



FREQUENTIS
FOR A SAFER WORLD

**FREQUENTIS
SESAR
PARTNERS**

Frequentis • Atos • HungaroControl



SESAR2020 PJ05 Solution 2 Multi Remote Tower

Open Day - V2 Validation – Oro Navigacija

Key Topics addressed in the validation

- Integrated Multi Tower CWP
- Planning and workflow tools
- Integration of
 - Squelch Indication
 - Met Warnings
 - Surveillance Labels



smartVISION Experience – Single Remote Tower Projects

DFS

Advanced
Remote Tower



Jersey
Contingency
Solution



VIE
Apron
Management



Iceland
Basic Remote
Tower - AFIS



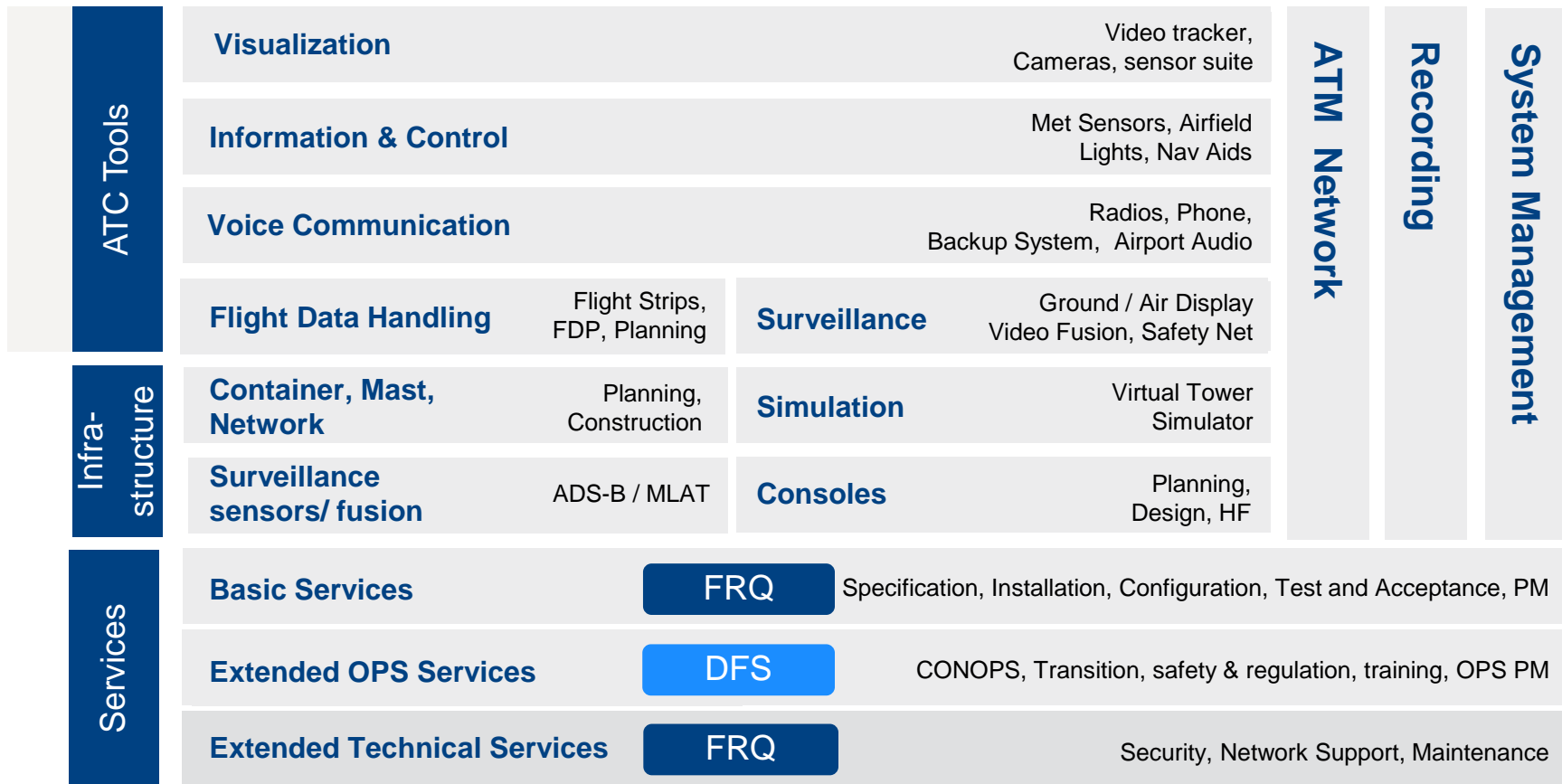
Auckland
Demonstrator



DFS Working Position in Remote Tower Center – Leipzig



Frequentis / Turn Key - Remote Virtual Tower Portfolio



FREQUENTIS Integration Topics

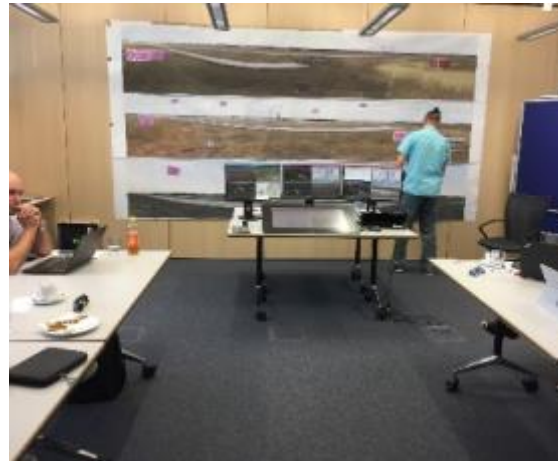
- Flight and Support Information from multiple airports on a single control panel
- Import flight plan data from simulator (Jason API)
- Squelch indication from VCS simulation system

Integration Process

- Definition of technical infrastructure & scenarios
- HMI design adjustments with HC & ON ATCO's involved
- Technical Integration
- pre-Validation with Engineers & ATCOs testing the system
- Fine-tuning and improvement for V2 validation

Multi CWP Design Process

- Workshops with ATCOs
- Paper Prototyping to get initial working position design
- Setup of simulation environment in Braunschweig
- Technical Integration
- Pre Validation Phase with ATCOs



Simulation Setup in Braunschweig (3 Airports)

Panorama Views with augmentation

Situation Display for each airport

Planning Tool

Flight Strips



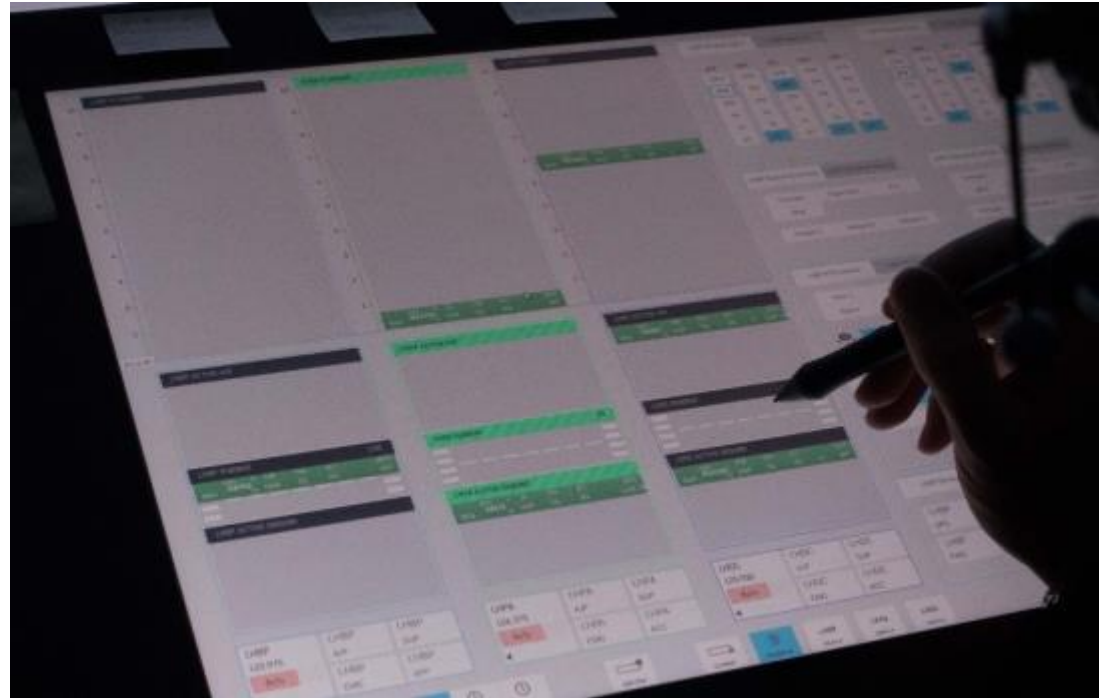
PTZ View for each airport

Support Information & Control Functions

Voice Communication

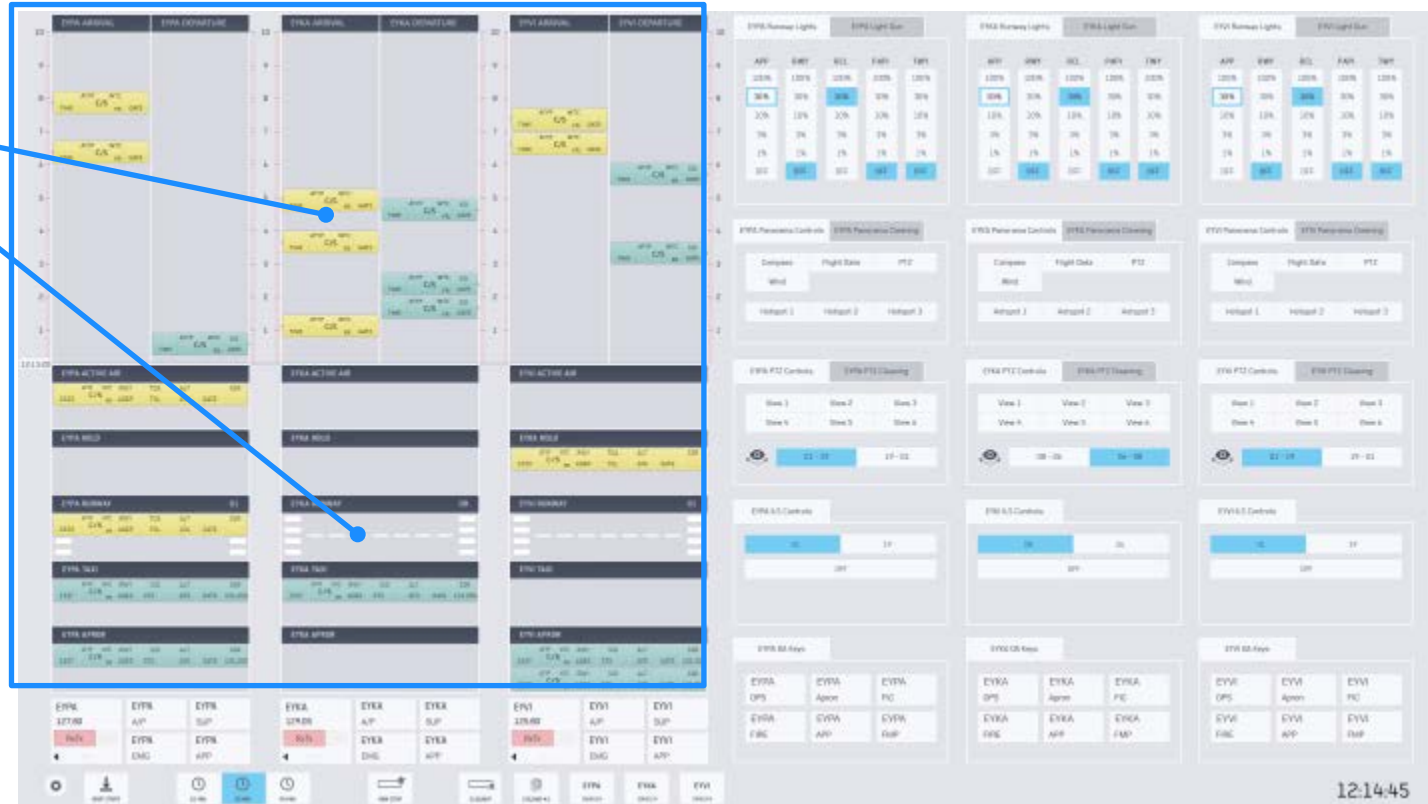
Integrated Control Panel

- Timeline based traffic display: multiple airports & parallel traffic indication
- Planning of upcoming traffic situation
- Re-planning function
- Integrated flight strips functions
- Clearance assignment
- Integrated VCS functionality (PTT / Squelch)



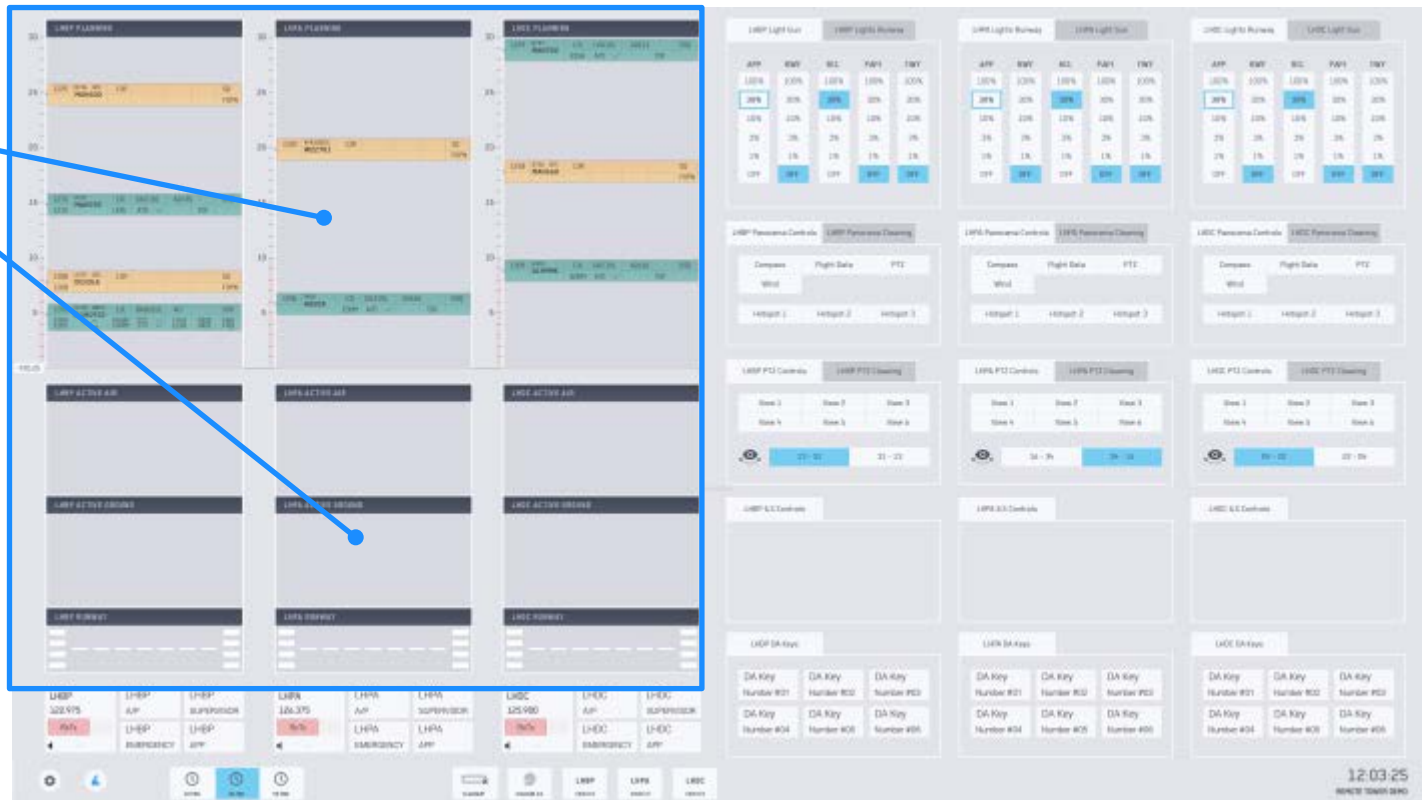
Planning Tool Option I - designed for Oro Navigacija

- Planning Tool
- Flight Strips

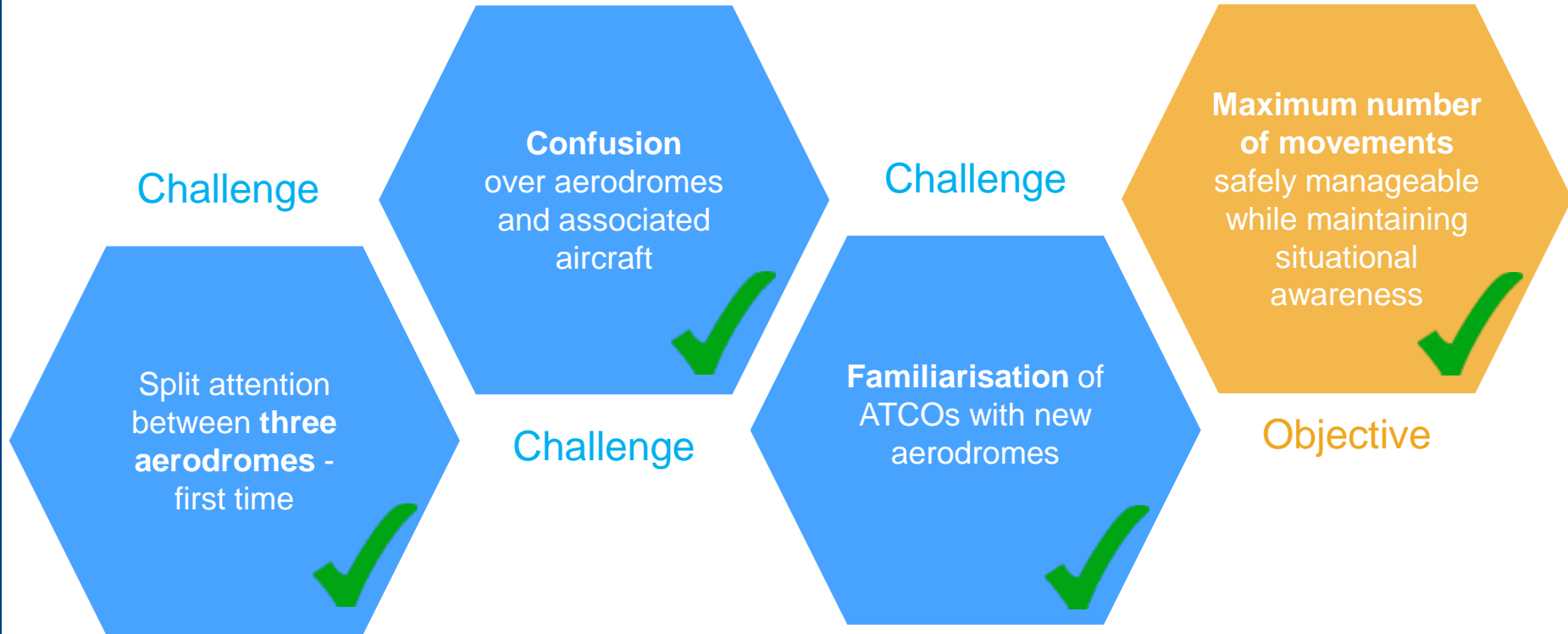


Planning Tool Option II – designed for Hungaro Control

- Planning Tool
- Flight Strips



Hungaro Control's Challenges & Objectives



Hungaro Control's Initial Operational Findings



No airport mix-up

Advanced HMI for improved situational awareness & adapted phraseology - usage of tower designator



Operational procedures

Harmonise procedures to lower workload



Traffic complexity

Based on ATCO feedback traffic complexity is key factor in contributing to workload



Frequency congestion

Frequency congestion to impact manageable traffic numbers

Planning Tool - added values

- Workload: Preview
- Timeline: Estimates
- Airport association: Squelch indication
- Traffic handling: seamless EFS integration

Next Steps

- pre-Validation @ Braunschweig for V3 – Nov 2018
- PJ 05 03 Validation with DFS – further automation functions
- Live Validation @ Budapest for 2-3 remotely controlled airports – March 2019
- ... development to be continued in Wave 2



FREQUENTIS

FOR A SAFER WORLD

