



Overview of Remote Tower Activities in **SESAR 2020**

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Deputy PJ05

Wien, 21 of September 2017



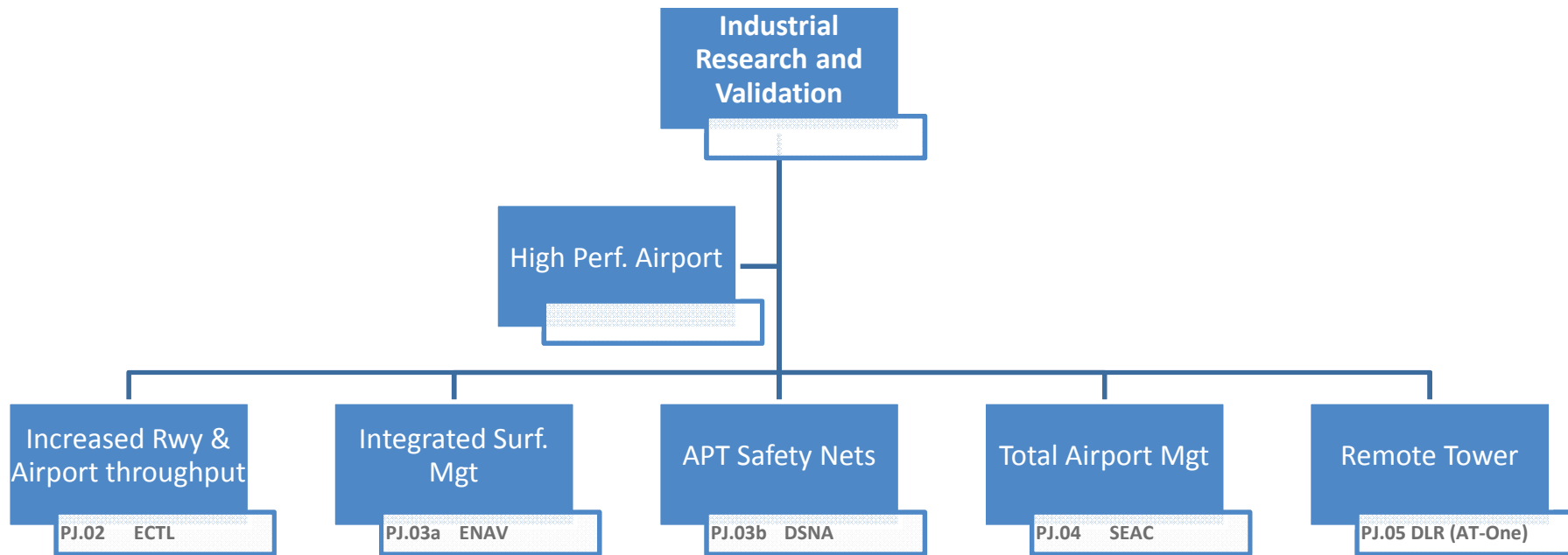
founding members



Planning in SESAR 2020

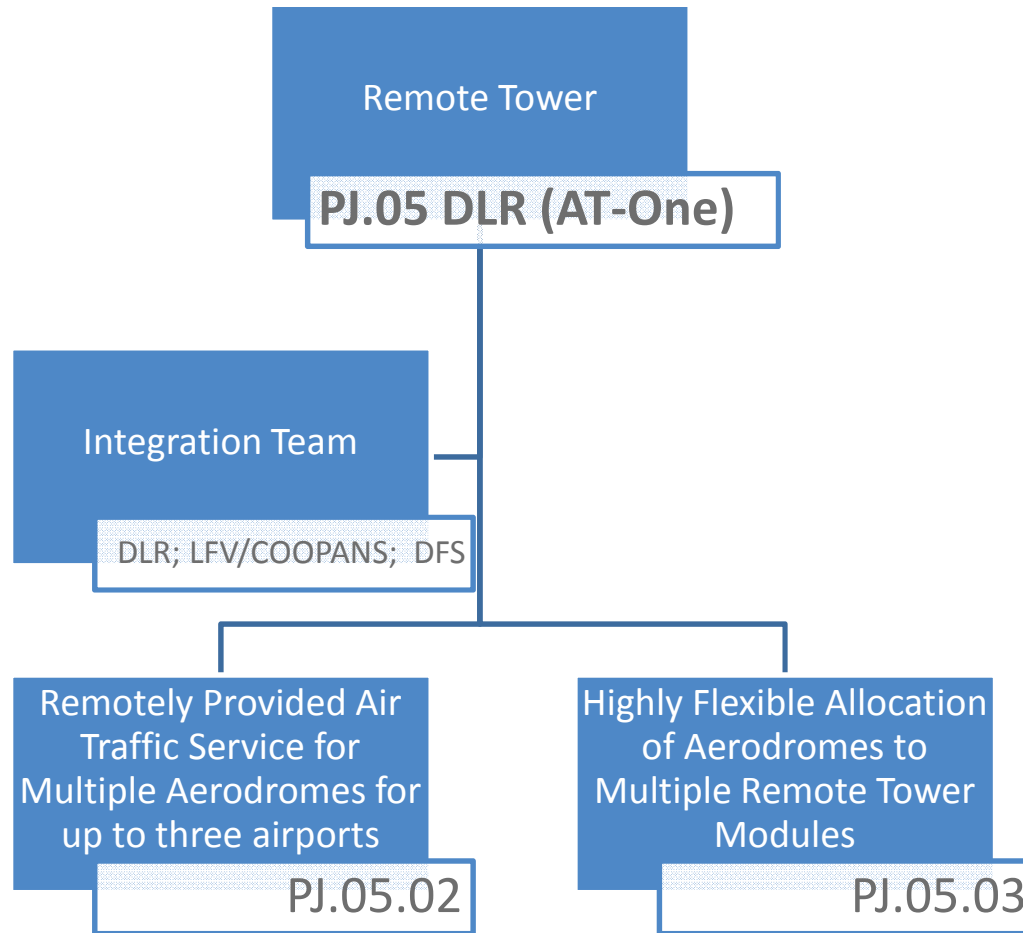
High Performing Aviation for Europe

S2020 Industrial Research Work packages



Remote Tower

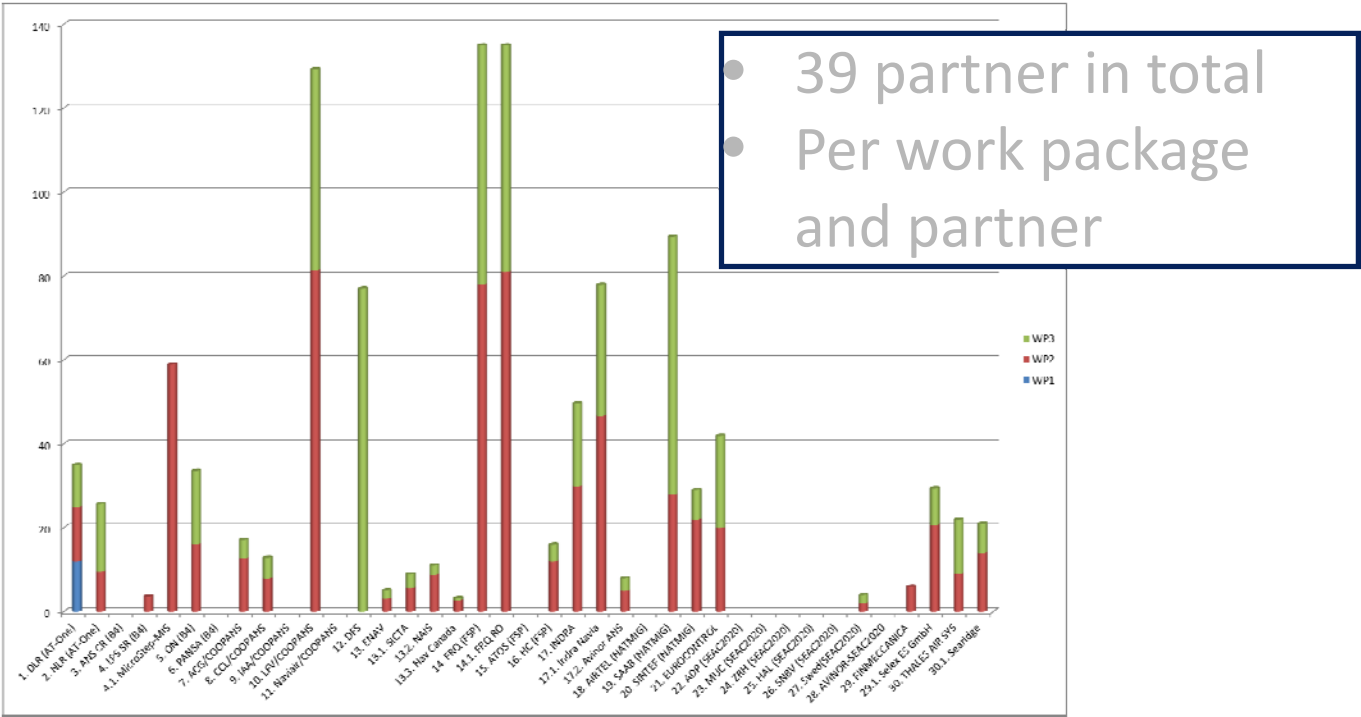
PJ.05 DLR (AT-One)



Pj.05 Remote Tower – Extended Management Board

AT-ONE Partners	PJ.05.02 PJ.05.03
B4 Partners	PJ.05.02 PJ.05.03
COOPANS Partners	PJ.05.02 (Lead) PJ.05.03
DFS	PJ.05.02 PJ.05.03 (Lead)
ENAV	PJ.05.02 PJ.05.03
FSP Partners	PJ.05.02 PJ.05.03
INDRA	PJ.05.02 PJ.05.03
NATMIG Partners	PJ.05.02 PJ.05.03
EUROCONTROL	PJ.05.02 PJ.05.03
SEAC Partners	PJ.05.02 PJ.05.03
Finmeccanica	PJ.05.02 PJ.05.03
THALES AIR SYS	PJ.05.02 PJ.05.03

Distribution of Effort



Remote Tower - PJ.05 DLR (AT-One)

PJ.05.02 – Solution 2

To design and validate the provision of ATS for two or more aerodromes simultaneously is possible, and concurrently reveals a sufficient level of safety.

4 Simulator exercises

Locations

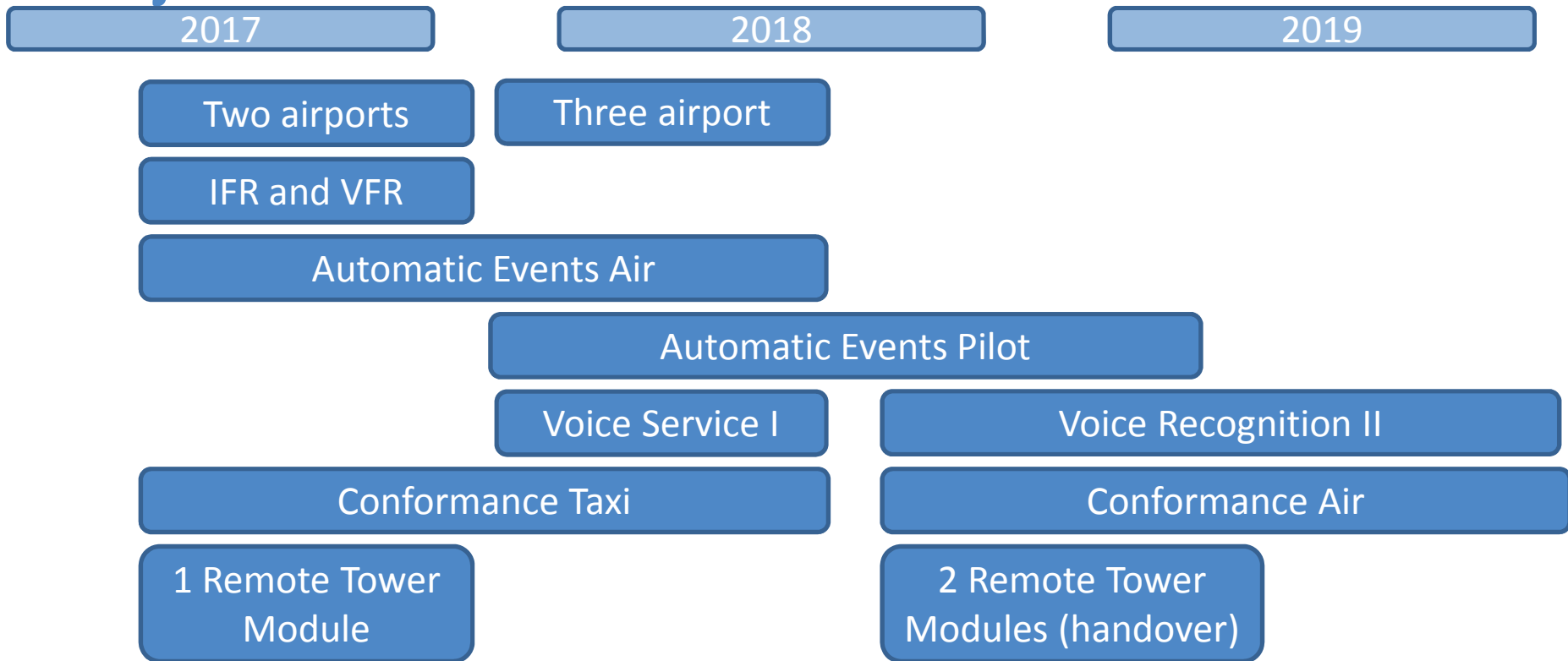
- Vilnius in Lithuania
- Växjö in Sweden
- Oslo in Norway
- Braunschweig in Germany

PJ.05.03 – Solution 3

To design and validate the flexible use of the human resource ATCO/AFISO through a flexible and dynamic allocation of airports connected to different RTMs.

5 Field and/or simulator exercises

Multiple Remote Tower Solution Objectives



Operational Environment

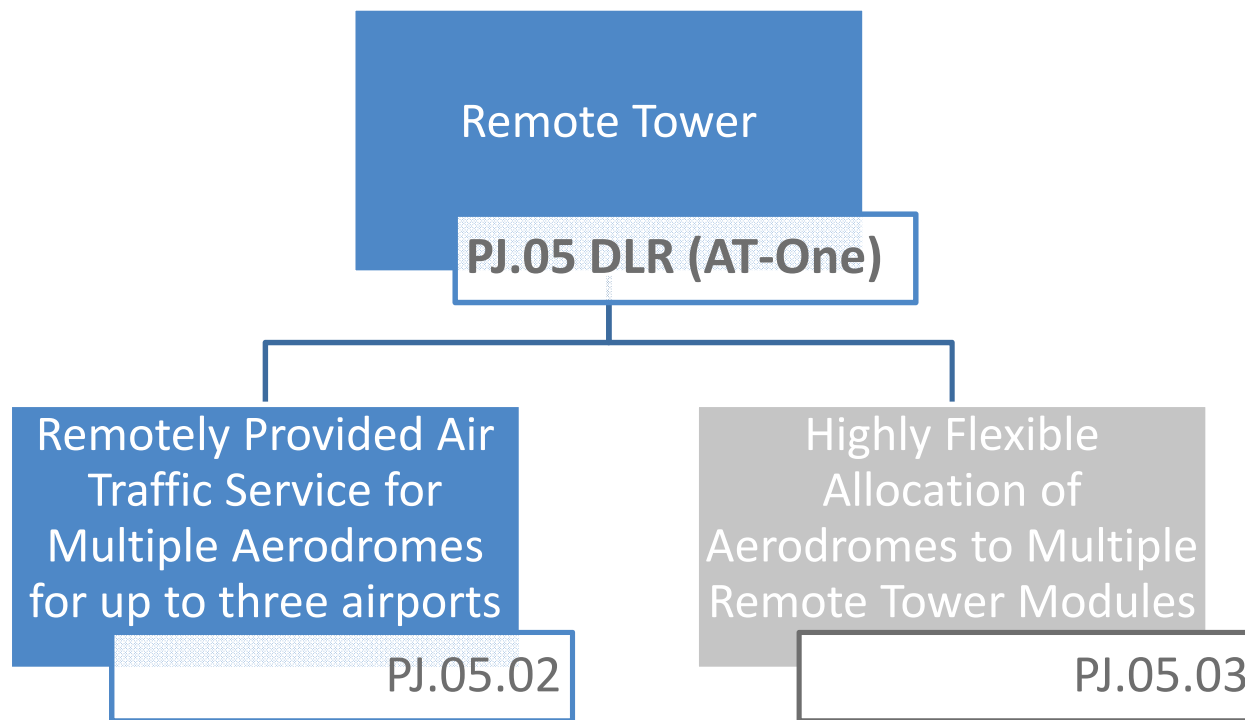
		Environment
Services	TWR	Including Clearance delivery / Ground Control / Tower Control / TWR Apron Control
	Opening Hours	Up to 24H (including night)
Staffing	Number of ATS staff	One ATCO per MRTM More than one ATCO in the RTC, including MRTMs and RTC Supervisor
Airspace	Airspace Classification	Class C and/or D
	Control Zone	10- 15 NM radius/rectangular, Vertical extension up to 3000 ft MSL
	Procedures	Specific IFR routes & approach procedures Established VFR routes

Operational Environment

		Environment
Aerodrome	Number of RWY	One to two runways (and or with a Final approach and takeoff area)
	Taxiway and runway entries	Typically one major taxiway parallel with the RWY, number of RWY intersections/entries varying typically between 1 and 3.
	Aprons	Typically 1 or 2 (ordinary and GA/freight)
Traffic	Number of simultaneous movements	<p>Corresponding to small and medium sized aerodromes</p> <p>The solutions PJ05-02 and PJ05-03 only apply when the traffic volume can be controlled by one ATCO from the MRTM (which might be limited to certain time periods at medium size Flughäfen)</p> <p>The number of simultaneous movements depends on the traffic complexity.</p>

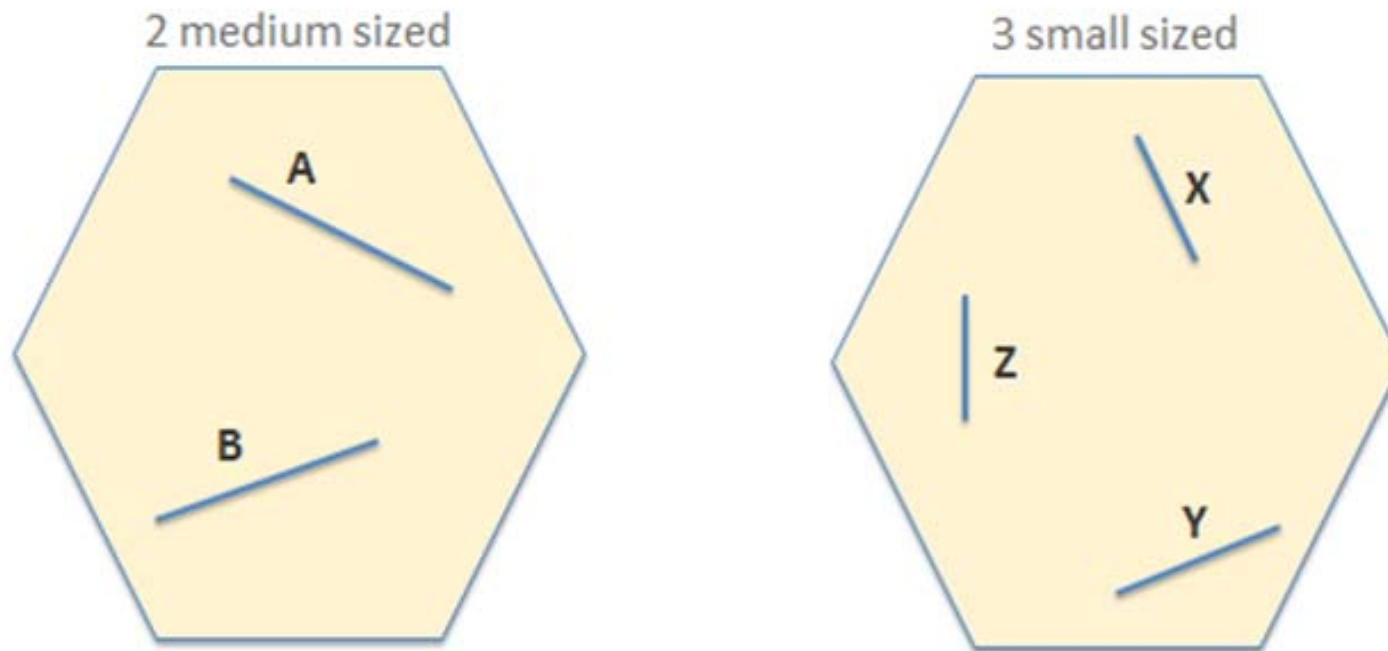
Technical Characteristics

	Solution PJ05-02	Solution PJ05-03
Surveillance	Air surveillance (optional) Ground surveillance (optional)	
Visual features	Visual tracking / object bounding Radar tracking (optional)	
Communication	ATC Voice Communications for multiple aerodromes VHF and UHF-transmitters/receivers, Ground Radio System, Autonomous VHF-radio, SAR radio.	
Voice Services	Advanced Voice Services	Advanced Voice Services Advanced Voice Services including Voice Recognition (optional)
Navigation	Monitoring and manoeuvring of navigation specifications including ILS, RNAV, NDB, DME.	
Planning tools	ATCO planning tools for planning ahead	ATCO planning tools for planning ahead RTC Supervisor planning tools for planning of an entire RTC and allocation of aerodromes to MRTM's
Other Systems	The remote facility shall include all other technical functions and systems, currently found in an RTM and necessary to provide the services e.g.: <ul style="list-style-type: none"> • Manoeuvring of ground lighting, navigation aids, alarms, etc.; • Signal light gun; • Pan Tilt Zoom camera, PTZ; 	

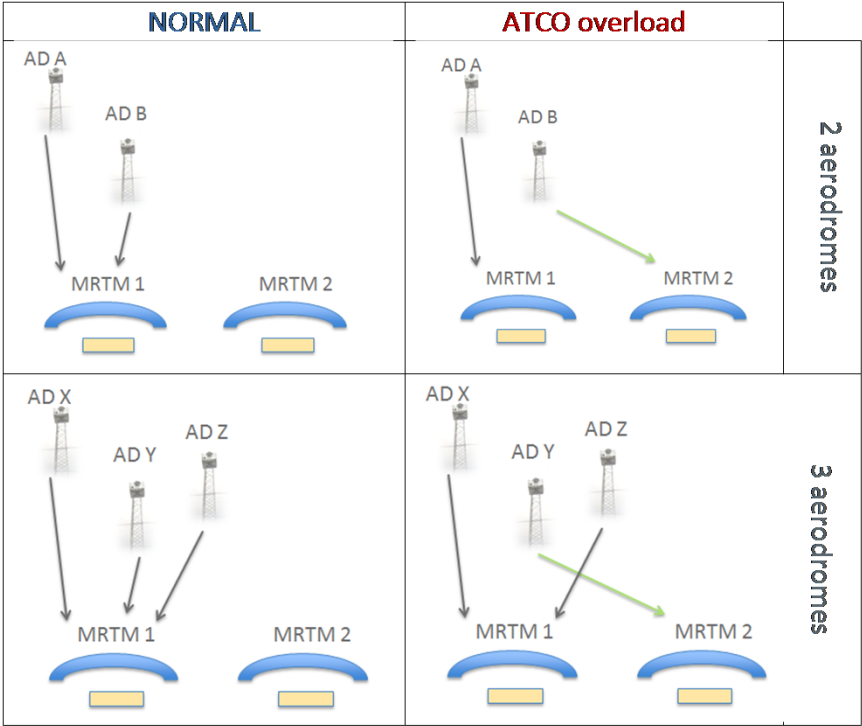




Solution 2 Airport Combination



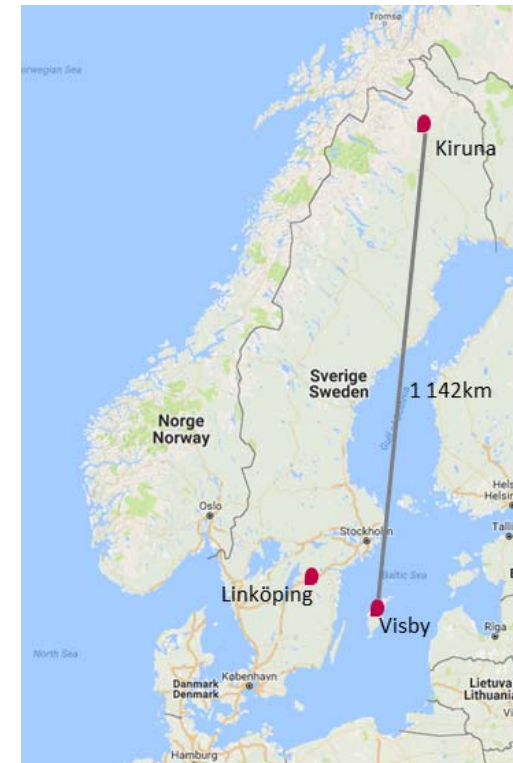
Distribution Multiple Remote Tower Module to Aerodrome



EXE-05.02-V2-2.2 – COOPANS

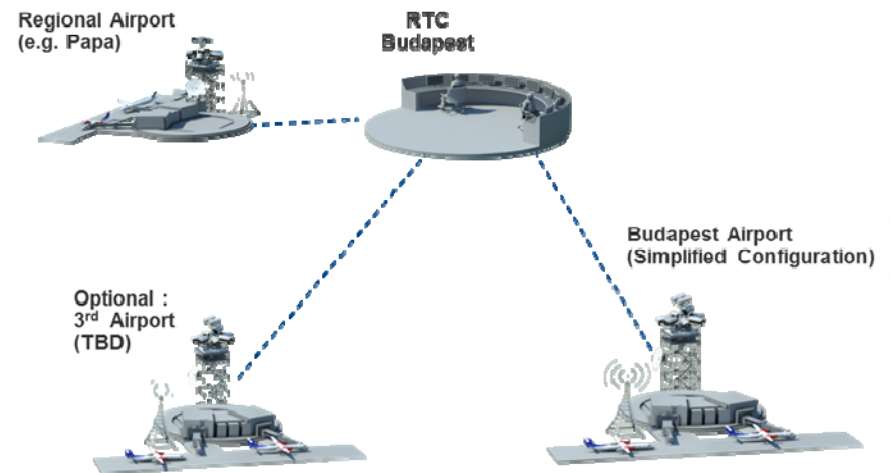
- includes ATS provided to two medium size aerodromes by one ATCO
- real-time simulation
- Validation platform is the COOPANS LFV NARSIM platform
- A set of 18 scenarios

	Airport A	Airport B	Airport C
Airport name (AIP)	Kiruna (ESNQ)	Visby (ESSV)	Linköping/Saab
Movements per year simulated runs	10.000 (movements spread over one year)	20.000 (movements spread over one year)	15.000 (movements spread over one year)
IFR flights / VFR flights	80 % / 20 %	70 % / 30 %C	50 % / 50 %
Movements per hour	3	7	5
Ground movements per hour	1	2	2
Movements per year actual figures	4.700 (2016 figures)	18.540 (2016 figures)	13.522 (2016 figures)

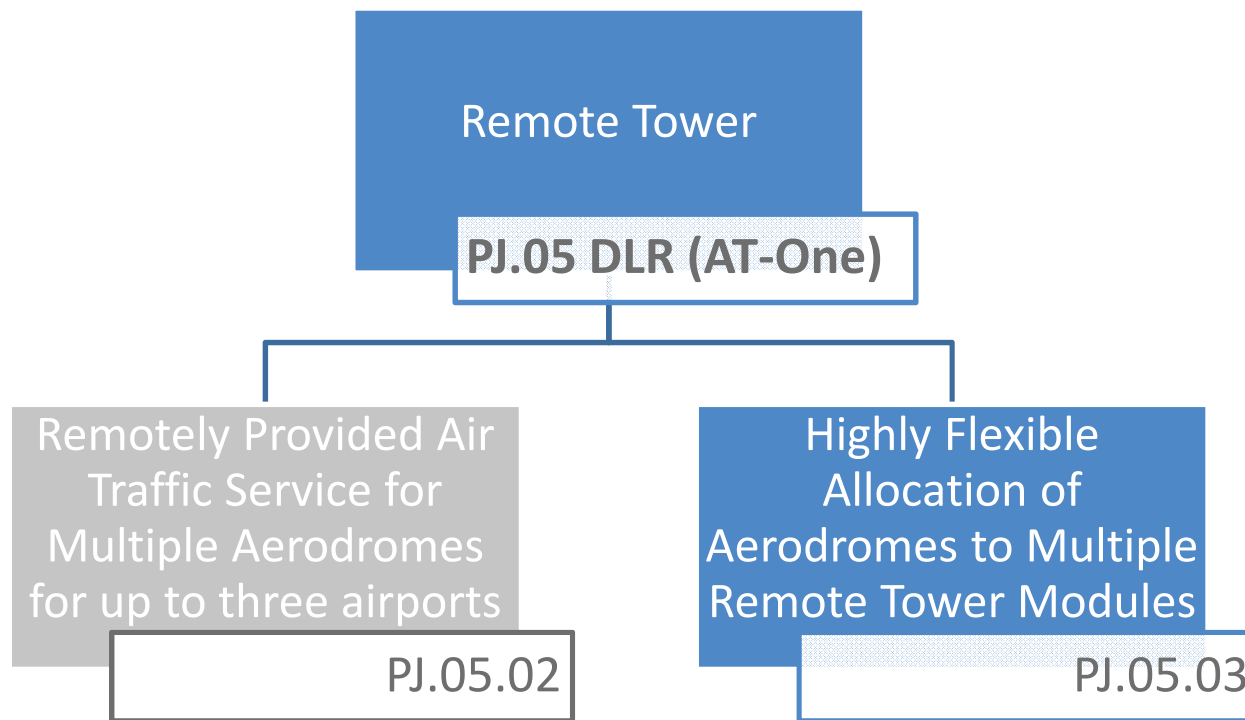


EXE-05.02-V2-2.4 - HC

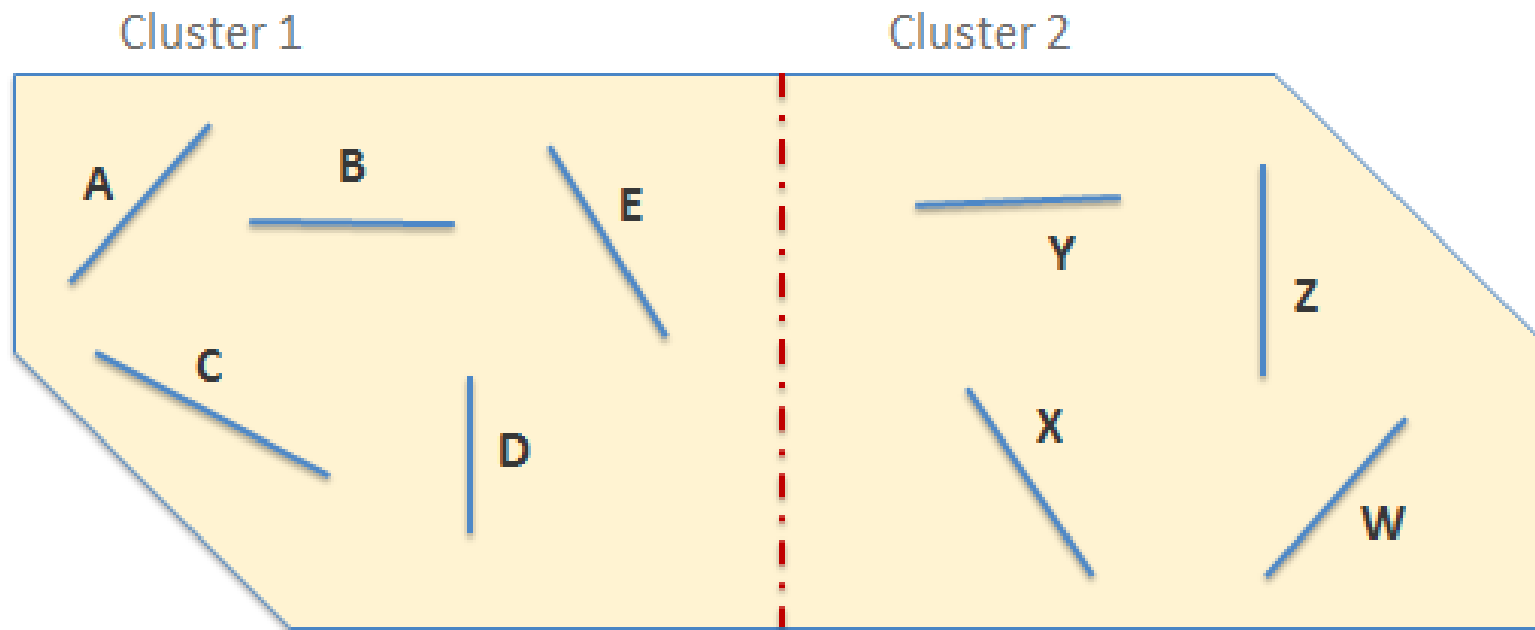
- ATS provided to three small size aerodromes including a military aerodrome
- real-time simulation
- Validation platform is the DLR NARSIM, extended by Frequentis and SELEX
- A set of 4 scenarios



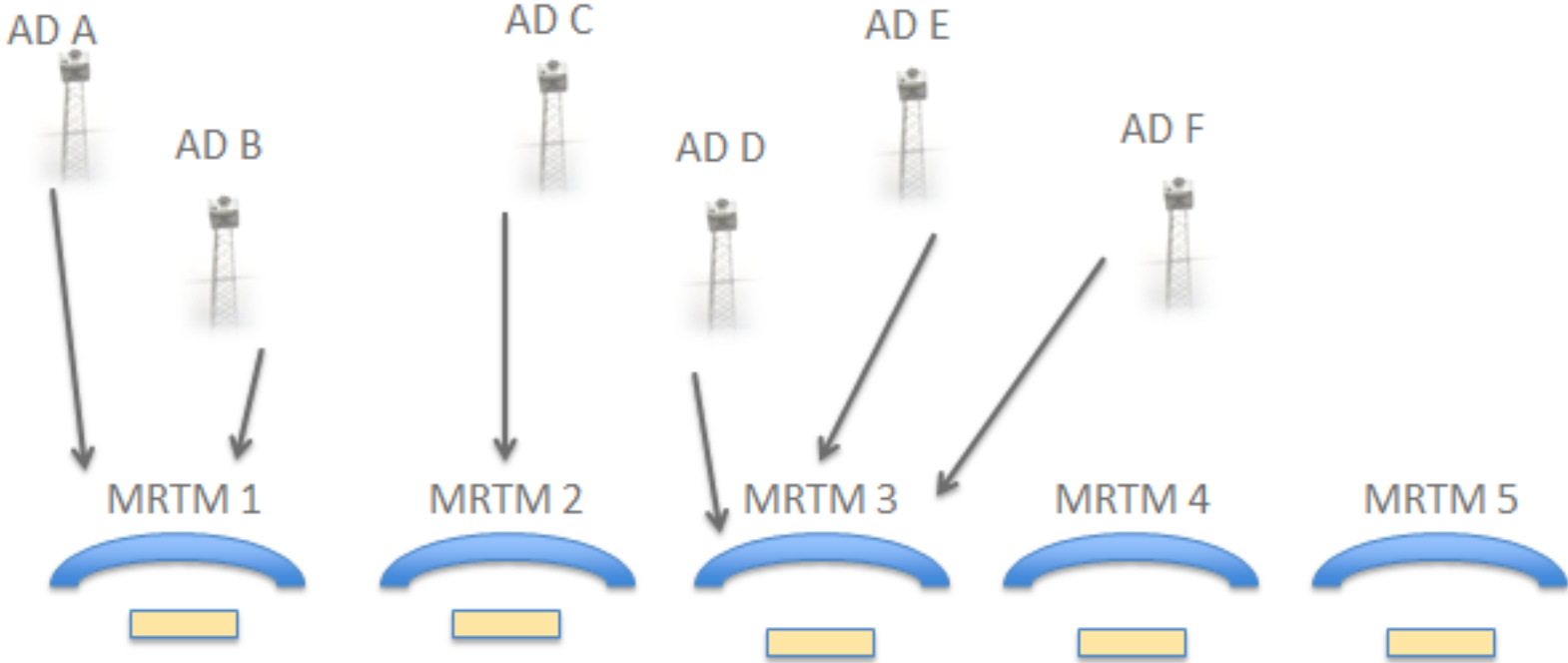
	Airport A	Airport B	Airport C
Airport name	Pápa (military)	Debrecen (civil)	RWY 1 – Budapest
IFR flights / VFR flights	100 % / 0 %	70 % / 30 %C	50 % / 50 %
Ground movements per hour	1	2	16



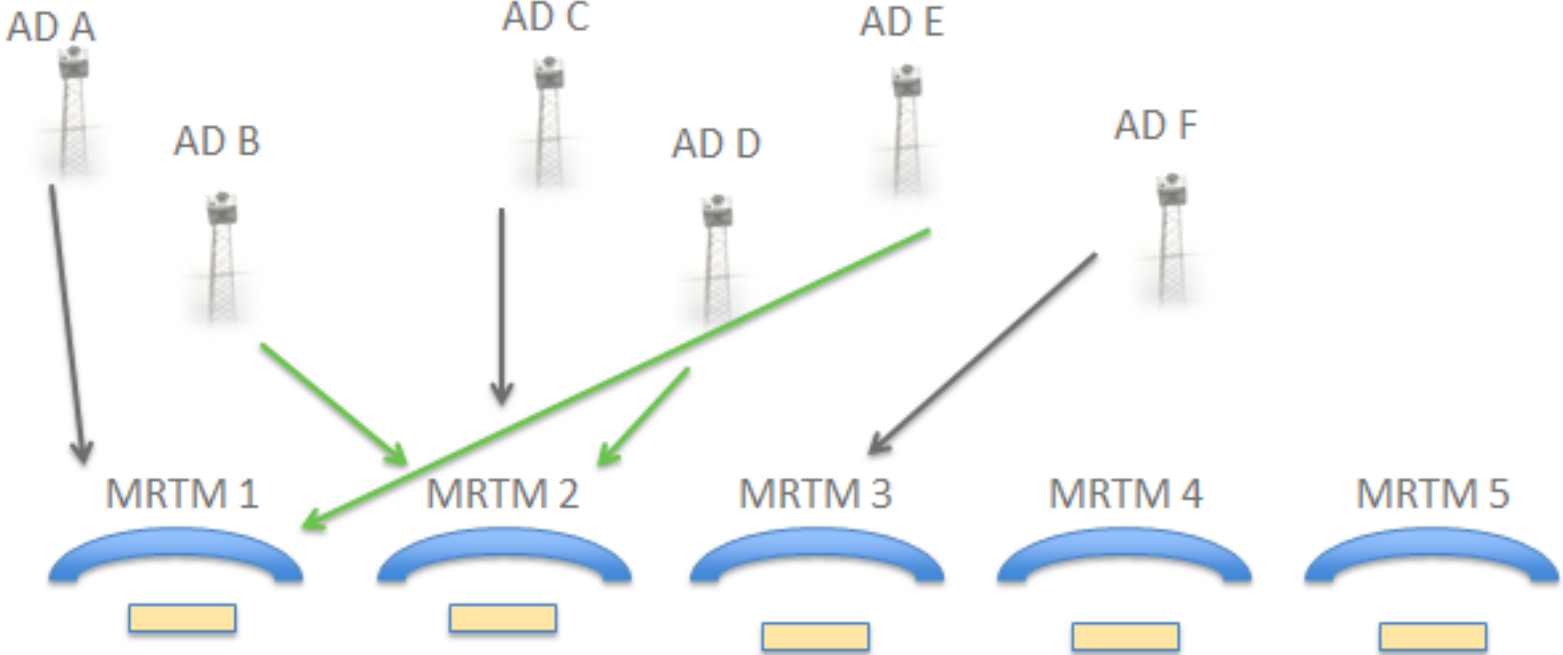
Airport Configuration for Remote Tower Center



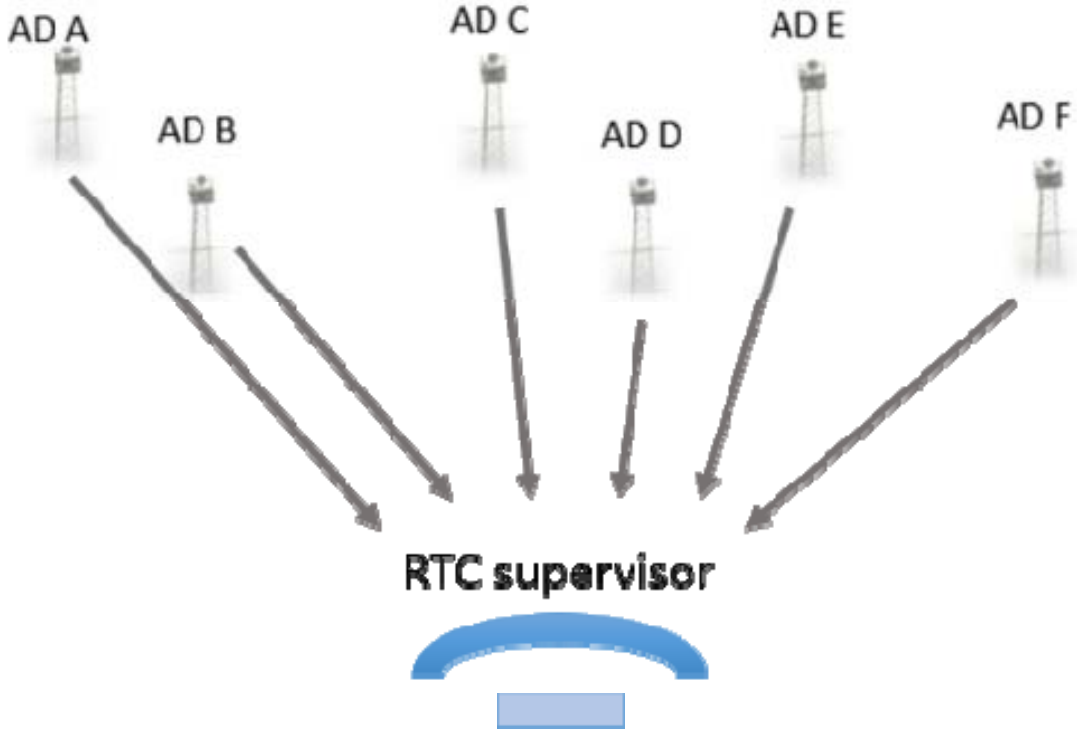
Between Multiple Airports



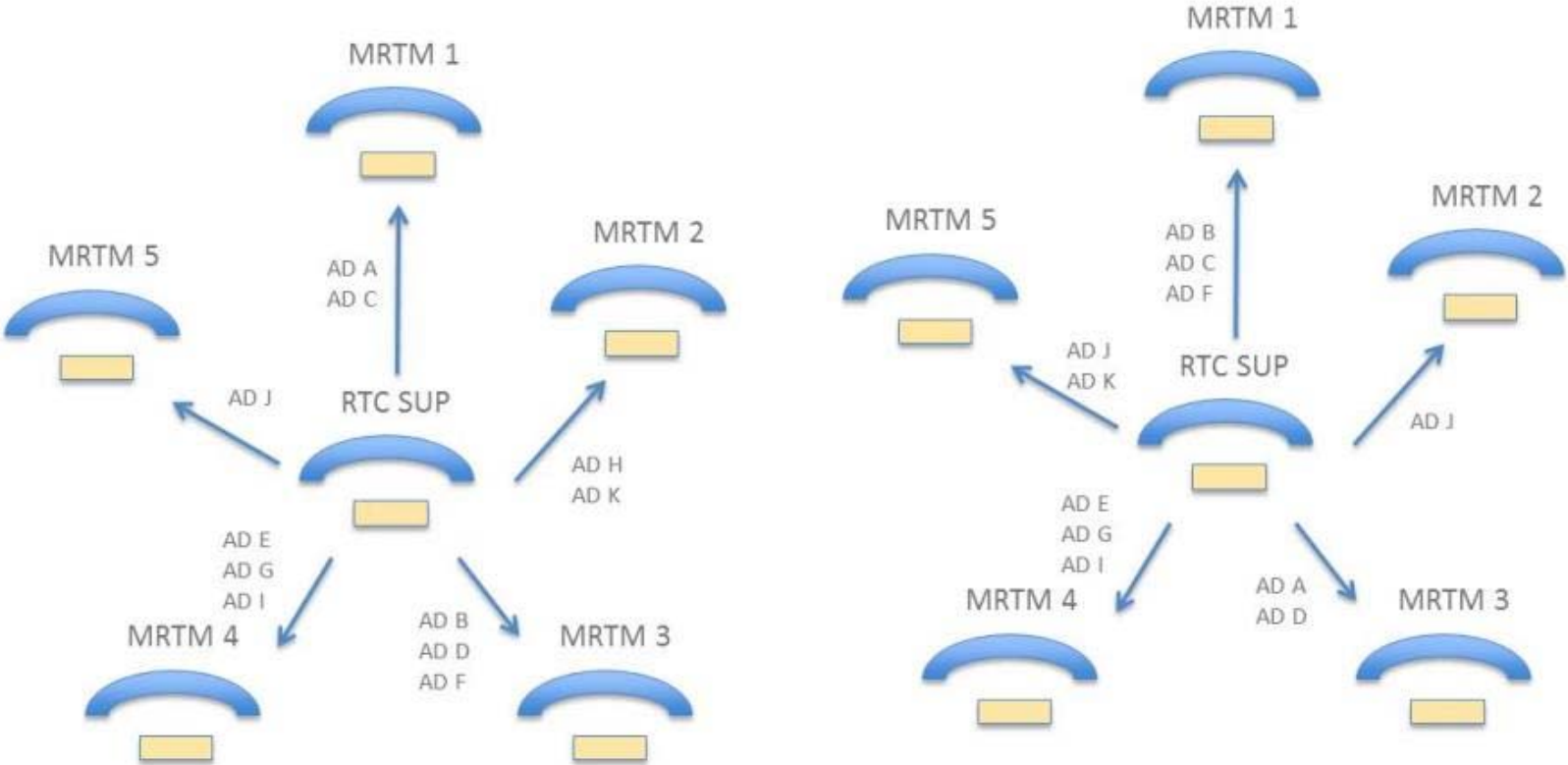
Between Multiple Airports



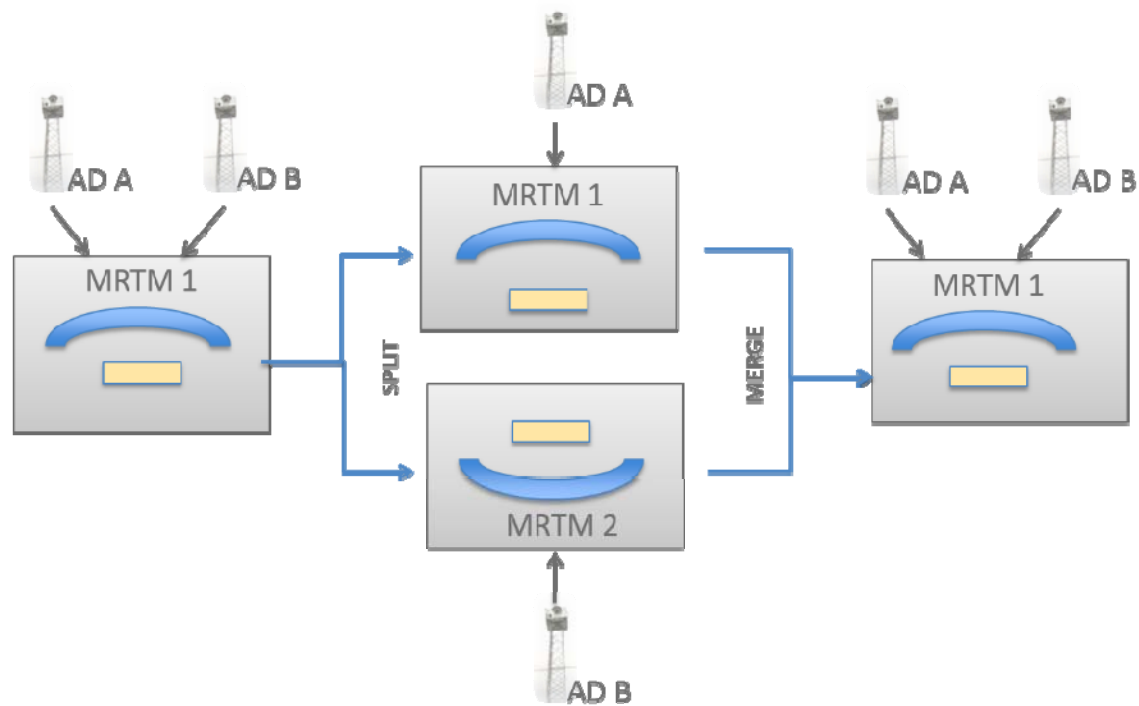
Between Multiple Airports



Between Multiple Airports



Important Use Cases – Common to Solution PJ05-02 and PJ05-03



Reference Documents

Project Management and Administration:

- SESAR 1 P06.08.04-D94-OSED Single Remote TWR Ph2 – Final Update
- SESAR 1 P06.08.04-D103-Multi Remote Advanced – OSED Update (P06.09.03 D04)
- SESAR 1 P12.04.07-D09-Remote tower specifications-final Consolidated DEL
- SESAR 1 P12.04.06 / P12.04.08 final deliveries

Project Management and Administration:

- PJ05 GA Annex 1 Part A and B
- SESAR 2020 Programme Execution Framework – Project Hand-Book
- Participant Portal H2020 Online Manual – Reports and payment requests (http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/reports_en.htm)
- Participant Portal H2020 Online Manual – Amendments to the Grant Agreement (http://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/amendments_en.htm)



Overview of Remote Tower Activities in SESAR 2020

Thank you very much
for your attention!



founding members

