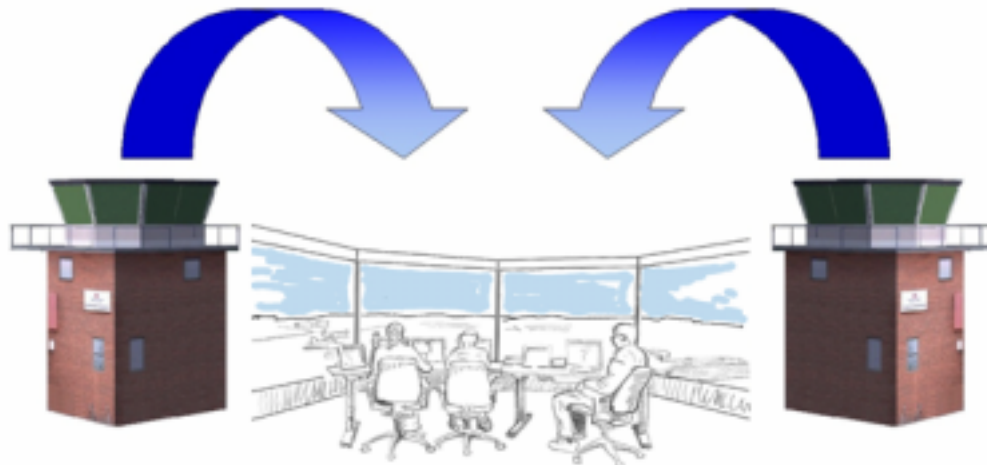


ART - Advanced Remote Tower



**A concept study of
Enhanced functionalities during low visual conditions
at Remotely Operated Towers;**

Kari Fält/Saab Project co-ordinator (kari.falt@saabgroup.com)

Project co-ordination and networking meeting – Brussels 9th-10th Jan 2007

ART Project

- **Consortium:**

- **Saab** (Sweden), project co-ordination, technical design, implementation, integration and evaluation of ATC systems
- **LFV** (Luffartsverket, Sweden), operational resources and expertise for specification, design, verification and validation, access to two airports in Sweden, ANS environment for Remote Tower Centre
- **NLR** (National Aerospace Laboratory, Netherlands), safety, EVV-planning
- **Equipe Electronics Ltd** (England), 360 degree seamless presentation system in cab
- **LYYN** (Sweden), specialized in Visibility Enhancement Technology (V.E.T)

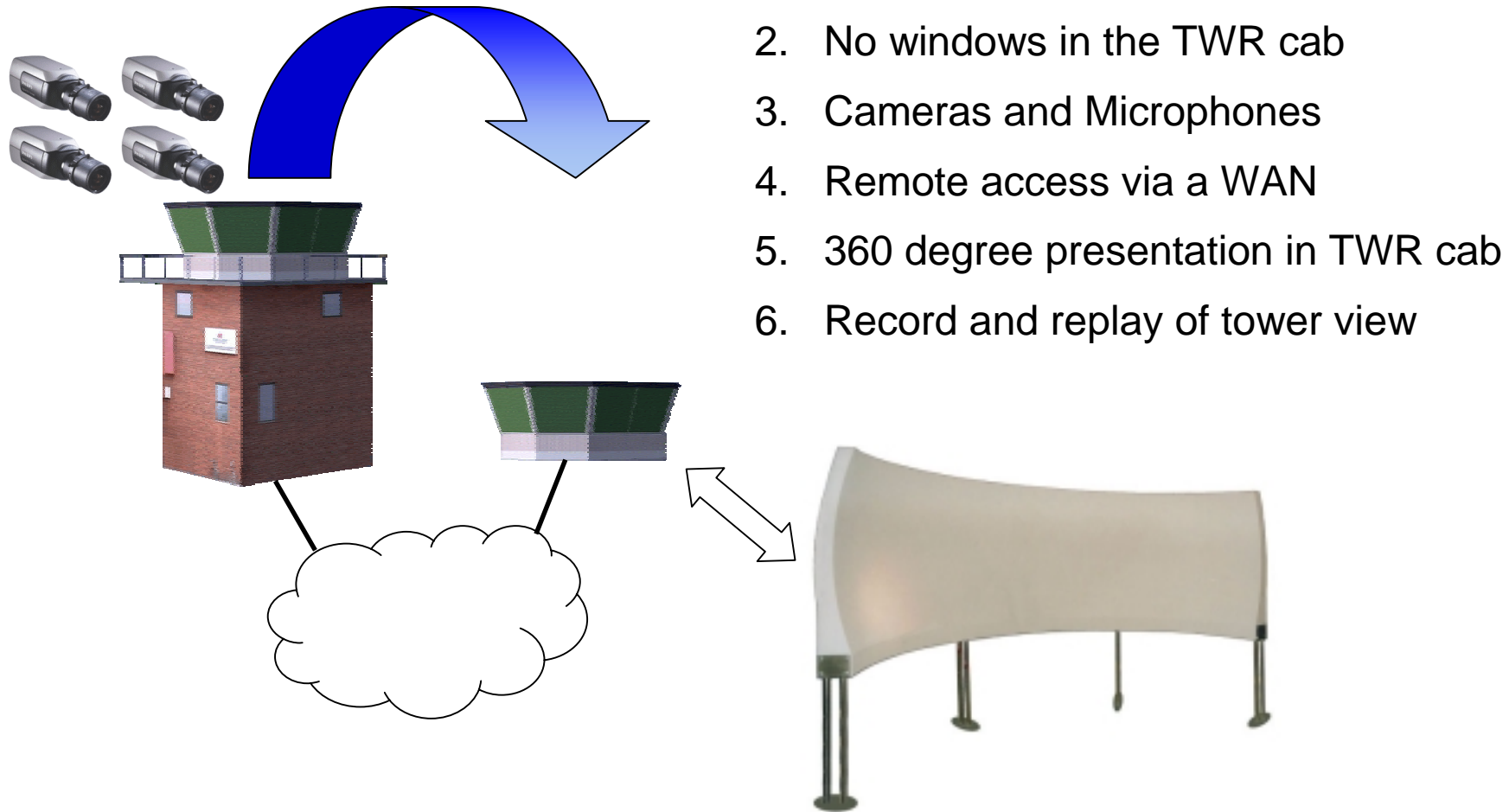
- **Budget and duration:**

- The total budget for the project is 2,9 MEuro
- 2 year project, start in April 2007

Project objectives

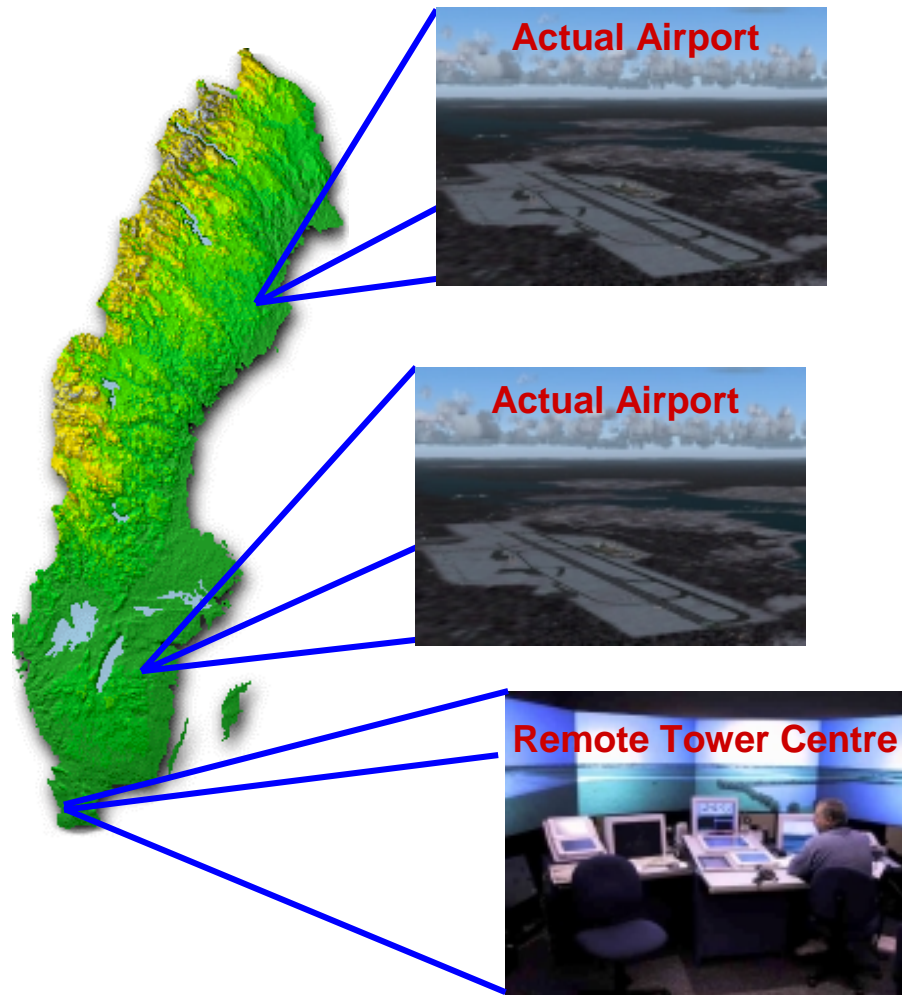
- **Current ATC concept:**
 - Low utilization of personnel resources
 - Need for redundant resources at each ATC unit
 - Adding new aids and sensors often implies stand-alone equipment
 - Stand-alone equipment adds to the head-down time removing focus from the primary field of view
- **ART change of the concept:**
 - Remotely operate ATC units at airports
 - Combine remote operation with enhanced visibility and composite presentation of view and operational data
 - Evaluate operational pros and cons of the remote airport concept
- **Expected benefits:**
 - Decrease ATC costs for low-density airports
 - Increased safety, by an enhanced situation awareness for air traffic controllers
 - A higher industry understanding of the technological benefits when merging diverse technology to a new media in order to support advanced remote control and monitoring

The Remote Tower



1. No air traffic controller in TWR building
2. No windows in the TWR cab
3. Cameras and Microphones
4. Remote access via a WAN
5. 360 degree presentation in TWR cab
6. Record and replay of tower view

RTC - Remote Tower Centre



1. RTC with TWR cabs for remote control and monitoring of airports
2. No geographical limitations
3. ATC units co-located in RTC
4. ATC personnel in RTC controls the Actual Airports
5. More efficient ATC service

Tower view in the cab

1. Overlay of labels on the view
2. Overlay of weather information
3. Virtual view of runway

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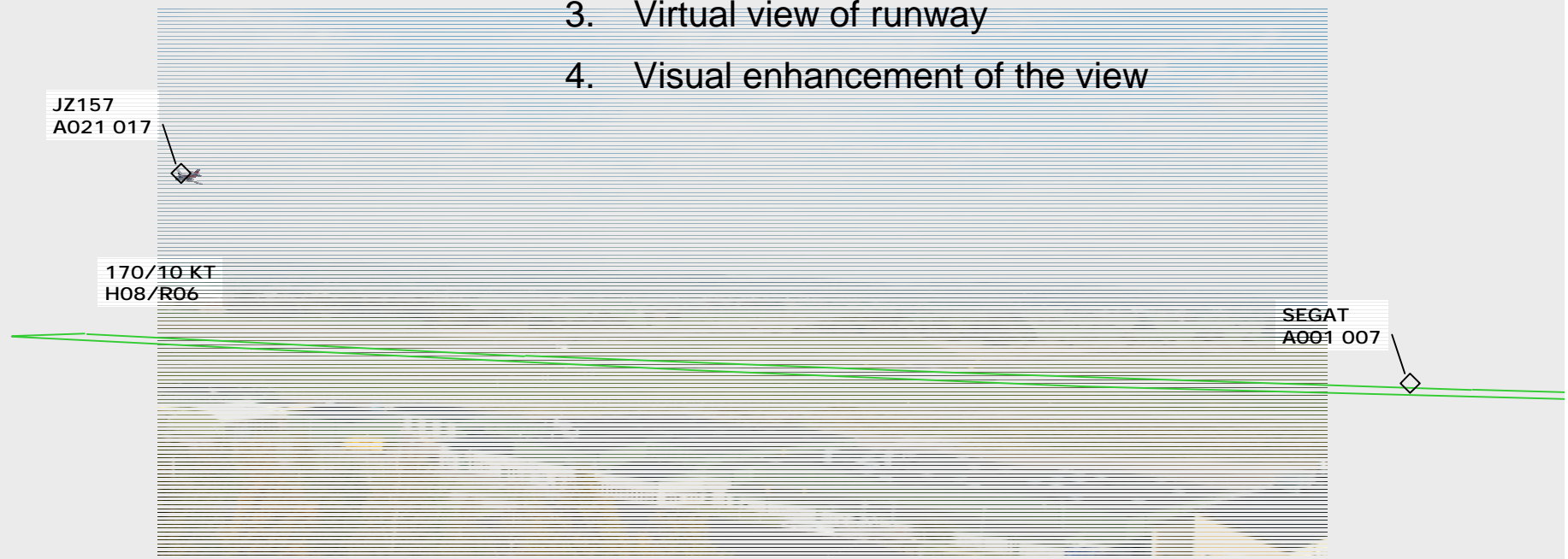
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Tower view in the cab

1. Overlay of labels on the view
2. Overlay of weather information
3. Virtual view of runway
4. Visual enhancement of the view



Visual enhancement in tower cab



ART – Advanced Remote Tower



Relevance to SESAR

- Harmonisation (other countries can learn from ART)
- Interconnectivity (remote airport control could be extended cross countries, using ART remote technology)
- Safety on regional airports, that will see increase in traffic, but have no tower
- Redundancy (if some ATC unit fails, other units could take over by means of ART-like remote control)
- Security benefits that actually fall under:
 - Other use of enhanced vision and data fusion techniques (not for remote airports only)