PdM to both internal teams and regulatory authorities



Growth of Predictive Maintenance

Model Explainability
- Transforming black-box OEM/MRO alerts into transparent insights accelerates actual implementation

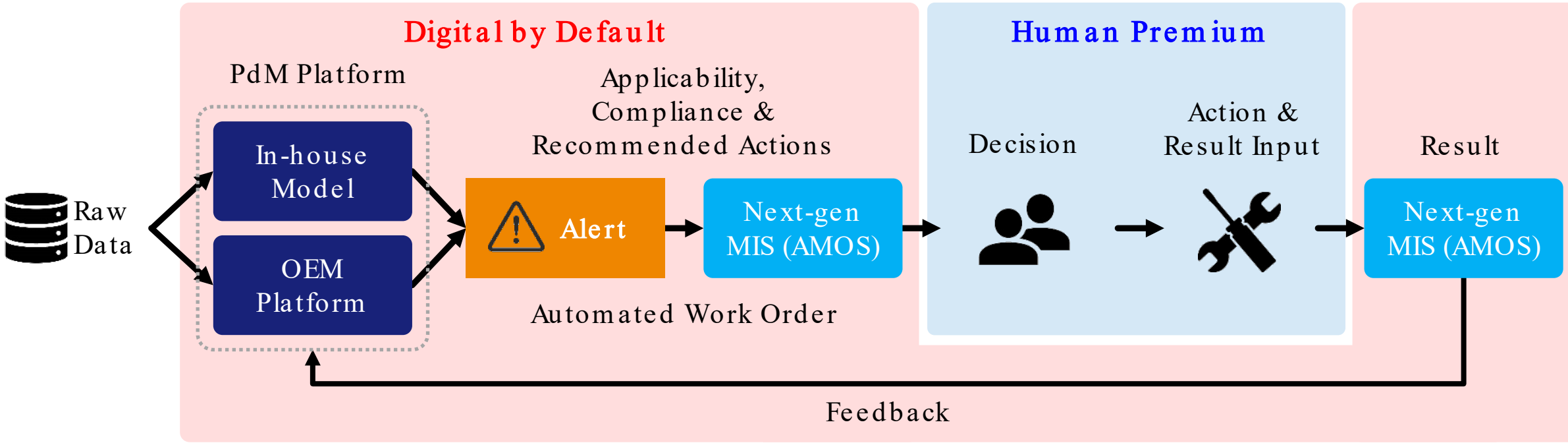
Alert Actionability
- Linking predictive alerts directly to specific FIM tasks within available maintenance slots

Analytics Resources Allocation
- Machine and man to analyze aircraft data
- Synergizing in-house models and OEM/MRO platforms

Effective PdM requires close collaboration of airline, OEM/MRO, and regulatory authority

Predictive Maintenance Ecosystem: Closed-Loop Concept

- **Hybrid Strategy:** Leverage both in-house models and OEM/MRO platforms for optimal coverage
- **Seamless Automation:** Predictive alerts automatically generate work orders in the MIS via seamless API
- **Human Premium:** Engineers focus on high-level judgment, prioritizing and directing the automated work orders
- **Continuous Feedback:** Maintenance results from the MIS feed directly back to improve predictive model accuracy



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Conclusions

- **Results and Challenges**
  - ✓ Replacing unplanned failures with planned actions to **prevent flight disruptions**
  - ✓ Data alone is not enough; **deep domain knowledge** is essential for accurate analytics
  - ✓ Synergy between data insights and engineers' expertise yields the best results

- **Key Success Factors**
  - ✓ Fostering **hybrid talent**: Bridging aviation engineering and data science
  - ✓ Unlocking the potential of design and performance data during operational phases

- **The Way Forward**
  - ✓ Industry-wide Collaboration: Building strong airline communities and **co-creating** with OEMs/MROs, and regulatory authorities.


Thank you for your attention

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The Endeavor and Vision: Advancing Maintenance through Innovation

Takuma Koga,
Assistant Manager, Engineering Planning & Administration,
All Nippon Airways

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AI for Aircraft Maintenance- Panel Discussion

Moderated by **Iryna Khomenko,**
Senior Manager Technical Operations and Supply Chain, IATA

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Moderated by
Iryna Khomenko,
Senior Manager Technical Operations and Supply Chain, IATA

Panelists

Yousif Jawher,
Reliability & Maintenance Program Manager,
Royal Jordanian Airlines

Mark Mazarek,
Predictive Maintenance Engineering Manager,
Boeing

Takuma Koga,
Assistant Manager, Engineering Planning & Administration,
All Nippon Airways

Jonghoon Oh,
General Manager-Head of Predictive Maintenance,
Korean

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Artificial intelligence for Engineering and Maintenance

Supervised learning	Unsupervised Learning	Reinforcement Learning	Deep Learning	Natural Language Processing	Generative AI? Agentic AI?
Learns from labeled historical data (known input – unknown output),can use statistical learning, deep learning • Failure prediction • Useful Life estimation • Fault classification	Finds patterns in unlabeled data (statistical or deep learning) • Abnormal events • Rare failures • Hidden patterns	Learns by interacting and optimizing decisions • Maintenance planning • Spare parts allocation and optimization	Neural networks for complex pattern recognition • Computer vision inspections • BSI • Health monitoring from sensor time series	Using LLM to understand and process human language • Analyze records • Speech / notes into insights • Failure trends from text reports	Generative AI? Tools that create text, images, or videos Agentic AI? Takes initiative, plans tasks, collaborates with other systems

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Networking Coffee Break

Next session starts at 11:00

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Introduction

Dragos Budeanu,

Senior Manager Engineering and Maintenance, IATA

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Moderated by
Dragos Budeanu,
Senior Manager Engineering and Maintenance, IATA

Panelists

Raki Islam,
Vice President, Technical Audit,
Safran Group

Urszula Szamotulska,
Senior Director Innovation & Regulation, Lufthansa Group

Peter Koopmann,
Senior Manager-Head of Seat Engineering,
Airbus

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Cabin Innovation Certification

Dragos Budeanu,

Senior Manager Engineering and Maintenance, IATA

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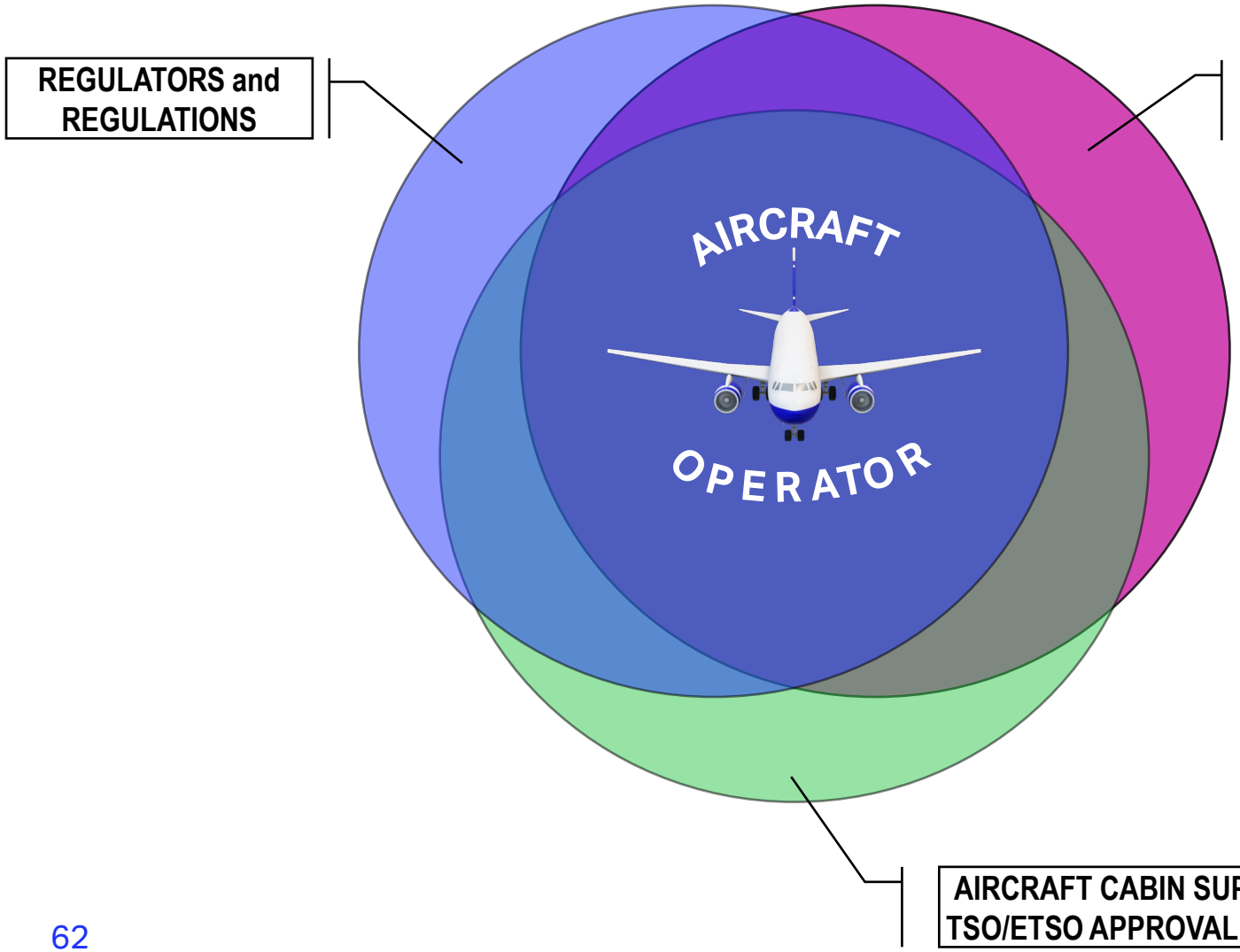
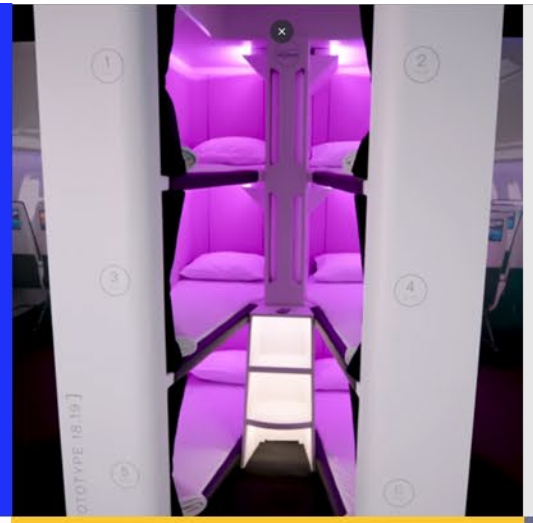
Aircraft Cabin = Airline "Link" to Passengers



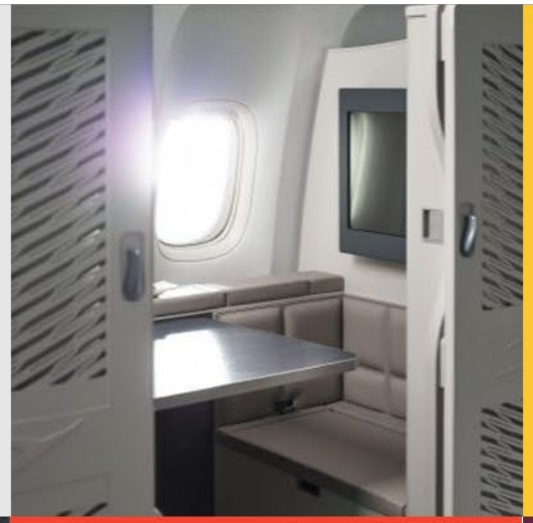
- Airlines are **not competing on the Safety of Flight and Passengers**
- Airlines are **competing on passengers' convenience and comfort**
- **Seating**, **Cabin Furniture and Monuments**, **IFEC** and **Cabin Service** are key to unlocking passengers' loyalty

Aircraft LOPA offer and level of cabin service = **High(est) airline differentiator for most operators**

NOVELTY



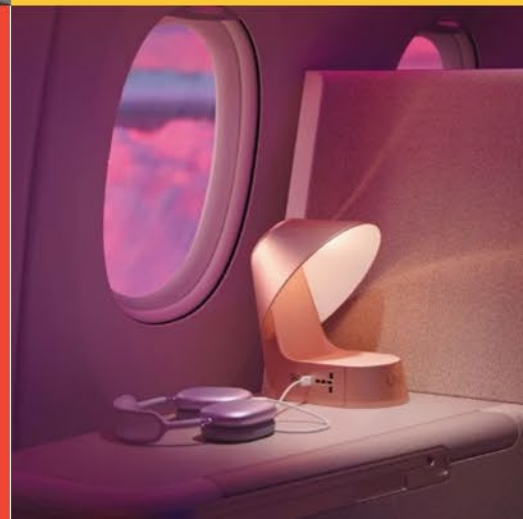
CREATIVITY



CUSTOMIZATION

FLEXIBILITY

INNOVATION



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Cabin Innovation Certification

Dragos Budeanu,

Senior Manager Engineering and Maintenance, IATA

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The Airline Perspective: Lufthansa Group

Urszula Szamotulska,

Senior Director Innovation & Regulation, Lufthansa Group

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The Seat Provider Perspective: SAFRAN

Raki Islam,

Vice President, Technical Audit ,Safran Group

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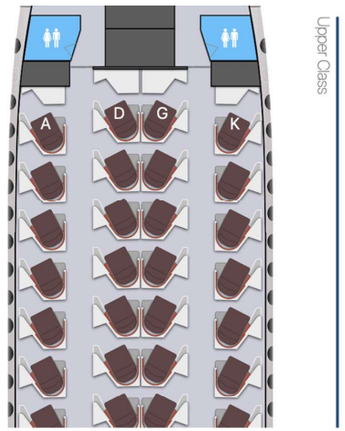
Seat Innovation & Certification

Raki Islam, Safran Seats

IATA Symposium, Madrid, Spain
25 June, 2026

SAFRAN

Innovation and Certification Challenges



- Oblique Seat
  - Passenger Injury Mechanism and Pass/Fail Criteria

- Business/First Class Suite with Privacy Door
  - Emergency Evacuation
  - New Certification Requirements

How would I certify my innovation?

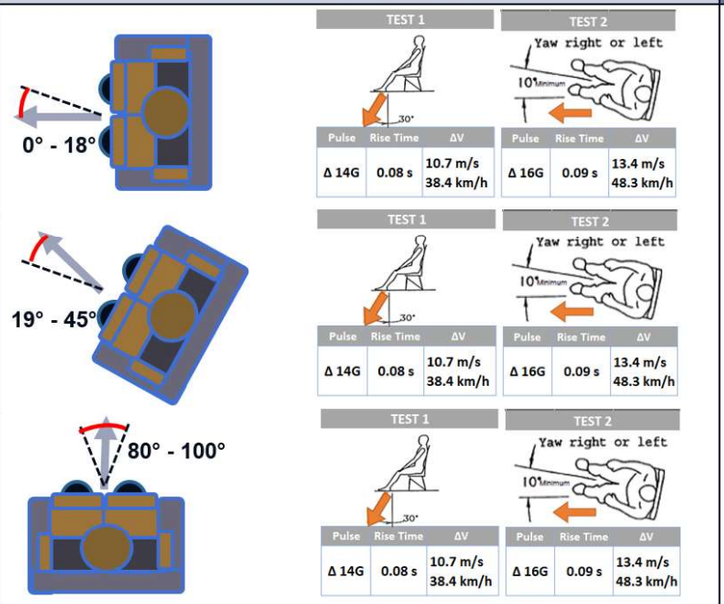
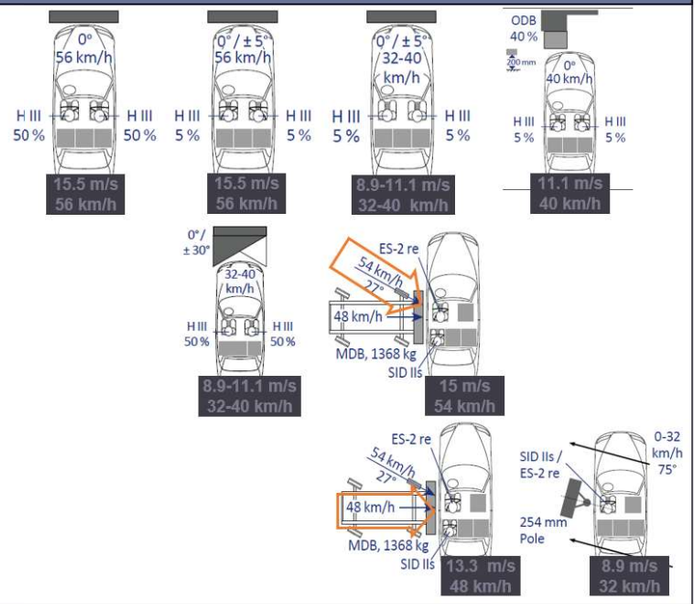
SAFRAN

Innovation and Certification Challenges

What are the certification challenges?

- Potential unavailability of regulation or guidance to certify an innovative design/feature, especially related to passenger injury and/or evacuation.
- Industry lags developing standards (in collaboration with regulators) for new designs and technologies.
- Limited research and collaboration between regulators and industry in identification of passenger injury mechanisms and development/refinement of Injury/ Pass-Fail Criteria.
- Extensive duration of development for any new reasonable regulatory guidance.
- Acceptance of simulation for prediction and mitigation of occupant injury has been slow due to lack of industry maturity in passenger injury crash simulation.
- Unpredictable interpretations of test results for passenger injury criteria testing.

Comparison of Automotive & Commercial Aviation Impact Testing

	Commercial Aviation	Automotive [2]
Frontal		
Oblique		
Side		

	Automotive	Commercial Aviation	Challenges for Commercial Aviation
Cabin/Test Environment	Enclosed and compact cabin	Typically, no surrounding considered	• Uncontrolled ATD movement due to open cabin environment • Feasibility of including surroundings (sidewall, doors etc.) could induce additional complexity
Regulatory Model	Injury/ Pass-Fail Criteria planned and developed by industry	Regulators establish Injury/ Pass-Fail Criteria	• Industry is fully dependent on regulators' interpretation of current Injury/ Pass-Fail Criteria, especially on subjective criteria

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Innovation and Certification Challenges

Probable Solution(s):

- Assessment of certification strategy, approach and means of compliance during new concept development. *Certification should not be an afterthought.*
- From the very beginning of the program. early engagement with regulators and deep dive into certification risk mitigation parallel to customer reviews.
- Collaborative (seat industry & regulators) development of injury assessment process based on AIS (Abbreviated Injury Scale) which will help to identify potential serious injury for any new innovations.
- Development of a safety roadmap including Injury/ Pass-Fail Criteria for commercial aviation in collaboration among regulators and seat industry.
    - This safety roadmap will benefit both FAA and industry, long-term, in developing and certifying new technologies enhancing overall passenger safety.
    - With combined support of regulators and industry, a roadmap, will ensure a predictable path-forward towards increasing the level of passenger safety and advancement of new technologies.

POWERED BY TRUST

SAFRAN

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The Seat Provider Perspective: SAFRAN

Raki Islam,

Vice President, Technical Audit ,Safran Group

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The Aircraft Manufacturer Perspective: Airbus

Peter Koopmann,

Senior Manager-Head of Seat Engineering, Airbus

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Cabin Innovation Certification

Moderated by **Dragos Budeanu,**
Senior Manager Engineering and Maintenance, IATA

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Panelists

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Senior Director Innovation & Regulation, Lufthansa Group

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Airbus

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Networking Lunch

Next session starts at 14:00

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Introduction

Iryna Khomenko,

Senior Manager Technical Operations and Supply Chain, IATA

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Aircraft Recovery

Peter Unger,

Head of Aircraft Recovery // MD Lufthansa LEOS, Lufthansa Airlines

#IATAWMES

Aircraft Recovery

IATA WMES 2026, MAD

Peter Unger, Head of Aircraft Recovery LH

Public

Agenda

- What is Aircraft Recovery?
- Different types of recovery
- Two recovery environments
- Recovery context, process and objectives
- Work distribution
- Challenges
- Why care? What is reasonable? What should be avoided?

What is Aircraft Recovery?

Aircraft Recovery in broader sense

- **Getting an aircraft**
  - Outside the usual / in normal operating manuals described processes
  - On the ground
  - Back into „normal“ operating or maintenance environment

What is Aircraft Recovery?

Aircraft Recovery in broader sense

- Getting an aircraft
  - Outside the usual / in normal operating manuals described processes
  - On the ground
  - Back into „normal“ operating or maintenance environment

For example

- Moving an aircraft that has left the TWY and is stuck in the ground
- Solving the problem of an aircraft that has „slipped out“ of the attachment points while jacking it for maintenance
- Lifting and moving an aircraft that has left the RWY and lost the L/H LDG

What is Aircraft Recovery?

Aircraft Recovery vs Aircraft Salvaging

- **Aircraft Recovery**
  An aircraft that is economically repairable

- **Aircraft Salvaging**
  An aircraft that sustained substantial damage, so the insurer considers the hull a constructive loss

→ However, that may only be known later in the process

Different types of recovery

1. Light recovery – debogging
(not always called recovery)

The Aircraft has left the hard surface. The LDG is down and locked and the Aircraft can be towed by normal procedures

2. Medium recovery

At least one LDG is not completely extended. However, the Aircraft is expected to be moved by normal towing procedures after the recovery

3. Heavy recovery

One or more LDG are severely damaged / torn out, so that a normal tow will not be possible

What do you think ?

What do you think ?

Medium

Light

Medium

Heavy → Salvaging

Medium

Salvaging

Lufthansa

Two recovery environments

Recovery can happen in two environments, where different rules may apply

1. Recovery of an aircraft that was in **operating conditions**

Taxi, take-off, landing, passengers / crew on board, …

2. Recovery of an aircraft in **maintenance/ ground status**

Parked aircraft , maintenance tow, …

Recovery context

In charge	Operations control center investigator in charge	Recovery manager	Technical control center
Focus	Situation handling people, authorities investigation	Aircraft recovery (salvaging)	Getting aircraft airworthy
Output	Aircraft cleared for recovery (release by authorities)	Aircraft recovered input for CAMO/OEM to provide required tasks (used forces, etc.)	CRS

Stay in control of the aircraft and tasks performed !

Lufthansa

Recovery process

(as outlined in ASM Part V)

1.	2.	3.	4.	5.	6.
Plan / organize	Official release by investigating authority to enter site / start recovery	Reduce weight ▪ Unloading (baggage, freight, catering) ▪ Defueling – (can take hours!!) ▪ Removal of parts ▪ Removal of elements of cabin	Lifting ▪ By air pressure bags under wing / fuselage ▪ By jacks using lifting points under wing and/or LDG ▪ By crane	Establish mobility of aircraft ▪ By extension of gears ▪ By repair or change of gear, wheels, etc. ▪ By trailer	Moving the aircraft ▪ By use of towing tractors, winch …

Recovery objectives

Objectives				
Safety	Avoid environmental damages	Avoid secondary damage	Precise documentation of actions taken, esp. forces used	Speed

Work distribution

Recovery manager	▪ Develops idea for recovery (i. e. how to lift / pull / ...) ▪ Focal point of action and recovery communication ▪ Link to recovery forces – also including contracting ▪ Functions as project manager
Recovery forces (touch aircraft)	▪ Technical staff (may be same as go-team could be station mechanic only), touch aircraft ▪ Lifting experts, fire brigades of airport (DACH), local MROs, contractor, own staff, helper,..
Recovery support	▪ Tbd. (e.g. solves fuel issue, digging, surface levelling, …) ▪ Individual concept depending on case
Emergency field organization (if available)	▪ Arranges all surrounding actions / needs (e.g. hotel, IT, ….)

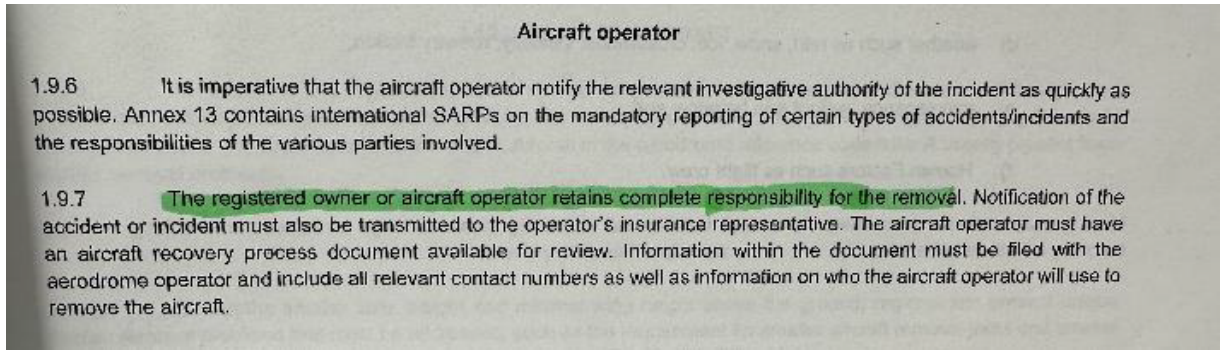
Recovery challenges

- **In the event**
  - Getting staff into the country (and work there)
  - Getting onto the airport on the site
  - Getting equipment into the country and onto the site
  - Challenge to focus on the recovery
  - Keep the “how-long” guys in control

- **Regular times**
  - Be prepared and trained
    (As this occurs infrequently, a smaller group with low turnover may be more suitable.)

Why care?

- The **responsibility** for the recovery remains with the **operator** / owner



Aircraft operator

1.9.6 It is imperative that the aircraft operator notify the relevant investigative authority of the incident as quickly as possible. Annex 13 contains international SARPs on the mandatory reporting of certain types of accidents/incidents and the responsibilities of the various parties involved.

1.9.7 The registered owner or aircraft operator retains complete responsibility for the removal. Notification of the accident or incident must also be transmitted to the operator's insurance representative. The aircraft operator must have an aircraft recovery process document available for review. Information within the document must be filed with the aerodrome operator and include all relevant contact numbers as well as information on who the aircraft operator will use to remove the aircraft.

- Thus, the airline shall have an **accountable manager** for Aircraft Recovery, that decides on the internal setup

- To ensure subsequent airworthiness – the **operator** must be in **control** of the action

- The **airport** may ask, **how** the **airline** intends to **recover** an aircraft

What is reasonable ?

Two different approaches (mainly driven by homebase(s) environment)

1. **Focus on recovery management (e. g. Central European carriers)**
   - Processes and relevant documents
   - Group of highly trained recovery managers
   - Aircraft specific tools

2. **Complete inhouse capability (e. g. North American carriers)**
   - Including continuously drilled recovery forces
   - Including complete sets of lifting equipment

PLUS: Be part of the “recovery networks”

- IATA Recovery Group– know the others that can help you
- Participation in the IATP – to cover your route network

What should be avoided ?

Unpreparedness

Recoveries without control/supervision of the airline

- Data required to repair the aircraft
- Hidden / unknown damage to the aircraft caused by the recovery (carbon fuselage, later incidents)

Recoveries not in control/supervision of Aircraft maintenance experienced personnel
(for easy debogging may be ok)

- Recovery documentation is complex and could be misunderstood by non-AMM experienced readers, cross references to AMM (e.g. aircraft stability)

Overpreparedness

- As by now all aircraft have been recovered, the impact of disabled aircraft to the overall punctuality of air traffic is negligeable

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Aircraft Recovery

Peter Unger,

Head of Aircraft Recovery // MD Lufthansa LEOS, Lufthansa Airlines

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IATP Aircraft Recovery

Manuel Mercado,

Tooling Supervisor / Aircraft Recovery Team Lead, American Airlines

#IATAWMES

IATP Aircraft Recovery

World Maintenance & Engineering Symposium (WMES)
Removal of Disabled Aircraft
25 June 2026
Madrid, Spain

IATP

Mission

The IATP is a convention of Airlines sharing Technical Resources to generate economic savings and support on time dispatch reliability and operational safety.

Organization Definition

The IATP is a non-profit, independent, non-political global organization based on a democratic culture with equal opportunities for all member Airlines and their delegates.

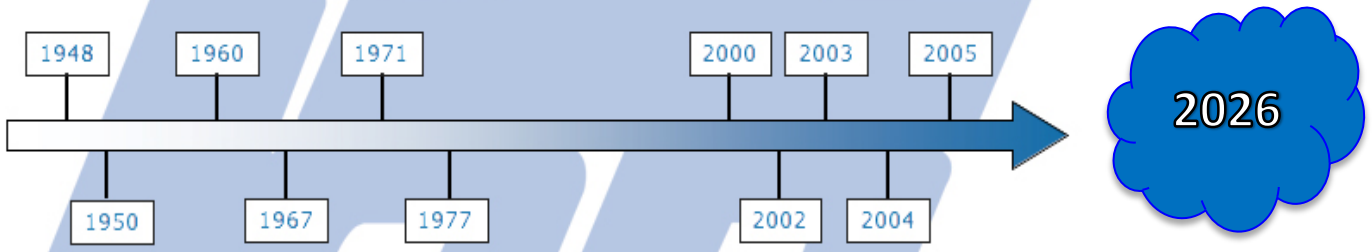
Technical Resources Definition

Technical Resources includes, but not limited to, aircraft spare parts, line maintenance, ground handling equipment, aircraft recovery kits, engines, and technical training.

Brief history of IATP

1948 – A few European airlines started sharing aircraft materials, equipment and manpower resources. Entirely reciprocal without financial settlement.

1977 – A second organization, the "North American Airlines Technical Pool" (N.A.A.T.P.), consisting of 16 airlines from North America, merged with IATP in February 1977.



2005 – Opening of the IATP Corporate Office in Luxembourg with permanent, paid staff on board. Creation of the www.iatp.com website and implementation of a new on-line conference registration system.

The IATP Today

- **142*** Airline Members + **51** Equalized and Guests Airline Members
- **45** Associate Members
- Share **6,675** items valued at **$ 169 M** (SS2025)
- **Parts Pool Groups** covering all major aircraft types
- Provide **line maintenance** pooling at **900+** stations
- Provide **12 Aircraft Recovery** Kits worldwide
- Provide **5** Large Kits for A-380/747-8 recovery
- Provide info on **Technical Training** Capabilities List
- **Engine pooling**

*6 are suspended: Rossiya (FV), GOL (G3), Fly Baghdad (IF), Ukraine Airlines (PS), Air Bridge Cargo (RU), Aeroflot (SU)

IATP Core Activities

- Ensure a **worldwide Airlines network founded on a collaboration spirit (exchange of support)**
- **Bi-Annual Conferences**
- **Pooling operations through the IATP platform**, 5 pooling sections:
  1. Parts
  2. Equipment
  3. Line Maintenance
  4. Aircraft Recovery
  5. Engine pooling

IATP Core Activities

Pool Groups: Parts

G - Avionics & Interchangeable

K - B737

M - B747

P - A220-100/300, Embraer (170,175,190,195), Bombardier (CRJ-7/9/1000)

Q - All Airbus Types

S - B757,767, B787

T - B777

IATP Core Activities

Pool Groups: Equipment & Maintenance

E- Equipment

Samples

- B777: Wheel change tooling
- Turbine Engine Turning Tools
- Flyaway Towbar
- Flyaway Axle Jack 35 Ton Capacity

F/L- Maintenance Pools

F - Technical Facilities and Services

L - Line Maintenance

IATP
AIRCRAFT RECOVERY
POOL GROUP



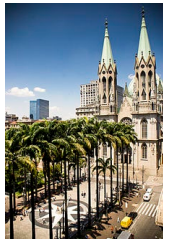


The recovery kits are owned by:

AA(2), AF, AI, BA, DL, JL, LA, QF, QR, SA, UA

- LHR London (**BA 51/51L**), Europe 1 & 2
- CDG Paris (**AF 52/52L**), Europe 1 & 2
- ORD Chicago (**AA 57**), N. America Central
- JFK New York (**DL 54**), N. America Eastern
- LAX Los Angeles (**AA 56**), N. America Western
- HNL Honolulu (**UA 55),** North Pacific
- DEL Delhi (**AI 60**), Mid East & Indian Subcontinent
- NRT Tokyo (**JL 58**), Asia Eastern
- SYD Sydney (**QF 53/53L**), Australia
- JNB Johannesburg (**SA 50/50L**), Africa
- GRU Sao Paulo **(LA 61)**, South America
- DOH Doha **(QR 62/62L)**, Middle East






Types of Kits

- Two types

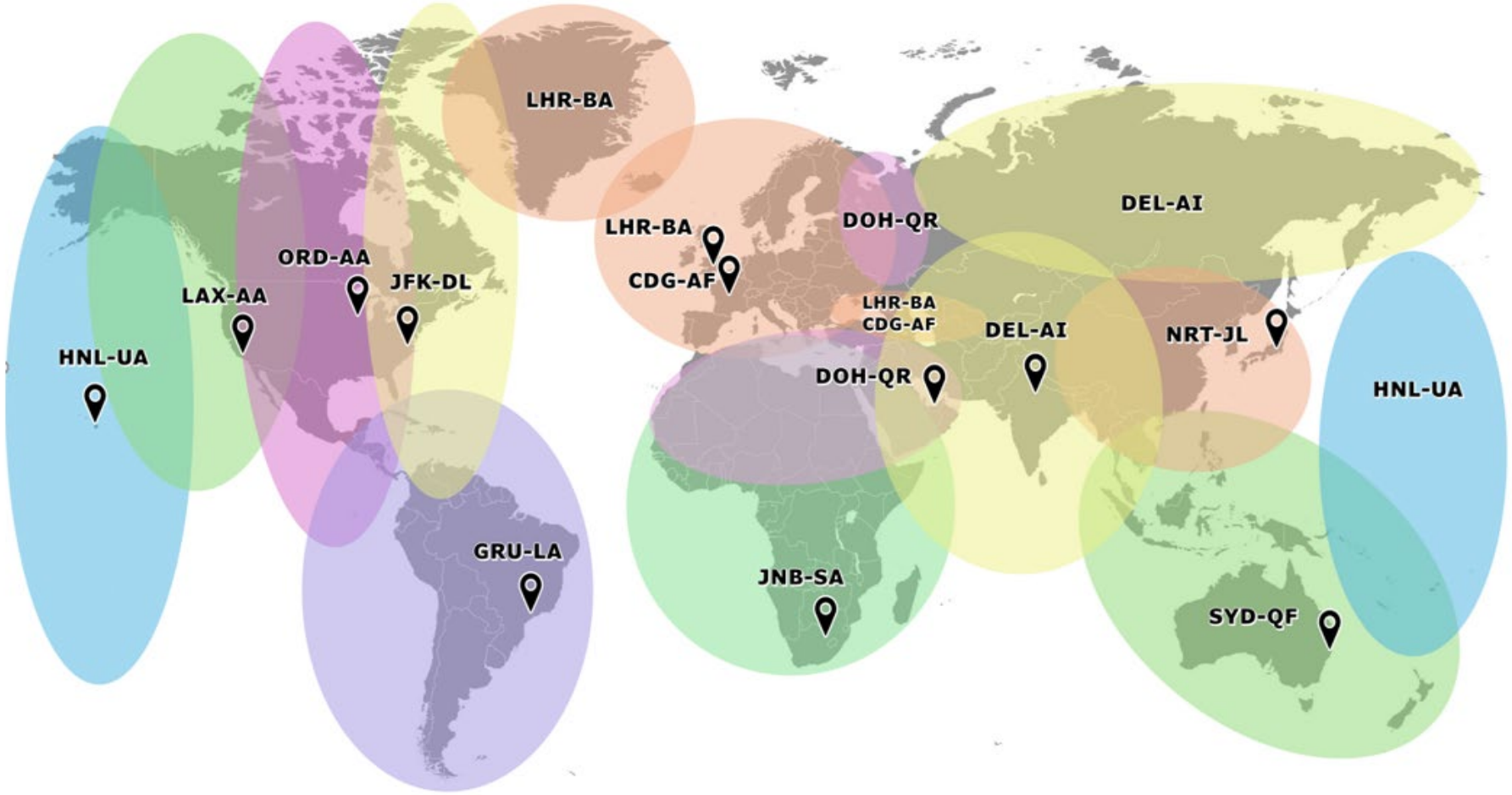
1. A **BASIC KIT** may be used when recovering an aircraft up to maximum take-off weight of 910,000 lbs. (i.e. B747-400).

2. A **LARGE AIRCRAFT KIT** may be used in conjunction with a basic kit when recovering an aircraft up to maximum take-off weight of 1,300,700 lbs. (i.e. A380 & B747-8).

- Example, QR 62/62L

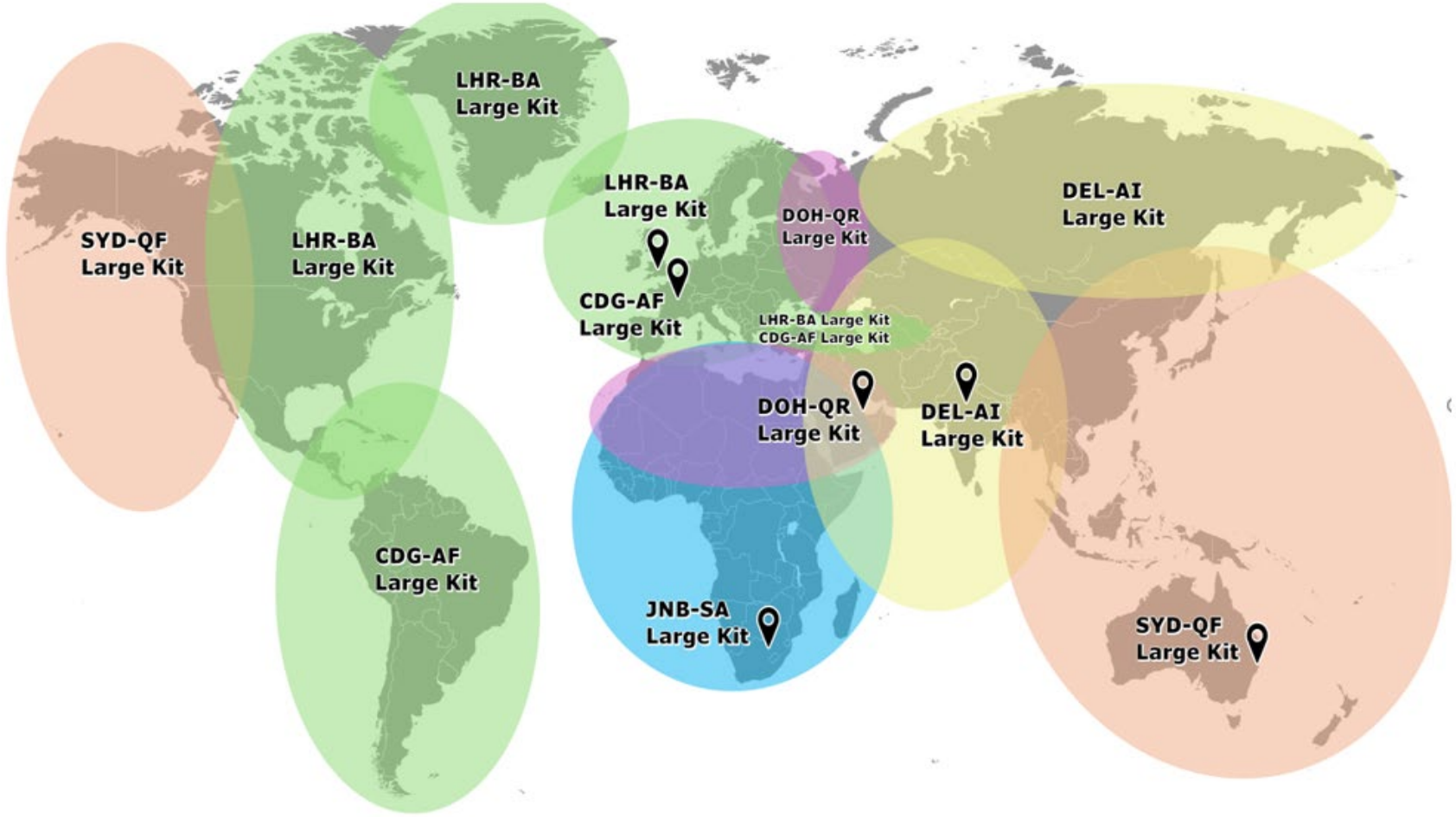
  -62 is Basic kit, 62L is Large kit

IATP BASIC KIT COVERAGE MAP



*Coverage Map- Approved as of Feb.2025

IATP LARGE KIT COVERAGE MAP



*Coverage Map- Approved as of Feb.2025

Low Profile Recovery Jack – Partially Extended

Profile Recovery Jack – Collapsed

Belly Bands, Slings and Tow Cables

Airbag, Fully Inflated (Capacity 40 to 60 Tons)

Cost of Membership

- The providers of the kits are reimbursed an annual availability fee, paid for by the group members, to cover
  - investment costs,
  - interest on invested capital, and
  - ownership costs.
- In return, the Providers must ensure that their kits are in a permanent state of readiness (24x7) and fully capable of recovery of any aircraft up to B747- 400 size for basic kit and up to A380 in case of extra large capability
- Members are subject to season cost shares based on:
  - Number of landings worldwide
  - Number of kits participating in

Membership Benefits

- For A/C Recovery Pool members, provides worldwide aircraft recovery insurance giving:

  - 12 recovery Kits available in 24x7 and ready to ship
  - Global Coverage – With 12 kits worldwide, coverage is comprehensive.
  - Speed – Predefined agreements allow immediate response
  - Technical Expertise – Access to airlines' trained personnel and best practices reduces to a minimum the risk of secondary damages to the A/C
  - IATP A/R pool participation is often considered on Aircraft Insurance premiums
  - Almost Free (mandatory a 500 USD/Day for a Supervisor Engineer accompanying the Airline kit) access to the Kit(s) for up to 10 days (afterwards a charge of $6,000 USD per Kit per day)

Membership Benefits

- For A/C Recovery Pool members, provides worldwide aircraft recovery insurance, also recognized by the Industry:

  - Aviation National Authorities internationally recognize IATP Aircraft Recovery
  - IATP Aircraft Recovery is reported in the *ICAO Airport Services Manual-Part 5 Removal of Disabled Aircraft*
  - IATP Aircraft Recovery pool is advised in *Airbus & Boeing Aircraft Maintenance Manuals (AMM)*

Note: All kits are audited every two years

IATP Contractual Forms

Form 41: IATP Member Airlines
Form 41A: Non IATP Members airlines

In these Agreements are specified the details of the uplift such as provider and user, shipment responsibility, if a recovery team is required by the provider, recovery manager, etc.

Thank you for your attention!

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IATP Aircraft Recovery

Manuel Mercado,

Tooling Supervisor / Aircraft Recovery Team Lead, American Airlines

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Removal of Disabled Aircraft from an Airport Perspective

Elena Rodríguez Martín,

Head of Firefighting Service Division, AENA

#IATAWMES

Removal of Disabled Aircraft from an Airport Perspective

Junio 2026

aena aeropuertos para ti

1

Legal and Regulatory framework

2

Aena's Network response strategy

3

Next steps

1

Legal and regulatory framework

Necessity

Objective

To address the requirement for **advance planning** and **preparedness** to enable the **timely** and **safe resumption of operations** following the occurrence of a disabled aircraft, thereby minimizing the **operational and financial impact** of the incident and ensuring the maintenance of airport **safety**.

Different stakeholders, different regulations → Is it enough with coordination and collaboration?

What is established in the applicable regulations?

- **EASA/AESA**: Regulation **UE 2024/1400**. Requirements:
  - ADR.OPS.B.011 Removal of disabled aircraft
  - GM1 ADR.OPS.B.011 Purpose of the disabled aircraft removal plan
  - GM2 ADR.OPS.B.011 Outline of the disabled aircraft removal plan document
  - GM3 ADR.OPS.B.011 Testing of the disabled aircraft removal plan
  - AMC1 ADR.OPS.B.011(a) Disabled aircraft removal plan
  - AMC1 ADR.OPS.B.011(b) Organisations responsibilities, equipment, personnel

ⓘ Applicable since 24th **May 2025**

Appoint a coordinator

- Responsible to implement the plan

Implement a Removal Plan

- Contact details
- Responsibilities, actions, lines of communication
- List of equipment / list of personnel
- Arrangements

Some questions

1

Role ambiguity

2

Lack of binding obligations

3

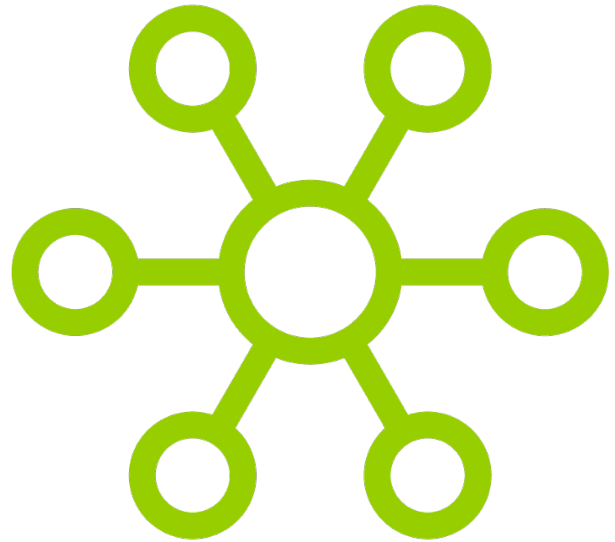
Operator availability

4

Conflict with airport continuity

2

Aena´s network response strategy



Aena´s network response strategy

Selected airports have been identified and equipped with dedicated resources and trained personnel. In islands or in challenging locations, they are provided with a minimum level of equipment.

España

46 airports

2 heliports

Aena´s network response strategy

Debogging

Body slings

Lifting bags

Tethering

Wheel dollies, turn-tables

Jacks

Aena´s network response strategy

Equipment Category	Main Capacities / Types	Network Distribution	Operational Role
Dollies	5 t, 10 t, 30 t, 100 t	5–30 t widespread; 100 t only at major hubs	Aircraft support and towing during recovery
Recovery Jacks	Up to 100 t	Mainly concentrated at large airports	Structural lifting of aircraft
Pneumatic Systems	10 t, 20 t, 55 t	Medium to large airports	Controlled lifting and load distribution
Recovery Kits	Debogging, slings, low-pressure cushions	All airports	Initial intervention and aircraft release
Ground Support	~300 m² mats, wooden sleepers	All airports (larger stocks at hubs)	Terrain stabilization and load spreading
Fuselage Cradles	Up to 55–90 t	Selected major airports	Transport of severely damaged aircraft

Aena´s network response strategy

CHALLENGES:

- **Equipment:**
  - Different equipment. Not adequate for every model of plane. It cannot be guaranteed that all potential situations can be addressed.
  - Bulky equipment, requiring a large storage area.
  - Difficult to transport.

- **Personnel:**
  - Personnel training is critical, as staff are not regularly exposed to this type of situation. It also requires the use of the equipment, ideally involving an aircraft and the simulation of different scenarios.
  - So far, exercises have been limited to the airport itself; however, they should involve all relevant stakeholders.
  - The mobilization of personnel and deployment to another airport is an area with which we have limited experience, and for which we do not yet have mature tools.

Aena's network response strategy

CHALLENGES:

- **Relationship with air operators:**
  - Air operators are not fixed. Very variable.
  - Identifying the aircraft operator can be challenging and knowing who to contact in these situations is not always straightforward.
  - At Aena, there are currently no agreements or contractual arrangements with air operators. As a result, there is no established framework to define the conditions governing the relationship between the airport and the air operator, particularly concerning the recovery of a disabled aircraft.
  - The standard's requirement for the airport to have a procedure is therefore not sufficient. It is an airport-specific document that does not create obligations for third parties.

- **Aircraft Removal Documents:**
  - It is extremely difficult, if not impossible, to obtain the Aircraft Recovery Manuals (ARM) from aircraft manufacturers. Air operators are reluctant to provide this information in advance. Without them, the capacity of an airport to develop an adequate aircraft recovery strategy is limited.

3

Next steps

Next steps

- **Procedure:**
  - Improve our procedure, working closely with aircraft operators.
  - Adapt the procedure to general aviation operations.
  - To enhance the guidance provided regarding equipment maintenance.

- **Equipment:**
  - Maintain an up-to-date inventory of existing equipment and to conduct a need assessments.
  - Procure equipment for other airports that currently lack it.

- **Personnel:**
  - Extend training to all real-time coordination staff.
  - Extend training to all Aena incident commanders, not just those based at selected airports.

- **Aircraft Removal Documents:**
  - Continue exploring avenues for acquiring ARMs from aircraft manufacturers.

- **Drills:**
  - Monitor exercises conducted at airports, capture lessons learned and leverage them to develop more realistic scenarios that take into account all relevant stakeholders.

Key messages

1

Regulatory model ≠ operational reality

2

Airports are first responders, but not fully enabled

3

Recovery capability depends on access, coordination and equipment

4

Need for stronger alignment across stakeholders

Gracias

FT FINANCIAL TIMES CLIMATE LEADERS statista 2023

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Removal of Disabled Aircraft from an Airport Perspective

Elena Rodríguez Martín,

Head of Firefighting Service Division,AENA

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Removal of Disabled Aircraft

Moderated by **Iryna Khomenko,**
Senior Manager Technical Operations and Supply Chain, IATA

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