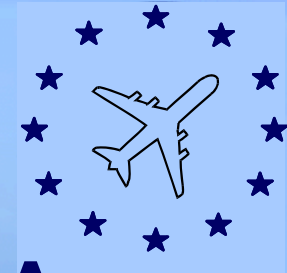


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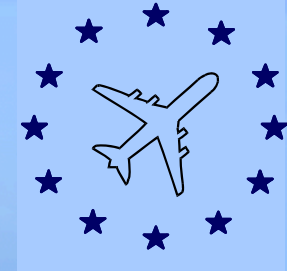
ACARE STRATEGIC RESEARCH AGENDA

The Challenge: Air Transport System Efficiency

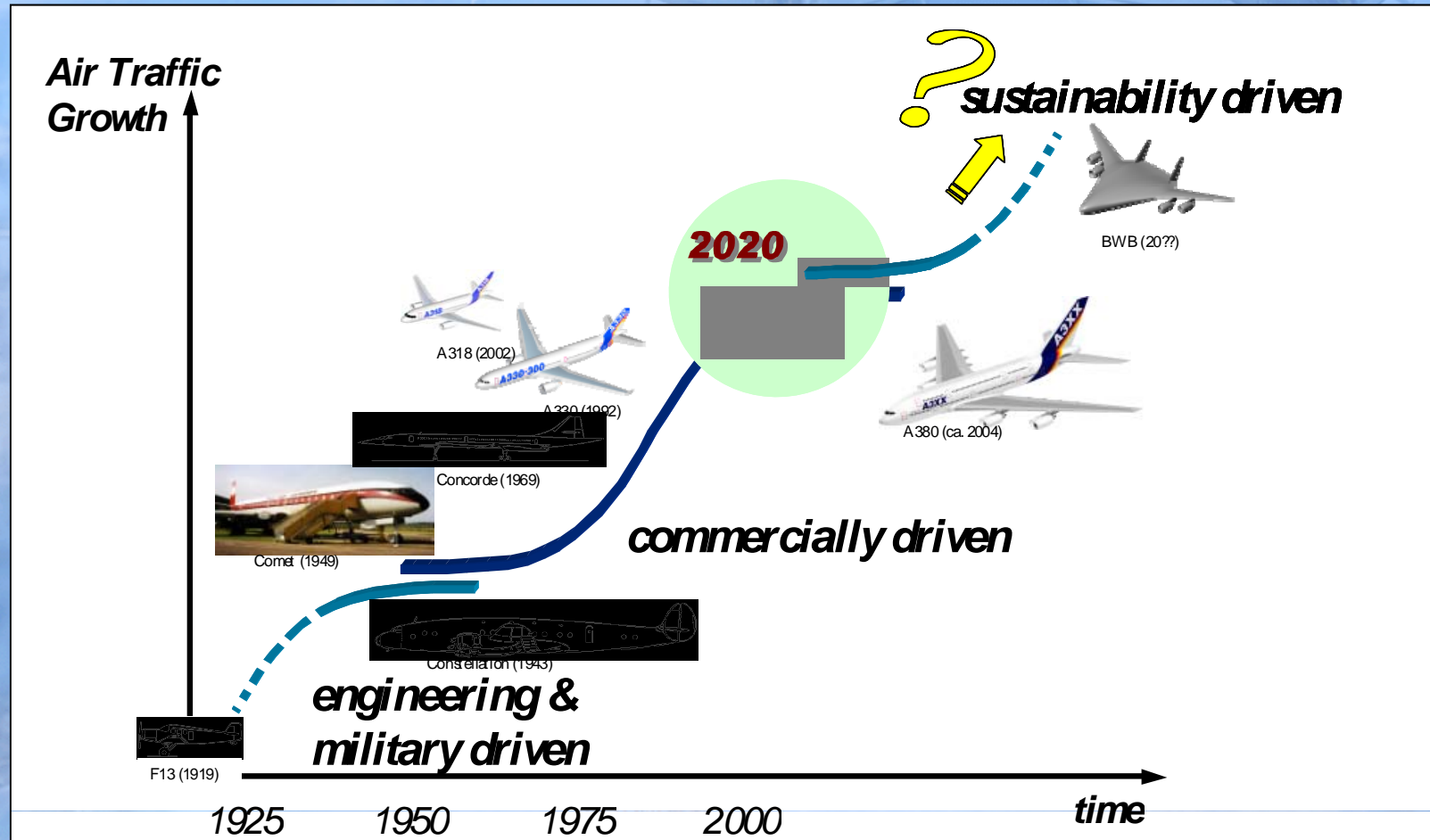
Jan van Doorn

Rapporteur of Working Team 4

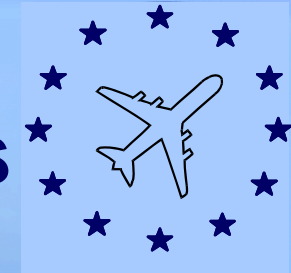
EUROCONTROL Senior R&D Co-ordinator



A new age in Aeronautics



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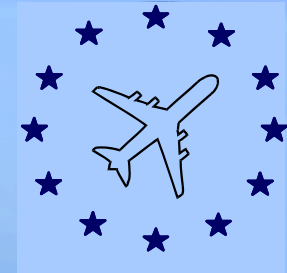


The Advisory Council for Aeronautics Research in Europe (ACARE)

EUROPEAN AERONAUTICS:
A VISION FOR 2020

Quality & Affordability	Fall in travel charges Passenger choice Air freight services Halve time to market
Environment	50% CO2 Reduction 80% NOx Reduction 10 dB reduction in external noise
Safety	80% reduction of accident rate Reduction of human error impact
Efficiency of the Air Transport System	3X increase in movements 99% arrivals/departures within 15 min Time in airport < 15 min (SH) < 30 min (LH) Seamless ATM system
Security	Zero successful hijack

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General Findings

- Holistic approach to Air Transport System
- Safety is key to efficiency
- Incorporate new/non-conventional types of traffic
- Transition: a critical element

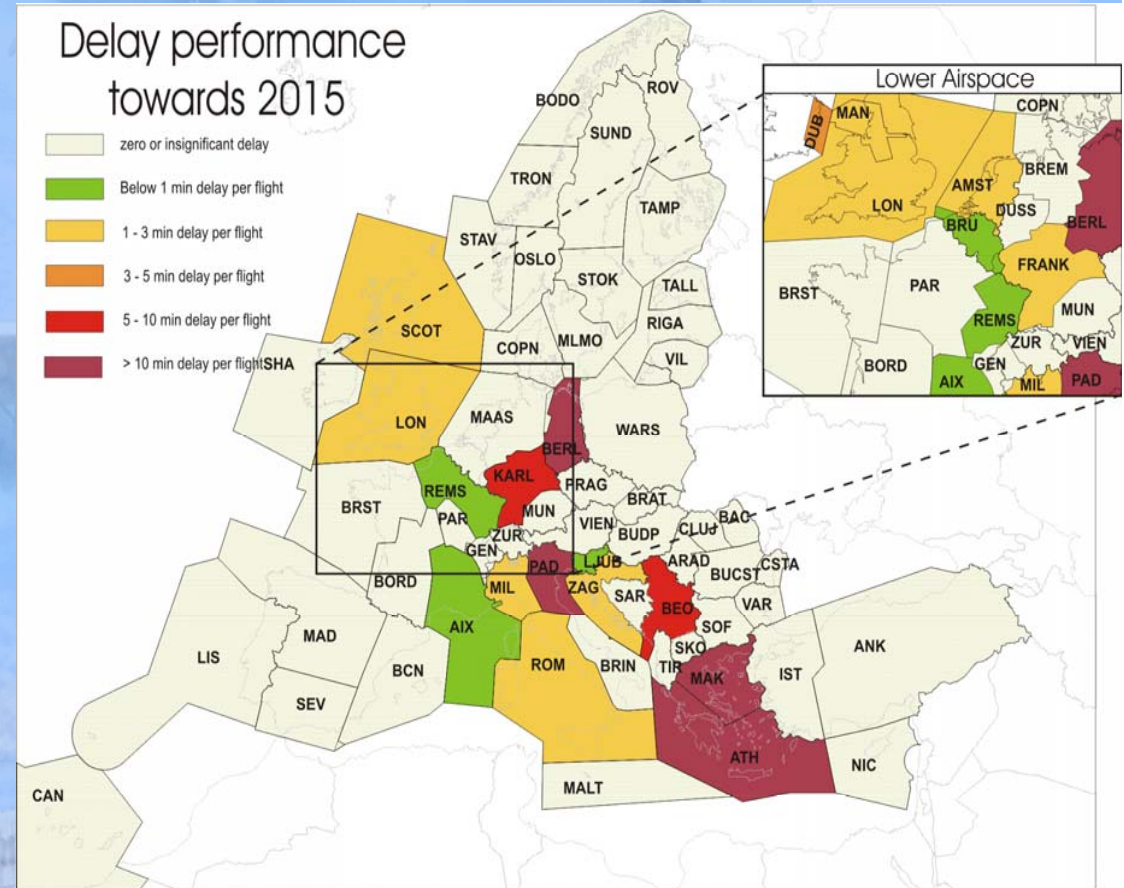
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Revolution in ATM ?

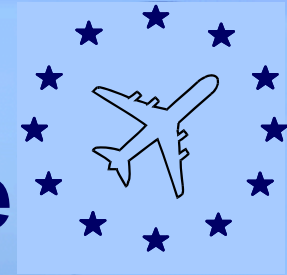
30 years of Research
have not succeeded
in bringing about
new ideas

But the ATM system
capacity has
doubled in the
last 20 years

Will it still be
possible for the
next twenty
years?



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The Air Traffic Management of the future



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Chosen R&T paths



Optimise use of existing airspace capacity

Remove the airspace capacity barrier



Airport of the future

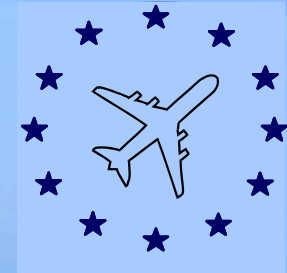
Seamless Global
European ATM System

Maximise current airport performance



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Optimise Use of Existing Airspace Capacity

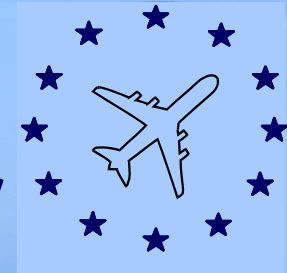


- Flexible and dynamic use of airspace
- Integrate air traffic control with flow management
- Collaborative Decision Making

Enablers

- *4D Trajectory based, end to end system*
- *System Wide Information Management*

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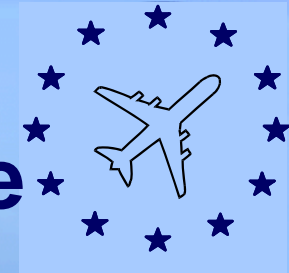
Remove the Airspace Capacity Barrier



Need for a paradigm shift in ATC operating mode

- More Autonomous aircraft, linked with co-operative ground ATC
- New operational concepts (group control, dynamic sectors, innovative control by airspace volume)
- Towards full automated air traffic control

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Maximise Current Airport Performance



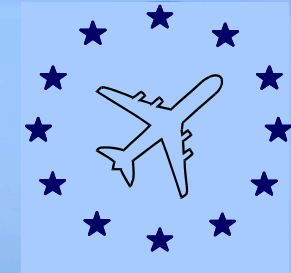
Efficient Runway usage

- Simultaneous operations on dependant runways
- New landing aids
- Reduced separation minima

All Weather Capability

- Improved Meteo forecasts
- Enhanced A-SMGCS

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Maximise Current Airport Performance

New operational concepts
for Airports and Airline Ops

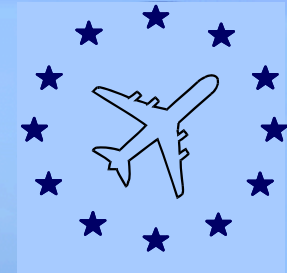
- New hub&spoke operations, using different airports infrastructures and different feeding capabilities:

development of small airports, airport clusters, use of rotorcraft or ground transportation feeds.



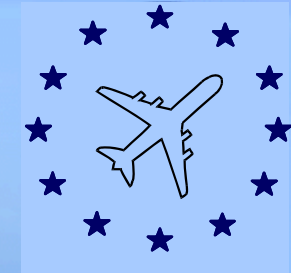
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Airport of the Future



Innovative Passengers & Luggage processes

- Integrated, passive pax processes, without queuing, using bio-technologies or microchip-based travel documents
- New passengers movements concepts inside the terminals



Airport of the Future

Consistent and integrated airport processes

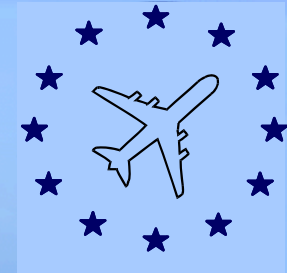
- Need for common standards
- Integration of multi-actors, multiple processes into efficient channels

System Wide Information Management

- CDM-networks, using remote access technologies (PDAs, pagers, mobiles)
- Passengers communication tools

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Seamless Global European ATM System



Interoperability

- Applies to humans and machines
- Concerns procedures, equipment and data

Seamless, satellite-based technologies

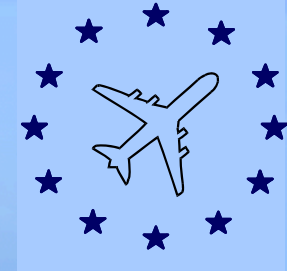
- Communications capabilities
- Navigation capabilities

New Airspace design

- New airspace concepts, using innovative ATM paradigm

Global Interoperability

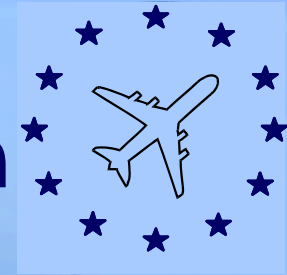
- Air transport per nature: a world-wide industry
- Pre-requisite for competitiveness of European aeronautics industry



Key Points

- No “new start” → Transition Issues are key
- New ATC paradigms / Fundamentally changed Operational Concepts
- Breakthrough Technologies / Total System Approach
- Safety / Security inherently built-in
- Network approach for airports, airspace, service providers and users
- Necessity for co-operation of all stakeholders

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Too many stakeholders, no decision makers

ATC is an infrastructure service, not economically significant on its own

All actors have different objectives

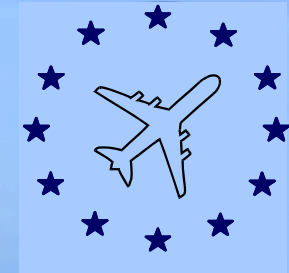
National providers with national programmes whereas air transport is multinational by nature

No political owner of the system

High dispersion, low return on investment



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No Scientific Background



ATM is computer-science oriented

Monk-Engineers making technical choices like entering religion

Very little cross-fertilization with other industries

Small technology push and no economic or social pull

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Conclusion

Research is needed, more than ever

ATM service providers focus more on short term, immediate profitability issues

Research should be funded by public funds rather than by airspace users

ATM supply industry should enable cross-fertilisation, and make the « technology push » which is needed to succeed



US, Europe and Asia have to work hand in hand