ENAC REMOTE TOWER SEMINAR
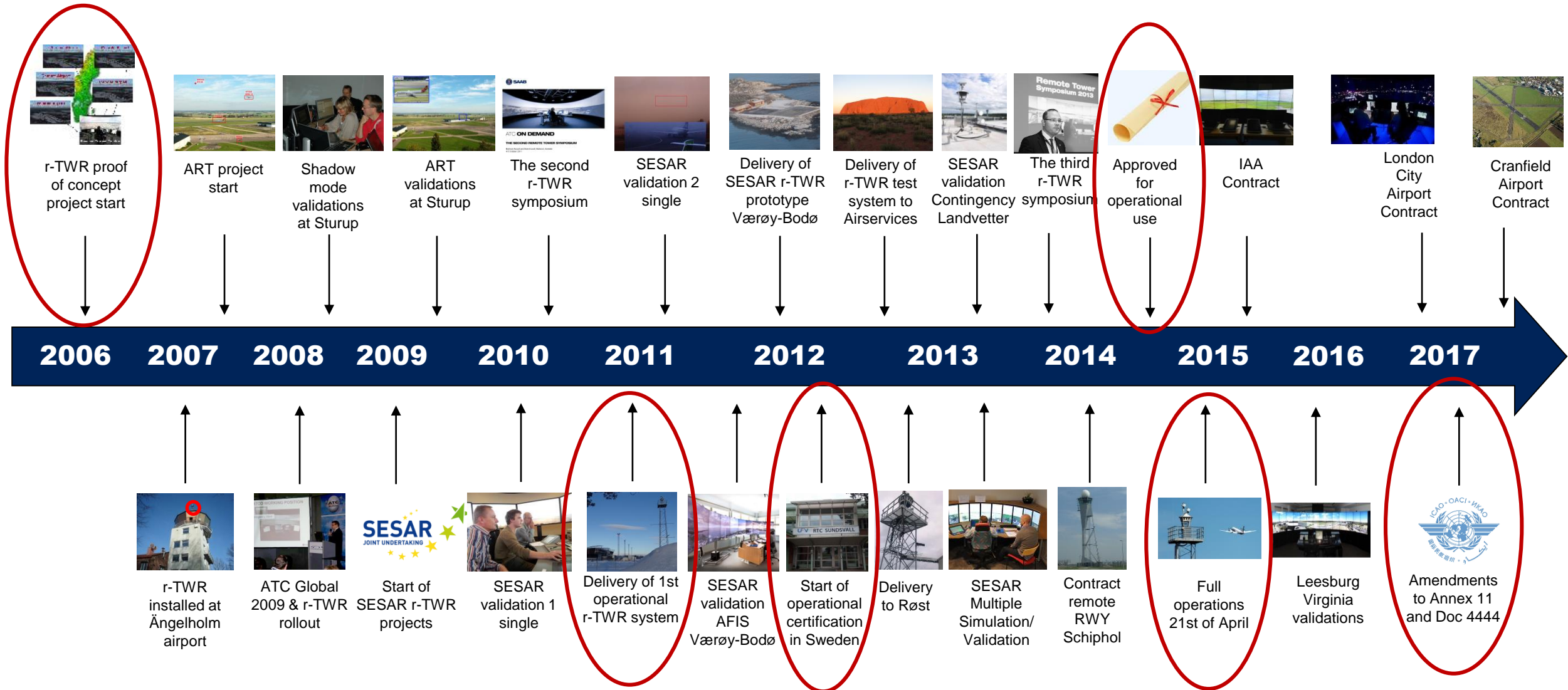– Toulouse, October, 2018 –

SAAB DIGITAL AIR TRAFFIC SOLUTIONS
– YOUR PARTNER FOR ATC BUSINESS TRANSFORMATION

LONG JOURNEY & EXPERIENCE – ITS IN OUR DNA

Above the timeline (left to right):

- r-TWR proof of concept project start
- ART project start
- Shadow mode validations at Sturup
- ART validations at Sturup
- The second r-TWR symposium
- SESAR validation 2 single
- Delivery of SESAR r-TWR prototype Værøy-Bodø
- Delivery of r-TWR test system to Airservices
- SESAR validation Contingency Landvetter
- The third r-TWR symposium
- Approved for operational use
- IAA Contract
- London City Airport Contract
- Cranfield Airport Contract

Timeline years: 2006 · 2007 · 2008 · 2009 · 2010 · 2011 · 2012 · 2013 · 2014 · 2015 · 2016 · 2017

Below the timeline (left to right):

- r-TWR installed at Ängelholm airport
- ATC Global 2009 & r-TWR rollout
- Start of SESAR r-TWR projects
- SESAR validation 1 single
- Delivery of 1st operational r-TWR system
- SESAR validation AFIS Værøy-Bodø
- Start of operational certification in Sweden
- Delivery to Røst
- SESAR Multiple Simulation/ Validation
- Contract remote RWY Schiphol
- Full operations 21st of April
- Leesburg Virginia validations
- Amendments to Annex 11 and Doc 4444

THE WORLD'S FIRST REMOTE TOWERS
DELIVERED AND APPROVED FOR OPERATION

- ATS Örnsköldsvik (32 000 hours)

- ATS Sundsvall (12 000 hours)

GLOBAL FOOTPRINT
SOLUTIONS INSTALLED AROUND THE WORLD

IRELAND
Cork and Shannon

USA
Leesburg Airport

THE NETHERLANDS
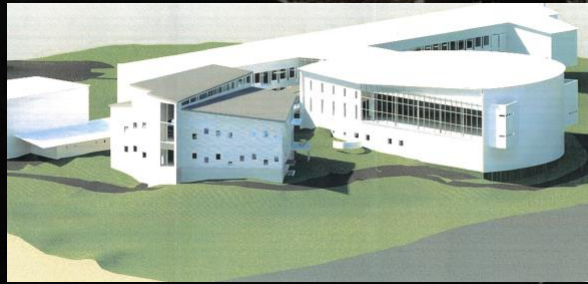Schiphol, Groningen

NORWAY
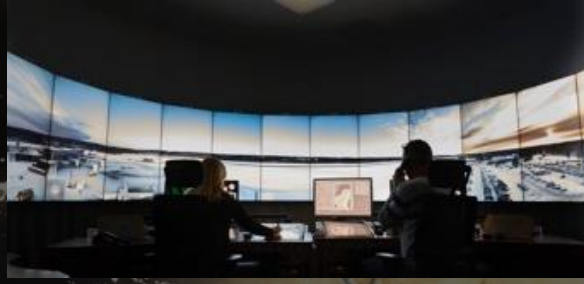Værøy, Røst

AUSTRALIA
Alice Springs airport

GLOBAL FOOTPRINT
SOLUTIONS INSTALLED AROUND THE WORLD

SWEDEN
RTC Stockholm + 4 airports

SWEDEN
Scandinavian Mountain Airport

UK
London City Airport

UK
Cranfield Airport

TECHNOLOGY - **REMOTE CAMERA**

- **Up to 14 Ultra HD cameras**
  - 360 degress coverage horizontal
  - +/- 23 degrees vertical view as in the ordinary tower
  - 30 fps., 100 Mpbs, H.264, max end-to-end delay < 1 sec

- **Integrated weather protected camera housing**

- **PAN/TILT/ZOOM CAMERA(S)**
  - 1-2 HD cameras
  - 1-2 IR cameras

- **Gap Filler Cameras**
  - Hot spot areas
  - Blind spots, covered by a building
  - Far away observations

- **Redundant network and power supply to ensure undisrupted service**

CAMERA HOUSING

PTZ CAMERA

GAP FILLER CAMERA

SAAB

WHAT WE HAVE LEARNED !

- Validate every technical part if its needed. Nice to have isn´t always need to have.

- Bring in operators (ATCO) early in the process to have impact on the industrial design and create thrust.

- Use a step by step implementation and add features in the future. Start BASIC and have an operational concept.

- Don't mix a lot of different systems. Let the interaction be handled by one system for all system parts. Reduce workload by system integration

- It takes time and build up a good cooperation with regulator and bring them onboard on the journey

- CWP HMI design is most important.

To see is to believe !

Find your operational, technical and Management champions!

Focus on getting into operations !

RTC OPERATIONAL EXPERIENCE

- **Important mindset**; We shall provide the same service from an center with new technical tools. Move the mind from TWR.

- **Presenting 360^0 in 225^0** RTM opening, ATCO adapted it easily..

- **Moving between airports** minor problem because of same CWP and interaction

- **Depth sight** is not an issue, human eye doesn't do it – it is an mental process that ATCO´s learn in the new operational environment.

- **MET observations** can be adopted

- **We can use most of our operational manuals.** (design decision 2010).

- **New modern integrated alarm system** needed to be developed
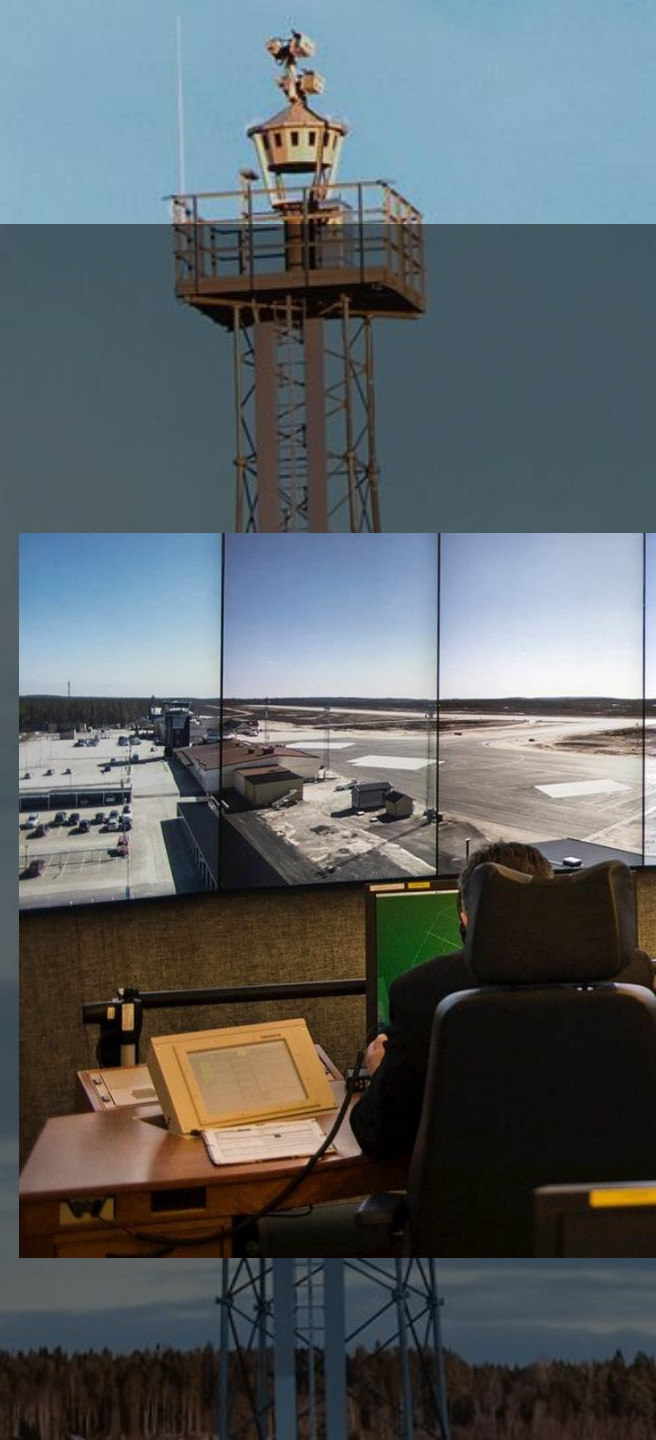
# DIGITAL TOWER SOLUTIONS
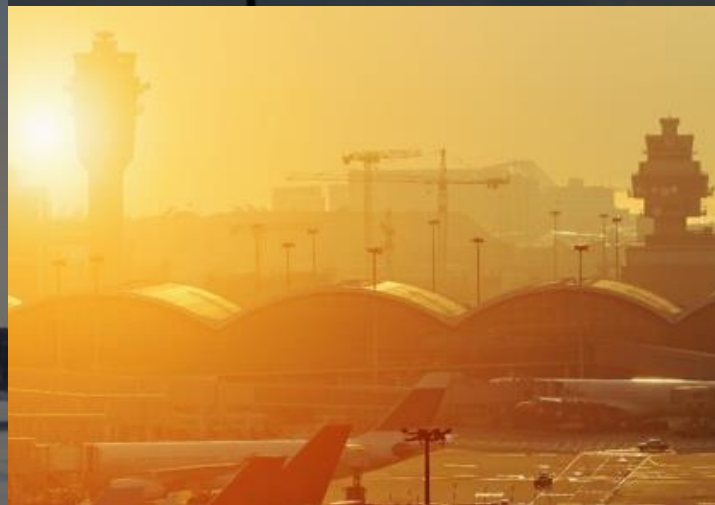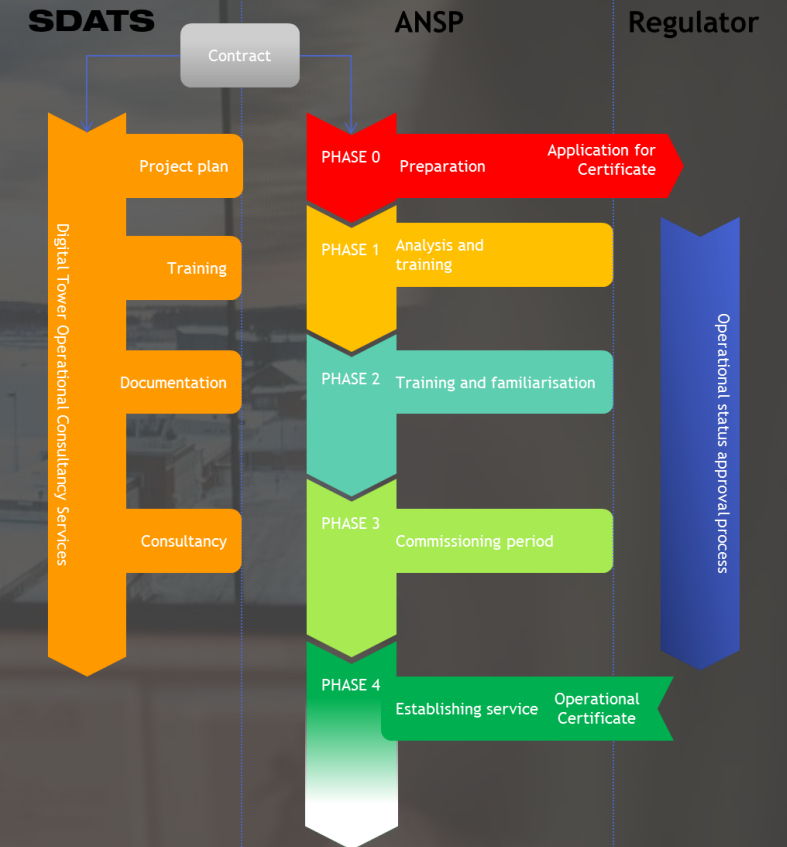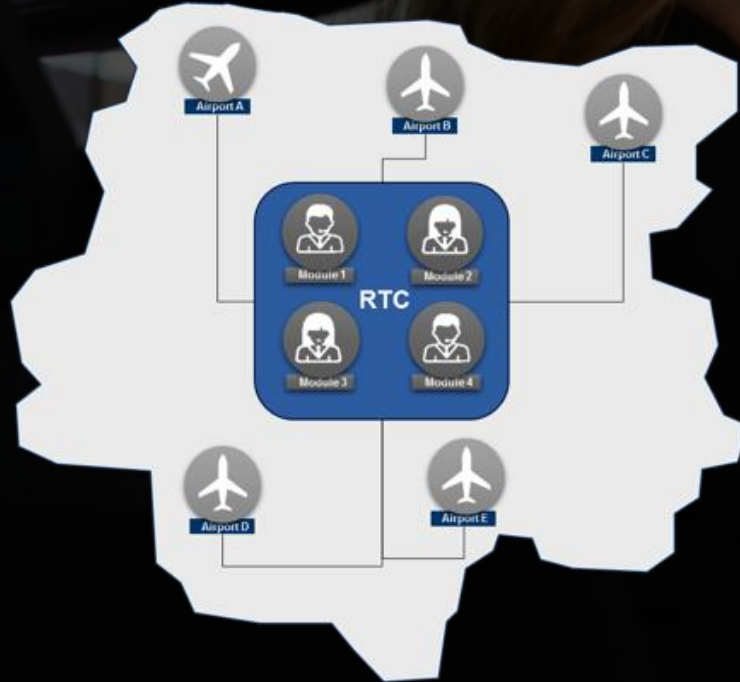
CENTRALIZED-APP
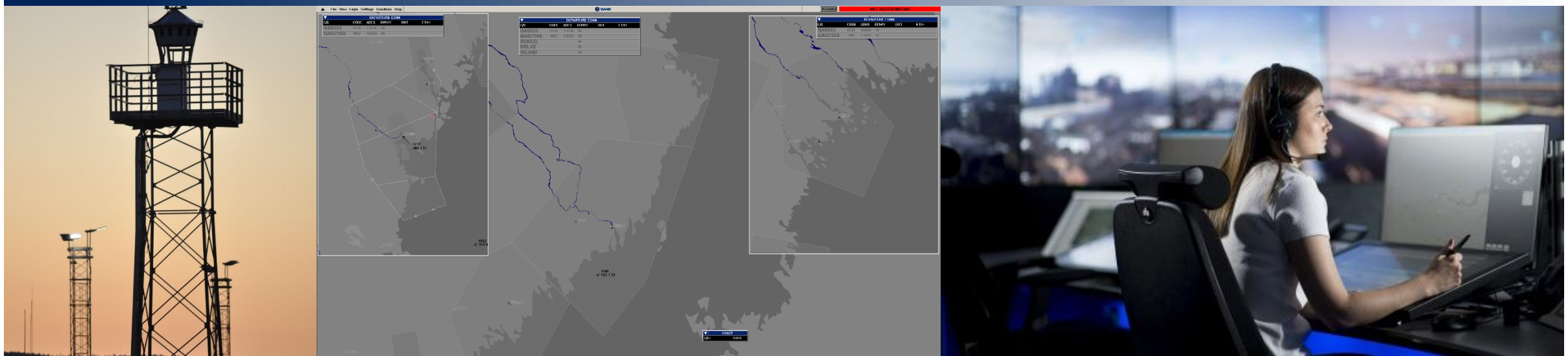
C-APP goal and purpose

- Very important for supporting multiple operations by sequencing the traffic to a multiple RTM, 2-3 airports simultaneously operated by one operator. C-APP is controlling operator workload in the module

- Most small towers are both TWR/ APP and with this RDP in the RTM it supports more the operator, especially in combination with SAAB e-strip that is fully integrated with RDP - same system. Reduces workload an easy to operate
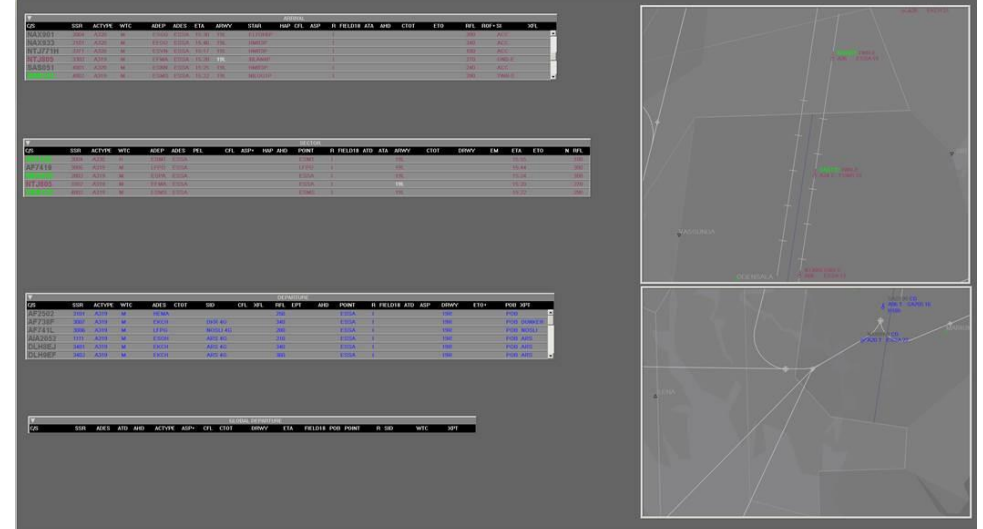
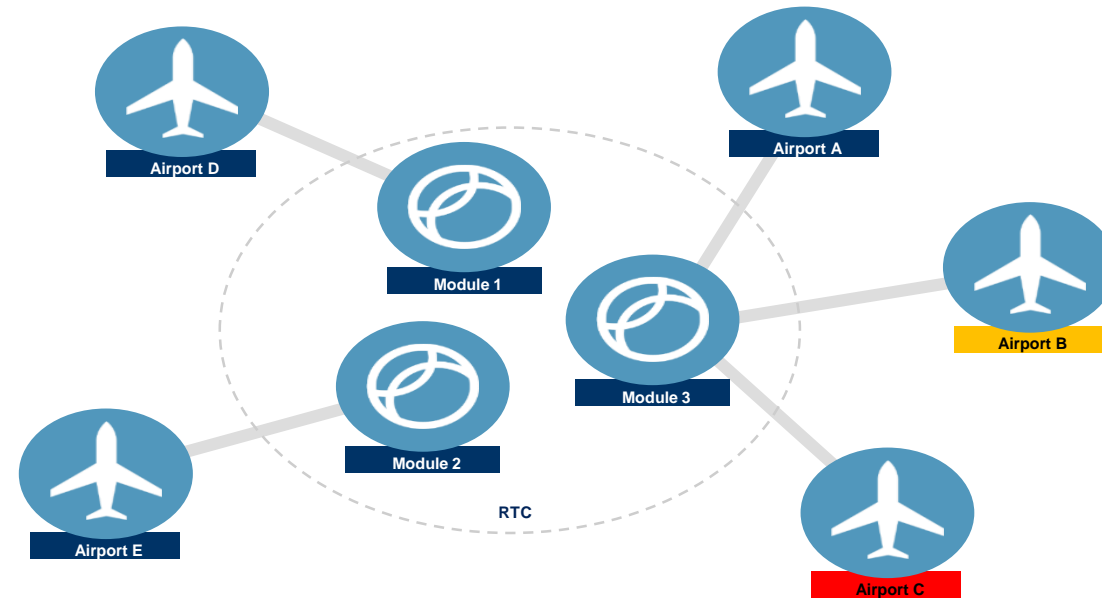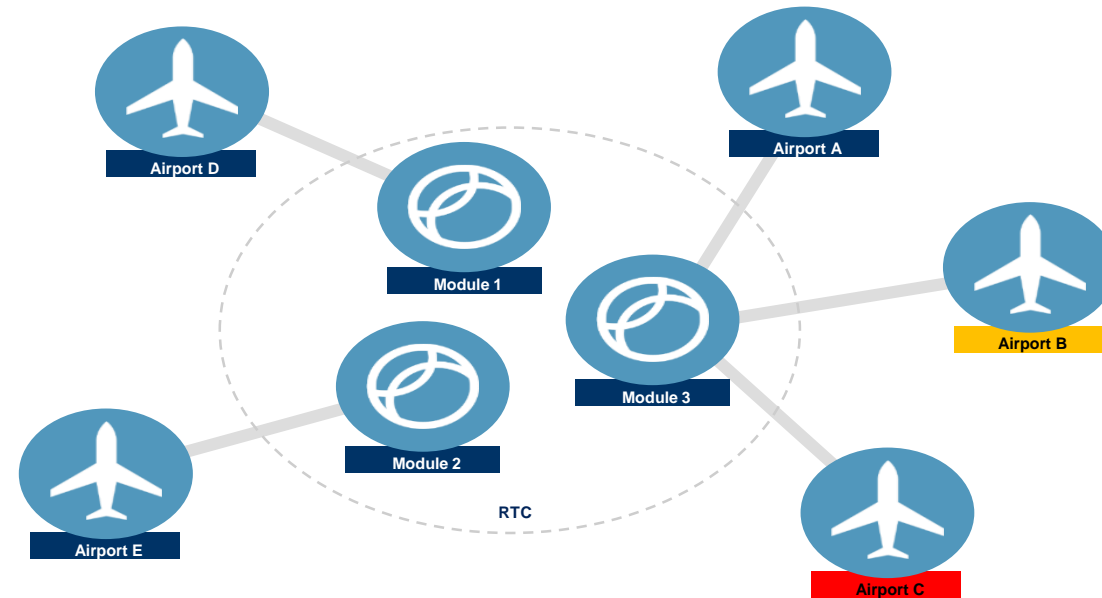# OUT THE WINDOW VIEW – DIGITAL POSSIBILITIES OR SAFETY NETS
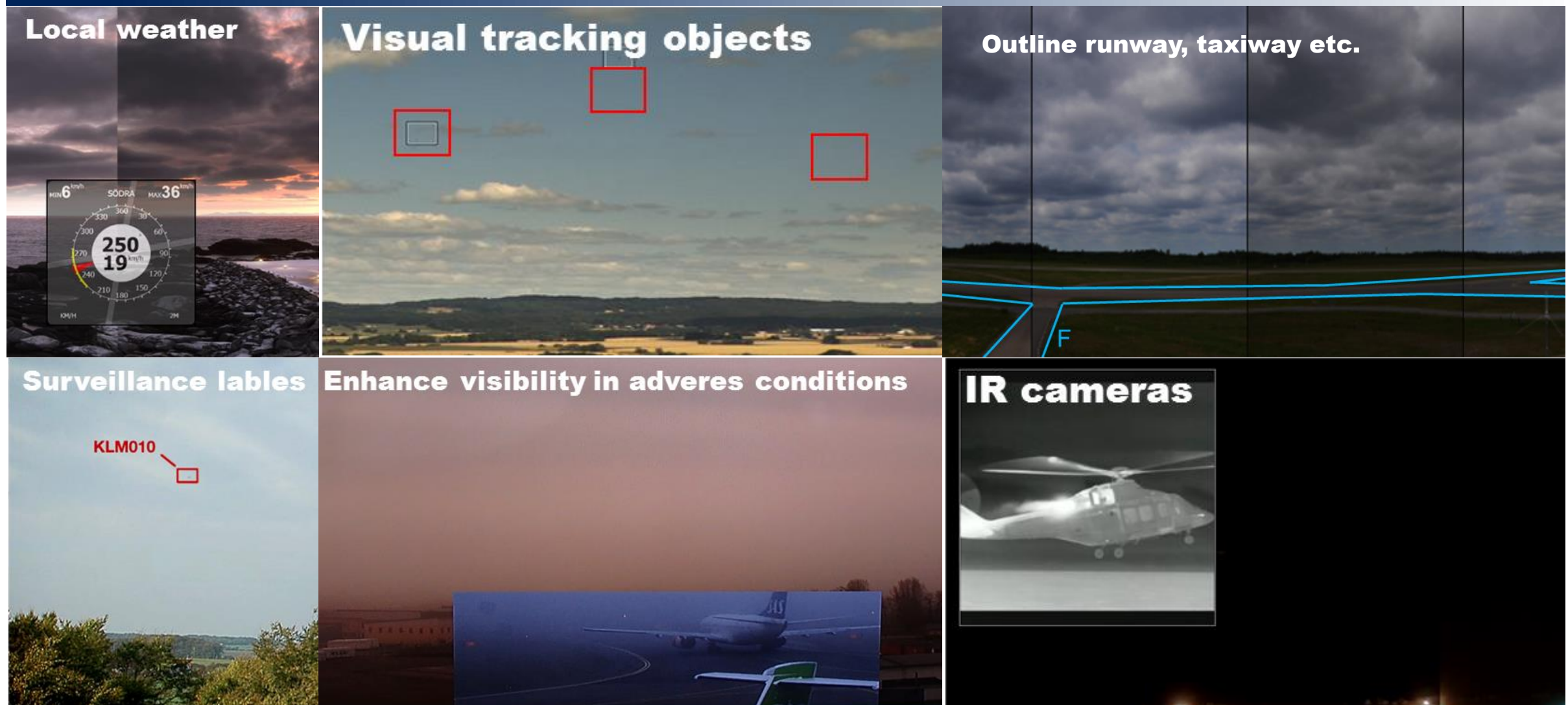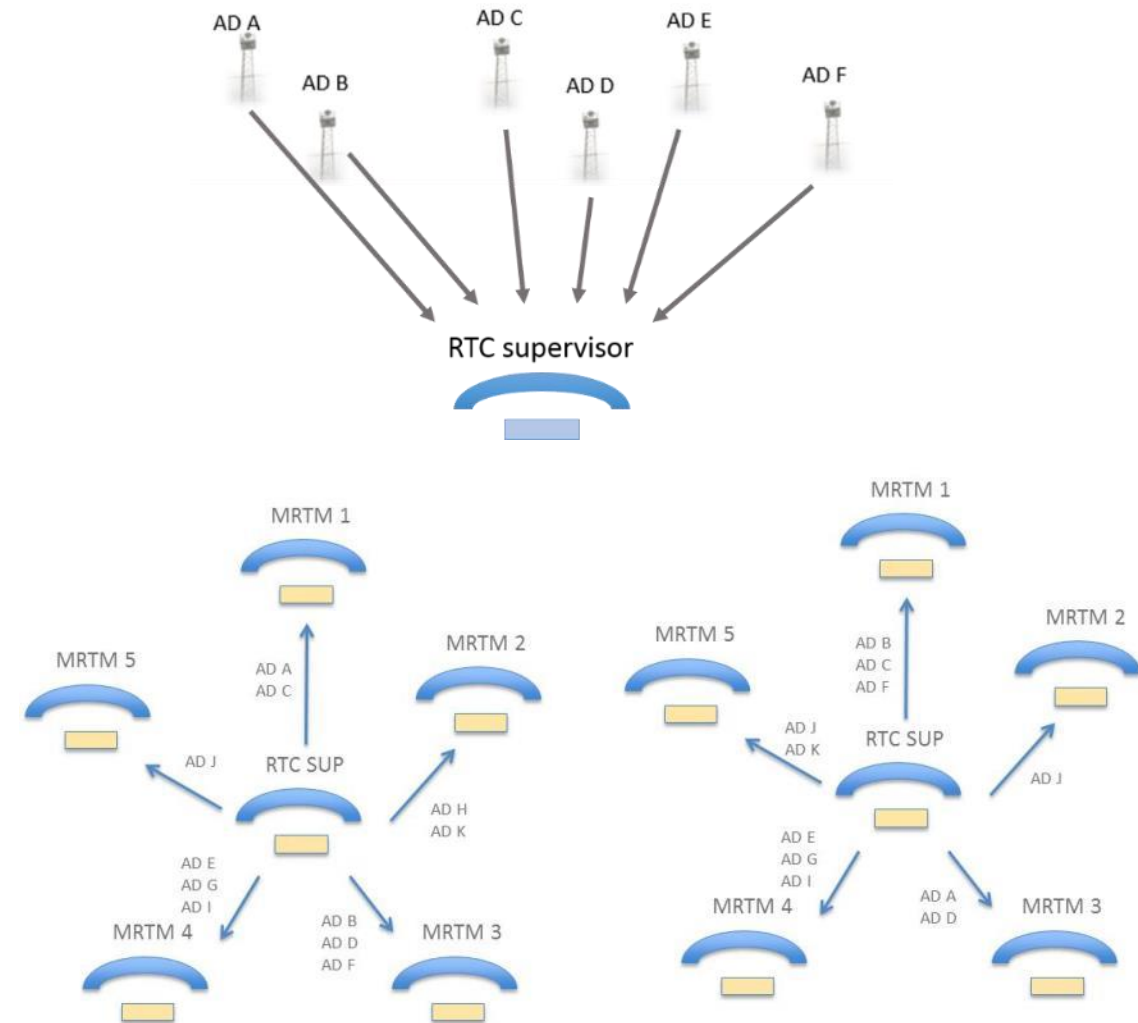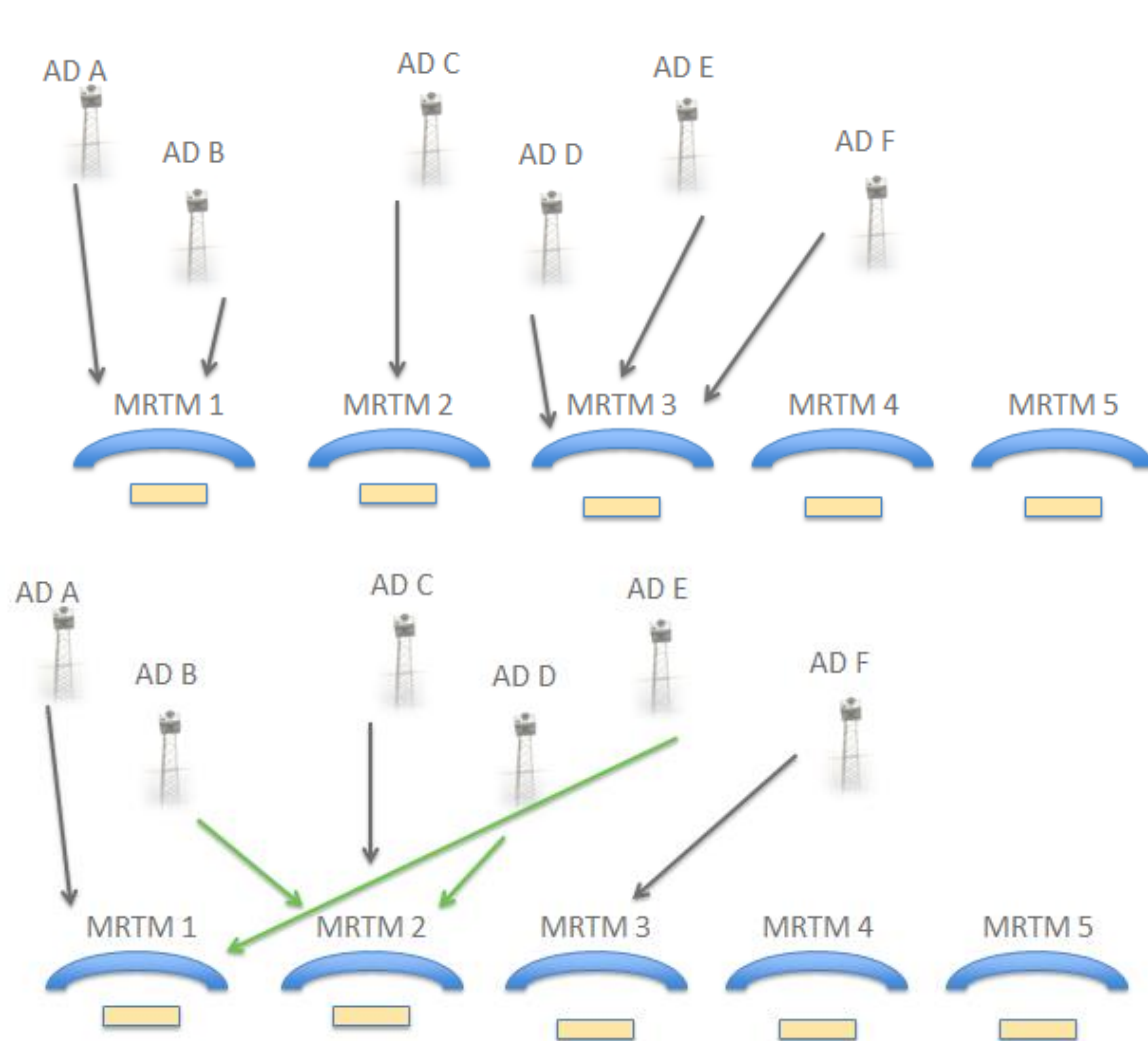
MULTIPLE AIRPORT CONTROL

SAAB RTS NEXT GENERATION
- A CENTRE OF TOWERS

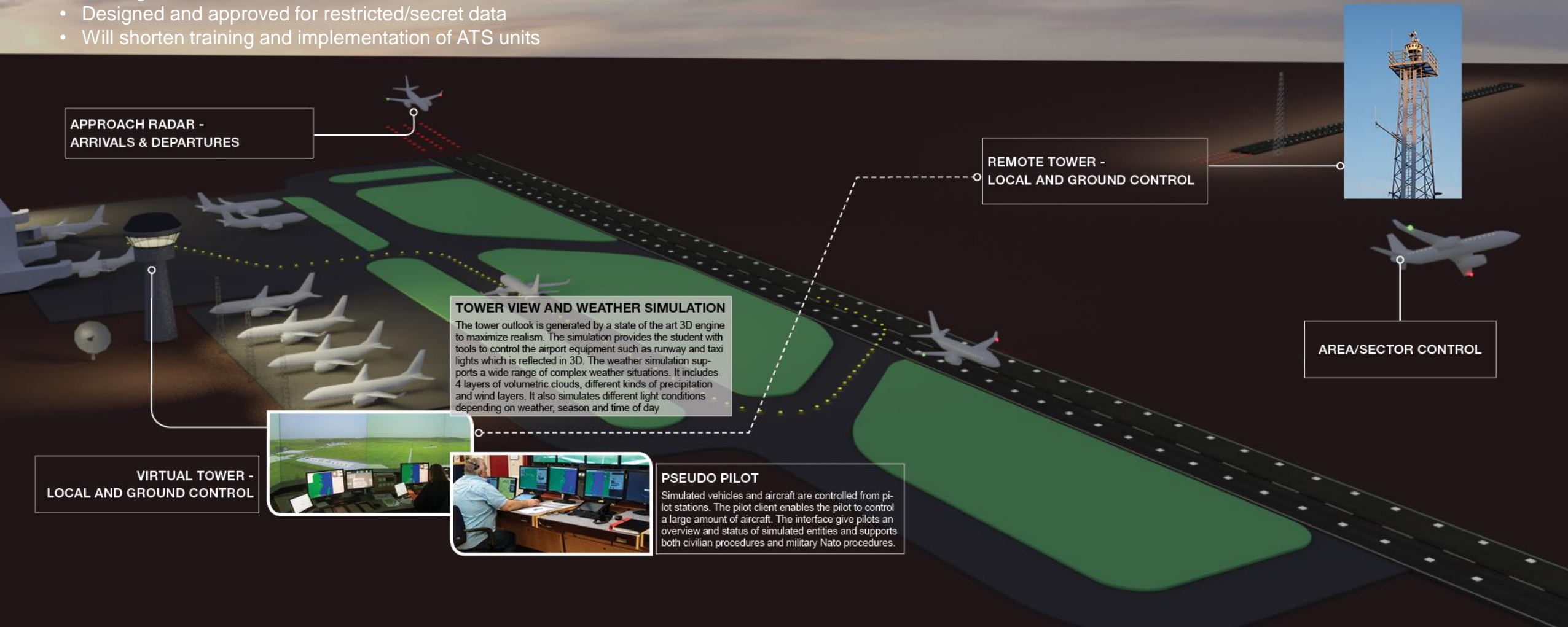# SAAB RTS NEXT GENERATION
- A CENTRE OF TOWERS

EFFICIENT OPERATION

SIMULATION - TRAINING

- Scalable simulator (15 CWP and 20 pilots)
- Applicable for training in a Remote Tower environment utilizing the actual remote tower hardware stimulated with synthetic training data
- Designed and approved for restricted/secret data
- Will shorten training and implementation of ATS units

APPROACH RADAR - ARRIVALS & DEPARTURES

REMOTE TOWER - LOCAL AND GROUND CONTROL

AREA/SECTOR CONTROL

TOWER VIEW AND WEATHER SIMULATION

The tower outlook is generated by a state of the art 3D engine to maximize realism. The simulation provides the student with tools to control the airport equipment such as runway and taxi lights which is reflected in 3D. The weather simulation supports a wide range of complex weather situations. It includes 4 layers of volumetric clouds, different kinds of precipitation and wind layers. It also simulates different light conditions depending on weather, season and time of day

VIRTUAL TOWER - LOCAL AND GROUND CONTROL

PSEUDO PILOT

Simulated vehicles and aircraft are controlled from pilot stations. The pilot client enables the pilot to control a large amount of aircraft. The interface give pilots an overview and status of simulated entities and supports both civilian procedures and military Nato procedures.

THE BIGGEST EXPERIENCE IS NOT ABOUT TECHNOLOGY

IT`S ABOUT CHANGE MANAGEMENT

SAAB AND LFV
– A WIN-WIN SOLUTION

- **Saab Digital Air Traffic Solutions AB**

  - The company will market, sell, develop and operate products and services for digital air traffic control

  - The company provide innovative customised remote air traffic control by combining unique operational and technical excellence to benefit our customers and society
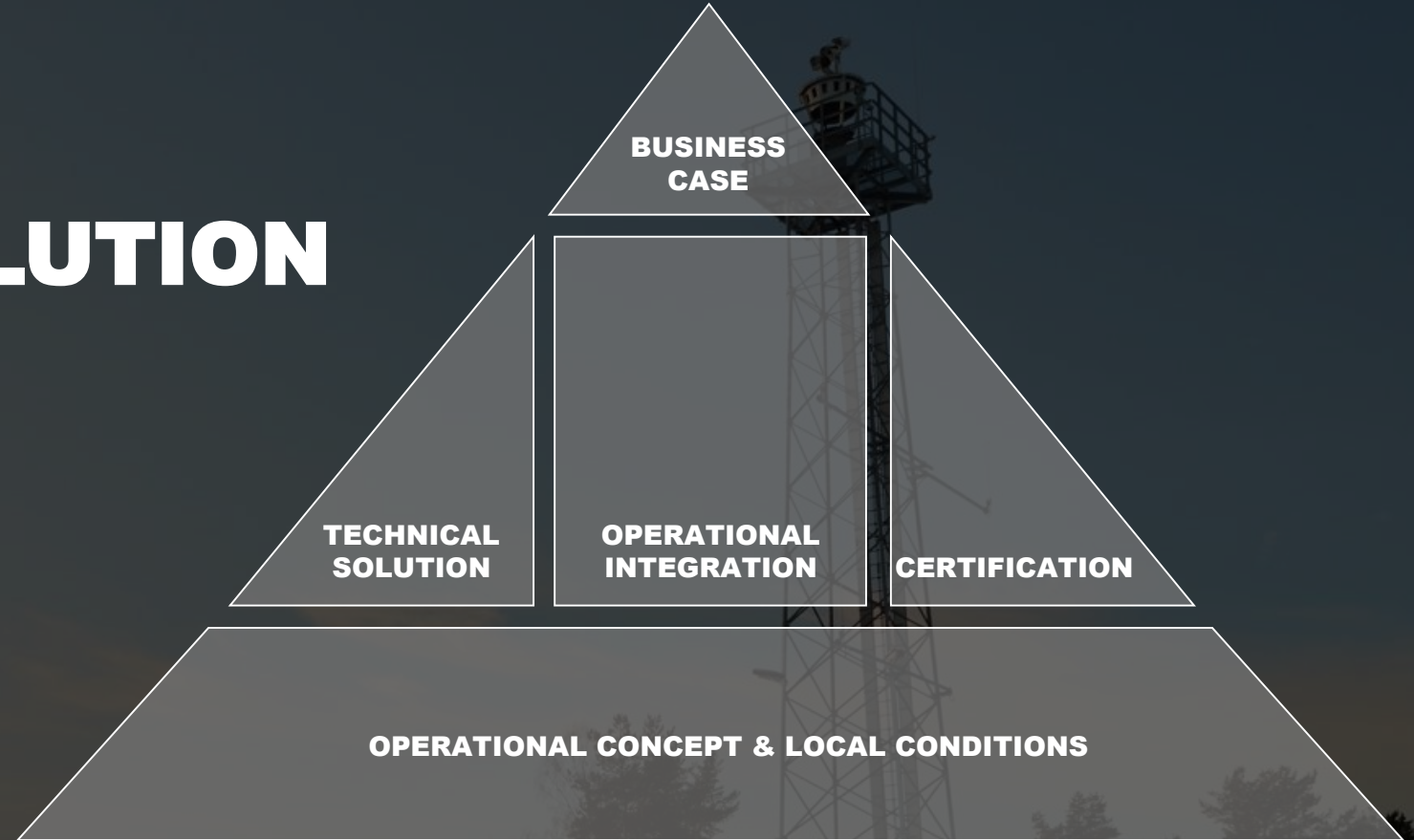
  - A digital ANS provider for the future

As a leading air navigation service provider for civil and military customers, LFV develops cutting edge solutions for the air navigation industry and beyond.

We are transforming the ATM industry
by creation of new added value for our customers

A DIGITAL **ANSP**

- Remote Air Traffic Control Services (RTS)

- Remote Aerodrome Flight Information Services (R-AFIS)

A DIGITAL SYSTEM **PROVIDER**

- Proven remote tower visual presentation systems

- Fully integrated ATC Automation system for TWR and APP

AN IMPLEMENTATION **PARTNER**

- Proven experience of transition to remote tower operation

TOP CLASS TECHNOLOGY
IS ONLY HALF
THE DELIVERY

Saab Digital Air Traffic Solutions