Multiple Remote Tower – Bane or Boon?

Jörn Jakobi - DLR (AT-One)
SESAR2020 PJ05 Project Coordinator
DLR, Braunschweig
WAC, Madrid - 12/03/2019
Past ‘Multiple’ Research

First DLR Multiple trials (2010)

SESAR P06.09.03 & P06.08.04 (2014)
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SESAR2020
PJ05 Remote Tower for Multiple Airports
DLR (AT-One)

WP2 Solution PJ.05-02
Multiple Remote Tower Module
LFV/COOPANS

WP3 Solution PJ.05-03
RTC with Flexible Allocation of Aerodromes to MRTMs
DFS
Validation Phases

**PJ.05-02 Multiple Remote Tower Module (V2)**
- 2x Braunschweig (Germany)
- Sturup (Sweden)
- Asker (Norway)

2017

**PJ.05-02 Multiple Remote Tower Module (V3)**
- Braunschweig (Germany)
- Växjö (Sweden)
- Asker (Norway)
- Rome (Italy)

2018

**PJ.05-03 RTC with Flexible Allocation of Aerodromes to MRTMs (V2)**
- Braunschweig (Germany)
- Sturup (Sweden)
- Asker (Norway)
- Langen (Germany)

2019

End of Project
Nov 2019
Mid - Run
• ISA – Scale

Post – Run
• NASA-TLX
• SASHA
• AIM
• Safety
• Tailored questions

Debriefing
• open questions to:
  • acceptance and
  • recommendations for improvement
Safety Assessment

1. Can the situation be solved without major impairment?
   - Yes
     - No impairment
       - Good: ATCO workload is low to easily achieve the desired performance.
     - Minor Impairment
       - Fair: ATCO requires a minor increased workload to achieve the desired performance.
   - No
     - ATC influences capacity

2. Can the situation be solved by measures reducing capacity?
   - Yes
     - Minor
       - Unpleasant delays: ATCO responds with delay to pilot’s requests.
     - Moderate
       - Disturbing delays: Situation leads to moderate delays in the traffic management.
     - High
       - Very disturbing delays: Situation leads to strongly delays in the traffic management.
   - No
     - ATC influences capacity

3. Can the situation be solved by measures reducing safety?
   - Yes
     - Impairments in prediction of traffic development: ATCO directs traffic sporadically, abruptly and does no longer plans ahead.
     - Impairments due to processing information: ATCO cannot build a complete picture of the traffic situation, confuses information and corrects himself/herself often.
     - Impairments due to information gathering: ATCO must neglect areas/information while monitoring and therefore misses aircraft.
   - No
     - Major Impairment: ATCO cannot longer control the traffic situation.
Safety Results

N = 35
M = 3.80
SD = 1.24
Splitting & Merging
I.S.A. Workload over the time

- **BASELINE - 3 Airports 100% [Emergency]**
- **SPLIT - 1 Airport 50% [Emergency]**
- **SPLIT - 2 Airports 50%**

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I.S.A. Workload over the time

![Graph showing workload over time with different scenarios: Baseline - 3 Airports 100%, Split: 2 Airports 75%, Split: 1 Airport 25%.]

- **Handover**
- **Bird Strike**

**Axes:**
- **Y-axis:** Workload
- **X-axis:** Time (min)
Myths to Multiple Remote Tower

• An ACTO is not able to work multiple

• *Multiple* needs new procedures

• *Multiple* only works with additional ground surveillance

• ATCOs do not like working *multiple*
The modernisation of air traffic management is one of the main challenges of current aeronautics research. The Single European Sky ATM Research (SESAR) project defines, develops and deploys what is needed to increase ATM performance and build Europe’s intelligent air transport system. The current programme is SESAR 2020, running from 2016 to 2024 with a budget of 1.6 billion Euro, supports projects to deliver solutions in four key areas, namely airport operations, network operations, air traffic services and technology enablers.

Part of SESAR 2020 is the Project PJ05 “Remote Tower for Multiple Airports” with focus on the safe and efficient airport of the future. By bringing the concept of remotely controlling multiple airports to a higher maturity level, the SESAR project aims at providing small and medium sized airports with more cost-efficient and service tailored air traffic services.
Be prepared for the future!
Jörn Jakobi (PJ05 Project Coordinator)
DLR Institute of Flight Guidance
Braunschweig, Germany
Joern.Jakobi@dlr.de
www.remote-tower.eu