

FREQUENTIS

FOR A SAFER WORLD

SESAR PJ05-35 V3
December 2021

EXE 2.1.1., EXE 2.1.2.

Operational & Technical Set-up

Regina Bruzek & Ibrahim Karaca

Our experience – Deployed solutions in operation around the world

DFS
Advanced Remote Tower



Jersey
Contingency Solution



VIE
Apron Management



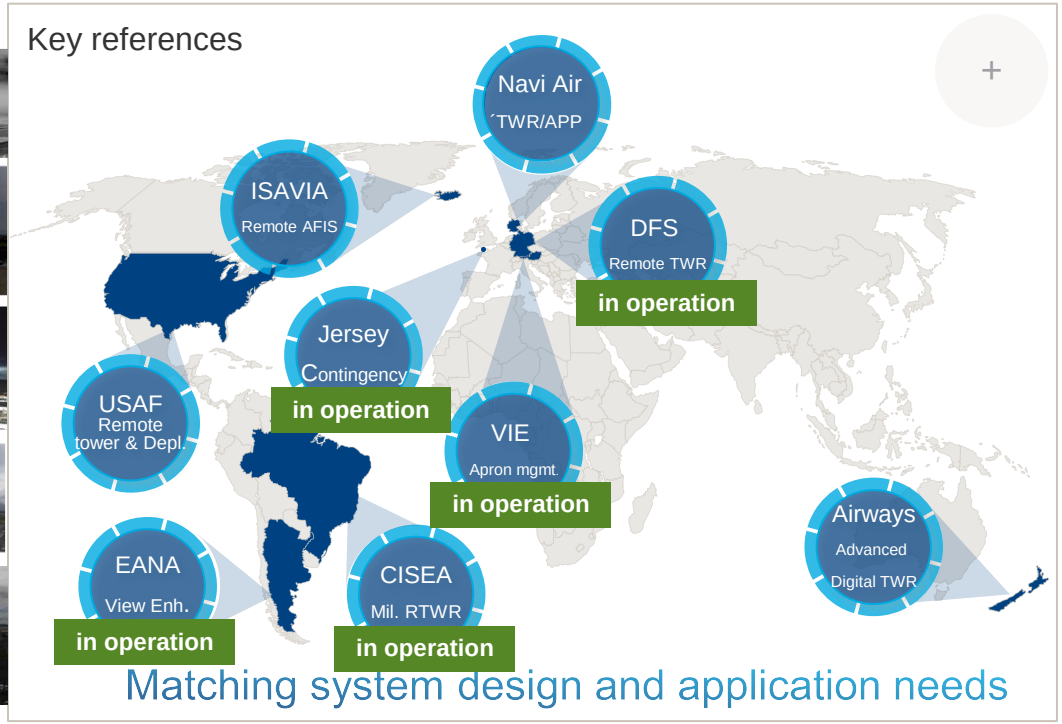
Iceland
Basic Remote Tower



NZ
Demonstrator



Key references



Matching system design and application needs

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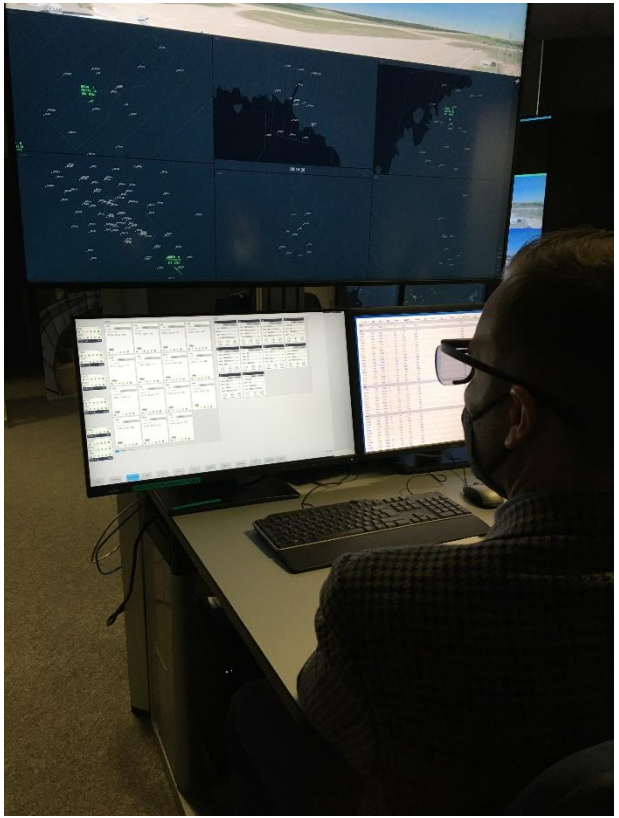
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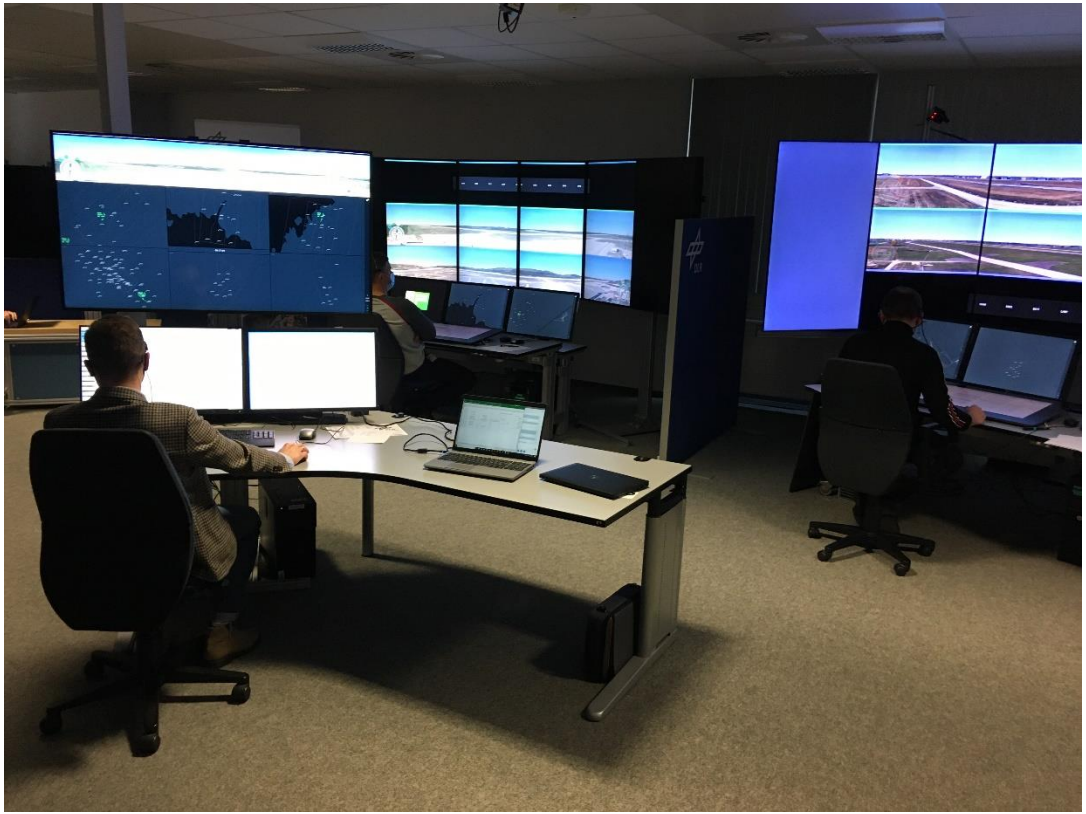
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EXE 2.1.1.

SUPERVISOR tool for flexible allocation of roles to working positions

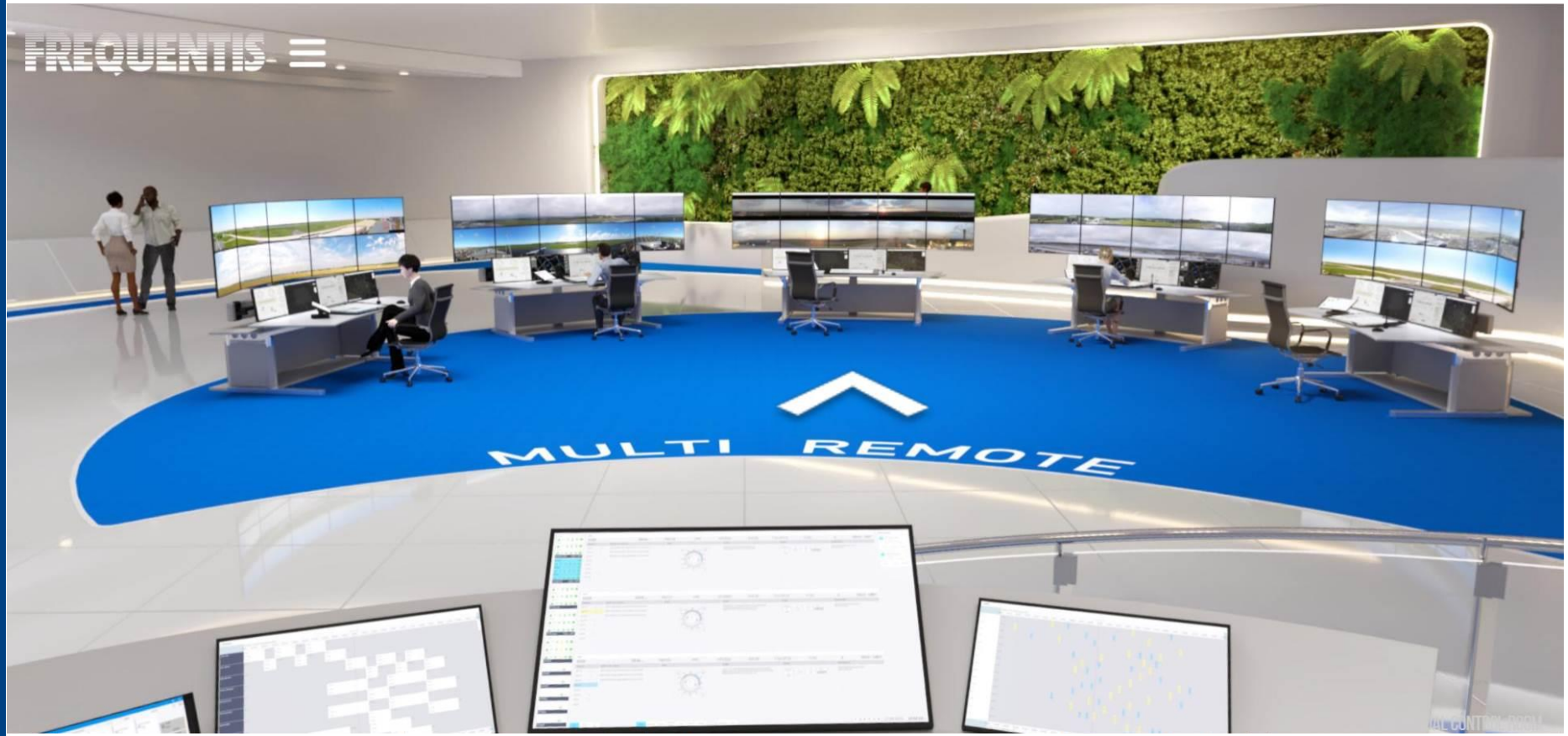
Supervisor Tool





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Center Supervisor‘s daily business



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Highly Flexible Allocation Of Aerodromes to Remote Tower Modules

Our approach

- Iterative workshops with ON & PANSA ATCOs - shaping ideas
- Use Cases Identification
- Focus on main tasks: role allocation, ATCO allocation, event logging
- Additional tasks for an authentic experience
- ATCO and Supervisor feedback and review cycles
- Software development
- Integration with existing Multiple Remote Tower working positions successfully validated in WAVE 1 – using one common MosaiX platform

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Previously on PJ05 – WAVE 1







Multiple Remote Tower Operation Validations at level V2 & V3

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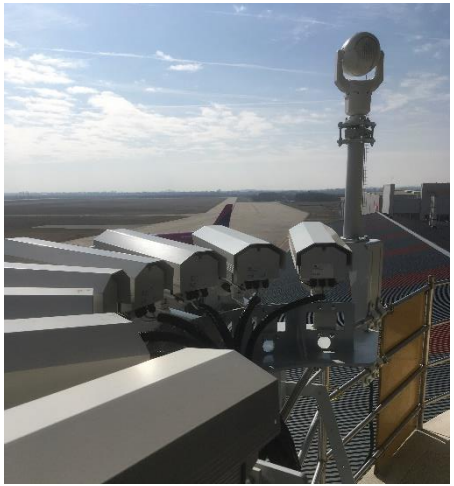
Multi Remote Tower Simulator set-up

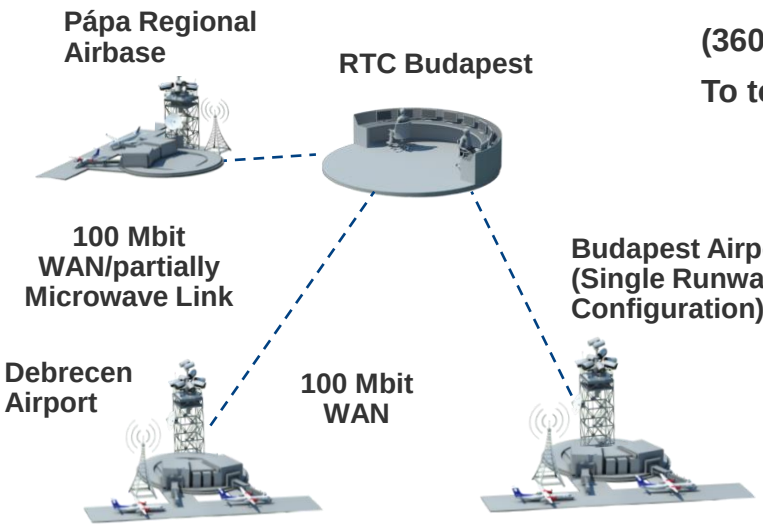


Multiple Remote Tower Module in the field

Temporary installation on existing towers / buildings







1 PTZ per Airport

(360° coverage, restriction due To tower and construction)

8 HD Cameras

(180° horizontal coverage, >40° vertical coverage)



3 HD Cameras

(180° horizontal coverage, >40° vertical coverage)

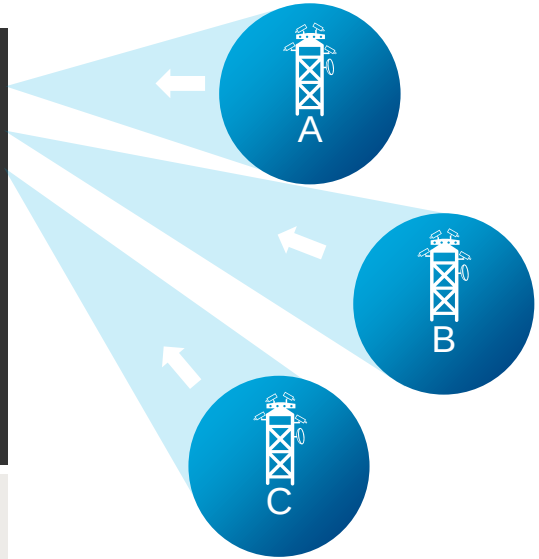
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RTM structure

Controller Working Position

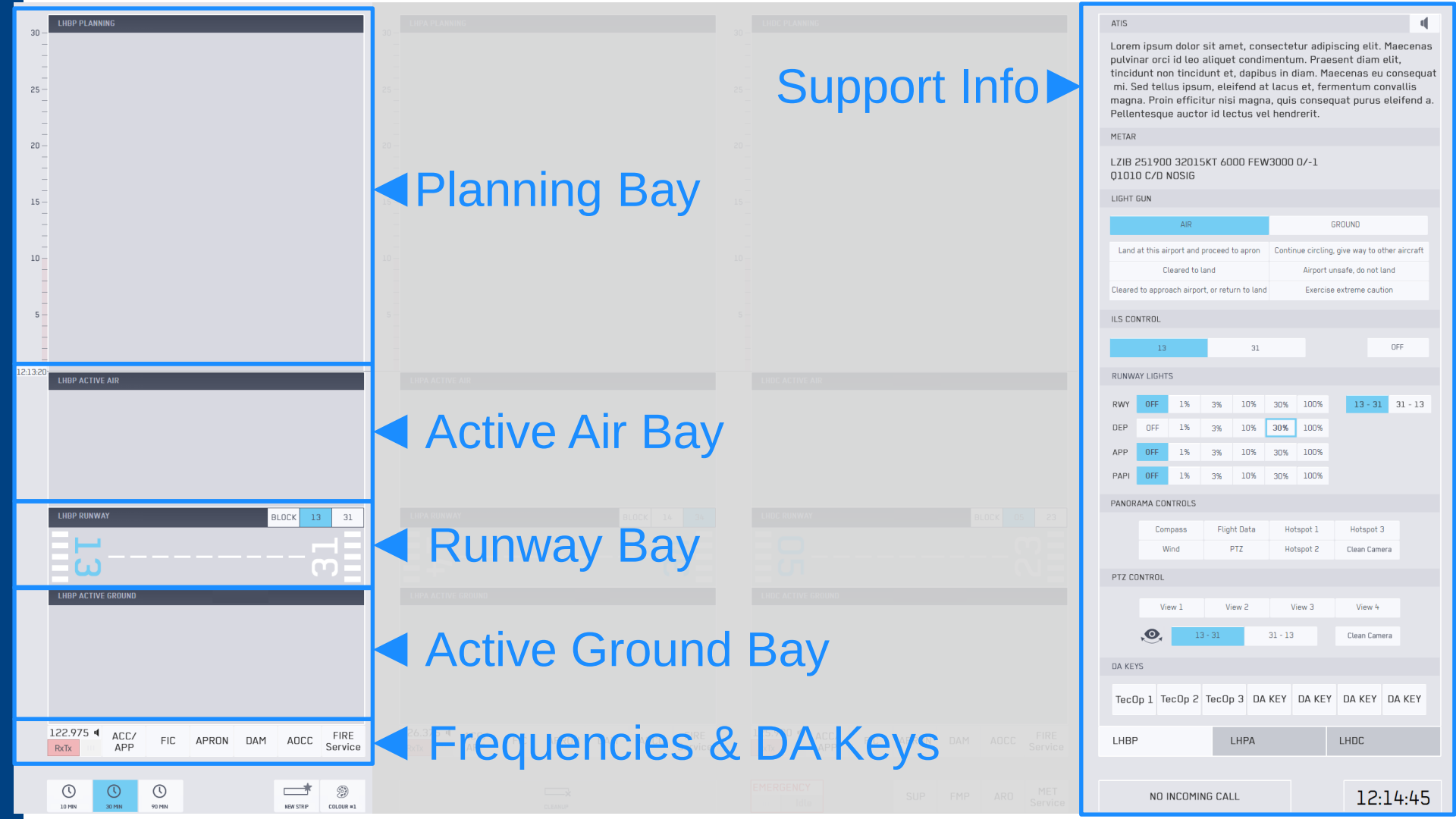


Full integration of enhanced voice services	Multi-airport planning tool for efficient and safe traffic handling	Surveillance Integration & Augmentation	Combined Civil / Military operations	Validations with DFS, Hungaro Control and Oro Navigacija

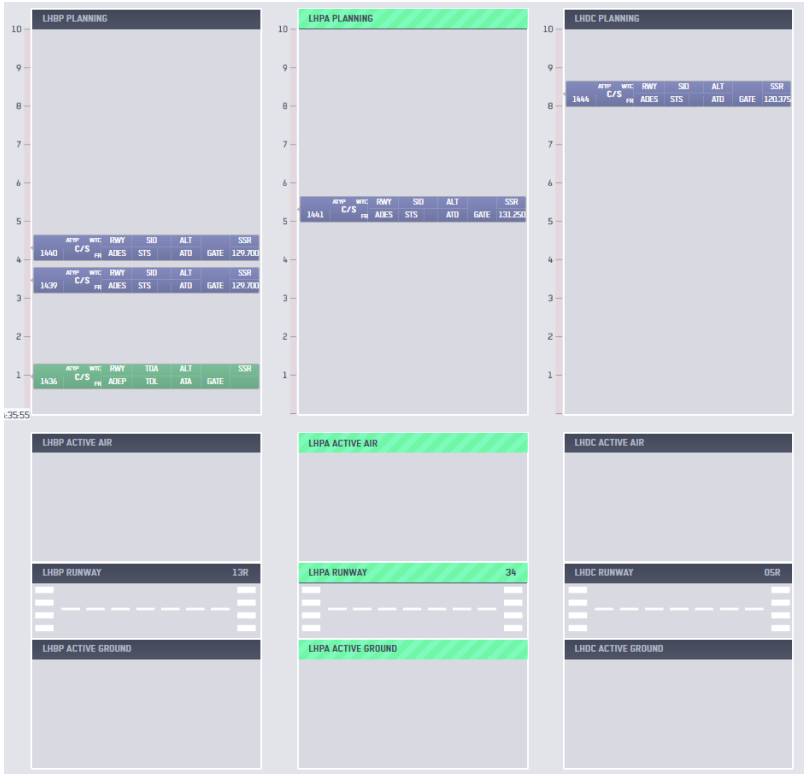


Control of up to 3 airports by one Air Traffic Controller

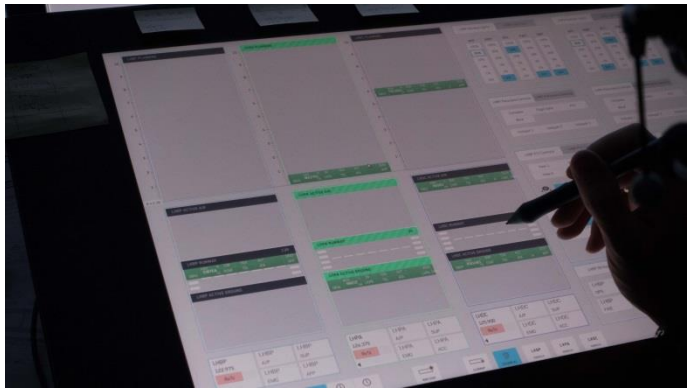
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LHBP PLANNING
LHBP ACTIVE AIR
LHBP RUNWAY
BLOCK
13
31
LHBP ACTIVE GROUND
122.975
RxTx
ACC/ APP
FIC
APRON
DAM
AOCC
FIRE Service
10 MIN
30 MIN
90 MIN
NEW STRIP
COLOUR #1
Planning Bay
Active Air Bay
Runway Bay
Active Ground Bay
Frequencies & DA Keys
Support Info
ATIS
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Maecenas pulvinar orci id leo aliquet condimentum. Praesent diam elit, tincidunt non tincidunt et, dapibus in diam. Maecenas eu consequat mi. Sed tellus ipsum, eleifend at lacus et, fermentum convallis magna. Proin efficitur nisi magna, quis consequat purus eleifend a. Pellentesque auctor id lectus vel hendrerit.
METAR
LZIB 251900 32015KT 6000 FEW3000 0/-1
Q1010 C/D NOSIG
LIGHT GUN
AIR
GROUND
Land at this airport and proceed to apron
Continue circling, give way to other aircraft
Cleared to land
Airport unsafe, do not land
Cleared to approach airport, or return to land
Exercise extreme caution
ILS CONTROL
13
31
OFF
RUNWAY LIGHTS
RWY
DEP
APP
PAPI
OFF
1%
3%
10%
30%
100%
13 - 31
31 - 13
PANORAMA CONTROLS
Compass
Flight Data
Hotspot 1
Hotspot 3
Wind
PTZ
Hotspot 2
Clean Camera
PTZ CONTROL
View 1
View 2
View 3
View 4
13 - 31
31 - 13
Clean Camera
DA KEYS
TecOp 1
TecOp 2
TecOp 3
DA KEY
LHBP
LHPA
LHDC
NO INCOMING CALL
12:14:45

VCS Integration – Squelch Highlighting





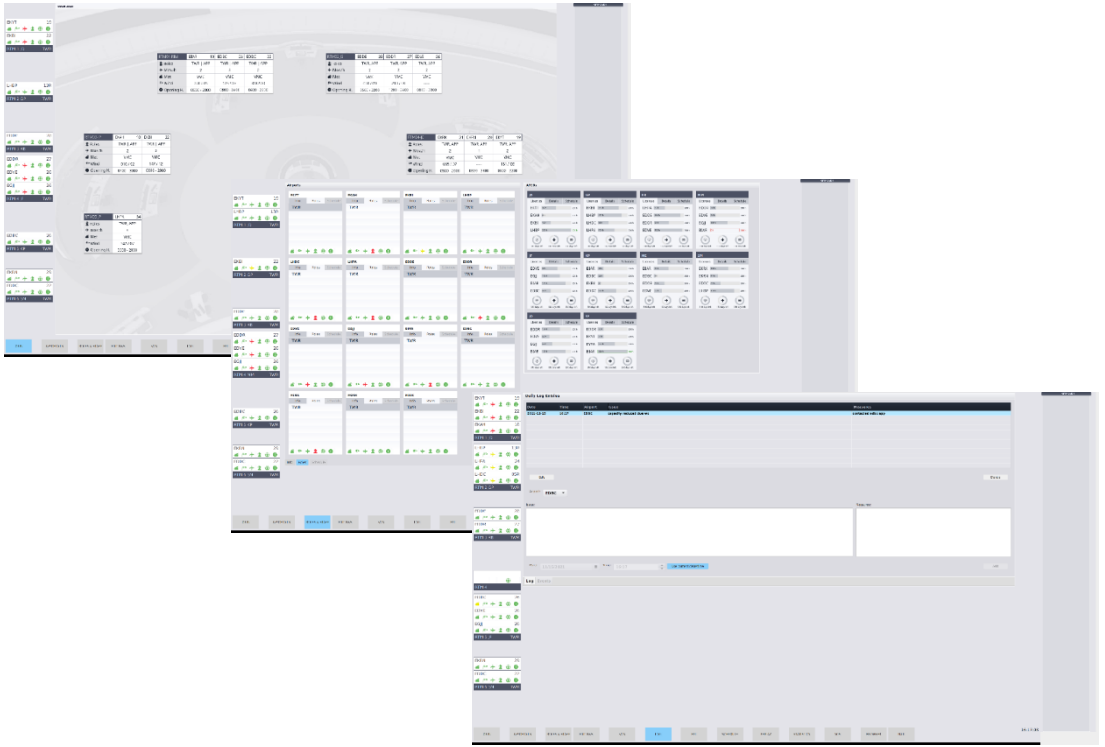


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PJ 05 - WAVE 2

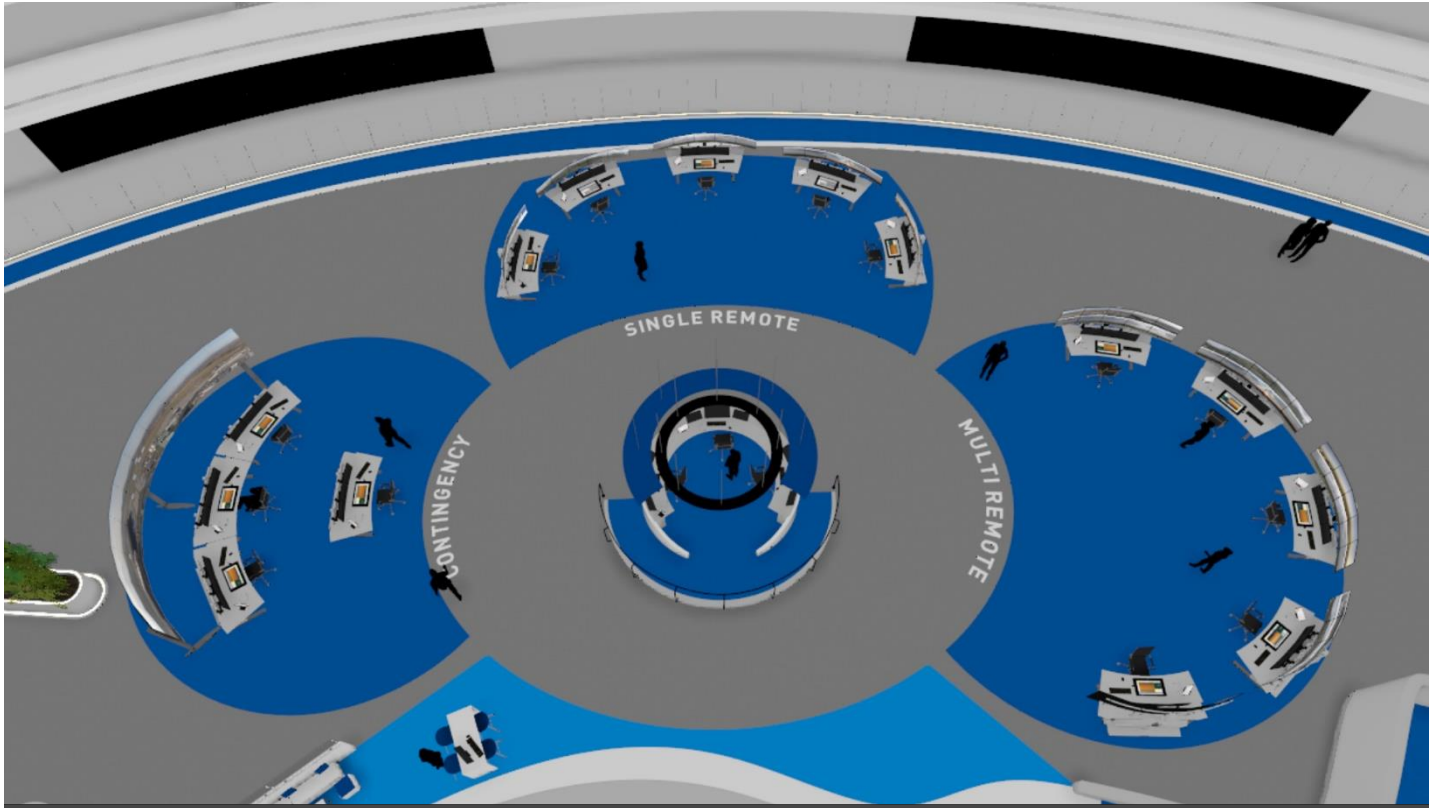
Results: validation of center software to support a supervisor in accomplishing his tasks:

- Role allocation
- Staff allocation
- Upfront traffic peak warnings
- Event logging
- Notification board



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15 airports in one control center



Scalable center design supporting different use cases

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Single Remote
Contin gency
Super- visor
Multi remote


MULTI REMOTE
Single Remote
Contin gency
Super- visor
Multi remote


CONTINGENCY
Single Remote
Contin gency
Super- visor
Multi remote

Way to go!

- Solid baseline
- Valuable insight into Supervisor operation at a center for multiple airports
- Better understanding of role management requirements in a multiple set-up
- Continue usability & efficiency improvements
- Strengthen automation
- Tighter integration of rostering
- Emphasize interoperability

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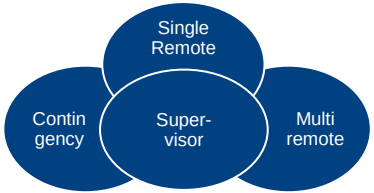
Responses

„All necessary information in one place.”

„Easy to operate, you don’t need a lot of time to learn it. ”

„Plenty of information that you need as a supervisor.”

We look forward to the first flexible multiple remote tower module center in operation.



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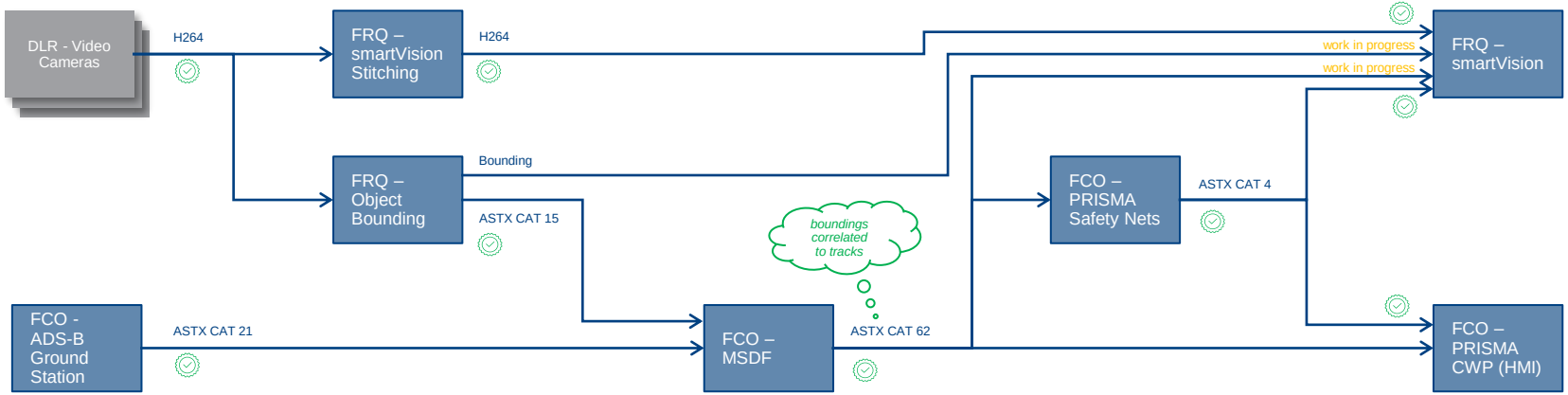
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EXE 2.1.2.

Tracker & Safety Net

EXE-PJ05-W2-35-V3-2.1.2



- Objective: Evaluate how correlation and fusion of electro-optical and ADS-B/MLAT detections enable Safety Net improvements that enhance the situational awareness
- DLR video cameras together with FRQ Object Bounding form electro-optical sensors that provide detection reports in CAT15 (partial measurements incl. azimuth and elevation, with high update rate of e.g. 10 Hz))
- FCO MSDF tracker correlates and tracks CAT15 detections together with classical surveillance, and provides track services with an equally high update rate (e.g. 10 Hz)
- FCO PRISMA Safety Net (achieved), PRISMA CWP (achieved) and smartVision (work in progress) make use of the high update rate track service to enhance situational awareness

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Visualization of the Safety Nets APW Alerts on the Panorama Screen

- Improves the SA of the ATCOs
- Provides time to ATCO to take an action.
- Prevents incidents in the apron.
- Does not depend on the weather
- Dynamically configurable APW Volumes





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Surveillance Input with High Update Rate (0.1s, 10 Hz)

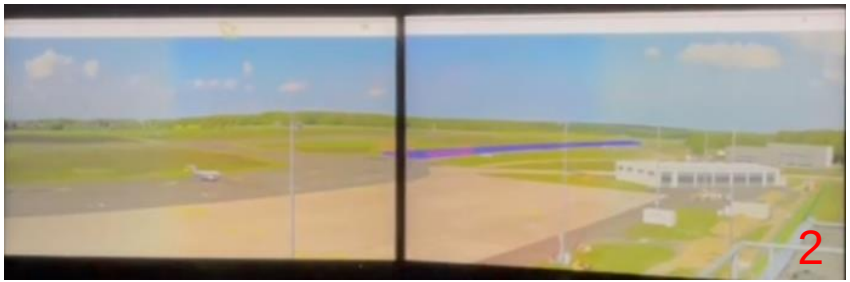
- Less Nuisance Alerts
- Better Prediction

4s update rate

vs

0.1s update rate









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