SESAR REMOTE TOWER SERVICES

Michael Standar
Chief Strategies & International relations
SESAR Joint Undertaking
• SESAR Concept and Development:
  – An Introduction to the SESAR activities

• Business Views:
  - Manufacturing industry (Michael Ellinger, Frequentis, Austria)
  - Air Navigation Service Provider (Niclas Gustavsson, LFV, Sweden)
SESAR contribution to Single European Sky (SES)

Implementing the Single European Sky

Performance
- Performance scheme
- Performance Review Body
- Functional Airspace Blocks
- Network Manager
- National Supervisory Authorities

Safety
- EASA
- Crisis coord. cell

Technology
- SESAR
- European ATM Master Plan
- SESAR Joint Undertaking
- Common projects

Airports
- Airport observatory

Human Factor
- Specific sectoral dialogue Committee
- Consultative expert group on social dimension of the SES
Remote Tower Symposium
Stockholm, Sweden 12 December 2013

An EU framework for modernising ATM
SESAR in three steps

STEP ONE: Time-based operations

STEP TWO: Trajectory-based operations

STEP THREE: Performance-based operations

By the end of STEP ONE, the SESAR Programme aims to have contributed the following:

- A 27% increase in Europe’s airspace capacity
- A 40% reduction in accident risk per flight hour - corresponding to the safety need associated with the anticipated traffic growth
- A 2.8% reduction per flight in environmental impact
- A 6% reduction in cost per flight
What has changed with SESAR?

1. Partnership
   • 3000 persons, 110 companies, Airspace users, military, staff,...

2. Pragmatism
   • Technologies validated in a real life operational environment
   • Trials/Demonstration flights

3. Business cases
   • Involvement of suppliers, integrators and investors
   • Direct link to standardisation and possible regulatory measures
30% is about Airports
SESAR Validation Methodology

European Operational Concept Validation Methodology (E-OCVM)

ATM needs

V0

Gather and access ATM performance needs

Scope

V1

Scope operational concept and develop validation plans

Feasibility

V2

Iteratively develop and evaluate concept

Pre-industrial development & integration

V3

Build, consolidate and test

Industrialisation

V4

Industrialisation and approval

Concept validation

Requirements development

Concept development

Technical development and verification

Integration

FROM INNOVATION TO SOLUTION
Remote Tower Services and Infrastructure in SESAR

**Pre-SESAR**
- 2006
- 2009

**SESAR RTS Concept Development & Validation**
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015

- **ART «proof of concept»**
- **Single Airport Remote TWR/AFIS at small airports**
- **Multiple Airport Remote TWR/AFIS at small airports**
- **Contingency Airport Remote TWR/AFIS**
- **Single Airport Remote TWR/AFIS at medium airports**
- **Demo projects – Italy, Hungary, Ireland, Netherlands, Germany, Sweden**

**Projection Screens**
- 40” LCD Screens

**Infra-Red Cameras**
- 55” HD LCD Screens
  - no-frame

**HD Cameras**
- Improved tracking algorithms

**3D modelling to improve tracking**
The scope of the **current** SESAR Solution covers:
- Remote Tower for Single Airport;
- ATC services and AFIS;

Other aspects of Remote Tower Operations will be covered in the ongoing research programme:
- Multiple airports from a single location;
- Contingency operations; and
- Higher-density operations.

SESAR also supports safety, deployment and standardisation activities through:
- Publication of project material in ‘Solution Packs’;
- Support to EUROCAE (WG 100); and
- Feeding back external analyses and comments (e.g. from regulators and Users) into continuing research.
Safety

• Analysis of the Safety Assessment Report of the SESAR single aerodrome remote tower services done after having gone through the SESAR R&D results

• Several important safety issues are of concern, which will require further clarifications in the implementation safety case for the particular implementation environment, e.g.:
  – Mitigation against loss of data connections and communications
  – Visual signalling
  – Controller responsibility and operational procedures for pilots and controllers
  – Cross-border operations

• SESAR will incorporate lessons learned from the implementations for the benefit of the future SESAR research programme – this process is already under way
The Remote Tower concept enables Air Traffic Control services (ATS) and Aerodrome Flight Information Services (AFIS) to be provided at aerodromes where such services are either currently unavailable, or where it is difficult or too expensive to implement and staff a conventional manned facility.
MANUFACTURING INDUSTRY VIEW

Michael Ellinger
Solution Engineer & Product Manager in Tower Automation
Frequentis

FROM INNOVATION TO SOLUTION
More than 65 years of innovation & expertise in mission critical applications

We develop and market high reliable communication and information systems for mission critical applications in the fields of Air Traffic Management and Public Safety & Transport.

Worldwide Control Centres develop towards the same standards.
More aircrafts (UAVs) are operated from remote
Each airport has still its local control tower!
Remote Tower Centre

IP Network (Voice, Data, Video)

Enable Remote Capabilities

Contingency Solution

Centralize ATC services for airports
High res 360° panorama view

Enhancement via infrared technology

Working under all weather conditions
Controllable
detail view
Thermal Infrared Technology

- Equivalent Day and Night Visibility
- Enhanced Visibility in Heavy Rain, Snow/Sandstorm, Fog etc
- Better Ground / Sky Contrast
Enhancing the Tower View
Automatic detection of objects

Multiple objects are marked and tracked

Wind / RVR Overlay
Label Overlay & Tracking
Measure distance of objects

report **distance**, **speed** and **altitude** of tracked object in real time
Video based Safety Net
3D Surveillance with Data Integration
Remote Tower is more than Visualisation:

- **DIVOS**
  - Visualization & Surveillance
  - Information & Control
  - Communication
  - Flight Data Handling

- **smartVision**
  - Cameras, Alt. Sensors
  - Sensors, Airfield Lights, Nav Aids
  - Radios, Phone, Backup Radios
  - FDP System, AFTN, etc.

- **smartTools**
- **smart3020X**
- **smartStrips**

- **VCX**
- **ATM Network**

**FROM INNOVATION TO SOLUTION**
2014 – Operational Evaluation (Germany DFS)
Military Validation - Airpower Zeltweg (ÖBH)
International Activities on Regulation

- SESAR – Remote Tower Projects
  Work Package 6 & 12, Operational Specification / Safety Analysis / Validations
- EUROCAE Working Group
  - to be initiated by end of 2013 – WG100
  - Definition of Performance Standards for Visualisation
- ICAO Working Group – Aviation System Block Upgrade
  - Performance Improvement Area 1: Airport Operations (Remote TWR)
Multi airport handling is a key enabler!

- Apply a new working method
- Support controller with additional support tools
- Increase Automation
- Close integration of all systems
- Introduce new planning tools for balancing workload
THE AIR NAVIGATION SERVICE PROVIDERS
BUSINESS VIEW

Niclas Gustavsson
Director Business development & International affairs

LFV
The ANS Provider challenges

- ~20 Million people
- > 100 Airports
- Aviation is vital for rural the regions/towns
- ATC costs increasing
- Limited but important IFR traffic
- Each and one tower differently equipped
- Long opening hours, low utilization of staff ATC personal
- Limited flexibility (vacations, sick leave, overtime)
- Limitations low visibility sensors/features – cannot afford
In addition we need to secure...

- Local / regional access for medical evacuation
- Emergency situations needs airports 24/7
- 100% contingency solutions for larger airports are in demand – we cannot afford to stay closed
- Increased threats to society

TIME TO ACT!

FROM INNOVATION TO SOLUTION
So if we could......establish Remote Tower Services
Remote Tower Centre - RTC

• A Remote Tower Centre – RTC (or more)
• 24H availability
• Open/close on demand
• Streamlined systems to ease training, maintenance etc..
• Flexibility of staffing
• Back-up for each other
• Improved safety

Lower costs
A new type of airport tower!

- 14 Cameras
- 2 Zoom cameras
- 2 Signal lights
- 2 Microphones
- Infra red sensor

Duplicated if you need backup or having a large airport

~20% of the costs for building a new tower!
LFV RTS™ Business case

- 2008: Basic research
- 2012: Pilot ATS site RTC
- 2015: FOC
- 2017: Multiple airport services
- 2020: ?

- Single airport services
- Contingency services
- New add on services
- Airport security Services?

- Return on Investment - ROI

FROM INNOVATION TO SOLUTION
RTS – a cooperative effort

Airports
Staff org.
Industry
Airlines
SESAR
Regulator
LFV board
"the champions"
Media

FROM INNOVATION TO SOLUTION
If you ask me at ATC Global 2015!
Green light – operational approval - 2014
Thanks for your attention