LONG JOURNEY & EXPERIENCE – ITS IN OUR DNA

- 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-Bodo
- Delivery of r-TWR test system to Airservices
- SESAR validation Contingency Landvetter
- Approved for operational use
- IAA Contract
- London City Airport Contract
- Cranfield Airport Contract


- 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-Bodo
- 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
GLOBAL FOOTPRINT
– BEING INSTALLED AROUND THE WORLD

IRELAND – Cork and Shannon
USA – Leesburg Airport
THE NETHERLANDS – Schiphol, Groningen

Australia – Alice Springs
TECHNOLOGY - REMOTE CAMERA

• Up to 14 Ultra HD cameras
  – 360 degrees 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
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.
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° in 225°** 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
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

- Local weather
- Visual tracking objects
- Outline runway, taxiway etc.
- Surveillance labels
- Enhance visibility in adverse conditions
- IR cameras
MULTIPLE AIRPORT CONTROL
MULTIPLE AIRPORT CONTROL

Airport A

Airport B

Airport C

Airport D

Module 1

Module 2

Module 3

RTC
Second generation – based on operational experience

• Up to 24 airports
• Reduced maintenance
• New cameras
• New tools, C-APP, Multiple Airport Control etc..
• Industrialised – Standard product
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**

**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 its 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 client gives 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

We are transforming the ATM industry by creation of new added value for our customers
DIGITAL TOWERS
MORE THAN A TECHNICAL SOLUTION
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