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HungaroControl Disruptive technologies in Air Traffic Management

8th Florence Air Forum
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HungaroControl
Straight to the point

HungaroControl
Hungarian Air Navigation Services

Planned HungaroControl involvement in SESAR 2020

Participating in projects aligned with our strategic initiavties

Key Feature name	SESAR 2020 PROJECT Number	SESAR SOLUTION NAME	Disruptive Technologies
High performing airports operations	PJ.03a Integrated Surface Management	Enhanced Guidance Assistance to Aircraft and Vehicles on the Airport Surface Combined with RNOing	
High performing airports operations	PJ.05 Remote Tower for Multiple Airports	Remotely Provided Air Traffic Service for Multiple Aerodromes	**D**
High performing airports operations	PJ.05 Remote Tower for Multiple Airports	Remotely Provided Air Traffic Services from a Remote Tower Centre with a flexible allocation of aerodromes to Remote Tower Modules	**D**
Advanced air traffic services	PJ.10 Separation Management En-RNOe and TMA	Flight Centred ATC	**D**
Enabling the aviation infrastructure	PJ.16 CWP - HMI	Workstation, Service Interface Definition & Virtual Centre Concept	**D**
Enabling the aviation infrastructure	PJ.16 CWP - HMI	Workstation, Controller productivity	

HungaroControl approach to Virtual Centre Concept

Today

ANSPs usually host a monolithic ATM system with very few information services and infrastructure

Future

In the **future Virtual Centre** (VC) the Controller Working Positions will be decoupled and separated from the ATM data service provision (ADSP).

ATM Data Service Provider hosting services that provides the necessary information one or more ANSPs' Virtual Centre. Virtual Centres will become ATM Data users.

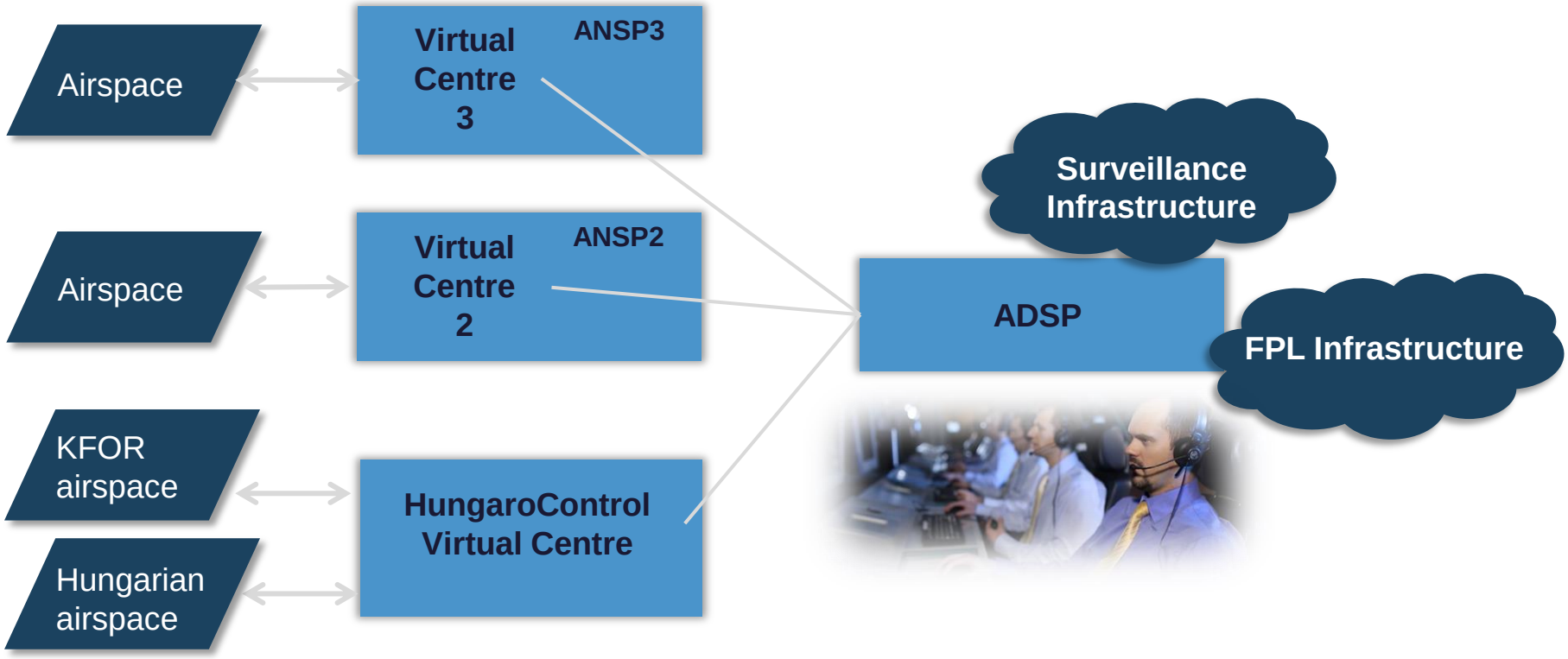
HungaroControl future

Robust THALES FDP as ADSP will be able to provide service to other ANSPs and other partners as well on the highest level of service in ATM.

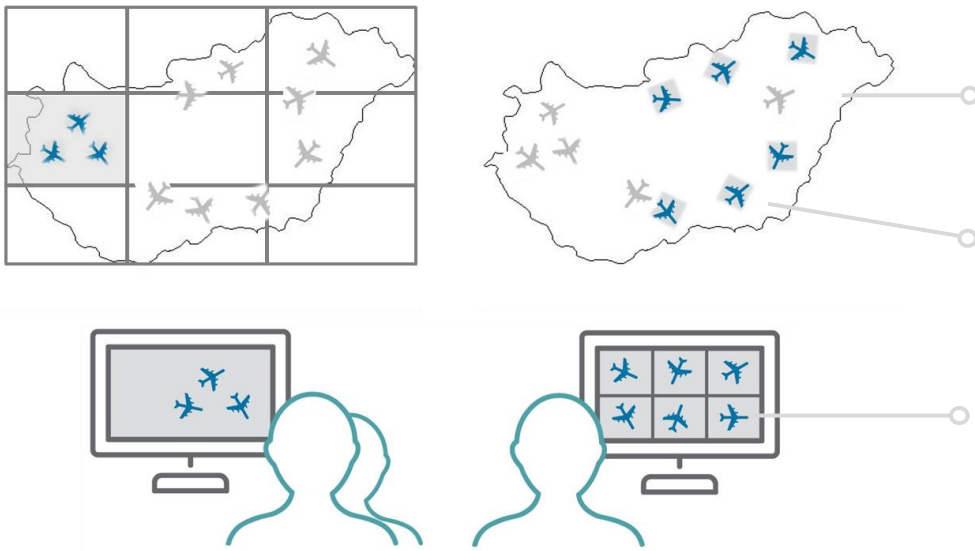
Virtual Centre and ADSP will be based on new technologies, working methods, Service Oriented Architectures (SOA).

HungaroContol's Thales system (MATIAS) is a potential test platform for PJ.16-03 project.

HungaroControl improvements to provide ADSP services to customers



HungaroControl is ready to support the DLR project with expert staff and ATCOs in methodology questions for operational viability and to provide simulation, validation platform



Undivided airspace

one airspace as one piece without conventional sectors

the controllers are responsible for certain flights from the entry points to their exit

assigning up to six (or more in the future) aircraft to one controller, regardless of the aircraft's geographic position

Benefits

Significantly increased controller efficiency, higher flexibility, user-preferred routes
Opportunity for regionally centralised ATC Centres

SESAR PJ10-01b

rTWR
Demanding business continuity

Tower building issues

- TWR building is maintained by airport, HungaroControl must rent it: mixed responsibility
- 30 years old infrastructure; ATM system upgrades require space
- Airport was closed twice due to infrastructure malfunctions in 2012 and 2015
- Separated ATCO staff, inconvenient SRA
- Periodic refurbishment is foreseen in a few years

☑ Business need: Full capacity aerodrome control even when the tower building might be evacuated for upgrading ATM-systems and refurbishment for 6-8 months.

Authority approval can be obtained under actual regulations

Main and contingency solution alternatives

Considered alternatives to provide business continuity (main + backup)

- Current concrete TWR + cTWR: temporarily 25% less capacity
- rTWR + current concrete TWR: expensive to refurbish the tower building
- Main + backup rTWR: increased service level
- Building new tower and refurbish: extremely expensive

☑ Business needs must be fulfilled by application of remote technologies

Remote tower paradigm

What does rTWR really mean?

Remote tower would mean controlling air traffic by cameras? No!

Out-of-the-window (OTW) view is one of the tools, not a goal

Provide ATCOs with the best visual information
(don't replicate or duplicate the actual view)

Controlling aerodrome traffic is building a mental model of the future traffic situation and repeatedly checking the actual traffic against the mental model

RTWR is an enhanced visual surveillance technique providing complex visual information for aerodrome control

☑ Remote tower means providing the same aerodrome services from an airport-independent place/way - each and every airport has to develop its unique solution

HungaroControl (LHBP) specialties

Specific circumstances of HungaroControl and Budapest Airport

- Two parallel and shifted runways, 6 km between the furthest thresholds
- A-SMGCS – an ability to control airport traffic even without any visual observation (radar is the main surveillance system, not human eyes)
- More than one simultaneous ATCO positions and specialized ATCO roles (ADC, CDC, GRC - apron, TPC, SV)
- Stripless operation; MATIAS TWR capability, ILS and AGL controls (partially integrated in A-SMGCS HMI)
- Medium size : 100.000 mvnts yearly

☑ SESAR single remote tower solution for small airports shall be extended, validated and demonstrated under Budapest circumstances

Stepwise approach

rTWR implementation phases in HungaroControl

2016	2018	2019	2020
SESAR VLD and contingency facility	rTWR as the main system (concrete TWR is backup)	Remote cTWR as a contingency of rTWR	Multi purpose simulation facility: contingency, training, R&D

Videowall

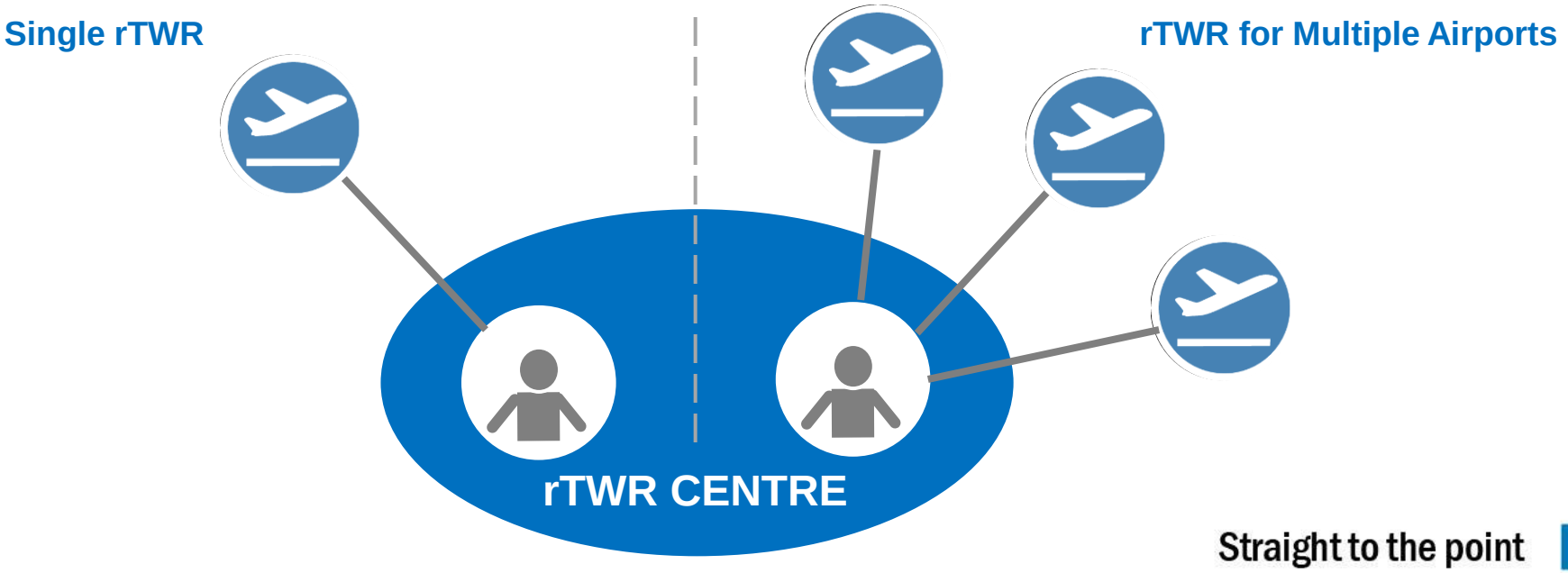
VLD test succesfully executed between beginning of August and middle of September, 2016

HungaroControl rTWR koncepció video (35 sec):
https://www.youtube.com/watch?v=rU1vXdf1h9U

Remote Tower for Multiple Airports

Based on HungaroControl experiences the multiple remote tower might be considered as a multi-runway airport instead of multiplicities of single runway environments

- To maximize the benefit of remote tower technology we can exploit synergies from ATCO responsibilities assigned by traffic pattern (clearance, airfield, ground, etc.) instead of airports – quality vs quantity
- Flexible staff management to build a cost efficient service at a more enhanced and safe level
- SESAR PJ.05 Remote Tower for Multiple Airports



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Thank you for your attention!

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