

# SESAR: From innovation to deployment



*Tuesday 6/03*

*FABEC OPS Theatre*

*11:00 - 12:45*

<b>11:00 – 11:15</b>	Welcome and introductory remarks	Maurizio Castelletti, European Commission
<b>11:15 – 11:45</b>	Update on SESAR	Florian Guillermet, SESAR JU Nicolas Warinsko, SESAR DM
<b>11:45 – 12:05</b>	SESAR success stories	Benoit Fonck, SESAR JU Mariagrazia La Piscopia, SESAR DM
<b>12:05 – 12:20</b>	The future of SES and SESAR	Maurizio Castelletti, European Commission
<b>12:20</b>	Q&A	Florian Guillermet, SESAR JU Nicolas Warinsko, SESAR DM
<b>12:45</b>	<b>END OF SESSION</b>	



# From Innovation to Deployment:

## Welcome and introductory remarks

### Maurizio Castelletti, European Commission





# Update on SESAR JU

**Florian Guillermet**

Executive Director, SESAR Joint Undertaking

World ATM Congress

07 March 2018



Founding Members



EUROPEAN UNION EUROCONTROL





# SESAR Deployment Update

Nicolas Warinsko  
*General Manager*

**World ATM Congress**

6<sup>th</sup> March 2018



LET'S DELIVER TOGETHER



# SESAR Success Stories

**Benoit Fonck, SESAR Joint Undertaking**  
Chief Development & Delivery

World ATM Congress  
07 March 2018



Founding Members



“Technology is like a fish. The longer it stays on the shelf, the less desirable it becomes”

André Heller (Austrian author)

# SESAR 1 achievements

## 63 tech solutions delivered

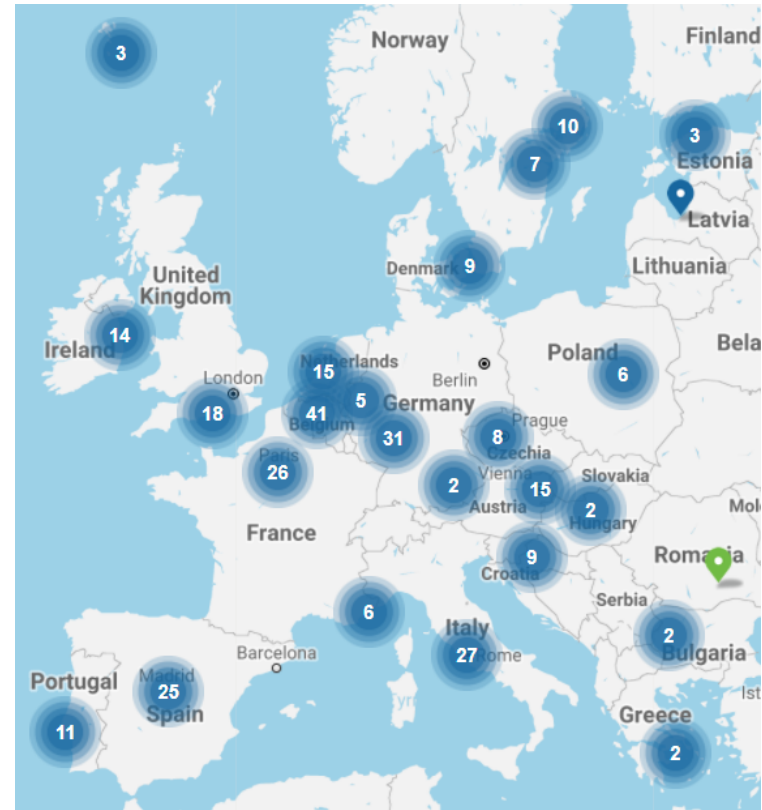


-  +11% Airport capacity
-  -39% flight variance
-  -5,3% costs
-  -2,4% fuel per flight
- 

### Solutions Catalogue :

[http://www.sesarju.eu/sites/default/files/solutions/SESAR\\_Solutions\\_Catalogue\\_Ed2\\_2017.pdf](http://www.sesarju.eu/sites/default/files/solutions/SESAR_Solutions_Catalogue_Ed2_2017.pdf)

## Solution deployment activities



**60% synchronised deployment**  
**(Pilot Common Project & Common Project 2)**  
**20% in local deployment**

# SESAR 2020: next wave of digital transformation



## 70+ projects underway

Exploratory research, industrial research, demonstrations



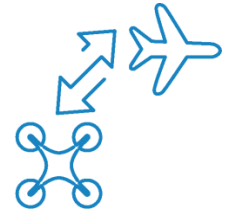
Virtual technologies



Mobile, terrestrial & satellite-based communications



Digital & automated tools



Higher levels of autonomy & connectivity



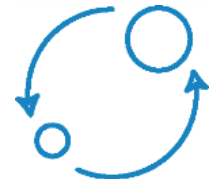
Video, synthetic & enhanced sensor tech



Big data analytics & open source data usage



System modularity



System flexibility



# Towards integrating all vehicles



DroC<sup>2</sup>om

2017

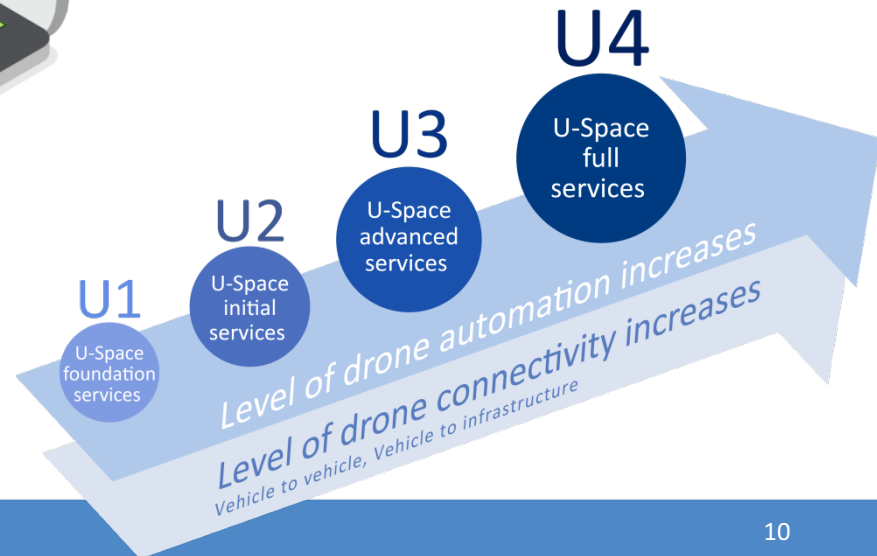
- U-space concept definition
- Higher level of automation
- Ground based technology
- Datalink
- Drone information management
- Security & Cyber-resilience
- Aircraft systems

U-space blueprint delivered  
9 U-space projects launched



Demonstrating U-space  
- Large-scale demos  
- Geo-fencing project

2018



# Towards Digitalisation – Augmented Reality

- A set of goggles with 3D matrix-like displays overlaid on the actual “out-of-the-window” view
- Enable tower controllers to manage traffic in low-visibility conditions
- Increases resilience at airports in particular in low visibility conditions



# Towards Virtualisation – Remote Tower



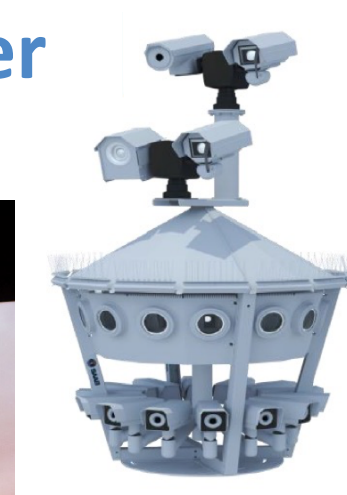
**Angelholm airport controlled from Malmö (100 km out)**

## Example of local implementation: Remote Tower centres

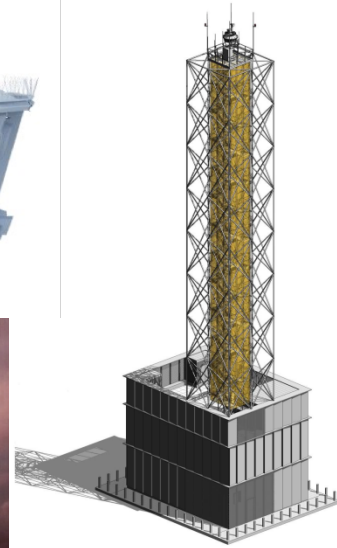




# London City Airport Digital Tower



**SESAR**  
JOINT UNDERTAKING



**NATS Demonstrator facility**

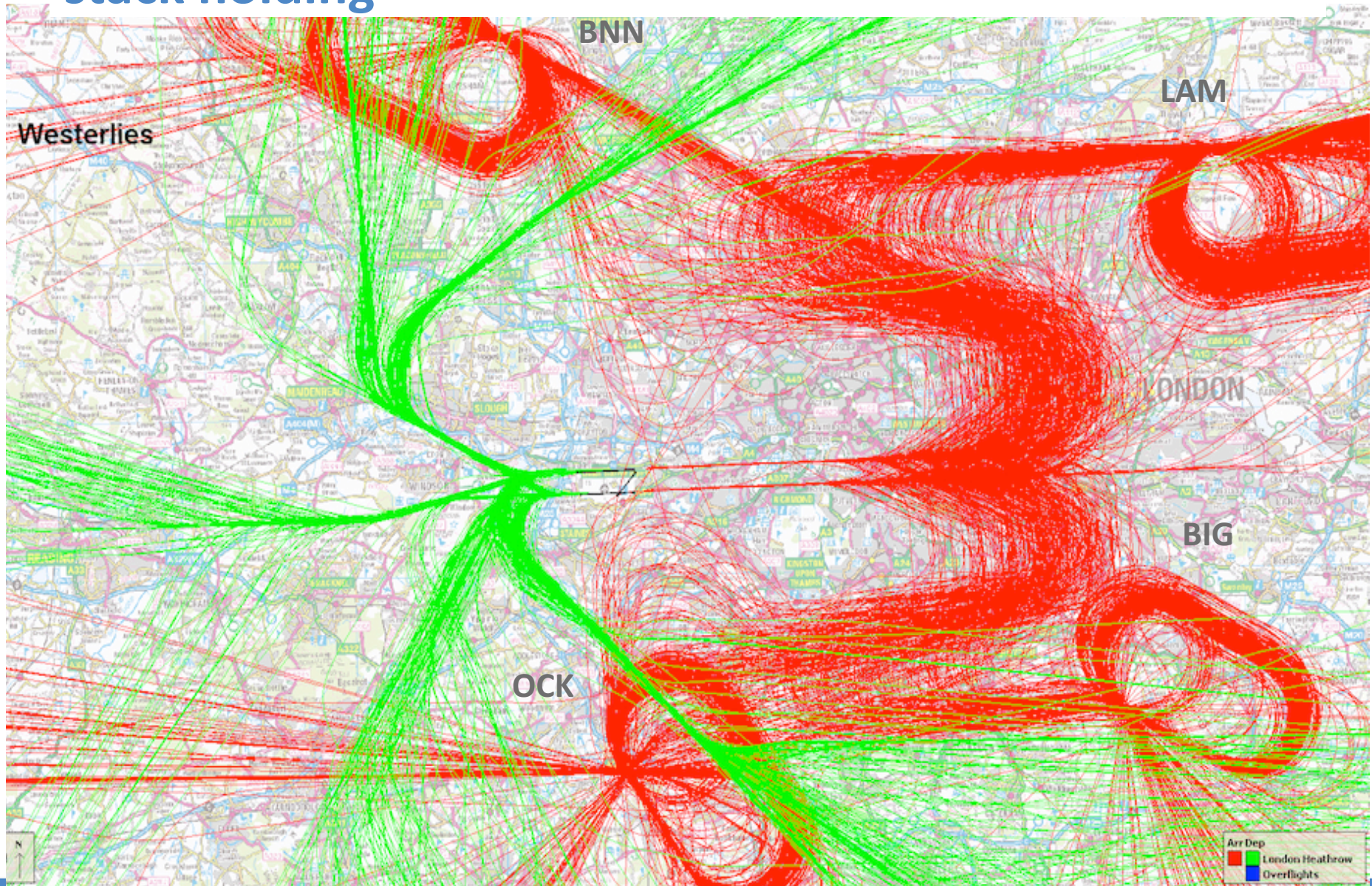


# Towards Safety – Runway Status Lights



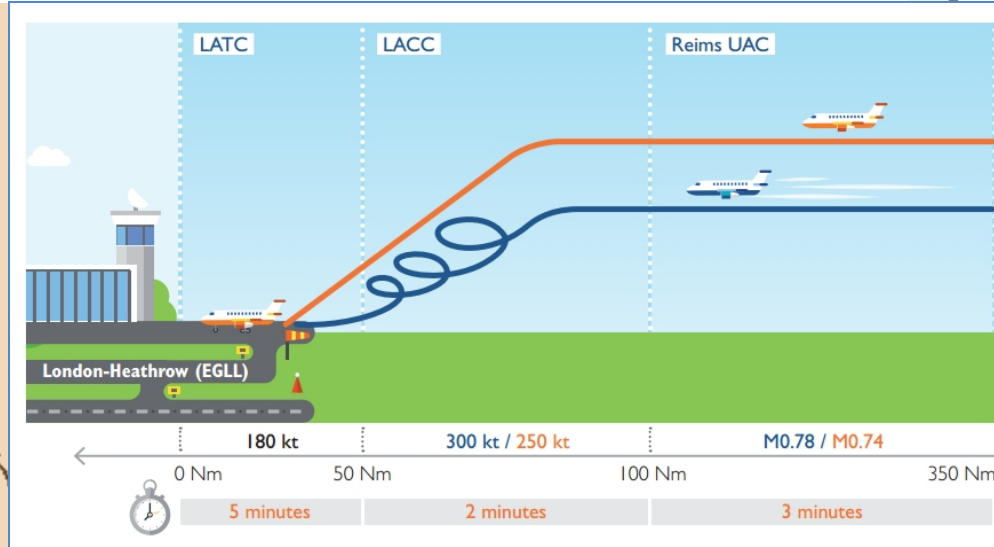
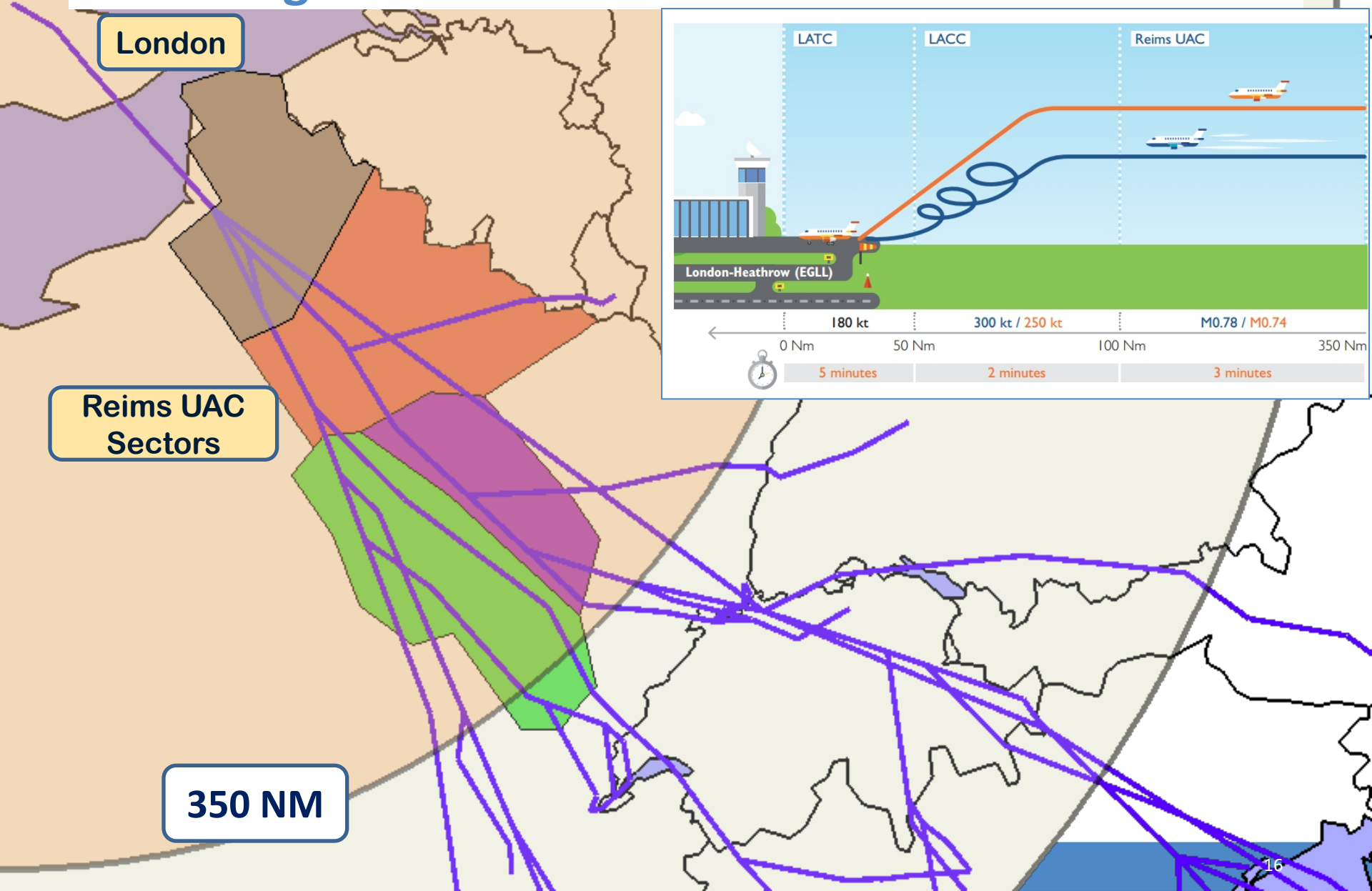


# Towards Greener Operations : the problem – stack holding





# Towards Greener Operations : the solution – Extending the Arrival Horizon into Reims UAC





# SESAR Deployment - Focus on Extended AMAN -

*Mariagrazia La Piscopia*  
*Head of Strategy, Technical and Operations*

**World ATM Congress**

6<sup>th</sup> March 2018



LET'S DELIVER TOGETHER

# From SESAR Solutions to the Deployment Programme



*From R&D...*

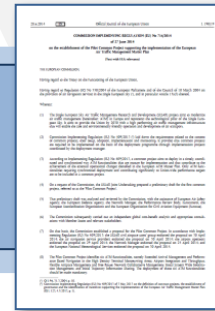
*through deployment*



*ATM  
Master  
Plan*



*SESAR  
Solutions*



*Common  
Projects*



*Deployment  
Programme*

*...to performance improvements*



**CAPACITY**



**COST  
EFFICIENCY**



**OPERATIONAL  
EFFICIENCY**



**ENVIRONMENT**



**SAFETY**



**SECURITY**





# SESAR Deployment across Europe – an overview

**299** Implementation Projects

**85** Implementing Partners

**28** EU Member States

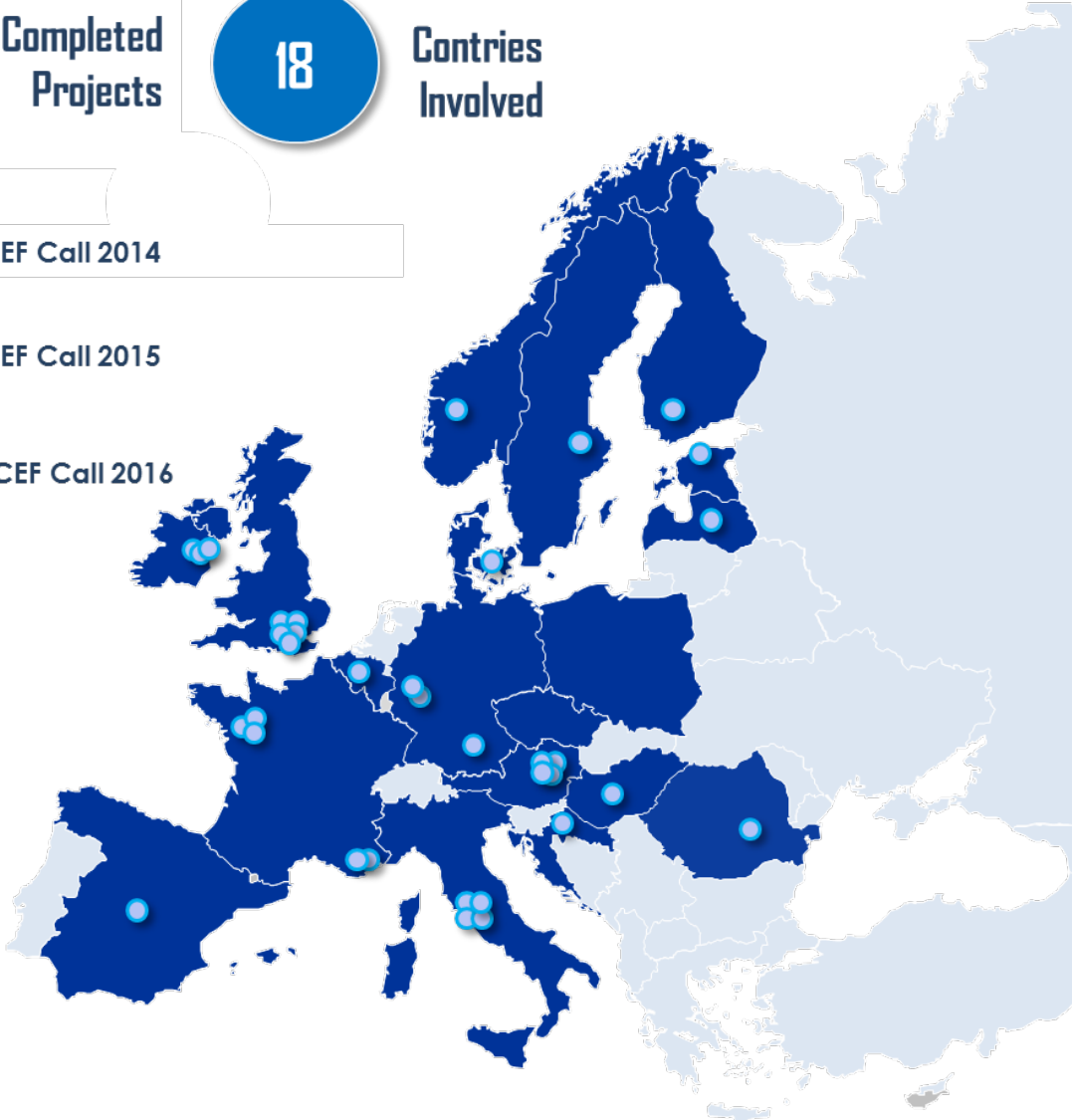
**6** Third Countries

**24** Airports



# Delivering SESAR Deployment – completed IPs

- 11 IPs Completed in **Belgium**
- 9 IPs Completed in **France**
- 8 IPs Completed in **Germany**
- 7 IPs Completed in **UK**
- 6 IPs Completed in **Italy**
- 5 IPs Completed in **Spain**
- 4 IPs Completed in **Sweden**
- 4 IPs Completed in **Austria**
- 2 IPs Completed in **Denmark**
- 3 IPs Completed in **Ireland**
- 2 IPs Completed in **Croatia**
- 1 IPs Completed in **Hungary**
- 1 IPs Completed in **Romania**
- 1 IPs Completed in **Estonia**
- 1 IPs Completed in **Poland**
- 1 IPs Completed in cooperation between **Norway, Estonia, Finland, Ireland, Sweden, Latvia, UK, Denmark (Borealis Alliance)**





# Extended AMAN – from Solution #05 to Deployment

From R&D...



## Solution # 05

**EXTENDED ARRIVAL MANAGEMENT (AMAN) HORIZON**

...to implementation

- 7** IMPLEMENTATION PROJECTS
- 9** PARTICIPATING ORGANIZATIONS
- 9** INVOLVED MEMBER STATES

## Family 1.1.2

**AMAN UPGRADE TO INCLUDE EXTENDED HORIZON FUNCTION**

AMAN extended to en-route	Ended
Network Support to Extended Arrival Management	Ending in 2020



**Impact on the EU Network**



**Stockholm TMA**

Lower Airspace Optimization	Ended
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**London, Amsterdam, Frankfurt, Dusseldorf, Berlin, Munich and Zurich TMAs**

X-MAN – Cross-centre arrival management	Ending in 2020
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Extended AMAN in Czech airspace	Ending in 2018
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**Prague, Berlin and Wien TMAs**

**Milan and Rome TMAs**

AMAN upgrade for extended horizon at DSNAs airports	Ending in 2019
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**Paris and Nice TMAs**

ENAV AMAN Extended Horizon	Ending in 2019
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# “XMAN - Cross-centre arrival management”

Implementation across Austria, Czech Republic, Germany, Netherlands, Switzerland, UK

The objective of the project “2015\_196\_AF1\_A - XMAN - Cross-centre arrival management” is to deploy - in the European core area - **Family 1.1.2 "AMAN upgrade to include Extended Horizon function"** of the SESAR Deployment Programme

## General Scope



- The implementation of **Extended Arrival Management (E-AMAN)** in en-route **Control Centers** adjacent to PCP-relevant airports Frankfurt, Munich, Zürich and London (LHR), based on a commonly developed Concept of Operations and System requirements, with a **timely, coordinated and synchronized effort**.
- The deployment of a **common service for E-AMAN to share data**, achieve common awareness and consistent and coherent application of E-AMAN actions to **enable appropriate interactions** among all actors involved.

## Expected Benefits\*



- **Environment** (CO<sup>2</sup> and fuel-burn reduction), **Safety** (stack holding reduction) and **Capacity** (reduction in traffic bunching/workload), in addition to **economic benefits** to Airspace Users (though reduced fuel burn / improved flight efficiency)
- Use of a **common operational concept (CONOPS)** and **standardized systems requirements** to provide a harmonized and coordinated approach to extended Arrival Management in the EU core area
- Promotion of **interoperability** through automated Inter-Centre coordination using system-to-system communication

# “XMAN - Cross-centre arrival management”

## Significant Achievements



**DFS** Deutsche Flugsicherung

IP Actual start date

15 Feb 16

IP Actual end date

31 Dec 20



- XMAN connection between **Zürich airport** and the upstream Control centres **Langen, Munich** and **Reims** have been successfully implemented in summer 2017;
- XMAN connection between **AMAN Munich** and the upstream control centers **Karlsruhe UAC, Langen ACC** and **Zürich ACC** have been successfully implemented;
- XMAN connection between **AMAN Frankfurt** and the upstream control centers **Bremen ACC, Karlsruhe UAC** and **Munich ACC** have been successfully implemented.





# CONTACT US

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# From Innovation to Deployment:

## The future of SES & SESAR

**Maurizio Castelletti, European  
Commission**

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