AFIS operations in a Remote TWR Centre environment

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What is New in RTC?

- Almost Everything

- However, the job remains the same (!) i.e AFIS shall be provided in the same manner as today, and the costumer will experience no difference

- Some challenges here? How do we manage the change?

- And we are still talking only Single operations

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The Camera Solution

Pan Tilt Platform (PTP)

360 VIS and 360IR

Optical sensors:
  360-camera
  360 IR-camera
  Pan-Tilt-Zoom (PTZ)
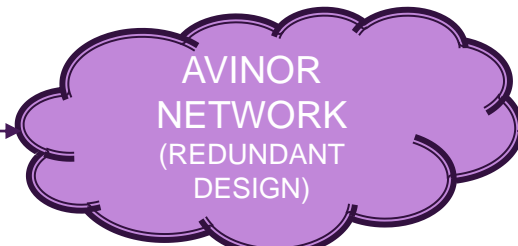 IR-Zoom
  Signal Light Gun (SLG)
  Laser Range Finder (LRF)

TECHNOLOGY

Optical sensors:
  360-camera
  360 IR-camera
  Pan-Tilt-Zoom (PTZ)
  IR-Zoom
  Signal Light Gun (SLG)
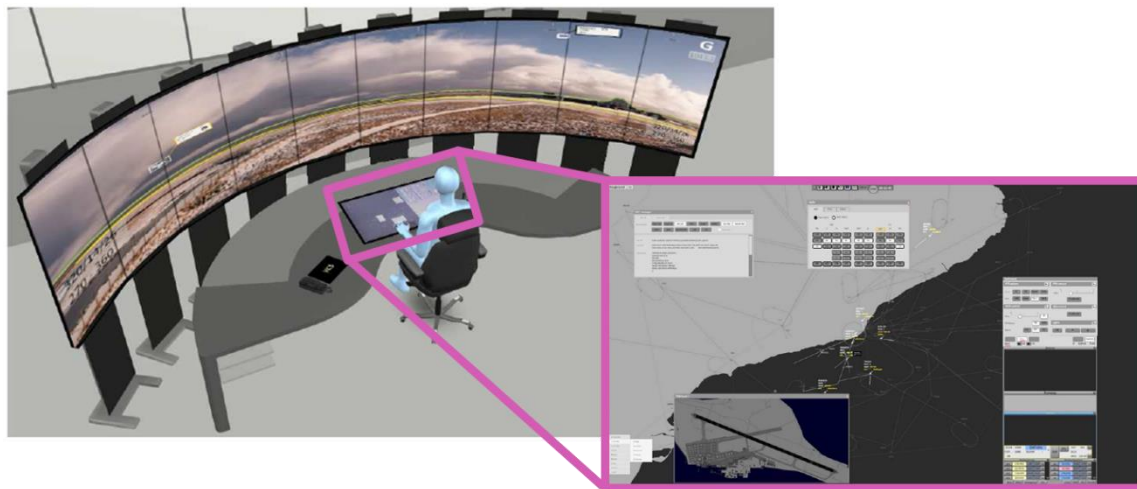 Laser Range Finder (LRF)

Local servers

AVINOR NETWORK (REDUNDANT DESIGN)

Airport lighting systems

MET-sensors (AWOS)

COM-NAV-SUR

REMOTE TOWER CENTRE

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Remote Tower Module

Remote Tower Center

Relax, kitchenette

Brief

Op.s

Storage Space and Offices with non load-bearing wall
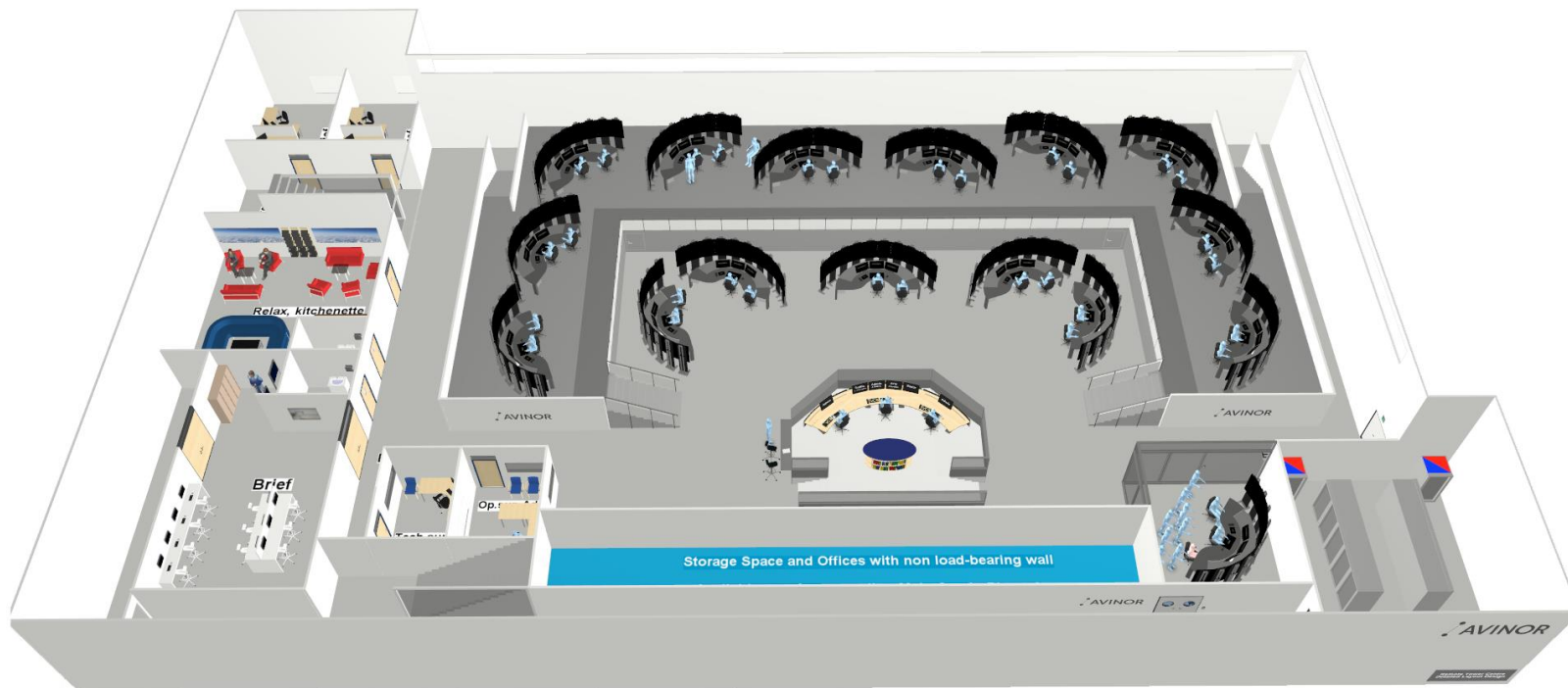
Main Entrance

New MAIN RTC (MRTC) in BODØ

Change in HMI and Procedures
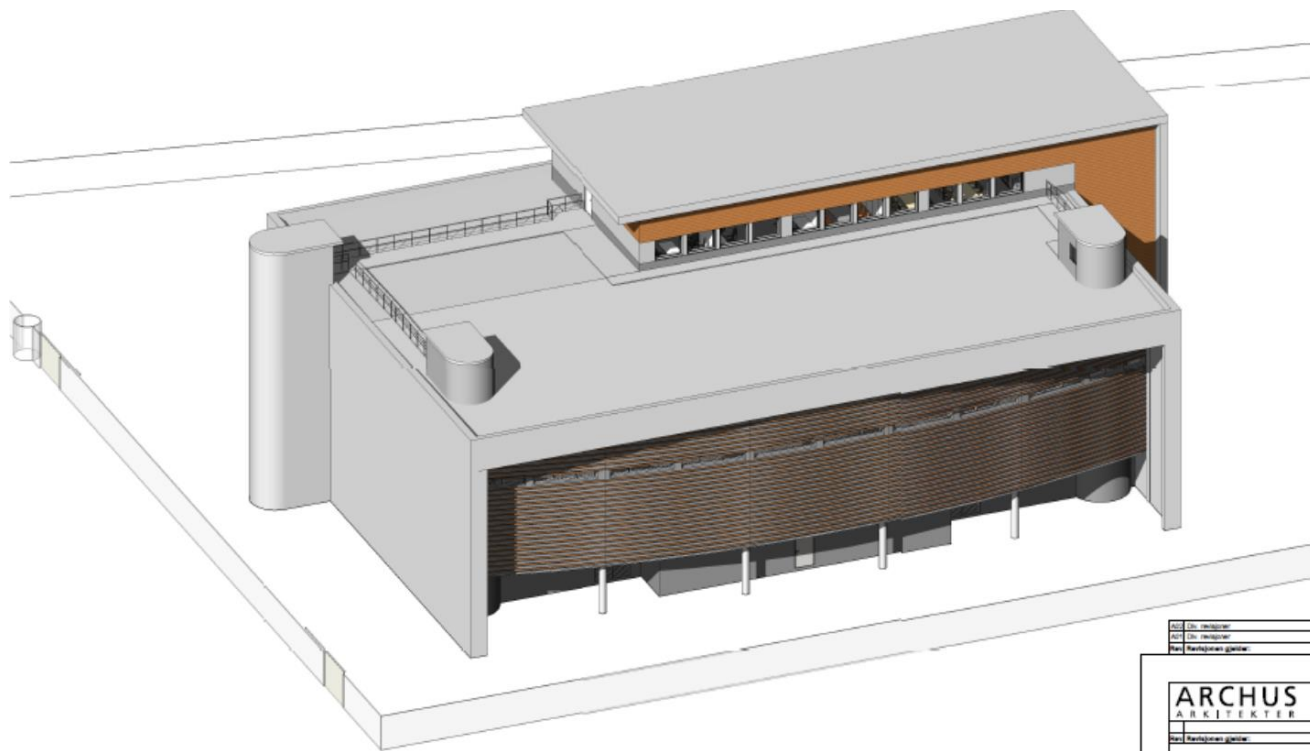
Main Challenges

- Moving people
- New equipment/Introducing SUR/HMI equals training
- New working environment
- Supervisory function

How do we overcome the challenges?

- Since day 1 operators (ATCOs/AFISOs) have been involved in the development of the system and leads the Core Design Team
- Development of HMI and Control Room Design have been assisted by leading experts/companies in Norway
- Involvement from unions and information to the Avinor ANS organisation on regular intervals
- Good and constructive dialog with NCAA
- Safety case
- Human Performance Analysis/Case
- Solid support from management

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Understanding The Change to RTS

What is Human Performance about?

- Human as a central element to
  - create **safety** in a complex system
  - enable **performance** (expected benefits) in the future environment

- To optimize interactions between humans and systems, work environments and organizations

- To guarantee that complex support tools are integrated and accessible in a simple and intuitive way for operator's use

- To enable operators to focus on their main tasks (ATS)

What is Human Performance about?

The HP work areas correspond to top-level arguments with sub-arguments that we want to prove:

1. The role of the human is consistent with human capabilities and limitations.
   - 1.1 Roles and responsibilities of human actors are clear and exhaustive.
   - 1.2 Operating methods (procedures) are exhaustive and support human performance.
   - 1.3 Human actors can achieve their tasks (in normal & abnormal conditions of the operational environment and degraded modes of operation).

2. Technical systems support the human actors in performing their tasks.
   - 2.1 There is an appropriate allocation of tasks between the human and machine (i.e. level of automation).
   - 2.2 The performance of the technical system supports the human in carrying out their tasks.
   - 2.3 The design of the human-machine interface supports the human in carrying out their tasks. (alarms, CWP)

3. Team structures and team communication support the human actors in performing their tasks.
   - 3.1 Effects on team composition are identified.
   - 3.2 The allocation of tasks between human actors supports human performance.
   - 3.3 The communication between team members supports human performance.

4. Human Performance related transition factors are considered.
   - 4.1 The proposed solution is acceptable to affected human actors..
   - 4.2 Changes in competence requirements are analysed.
   - 4.3 Changes in staffing requirements and staffing levels are identified. (HR)
   - 4.4 The impact on recruitment and selection processes has been considered. (HR)
   - 4.5 Training needs are identified for the affected human actors. (content, duration, required types of training)

MAIN AREAS OF THE HUMAN PERFORMANCE CASE

1. Roles and responsibilities
   a) Operational methods
   b) Tasks
2. Human and systems
   a) Task distribution (human/system)
   b) System performance
   c) Human Machine Interface
3. Team and team communication
   a) Team
   b) Task distribution between teammembers
   c) Team communication

4. Working environment
   a) Design of controller working position
   b) Physical working environment
5. Organisation and staffing
   a) Accept and job satisfaction
   b) Competency requirements
6. Training
   a) Training plans

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BUILDING THE SAFETY CASE

- Operational Concept for Single RT operations developed
- Concept was base for a functional hazard identifcation work shop. Goal:
  - ✓ Identify and assess hazards;
  - ✓ Establish safety objectives for the RT concept
- The Functional Hazard Assessment (FHA) was brought further to a Preliminary System Safety Assessment (PSSA). Goal:
  - ✓ Establish initial safety requirements to the system as a whole (technology, procedures, people);
  - ✓ Safety requirements formed part of tender documents
- A similar process to assess human factors:
  - ✓ Work shops to establish main drivers and requirements to the system – particularly for the development of technology
  - ✓ HP Requirements formed part of tender documents

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TRANSITION INTO OPERATION

- **Acceptance:**

The proposed solution is acceptable to affected human actors
- ✓ *Changes in roles and responsibilities*
- ✓ *Impact of changes on job-satisfaction*

- **Competency**

Changes in competence requirements are analysed
- ✓ *Knowledge, skills and experience requirements*
- ✓ *Impact on operator licensing*
- ✓ *Possible interference between existing and new knowledge and skills*

- **Staff:**

Changes in staffing requirements and staffing levels are identified
- ✓ *Impact on staff levels*
- ✓ *Impact on shift organization*
- ✓ *Impact on workforce location*

- **Recruitment and Selection:**

The impact on recruitment and selection processes has been considered
- ✓ *Changes in operator´s profiles*
- ✓ *Changes in selection criteria*

- **Training:**

Training needs are identified for the affected human actors
- ✓ *The content of training for each actor group*
- ✓ *The duration of training for each actor group*
- ✓ *The required types of training (classroom, simulator, OJT)*

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Other interesting projects that affects RTC/AFISOs

- iPad/Trac

- Horizon

To Conclude

- Remote Towers is more than an equipment change
- Technology is important but not the most important enabler to make operations a success
- The consideration of the human is key to make this a success for safety and business expectations