Remote Operations

Remote Towers in operation

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This is me
Remote tower instead of conventional TWR

- Replaces the conventional Air Traffic Tower
- Integrated ATC automation system
- …or using the customer’s existing ATC system
- Providing the visual view by means of cameras and displays
- Improved safety by use of digital tools
System components
Long Journey

- 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
- The third r-TWR symposium
- Approved for operational use
- IAA Contract
- 2nd airport in operation in Sweden
- London City Airport Contract
- Cranfield (UK) 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
Saab’s Digital Tower Sites

- Örnsköldsvik: Almost 4 years
- Sundsvall: Over a year
- Cranfield Airport: Since December 2018
- Linköping city airport
- Scandinavian Mountain Airport

A LONG JOURNEY AND LOTS OF EXPERIENCE
FUTURE – to young to see

• Will the RTC change how ATS is provided?
• What happens with the ATCO if the environment is to technical?
HISTORY

- In 1920, Croydon Airport, London was the first airport in the world to introduce air traffic control.
- In 1929, the first U.S. air traffic controller – Archie W. League
- First new build control tower at Cleveland build 1929 and in operation 1930
- Tower at Sundsvall/Timrå Airport 1940-1960
- Interesting history is that Villa Tybo, at Sundsvall/Timrå, was located 500 m from runway with a lot of trees covering runway. Remote operations in 1940?!?
Workload in a TWR

- Small tower and big tower
- Single ATCO operations – is the working position optimised?
- Old equipment works, why replace it?
- Small tower – availability?
- Big tower – capacity?
- Organisation fit for purpose.
- Optimization – one or many suppliers of systems good or bad?
Old fashion in old towers – but it works

- Paper and pen
- No support, no safety nets, no help?
- Memory!
RTC – FOCUS ON ATCO HMI
Workload in a RTC

- Crowded – never alone good or bad?
- To keep one system interface is important
- How much training do you need and should you always have training?
- ATCO need to keep them "updated" on manuals and methods
- Organisation grows – more interfaces
- When do you set a "system freeze"? And for how long?
Challenges today

Integrating new units and cultures in a RTC
Meeting different demands from people
Roster ing and multi endorsements for good efficiency….it takes time
Using operational experience to push the technology forward
Implementing more Remote Tower Modules during live operations
Convince pilots, airports, ATCO and more
Challenges tomorrow

• Can AI support ATCO in decision
• Loss of "basic" knowledge, (procedual)
• Technology demands new supporting functions in an organisation
• What happens with the airports?
• Drones?
Who and why? – example of "risks"

- Example on the upcoming fusion in the Eurocae WG-100
- Are we setting new risks
- Different aspects for objects on the ground vs objects in the air?
- System vs operator initiated fusions?

Too far away – don’t fuse
Close enough - fuse
Oops, another one!
Remove fusion symbol
MULTIPLE AIRPORT CONTROL
MULTIPLE AIRPORT CONTROL
TRIPPLE AIRPORT CONTROL
FOCUS ON OPERATOR

Move your eye from "look down" to "look up"
Increase situational awareness
Usage of "The donut" designed by ATCO
Bring in things needed and step by step
Focus on Camera Performance

- The figure to the left is in heavy snow.
  - The top image accurately represents how the naked human eye views the scene.
- The bottom image shows how the camera views the same scene at full speed (30FPS).
  - sharp and vibrant
  - more details are visible in the darker parts of the image
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