



Air Traffic
Management

Defence

Maritime

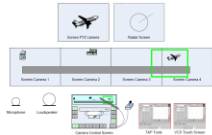
Public
Transport

Public
Safety

FREQUENTIS
FOR A SAFER WORLD

SESAR2020 PJ05 SOL2
Multi Remote Tower
Open House – V3 Validation

Frequentis & Remote TWR - more than eight years of experience



2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Early concept definition	Technology research, SESAR		Operational validation Germany, Austria		DFS RTC Project	Jersey, Iceland Vienna, Military		SESAR 2020 Multi Airport	Live Validation

Research & development

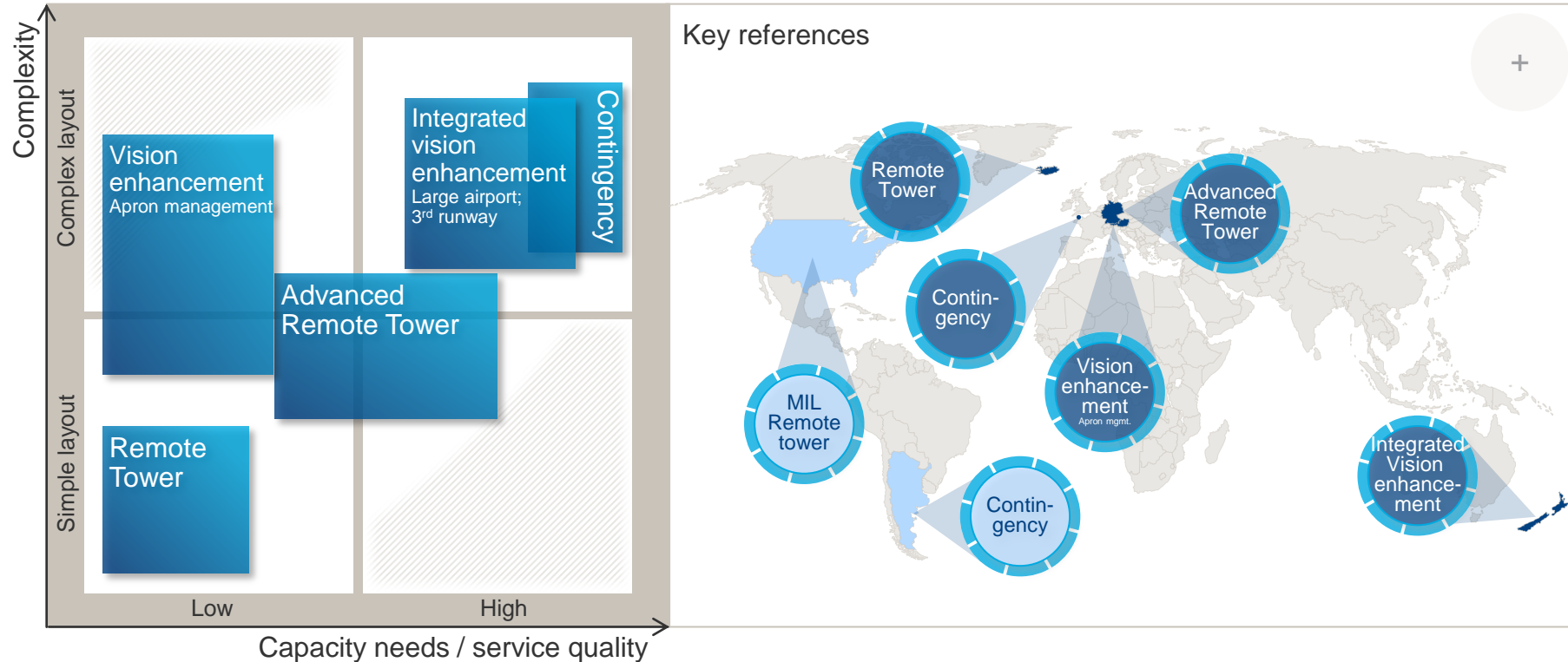
Single Remote Tower

Multi Remote Tower

Driving Innovations from a Concept to the Solution

Advanced remote sensing around the world

Systems in Operation 2018



Different flavours of Digital Tower – Flexible Controller Working Position

Single Operator - Single Airport



Multiple Operator – Single Airport (Shared View)



Single Operator - Multi Airport



Multiple Operator – Multi Airport (Shared View)

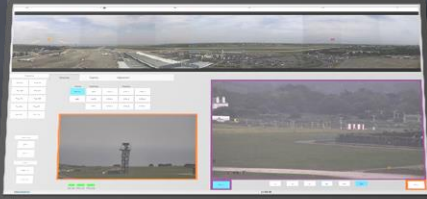


Individualization of the HMI

“Controller takes care of the airspace – not of the system”



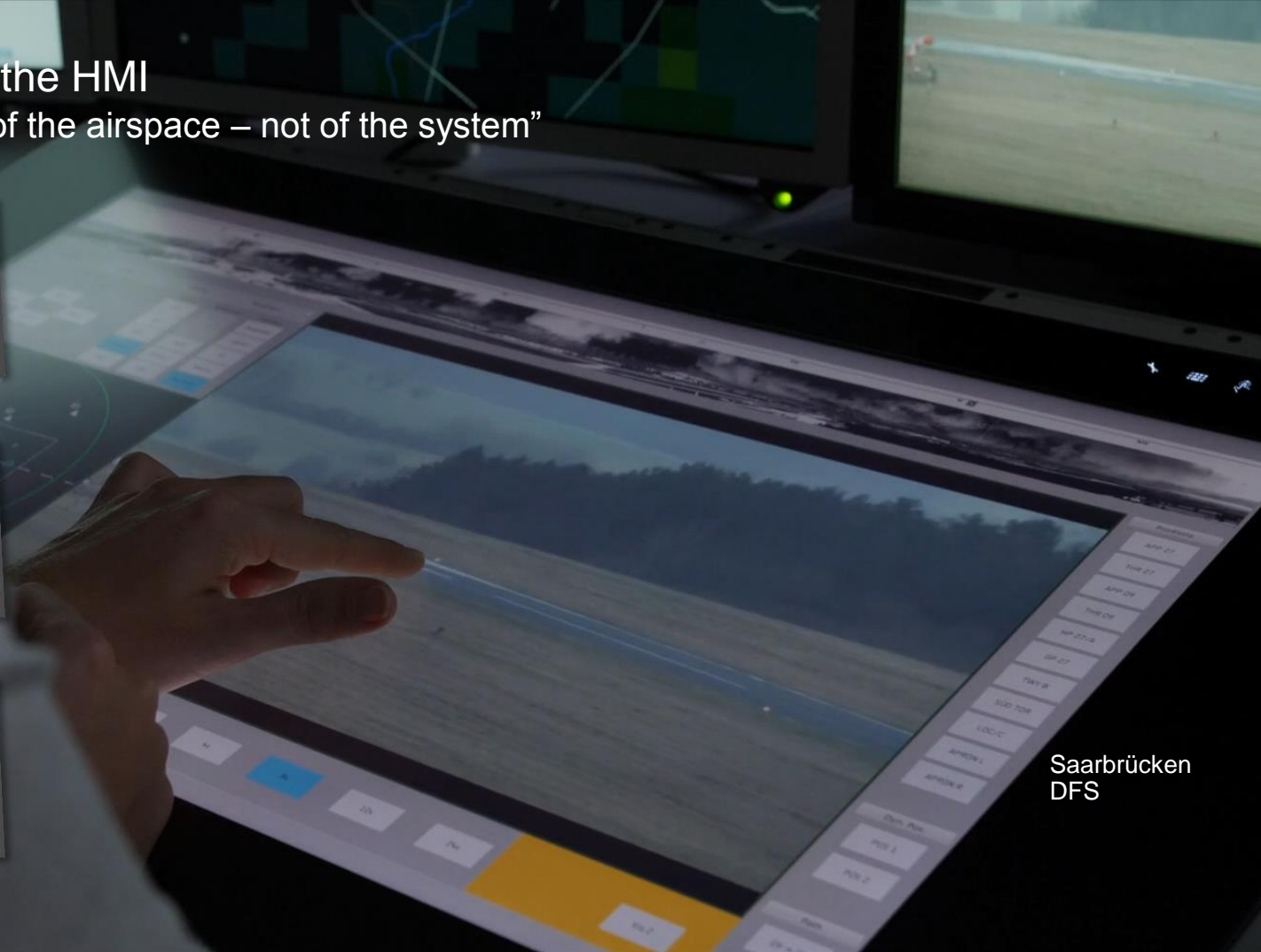
Vienna



Jersey



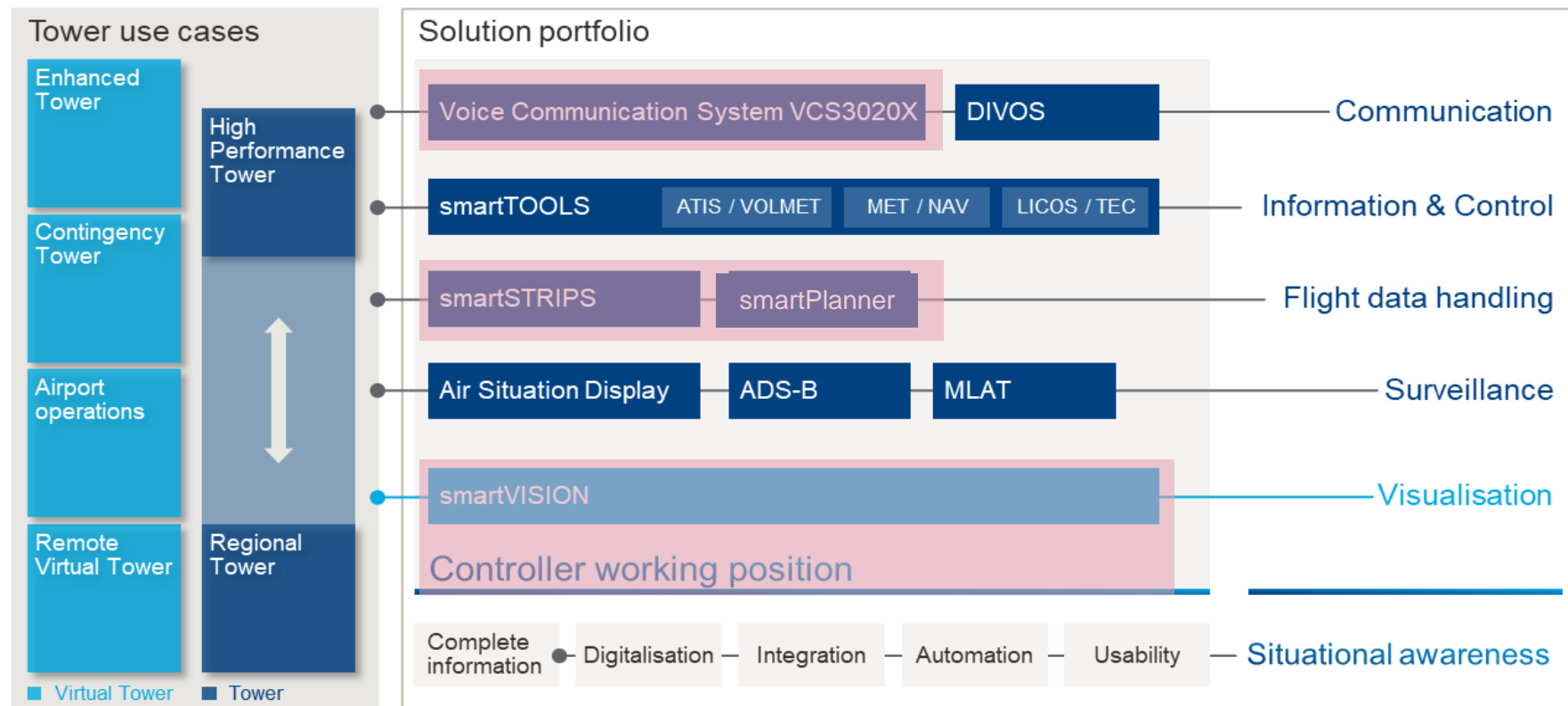
Iceland



Saarbrücken
DFS

Remote tower – more than visualization

Important factors for Multi Remote Tower



Multi Remote Tower

Augmentation
of Video

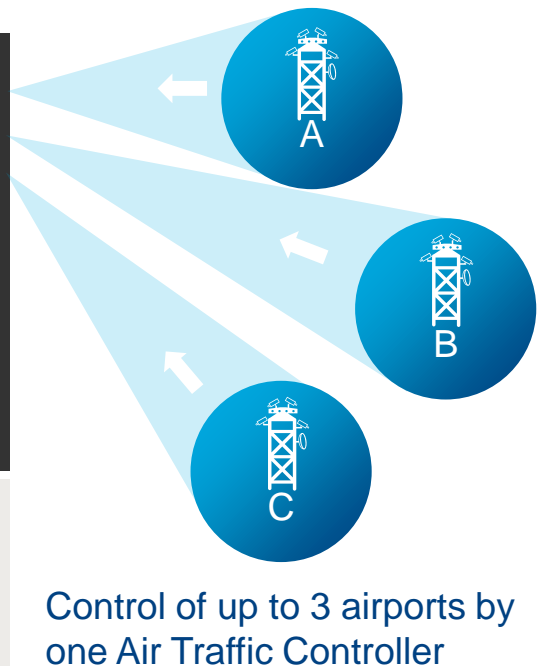
Integration
of VCS

Support
Planning

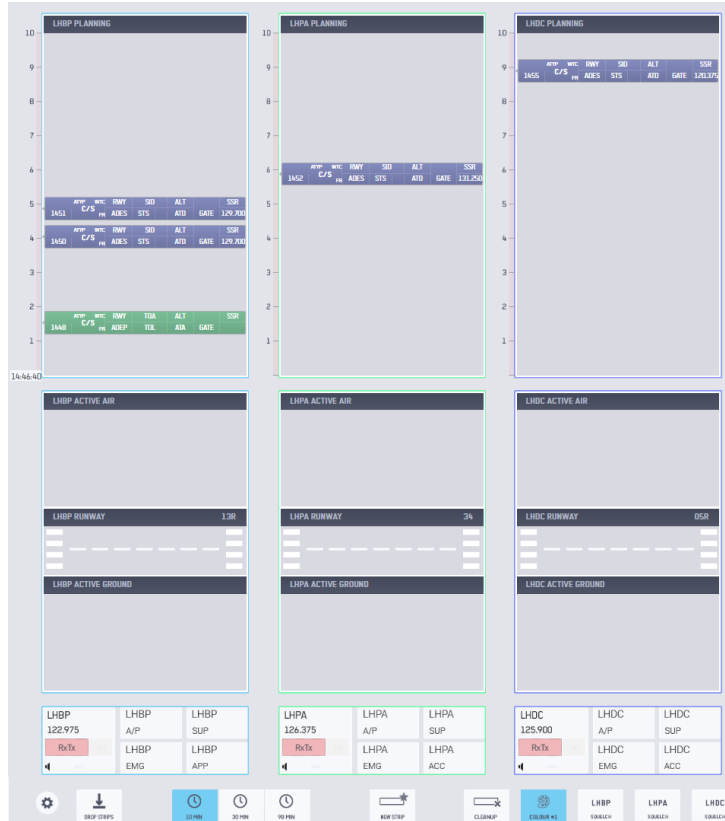


Multi Remote Tower

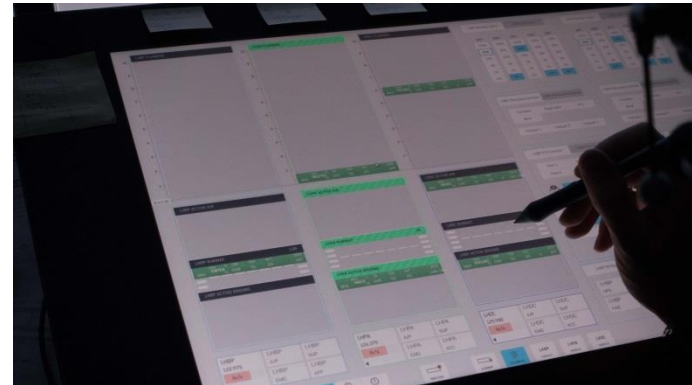
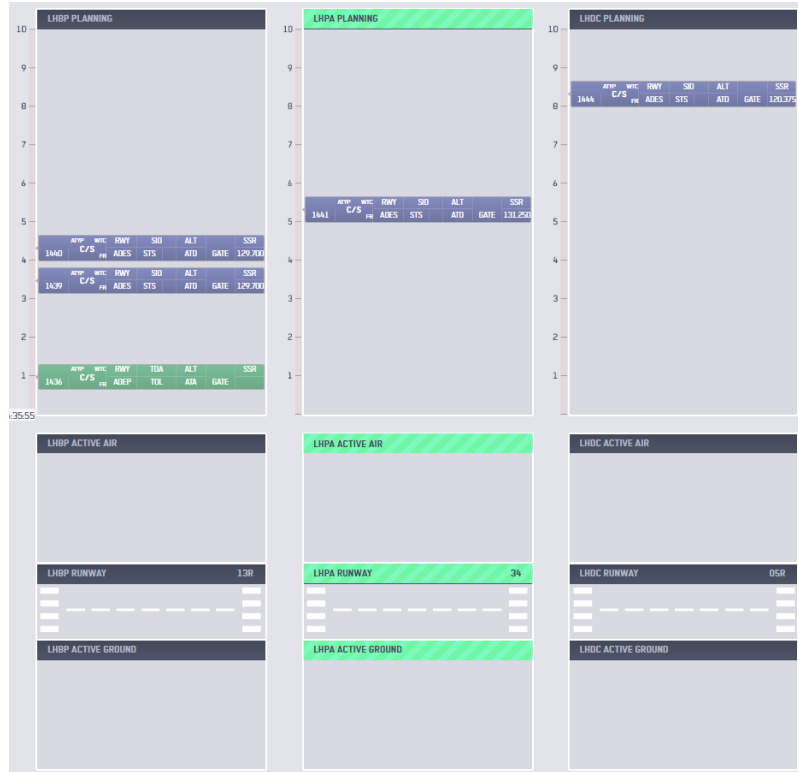
Controller Working Position



Multi Airport CWP – Colour Coding



VCS Integration – Squelch Highlighting



Support Info ▶

◀ Planning Bay

◀ Active Air Bay

◀ Runway Bay

◀ Active Ground Bay

◀ Frequencies & DA Keys

ATIS

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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
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RUNWAY LIGHTS

RWY	OFF	1%	3%	10%	30%	100%	13 - 31	31 - 13
DEP	OFF	1%	3%	10%	30%	100%		
APP	OFF	1%	3%	10%	30%	100%		
PAPI	OFF	1%	3%	10%	30%	100%		

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	DA KEY	DA KEY	DA KEY
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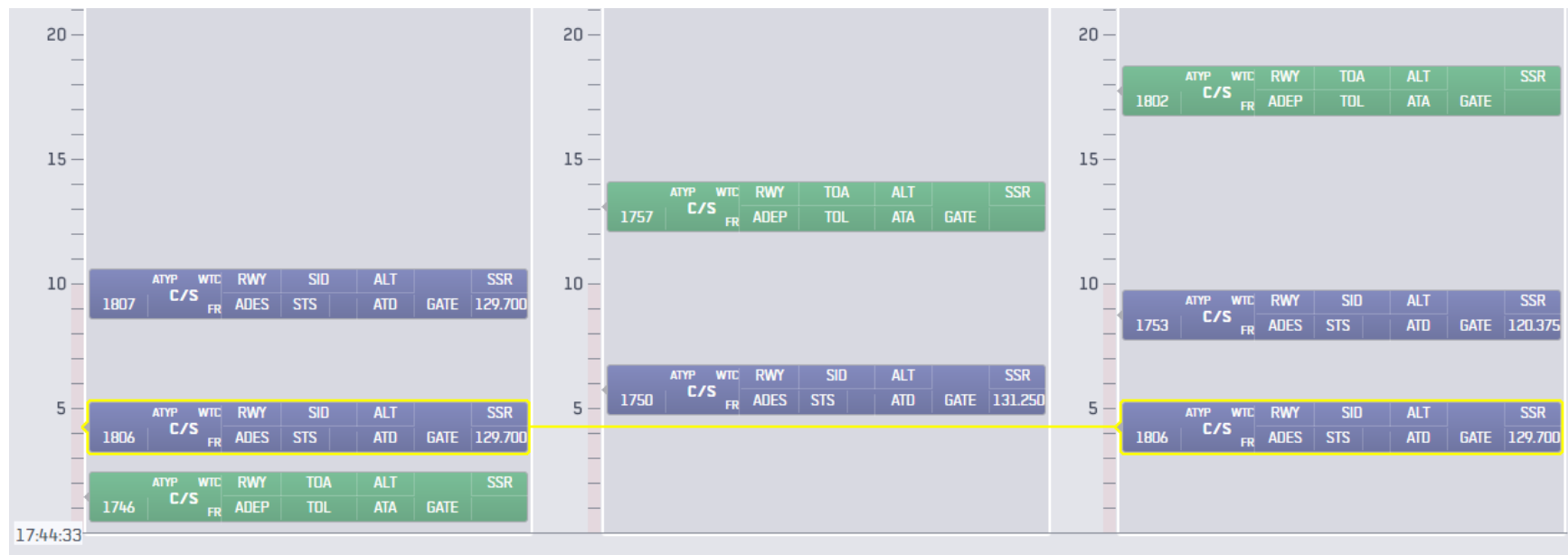
LHBP	LHPA	LHOC
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NO INCOMING CALL

12:14:45

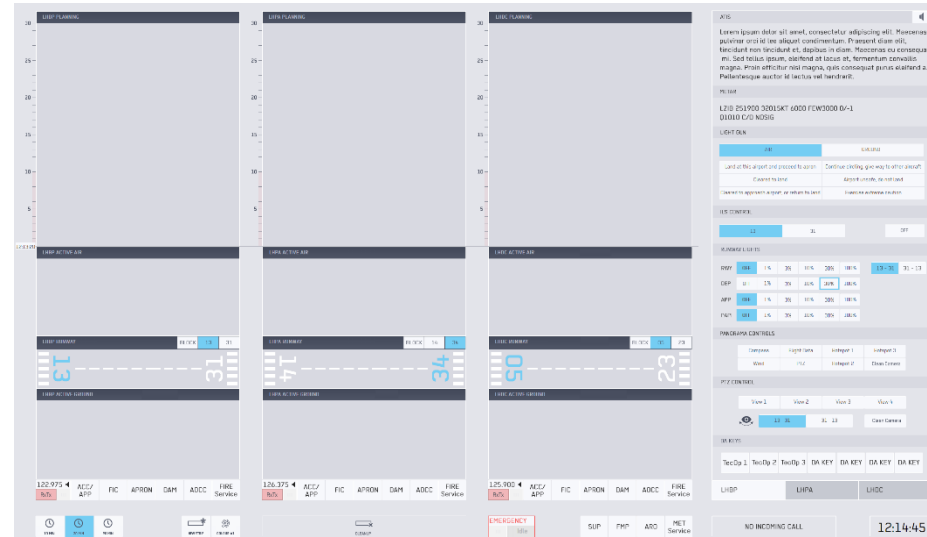
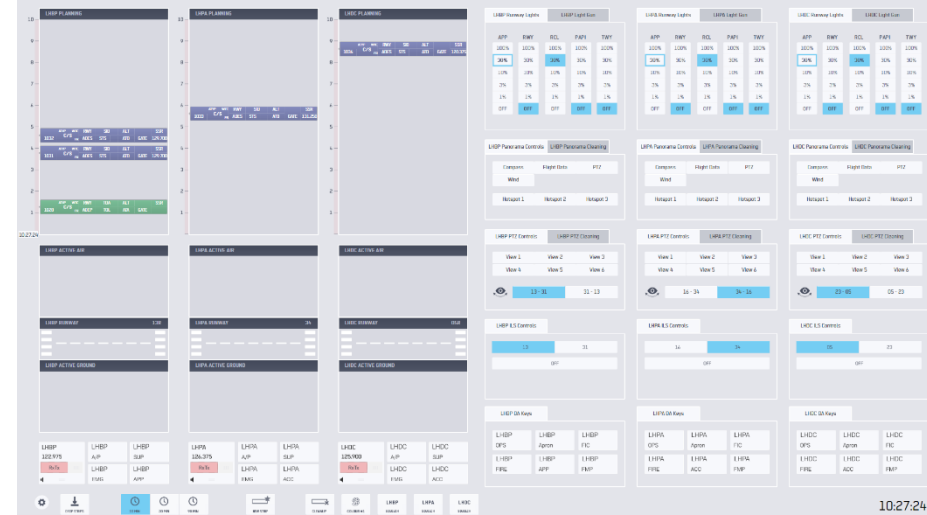
Planning Tool

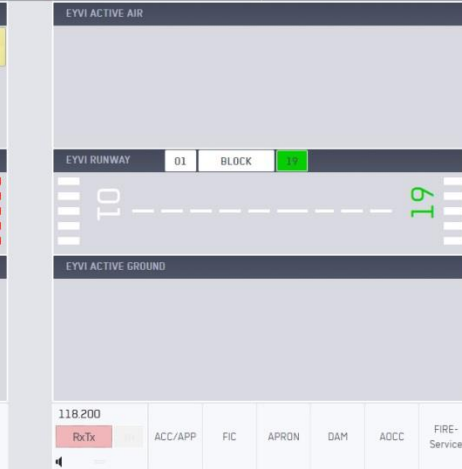
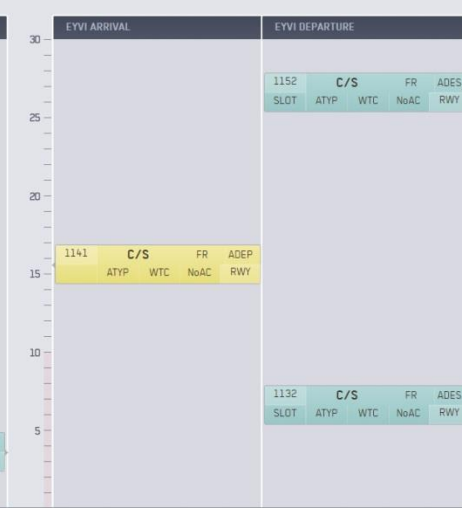
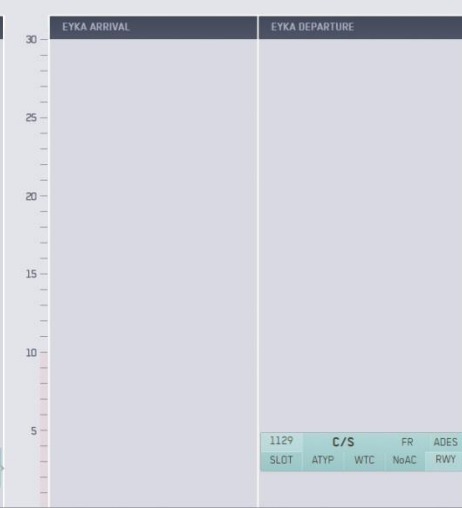
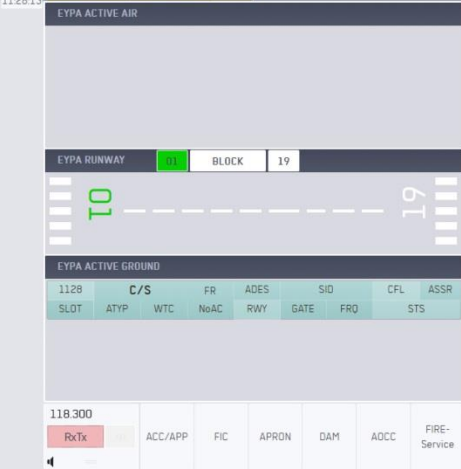
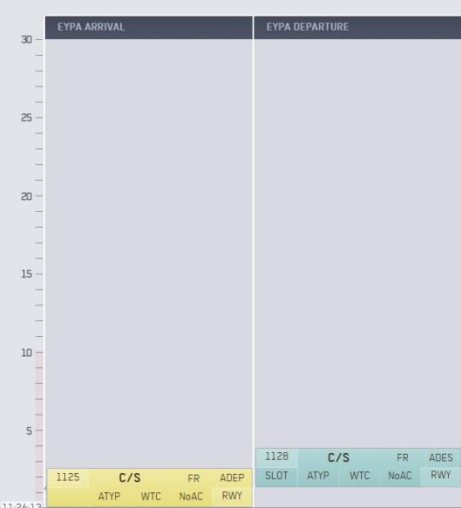
Traffic: Same Time - Multiple Airports



Feedback & Changes from last Validation

- Expansion of Planning Tool & Strips
- Integration of Ground - Ground communication (coordination)
- Runway Direction & Status for RWY Change
- Rework Support Info & Control Area
- Preparation for Working Position Split & Merge (ON Validation)





ATIS

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METAR

LOWW 011450Z 13015KT 9999 -SN FEW022 BKN026 MO6/M11 Q1012 R88/11//95 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

01

19

Operational

Downgraded

Unserviceable

RUNWAY LIGHTS

ARR

OFF

01

19

1%

3%

10%

30%

100%

DEP

OFF

01

19

1%

3%

10%

30%

100%

PAPI

OFF

01

19

FLASH

OFF

01

19

PANORAMA CONTROLS

Compass

Flight Data

Wind

PTZ

Clean Camera

PTZ CONTROL

View 1

View 2

01 - 19

19 - 01

Clean Camera

DA KEYS

DA 1

DA 2

DA 3

DA 4

DA 5

DA 6

DA 7

EYPA

EYKA

EYVI

30 MIN

30 MIN

90 MIN

COLOUR #1

NEW STRIP

CLEANUP

EMERGENCY

Idle

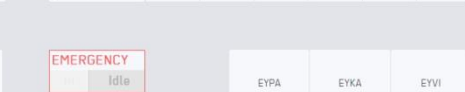
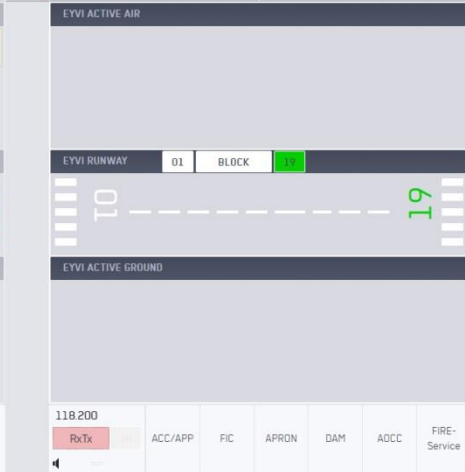
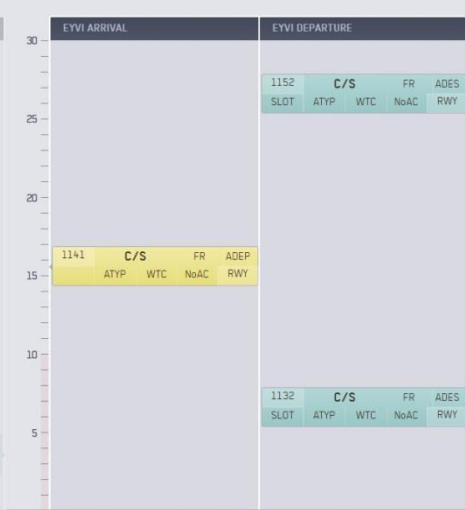
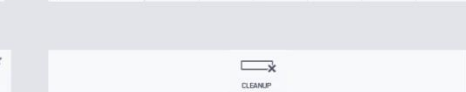
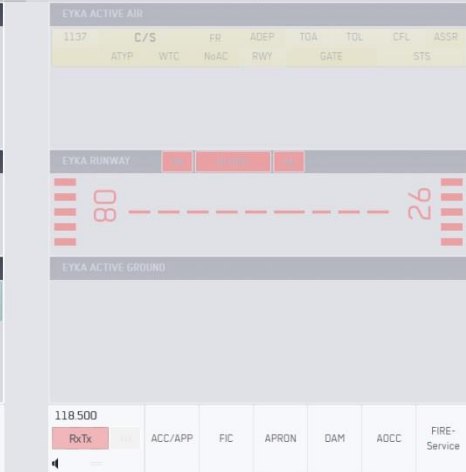
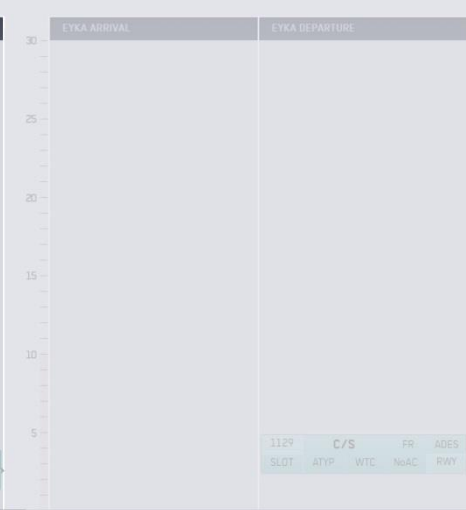
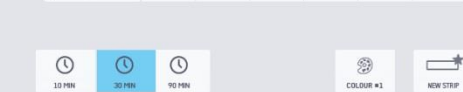
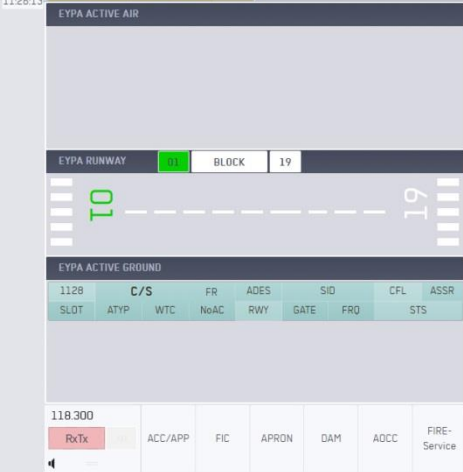
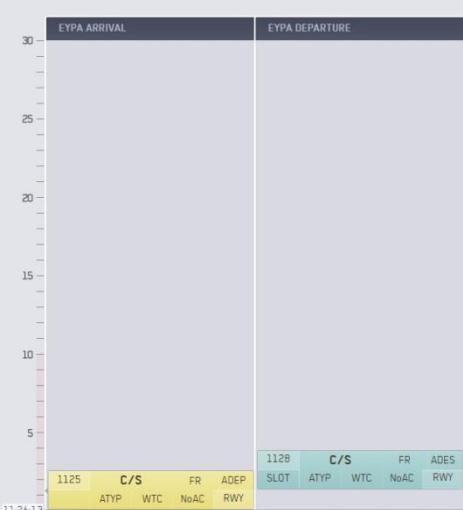
EYPA

EYKA

EYVI

NO INCOMING CALL

11:29:03



ATIS

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METAR

LOWW 011450Z 13015KT 9999 -SN FEW022 BKN026 MO6/M11 Q1012 R88/11/95 NOSIG

LIGHT GUN

AIR

GROUND

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ILS CONTROL

01

19

Operational

Downgraded

Unserviceable

RUNWAY LIGHTS

ARR

OFF

01

19

1%

3%

10%

30%

100%

DEP

OFF

01

19

1%

3%

10%

30%

100%

PAPI

OFF

01

19

FLASH

OFF

01

19

PANORAMA CONTROLS

Compass

Flight Data

Wind

PTZ

Clean Camera

PTZ CONTROL

View 1

View 2

01 - 19

19 - 01

Clean Camera

DA KEYS

DA 1

DA 2

DA 3

DA 4

DA 5

DA 6

DA 7

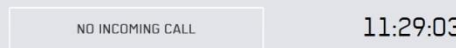
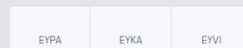
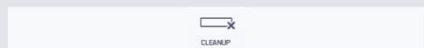
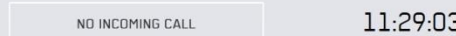
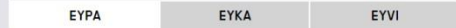
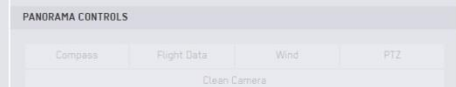
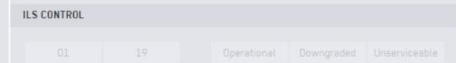
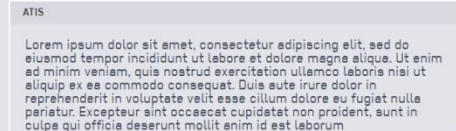
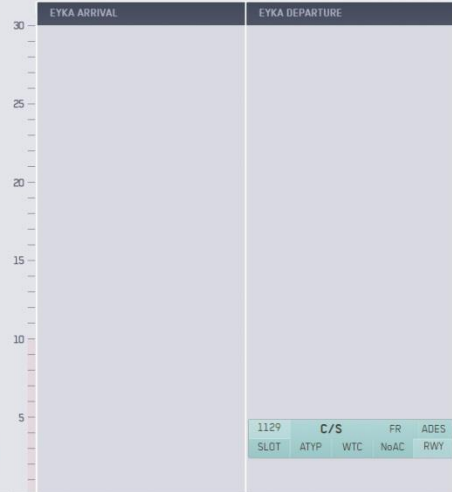
EYPA

EYKA

EYVI

NO INCOMING CALL

11:29:03



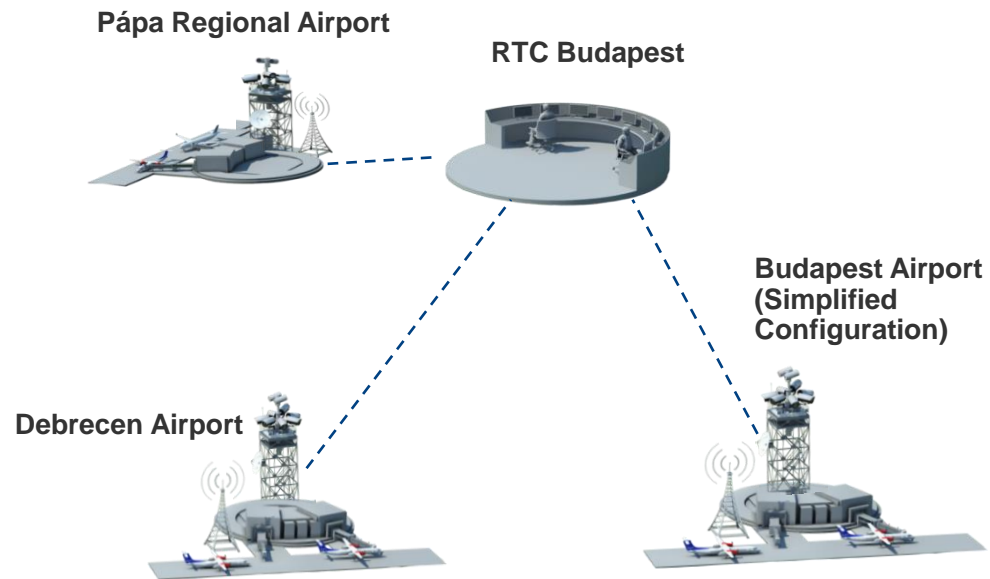
Next Steps – Further Validation

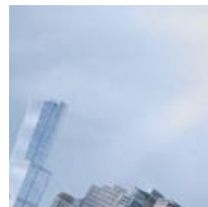
- PJ05 SOL3 – V2 Validation with ON
DECEMBER 2018 – SIMULATION

Focus: airport split off to 2nd working position

- PJ05 SOL2 – V3 Validation with HC
MARCH 2019 – **LIVE Val Budapest**

Focus: Live traffic evaluation with real airports





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