



## **1<sup>st</sup> roundtable consultation**

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HUMAN AND ORGANISATIONAL FACTORS

**How would you invest  
European research funding  
for Human Factors in  
aviation safety?**



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**Insights from the  
1<sup>st</sup> Round Table Consultation**



# Objectives and agenda

**At a central location in Rome on December 3 & 4, a dozen industry experts gathered to participate in the first OPTICS2 Round Table exercise, focusing on aviation safety research needs in the area of Human and Organisational Factors (HF).**

The three aims of the Round Table were as follows:

1. To better understand why there has been less than desirable take-up of EU-funded research results by industry, by determining what aspects about research appealed to industry stakeholders, and what aspects put them off.
2. To determine the top priority safety (HF) research needs for each of three domains: airports, airlines and air navigation service providers (ANSPs)
3. To determine common aviation-wide research themes across the three domains.

## AGENDA

### DAY 1

09:00-10:50 **Intro and “Human and Organisational Factors”**

10:50-12:30 **Keynote Speakers**

13:30-15:00 **The Apprentice: selecting your next best project**

15:30-17:30 **Research prioritisation session**

19:30 **Networking Dinner**

### DAY 2

09:00-09:30 **Welcome coffee & pitch preparation**

09:45-10:45 **Pitches from 3 groups in plenary**

11:15-12:30 **Plenary discussion, wrap-up and feedback**

12:30-13:30 **Farewell Lunch**

**Key research project results will be reviewed, including cutting-edge research linked to EASA priority safety concerns.**

**Reasons why such research is often not taken up by industry will be explored.**

**Three keynote presentations from industry will showcase projects where research has improved operational safety (ANSP, airline and airport).**

**Three groups will then develop some project concepts. Each be allocated 100 million euros to invest in research. At the end of this session each group must decide how much “money” they want to invest in each of the project concept developed.**

**Research areas to be discussed: (1) Monitoring the Human, (2) Automation and Adaptive automation, (3) Application of Artificial Intelligence in Aviation, (4) New concepts and Future Skills and Competences, (5) *ad hoc* proposed by participants.**

Insights from the 1<sup>st</sup> Round Table Consultation

## SESSION 1

# Participation/ Research Familiarisation

### Participation

Although the Strategic Research & Innovation Agenda (SRIA) is informed by industry via the Advisory Council for Aviation Research in Europe (ACARE), which includes a wide range of industrial stakeholders, and although former OPTICS exercises have elicited HF research priorities before, notably via a workshop with 70 HF experts in 2014, this is the first time expertise has been sought from the operational layer. The Round Table participants had a reasonable representation of industry: Lufthansa, Ryanair, and EasyJet; ANSPs ENAIRE (Spain), FerroNATS (Spain), ENAV (Italy), LFV (Sweden), DFS (Germany), and HungaroControl (Hungary); and three airports, London Luton Airport, Dublin International Airport, and a representative linked to Arlanda Airport in Sweden and SESAR airport safety initiatives (including remote towers); plus a representative from EASA covering cockpit and ground handling safety/HF issues. With the exception of the EASA participant, all others are involved in day-to-day operational safety, whether for example as a base captain for a major airline, an airport airside safety manager, or an operational safety manager for an ANSP. As such, these participants are close to the realities of operational safety, and so have a unique perspective on what research is required, and where it could help most. The OPTICS2 team served as facilitators, including a EUROCONTROL representative who is deeply involved in SESAR safety and HF, who worked with the ANSP team during the Round Table.

### Research Familiarisation

Around half the participants had little or no experience of typical EU-funded safety research projects, and so on the first half of Day 1, members of the OPTICS2 team explained how aviation safety research works in Europe. Three of the participants (one from each domain) then presented their involvement in a recent H2020 project (all three projects were from the Future Sky Safety: Luton Safety Stack, Human Performance Envelope and Safety Dashboards), outlining how they'd become involved in the project, and what they and their organisations had gotten out of it. This already elicited some 'success factors' for industry-targeted research.





## SESSION 2

# Finding out what appeals to industry, and what doesn't

Next, an 'apprentice'-style session was held, wherein one of the OPTICS2 team presented four EU-funded projects – two recently completed, two still ongoing – each in one of four SRIA thematic areas: Adaptive Automation, Artificial Intelligence, Human Performance Monitoring, and Future Crew Concepts.

Each of the twelve experts were asked to individually identify their favourite and least favourite project from the four presented. This simple process led to the identification of project aspects that either they found appealing or else would lead them disregard such a project. The factors are summarised below:

## Appealing factors

- Increases performance
- Deals with an urgent issue
- Provides clear benefits in the short term
- Real development potential
- Practical relevance
- Important ground work
- More evolved
- Put the money first in the aircraft
- Advances could be made quickly
- Concept relevant, leading the way for more ambitious research.
- Tackles how to manage transition to new technology
- Relevant for change management
- Encompasses the full transport chain and not just one segment
- Integrates everything from ATCOs, ground control, pilots, etc.
- Does not recycle old stuff, starts from scratch.

## Unappealing factors

- Research appears expensive
- Implementation would be costly
- Addressing a low priority issue (e.g. incapacitated pilots)
- Good human solutions already exist for the problem being addressed
- Just about awareness, not about training and does not make people better
- Legal issues with personal data collection
- Local laws will make it complex to implement
- Although the concept is interesting, data protection issues are too great
- If the research gets it wrong, it will be worse
- Major ethics issues with data collection
- Not validated yet
- More expensive than other projects presented
- Implies system design changes, but US manufacturer might not be interested when it should be a global issue.

To an extent these overlap with the criteria already used in the OPTICS2 methodology for evaluating research projects (e.g. economy, legal aspects and organisational 'pull'), but these factors are finer-grained and include some new criteria, which could be useful for EASA and the EC, as well as being of interest to OPTICS2 and the aviation safety research community. What was also interesting from this session was that there was a clear favourite amongst

the entire group, and a clear 'least favourite' project, both of which were not those informally predicted by the OPTICS2 team. The favourite was to do with future crews, and the least favoured was adaptive automation, the former being new and therefore perhaps more current, the latter having finished some years ago, and the most expensive and addressing issues that were relevant at the time, but less so now.


 Insights from the 1<sup>st</sup> Round Table Consultation


### SESSION 3

## Research Prioritisation Exercise

**The main session on the afternoon of Day 1 was dedicated to identifying the top 4-5 research action lines for each of the three domains.**

Each group, aided by an OPTICS2 facilitator with domain knowledge and a note-taker, as well as an excerpt from the SRIA on HF research action lines in three timeframes (2025; 2035; 2050) was given a budget of 100 million euros (in the form of casino chips) to allocate to their identified research streams. Each group was also given an A1-sized matrix, with the four HF research action areas in the SRIA (and an optional fifth one for ad hoc ideas outside the SRIA) on one axis, and the three timeframes of 2025, 2035 and 2050 on the other axis. This matrix was also in 'casino-style'.

All three groups progressed in the same phases, all spending approximately 2.5 hours on this exercise.



In the first phase, participants used post-its to put their ideas onto the matrix. Prior to the workshop all participants had received a pre-package of information and an extract from the SRIA, so many came with pre-planned ideas for research. This resulted in 15-30 research ideas being placed on the matrix, each one being outlined by its proponent and then discussed as necessary by the group. In the second phase, the group began to home in on the key issues, and clustered many of the post-its together to form richer research ideas. In the final phase, the participants each allocated their 'funds' to the refined research action lines. This use of money via the 'chips' was found to be very effective, more so than simple voting or other methods, as well as being less confrontational between the experts – they could move their money around and either make clear priorities via using most of their funds for their highest priority items, or they could 'cover their bets' by spreading their funds across several or even all research action lines. This process was allowed to continue until each group was happy with their funding allocation.

*[Note that in prior agreement with EASA, they were not included in the funding allocation part of the process].*



Insights from the 1<sup>st</sup> Round Table Consultation

## SESSION 4

# Research Prioritisation Results

On Day 2, each group elected either a single spokesperson (APT) or else all the participants spoke for one or more of their prioritised research lines. Each group then made a short video-recorded 'pitch' to the European Commission, explaining the research ideas, their rationale and timeframe, their relevance and their risks.

Each pitch started from the 4th or 5th most important issue and concluded with the most important. The titles of the resulting prioritised action lines are as follows (see videos and Appendix with full descriptions of all action lines):



### THE AIRPORT TEAM

1. Maximise safe runway and taxiway throughput.
2. Aviation wide safety stack.
3. Human Resilience improvement through adaptative training.
4. Safe workload reduction by automation.
5. Safety implications of carbon neutral airports by 2050.



### THE ANSP TEAM

1. AI for reducing ATCO Workload.
2. Future ATCO roles related to New Technologies.
3. Real-time Monitoring of OPS Room Staffing.
4. New safety assessment approaches for AI and machine learning.
5. Dynamic Integration of mixed manned/unmanned traffic.



### THE AIRLINE TEAM

1. Dynamic integrated pilot support (DIPS).
2. Wellbeing linked with safety.
3. Understanding current OPS (Task Analysis WAD vs. WAI).
4. Ethical barrier removed for better rostering.

Insights from the 1<sup>st</sup> Round Table Consultation

## SESSION 4

# Research Prioritisation Results

### Aviation-Wide Themes

The final session on Day 2, which finished at lunchtime, sought to identify common HF research themes. These were apparent in two categories – research enablers, tackling bottlenecks that prevent useful research from being carried out, and aviation-wide research action lines. The three key enablers are as follows:

1. A project to carry out **'open book' task analysis** of all aviation operations (across the three domains), focusing on how the job is really done, rather than just basing such analyses on procedures. The idea of task analysis was already in the original SRIA, but the call here is for a more realistic task analysis of the way jobs are truly done, from tasks in the cockpit using EFBs and ECAMs, to ground handling and turnaround operations. This will pave the way for adaptive automation, robotics and AI helping with the human operators workload. Without it, such intelligent digital support systems are unlikely to be effective or accepted. Open book task analysis also paves the way for the aviation-wide safety stack.

2. The **resolution of ethical issues concerning the usage of personal data**, to pave the way for human performance monitoring. A real-time human performance monitoring capability (necessary for adaptive automation and required for better rostering processes) is approaching fast, but unless the ethical issues are resolved, such technology is unlikely to enter operational environments.

3. **Wellbeing linked to safety.** Currently there are business models and rostering practices, coupled with an incomplete scientific understanding of fatigue, that lead to human performance issues and wellbeing concerns, but these are rarely quantified or linked directly to safety. There needs to be a better understanding of how today's lifestyles and the industry's business models interact with work rosters and shift schedules, so that people know when they are not fit for work, or that their performance is at risk.

*Note that all three of these require open and honest dialogue between business and social partners, in order to have an accurate and robust foundation for securing safe human performance under all conditions.*



## SESSION 4

# Research Prioritisation Results and Next Steps

**Three emergent projects cut across all the domains, and would also include the manufacturing side of the aviation industry:**

### **1. Integrated AI to support the operator and reduce workload.**

This could amount to reduction of routine tasks for ATCOs, but leaving them the tasks they are good at, and assisting the pilots in complex time-pressured tasks such as finding an alternative airport when the planned one closes, or dealing with flight upset situations under normal and degraded modes or extreme weather. The AI should be an intelligent assistant, supporting rather than taking over from the human operator, ultimately part of the crew.

### **2. Future roles related to advanced technologies.**

Automation, robotics and the arrival of AI are likely to profoundly affect the industry, perhaps most of all at the airport, but also in the cockpit and the air traffic control centres. New human roles will emerge related to these changes, and research should begin now so that it can run hand-in-hand with automation developments, defining clear and meaningful roles, rather than assuming the human will do whatever is left for him or her by the automation/robotics/AI.

### **3. New safety approaches for AI-automation.**

Future technology is likely to require major re-thinking in how risk models and assessments, and safety cases, are carried out, as particularly with AI, deterministic models will no longer be applicable. Such new approaches must include human roles and interactions with such technology, and model how the human can detect and recover from automation/AI-assisted failures.

## **Next steps**

The first step involves the videos of the pitches being sent to the EC and EASA for their consideration of the merits of the action lines proposed. The results of the Round Table may also be of interest to SJU. The results are also of interest to ACARE via Working Group 4 (Safety and Security), so WG4 will be briefed at the next available opportunity. A second video of 3-5 minutes for dissemination purposes will be prepared, and a more strategic document encompassing the full details of the discussions and common themes will be produced.

Participants commented that they found the Round Table very well structured and felt they had made good achievements made over both days. They also said they were ready to be involved in projects based on their proposals, as they consider these burning issues. They said they wanted to stop reinventing the wheel and address concrete safety issues.



## THE ANSP TEAM SOLUTION #1

### TITLE

AI for Reducing ATCOs Workload - 2035

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### ADDRESSED NEED

The proposed 'solution' is expected to address increasing complexity and traffic load without putting more workload on operators.

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### SOLUTION/OUTCOME

The proposed solution/outcome is automation as a team player!

1. Assessment of tasks which could be delegated to AI, moving AI from information to decision making.
2. Two use cases:
  - Provision of MET information for ops
  - Delivering of clearances for sequencing

And basic information

3. Understanding regulatory structures required for integrating AI in ops.
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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- Existing projects
- Social dialogue
- Danger of training for known issues and not «unkown» ones
- Legal issues of changing roles and changing responsibilities

#### ENABLING FACTORS

- Early engagement of unions
  - Industry interest
  - Broad scope of stakeholder organisation
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### PRESENTER

Raquel Martínez Arnáiz (FerroNATS)

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**THE ANSP TEAM  
SOLUTION #2****TITLE**

Future ATCOs Roles Related to New Technologies – 2025-2035

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**ADDRESSED NEED**

The proposed 'solution' is expected to address the new roles, competences, data, job satisfaction, system understanding.

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**SOLUTION/OUTCOME**

The proposed solution/outcome is a better understanding of new role and competencies of ATMMonitoring (ATMOS).

- Day to day analysis to understand competency issues
- New training methods
- New selection criteria
- Re-skilling

Case study: multiple instantiations of remote towers.

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**RISKS, BARRIERS & ENABLING FACTORS**

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- Social dialogue
- Danger of training for known issues and not «unkown» ones
- Legal issues of changing roles and changing responsibilities

**ENABLING FACTORS**

- Early engagement of unions
  - Industry interest
  - Broad scope of stakeholder organisation
- 

**PRESENTER**

Joerg Leonhardt (DFS)

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## THE ANSP TEAM SOLUTION #3

### TITLE

Real-time Monitoring of OPS Room Staffing - 2035

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### ADDRESSED NEED

The proposed 'solution' is expected to have the person in the best position (mental/physical state) to manage traffic.

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### SOLUTION/OUTCOME

The proposed solution/outcome is to use non-intrusive tools to monitor human physical/mental state in order to provide optimised service. Managing on sector time as a function of psycho-physiological and operational performance data.

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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- GDPR
- Staff resistance
- Regulatory issues
- Personal comfort
- Impact on rostering and staffing
- Legal issues/responsibility

#### ENABLING FACTORS

- Technology already available
  - Union support could be established
  - Regulatory push for fatigue
  - Risk management
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### PRESENTER

Jesus Romero Hernandez (ENAIRES)

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**THE ANSP TEAM  
SOLUTION #4****TITLE**

New Safety Assessment Approaches for AI and Machine Learning - 2025

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**ADDRESSED NEED**

The proposed 'solution' is expected to address the gaps of existing regulation and safety assessment methodologies with regards to new technology (AI).

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**SOLUTION/OUTCOME**

The proposed solution/outcome is Advanced Safety Assessment concepts including:

- Validating of assumptions relating to human intervention
  - Non-deterministic decision making by AI
  - Emergent decision making properties
  - New approach to software safety assessment
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**RISKS, BARRIERS & ENABLING FACTORS**

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

**RISKS / BARRIERS**

- Rulemaking process is heavy
- Apparent reliability of existing processes
- Alignment with necessary technology
- Regulatory "black hole" on AI

**ENABLING FACTORS**

- Market is "hungry" for such a project
  - Other industries ahead of aviation
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**PRESENTER**

Jesus Romero Hernandez (ENAIRE)

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**THE ANSP TEAM  
SOLUTION #5****TITLE**

New Safety Assessment Approaches for AI and Machine Learning - 2025

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**ADDRESSED NEED**

The proposed 'solution' is expected to address the capacity saturation and integration of new entrants in the airspace.

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**SOLUTION/OUTCOME**

The proposed solution/outcome is an integrated system (tool and procedures) for managing in an efficient and safe way the integration of all different actors.

Provide an optimized airspace structure and capacity, taking into account the impact of the concept in Human Factors.

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**RISKS, BARRIERS & ENABLING FACTORS**

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

**RISKS / BARRIERS**

- Rulemaking process
- Existing projects
- Legal Issues
- Multiple solutions
- New entrants without aviation specific backgrounds

**ENABLING FACTORS**

- Stakeholder pressure
  - New entrants have resources
  - Regulatory need
  - Unacceptable delays in current operations
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**PRESENTER**

Alessandro Boschiero (ENAV)

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## THE AIRLINE TEAM SOLUTION #1

### TITLE

Dynamic Integrated Pilot Support (DIPS) – 2025/2035

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### ADDRESSED NEED

The proposed 'solution' is expected to address information overload and will update/filter information and provide advise in case of unexpected events (div., tech, etc..)

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### SOLUTION/OUTCOME

DIPS is a system that continuously collects and stores on one single digital support (tablet or phone) all relevant information (including manuals, performance calculation, weather info, etc...) that at the moment are present on various supports (paper, different screens, etc..). Moreover, the dynamic system may suggest to the pilot and the crew the actions that can't be done as well as those that are allowed in case of emergencies or unexpected situations. It may be used to improve the situational decision making process by providing explainable advise. It reduces stress, information overload, exposure to errors.

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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- Up to date information (collection/identification)
- Combining/linking INB information with EFB
- Advise might NOT be accepted by pilots
- Connectivity
- Cyber-security

#### ENABLING FACTORS

- All information already existing
  - EFB existing
  - Aircraft FMC/ECAM existing
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### PRESENTER

Sascha Leuer (Ryanair)

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## THE AIRLINE TEAM SOLUTION #2

### TITLE

Understanding Current OPS (Task Analysis WAD vs. WA!) - 2025

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### ADDRESSED NEED

The proposed 'solution' is expected to ensure we have an understanding of work as done vs work as imagined, particularly in response to abnormal situations and their recovery management.

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### SOLUTION/OUTCOME

The proposed solution/outcome is an increased understanding of how pilots respond to an event, either normal/abnormal, that falls outside of standard operation procedures. Benefits to this:

1. This shall allow us to assess the recovery of abnormal events and ensure that there is a focus on emotional intelligence. Why do some recover and others don't?
  2. Several projects refer to task analyses. We need a baseline to ensure others are using task analysis effectively.
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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- Open/safety culture
- Cultural differences, individual differences
- Limiting individual creativity that might be just as safe
- Not considering individual abilities

#### ENABLING FACTORS

- People knowing they do the best solution
  - Higher standardization and better «feeling» of people involved
  - Better training
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### PRESENTER

Julia Hobbley (Easyjet)

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**THE AIRLINE TEAM  
SOLUTION #3****TITLE**

Wellbeing linked with safety - 2025

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**ADDRESSED NEED**

The proposed 'solution' is expected to address the need that people have to be happy, and to have their capabilities and competencies taken into account.

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**SOLUTION/OUTCOME**

The proposed solution/outcome is that, based on knowledge of the individual, the pilot/controller should be offered additional options or working conditions to satisfy their needs and that fit their personal profile. In the end this will lead to the situation in which people are being brought in the situation in which they perform best. This in turn will lead to increased performance and vigilance (and thus safety).

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**RISKS, BARRIERS & ENABLING FACTORS**

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

**RISKS / BARRIERS**

- Privacy concerns regarding the use of personal data
- Non standardization means less safety
- Less process means larger variance

**ENABLING FACTORS**

- Correct awareness of fatigue issues may lead to a willingness to exploit personal data
  - Happier people are more vigilant
  - Less standardization and more personal influence
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**PRESENTER**

Carsten Schmidt-Moll (Lufthansa)

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## THE AIRLINE TEAM SOLUTION #4-5

### TITLE

Ethical barrier removed for improved rostering -2025

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### ADDRESSED NEED

The proposed 'solution' is expected to identify the ethical barriers to be faced when monitoring the human and thus allow to take into account personal characteristics when rostering and planning a complex flight schedule.

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### SOLUTION/OUTCOME

The proposed solution/outcome considers people with their differences. The first step would be to take away barriers that currently hamper the use of personal data. Technology and procedures need to be developed that provide the opportunity to use personal data, knowing that it can not be put to a use that is counterproductive or could even harm the individual (have a negative impact on career for example).

Then improved rostering will be developed. Today when pilots are fatigued on long haul flights, they still have to fly, because the schedule is fixed. In the future, if we could gather personal information concerning sleep for example, it would become possible to consider that info to improve flight safety.

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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- Complete knowledge of personal activities including sleep
- People wearing a tracker is infecting their personal sighth

#### ENABLING FACTORS

- Sleep measurement and individual criteria are key to predicT flight safety/performance
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### PRESENTER

Carsten Schmidt-Moll (Lufthansa)

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**THE AIRLINE TEAM  
SOLUTION #4-5****TITLE**

Ethical barrier removed for improved rostering -2025

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**ADDRESSED NEED**

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**SOLUTION/OUTCOME**

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Then improved rostering will be developed. Today when pilots are fatigued on long haul flights, they still have to fly, because the schedule is fixed. In the future, if we could gather personal information concerning sleep for example, it would become possible to consider that info to improve flight safety.

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**ENABLING FACTORS**

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**PRESENTER**

Carsten Schmidt-Moll (Lufthansa)

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## THE AIRPORT TEAM SOLUTION #1

### TITLE

Maximise Safe Runway and Taxiway Throughput - 2025

### ADDRESSED NEED

The proposed 'solution' is expected to address controlled growth + demand within current infrastructure constraints.

### SOLUTION/OUTCOME

The proposed solution/outcome is to maximise runway + taxiway efficiency and safety through the application of AI solutions:

- Block System (Virtual)
- Runway Incursion | Excursion
- Hazard Identification
- Taxi Speed
- Touchdown (late) braking on runway maximising on A|L separation
- Approach Management
- Reduction in go-arounds

People we need: ATC / Tech Experts / Regulator / Airlines / Airports / AI Experts

### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- Regulation/ Certification
- Lack of Proper method for safety demonstration
- Seeking approval (user)
- New Technology
- User Acceptance

#### ENABLING FACTORS

- Willingness to do it
- Continuing growth / Meeting demand
- Progress in AI

### PRESENTER

Liam Bolger (London Luton Airport)



## THE AIRPORT TEAM SOLUTION #2

### TITLE

Aviation Wide Stack - 2025

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### ADDRESSED NEED

The proposed 'solution' is expected to address greater collaboration on aviation challenges, safety and operational performance identification of system wide opportunities

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### SOLUTION/OUTCOME

The proposed solution/outcome is roadmap to identify + address major opportunities to address leadership + training needs.

Provide solutions in contract management for ground handling for Airlines / Airports / ANSP. Engagement of regulator on rules / regulations + certification.

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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling

#### RISKS / BARRIERS

- Reluctance to change
- Competitive concerns
- Reluctance to share
- Safety performance
- Maintaining commitment

#### ENABLING FACTORS

- Realisation we rely on each other and need to cooperate
  - Continued growth in air travel
  - Common interests on safety +operational performance
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### PRESENTER

Liam Bolger (London Luton Airport)

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**THE AIRPORT TEAM  
SOLUTION #3****TITLE**

Human Resilience Improvement thru Adaptative Training - 2025

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**ADDRESSED NEED**

The proposed 'solution' is expected to address the fact that lots of non-native speakers / with limited speaking/understanding skills in grounding staff / low qualification workforce.

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**SOLUTION/OUTCOME**

The proposed solution/outcome is explore and assess the use of visualisations, pictograms, virtual reality etc. for training and checking and for procedures. Assess difficulties and advantages of environmental visualisations, affordances and indications aids, in particular for Ground Personnel.

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**RISKS, BARRIERS & ENABLING FACTORS**

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

**RISKS / BARRIERS**

- Legal and ethical issues
- Insurance issues
- Benefits from standardisations as performance decreases

**ENABLING FACTORS**

- IATA initiatives like IGOM, for ground staff
  - Pictograms with reduced text already used in some airports in Europe (good practice)
  - Research needed to assess efficacy / advantages
  - Could be consolidated Acceptable Means of Compliance by EASA
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**PRESENTER**

Liam Bolger (London Luton Airport)

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**THE AIRPORT TEAM  
SOLUTION #4****TITLE**

Safe Workload Reduction by Automation - 2025

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**ADDRESSED NEED**

The proposed 'solution' is expected to address increasing workload driven by continued demand – ANSP – Flight deck – GSP – Airport – Engineering.

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**SOLUTION/OUTCOME**

The proposed solution/outcome is Automate repetitive + routine checks:

- Maintenance
  - ATC
  - Ground Operations
  - Geo Fencing
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**RISKS, BARRIERS & ENABLING FACTORS**

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

**RISKS / BARRIERS**

- Adoption of new technology
- Regulatory approval
- Trade Unions
- Re-designed roles

**ENABLING FACTORS**

- Inability to keep abreast of current grow demand
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**PRESENTER**

Liam Bolger (London Luton Airport)

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## THE AIRPORT TEAM SOLUTION #5

### TITLE

Carbon Neutral Airports 2050? Identify Implications - 2050

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### ADDRESSED NEED

The proposed 'solution' is expected to address zero carbon emission by 2050: what does that mean?

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### SOLUTION/OUTCOME

The proposed solution/outcome is development of sustainable fuel solutions:

- Replacement for (JET-A1)
- Hydrogen fuel cell
- Electric
- Infrastructure challenges needed to support energy sources of the future
- Training

(Shell / BP / University experts + developing energy sources / Regulators from transport sector / Legal-environmental)

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### RISKS, BARRIERS & ENABLING FACTORS

For the implementation of the proposed 'solution', the main risks/barriers/enabling factors are:

#### RISKS / BARRIERS

- High number of uncertainties: what does carbon neutral mean?

#### ENABLING FACTORS

- Need to protect the environment
  - Finite natural resources
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### PRESENTER

Liam Bolger (London Luton Airport)

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