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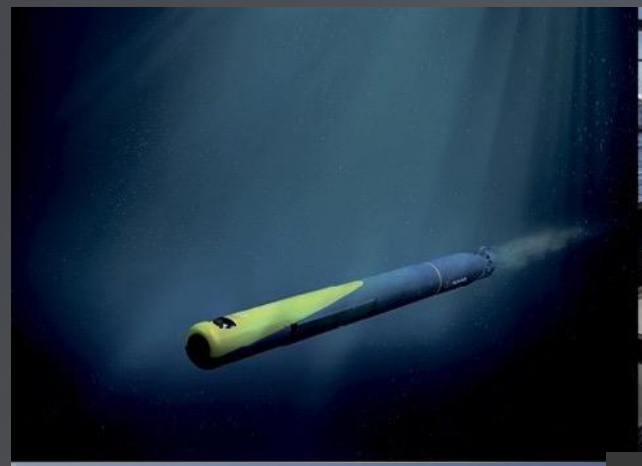
IFISA
INTERNATIONAL FLIGHT INFORMATION SERVICE ASSOCIATION

Saab Digital Tower - a look at AFIS

Copenhagen, 2023-09-06

Niclas Gustavsson, Director Business Development,
Saab ATM





Our broad offering

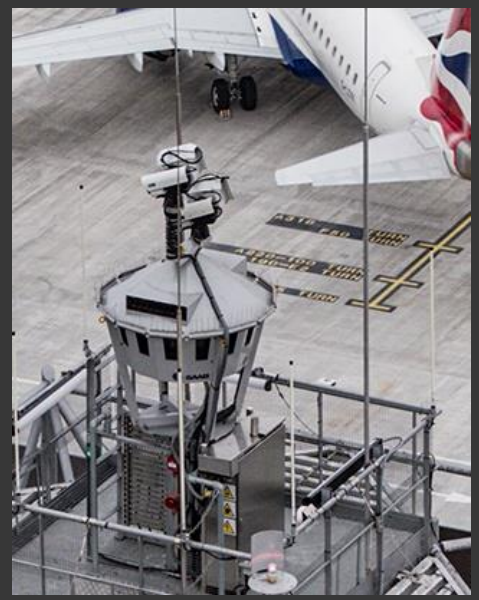




Saab ATM Product portfolio today !

ATC Automation

I-ATS takes your tower and controller operations to the next level of automation



Digital Towers

World leading digital and remote tower solutions.

CDM & Efficiency

Power your decisions and maximize performance at every stage to reduce delays, costs and environmental impact.

CNS

Critical situational awareness and safety at all weather conditions for ANSPs and airport operators

Saab r-TWR supplier….and an ANSP

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PRESS RELEASE

Date
26 November 2018

Reference
CU 18:113 S

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SDATS Takes Over Remotely Operated Air Traffic Control in Sweden

Saab Digital Air Traffic Solutions (SDATS), a joint-venture between Saab and LFV, will take over responsibility for air traffic control of the Swedish airports of Örnsköldsvik and Sundsvall-Timrå, starting 1 January 2019.

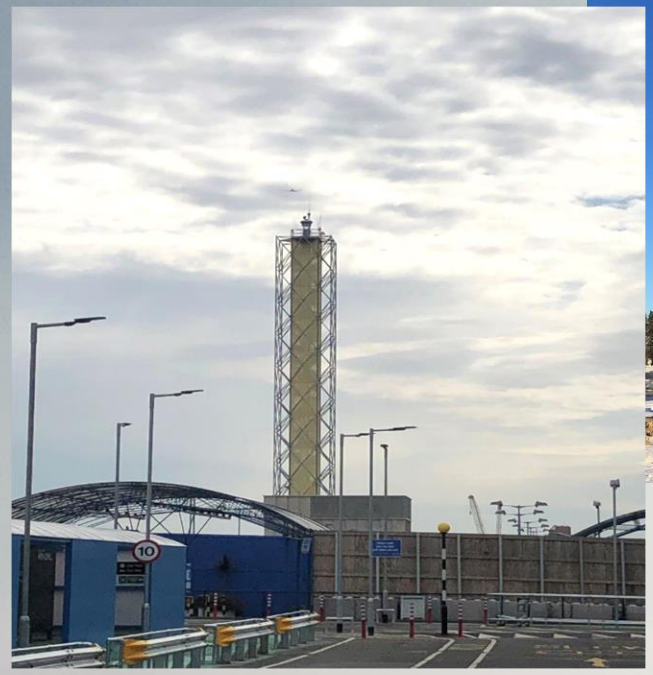
Saab and LFV, the Swedish air navigation service provider, have jointly developed a cutting-edge system, including an operational concept, which facilitates remotely operated air traffic control of one or multiple airports from a single command centre in Sundsvall. In 2015 Örnsköldsvik Airport became the first in the world to be operated by means of remote tower services, led from Sundsvall.

SDATS is now taking another step by becoming an established provider of air traffic services and taking over air traffic management from LFV for both these airports. The agreement will come into force on 1 January 2019, and will run over six years, with an option for another two years.

"Being awarded contract to deliver cost-efficient remote tower services for our customers is an important milestone for SDATS," says Johan Klintberg, CEO of Saab Digital Air Traffic Solutions.

"The agreement is an important milestone for Saab and LFV. We have now jointly achieved an objective for SDATS and can continue the expansion," says Per Kjellander, head of operations at LFV.

"The new agreement provides us with the right conditions to develop our effective administration of air traffic management and future-proof the airports. I'm looking forward to working further with SDATS as provider of air



Saab r-TWR Skyline

– In operations since 2013

Saab r-TWR centre

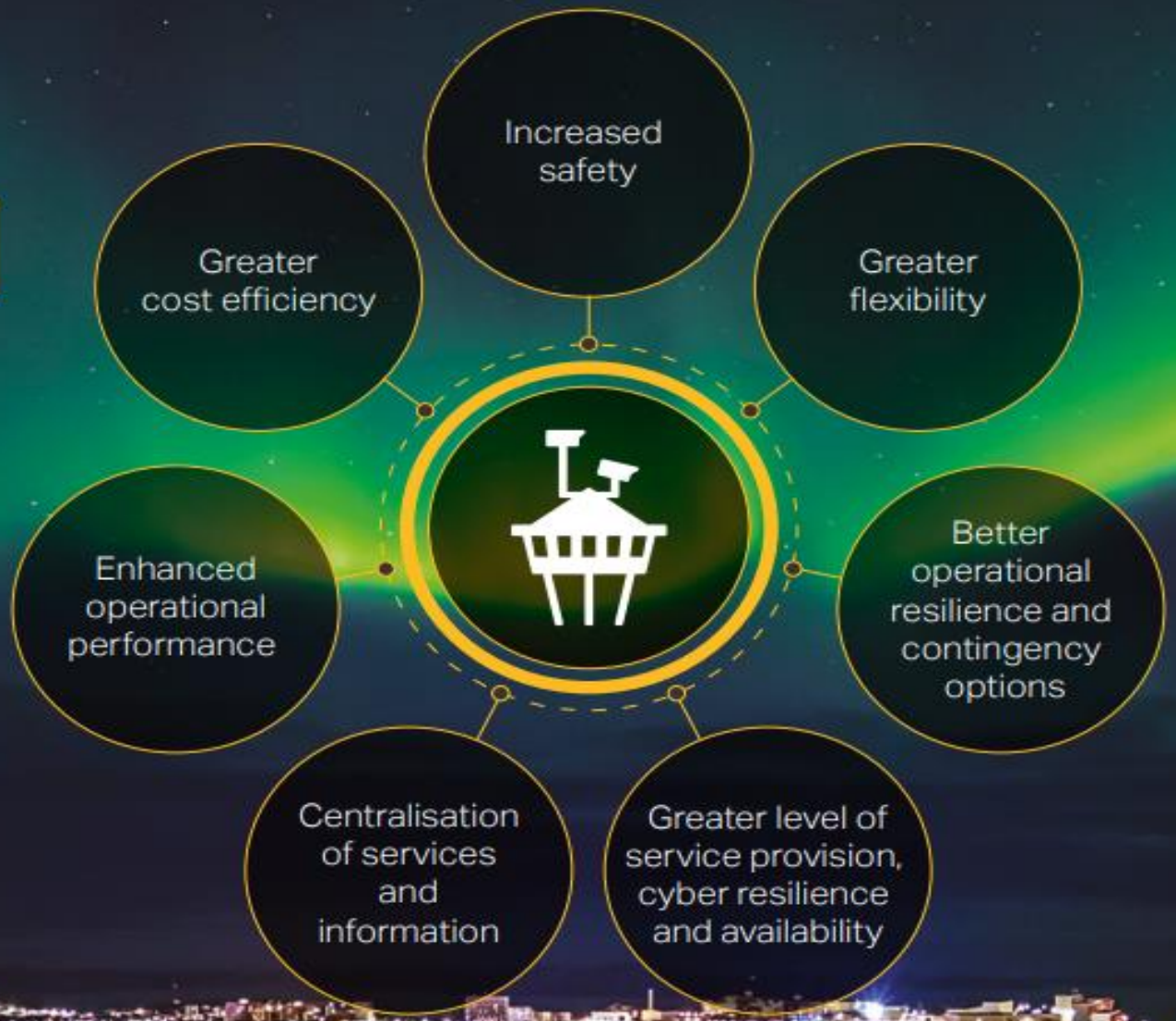
– A new Digital Working Environment

Saa

– Firs

Why you need a digital tower

The decision to implement a digital tower comes down to a balance of taking business needs, benefits, risks and rewards into consideration. It is also linked to future proofing operations for tomorrow's aviation ecosystem and the people that will operate it.



Check out our Saab r-TWR handbook

https://www.saab.com/products/product/surveillance/r-twr-handbook

Generic Remote/Digital Tower setup

- Required automation systems
- MET
- AGL/ NAVAIDS control

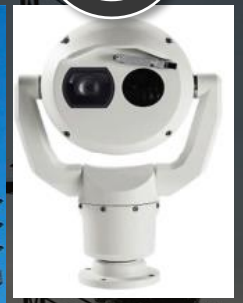
- Required sensors
- (airport dependent)

Integration

Integration

- Main Remote Tower Module (RTM)
- Backup RTM
- Training/Simulator RTM

- Camera tower(s) and
- Gap fillers as needed



- Redundant Fiber Network
- Cyber Security

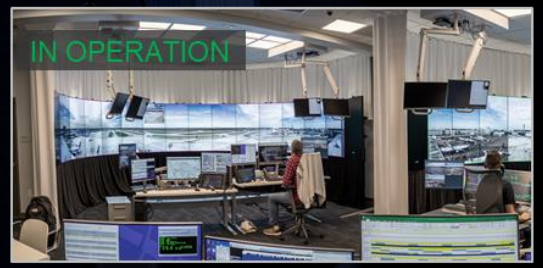
r-TWR Installed Base our champions

UK
London City Airport

USA
Leesburg Airport

THE NETHERLANDS
Schiphol, Centralised base

SWEDEN
RTC Sundsvall Örnsköldsvik, Sundsvall, Linköping, SMA



USA
United Airlines - Houston & Kansas City

UK
Cranfield Airport

SWEDEN
RTC Stockholm + 4 airports

IRELAND
Cork and Shannon

GERMANY
NATO Base, Geilenkirchen

UK
Royal Navy, Culdrose

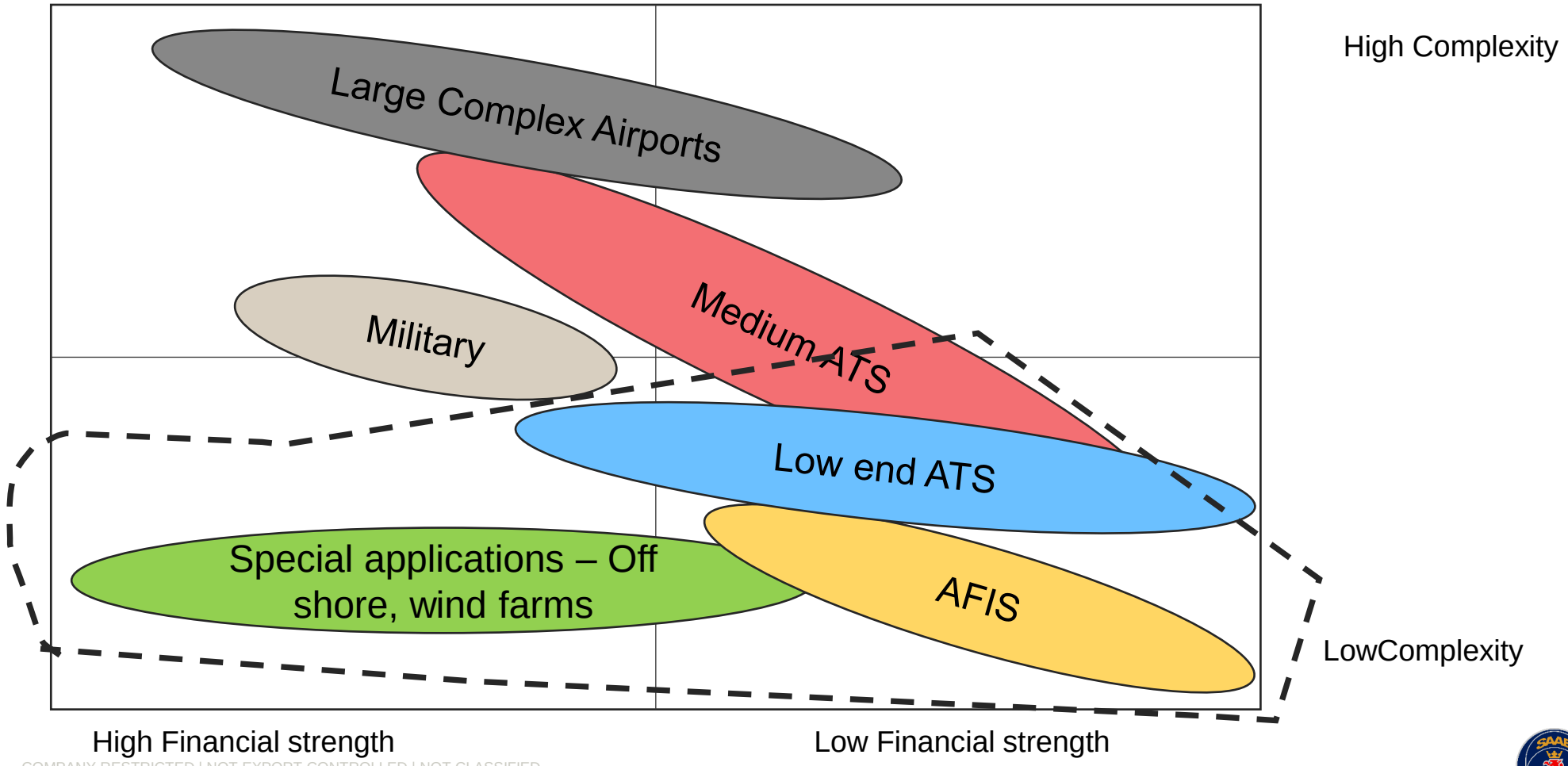
Romania
Brasov new airport, ROMATSA

Belgium
Charleroi/ Liege RTC

Towards **Digitalized ATM & Airports**

DIGITAL TRANSFORMATION new Services
...on almost every ANSPs agenda!

AFIS - a special case ?



Some industrial observations on AFIS

Aerodrome Flight Information Service [edit]

In most countries, an Aerodrome Flight Information Service (AFIS)[1] is provided at airfields where, despite not being busy enough for full air traffic control, the traffic is such that some form of service is necessary. It can be seen as a half-way house between an uncontrolled and controlled airfield: As a part of the FIS, the AFIS provides pilots of aircraft with details of other known traffic taking off, landing and flying in the vicinity of the airfield.

AFIS around the world [edit]

AFIS is provided at airfields and aerodromes all over the world.

Regulation [edit]

AFIS is not internationally regulated like Air traffic control is by ICAO. However Eurocontrol have issued a recommendation called Eurocontrol manual for AFIS.[2] Since there is no international regulation AFIS is subject to national regulation by the relevant CAA.

From idea to a solid business case…..

6 Demonstration Exercises reports

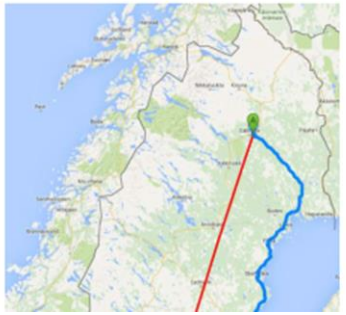
6.1 EXE-0205-001 (Single – AFIS very small Airport)

6.1.1 Exercise Scope

LFV executed a Passive Shadow Mode (PSM) demonstration of operations in Gällivare from the established RTC at Sundsvall Midlanda Airport, The demonstration was carried out in line with the Demonstration Plan for LSD.02.05 [1] addressing OFA 06.03.01.

The aim of the demonstration was to show that it is possible to establish and provide a low cost remote solution for AFIS, provided in TIZ, with the same service provided as normal operations for airports in rural regions with a very low density of traffic. The aim was also to demonstrate a possibility for these airports to gain features and development that are normally too expensive for investment with that amount of traffic. Objectives addressed are described in detail in chapter 2.1.

Gällivare is a very small airport in the northern regions of Sweden, having a total of 3152 movements during 2015. The distance between Gällivare airport and RTC Sundsvall is 537 km as the crow flies (738 km by land transport), see Figure 3 below.



SESAR PJ 05 – Smaller RTM – Multiple Airports – 2017…….

The Way to a sustainable AFIS product

Scale down of existing RTS/ATS product

Level of complexity/ cost

ICAO-INTERNATIONAL CIVIL AVIATION ORGANIZATION (1988). *Aerodrome Flight Information Service .Circular 211-An/128*. ICAO (Montreal, Canada). 1988.

Saab r-TWR Light(AFIS) - product

Low end RTS/ATS product

Scale-up from local AFIS operations

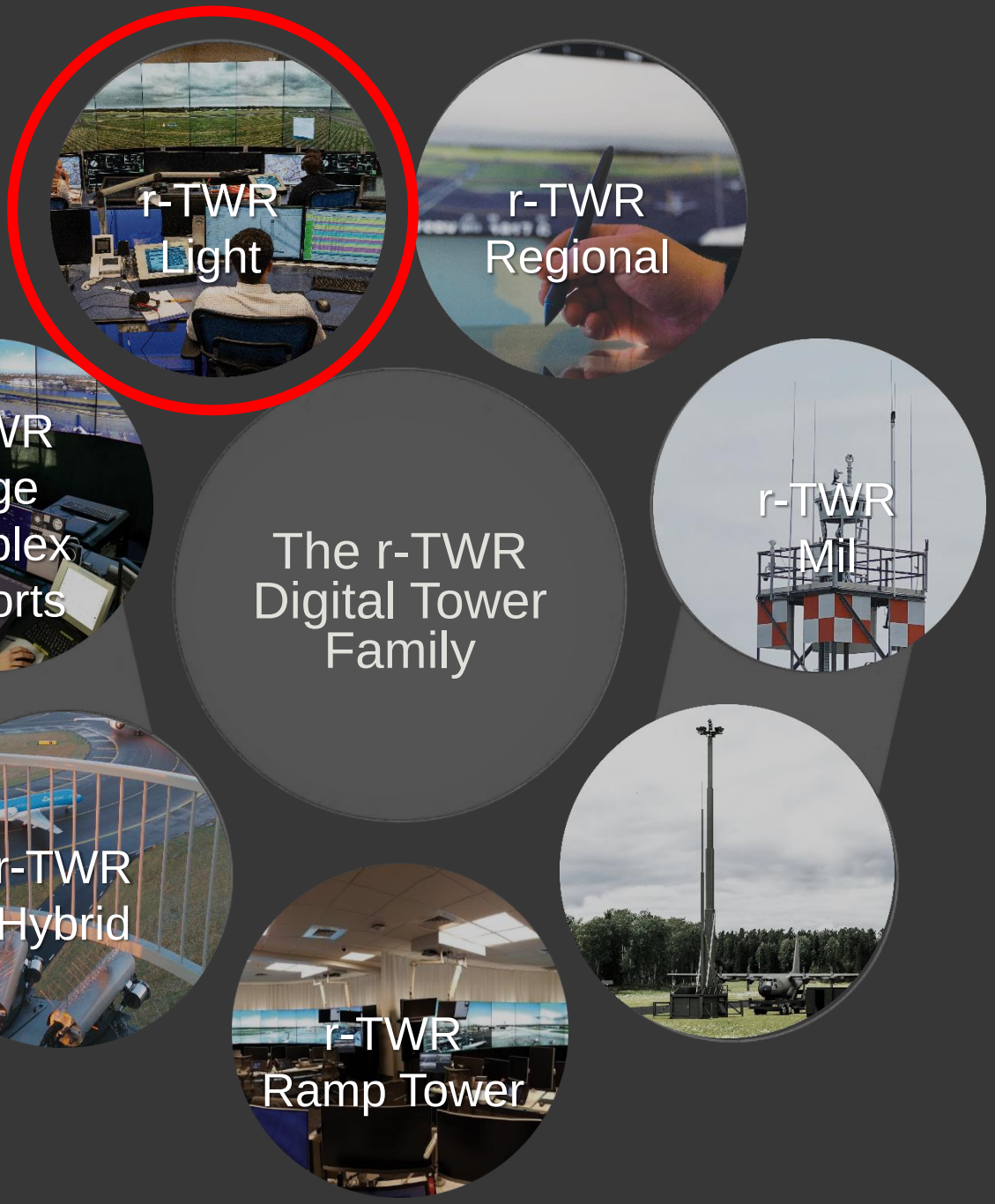
LFV BRAS project – ”Basic Remote AfiS

BRAS (Basic Remote AFIS)- Simuleringsrapport
Hemavan

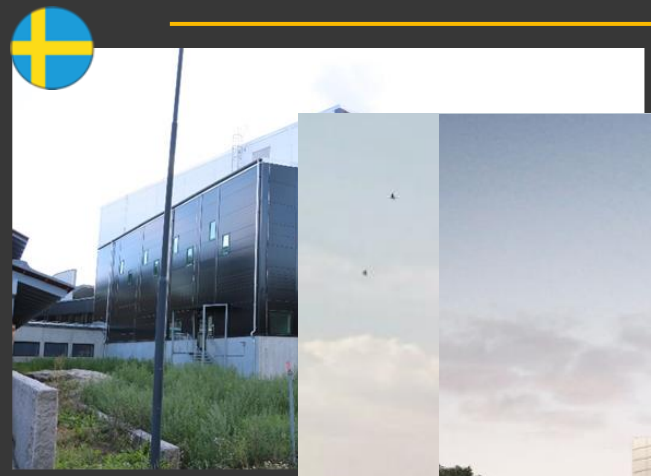
Aktivitet A2 – ”Simulering av olika visuella lösningar”

- 4 cameras with 230 degrees (ish coverage) well enough
- PTZ functions to handle the full view
- Use key PTZ pre-sets
- Multiple airport operations possible

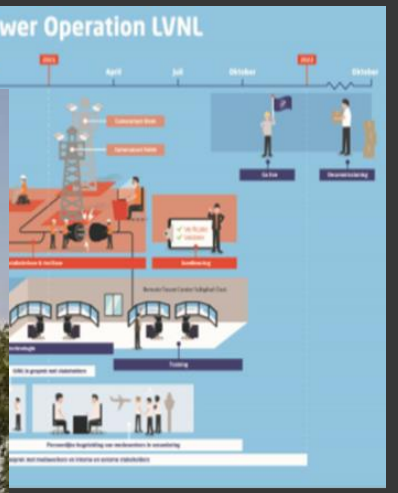
Saab r-TWR product family!



Three Saab r-TWR 2.0/3.0 centres in the making…..



Purpose built RTC



e – Remote Tower

Standardised RTM for training, evaluation/ testing and operations

Malmoe airport – Southern Sweden
~40 000 Movement a year

First two LVNL Remote Airportss – Groningen/ Maastricht

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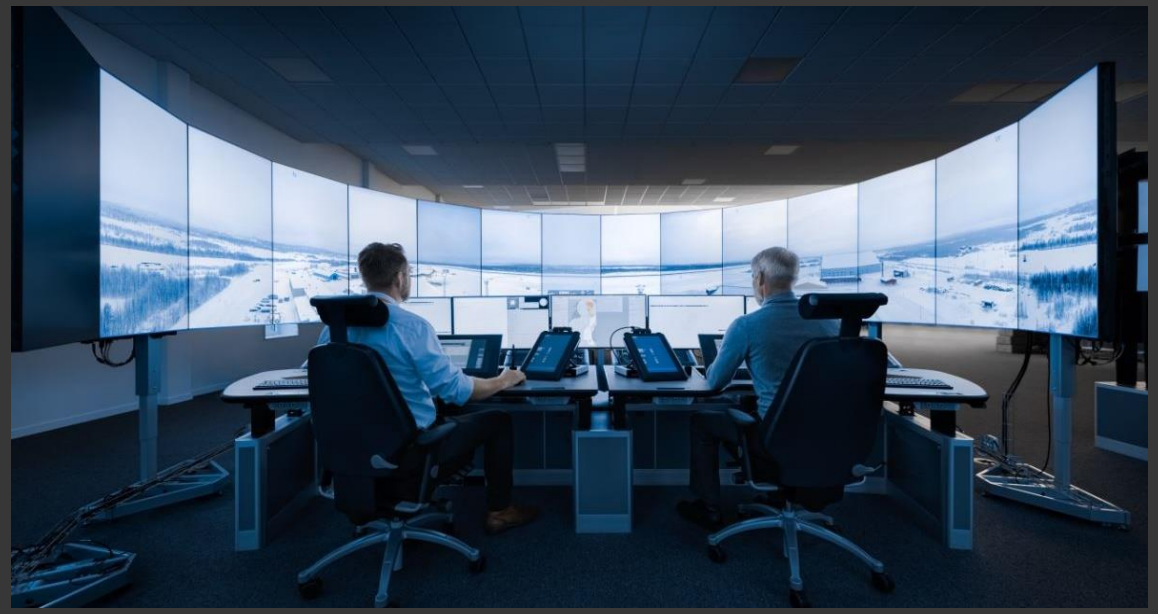
Visual solution – field proven since 2007

In full ATC operations since 2015

14x VP camera (2K/HD, 30 fps)



Remote Tower Module, RTM (2 CWP), in Stockholm RTC

2x PTZ/IR

2x PTZ
Gap-filler

All weather protected camera house

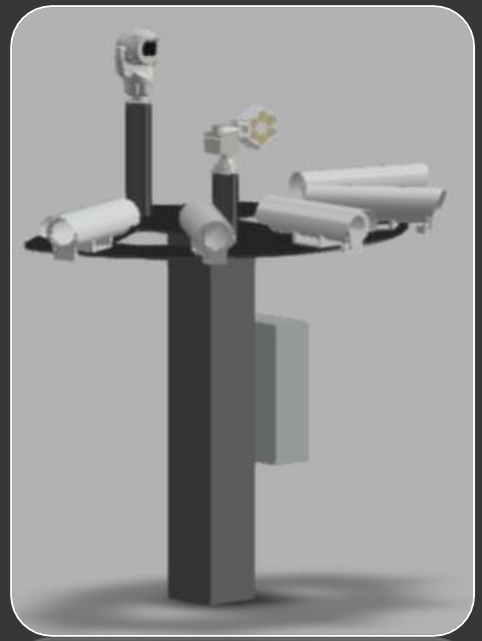
Signal Light Gun (SLG)

r-TWR Sensor pack options

r-TWR Sensor pack
AEP 360
”**A**dvanced **E**nvironmental **P**rotection”

r-TWR Sensor pack
MEP 360
”**Modular E**nvironmental **P**rotection”

r-TWR Sensor pack
MEP 240 (AFIS/FIS)
”**Modular E**nvironmental **P**rotection”



Advanced Environmental protection - AEP

r-TWR COMPONENTS

AEP 360

The AEP 360, or **Advanced Environmental Protection** sensor pack, is the logical choice for airports and services requiring maximum image quality during all types of weather and supporting demanding operations. The AEP 360 is field proven with over 150,000 hours.

14 Cameras

360° Field of view

Complete weather protection

36

Feature	Included	Data	Information
Horizontal coverage		360 degrees	14 cameras
Vertical coverage		+/- 22.5 degrees	
Weather protection	●		
Operative temperature range		-40°C – +50°C	
Internal heating	●		
External heating	●		
Internal cooling	●		Vortex cooling
Double shell design	●		To reduce heat dissipation
Recessed camera window	●		To reduce environmental impact
Overpressured camera house	●		To reduce impact of moisture and pollution
Camera window cleaning	●	Air Blades	Clear view solution with compressed air
Time to remove contamination		1 second	Saab clear view system
Sun filters	●	Controlled from VP	To reduce impact of direct sunlight
Bird spikes	●		
Standard camera	●	Bosch, 2K, 30 fps	
Gapfiller camera(s)		Bosch, 2K, 30 fps	
Standard mast type		Scanmast lattice tower	
Footprint 24 m mast		5 x 5 m^2	
Mast pointing error		< 0.10 degrees	Severe storm
Mast operational		120 km/h	Severe storm
Mast survival		210 km/h	Hurricane
Pan/Tilt/Zoom (PTZ) camera	●	Bosch, 30x zoom, 2K, 30 fps	IR as an option
Signal Light Gun (SLG)	●	Saab COTS	
Technical cabinet	●	120 kg	Designed for Saab r-TWR
Technical shelter	●	7.5 x 3 m^2	Designed for Saab r-TWR
Weight of sensor pack	●	245 kg	
Weight of PTZ	●	10 kg	
Weight of SLG including PT unit	●	10 kg	
Weight of pedestal including ladder	●	260 kg	
Service balcony including 4 lightning rods and 1 obstacle light		3 x 3 m^2, 890 kg	Optional

Modular Environmental Protection - MEP

r-TWR COMPONENTS

MEP (ATC/AFIS/FIS)

The MEP 360, or **Modular Environmental Protection** sensor pack is the choice for airports and services where a basic level of weather protection for the cameras is required. The MEP 360 can also be applicable for sites requiring a lighter weight, reduced footprint and specific camera types.

1–8
Cameras

30–360°
Field of view

38

Feature	Included	Data	Information
Horizontal coverage		30–360 degrees	1–8 cameras
Vertical coverage		+/- 13.0 degrees (adjustable)	Other lens combinations are available
Weather protection	●		
Operative temperature range		-40°C – +55°C	
Internal heating	●		
External heating	●		
Internal cooling	●		
Recessed camera window			
Camera window cleaning	●	Wiper	
Time to remove contamination		1 second	
Sun filters	●	Controlled from VP	To reduce impact of direct sunlight
Bird spikes	●		
Standard camera	●	2K/3K/4K, 30 fps	
Gapfiller camera(s)		2K/3K/4K, 30 fps	
Standard mast type		Scanmast lattice tower	
Footprint 24 m mast		5 x 5 m^2	
Mast pointing error		< 0.10 degrees	Severe storm
Mast operational		120 km/h	Severe storm
Mast survival		210 km/h	Hurricane
Pan/Tilt/Zoom (PTZ) camera	●	Bosch, 30x zoom, 2K, 30 fps	IR as an option
Signal Light Gun (SLG)	●	Saab COTS	
Technical cabinet	●	50–100 kg	Designed for Saab r-TWR
Weight of sensor pack	●	15 kg per camera	
Weight of PTZ	●	10 kg	
Weight of SLG including PT-unit	●	10 kg	
Weight of pedestal	●	150–200 kg	
Service balcony including 4 lightning rods and 1 obstacle light		3 x 3 m^2, 890 kg	Optional

Saab r-TWR Single Cased Cameras

r-TWR Single Camera Environmental Protection - SCEP
SCEP- HD/ 4K/ IR

- ✓ Purpose design Digital Tower camera enclosure - optimized environmental protection
- ✓ Supports a variety of cameras – same enclosure. Improved life cycle cost

r-TWR Signal Light Gun
SLG

- ✓ Purpose design Digital Tower Signal Light Gun

r-TWR Pan Tilt Zoom Camera
PTZ

- ✓ Fully integrated and tested COTS PTZ robot camera

r-TWR Digital Tower Module options

r-TWR RTM Standard – 15 screens

- ✓ Optimized working environment for Multiple Controller Working Positions CWP's

r-TWR RTM Compact – 6 screens

- ✓ Optimized working single or dual manned towers – where space is an issue

r-TWR RTM Compact 2-4 screens

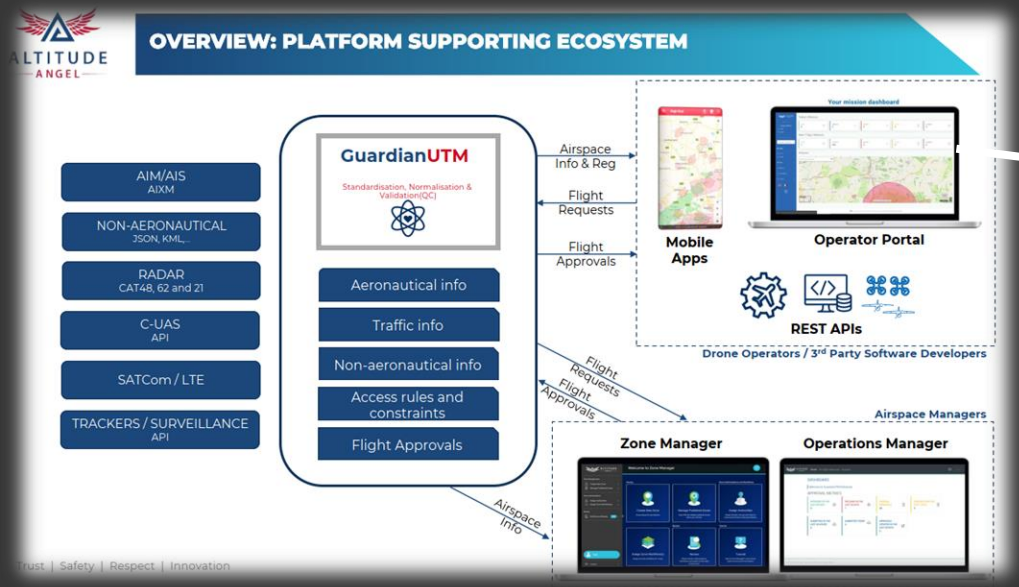
- ✓ Optimized for very small airports and AFIS(advisory services)

- ✓ Same SW
- ✓ Multiple Airport Control Capable
- ✓ All support Saab r-TWR center architecture

Integration of Saab TACTICALL VCS

- Comprehensive VCS API for full integration into Saabs Digital Tower solution
- Radio resources and telephony resources are shared between multiple virtual control room partitions
- Multiple simultaneous airport operations for remote tower solutions
- Advanced role concept for collaborative working and resource sharing
- Recent frequency list & phone call queues supporting multiple airport operations

Integration of Altitude Angel Guardian UTM

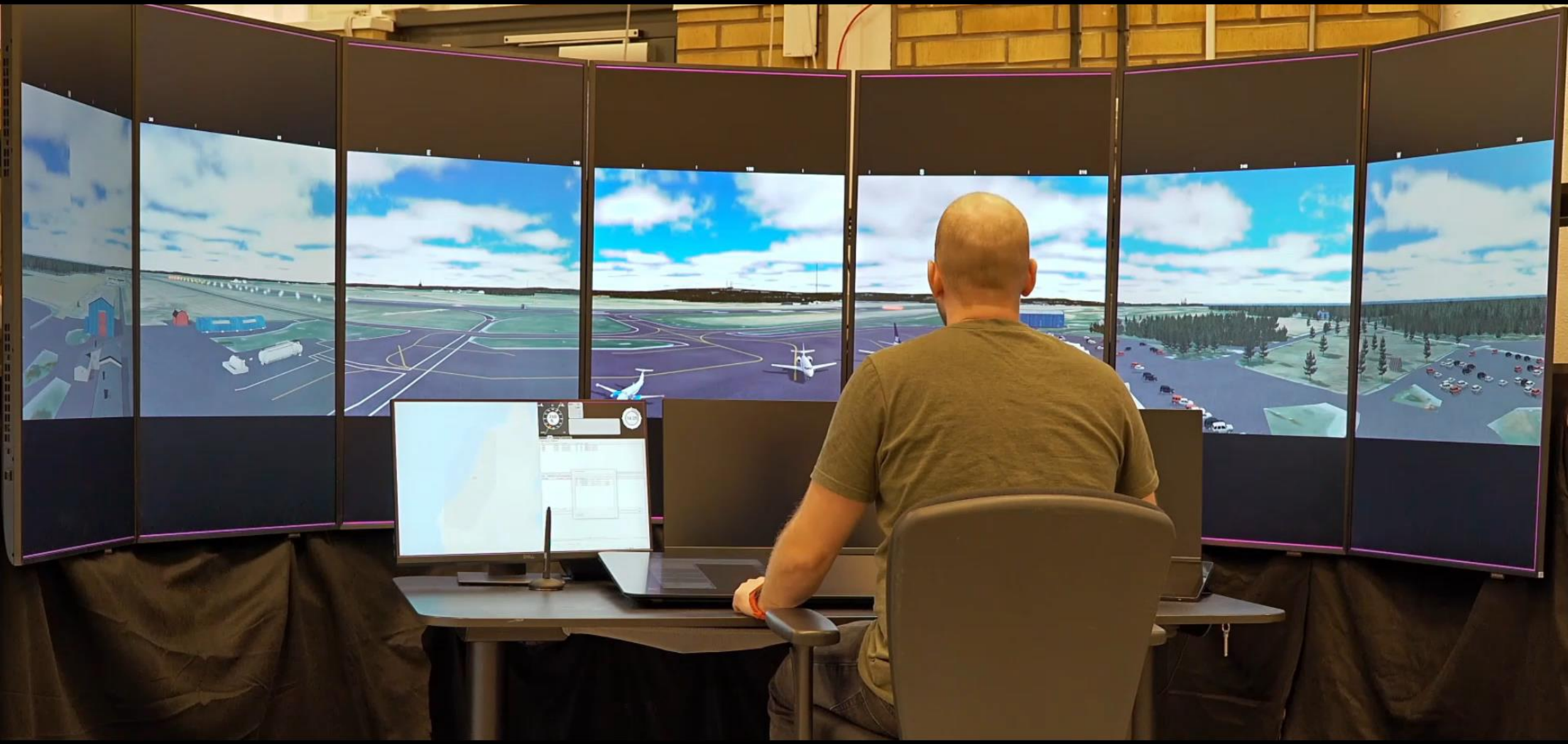


- ✓ Common concept
- ✓ Validated integration
- ✓ Coordinated road-map and support concept

Saab Multiple Airport Control – MAC

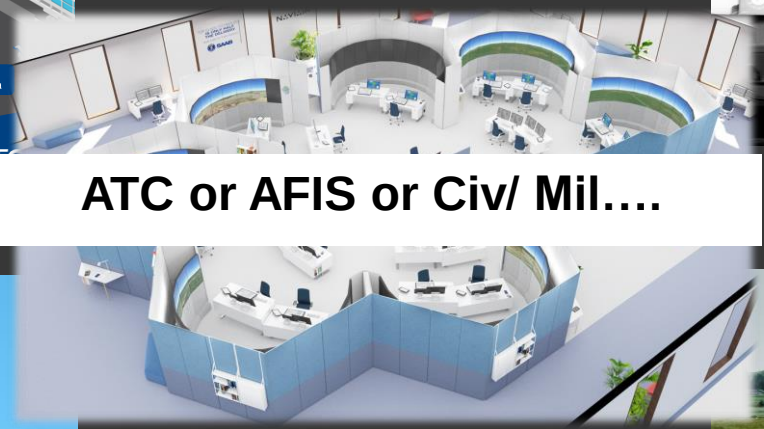
- Flexible setup – managing multiple bases
- Validated and ready to go
- Integrated part of Saab r-TWR SW

ATC or AFIS or



Scope of Saab Digital Sky

Airport services - CDM



ATC or AFIS or Civ/ Mil….

Digital Air Traffic Control and Automation

Local/National UTM/ UAM systems – incl. SUR/

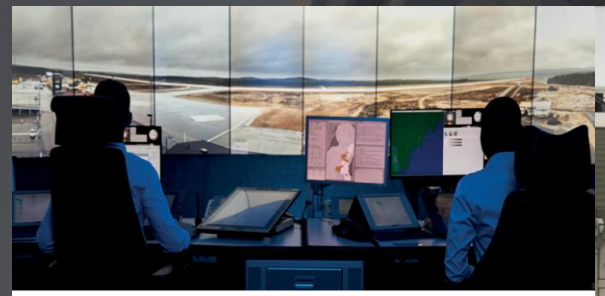
ATM – UTM - UAM centre

Civ/ Mil (C-UAS) integration – Smart Air Base

Digital / Remote Towers and AFIS

- Business case for investment is sensitive – AFIS airports normally do very smart operations !
- As Digital Tower technology evolve the price and compleixity will go down (risks burden on larger ATC airports)
- Bandwidth to/ from AFIS airports globally can be a constraining and costly factor
- In a remote tower centre AFIS and ATC can be operated in parallel – thus re-using costly infrastructure
- Multiple Airport Control can be applied for AFIS and will improve the business case
- Saab r-TWR Light is designed for AFIS…

Welcome to the Saab r-TWR Family !



Saab Digital Tower User Group

10 NOVEMBER 2020 at 13:00 CET – Online

We are pleased to invite you to the kick off of the Saab Digital Tower User Group 2020 on Tuesday the 10th of November 2020.

The User Group will bring together Saab digital tower users, stakeholders and other respected industry leaders. It is an opportunity to learn more about the platform and its future, and for you to help shape that future.

Please confirm your interest by sending an e-mail to Emelie Bengtsson (emelie.bengtsson@saabgroup.com)

Save the date

Tuesday 10 November at 13:00 CET

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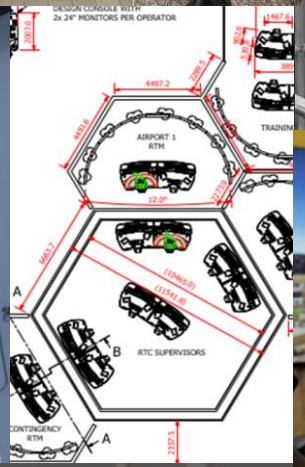

Thanks !

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