1st AirTN NextGen Network Meeting

Activities on research infrastructure – ACARE WG5

27 October 2014 - Brussels
Covent Garden SDRI 19th floor, European Commission
WG 5 New Tasks

• **Research**
  – Stimulate activities to install a European Aviation Impact Assessment
  – Support ACARE Monitoring Group with technical advice on progress
  – Support EC in formulating WP of H2020 in terms of research
  – Team with EREA to harmonise activities towards FP2050 goals

• **Testing Capabilities / Aviation Research Infrastructures**
  – Finalize first roadmap 2014 – 2020 incl. definition of processes
  – Monitor infrastructure availability (new and existing), advise EC
  – Extend roadmap beyond H2020 to reach FP2050 long term goals

• **Education & Workforce**
  – Identify needs for talents, e.g. via polls & workshops
  – Monitor harmonisation of accreditation
  – Support / advise EC on education activities, e.g. “serious gaming”
  – Organise HR related workshops on aviation research and innovation
  – Establish process to populate education roadmap with projects…
  – Support Aerospace sector skills alliances proposal under "Erasmus for all"
Step 1: Define RIs needed to fulfill FP2050 objectives

Step 2: Identify existing RIs & new needs. Explore capabilities/deficits

Step 3: Set up RI Management Team to coordinate

Step 4: Prepare Strategic Roadmap on Aviation RI

Goal: Aviation RI as European Network

ACARE SRIA Vol. 1 & 2
IEG Report
FP 2050 Matrix by WG 5
FP 2050 Matrix

- What is needed?
- Where are gaps?

Infrastructure

Wind Tunnels
Engine Test Beds
Structure Test Rigs
System Test Rigs
HPC Centres
Production Centres
A/C Simulators
F/T Aircraft & Airport
ATC/ATS Simulators
Logistics & Security
Medical Testing

FP 2050 Goals

0. General
1. Societal Needs
2. Ind. Leadership & Energy
3. Environment & Safety
4. Security
5. Research & Education

Rating
Availability
Plus
- Precision
- Sophistication
- Accessibility
- Uniqueness

Importance of these KPI?
### The idea behind

<table>
<thead>
<tr>
<th>Rating:</th>
<th>Availability:</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - Vital</td>
<td>a. Available</td>
</tr>
<tr>
<td>3 - Needed</td>
<td>b. Not Available</td>
</tr>
<tr>
<td>1 - Supportive</td>
<td>c. Unknown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Type</th>
<th>Sub-Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Flow Tunnel</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Logistics &amp; Security</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Security; e.g. THz-Scan.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PAX Flow Simulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Airport Logistic Simul.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>0. General Topics</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS integrated in transport chain</td>
<td>16 Billion passengers annually</td>
<td>Next gen. wide &amp; narrow body</td>
<td>Tilt rotors</td>
<td>QSTOL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UAS non transport missions</td>
<td>UAS non transport missions</td>
<td>Night ops by quiet aircraft</td>
<td>Airports resilient ag. disruptions</td>
<td>Aviation incl. military in modal networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24/7 aircraft and rotorcraft door-to-door</td>
<td>Pilots and ATCs as strategic managers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rating: 5 - Vital, 3 - Needed, 1 - Supportive

Availability:
- a. Available
- b. Not Available
- c. Unknown

<table>
<thead>
<tr>
<th>Availability</th>
<th>5 - Vital</th>
<th>3 - Needed</th>
<th>1 - Supportive</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Billion passengers annually</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Next gen. wide &amp; narrow body</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Tilt rotors</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>QSTOL</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>UAS non transport missions</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Night ops by quiet aircraft</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Airports resilient ag. disruptions</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Aviation incl. military in modal networks</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>24/7 aircraft and rotorcraft door-to-door</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Pilots and ATCs as strategic managers</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Group on Research Infrastructures
EREA infrastructure needed to realize Flightpath 2050 goals

Clear commitment to support and contribute to ACARE WG5
1. Based on AirTN (Air Transport Network) questionnaire.

2. Not yet fully comprehensive (Beta-Version)

3. Key information provided:

   - Identification of the installation/facility,
   - Technical characteristics.
   - Size, measured in terms of replacement costs.
   - Access policy and source of support.
   - EREA/AirTN points of contact.
ACARE ROADMAP FOR R&D INFRASTRUCTURES DEVELOPED

- Identification of further EREA facilities
- Validation/completion of RI Selection Criteria (w.r.t. EREA selection criteria)
- Translation of FlightPath 2050 goals to RI requirements
- Preparation of Flightpath 2050 RI Plan
- Identification of non-ERA facilities
- Identification of GAPS (w.r.t. Flightpath 2050 requirements)
- Definition of RI that need to be built (new) and/or refurbished (existing)

DELIVERABLE

EREA RI Catalogue (beta version)

EREA RI Catalogue categorised and approved

EREA RI group Contribution to Way Forward

Group on Research Infrastructure

12/06/2014
ACARE ROADMAP FOR R&D INFRASTRUCTURES DEVELOPED

Translation of FlightPath 2050 goals to RI requirements

- EREA RI Catalogue (beta version)
- FlightPath2050 RI Catalogue: identified and categorised
- RI Selection Criteria defined and approved
- Timeline Plan showing:
  - Facility Build (new-gaps).
  - Facility Refurbish (existing).
- Identification of GAPS (w.r.t. Flightpath 2050 requirements)
- Identification of non-EREA facilities
- Validation/completion of RI selection criteria (w.r.t. EREA criteria)
- Definition of RI that need to be built (new) and/or refurbished (existing)
Next Step

Step 1
RIs needed to fulfill FP2050 objectives identified

Step 2
Identify existing RIs & new needs. Explore capabilities/deficits

Step 3
Set up RI Management Team to coordinate

Step 4
Prepare Strategic Roadmap on Aviation RI

Goal
Aviation RIs as European Network

Supported by AirTN
Input by EREA
Next Step(s)

**Flightpath 2050**

- **ACARE WG 5**
  - Roadmap & FP 2050 matrix
- **ACARE MSG / AirTN-NextGen**
  - Survey & Database
- **EREA Group on RI**
  - Knowledge
- **IEG on RDT&E Infrastructure**
  - Methodology

**Merge activities:**
- to identify the aviation R&D infrastructure needs
- by answering: what is needed when for?
Next Step(s)

Key Questions:

**What** kind of aviation R&D infrastructure must be available **by when** to enable the achievement of FP 2050?

How to proceed:

- Establish a task force with **independent experts** from universities supported by WG 5, EREA, AirTN/MSG and industry
- Why experts from universities: experienced in RI scene, no commercial interest & cover the educational aspect
- Based on available information/data, identify the RI needs together with relevant stakeholders (customers, RI operators/owners, etc.) e.g. at workshops
The Result: European RI Network

- Engine Test Facilities
- Structure & Material Testing
- ATC/ATS Simulators
- Production Technology Centers
- Flight Simulators
- Flight Test Aircraft
- Wind Tunnels
- HPC / VR

European Network of Aviation Research Infrastructures in 2050
Future Step

The Result: European RI Network

Key Questions:

Who will drive the process?
Who will support by manpower and budget?
European Aviation Research Infrastructure

Step 1: Define RIs needed to fulfill FP2050 objectives

Step 2: Identify existing RIs & new needs. Explore capabilities/deficits

Step 3: Set up RI Management Team to coordinate

Step 4: Prepare Strategic Roadmap on Aviation RI

Goal: Aviation RI as European Network

Supported by AirTN
Input by EREA

Financial support by EC, MS and customers?
# Resources needed: 300 K€ plus in kind

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Contribution</th>
<th>Main Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC CSA MS support</td>
<td>tbd</td>
<td>Set-up / running European RI Management Team</td>
</tr>
<tr>
<td>AirTN NextGen</td>
<td>30 – 40 K€</td>
<td>Database, survey, report drafting and editing</td>
</tr>
<tr>
<td>EREA Group on RI</td>
<td>In kind + financial support?</td>
<td>Assessment SRIA needs against capabilities</td>
</tr>
<tr>
<td>ACARE WG 5</td>
<td>In kind</td>
<td>Assessment SRIA needs against capabilities</td>
</tr>
<tr>
<td>ACARE MSG</td>
<td>In kind</td>
<td>Ensure database completeness</td>
</tr>
<tr>
<td>Industry</td>
<td>In kind</td>
<td>Inputs on industrial needs</td>
</tr>
</tbody>
</table>
The Result: European RI Network

European Network of Aviation Research Infrastructures

- Engine Test Facilities
- Production Technology Centers
- Flight Simulators
- Flight Test Aircraft
- Structure & Material Testing
- ATC/ATS Simulators
- Wind Tunnels
- HPC / VR
- Production Technology Centres

???
in 2050

Advisory Council for Aviation Research and Innovation in Europe

11/14/2014