Remote Tower Technical Specifications

Document information	
Project title	Remotely Operated Tower Multiple Controlled Airports with Integrated Working Position
Project N°	12.04.07
Project Manager	NATMIG
Deliverable Name	Remote Tower Technical Specifications
Deliverable ID	D09
Edition	01.00.00
Template Version	03.00.00

Task contributors
FREQUENTIS, INDRA, NATMIG, NORACON, SELEX

Please complete the advanced properties of the document

Abstract

The objective of this document is to produce a technical specification that should work as a generic specification for Remote Tower for the future, and not as a template for implementation of a specific prototype. The Remote Tower is a new area without any earlier specifications and there is a need to write a specification foundation for the total concept.
This technical specification will be produced in four iterations:

- Iteration1 (D05) - First draft of Single Remote Tower
- Iteration 2 (D06) - Finalizing Single Remote Tower draft and first draft of the Multiple Remote Tower & Contingency
- Iteration 3 (D07) - Finalizing Multiple Remote Tower & Contingency
- **Final iteration(D09) - Finalizing all parts of the document**

Authoring & Approval

Prepared By - *Authors of the document.*		
Name & Company	Position & Title	Date
[redacted] (Saab/NATMIG)	[redacted]	2014-04-23
[redacted] (Saab/NATMIG)		2014-11-12
[redacted] (Saab/NATMIG)		2015-05-18
[redacted] (Saab/NATMIG)		2016-01-11

Reviewed By - *Reviewers internal to the project.*		
Name & Company	Position & Title	Date
[redacted] (Saab/NATMIG)	[redacted]	2015-12-03
[redacted] (Saab/NATMIG)		2015-12-03
[redacted] (Indra)		2015-12-03
[redacted] (LFV/NORACON)		2015-12-03
[redacted] (Frequentis)		2015-12-03
[redacted] (Frequentis)		2015-12-03
[redacted] (Indra)		2014-05-21
[redacted] (Indra)		2015-10-16
[redacted] (Indra)		2015-08-24
[redacted] (Selex)		2015-12-03

Reviewed By - *Other SESAR projects, Airspace Users, staff association, military, Industrial Support, other organisations.*		
Name & Company	Position & Title	Date
[redacted] (LFV/NORACON)	[redacted]	2015-12-03
[redacted] (LFV/NORACON)		2015-12-03
[redacted] (Saab/NATMIG)		2015-12-03
[redacted] (Avinor/NORACON)		2015-12-03
[redacted] (Indra)		2015-10-15
[redacted] (Thales)		2015-10-15
[redacted] (Selex)		2015-12-03
[redacted] (DFS)		2015-12-03

Approved for submission to the SJU By - *Representatives of the company involved in the project.*		
Name & Company	Position & Title	Date
[redacted] (Saab/NATMIG)	[redacted]	2016-01-11
[redacted] (Saab/NATMIG)		2016-01-11
[redacted] (LFV/NORACON)		2016-01-11
[redacted] (Selex)		2016-01-11
[redacted] (Frequentis)		2016-01-11
[redacted] (Frequentis)		2016-01-11
[redacted] (Indra)		2016-01-11

Rejected By - *Representatives of the company involved in the project.*

Name & Company	Position & Title	Date

Rational for rejection
None.

Document History

Edition	Date	Status	Author	Changed sections:	Justification
00.01.01	2012-10-10	First draft of Iteration 2 - D05 deliverable.	[redacted]		Corrected requirements tables for import into DOORS. Version 3 of the TS template.
00.01.02	2012-11-26	Finalizing Single Remote Tower - D05 deliverable.		All	Updated sections according to work split.and pending issues table.
00.01.03	2013-04-25	First draft Multiple and Contingency Remote Tower - D06 deliverable.		All	Updated sections according to work split.and pending issues table.
00.01.04	2013-06-07	Revised draft of Multiple and Contingency Remote Tower - D06		All	Updated sections according to comments

		deliverable.	[redacted]		
00.02.00	2013-08-21	Final version of Multiple and Contingency Remote Tower - D06 deliverable.			Updates based on comments from project members on revised version 00.01.04
00.02.01	2014-04-23	Updated version 2 after preliminary assessment		All	Update on version 2 based on preliminary feedback from SJU
00.02.02	2014-05-21	Updated version 2 after member review			Clarification on functional block allocation
00.02.03	2014-08-11	Updated first page			
00.02.04	2014-11-12	Revised after SJU assessment report			
00.02.05	2015-05-18	Updated after member review		All	Updated sections according to comments
00.02.06	2015-06-18	Updated after member review		All	Updated sections according to comments

			[redacted]		
00.02.07	2015-08-16	Updated after member review		1.6, 1.7, 2.1, 2.2, 3	Updated sections according to comments
00.03.00	2015-08-27	Final version of Multiple and Contingency Remote Tower - D07 deliverable		All	Updates based on comments from reviewers
00.03.01	2015-09-01	Updated final version of Multiple and Contingency Remote Tower - D07 deliverable		Corrected footer, and updated authoring & approval info.	Updates based on comments from reviewers
00.03.02	2015-09-21	Updated version after review.		2.6, Appendix A.	Updates based on comments from reviewers
00.03.03	2015-10-13	Updated D07 version after SJU review.		All	Update based on feedback from SJU
00.03.04	2015-10-19	Updated D07 version.		All	Updates based on feedback from internal and external reviewers
00.03.05	2015-11-24	Updated D07 version		3, 5, Appendix B	Updates based on feedback from SJU
00.03.06	2015-11-26	D09 Draft		All	Updates according to internal and external review. Updates reflecting changes in ADD and OSED documents.
00.04.00	2016-01-11	D09 Final		All	Updates

			[redacted]		according to internal and external review.
01.00.00	2016-03-07	D09 Final		Minor	Comments from SJU assessment

Intellectual Property Rights (foreground)

SJU foreground.

Table of Contents

List of figures

Executive summary

This document defines the general functional capabilities and technical requirements that satisfy the OFA06.03.01 OSED for Remote Provision of ATS to Aerodromes. The purpose is not to answer *how* a remote/virtual tower is implemented nor to describe a specific solution, but to describe on a general level the functionality such a solution must provide in order to fulfil the operational methods and scenarios described in the OSED. The purpose is also to provide a requirement description that fulfil the operational and functional requirements, and that can be used by stakeholders to procure a specific implementation.

The OSED describes three new SESAR operational methods, all addressed from a technical perspective in this document:

- Remote Provision of Air Traffic Services for a Single Aerodrome;
    - P12.04.07 has developed three platforms, that have been validated by P06.09.03
        - Two live platforms in (airport site -> RTM site) Ängelholm->Sturup, Sweden (EXE-06.09.03-VP-056, EXE-06.09.03-VP-057)
        - One live platform in Vaeröy->Bodö, Norway (EXE-06.09.03-VP-058)
- Remote Provision of Air Traffic Services for Multiple Aerodromes;
    - P12.04.07 has developed three platforms that have been validated by P06.09.03
        - One live platform in Sundvall+Örnsköldsvik->Sundsvall (EXE-06.09.03-VP-061)
        - One live platform in Röst+Vaeröy->Bodö (EXE-06.09.03-VP-063)
        - One simulation platform in Växjö for real time simulation of Halmstad, Kristianstad and Ängelholm airports. (EXE-06.09.03-VP-060)
- Remote Provision of Air Traffic Services in Contingency Situations at Aerodromes
    - P12.04.08 has developed three platforms
        - Two live platforms in Landvetter->Landvetter, validated by P06.09.03 (EXE-06.09.03-VP-059 1A, EXE-06.09.03-VP-059 1B)
        - One live platform in Girona->Girona, validated by P06.08.04 (EXE-06.08.04-VP-751, EXE-06.08.04-VP-752)

The main change in the new operating methods is that the ATCO of AFISO will no longer be located at the aerodrome. They will be re-located to a Remote Tower Module, often co-located in a Remote Tower Centre. The views of the aerodromes are then visually reproduced in the Remote Tower Module using either Remote Tower technology (live video capture using cameras) and/or Virtual Tower technology (3D models supported by surveillance data). This document will not cover the virtual tower concept in any depth, since no validations have been made on that platform.

The content of this document will be based both on experience from previous projects as well as a series of P06.09.03 remote tower validations within all three mentioned operational applications.

In the final version of the document relevant requirement is updated with configurations and hardware parameters used in platforms in different validations. This makes it possible to look in to validations results using the different validations reports (VALR) for each validation.

1 Introduction

1.1 Purpose of the document

This document describes the functions of a remote tower solution and provides a requirement specification for those functions. The aim is not to answer *how* a remote tower is implemented nor to describe a specific remote tower solution, but to describe on a general level the functionality such a solution must provide in order to fulfil the operational methods and scenarios described in the OFA06.03.01 OSED for Remote Provision of ATS to Aerodromes. The purpose is also to provide a requirement description that can be used by stakeholders to procure such a technical solution.

Previous versions of this document aimed to define a “virtual tower” concept in addition to remote tower, but this ambition has been dropped since no validation platform of this concept has been produced or validated.

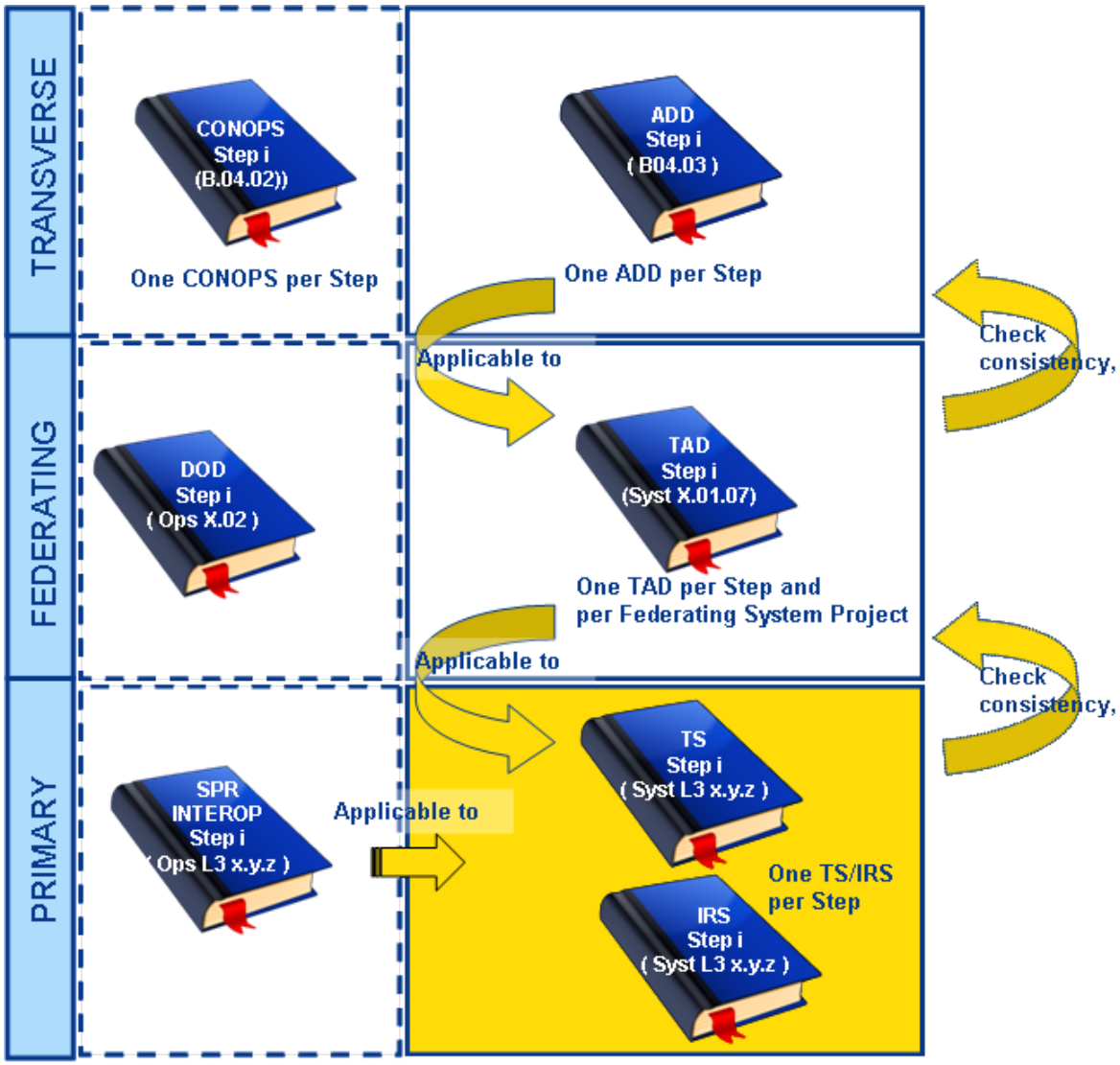


Figure 1 - The position of the technical specifications with regards to the other SESAR deliverables

The target architecture will be defined in the ADD [7], while the further breakdown will be done in the TAD [6] for each ATM system and in the TS (this document) for ATM Functional blocks. This

document will address the P12.01.07 TAD [6] functional blocks impacted by the concept. This information will be used in a “bottom-up” approach to extend the TAD [6] with relevant architectural design.

In addition, the technical specifications will satisfy the operational and functional requirements described in the OFA06.03.01 OSED [5].

1.2 Intended readership

The intended audience for this document are corresponding operational projects P06.09.03 & P06.08.04 and members of related technical projects P12.04.06, P12.04.07 and P12.04.08. The functional description is of interest to P12.01.07 for functional decomposition of the Tower CC domain using a “bottom-up” approach.

In the extension of the SESAR programme, the document is aimed at air navigation service providers (ANSPs) or airport owners/providers for procurement of a remote or virtual tower solution, and for the concerned industry to develop such a solution.

1.3 Inputs from other projects

A proof of concept remote tower platform was developed by Saab and LFV in the Remotely Operated Tower (ROT) project. The purpose of the ROT project was to prove that air traffic services could be provided from a remote location. The platform was further enhanced during the Advanced Remote Tower (ART) project. This platform is used as a background technology base in the project for validating new features and concepts with SESAR.

P06.09.03 is providing all the operative input required to develop the technical specifications, including the OSED, safety assessments, human factors aspects etc.

- During the project lifetime, P12.04.06 is continuously providing technical enablers that are integrated into the validation platforms.

1.4 Structure of the document

This document is organized as follows:

Chapter 1: Purpose and scope; Requirements structure; Functional block purpose and high level overview

Chapter 2: General functional blocks description

Chapter 3: Functional block requirements

Chapter 4: Assumptions

Chapter 5: Referenced documents

Appendix A: Human factors - CWP and OTW view

Appendix B: Deleted functional block requirements

1.5 Requirements Definitions – General Guidance

The requirements in this document have been developed according to the SESAR Requirements and V&V Guidelines (ref.[2]) and the SESAR Template Toolbox (ref.[3]).

1.6 Functional Block Purpose

The B4.3 Architecture Design Document (ADD) [7] contains a functional breakdown of the Aerodrome ATC Domain System and the Aerodrome Voice Domain. The objective of the *Remote Provision of*

ATS to Aerodromes concept is to provide *all* applicable functions within these domains, but to do so from a remote location i.e. not from the Control Tower local to the aerodrome.

As the domains themselves are the target for the concept rather than the functional blocks within the domains, more than one functional block will be addressed in this document. The technical differences between the current operating method and Remote Provision of ATS are described in chapter 2.6, in the context of each functional block.

1.7 Functional Block Overview

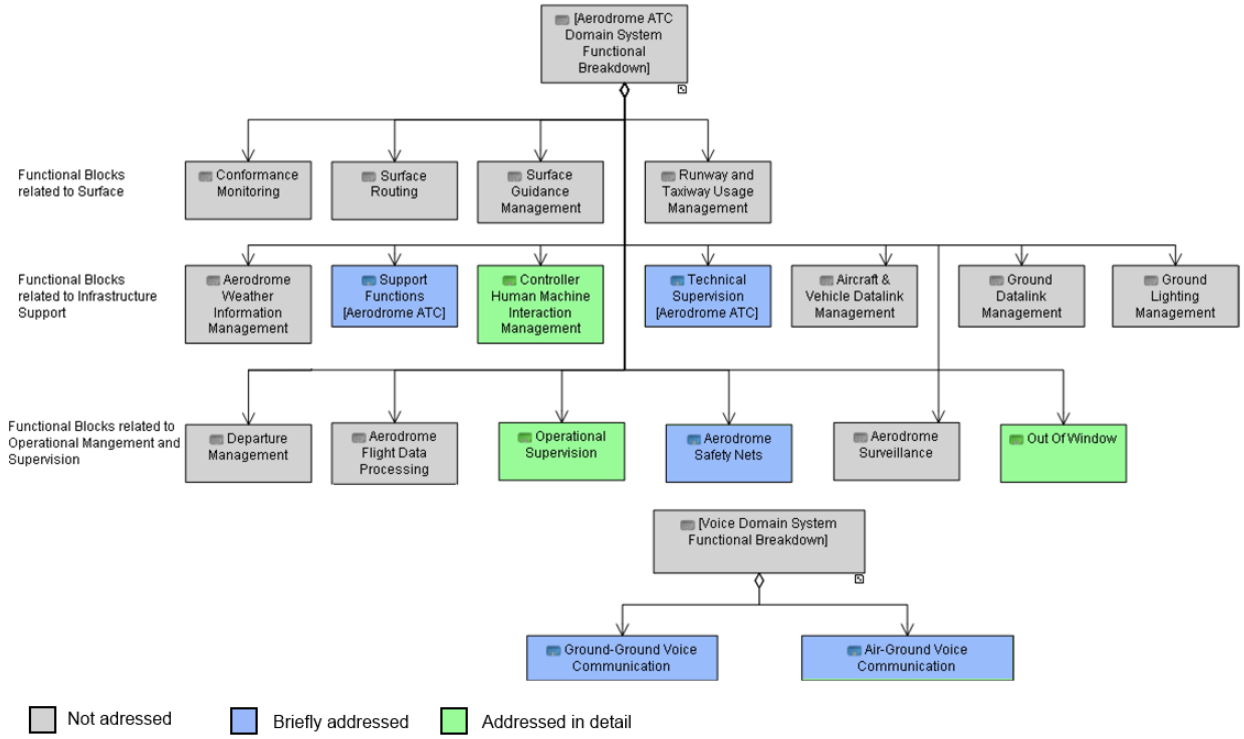


Figure 2 - Addressed functional blocks

Figure 2 shows the functional blocks within the domains impacted by the *Remote Provision of ATS* concept. Some blocks are substantially impacted (marked green in Figure 2) and will be addressed in detail in this document:

- **Controller Human Machine Interaction Management** provides the controllers with a graphical user interface and with the means to interact with the aerodrome ATC system. This document will address a graphical user interface that allows an ATCO or AFISO to remotely provide ATS to multiple aerodromes simultaneously from a single working position.
- **Out the Window** provides Tower Controllers with a clear view of the real traffic situation and with all the necessary traffic data concerning a Remote Tower of another aerodrome ATC system, in order to assist them in their control tasks.

  OTW can also help the Tower Controller to identify targets in Low Visibility with the support of the Aerodrome Surveillance Data. These data are the result of merging the surveillance information provided by the different surveillance sources providing a unique picture of the actual traffic situation.

  The remote tower implementation will use these sensors (with the possible addition of camera sensors) and provide the ATCO or AFISO with a visual presentation of the aerodrome to allow ATS to be provided remotely.

- **Operational Supervision** allows the supervisor to manage the most appropriate operational configuration, according to traffic demands and needs, and to react in case of system fault, re-assigning and distributing available resources in order to maintain adequate safety levels and quality of service. The remote tower concept introduces a new description of the operational supervision in the context of a Remote Tower Centre.

Some of the functional blocks will be impacted in a minor way only (as marked in Figure 2) and will only be briefly addressed in this document. They include:

- **Support functions:** Recording of visual aerodrome data.
- **Technical Supervision:** Increased focus on remote and centralised supervision.
- **Aerodrome Safety Nets:** New safety net opportunities with visual data available.
- **G-G / A-G Voice communication:** Limitations on local aerodrome solutions.

NOTE: These functional block names conform to the current ADD [7]. Some changes to the names are anticipated in future versions of the ADD and TAD [6] according to EATMA [8] v6.0.

1.8 Glossary of terms

The document uses the following important top level naming conventions:

Where reference is made to the actual Control Tower building, the full word "**Tower**" is used e.g. the local Tower is 87 metres tall.

Aerodrome Control Service (**TWR**) is the air traffic control (ATC) service provided by the Air Traffic Control Officer (**ATCO**) for an aerodrome.

Actor is specified as role played by a user or any other system that interacts with the system (subject).

AFIS is the Aerodrome Flight Information Service provided by an **AFISO** (Aerodrome Flight Information Service Officer).

APP (Approach control service) is the service for Arrival and Departing traffic (before and after they will be/have been under the TWR control. APP is provided by a single ATCO for one or more airports, either separate or in combination with TWR (TWR & APP from the Tower).

ATS (Air Traffic Service) is a generic term for the three services Flight Information Service (FIS), Alerting Service (ALRS) and Air Traffic Control Service (ATC). (ATC is then subdivided into the three services of TWR, APP and ACC (Area Control Service).) In this document, when the term ATS is used, it is usually referring to TWR or AFIS in the context of Single & Multiple applications, however referring to TWR only in the context of Contingency applications.

Remote Tower is where ATS are remotely provided through the use of direct visual capture and visual reproduction e.g. through the use of cameras.

Virtual Tower is where ATS are remotely provided through the use of computer generated images of the aerodrome, aircraft and vehicles, and/or surveillance e.g. through the use of terrain mapping and computer modelling of aerodromes.

Single Remote Tower is where a remote tower module is able to connect to a single airport at a time. (May connect to more than one airport, but not in parallel.)

Multiple Remote Tower is where a remote tower module is used to control several airports in parallel.

Local/Remote Control refers to the current state of a Remote Controlled Airport (RCA) in respects of from where ATS is provided for the aerodrome at the moment. It is either controlled from the local tower (Local Control) or from an RTC (Remote Control). Example use: "*The airport is controlled locally*

during day-time and controlled from the RTC during night-time" or "*Local Control is transferred to the RTC during unforeseen events that does not allow ATS to be provided from the Tower*".

CWP (Controller Working Position) is the operator (ATCO/AFISO) work station including necessary ATS systems. Unlike Remote Tower Module (RTM), the term CWP excludes the visual presentation.

Visual Presentation is the term for the collected aerodrome sensor data (from cameras and/or other sensors) and presented to the ATCO/AFISO in order to provide situational awareness of the aerodrome and its vicinity. Note that other terms such as Visual Reproduction and Visual Representation have been applied throughout the lifetime of the projects. The definition of the terms should be taken as identical to the definition provided for visual presentation.

OTW view (Out-The-Window view) is a narrower term than visual reproduction and only refers to the actual view of the aerodrome (as the ATCO would have through the window of a tower, hence the name). Example use: "*The coverage of the OTW view is 42 degrees vertical and 360 degrees horizontal*".

Video image refers to the image produced by the airport camera sensors. It is either used to describe a data or network flow or when talking about characteristics of the image rather than the entire view (OTW view). Example use: "*The visual reproduction is in a degraded mode if one or more video images are delayed, frozen, corrupt or unavailable*".

Remote Tower Module (RTM) is the term for the complete module including both the CWP(s) and the Visual Presentation display screens. An RTM is defined as a work station for an operator. The RTM will enable the remote tower operator to maintain a view over the aerodrome including the manoeuvring area and surfaces as stipulated in regulation. The RTM may be located on the aerodrome site or at a location remote to the aerodrome. Independent of the exact location of the RTM a specialist facility/building is not required to house the RTM and location of the facility is flexible. The RTM is independent of the concept of operations being applied within and hence may be used to provide an ATS to single or multiple aerodromes or during contingency.

A **Remote Tower Centre** (RTC) is a centralised facility housing one or more RTMs where the provision of a remote ATS may be provided to one or more aerodromes.

A **Remote Contingency Tower** (RCT) facility is a facility used to provide remote ATS, including a visual reproduction, to an aerodrome in contingency situations.

PTZ (Pan-Tilt-Zoom) is a technical solution used in the trials to fill the function of the binoculars in a Tower. It comprises (at least) a zoom camera mounted on a pan-tilt head. The movement and zoom can be controlled from the RTM.

1.9 Acronyms and Terminology

Term	Definition
ACC	Area Control Centre
ADD	Architecture Definition Document
ADS-B	Automatic Dependant Surveillance - Broadcast
AFIS	Aerodrome Flight Information Service
AFISO	Aerodrome Flight Information Service Officer
APOC	AirPort Operations Centre
APP	Approach

Term	Definition
A-SMGCS	Advanced Surface Movement Guidance & Control System
ART	Advanced Remote Tower Research Project
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
ATS	Air Traffic Service
CHMIM	Controller Human Machine Interaction Management
CWP	Controller Working Position
ICAO	International Civil Aviation Organization
ILS	Instrumental Landing System
OSED	Operational Service and Environment Definition
OTW	Outside The Window
ROT	Remotely Operated Tower (proof of concept project)
RTC	Remote Tower Centre
RTM	Remote Tower Module
RVT	Remote and Virtual Tower Project
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
SLG	Signal Light Gun
TAD	Technical Architecture Description
TS	Technical Specification
TWR	Aerodrome Control Service (which is a subset of ATC Service)
VCS	Voice Communication System

2 General Functional Block Description

2.1 Context

The main change about Remote provision of ATS for Aerodromes is that the ATCO or AFISO will no longer be located at the aerodrome. They will be re-located to Remote Tower facility or a Remote Tower Centre (RTC) which will be remotely connected to (at least) one airport being able to perform all ATS tasks from this remote location.

In order to provide Remote TWR Air Traffic Control Service, the remote location will require a visual representation of the aerodrome in which ATS is to be provided through the use of cameras or other sensors that will be placed at the local aerodrome.

It should be noted that technical elements required for the provision of ATS from a Remote location are (usually) common to single, multiple or contingency concepts.

2.1.1 Visual presentation

The visual presentation in the Remote Tower replaces the OTW view from the local tower building.

The OTW view is obtained by a number of cameras, mounted on top of the local tower or on a separate tower structure, covering partial or totally the tower field of view.

Those cameras capture the image at the local aerodrome and reproduce it over display screens arranged around the controller.

- Binocular Function: A binocular functionality performed by Pan-Tilt Zoom (PTZ) cameras should replace the manually operated binocular which is currently used in the local aerodrome tower to facilitate the visualisation of certain items of interest. (e.g. engine on fire, landing gear extended..)

- Advanced Visual Features:
  - Automatic visual tracking: The PTZ camera will be used for the automatic visual tracking of objects. The automatic visual tracking may increase the ATCO's / AFISO's ability to spot and follow relevant objects.

  - Overlay information: The visual reproduction may be enhanced with additional overlaid information, such as meteorological conditions (e.g. QNH, actual wind, RVR…), flight information obtained from Flight Plan Data, etc.

  - Low Visibility conditions or darkness: Low Visibility Conditions require specific procedures even when operating from a remote location. That procedures can include advanced technology such as infrared cameras which provides a thermographic representation of the focused area, could be used as a supplement to the regular cameras enhancing controller vision during that periods.

  - Additional viewpoints: Additional cameras may be used at selected positions such as, hot spots or dead zones not visible from the local tower, to enhance the situational awareness of the controller.

2.1.2 Controller Working Position

The controller should be provided with a Controller Working Position (CWP) which enables the provision of ATS from an RTM. The system should fulfil the characteristics of the aerodrome to be controlled, along with new features that would help the controller.

As main features the CWP should contain:

- Electronic or Paper Flight Strips
- Ground/Air Communications

Some other functionalities should be also useful depending on the local needs

- Air situation display
- Ground situation display
- Functionality for manoeuvring and controlling:
    - Airport lights;
    - Signal Light Gun;
    - Navigation aids;
    - Meteorological information;
    - ILS;
    - Alarms;
    - Other airport systems.

2.1.3 Aerodrome Sound

In order to improve the situational awareness of the controller, aerodrome's background sounds can be captured with a microphone and played back in the RTC.

2.2 Functional Block Modes and States

Functional blocks Modes and States here analysed come from the Functional Breakdown of the Aerodrome ATC and Aerodrome Voice Domain Systems provided in the TAD [6] by P12.01.07, as depicted in section 1.7.

The main functional blocks addressed in this process are:

- Controller Human Machine Interaction Management: This functional block provides controllers with a graphical user interface and with the means to interact with the Aerodrome ATC system.
- CHMIM functional block main responsibility is to provide any relevant information to the external actor and provide any support for actor's insertion of new information or modification of the existing information through the HMI.
- Out the Window: This functional block provides the controller with a clear view of the real traffic situation and with all the necessary traffic data concerning a Remote Tower of another Aerodrome ATC system, in order to assist them in their control tasks.
- Operational Supervision: This functional block allows the Supervisor to manage the most appropriate operational configuration, according to traffic demand and aerodrome needs, and to react in case of system fault, re-assigning and distributing available resources in order to maintain adequate safety levels and quality of service.

Being partially addressed the following functional blocks:

- Technical Supervision: This functional block is in charge of the technical supervision of an Aerodrome ATC system. The Technical Supervision encompasses the following functions:
    - Presenting technical and functional systems status.
    - Acquire, synthesize and display technical and functional status on all the system hardware/software resources.
    - Providing failure detection and analysis assistance.
    - Provide support for analysis of supervision data.
    - Providing supervision commands and actions.
- Support Functions: The Support functions do not affect directly the provision of ATM Services at operational time. They contain at least the following:
    - Recording - performing the recording of the ATM System data related to the Aerodrome ATC, and buffering those data on a persistent database.
    - Playback - providing support for display and voice recording, display and voice playback, other data recording and reduction, etc.
    - Data analysis - providing support for maintenance, investigation etc.
    - Airport Sound - providing real time environment sound from the airport to increase situation awareness for the controller.

    In context of a video based remote tower supporting functions will be extended by recording of video streams and additional audio feed (from the airport environment).
- Aerodrome Safety Nets: This functional block detects and triggers alerts within manoeuvring areas, potential conflicts **between two objects** or between an object and a restricted area, by processing the actual traffic situation. It is also extended on final approach and take-off path.
- G-G / A-G Voice communications: This functional block is responsible for the air-ground communication. Its main role is to handle datalink messages, supporting the exchange of the messages between the TWR and the vehicles and/or the aircraft-aircraft on ground.

2.2.1 Modes

As outlined in the OFA06.03.01 OSED chapter 1.2, the remote tower concept can be divided into three configurations according to the type of operation:

- Single Remote Tower:
    - Allows the controller to provide ATS to one airport at a time from a single remote tower module.
    - RTM supervisor position, in case more than one single module is in operation.
- Multiple Remote Tower:
    - Allows a single controller to provide ATS to multiple airports in parallel from a single remote tower module.
    - RTM supervisor position.
- Contingency Remote Tower:
    - The controller provides ATS from an alternate facility due to a planned or unplanned event.

Although each configuration has its particular characteristics and functional block adaptations that will be described hereafter, several FBs are independent to the configuration to be used

- Support Functions

- Technical Supervision
- Aerodrome Safety Nets

In the particular case of G-G/A-G Voice communications, the FB is independent to Single and Contingency configuration used but it has to be adapted for Multiple Remote Tower.

2.2.1.1 Single Remote Tower

The following characteristics and functional block adaptations for the Single Remote Tower will be taken in to account:

- Out the Window: One controller provides ATS to one airport at a time from a single remote tower module. So the image to be displayed should be individual of the airport to be controlled.
- Operational Supervision: This function is equivalent to the standard tower, however it should be adapted in case several airports are hosted in the same remote tower centre..
- Controller Human Machine Interaction Management: The functionalities provided by the controller working position should be enhanced or at least equivalent to the standard tower.

2.2.1.2 Multiple Remote Tower

The following characteristics and functional block adaptations for the Multiple Remote Tower will be taken in to account:

- Out the Window: For a multi remote tower scenario, in which one controller can provide ATS to multiple airports, the images should be managed in a way that conflicting situations are avoided. Special attention should be paid to control functions for dedicated resources such as PTZ control or camera settings to avoid change the settings or take the control of the wrong PTZ.
- Operational Supervision: This function will be extended to provide some planning and resource allocation capabilities (see chapter 2.4.2) in particular when the RTC consist of several RTMs or the ATCO is controlling airports with parallel operations.
- Controller Human Machine Interaction Management: The controller working position has to handle information of multiple Aerodromes. This is related to the visualisation part, flight data display, support information and surveillance information.

  The supervisor role defines which airports are assigned to a dedicated controller and which information needs to be displayed on the HMI.
- G-G / A-G Voice communications: Communication for the different airports served shall be enabled when ATS is performed to more than one aerodrome simultaneously

2.2.1.3 Contingency Remote Tower

The following characteristics and functional block adaptations for the Contingency Remote Tower will be taken in to account:

- Out the Window: Single characteristics can be applied depending on the configuration used and the airport characteristics.
- Operational Supervision: Single characteristics can be applied depending on the configuration used and the airport characteristics. The Operational supervision should be equivalent to the standard tower, unless the Contingency Remote Tower is handled from an RTC somewhere far away from the aerodrome.
- Controller Human Machine Interaction Management: The CWP will be made to be as similar to the local tower CWP as possible in order to reduce the familiarisation time and the potential

stress induced by a contingency event. Unless the Contingency Remote Tower is handled from an RTC somewhere far away from the aerodrome.

An existing RTM which is used for either single or multiple aerodromes could be used in contingency cases

2.2.2 States

The remote tower can be in one of the following states:

- Connected: Remote Tower Module is connected to an airport or multiple airports.
- Disconnected: Remote Tower Module is disconnected to an airport.

Besides the states of the remote tower, different causes could lead to a non-normal provision of remote control. The functional blocks depicted should foresee the following operating states:

- Normal:
  - The extended visualisation is working fine;
  - The CWP provides continuous operational service. All functions are in use.
- Degraded:
  - The extended visualisation is affected from some kind of malfunctioning (i.e. delay in presenting remote situation to the operator);
  - As a result of failure, a function can automatically or manually be switched off leading to a degraded mode of operation. The user can continue working with the CWP but some functions are missing.
- Failed/Unavailable:
  - The OTW visualisation is unavailable (i.e. picture frozen, delayed, lost or defect);
  - A significant set of CWP functions, necessary for the continuation of the operational service, are not available. The user cannot use the system anymore.

2.2.2.1 Switch from local TWR to Remote TWR

In order to successfully manage the remote provisioning of air traffic services from a location rather than the local tower (if such exists), functional blocks have to be extended to manage the 'context switch' from local to remote provisioning.

The switch between local and RTC can be performed during temporary times according to the level of operation:

- Nights or seasonal time periods of low density traffic that can be easily managed from a remote location.
- Planned events such as planned maintenance/outage in the Control Tower.
- Unplanned events which would tend to be emergency situations.

Or permanent switch from local to remote operations.

This transition from local to remote tower is performed through three main steps.

- **Local Control:** the air traffic service is performed by the local tower.
- **Transferring Control**: the air traffic service is still provided locally, but data is also being transferred to the remote location for shadow operations / transfer of control initiation. Upon successful completion of this protocol, the responsibility for providing air traffic services will fall under remote site personnel.
- **Remote Control:** the remote site provides the service.

In a RTC setup with several RTMs (Single or Multiple) an operational supervisor may be required to dispatch and assign resources to an specific RTM in order to handle a switch over from one airport to another.

In an unplanned contingency operation, when the disruption of the service is caused by an unforeseen event, which could lead to immediate interruption of local operation (sudden event), the switchover could not be handled in the same manner.

Once the disruption has been solved the transition from remote to local tower will be performed through the same three steps but in opposite order.

2.3 Major Functional Block Capabilities

The Remote Tower technical requirements as laid out in Section 3 of this document are structured as follows:

- Baseline concept requirements
- General service/functional requirements
- Remote functional requirements
- Additional requirements for Multiple aerodrome applications
- Contingency applications

This structure mirrors the structure for the OSED requirements as in ref [5] since the technical requirements are a product of the operational requirements.

Since it is assumed that this specification is on a general level, many of the requirements will be written as 'may', which means there may be a need to write a requirement about this topic. Then for a specific implementation of a prototype there is a need to produce a complementary specific requirements specification where there should be a 'shall' or 'should' requirement addressing that topic.
Each requirement is prioritised as one of the following:

- **Essential:** Indicates that the requirement is mandatory. A failure to meet an essential requirement implies that the implementation does not fully support the concept of remote control as defined in the OFA06.03.01 *OSED for Remote Provision of ATS to aerodromes*. Essential requirements are indicated by the word ***shall*** in the requirement text.
- **Important:** Indicates that the requirement is important. A failure to meet an important requirement implies a limited performance of the implementation. Important requirements are indicated by the word ***should*** in the requirement text.
- **Desirable:** Indicates that the requirement is optional. Desirable requirements should be taken into account if they not significantly affect cost or schedule. Desirable requirements are indicated by the word ***may*** in the requirement text.

A configuration field is included in the trace table of each requirement. The configuration states for which of the following implementation configurations that the requirement applies to. Requirements that apply to all of the configurations are marked ***All***. Note that a single installation can support several configurations. For example, a CWP can be used both for simultaneous control of multiple airports and still act as a contingency CWP for one (or more) of those airports.

- **Single:** The single remote tower configuration is where a module and CWP can be connected to and support a single remote tower at a time. The module and CWP can be switched from one airport to another in sequence. Requirements that are specifically for single configurations are marked ***S***.
- **Multiple:** In a multiple configuration implementation, a module and CWP enable ATS to be provided for two or more airports in parallel, at the same time. Requirements that are specifically for multiple configurations are marked ***M***.
- **Contingency:** The contingency configuration is referring to when a module and CWP is used as a redundancy for an ordinary tower. Control is transferred to the remote tower system from

a local tower during emergency or planned maintenance. Requirements that are specifically for contingency configurations are marked ***C***.

All requirements in the OFA06.03.01 OSED [5] are mapped to one or more technical requirements in this document, with exception to the following OSED requirement IDs:

- REQ-06.09.03-OSED-FN02.5007
- REQ-06.09.03-OSED-RTC3.0015
- REQ-06.09.03-OSED-RTC3.0016
- REQ-06.09.03-OSED-RTC3.0017
- REQ-06.09.03-OSED-RTC3.0018
- REQ-06.09.03-OSED-RTC3.0019
- REQ-06.09.03-OSED-RTC3.0020
- REQ-06.09.03-OSED-MC04.2007

These requirements are not feasable to map to a technical requirement since they are of a purely operational nature.

2.4 User Characteristics

2.4.1 ATCO/AFISO

The ATCO/AFISO will have main responsibility for the provision of ATS.

The TWR ATCO is responsible for assuring safe operations and provision of air traffic control services for the aerodrome manoeuvring area and the vicinity of the aerodrome. This includes responsibility for clearance delivery, ground control, arrival management, departure management and flight data processing. The AFISO is responsible for the provision of the AFIS.

2.4.2 RTC Supervisor

A new role for consideration when providing ATS remotely is the RTC Supervisor. In the same way that an ACC/Approach Supervisor is responsible for the general management of all activities in the Operation Room, an RTC Supervisor is responsible for the general management of all activities in the RTC. This role may be filled by an ATCO or alternatively a separately appointed person.

During a shift, an RTC Supervisor role can manage the allocation of staff and CWP´s at any one time during the shift in order to provide an efficient set up at all times and guarantee a flexible system. The Supervisor role can be performed by a dedicated person, or can be handled by one of the shift staff in addition to their ATCO/AFISO role.

In order to maintain the overall traffic picture required for the staff/CWP allocation, the Supervisor may either:

- Be a separate and extra role with overall responsibility for the management of the RTC. The Supervisor maintains overall vision of all aerodromes within the RTC at all times in addition to the ATCO/AFISO providing ATS. This role could be performed from a dedicated Supervisor CWP. The Supervisor would be expected to perform the planning, administration, staff management and staff allocation tasks, and supervision of technical systems, allowing the ATCO/AFISO to concentrate solely on the provision of ATS. Since this is an “extra” role, it is expected that this type of role would only be required for the larger or more complex RTC;
- Perform the role in combination with the duties of a regular ATCO/AFISO, and therefore not be a separate role.

2.4.3 Airspace Users

The airspace users (Flight Crews) are receivers of the ATS service. However, as previously stated, neither their role nor their responsibility should change as a result of introducing the remote aerodrome ATS.

2.4.4 Technical personnel

Matters regarding calibration, maintenance and testing will be addressed by qualified engineers and technicians such as Air Traffic Electronic Personnel (ATSEP) who may monitor the status of systems and perform maintenance as appropriate, both on the remote facility site and the airport side and related systems.

2.4.5 Other stakeholders

Other stakeholders might be:

- Airport Rescue Units; could utilize by external sharing of the visual reproduction for quick response and localization of the emergency, even during low visibility and without being dependent on information passed on by ATCO personnel.
- Airport security and ground handling; could be alerted of unauthorized infringements on the manoeuvring area, debris on the runway and other safety and/or security related issues.
- AirPort Operations Centre (APOC); could utilize the visual reproduction for situation assessment and short term planning.
- Ordinary control tower personnel; could benefit from increased situational awareness by the introduction of parts of the RVT technology into ordinary control towers.
- Local airport officers

2.5 Operational Scenarios

The operational scenarios are described in the OSED [5] chapter 5.

2.6 Functional

2.6.1 Functional decomposition

The functional decomposition of the remote tower system (see Figure 3: Aerodrome ATC Domain system and Aerodrome Voice Domain system - Functional Breakdown) is based on the component structure defined for the standard tower (project B4.3 ADD [7]). Certain components defined in the ATC Domain System are not applicable for airports categorized for remote tower usages in terms of movements and capacity (as defined in the OSED [5]). On the other hand, specific components might be enhanced with additional functionality required to support the remote tower operational scenario.

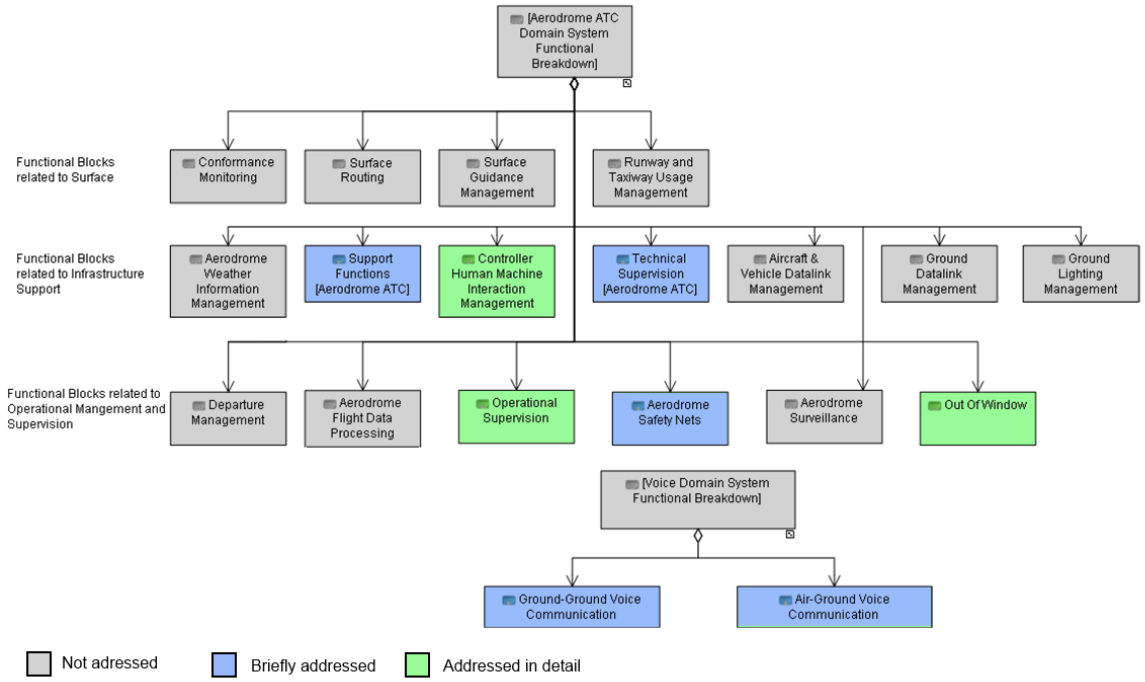


Figure 3: Aerodrome ATC Domain system and Aerodrome Voice Domain system - Functional Breakdown

This chapter will provide an overview of the functional components that are mainly involved in Remote Tower system as defined by B4.3 and in the P12.01.07 TAD and highlight the remote tower specific capabilities and extension.

The functions are grouped under the following functional blocks:

- Aerodrome ATC Domain system :
  - Out the Window (OTW)
  - Controller Human Machine Interaction Management (CHMIM)
  - Aerodrome safety nets
  - Operational supervision
  - Support functions
  - Technical supervision
- Aerodrome Voice Domain system
  - Air-Ground Voice Communication
  - Ground-Ground Voice Communication

2.6.1.1 OTW (Out The Window)

The OTW (Out The Window) functional block allows to ATCO/AFISOs to have an opportune HMI with the representation of what is possible to see out the window in a conventional tower, in order to support him/her in the air traffic management. The OTW functionality provides to the Tower Controllers with a clear view of what usually ATCO/AFISO can see out the airport tower window and view of all the necessary traffic (such as aircraft and vehicle localization, etc.) concerning a Remote Tower of Aerodrome ATC system, in order to assist them in their control tasks.

OTW may also help the ATCO/AFISO to identify targets in low visibility, with the support of the Aerodrome Surveillance Data. These data are the result of merging the surveillance information provided by the different surveillance sources providing a unique picture of the actual traffic situation.

Inside the OTW (Out The Window) functional block, different functions, that will be better explained in the next paragraphs, are included:

- OTW view

- PTZ cameras
- Additional views, e.g. IR cameras;
- Tracking function;

2.6.1.1.1 OTW View

The remote tower visual view will be captured by the OTW video sensors and sensors of the Aerodrome Surveillance. The captured data is compressed and sent to the Remote Tower Module. The OTW (in the Remote Tower Module) decompresses the captured data and sends it to the CHMIM in order to let the ATCO/AFISO to see the actual view of the controlled tower on the OTW displays.

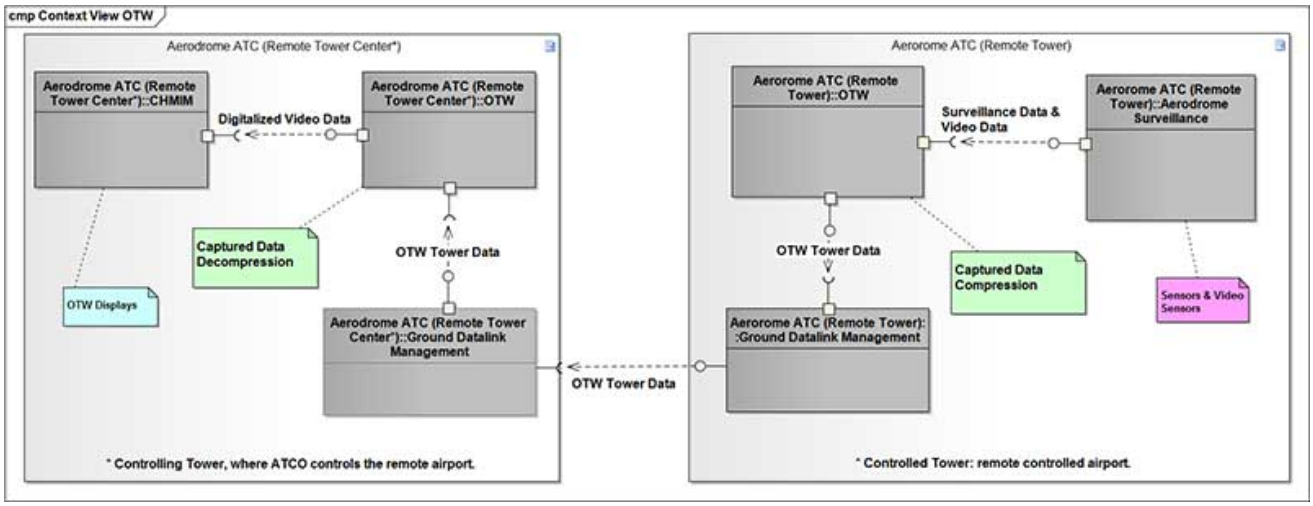


Figure 4: OTW Context View

2.6.1.1.2 Pan-Tilt-Zoom (PTZ) Cameras

In the Remote tower field, the system makes a large use of cameras that collect and send to the RTM images of the airport in order to provide to the remote ATCO/AFISOs the possibility to have the same view as conventional ATCO/AFISOs. Moreover, the remote tower environment shall have PTZ (Pan Tilt Zoom) cameras that the ATCO/AFISO can remotely manage in order to focus the image on a specific area of the airport with the correct zoom. Thanks to the use of PTZ cameras additional functionalities could be incorporated in the system, such as, automatic tracking, anomalies detection, etc.

For a multi remote tower scenario all control functions for dedicated resources (e.g. PTZ control or camera settings) have to be managed in a way that conflicting situations are avoided, such as the interference of vehicles in the aircraft movement.

2.6.1.1.3 Additional View

In addition to the cameras, conventional or PTZ, the remote tower system can be equipped with additional sensors able to support the ATCO/AFISOs, for example in case of low visibility or during the night hours. The additional sensors usually are placed in the aerodrome in order to support the viewing of critical and obscure areas where the visibility is avoided or reduced.

The system can be supported by Infra-Red (IR) cameras, or by A-SMGCS, or by laser system that provide additional information on the position of the aircraft and/or vehicle on the runway.

2.6.1.1.4 Tracking

This component performs automatic object tracking functions based on the managed video streams. Output of this component is position information of the identified object or marking of the identified

object in the video stream. The tracking can be made exploiting only the video data or exploiting a combination of the position information coming from different sensors.

Data fusion combines different inputs from surveillance sensors and generates an aggregated system track for a dedicated object.

The data fusion could take data both from the conventional surveillance sensors (like radars, Mode S, A-SMGCS, etc.) and sensors dedicated to the remote tower purpose (like cameras, IR, etc.) and will provide to the remote ATCO/AFISO a common picture, for normal and Low visibility, in a OTW dedicated or separate display.

2.6.1.1.5 OTW display

In the Remote Tower, together with the CWP, an opportune OTW display function will allow to the ATCO/AFISOs to have a view of the airport and its vicinity that will support them in the air traffic management.

2.6.1.2 Controller Human Machine Interaction Management (CHMIM)

The CHMIM Functional Block provides ATCO/AFISOs with a graphical user interface and with the means to interact with the Aerodrome ATC system. The main responsibility is to provide any relevant information concerning the domains (see Figure 3, page 27) and provide an friendly user interface to the ATCO/AFISO.

In addition to the information that usually the ATCO/AFISO needs for the ATC, in the remote tower environment the CHMIM shall provide further information related to the environment, such as video from external cameras, real-time weather information, reproduction of airport sound, etc.

2.6.1.2.1 RTC

The Remote Tower Centre (RTC) allows the ATCO/AFISO to access to the different Remote Tower Modules (RTM) that he/she needs for the managing the remote airport/airports. It is connected with the different services offered by the other functional blocks in order to connect in an unified HMI all the information the ATCO/AFISO needs: this aspect is covered by Controller Human Machine Interaction Management (CHMIM) Functional Block.

Among the others, the RTC should allow to the ATCO/AFISO to move the control of a remote airport from a RTM to another one.

In context of remote tower additional components capture and generate surveillance information to replace the Out of The Window (OTW) view of classical towers. Dependent on the selected solution approach (virtual tower / video based tower) different technologies for acquisition of surveillance data might be used.

Surveillance data will be gathered and displayed at the Remote Tower Centre. Technical implementation of these features may vary, but generally it does not depend on type of the tower (Remote/Virtual). The multi sensor surveillance data, optional in the Remote Tower, are among the main requirements for the Virtual Tower.

2.6.1.2.2 RTM

The Remote Tower Module is the functionality that allows to ATCO/AFISO to remotely access the function of the control tower. The RTC allows to ATCO/AFISO to have access to all the active service for a specific airport. The remote tower system can add additional sensors for aerodrome surveillance. For example, static and manoeuvrable cameras for visual surveillance and sound capture to augment the impression of the events at the remote airport. These sensors supports a representation of the OTW view the officer would have while working in the airport control tower, along with a reproduction of the sounds he/she would hear in its usual workplace. As outlined in the P06.09.03 OSED two different approaches can be followed:

- Remote Tower Approach
- Virtual Tower Approach

2.6.1.2.2.1 Remote Tower

In the video based remote tower approach there are dedicated subcomponents for acquisition, handling and processing of video and audio information which can be used in combination with the conventional radar based surveillance technologies.

- Video stream management
- Camera Control
- Visual Tracking
- Video Data Fusion

For the multi remote tower scenario, a single RTM shall allow to provide information and allow to the ATCO/AFISO to manage more aerodromes simultaneously. In that case all the functional blocks shall be extended in order to cover more than a single airport.

For a RTC with multiple RTMs the technical supervision function handles information of multiple airports. The control centre needs to provide an aggregated view of all relevant status information of all remote airports.

2.6.1.2.2.2 Virtual Tower

A Virtual remote Tower is mainly using classical surveillance technologies for acquisition of target information for presentation in a virtual environment, while provides the visualization of the remote aerodrome through its synthetic visual reproduction.

2.6.1.2.3 Airport Connection HMI

This function allows to the ATCO/AFISO through an opportune HMI, instruction for management of the airport and to monitor the state of the airport.

2.6.1.3 Operational Supervision

This functional block allows the Supervisor to manage the most appropriate operational configuration, according to traffic demand and aerodrome needs, and to react in case of system fault, re-assigning and distributing available resources in order to maintain adequate safety levels and quality of service.

The supervisor role is not dependant of the Single or Multiple remote tower configuration, but regarding of how many RTMs and airports that are handled from an RTC. If implemented the RTC needs to provide some planning and resource allocation capabilities to the supervisor (see chapter 2.4.2).

2.6.1.4 Aerodrome Safety nets

This functional block detects within manoeuvring areas (runway/s and taxiways) potential conflicts between two objects (i.e. aircraft or vehicles), or between an object and a restricted area, by processing the actual traffic situation, It is also extended to final approach and take-off paths. The potential safety hazards situations on the airport movement area encompass: runway incursion, intrusion in protected areas, aircraft/aircraft and aircraft/vehicle collisions.

In context of remote tower this function is particularly important and will exploit the capabilities provided by the aerodrome surveillance functions in order to provide alarm and alert to ATCO/AFISO. Especially for a multi remote tower setup some additional alerting functions might be introduced to increase situation awareness for the ATCO/AFISO and reduce the workload. In the remote tower approach, in order to increase the potentiality of the Aerodrome safety nets, it is important to exploit all the available technologies: cameras, PTZ, visual tracking. Exploiting fixed and moving cameras, and implementing solutions for the visual tracking, it is possible to support the ATCO/AFISOs with alerting and warning.

2.6.1.4.1 Anomaly Detection

Thanks to the use of cameras., tracking, data fusion, radar, A-SMGCS etc., anomaly detection function could provide alert to the ATCO and to AFISO (aerodrome flight information service officer) in case of detection of anomaly in airport area.

2.6.1.4.2 A-SMGCS

As in the conventional airport, the A-SMGCS system detects and monitors the movement of vehicle and aircraft on the airport exploiting radar data. Usually the data coming from A-SMGCS are displayed on the CWP in order to have the position of the aircraft on the runway and to manage the movement on the airport. The data coming from A-SMGCS can be simply displayed or used in the anomaly detection function in order to discover anomalies in the localization of vehicles/aircraft.

2.6.1.5 Support Functions

In context of a video based remote tower supporting functions will be extended by recording of video streams and additional audio feed (from the airport environment).

The Support functions do not affect directly the provision of ATM Services at operational time. They contain at least the following:

1. Recording - performing the recording of the ATM System data related to the Aerodrome ATC, and storing those data on a persistent database.
2. Playback - providing support for display and voice recording, display and voice playback, other data recording reproduction, etc.
3. Data analysis - providing support for maintenance, investigation etc.

The data distribution system will collect data from the sensors located in the remote airport and, after opportune processing and compressions, distribute them, by datalink, in the Remote Tower Centre where the information will be opportunely displayed in the HMI systems.

The Video Stream Management component includes handling of video data from several local cameras and transferring this data to the remote tower centre. It includes bandwidth management and compression, monitoring of delay times, frame rate and access control

2.6.1.5.1 Recording

The recording function allows to collect and store all the data (ATC data, cameras, audio, IR, etc.) used for the monitoring. On needs, the ATCO/AFISO can access and use the recorded data.

2.6.1.5.2 Playback

The Playback function allows to the ATCO/AFISOs to see or to hear again image or audio data exploiting the recording function. This can help the ATCO/AFISO to have a better awareness of the airport situation. Other important uses of the payback function are the analysis in case of incident (with the objective to understand the dynamics of the incident/event) and training of the ATCO/AFISO that can be trained on real stored data.

2.6.1.5.3 Outdoor sound

The airport sound reproduction functional block provides to the ATCO/AFISOs the possibility to increase the awareness of the airport status also exploiting the reproduction of the sound in the remote airport. In the conventional airport the ATCO/AFISO is inside the airport environment and can exploit all the senses to make the situation awareness, in the case of the remote tower, specific instrument (like microphone) have to collect the sounds in the airport and send them to the RTM.

2.6.1.6 Technical Supervision

This functional block is in charge of the technical supervision of an Aerodrome ATC system (e.g. monitoring the services provided by the system, starting, stopping or re-starting the system or part of it).

The Technical Supervision encompasses the following functions:

- Presenting technical and functional systems status: monitor system availability. Acquire, synthesize and display technical and functional status on all the system hardware/software resources.
- Providing failure detection and analysis assistance: generate alarm or warning on failure detection. Provide support for analysis of supervision data (enable queries on historic of events).
- Providing supervision commands and actions: accept supervision commands/actions (e.g. (Re) start/stop/stand-by/reset/switch-over) from eligible operators and give the capability to perform maintenance activities.

In context of the remote tower the technical supervision is deployed in a distributed environment and has to cover equipment hosted at the airport and the remote tower centre.

2.6.1.6.1 Security Management system

The Security management system is connected to all the functional blocks/systems and monitors the status of each system in order to detect and identify threats/faults and to implement the defined countermeasures to avoid impact of these events on the operability of the remote tower. In the field of remote tower the security management system is very important for the communications service, because all the functionality are based on the data exchange among the airports and the remote tower.

2.6.1.7 Voice Domain System

2.6.1.7.1 A-G Voice Communication

This functional block provides, as main function, the functions performed by a Radio VCS

In the remote tower operation scenario the air ground communication is not directly interconnected to the local radio. The remote located remote tower centre needs a dedicated connection to the local radio to access air ground communication. Therefore additional infrastructure and an access gateway for the radio will be required.

Especially for a backup or emergency radio system a dedicated backup connection between the local tower and the remote tower centre will be required. Standard fall back solution such as handheld radios used directly in the tower is not applicable for the remote tower scenario.

In a multi remote tower scenario the VCS system has to combine and handle all frequencies of the related airports. Based on a role concept an assigned function of frequencies or coupling of frequencies has to be provided to a ATCO/AFISO.

2.6.1.7.1.1 Aeronautical mobile service

The aeronautical mobile service allows the ATCO/AFISO to enter in contact directly with the pilot in the aircraft, as for the conventional ATCO/AFISOs. An opportune data link for the air-ground communication have to be considered.

2.6.1.7.1.2 SLG

In the case of a radio failure or aircraft not equipped with a radio, or in the case of a deaf pilot, air traffic control may use a signal lamp to direct the aircraft. The signal lamp or Signal Light Gun (SLG) has a focused bright beam and is capable of emitting three different colours: red, white and green. The remote ATCO/AFISO, in this case, needs a connection with SLG that have to be remotely controlled.

2.6.1.7.2 G-G Voice Communication

This functional block provides the function that allows to the ATCO/AFISO using the communication infrastructure to connect the remote ATCO/AFISO with the remote airports, in particular aeronautical services and the surface vehicles.

This connection can be performed exploiting traditional voice system or innovative Ground Datalink.

2.6.1.8 Other functions

The functions described in this section are the same functions used in the conventional airport management and can be used just as in a traditional tower. Therefore a detailed description of these function is not included in this deliverable, because they are not changed for usage in a remote tower.

2.6.1.8.1 Functions for receiving meteorological information

This function block provides to the ATCO/AFISO the access to the meteorological information that he/she needs to understand the status of the weather in the remote airport. All the meteorological information have to be provide continuously and in the real time in order to allow to the ATCO/AFISO to take into account this information to manage the air traffic.

2.6.1.8.2 Function for control of airport systems (visual and non-visual)

The functions conventionally used for the control of the airport system, such as navigational aids, ground lighting, etc., could be used also for the remote airports. The main difference among the conventional and the remote airport is that in the conventional airport the control system are locally controlled while in the remote airport we needs external system that have to manage the control systems (navigational aids, ground lighting, etc.)

2.6.1.8.3 Functions for receiving radar data and ATS messages

A function that manage the connection among the system that collects ATM data (primary and secondary radar, a-SMGC, etc.) should be foreseen in order to allow to the ATCO/AFISO to have the view of the position of the different vehicles on the airport.

2.6.1.8.4 Functions for access and update flight plan and control data

In order to manage the airport resources (especially runways and parking bays), the ATCO/AFISO should have access to the flight plan data.

2.6.1.8.5 Functions for monitoring and manage accident, incident and distress alarms

This functions allows the Supervisor and ATCO/AFISO to monitor the airport in order to detect and manage accident, incident and distress alarms. This functions used the sensors and systems described in the previous section in order to allow to the Supervisor to have the right figure of the airport status and to reach in case of need.

2.6.2 . Functional analysis

Figure 5 lists all functional components of the remote tower solutions and their dependencies and relations. Furthermore external systems or sensors which are related to the remote tower systems are shown. The logical information flow of flight data, support information and voice communication is the same as for the standard tower. Main difference is the remote connection to dedicated information sources at the local airport and the acquisition of this information via the WAN infrastructure.

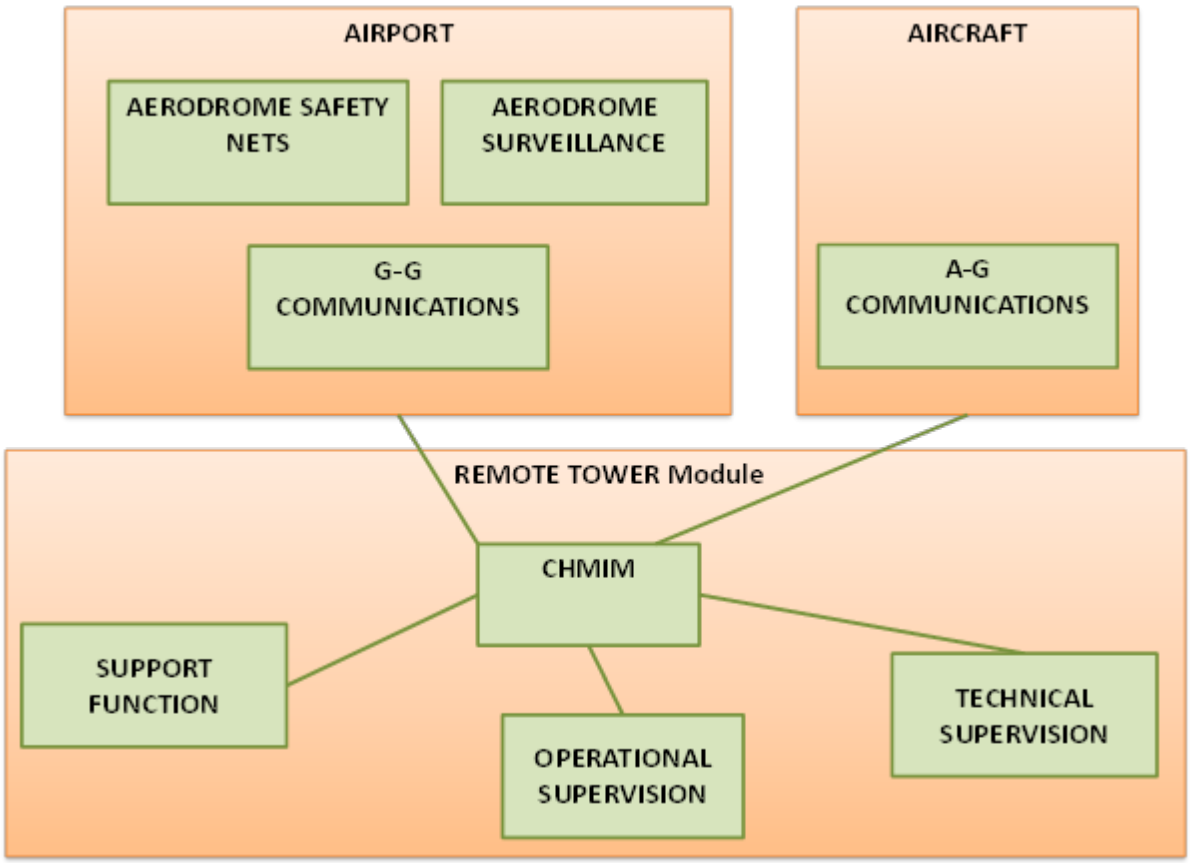


Figure 5 Functional block interrelations

The central element is the Controller HMI, which combines functions from the other components to an integrated controller working position. A remote tower specific part is the OTW View component. It uses mainly the Aerodrome Surveillance functions to replicate the out of the window view.

The Aerodrome Surveillance block is processing surveillance sensor data (including radar data and video streams) from the local airport, which are transferred via the network infrastructure. Parts of the processing may be performed locally at the airport or at the RTC. The exact deployment is a matter of detailed design and specific for a dedicated implementation.

Other data such as support information or status and control of airfield light are also integrated in the controller working position. Selected support information might be directly embedded into the visualization component (e.g. as overlay information).

The information flow for technical supervision starts at the acquisition of status information of all technical equipment at the local airport or in the remote tower centre. Status information is aggregated and processed for presentation.

Voice Communication is interconnecting local radios and standard phone interfaces. All data are transferred via the common network infrastructure. Voice Communication functions should be integrated in the controller HMI.

As evident in the Figure 3, the CHMIM functional block represents the contact point between ATCO/AFISOs which use the system and the internal functional block. The CHMIM contains and supports all interaction between ATCO/AFISO and functional blocks.

The number of provided/required interfaces shows the degree of architectural complexity linked to the CHMIM functional block.

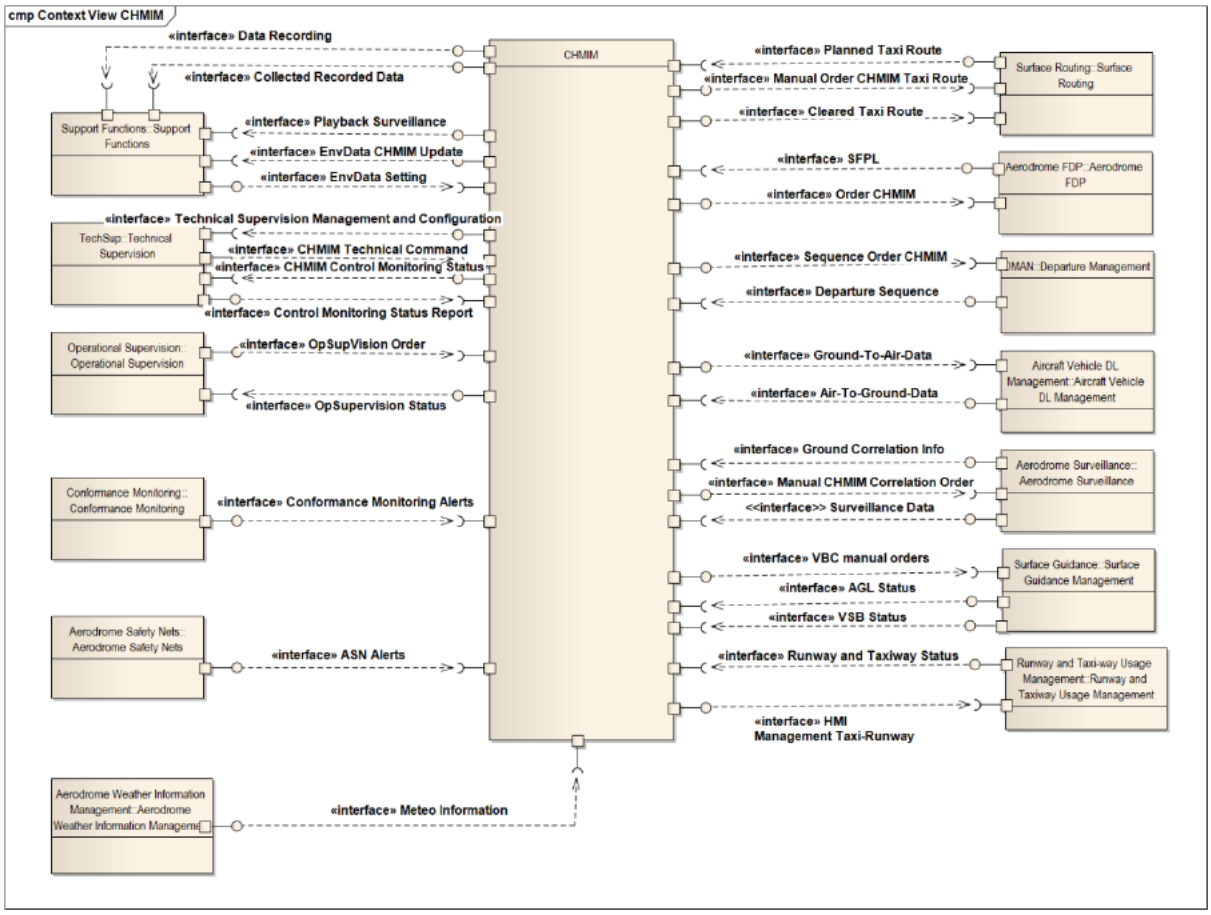


Figure 6: CHMIM 's Context View

Data Flow In/Out	Origin	Destination
SFPL	Aerodrome Flight Data Processing	CHMIM
Order CHMIM	CHMIM	Aerodrome Flight Data Processing
Cleared Taxi Route	CHMIM	Surface Routing
Manual Order CHMIM Taxi Route	CHMIM	Surface Routing
Planned Taxi Route	Surface Routing	CHMIM
Departure Sequence	Departure Management	CHMIM
Sequence Order CHMIM	CHMIM	Departure Management
Conformance Monitoring Alerts	Conformance Monitoring	CHMIM
ASN Alerts	Aerodrome Safety Nets	CHMIM
Surveillance Data	Aerodrome Surveillance	CHMIM
Manual CHMIM Correlation order	CHMIM	Aerodrome Surveillance
Ground Correlation Info	Aerodrome Surveillance	CHMIM
VBC manual orders	CHMIM	Surface Guidance Management
AGL Status	Surface Guidance Management	CHMIM
VSB Status	Surface Guidance Management	CHMIM
Air-To-Ground Data	Aircraft & Vehicle DL	CHMIM

Data Flow In/Out	Origin	Destination
	Management	
Ground-To-Air Data	CHMIM	Aircraft & Vehicle DL Management
Data Recording	CHMIM	Support Functions
Collected Recorded Data	CHMIM	Support Functions
Playback Surveillance	CHMIM	Support Functions
EnvData Setting	Support Functions	CHMIM
EnvData CHMIM Update	CHMIM	Support Functions
CHMIM Control Monitoring Status	CHMIM	Technical Supervision
Technical Supervision Management and Configuration	CHMIM	Technical Supervision
CHMIM TechSup Command	Technical Supervision	CHMIM
Control Monitoring Status Report	Technical Supervision	CHMIM
OpSupVision Order	Operational Supervision	CHMIM
OpSupervsion Status	CHMIM	Operational Supervision
HMI Management Taxi-Runway	CHMIM	Runway and Taxi-way Usage Management
Runway/Taxiway Status	Runway and Taxi-way Usage Management	CHMIM

The CHMIM functional block is in charge of displaying and providing relevant information to ATCO/AFISOs: in the remote tower context, the CHMIM is the only access to the airport information.

In short the CHMIM FB is able to provide the relevant configuration capability concerning information display (e.g. range scale selection, pan/zoom, brightness, and map overlays, OTW).

The interface supports also the graphical format used to display in the CWP the traffic position and trajectory with label and supports actors and controllers providing a clear indication concerning the traffic with respect to their area of responsibility. The interface also provides the flight plan display capability requested by operational needs. The interface is able to present the list of movement plans for all targets present in movement area to the controller, and update them in real time.

In a multi remote tower scenario the main difference is that there are multiple instances of interfaces to the dedicated airports. The relevant functional blocks have to handle multiple data streams and their assignment to the relevant position. The different function of the remote tower are strictly connected. In particular, one of the core function, on which is based all the functionalities of Remote Tower, is the WAN and the data connection, because all the functionalities is based on the replication of the airport environment (in term of video, sound and data) in the RTC where the ATCO/AFISO can operate as it is physically present in the airport.

An detailed example of relationship among different functions, focused on video data, is reported in Figure 7. The data collected by the fixed cameras or PTZ are exploited by different functions:

- Visual tracking: that analyse the data and track the vehicle on the airport;
- Sound and video recording function: this function collects the data from cameras and store the recorded sound and video that have to be sent to the ATCO/AFISOs to allow him to have the situation awareness.

The data from Visual tracking and Sound/Video recording are sent, through the Ground Datalink, to the Remote Tower Centre (RTC) where the ATCO/AFISOs and the supervisors can visualize the data exploiting the following functions:

- Out The Window (OTW): that replicate the airport environment;

- CHMIM: that provide to the ATCO/AFISOs the instrument for the visualization of all the information for the remote air traffic control
- Aerodrome Safety Nets: that exploits the data from Visual tracking to identify anomalies.

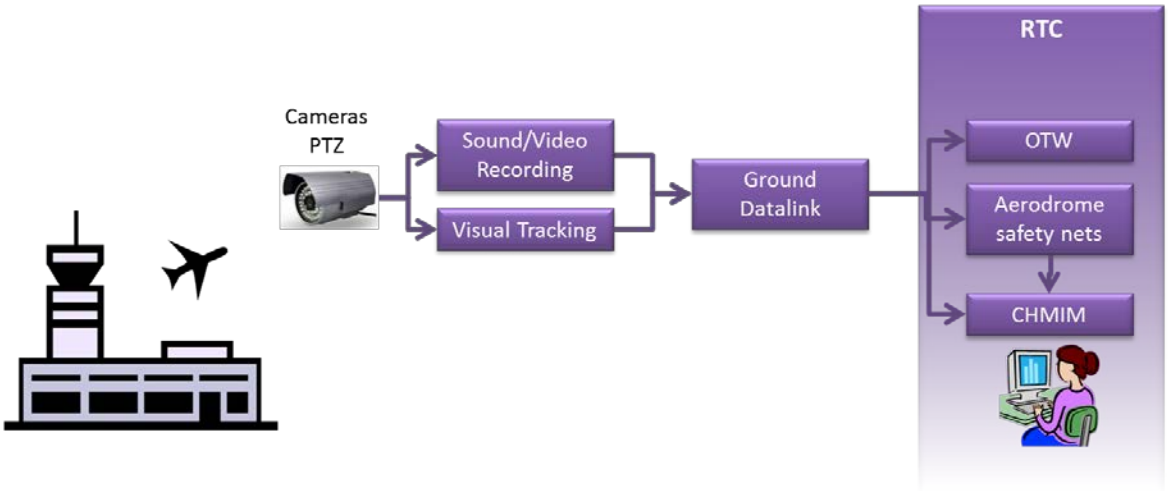


Figure 7 – Data flow of Video

2.7 Service View

N/A (because no services are specified within SESAR 1)

3 Functional Block Functional and non-Functional Requirements

Each requirement table has a section with "hidden text" for easier reading of the document. To see the full tables, "hidden text" has to be enabled. If not, only the "Identifier" and "Requirement" fields of each table are visible. "Hidden text" can also be toggled on/off via the ¶ button (if not enabled in "Word Options").

3.1 Baseline Concept Requirements

[REQ]

Identifier	REQ-12.04.07-TS-0010.0001
Requirement	Each RTM shall allow an ATCO to provide Air Traffic Services (ATS) for the active Remote Airport(s).
Title	RTWR-BCR-1
Status	<Validated>
Rationale	Requirement applicable for the ATC SINGLE aerodrome environment only. Aerodrome Control Service (TWR) is herein implicit to also include Flight Information Service and Alerting Service. At some ATC units the service is (and will possibly still be) performed as a combined Approach (APP) and Aerodrome Control Service (TWR) This requirement defines part of the concept baseline. Aerodrome Control Service (TWR) as defined in ICAO Documents 4444 & 9426 and ICAO Annexes 2 & 11.
Category	<Design><Operational>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED TO>	<Functional block>	Out the Window	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0010.0003
Requirement	All technical failures on an RTM or remote airport shall be categorized by severity and technical procedures shall be defined how to handle each severity level.
Title	RTWR-BCR-3
Status	<Validated>
Rationale	Security Management systems are already a regulatory requirement on ANSPs, however needs to be expanded to cover e.g. for the transmission of remote airport data. Security measures is to be determined in the scope of local implementations, but may include controls such as; -Data Input Credibility and Authentication, -Data Encoding / Encryption.

	-Technical controls against different threats such as viruses, malware, Trojans, electromagnetic interference etc. -Alternate Supply Systems. A Security Risk Assessment Report have been produced by WP16.06.02, under “06.03.01 Remote and Virtual Tower Security Risk Assessment”, Edition 00.00.02, 09/12/2013.
Category	<Functional><Operational>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Technical Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0010.0004
Requirement	The RTMs in the RTC should be designed uniformly so that it is possible to operate any airport connected to that RTC from any of its RTMs.
Title	RTWR-BCR-4
Status	<Validated>
Rationale	Operate on the basis of uniformity throughout Europe Applying standards and uniform principles, and ensuring the technical and operational interoperability of aircraft and ATM systems.
Category	<Design><Interoperability>
Validation Method	
Verification Method	<Review of Design><Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0010	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.2 General Service / Functional requirements

3.2.1 Communications

[REQ]

Identifier	REQ-12.04.07-TS-0100.0001
Requirement	The RTM shall provide access to aeronautical mobile services (air-ground communications) to the ATCO/AFISO for active Remote Airport(s), in accordance with ICAO Annex 11, Chapter 6.1
Title	RTWR-GSFR-COM-1
Status	<Validated>
Rationale	OSED 4.1 Operational Characteristics Environment defines the applicable environment. ICAO Annex 11, Chapter 6.1
Category	<Functional>

Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0002
Requirement	The RTM shall provide access to aeronautical fixed service (ground-ground communications) to the ATCO/AFISO for active Remote Airport(s), in accordance with ICAO Annex 11, Chapter 6.2
Title	RTWR-GSFR-COM-2
Status	<Validated>
Rationale	ICAO Annex 11, Chapter 6.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0003
Requirement	The RTM shall provide access to surface movement control service (communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes) to the ATCO/AFISO for active Remote Airport(s)
Title	RTWR-GSFR-COM-3
Status	<Validated>
Rationale	ICAO Annex 11, Chapter 6.3
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0004
Requirement	The RTM shall provide a signalling lamp functionality to the ATCO/AFISO on the active Remote Airport(s), in accordance with ICAO Annex 14 section 5.1.3 / Eurocontrol Manual for AFIS section 4.2.2.3.2.
Title	RTWR-GSFR-COM-4
Status	<Validated>
Rationale	ICAO Annex 14, Volume 1, chapter 5.1.3 (5.1.3.1 A signalling lamp shall be provided at a controlled aerodrome in the aerodrome control tower.) ICAO Annex 2, Appendix 1, chapter 4.1. (4.1 Light and pyrotechnic signals, Figure 1.1) Eurocontrol Manual for AFIS, 4.2.2.3.2 (4.2.2.3.2 When communications by a system of visual signals is deemed to be adequate, or in the case of radio-communication failure, the signals given hereunder shall have the meaning indicated therein:...) Eurocontrol Manual for AFIS, Attachment A, 1.2 (1.2 The equipment in the AFIS unit should be the same as that required for an aerodrome control tower at an aerodrome with low traffic density.)
Category	<Functional>
Validation Method	
Verification Method	<Test><Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Safety Nets	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.2.2 MET-functions

[REQ]

Identifier	REQ-12.04.07-TS-0101.0001
Requirement	The RTM shall provide the ATCO/AFISO access to meteorological info from the active Remote Airport(s).
Title	RTWR-GSFR-MET-1
Status	<Validated>
Rationale	ICAO Annex III, ICAO Annex 11 Chapter 7.1 and national regulations.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0006
Requirement	The meteorological info provided by an RTM shall be in accordance with ICAO Annex III, ICAO Annex 11 Chapter 7.1 and national regulations.
Title	RTWR-GSFR-MET-2
Status	<Validated>
Rationale	ICAO Annex III, ICAO Annex 11 Chapter 7.1 and national regulations.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0007
Requirement	The RTM shall continuously present the current MET report from the currently active Remote Airport(s).
Title	RTWR-GSFR-MET-3
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.3.1.2 & ICAO Annex 11 Chapter 7.1.4. This is essential information used very frequently by the ATCOs/AFISOs to inform pilots in real time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0003
Requirement	The RTM shall continuously present the actual wind information from the currently active Remote Airport(s).
Title	RTWR-GSFR-MET-4
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.3.1.2 & ICAO Annex 11 Chapter 7.1.4. This is essential information used very frequently by the ATCOs/AFISOs to inform pilots in real time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2002	<Partial>

<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0004
Requirement	The RTM shall continuously present the actual QNH from the currently active Remote Airport(s).
Title	RTWR-GSFR-MET-5
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.3.1.2 & ICAO Annex 11 Chapter 7.1.4. This is essential information used very frequently by the ATCOs/AFISOs to inform pilots in real time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0005
Requirement	The RTM shall, if measured for the particular airport, continuously present the RVR values from the active Remote Airport(s).
Title	RTWR-GSFR-MET-6
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.3.1.2 & ICAO Annex 11 Chapter 7.1.4. This is essential information used very frequently by the ATCOs/AFISOs to inform pilots in real time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.2.3 NAV functions

[REQ]

Identifier	REQ-12.04.07-TS-0103.0001
Requirement	The RTM shall include functionality for the ATCO/AFISO to monitor, adjust intensity and on/off status of visual navigational aids for the active Remote Airport(s).
Title	RTWR-GSFR-NAV-1

Status	<Validated>
Rationale	ICAO Annex 11 Chapter 7.3 & ICAO Doc 4444 Chapter 7.15 Visual navigational aids, such as: Approach, PAPI, runway, taxiway, RGL
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-NV02.4001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0103.0002
Requirement	The RTM shall include functionality for the ATCO/AFISO to monitor and adjust the status of non-visual aids for the active Remote Airport(s).
Title	RTWR-GSFR-NAV-2
Status	<Validated>
Rationale	ICAO Annex 11 Chapter 7.3. Non-visual navigational aids., such as: ILS LOC/GP,LO NDB,OM/MM/IM, VOR, DME.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-NV02.4002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.2.4 Other ATS Systems / Functions

[REQ]

Identifier	REQ-12.04.07-TS-0104.0001
Requirement	The RTM should allow the ATCO/AFISO to access surveillance data such as radar presentation, when available, from the active Remote Airport(s).
Title	RTWR-GSFR-ATS-1
Status	<Validated>
Rationale	ICAO Doc 4444, Chapter 7.1.1.2 Eurocontrol Manual for AFIS Chapter 3.1.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5001	<Full>

<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0002
Requirement	The RTM shall allow the ATCO/AFISO to access and handle ATS messages (as described in ICAO Doc 4444 Chapter 11).
Title	RTWR-GSFR-ATS-2
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 11
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0003
Requirement	The RTM shall allow the ATCO/AFISO to access and update flight plan and control data for all flights being provided with the ATS service (in accordance with ICAO Doc 4444 Chapter 4.13).
Title	RTWR-GSFR-ATS-3
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 4.13
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0004
Requirement	The RTM shall allow the ATCO/AFISO to monitor and manage accident, incident and distress alarms as applicable to the active Remote Airport(s).
Title	RTWR-GSFR-ATS-4
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.1.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Technical Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0005
Requirement	The RTM shall include functionality to present the correct time, in the format of hours, minutes and seconds in UTC, to the ATCO/AFISO.
Title	RTWR-GSFR-ATS-5
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.3.1.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0006
Requirement	The RTM shall include functionality to notify the ATCO/AFISO about any technical status of systems that can affect the safety or efficiency of flight operations and/or the provision of air traffic service for the RTC and for the active Remote Airport(s).
Title	RTWR-GSFR-ATS-6
Status	<Validated>
Rationale	ICAO Doc 4444, Chapter 4.14
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5006	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Technical Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0009
Requirement	The RTM shall enable the ATCO/AFISO to alert the rescue and firefighting services.
Title	RTWR-GSFR-ATS-7
Status	<Validated>

Rationale	ICAO Doc 4444 Chapter 7.1.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5008	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.2.5 Voice and Data Recording

[REQ]

Identifier	REQ-12.04.07-TS-0105.0006
Requirement	ATCO/AFISO direct-speech communication via Aeronautical mobile service, Aeronautical fixed service and Surface movement control service shall be recorded.
Title	RTWR-GSFR-VDR-1
Status	<Validated>
Rationale	ICAO Annex 11, Chapters 6.1, 6.2, 6.3 & 6.4
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0007
Requirement	Data-link communication via Aeronautical mobile service (air-ground communications), Aeronautical fixed service (ground-ground communications) , Surface movement control service and Aeronautical radio navigation service shall be recorded.
Title	RTWR-GSFR-VDR-2
Status	<Validated>
Rationale	ICAO Annex 11, Chapter 6.4 ICAO Annex 11, Chapter 6.2.2.3.3 ICAO Annex 11, Chapter 6.2.2.3.7 ICAO Annex 11, Chapter 6.2.3.5
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>

<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0008
Requirement	Aeronautical radio navigation service data and surveillance data (from primary and secondary radar equipment or other systems (e.g. ADS-B, ADS-C)) shall be recorded.
Title	RTWR-GSFR-VDR-4
Status	<Validated>
Rationale	ICAO Annex 11 Chapters 6.4.1.1 & 6.4.1.2
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0005
Requirement	It shall be possible to access recorded data up to 30 days after it has been recorded.
Title	RTWR-GSFR-VDR-3
Status	<Validated>
Rationale	ICAO Annex 11, Chapter 6
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3 Remote Functional Requirements

3.3.1 Concept Requirements Single aerodrome Applications

[REQ]

Identifier	REQ-12.04.07-TS-1001.0001
Requirement	An RTM shall be able to connect to a remote airport.
Title	RTWR-RFR-CS-1
Status	<Validated>

Rationale	To connect means RTM shall provide all remote tower functions required to provide ATS to the aerodrome
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CS03.0003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CS03.0001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1001.0002
Requirement	An RTM should be able to connect to and be connected to multiple remote airports sequentially, one at a time.
Title	RTWR-RFR-CS-2
Status	<Validated>
Rationale	To connect means RTM shall provide all remote tower functions required to provide ATS to a set of aerodrome(s), one at a time. Implementing remote management of airports should reduce the costs providing ATS.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0009	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CS03.0003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CS03.0002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.2 RTC level requirements

[REQ]

Identifier	REQ-12.04.07-TS-1002.0001
Requirement	The graphical user interfaces should be unified between RTMs within a RTC.
Title	RTWR-RFR-RTC-1
Status	<Validated>
Rationale	No significant adjustment in HMI should be necessary when an ATCO/AFISO change RTM, enabling uniform procedures for all RTMs.
Category	<HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0004	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0010	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0005	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0002
Requirement	The hardware used by ATCO/AFISO to operate the RTM should be unified between RTMs within a RTC.
Title	RTWR-RFR-RTC-2
Status	<Validated>
Rationale	Behaviour and hardware visible to ATCO/AFISO should be the same within a RTM. It is not necessary to use the same hardware for the back end systems.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0004	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0010	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0005	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0003
Requirement	The RTM should enable the ATCO/AFISO to a transfer the active Remote Airport and all the associated services active in an RTM (source RTM) to another RTM (destination RTM).
Title	RTWR-RFR-RTC-3
Status	<Validated>
Rationale	Responsibility transfer require transfer of all active services
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MP04.0001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0006	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0004
Requirement	The RTM shall enable ATCO/AFISO in the destination RTM to see the state of all active services from the source Remote Airport before assuming control over it.
Title	RTWR-RFR-RTC-4
Status	<Validated>
Rationale	The ATCO/AFISO need to fully see the state of the remote airport before the responsibility transfer is acknowledged.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0006	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0005
Requirement	All services active in the source RTM shall remain active until the transfer is finalized.
Title	RTWR-RFR-RTC-5
Status	<Validated>
Rationale	The transfer shall not interrupt any ongoing services
Category	<Functional><Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0007	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0006
Requirement	The RTM shall enable the ATCO/AFISO in the destination RTM to acknowledge the transfer of the active Remote Airport and all the associated services before it is finalized.
Title	RTWR-RFR-RTC-6
Status	<Validated>
Rationale	The transfer in responsibility shall be acknowledged.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0008	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1002.0007
Requirement	The ATCO/AFISO/RTC Supervisor shall be able to see the state of all active services of a Remote Airport before assuming control.
Title	RTWR-RFR-RTC-7
Status	<Validated>
Rationale	The transfer in responsibility shall be acknowledged.
Category	<Functional><Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RTC3.0008	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.3 RTC Supervisor

[REQ]

Identifier	REQ-12.04.07-TS-1003.0001
Requirement	If the RTC enables transfer of responsibility of ATS for aerodromes between RTMs within the RTC, the RTC should enable a RTC Supervisor role for the RTC.
Title	RTWR-RFR-SUP-1
Status	<Validated>
Rationale	When RTC enables transfer of responsibility of ATS for aerodromes between RTMs within the RTC, RTC should enable a RTC Supervisor role for the RTC. Note: The RTC Supervisor role may be performed either from a separate stand-alone CWP/RTM or combined from a CWP/RTM in a RTC.
Category	<Operational>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0009	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A

<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0002
Requirement	The RTC supervisor role shall have access to functions for planning, coordination and monitoring of the upcoming and present traffic flow for all aerodromes that can be handled by the RTC, in the purpose of tactical opening and closure of RTMs and allocation of airports to them.
Title	RTWR-RFR-SUP-2
Status	<Validated>
Rationale	As an example, available tools could include e.g. flight plans, slot coordination, communications and surveillance data. The role of the RTC Supervisor is defined in the OSED
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0010	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0003
Requirement	The RTC supervisor role shall have access to information about - what aerodromes are connected to each RTM - transfer status for each RTM (if transferral of responsibility is ongoing) - what aerodromes are selectable for each RTM
Title	RTWR-RFR-SUP-3
Status	<Validated>
Rationale	The role of the RTC Supervisor is defined in the OSED.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0011	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0004
Requirement	The RTC supervisor role should have access to airport system status for all aerodromes connected to the RTC.
Title	RTWR-RFR-SUP-4
Status	<Validated>
Rationale	The role of the RTC Supervisor is defined in the OSED.

Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0012	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0005
Requirement	The RTC supervisor role shall have access to RTC system status.
Title	RTWR-RFR-SUP-5
Status	<Validated>
Rationale	The role of the RTC Supervisor is defined in the OSED.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0012	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0006
Requirement	The RTC supervisor role shall have access to weather condition information for all aerodromes connected to the RTC.
Title	RTWR-RFR-SUP-6
Status	<Validated>
Rationale	The role of the RTC Supervisor is defined in the OSED.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0013	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-1003.0007
Requirement	The technical status of each RTM and all aerodrome(s) connected to the RTC shall be accessible to the RTC supervisor.
Title	RTWR-RFR-SUP-7
Status	<Validated>

Rationale	The role of the RTC Supervisor is defined in the OSED.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-SUP3.0014	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.4 Visualization

3.3.4.1 General

[REQ]

Identifier	REQ-12.04.07-TS-0102.0009
Requirement	The ATCO/AFISO shall have access to live video image of flight operations on and in the vicinity of the aerodrome as well as vehicles and personnel on the manoeuvring area through the use of camera(s).
Title	RTWR-RFR-VIS-2
Status	<Validated>
Rationale	In order to fulfil the task of keeping watch by visual observation while not being physically present at the aerodrome, a technical solution is needed that presents visual sensor data - collected from the aerodrome and its vicinity and transmitted to the remote tower facility - to the ATCO/AFISO in a way that provides him/her with the situational awareness required for conducting the associated services. This technical solution will be termed the Visual Presentation.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0010
Requirement	The visual presentation shall have a sufficient horizontal coverage to include the manoeuvring area and the vicinity of the aerodrome.
Title	RTWR-RFR-VIS-3
Status	<Validated>
Rationale	The horizontal coverage requirement is dependent on the airport layout and placement of the camera(s). The horizontal coverage must be sufficient to observe flight operations on and in the vicinity of the aerodrome as well as vehicles and personnel on the manoeuvring area. **EXE-06.09.03-VP-056 Single I**: 9 horizontal cameras (5HD+4 1280x720) presented on 9 horizontal 42” HD

	screens with a horizontal coverage of 360 degrees presented on 360 degrees in a circle **EXE-06.09.03-VP-057 Single II**: 9 horizontal cameras (6HD+3 1280x720) presented on 9 horizontal 42" HD screens with a horizontal coverage of 360 degrees presented on 360 degrees in a "broken circle". 6 screens to the front were placed together continuously and 3 screens to the rear were placed apart from the other 6 to allow extra space around the ATCO as well as a gap for entry/exit. **EXE-06.09.03-VP-058 Single III**: 14 portrait HD cameras presented on 14 portrait HD 55" screens with a horizontal coverage of 360 degrees presented with 10 screens in front on 180 degrees and 4 screens in back on 120 degrees **EXE-06.09.03-VP-059 Contingency I**: 6 horizontal HD cameras presented on 6 horizontal 42" HD screens with a horizontal coverage of 240 degrees presented on 180 degrees **EXE-06.09.03-VP-060 Multiple (Simulation) I**: 8 portrait HD simulated cameras on each airport (of three) presented on 12 portrait HD 23" screens with a horizontal coverage of 240 degrees coverage on each airport. Each airport presented on 8, 4 or 2 screens. With horizontal compression using 4 and 2 screens. **EXE-06.09.03-VP-061 Multiple II** : 14 portrait HD cameras on each airport presented on 14, 8, 4 or 0 portrait HD 46" screens with a horizontal coverage of 360, 205, 205, 0 degrees presented. When 8 cameras presented on 4 screens it was horizontally compressed, two cameras on each screen. **EXE-06.09.03-VP-062 Contingency II**: Two Camera Towers: NW tower: 9 horizontal cameras (6HD+3 1280x720) presented on 6 horizontal 42" HD screens with a horizontal coverage of 360 degrees presented on 180 degres. 6 Front normally shown, 3 rear possible to shift in SW tower: 3 wide angle cameras covering 180 degrees presented by selection in CWP **EXE-06.09.03-VP-063 Multiple III** : 14 portrait HD cameras on each airport presented on 14, 8, 4 or 0 portrait HD 46" screens with a horizontal coverage of 360, 205, 205, 0 degrees presented. When 8 cameras presented on 4 screens it was horizontally compressed, two cameras on each screen. **EXE-06.08.04-VP-751**: 7 HD cameras presented on 7 vertical 46"HD monitors with an horizontal coverage of 180 degrees presented on 180 degrees. **EXE-06.08.04-VP-752** : 7 HD cameras presented on 7 vertical 46"HD monitors with a horizontal coverage of 180 degrees presented on 180 degrees.
Category	<Design><HMI>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0011
Requirement	The vertical coverage shall be a sufficient number of degrees above the imagined horizon to include the manoeuvring area and the vicinity of the aerodrome.
Title	RTWR-RFR-VIS-4
Status	<Validated>
Rationale	The vertical coverage requirement is dependent on the airport layout and placement of the camera(s). The vertical coverage above the imagined horizon must be sufficient to observe traffic in, entering or leaving the aerodrome traffic circuit. Note that different vertical coverage requirements may apply to different horizontal ranges of the visual reproduction (e.g. less vertical coverage of the sky outside the traffic pattern) . Duplicate this requirement for each horizontal range with different vertical requirements. **EXE-06.09.03-VP-056 Single I**: 12 degrees above the imagined horizon. **EXE-06.09.03-VP-057 Single II**: 12 degrees above the imagined horizon. **EXE-06.09.03-VP-058 Single III**: 22 degrees above the imagined horizon. **EXE-06.09.03-VP-059 Contingency I**: 12 degrees above the imagined horizon. **EXE-06.09.03-VP-060 Multiple (Simulation) I**: 27 degrees above the imagined horizon. **EXE-06.09.03-VP-061 Multiple II** : 22 degrees above the imagined horizon. **EXE-06.09.03-VP-062 Contingency II**: 12 degrees above the imagined horizon. **EXE-06.09.03-VP-063 Multiple III** : 22 degrees above the imagined horizon. **EXE-06.08.04-VP-751**: 26,82 degrees above the imagined horizon **EXE-06.08.04-VP-752** : 26,82 degrees above the imagined horizon.
Category	<Design><HMI>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0012
Requirement	The vertical coverage shall be a sufficient number of degrees below the imagined horizon to include the manoeuvring area and the vicinity of the aerodrome.
Title	RTWR-RFR-VIS-5
Status	<Validated>
Rationale	The vertical coverage requirement is dependent on the airport layout and

	placement of the camera(s). The vertical coverage below the imagined horizon must be sufficient to observe vehicles and personnel on the manoeuvring area. Different vertical requirements may apply to different horizontal ranges of the visual reproduction (e.g. less vertical coverage outside the manoeuvring area, such as woods, terminals and parking lots). Duplicate this requirement for each horizontal range with different vertical requirements. **EXE-06.09.03-VP-056 Single I**: 12 degrees below the imagined horizon. **EXE-06.09.03-VP-057 Single II**: 12 degrees below the imagined horizon. **EXE-06.09.03-VP-058 Single III**: 22 degrees below the imagined horizon. **EXE-06.09.03-VP-059 Contingency I**: 12 degrees below the imagined horizon. **EXE-06.09.03-VP-060 Multiple (Simulation) I**: 27 degrees below the imagined horizon. **EXE-06.09.03-VP-061 Multiple II** : 22 degrees below the imagined horizon. **EXE-06.09.03-VP-062 Contingency II**: 12 degrees below the imagined horizon. **EXE-06.09.03-VP-063 Multiple III** : 22 degrees below the imagined horizon. **EXE-06.08.04-VP-751**: 18,84 degrees below the imagined horizon **EXE-06.08.04-VP-752**: 18,84 degrees below the imagined horizon.
Category	<Design><HMI>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0013
Requirement	The RTM should include functionality for the ATCO/AFISO to be able to activate any additional sensors which improve visual range and resolution, compared to unaided viewing in the visual presentation.
Title	RTWR-RFR-VIS-7
Status	<Validated>
Rationale	The sensors considered in this requirement may utilise additional “hot spot cameras” or sensors/cameras other than narrowly light band spectrum, such as UV and IR. The purpose of such sensors would e.g. be to assist the ATCO/AFISO to; - monitor aircraft/vehicles entering or vacating the runway, (or to confirm stopping at holing points) during low visibility conditions, - detect obstructions/objects/personnel/animals (without its own light source) during darkness
Category	<Functional><Safety>
Validation Method	

Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1004	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0014
Requirement	The RTM shall enable the ATCO/AFISO to see if additional sensors are activated in the visual presentation
Title	RTWR-RFR-VIS-8
Status	<Validated>
Rationale	So to not mislead the AFISO/ATCO regarding the information provided by the non-improved visual presentation. The sensors considered in this requirement may utilise additional “hot spot cameras” or sensors/cameras other than narrowly light band spectrum, such as UV and IR.
Category	<Functional>
Validation Method	
Verification Method	<Inspection><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1004	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0002
Requirement	The visual presentation may include additional (digital) information to provide the ATCO/AFISO with a greater level of information and/or situational awareness.
Title	RTWR-RFR-VIS-9
Status	<Validated>
Rationale	The aim with this requirement is to present additional information directly in the OTW view (compare with head up displays in aircrafts) in order to minimise ATCO/AFISO head down time.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0058
Requirement	The visual presentation should incorporate enhancements such as high-dynamic-range imaging, automatic contrast management and other techniques to improve the "raw" picture to provide a greater situational awareness to the ATCO/AFISO.
Title	RTWR-RFR-VIS-50
Status	<Validated>
Rationale	The aim of the quality of the visual presentation should be to make it as close to how the human eye would see the view directly, opposed to through a camera, in order to have as good situational awareness as possible.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.4.2 Characteristics

[REQ]

Identifier	REQ-12.04.07-TS-0110.0003
Requirement	The visual presentation shall be designed so as to avoid unnecessary discontinuities or non-uniformities in terms of the presented scale, orientation and field of view of the area under observation by the ATCO/AFISO.
Title	RTWR-RFR-VIS-10
Status	<Validated>
Rationale	Additionally, existing discontinuities and non-uniformities needs to be clearly indicated so as to avoid misleading impressions of the observed area. Validation experiences have showed this to be an essential requirement. Avoid eventual (screen) seams / joints in the visual presentation located at “hot spot” areas, e.g. holding positions, RWY entrance / exits etc as far as possible. If that is not possible, consider to implement mitigations such as hot spot cameras (if the PTZ camera is not sufficient) in order for the ATCO/AFISO to get an undivided/unbroken/unobscured presentation of these “hot spot” areas.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1101	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A

<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0006
Requirement	The video image of the visual presentation (including any additional sensors and the binocular functionality) shall be captured and rendered on the display at a frequency of a sufficient amount of frames per second to provide a smooth and regular impression of moving objects to the human eye.
Title	RTWR-RFR-VIS-11
Status	<Validated>
Rationale	Validations (VP-056) found that a frame rate of 20 caused objects to appear "jumpy" which was both tiring to the eyes to watch over extended periods of time and also made it more difficult to detect acceleration and retardation of objects. Things such as cancelled take-off and gear down were harder to detect. This requirement is also related to transient phenomena, e.g. flashing lights such as Runway Guard Lights (RGL) or aircraft strobe lights. It is of high operational importance for an ATCO/AFISO to be able to see/judge if a light is flashing or not, e.g. confirming RGL on/off status. Validations (VP-057, VP-058) found that 30 frames per second was considered sufficient to provide ATS. **EXE-06.09.03-VP-056 Single I**: 20 FPS **EXE-06.09.03-VP-057 Single II**: 30 + 20 FPS **EXE-06.09.03-VP-058 Single III**: 30 FPS **EXE-06.09.03-VP-059 Contingency I**: 30 + 20 FPS **EXE-06.09.03-VP-060 Multiple (Simulation) I**: 30 FPS **EXE-06.09.03-VP-061 Multiple II** : 30 FPS **EXE-06.09.03-VP-062 Contingency II**: 30 + 20 FPS **EXE-06.09.03-VP-063 Multiple III** : 30 FPS **EXE-06.08.04-VP-751**: 30 FPS **EXE-06.08.04-VP-752**: 30 FPS
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1104	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0007

Requirement	The implementation requirement specification shall define the maximum allowed delay from the capturing of the video image to displaying the video image on the visual presentation.
Title	RTWR-RFR-VIS-12
Status	<Validated>
Rationale	The validations (VP-056, VP-057, VP058) have found that a delay of maximum 1 second is sufficient to provide ATS. **EXE-06.09.03-VP-056 Single I**, **EXE-06.09.03-VP-057 Single II**, **EXE-06.09.03-VP-058 Single III**, **EXE-06.09.03-VP-059 Contingency I**, **EXE-06.09.03-VP-060 Multiple (Simulation) I**, **EXE-06.09.03-VP-061 Multiple II** , **EXE-06.09.03-VP-062 Contingency II**, **EXE-06.09.03-VP-063 Multiple III** : All less than 1 second **EXE-06.08.04-VP-751**: Less than 1 second **EXE-06.08.04-VP-752**: Between 0.25 and 0.80 s
Category	<Performance><Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1105	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Ground Datalink Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0005
Requirement	The visual presentation shall provide a non-flickering impression to the human eye.
Title	RTWR-RFR-VIS-41
Status	<Validated>
Rationale	Flickering displays causes tiredness
Category	<HMI>
Validation Method	
Verification Method	<Analysis><Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0053
Requirement	If there is a difference in the perception of daylight / darkness conditions

	between the visual presentation and the reality, the RTM should provide access to information about the current daylight/dusk/darkness/dawn condition at the remote aerodrome as well as the expected time for the transitioning between these phases
Title	RTWR-RFR-VIS-44
Status	<Validated>
Rationale	Knowledge of the true conditions at the remote airport is of high importance for the ATCO/AFISO. If there is a difference between the displayed image in the RTM and the reality at the remote airport, means to compensate for the difference is necessary.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1106	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

3.3.4.3 Quality

This section intends to set a minimum standard for the quality of the visual presentation, in terms of what the ATCO/AFISO needs to be able to visually observe/see. For this reason a terminology based on the Johnson Criteria model and adapted for use in an ATS context has been introduced. Whenever one of the terms below is used within the following requirements, they should be interpreted as follows:

Detect (Visual Detection): Something in the image raises the observer's attention

- "There is something!"

Recognise (Visual Recognition): Classes of objects can be differentiated

- Class/category/type of aircraft, to be determined with the help of e.g. one or several of the following parameters;
  - aircraft size & fuselage configuration (e.g. fighter/glider/ commercial aircraft, etc.)
  - engine configuration (e.g. wing mounted (below / above) or tail mounted, number and type of engines)
  - wing configuration (e.g. mid or top mounted wings)
  - stabilizer configuration
  - landing gear configuration
  - aircraft painting
- Vehicle type/class; e.g. Fire Truck / Car / Snow Sweeping Truck / Luggage Trolley
- Personnel and obstructions; e.g. Person / Wildlife of potential hazards, e.g. birds, dears etc. / / FOD (Foreign Object (Damage))

[REQ]

Identifier	REQ-12.04.07-TS-0110.0008
Requirement	The visual presentation shall have a resolution of a sufficient number of

	pixels per degree to be able to detect an aircraft of type A320, ATR72 or similar size on 4NM final during daylight CAVOK.
Title	RTWR-RFR-VIS-13
Status	<Validated>
Rationale	Detection of an aircraft of type ATR72 (7x7 m according to EUROCAE WG-100) or similar size at a distance of 4NM requires at least 36 pixels per degree according to Johnson's criteria. Dependent on camera placement, aerodrome and manoeuvring area layout. Requires approx. 31 pixels per degree to detect humans at a distance of 1,5km. Requires approx. 120 pixels per degree to recognise them as humans. **EXE-06.09.03-VP-056 Single I**, **EXE-06.09.03-VP-057 Single II**, **EXE-06.09.03-VP-058 Single III**, **EXE-06.09.03-VP-059 Contingency I**, **EXE-06.09.03-VP-060 Multiple (Simulation) I**, **EXE-06.09.03-VP-061 Multiple II** , **EXE-06.09.03-VP-062 Contingency II**, **EXE-06.09.03-VP-063 Multiple III**: **EXE-06.08.04-VP-751**, **EXE-06.08.04-VP-752**: All 42 pixels per degree
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1201	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0054
Requirement	The visual presentation shall enable the ATCO/AFISO to detect all flight operations and vehicles on the manoeurvring area during CAVOK conditions.
Title	RTWR-RFR-VIS-45
Status	<Validated>
Rationale	The purpose of this requirement is to define a quantifiable minimum standard for the quality of the visual presentation, where a gradual degradation of performance is expected in less favourable conditions.
Category	<Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1208	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0055
Requirement	The visual presentation in combination with the binocular functionality shall enable the ATCO/AFISO to visually recognise all flight operations and vehicles on the manoeuvring area during CAVOK conditions.
Title	RTWR-RFR-VIS-46
Status	<Validated>
Rationale	The purpose of this requirement is to define a quantifiable minimum standard for the quality of the visual presentation in combination with the binocular functionality, where a gradual degradation of performance is expected in less favourable conditions.
Category	<Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1209	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0056
Requirement	The visual presentation in combination with the binocular functionality shall enable the ATCO/AFISO to visually recognise personnel on the manoeuvring area during daylight CAVOK conditions.
Title	RTWR-RFR-VIS-47
Status	<Validated>
Rationale	The purpose of this requirement is to define a quantifiable minimum standard for the quality of the visual presentation in combination with the binocular functionality, where a gradual degradation of performance is expected in less favourable conditions.
Category	<Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1210	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0048
Requirement	During daylight and good visibility conditions, the visual presentation in combination with binocular functionality should enable the ATCO/AFISO to detect obstructions on the manoeuvring area.
Title	RTWR-RFR-VIS-15

Status	<Validated>
Rationale	The fulfilment of this requirement will be dependent on distance to and size of the obstruction as well as on meteorological conditions - as already implicit in current ICAO regulations.
Category	<Safety>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1205	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0049
Requirement	Depending on visibility and daylight/darkness conditions, the visual presentation in combination with binocular functionality may enable the ATCO/AFISO to observe significant meteorological conditions in the take-off and climb-out area.
Title	RTWR-RFR-VIS-16
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 7.4.1.2.2 states that aircraft shall be advised of significant meteorological conditions in the take-off and climb-out area, except when it its known that the information has already been received by the aircraft. Significant meteorological conditions in this context are defined in ICAO Doc 4444 Chapter 7.4.1.2.2. Significant meteorological conditions can be either visually observed by the ATCO/AFISO or reported to the same from pilots, met-offices etc. In addition, "significant meteorological conditions" can be a variety of different weather phenomena's, many of them impossible to observe visually, some difficult to observe visually. In conclusion this it is not a mandatory requirement" to be able to observe all significant met conditions at all times even in today's regulations / today's traditional towers. The fulfilment of this requirement will be dependent on the type of and distance to the significant weather, the daylight/darkness conditions as well as the meteorological visibility - as already implicit in current ICAO regulations. The purpose of this requirement is to define a quantifiable minimum standard for the quality of the visual presentation in combination with the binocular functionality, where a gradual degradation of performance is expected in less favourable conditions. The purpose is not to define operator responsibilities.
Category	<Safety>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2003	<Partial>

<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1206	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0005
Requirement	The visual presentation shall include functionality that reduces the negative impact caused by counter light on the visual presentation (as applicable depending on the technical solution)
Title	RTWR-RFR-VIS-37
Status	<Validated>
Rationale	Negative impact such as direct sunlight within the camera field of view. Set as shall requirement since if not implemented, impact of counterlight will negatively affect the performance of the visual presentation.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0006
Requirement	The visual presentation should include functionality that reduces the negative impact caused by variable light conditions across the field of view of the visual presentation (as applicable depending on the technical solution).
Title	RTWR-RFR-VIS-38
Status	<Validated>
Rationale	Include functionality that reduces negative impact on the visual presentation caused by variable light conditions. This is only set as a should requirement since it may not severely affect the operational status of the system, but is more of a nuisance to the ATCO/AFISO.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0007
Requirement	The visual presentation shall include functionality that reduces the negative impact caused by precipitation (rain, snow, etc) on the visual presentation

	(as applicable depending on the technical solution).
Title	RTWR-RFR-VIS-39
Status	<Validated>
Rationale	Include functionality that reduces negative impact on the visual presentation caused by precipitation. Set as shall requirement since if not implemented, precipitation will negatively affect the performance of the visual presentation.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0008
Requirement	The visual presentation shall include functionality that reduces the negative impact caused by insects, birds, etc. on the visual presentation (as applicable depending on the technical solution).
Title	RTWR-RFR-VIS-40
Status	<Validated>
Rationale	Include functionality that reduces negative impact on the visual presentation caused by insects, birds, etc. Set as shall requirement since if not implemented, objects (birds, insects, etc.) may obstruct the visual presentation view.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0005
Requirement	The RTM visual presentation in combination with binocular functionality shall allow an ATCO/AFISO to observe the visual communication from aircraft that are within the Remote Airport visual range, if meteorological conditions permits.
Title	RTWR-RFR-VIS-49
Status	<Validated>
Rationale	ICAO Doc 4444 12.3.4 “Phraseologies for use on and in the vicinity of the aerodrome” defines rocking wings, moving ailerons (or rudder), and flashing / showing landing lights as a possible means of acknowledgement of visual communication.
Category	<Design><Functional><Safety>
Validation Method	
Verification Method	<Analysis><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1211	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0043
Requirement	The resolution of the zoom camera shall be sufficient to produce at enough pixels per degree for the ATCO/AFISO to be able to recognise an aircraft of type A320, ATR72 or similar size on 4NM final, in combination with visual presentation, during daylight CAVOK conditions.
Title	RTWR-RFR-VIS-33
Status	<Validated>
Rationale	Dependent on camera placement, aerodrome and manoeuvring area layout. Recognition of an aircraft of type ATR72 (7x7 m according to EUROCAE WG-100) or similar size at a distance of 4NM requires at least 143 pixels per degree according to Johnson's criteria. Requires approx. 31 pixels per degree to detect humans at a distance of 1,5km. Requires approx. 120 pixels per degree to identify them as humans. **EXE-06.09.03-VP-056 Single I**: Up to 662 pixels per degree **EXE-06.09.03-VP-057 Single II**: Up to 662 pixels per degree **EXE-06.09.03-VP-058 Single III**: Up to 581 pixels per degree **EXE-06.09.03-VP-059 Contingency I**: Up to 662 pixels per degree **EXE-06.09.03-VP-060 Multiple (Simulation) I**: N/A **EXE-06.09.03-VP-061 Multiple II** : N/A **EXE-06.09.03-VP-062 Contingency II**: Up to 662 pixels per degree **EXE-06.09.03-VP-063 Multiple III** : Up to 581 pixels per degree **EXE-06.08.04-VP-751**: Up to 662 pixels per degree **EXE-06.08.04-VP-752** Up to 662 pixels per degree
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1207	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1502	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A

<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0051
Requirement	The resolution of the zoom camera should be sufficient to produce enough pixels per degree for the ATCO/AFISO to be able to judge the position of a light aircraft (e.g. C172 or P28A) in the traffic circuit, and to observe abnormal configurations (such as landing gear not or only partly extended or unusual smoke emissions from any part of the aircraft).
Title	RTWR-RFR-VIS-34
Status	<Validated>
Rationale	Dependent on camera placement, aerodrome and manoeuvring area layout. Requires at least 460 pixels per degree to recognise a light aircraft of type C172 (2.25x2.25m according to EUROCAE WG-100) or similar size at a distance of 4NM. Requires at least 512 pixels per degree to detect gear down (0,5x0,5m gear) at a distance of 4NM. **EXE-06.09.03-VP-056 Single I**: Up to 662 pixels per degree **EXE-06.09.03-VP-057 Single II**: Up to 662 pixels per degree **EXE-06.09.03-VP-058 Single III**: Up to 581 pixels per degree **EXE-06.09.03-VP-059 Contingency I**: Up to 662 pixels per degree **EXE-06.09.03-VP-060 Multiple (Simulation) I**: N/A **EXE-06.09.03-VP-061 Multiple II** : N/A **EXE-06.09.03-VP-062 Contingency II**: Up to 662 pixels per degree **EXE-06.09.03-VP-063 Multiple III** : Up to 581 pixels per degree **EXE-06.08.04-VP-751**: Up to 662 pixels per degree **EXE-06.08.04-VP-752** Up to 662 pixels per degree
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1202	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1203	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.4.4 Augmentation

[REQ]

Identifier	REQ-12.04.07-TS-0110.0050
Requirement	The implementation requirement specification should specify if the visual presentation is to include overlaid information regarding elements or specific targets (tracks, labels, obstacles, runways, and other objects of interest).
Title	RTWR-RFR-VIS-17
Status	<Validated>
Rationale	This requirement primarily targets symbols and labels associated with elements capable of movement and relevant for the service provision, such as aircraft, vehicles, personnel, obstructions, birds etc on the manoeuvring area and the vicinity of the aerodrome. (Objects not relevant for the service provision would include e.g. vehicles outside of the aerodrome premises.) Such symbols and labels can be based on; • surveillance information (from radars, ADS-B etc), targeting cooperative targets (commonly referred to as “radar tracking”), • visual information (system detection of moving objects in the visual presentation), targeting all moving objects (including also non-cooperative targets) in the visual field of view (commonly referred to as “visual tracking”), In order to only present relevant targets for the service provision (i.e. to not present disturbing information), there may be a need to mask some areas in the visual field, e.g. aprons, roads or other areas outside of the aerodrome premises, airspace/sky outside CTR etc. The exact configuration of these features is to be determined in the scope of local implementations. The importance of this requirement is dependent on total traffic density and ATCO/AFISO work load and is likely to be more advantageous in a high density environment. Requirement likely to be more important in a Multiple Aerodrome application environment or in a high traffic density environment.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3101	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1401	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.06	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0033
Requirement	The implementation requirement specification should specify if the visual presentation is to include overlaid information to indicate / high light specific parts of the aerodrome.
Title	RTWR-RFR-VIS-18
Status	<Validated>
Rationale	This requirement primarily targets framings around runways, taxiways, aprons etc., in order to enhance the ATCO/AFISO situational awareness. The exact configuration of these features is to be determined in the scope of

	local implementations. Requirement likely to be more important in a Multiple Aerodrome application environment or in a high traffic density environment.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3102	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1402	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.06	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0034
Requirement	The implementation requirement specification should specify if the visual presentation shall include overlaid information to present information pertinent to the general area of interest or area of responsibility.
Title	RTWR-RFR-VIS-19
Status	<Validated>
Rationale	This requirement is primarily targeting geographic, meteorological and operational and service status and handover information. Instances of element classes include: - Geographic: cardinal / compass directions - Meteorological: current wind and RVR values, met report, METAR; TAF - Operational and service: runway/taxiway/apron designators, aerodrome systems status such as lighting, clock, checklists, maps - Visual reminders such as “RWY blocked” markings to aid with runway incursion prevention. Requirement likely to be more important in a Multiple Aerodrome application environment or in a high traffic density environment.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3103	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1403	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.06	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0035
Requirement	Tracked targets presented as overlaid information within the visual presentation shall be possible to toggle on/off as well as adjust in light

	intensity by the ATCO/AFISO.
Title	RTWR-RFR-VIS-20
Status	<Validated>
Rationale	Based on validation feedback. It is particularly important to be able to dim such overlays during darkness so as not to dazzle the operator.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3104	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1404	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1401	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0036
Requirement	Aerodrome indications/high lights presented as overlaid information within the visual presentation shall be possible to toggle on/off as well as adjust in light intensity by the ATCO/AFISO.
Title	RTWR-RFR-VIS-21
Status	<Validated>
Rationale	Based on validation feedback. It is particularly important to be able to dim such overlays during darkness so as not to dazzle the operator.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3104	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1404	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1402	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0037
Requirement	Areas of responsibility or areas of interest presented as overlaid information within the visual presentation shall be possible to toggle on/off as well as adjust in light intensity by the ATCO/AFISO.
Title	RTWR-RFR-VIS-22
Status	<Validated>
Rationale	Based on validation feedback. It is particularly important to be able to dim such overlays during darkness so as not to dazzle the operator.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MA04.3104	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1404	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VA03.1403	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.4.5 Binocular functionality

[REQ]

Identifier	REQ-12.04.07-TS-0110.0052
Requirement	The airport shall be equipped with at least one camera with pan, tilt and zoom capabilities. (Corresponding to binoculars in a local tower.)
Title	RTWR-RFR-VIS-23
Status	<Validated>
Rationale	ICAO Doc 9426 (Planning manual), Appendix B, (Aerodrome Control Tower Equipment Checklist) states binoculars as equipment.
Category	<Design><Safety>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3004	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0038
Requirement	The binocular functionality shall be as simple, quick and easy to use as manually operated binoculars (in a local tower).
Title	RTWR-RFR-VIS-25
Status	<Validated>
Rationale	The binocular functionality shall be as simple, quick and easy to use as binoculars. This time restraint should to be in parity with locating and picking up a pair of binoculars in the tower, and then finding any given location through those binoculars. The time restraint includes any HMI interaction, aiming and travel time for the zoom camera, thus setting a requirement on quickness and ease of use. In order to make this functionality as easy and quick to use as normal binoculars, features like this should be included; - predefined and user-definable positions, - automatic (pre-defined and user definable) scanning patterns and - automatic tracking of aircraft, vehicles or obstructions (e.g. personnel or

	large animals) RT_REQ_ DESIGN_012 in *SESAR DEL-06.09.03-D15-HP "PP 6.9.3 HP Assessment Report for Single Remote Tower", Edition 00.01.02* complies with requirement.
Category	<Performance>
Validation Method	
Verification Method	<Analysis><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1501	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0039
Requirement	It shall be possible to manoeuvre the zoom camera to any given location and be presented with an image of that location within ATCO/AFISO operational acceptable limits.
Title	RTWR-RFR-VIS-26
Status	<Validated>
Rationale	The binocular functionality shall be as simple, quick and easy to use as binoculars. This time restraint should to be in parity with locating and picking up a pair of binoculars in the tower, and then finding any given location through those binoculars. The time restraint includes any HMI interaction, aiming and travel time for the zoom camera, thus setting a requirement on quickness and ease of use. **EXE-06.09.03-VP-056 Single I**: Less than 5 seconds **EXE-06.09.03-VP-057 Single II**: Less than 5 seconds **EXE-06.09.03-VP-058 Single III**: Less than 3 seconds **EXE-06.09.03-VP-059 Contingency I**: Less than 5 seconds **EXE-06.09.03-VP-060 Multiple (Simulation) I**: Less than 1 second **EXE-06.09.03-VP-061 Multiple II** : Less than 3 seconds **EXE-06.09.03-VP-062 Contingency II**: Less than 5 seconds **EXE-06.09.03-VP-063 Multiple III** : Less than 3 seconds **EXE-06.08.04-VP-751**: Less than 2 seconds **EXE-06.08.04-VP-752**: Less than 2 seconds
Category	<Performance><Safety>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1501	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0040
Requirement	The direction of bore sight shall be visually indicated to the ATCO/AFISO.
Title	RTWR-RFR-VIS-27
Status	<Validated>
Rationale	It shall be possible to determine where the zoom camera is aiming. This can for example be accomplished by overlaying the zoom camera image in the corresponding position of the OTW view, or presenting the current direction within the PTZ view.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1503	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0046
Requirement	The implementation requirement specification shall specify the required zoom factor for the zoom camera.
Title	RTWR-RFR-VIS-42
Status	<Validated>
Rationale	The required magnification depends on site specific factors. **EXE-06.09.03-VP-056 Single I**: 20x **EXE-06.09.03-VP-057 Single II**: 20x **EXE-06.09.03-VP-058 Single III**: 30x **EXE-06.09.03-VP-059 Contingency I**: 20x **EXE-06.09.03-VP-060 Multiple (Simulation) I**: digital **EXE-06.09.03-VP-061 Multiple II** : digital **EXE-06.09.03-VP-062 Contingency II**: 20x **EXE-06.09.03-VP-063 Multiple III**: 30x **EXE-06.08.04-VP-751**: 20x **EXE-06.08.04-VP-752**: 20x

Category	<Metadata><Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1502	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0041
Requirement	It shall be possible for the ATCO/AFISO to change the zoom level of the zoom camera.
Title	RTWR-RFR-VIS-28
Status	<Validated>
Rationale	In order for the binocular functionality to be as simple, quick and easy to use as manually operated binoculars (in a local tower), this forms an essential feature.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1503	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0047
Requirement	The implementation requirement specification shall specify the required zoom speed for the zoom camera.
Title	RTWR-RFR-VIS-43
Status	<Validated>
Rationale	The binocular functionality shall be as simple, quick and easy to use as binoculars. This time restraint should to be in parity with locating and picking up a pair of binoculars in the tower, and then finding any given location through those binoculars. The time restraint includes any HMI interaction, aiming and travel time for the zoom camera, thus setting a requirement on quickness and ease of use. **EXE-06.09.03-VP-056 Single I**: Less than 5 seconds **EXE-06.09.03-VP-057 Single II**: Less than 5 seconds **EXE-06.09.03-VP-058 Single III**: Less than 3 seconds **EXE-06.09.03-VP-059 Contingency I**: Less than 5 seconds **EXE-06.09.03-VP-060 Multiple (Simulation) I**:

	digital instant **EXE-06.09.03-VP-061 Multiple II** : digital instant **EXE-06.09.03-VP-062 Contingency II**: Less than 5 seconds **EXE-06.09.03-VP-063 Multiple III** : Less than 3 seconds **EXE-06.08.04-VP-751**: Less than 1 second **EXE-06.08.04-VP-752**: Less than 1 second
Category	<Metadata><Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1501	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0027
Requirement	It should be possible to predefine and user-define positions (direction, zoom and focus) for the zoom camera.
Title	RTWR-RFR-VIS-29
Status	<Validated>
Rationale	Assisting the ATCO/AFISO in performing checks on fixed points of interrest, such as holding points etc.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1504	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0028
Requirement	It should be possible to predefine and user-define automatic scanning patterns, such as runway sweeps, for the zoom camera.
Title	RTWR-RFR-VIS-30
Status	<Validated>
Rationale	Assisting the ATCO/AFISO in performing e.g. runway sweeps or sweeps of any of other area of interest within the area of responsibility.
Category	<Functional>
Validation Method	

Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1505	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0029
Requirement	The zoom camera should be able to automatically track moving aircrafts, vehicles or obstructions (e.g. personnel or large animals).
Title	RTWR-RFR-VIS-31
Status	<Validated>
Rationale	Assisting the ATCO/AFISO to automatically follow moving objects with the binocular function improves usability of the system.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1506	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.06	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0042
Requirement	The visual representation provided by the binocular functionality shall be of sufficient quality (image sharpness, magnification, contrast) to support the related ATCO/AFISO tasks.
Title	RTWR-RFR-VIS-32
Status	<Validated>
Rationale	Dependent on camera placement, aerodrome and manoeuvring area layout.
Category	<Performance><Operational>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1502	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0044
Requirement	The contrast of the zoom camera image shall be of sufficient quality to

	support the related ATCO/AFISO tasks.
Title	RTWR-RFR-VIS-35
Status	<Validated>
Rationale	Dependent on camera placement, aerodrome and manoeuvring area layout. **EXE-06.09.03-VP-056 Single I**: Minimum sensitivity 0.5 Lux **EXE-06.09.03-VP-057 Single II**: Minimum sensitivity 0.5 Lux **EXE-06.09.03-VP-058 Single III**: Minimum sensitivity 0.5 Lux **EXE-06.09.03-VP-059 Contingency I**: Minimum sensitivity 0.5 Lux **EXE-06.09.03-VP-060 Multiple (Simulation) I**: N/A **EXE-06.09.03-VP-061 Multiple II**: N/A **EXE-06.09.03-VP-062 Contingency II**: Minimum sensitivity 0.5 Lux **EXE-06.09.03-VP-063 Multiple III**: Minimum sensitivity 0.5 Lux **EXE-06.08.04-VP-751**: Minimum sensitivity 0.3 Lux with dynamic margin of 86 dB in WDR **EXE-06.08.04-VP-752** Minimum sensitivity 0.3 Lux with dynamic margin of 86 dB in WDR
Category	<Design><Operational>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1502	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0045
Requirement	It should be possible to display the image from the zoom camera in the same presentation area as the static visual presentation (if applicable).
Title	RTWR-RFR-VIS-36
Status	<Validated>
Rationale	VP-056 raised concerns with a separated presentation of the zoom camera for reducing its usefulness and drawing ATCO focus away from the visual presentation.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3004	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0057
Requirement	The means of directing the signalling lamp towards the applicable aircraft may be combined with the binocular functionality.
Title	RTWR-RFR-VIS-48
Status	<Validated>
Rationale	This solution has been successfully tested in validations.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1507	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.5 Airport sound reproduction

[REQ]

Identifier	REQ-12.04.07-TS-0111.0004
Requirement	The airport may be equipped with at least one microphone for collecting the outdoor sound.
Title	RTWR-RFR-SND-1
Status	<Validated>
Rationale	In order to increase situational awareness and compensate for being placed remote.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0005
Requirement	The airport may be equipped with two or more microphones pointed, or placed, at different parts of the manoeuvring area to create stereo sound.
Title	RTWR-RFR-SND-2
Status	<Validated>
Rationale	In order to increase situational awareness and compensate for being placed remote.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0006
Requirement	The RTM may be equipped with at least one speaker for reproducing the airport sound.
Title	RTWR-RFR-SND-3
Status	<Validated>
Rationale	In order to increase situational awareness and compensate for being placed remote.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0007
Requirement	The RTM may be equipped with two or more speakers able to reproduce airport stereo sound.
Title	RTWR-RFR-SND-4
Status	<Validated>
Rationale	In order to increase situational awareness and compensate for being placed remote.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0003
Requirement	The ATCO/AFISO shall be able to adjust the volume, and turn off, any reproduced sound from the airport.
Title	RTWR-RFR-SND-5
Status	<Validated>
Rationale	In order to increase situational awareness and compensate for being placed remote.

Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.6 Other ATS System/Functions

[REQ]

Identifier	REQ-12.04.07-TS-0112.0001
Requirement	The implementation requirement specification should specify if the RTC shall be equipped with an electronic system for presentation and updating of flight plan and control data.
Title	RTWR-RFR-ATS-1
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 4.13
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0002
Requirement	If the RTC enables transfer of responsibility of ATS for aerodromes between RTMs within the RTC, the RTC shall be equipped with an electronic system for presentation and updating of flight plan and control data .
Title	RTWR-RFR-ATS-2
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 4.13
Category	<Functional>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0003
Requirement	If the RTM is equipped with an electronic system for presentation and updating of flight data, the implementation requirement specification should specify what pre-sets to use to access common actions .
Title	RTWR-RFR-ATS-3
Status	<Validated>
Rationale	This requirement is based on feedback from EXE-060 particularly
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0004
Requirement	The implementation requirement specification should specify if updates for flight plan and control data to other ATS units is to be done automatically
Title	RTWR-RFR-ATS-4
Status	<Validated>
Rationale	ICAO Doc 4444 Chapter 4.13 This requirement is likely to be more important in a multiple aerodrome environment/RTM compared to a single aerodrome environment/RTM (OFA06.03.01 OSED suggests “may” for Single Aerodrome applications and “should” for Multiple Aerodrome applications).
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MF04.4002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0005
Requirement	The implementation requirement specification may specify that functionality shall exist to notify when an aircraft or vehicle is entering or vacating a runway.
Title	RTWR-RFR-ATS-5
Status	<Validated>
Rationale	Such notifications may be utilized by cameras / laser beams monitoring specific parts of the manoeuvring area, such as runway entry/exits.

	To assist ATCOIAFISOs identifying aircraft/vehicle entering/vacating RWY.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0006
Requirement	The implementation requirement specification may specify that functionality shall exist to warn when an aircraft or vehicle is entering a runway without clearance.
Title	RTWR-RFR-ATS-6
Status	<Validated>
Rationale	To assist in identifying/avoiding RWY incursions.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3006	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0007
Requirement	The implementation requirement specification may specify that functionality shall exist to warn when an aircraft or vehicle is entering the manoeuvring area without clearance.
Title	RTWR-RFR-ATS-7
Status	<Validated>
Rationale	To assist in identifying/avoiding manoeuvring area incursions.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3007	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0112.0008
Requirement	The RTM shall enable the ATCO/AFISO to be notified of changes in the technical status of the system, including systems and/or data that are specific to remote tower operations, in all respects that may affect safety or efficiency of flight operations and/or the provision of air traffic service.
Title	RTWR-RFR-ATS-8
Status	<Validated>
Rationale	ICAO Doc 4444, Chapter 4.14, ICAO Doc 4444, Chapter 7.1.3 For example detecting corrupt/delayed/frozen visual presentation.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3008	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Operational Supervision	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

3.3.7 Voice and Data Recording

[REQ]

Identifier	REQ-12.04.07-TS-0113.0001
Requirement	The voice and data recording shall include the visual presentation data.
Title	RTWR-RFR-VDR-1
Status	<Validated>
Rationale	ICAO Annex 11 Chapter 6 states that; - For aeronautical radio navigation service, surveillance data (from primary and secondary radar equipment or other systems (e.g. ADS-B, ADS-C)) used as an aid to air traffic services shall be automatically recorded for use in accident and incident investigations, search and rescue, air traffic control and surveillance systems evaluation and training. Such automatic recordings shall be retained for a period of at least thirty days. When the recordings are pertinent to accident and incident investigations, they shall be retained for longer periods until it is evident that they will no longer be required. (6.4.1.1 & 6.4.1.2)
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR03.4001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0113.0003

Requirement	It shall be possible to access the visual presentation data up to 30 days after it has been recorded.
Title	RTWR-RFR-VDR-2
Status	<Validated>
Rationale	ICAO Annex 11 Chapter 6.
Category	<Design>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0113.0004
Requirement	It shall be possible to reproduce the recorded visual presentation at the same quality as it was presented to the ATCO at the time of the recording.
Title	RTWR-RFR-VDR-3
Status	<Validated>
Rationale	ICAO Annex 11 Chapter 6.4.1.1 & 6.4.1.2.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0113.0005
Requirement	It shall be possible to retain the recorded data for longer periods until it is evident that they will no longer be required, when recordings are pertinent to accident and incident investigations.
Title	RTWR-RFR-VDR-4
Status	<Validated>
Rationale	ICAO Annex 11 Chapter 6.4.1.1 & 6.4.1.2.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.8 Work Environment

[REQ]

Identifier	REQ-12.04.07-TS-0114.0001
Requirement	Any information presented within a RTM shall still be visible in office daylight conditions .
Title	RTWR-RFR-WE-1
Status	<Validated>
Rationale	ATCOs/AFISOs are used to work in a daylight environment (normal towers). Compare with modern ACCs, which are also designed to allow for daylight conditions to avoid fatigue etc.
Category	<HMI><Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0002
Requirement	The technical solution shall describe the temperature and noise levels generated.
Title	RTWR-RFR-WE-2
Status	<Validated>
Rationale	In order to ensure good working environment to avoid fatigue etc.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0003
Requirement	It shall be possible for the ATCO/AFISO to adjust the lighting conditions in the RTM, in order to adapt to conditions at the remote airport(s).
Title	RTWR-RFR-WE-3
Status	<Validated>
Rationale	E.g., during darkness at the remote aerodrome, the room/RTM is likely needed to be darker.

	Based on validation feedback.
Category	<HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0005
Requirement	If several RTMs are collocated in a RTC, it should be possible for the ATCO/AFISO to control the lights individually for each RTM in a RTC.
Title	RTWR-RFR-WE-5
Status	<Validated>
Rationale	It can be daylight conditions (at the remote airport) in one RTM, and darkness (at the remote airport) in the RTM next beside.
Category	<HMI>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0004
Requirement	Each CWP shall have a place available for taking notes, not less than roughly the size of an A5 sheet.
Title	RTWR-RFR-WE-4
Status	<Validated>
Rationale	Based on validation feedback, particularly from VP-058. The space shall be properly lit as required, minding the difference in daylight/night-time operations. Taking manual notes are often common practice in small towers due to e.g. lot unplanned traffic. Making manual paper notes is ultimately also the final fall-back procedure if all technical systems would stop functioning. Using paper strips may satisfactory fulfil this need, hence if using paper strips no additional separate space for making notes may be needed.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0006
Requirement	Each CWP should be designed to suit both left and right handed persons.
Title	RTWR-RFR-WE-6
Status	<Validated>
Rationale	A comfortable working position improves human performance
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5006	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0114.0007
Requirement	Each CWP should be designed to accommodate users of different hights and sizes.
Title	RTWR-RFR-WE-7
Status	<Validated>
Rationale	A comfortable working position improves human performance
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-WE03.5006	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.3.9 Reliability and integrity

[REQ]

Identifier	REQ-12.04.07-TS-0205.0001
Requirement	The implementation specific requirement specification shall define the operational acceptable level of failure or degradation as per local implementation and as per applicable regulations.

Title	RTWR-RFR-RI-1
Status	<Validated>
Rationale	The reliability and integrity of the system needs to be defined.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RI03.6002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RI03.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0205.0002
Requirement	The remote tower implementation, including both remote tower specific systems and non-remote tower specific systems, shall conform to the implementation specific requirement as defined by REQ-12.04.07-TS-0205.0001 in order to be operationally acceptable.
Title	RTWR-RFR-RI-2
Status	<Validated>
Rationale	The reliability and integrity of the system needs to be defined.
Category	<Reliability>
Validation Method	
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RI03.6002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-RI03.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.4 Additional requirements for multiple aerodrome applications

3.4.1 Concept requirements multiple aerodrome applications

[REQ]

Identifier	REQ-12.04.07-TS-0115.0001
Requirement	It shall be possible to connect an RTM to more than one Remote Airport, in parallel.
Title	RTWR-ADDM-CM-1
Status	<Validated>
Rationale	This requirement defines part of the concept baseline.
Category	<Functional>
Validation Method	

Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM04.0007	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0009	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM04.0001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

3.4.2 Remote functional requirements

3.4.2.1 Multiple Handling

[REQ]

Identifier	REQ-12.04.07-TS-0116.0001
Requirement	Each RTM shall be able to provide ATC/AFIS services simultaneously for all aerodrome(s) served by that RTM
Title	RTWR-ADDM-RFRM-1
Status	<Validated>
Rationale	The configuration of a CWP may differ depending on the number of aerodromes under responsibility and the level of service given at any particular time.
Category	<Design><Functional><Operational>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MP04.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0116.0002
Requirement	The HMI in the RTM shall clearly indicate which aerodrome(s) that are currently being served.
Title	RTWR-ADDM-RFRM-2
Status	<Validated>
Rationale	In order to minimise the risk of making mistakes and mixing the airports up
Category	<HMI><Safety>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0116.0003
Requirement	The aerodrome that is being affected when manoeuvring airport systems shall be clearly shown within the RTM.
Title	RTWR-ADDM-RFRM-3
Status	<Validated>
Rationale	In order to minimise the risk of making mistakes and mixing the airports up.
Category	<HMI><Safety>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0116.0004
Requirement	Each RTM shall provide the ATCO/AFISO with all systems and data required to perform the ATS for all connected aerodromes.
Title	RTWR-ADDM-RFRM-4
Status	<Validated>
Rationale	To ensure all necessary systems and data are available regardless of the number of airports under responsibility from a CWP.
Category	<Functional><Operational>
Validation Method	
Verification Method	<Inspection><Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1007	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

3.4.2.2 Communication

[REQ]

Identifier	REQ-12.04.07-TS-0117.0001
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports shall be able to receive and play aeronautical mobile services (air-ground communications) communication channels for all aerodromes being served to the ATCO/AFISO.
Title	RTWR-ADDM-RFRC-1
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from

	one RTM, the ATCO/AFISO shall listen to all aeronautical mobile service (air-ground communications) communication channels for all aerodromes being served. Note: If a separate ground controller position is introduced, a separate communication channel for the control of traffic operating on the manoeuvring area would be needed for each aerodrome served by a ground controller.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0117.0002
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports shall enable the ATCO/AFISO to transmit aeronautical mobile services (air-ground communications) either to "all aerodromes" being served or to an "individual aerodrome" when ATS is performed to more than one aerodrome simultaneously .
Title	RTWR-ADDM-RFRC-2
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from one RTM, the ATCO/AFISO shall for the aeronautical mobile service (air-ground communications), be able to transmit either to “all aerodromes” being served or to an “individual aerodrome”.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0117.0003
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports simultaneously should enable retransmission and relay of aeronautical mobile service (air-ground communications) between all aerodromes being served from the RTM.
Title	RTWR-ADDM-RFRC-3
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from one RTM, aeronautical mobile service (air-ground communications) may be retransmitted / relayed between all aerodromes being served from the RTM.
Category	<Functional>

Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0117.0004
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports shall be extended to enable aeronautical fixed service (ground-ground communications) to cover communications with all units relevant for all aerodromes being served.
Title	RTWR-ADDM-RFRC-4
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from one RTM, the ATCO/AFISO shall use aeronautical fixed service (ground-ground communications) extended to cover communications with all units relevant for all aerodromes being served.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0117.0005
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports shall enable the ATCO/AFISO to listen to all surface movement control service (communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes) communication channels for all aerodromes being served.
Title	RTWR-ADDM-RFRC-5
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from one RTM, the ATCO/AFISO shall be able to listen to all surface movement control service (communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes) communication channels for all aerodromes being served.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>

<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0117.0006
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports shall enable the ATCO/AFISO to transmit surface movement control service (communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes) to individual aerodromes.
Title	RTWR-ADDM-RFRC-6
Status	<Validated>
Rationale	When ATS is performed to more than one aerodrome simultaneously from one RTM, the ATCO/AFISO shall for the surface movement control service (communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes), be able to transmit to individual aerodromes.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2006	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communications	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

3.4.3 Visualization

[REQ]

Identifier	REQ-12.04.07-TS-0119.0001
Requirement	The visual presentation should include additional (digital) information to enhance visibility (e.g. in identifying the runway and key areas).
Title	RTWR-ADDM-VIS-1
Status	<Validated>
Rationale	The aim with this requirement is to present additional information directly in the OTW view (compare with head up displays in aircrafts) in order to minimise ATCO/AFISO head down time.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Inspection><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MV04.3001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

3.4.4 Sound

[REQ]

Identifier	REQ-12.04.07-TS-0206.0001
Requirement	Each RTM that is able to provide ATC/AFIS services for multiple airports should enable the ATCO/AFISO to hear the outdoor sounds from the controlled remote airports.
Title	RTWR-ADDM-MSND-1
Status	<Validated>
Rationale	To facilitate provision of ATS to multiple aerodromes, the importance of this requirement has been raised to a higher level compared to when ATS is provided to a single aerodrome only. Requirement is likely to be more important for small aerodromes (to attract ATCO/AFISOs attention of arising occurrences at the aerodrome) where sound plays an important role in the ATCOAFISO's job. Requirement can also increase situational awareness in low visibility conditions. In addition, airport sound is also deemed as a helpful tool in a multiple environment, aiding in attracting ATCO/AFSOs attention to occurrences at the different aerodromes.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MS04.3201	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0206.0002
Requirement	If requirement REQ-12.04.07-TS-0206.0001 is implemented, the RTM shall enable the ATCO/AFISO to turn off and adjust the volume for the outdoor sound for each airport individually.
Title	RTWR-ADDM-MSND-2
Status	<Validated>
Rationale	In order to meet individual ATCO/AFISO needs and to be able to minimise disturbing background noise in some circumstances
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MS04.3202	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0206.0003

Requirement	If requirement REQ-12.04.07-TS-0206.0001 is implemented, the outdoor sound reproduction shall be directionally linked to the visual presentation of the aerodromes.
Title	RTWR-ADDM-MSND-3
Status	<Validated>
Rationale	The implementation of aerodrome sound in a directional manner to the visual presentation of aerodromes contributes to situational awareness.
Category	<Functional><HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MS04.3203	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	M	N/A

3.4.5 Work environment

[REQ]

Identifier	REQ-12.04.07-TS-0207.0001
Requirement	The RTM shall be designed to use as few input devices for the same functionality for different aerodromes as possible.
Title	RTWR-ADDM-MWE-1
Status	<Validated>
Rationale	To ensure the possibility to perform the tasks in an efficient manner in a multiple environment.
Category	<HMI>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MW04.5001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

3.5 Contingency requirements

3.5.1 Concept requirements

[REQ]

Identifier	REQ-12.04.07-TS-0122.0001
Requirement	The RCT shall not be located in the primary ATS tower.
Title	RTWR-ADDC-RFRC-1
Status	<Validated>
Rationale	A closure of the primary ATS tower should not affect the contingency tower (for instance if there is a fire)

Category	<Design>
Validation Method	
Verification Method	<Inspection><Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CC05.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CC05.0001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0122.0002
Requirement	The RCT should not be any single points of failure affecting both the RCT and the primary ATC tower.
Title	RTWR-ADDC-RFRC-2
Status	<Validated>
Rationale	A single point of failure could make both the RCT and the primary tower unusable for providing an ATC service.
Category	<Reliability>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CC05.0001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

3.5.2 Performance and functional requirements

[REQ]

Identifier	REQ-12.04.07-TS-0122.0003
Requirement	The implementation specification shall define the minimum requirements on safety, security, reliability, integrity, and adaptability, for each contingency application.
Title	RTWR-ADDC-PFR-1
Status	<Validated>
Rationale	From OSED May be different for daytime/night. In CNS; Reliability is usually defined as Continuity and Availability
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CF05.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0122.0004
Requirement	The implementation specification shall define the minimum requirements on capacity, duration of service and switchover time, for each contingency application.
Title	RTWR-ADDC-PFR-2
Status	<Validated>
Rationale	Capacity duration of service and switchover time are operational parameters that form critical input to the business case of the application. May be different for daytime/night applications.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CF05.1002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0122.0005
Requirement	The implementation specification shall define the required level of commonality of HMI for each application with respect to the tower being served by the contingency application.
Title	RTWR-ADDC-PFR-3
Status	<Validated>
Rationale	Commonality will be tailored to each application; a high level of commonality is conductive to improved controller confidence in controllers familiar with the environment under contingency; however, in joint multimode/contingency setups a true commonality may not be attainable and additional procedures or training may be required to make up the shortfall in controller confidence.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CF05.1003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0122.0006
Requirement	The implementation specification shall for each contingency application define the character and form of visual presentation, airport sound

	presentation, other ATS systems/functions, (extension of) voice and data recording and working environment.
Title	RTWR-ADDC-PFR-4
Status	<Validated>
Rationale	Coverage (azimuth, elevation), the number of and performance of PTZ, enhancements (IR, tracking labels, overlay), latency and similar visualisation related requirements will be determined from the required levels of safety and capacity to be provided. Enhancements may contribute additional failure modes which will be detrimental to safety and robustness of the application.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CF05.1004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-51	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Configuration>	C	N/A

4 Assumptions

N/A
(Document have no requirements without a reference to OSED and all requirements in OSED is mapped to this document)

5 References

[1] SESAR Template Toolbox, Edition 03.01.03
[2] SESAR Requirements and V&V Guidelines, Edition 03.01.00
[3] SESAR Templates and Toolbox User Manual, Edition 03.01.01
[4] SESAR Definition Phase – Task 2.4.x Milestone 3 – System Architecture (DLT-0612-244-00-10), September 2007
[5] SESAR DEL-06.09.03-D35 OSED (Operational Service and Environment Definition), Edition 00.06.02
[6] SESAR 12.01.07-D22 Step1-3rd Iteration- Airport Technical Architecture Description, Edition 00.03.00
[7] SESAR B04.03-D95 ADD Step 1 (2014 edition), Edition 00.02.02
[8] EATMA Guidance Material, D66, Edition 00.04.02
[9] ICAO Document 4444 “Procedures For Air Navigation Services - Air Traffic Management”, 15th Edition, 2007 (amendment 4, November 2012)
[10] ICAO Document 9426 “Air Traffic Services Planning Manual”, 1st Edition, December 1992
[11] EUROCONTROL “Manual for Aerodrome Flight Information Service (AFIS)”, Edition, 1.0, June 2010
[12] Convention on International Civil Aviation, Annex 2, Air Traffic Services, July 2005
[13] Convention on International Civil Aviation, Annex 3, Air Traffic Services, July 2010
[14] Convention on International Civil Aviation, Annex 11, Air Traffic Services, November 2013
[15] Convention on International Civil Aviation, Annex 14, Air Traffic Services, July 2013
[16] SESAR DEL-06.09.03-D08-02-VALR (Remotely Provided Air Traffic Service for Single Aerodrome VALR), Edition 00.05.02, 01/05/2014;
[17] SESAR DEL-06.09.03-D08-02-VALR-ANNEX (Remotely Provided Air Traffic Service for Single Aerodrome VALR Annex), Edition 00.05.02, 29/04/2014;
[18] SESAR DEL-P06.09.03-D13-VALR Remotely provided ATS for two low density aerodromes Validation Report, VALR, Edition 00.04.00, 31/08/2015;
[19] SESAR DEL-06.09.03-D12-VALR Contingency TWR Trial 1 & 2 Validation Report, Edition 00.03.01, Oct/Nov 2015;

5.1 Use of copyright / patent material /classified material (NATMIG)

This document needs no prior consent of copyright and patent owner.

5.1.1 Classified Material (NATMIG)

There is no sensitive information contained in this technical specification.

Appendix A Human factors – CWP and OTW view

A.1 Introduction

The aim of Human Factors is to evaluate and define a safe, efficient, and resilient working environment where human limitations and health are considered.

Appendix A compares multiple Human Factors standards for the attainable visual field. This information is the base to present different types of OTW views in order to discuss advantages and disadvantages for their arrangement in the RTM, thus providing a foundation for comparison of different RTM types. Referenced documents include:

Project	Definition	Deliverable ID	Edition
06.09.03	Remotely Provided Air Traffic Service for Single Aerodrome VALR	D08-02	00.05.02
06.09.03	OSED for Remote Provision of ATS to Aerodromes	D35	00.06.02
06.09.03	HP Assessment Report for Single remote Tower	D15	00.01.01
10.10.02	Human Factors Design Document TMA/En-Route	D04	00.01.00

Table 1 –Referenced Documents

Note: Some Synonyms are to be found in this appendix, as they are used interchangeably in the project documentation of P06.09.03:

- situation awareness | situational awareness
- controller | operator | ATCO/AFISO

A.2 Related Standards

This chapter answers the question: “Which standards are available for the design of an RTM module?”. The larger the visual field, the more eye-, head, and body movements are involved. The less movements necessary, the lesser the strain for the body, the lesser the fatigue. However, too little movement also adds to an operator’s fatigue, which makes it vital to find a balance between these two opposites.

A.2.1 Visual Field

The human visual field is determined by the limitations of the visual system (e.g. eye movement, accommodation) and the limitations of body movements (e.g. head tilt).

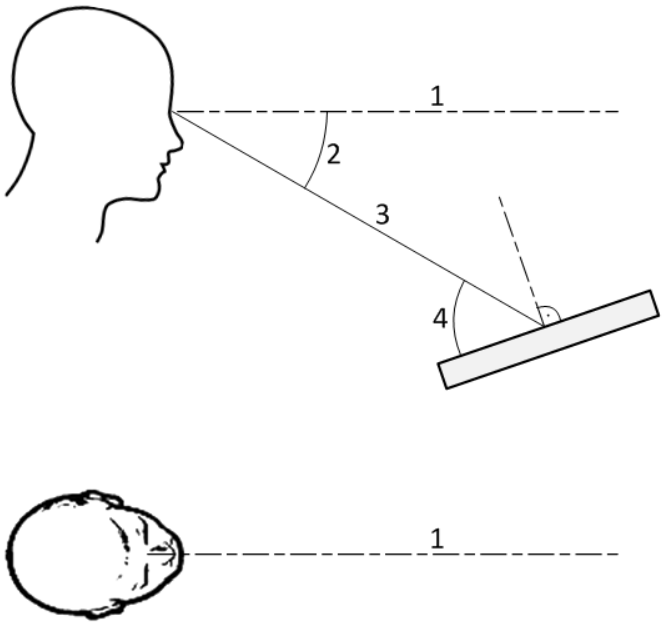
There is a trade-off between human performance on the one hand, and the size of the visual field, the rate and the frequency of body movement and accommodation of the eyes on the other hand.

The larger the visual field and the more often the operator has to move the body and/or the eye has to accommodate to ‘*extreme*’ values, the more this impacts the operator’s performance.

Additionally, accommodation and change between targets in the visual field take time.

A.2.1.1 Terms and Definitions

This chapter details on the terms that will be used.



1: the horizontal
2: gaze angle
3. line of sight
4. viewing angle

Figure 5-1: Visual angles

A.2.1.1.1 Viewing Distance

The viewing distance (=length of the *line of sight (3)* in *Figure 5-1*) is the distance from the operator’s eye to the display (centre). Viewing distance in this context has important implications: it is directly related to the perceived size of the display, it affects the minimum resolution of the display, and it influences the gaze angles to specific points on the display.

The optimal viewing distance is determined by factors such as the desired field of view, the required resolution of the image (which is based on the expected content), and limitations of the human visual system (such as accommodation)

Viewing distance dictates the maximum dimensions of an OTW view as well as the minimum resolution the visual representation needs to feature.

A.2.1.1.2Viewing Angles

The viewing angle is the angle between the *line of sight (3)* and the display in *Figure 5-1*.

Touch-screen viewing angle
Touch-screens shall be perpendicular to the user's line of sight while the user is in a normal operating position when possible. A reduced viewing angle, less than 90 degrees from horizontal, may reduce arm fatigue for frequent actions; however, changes to viewing angle shall be evaluated in relation to the negative impact on parallax, specular glare, and readability.
[MIL-STD-1472G]

Working position - Display location in relation to the angle of view *[=viewing angle]*
The angle of view shall not exceed 40 degrees anywhere on the visual display.
[REQ-10.10.02-HFDD-2002.002]

Large-screen optical projection displays
The ratio of viewing distance to screen size (measured diagonally) shall be more than 2:1 and less than 8:1. The optimum ratio is 4:1; the preferred range is more than 3:1 or less than 6:1.
[FAA HF-STD-001:2003, Ch5]

A.2.1.1.3Percentile

In statistics, the 5th percentile indicates that 5% of a target group are below that value, i.e., 95% of the target group exceed that value. E.g., if 50,8 cm is the 5th percentile of the maximum reaching distance of a target group, then 95% of the group have a least a reaching distance of 50,8 cm.

The 95th percentile indicates that 95% of a target group are below that value, i.e., 5% of the target group exceed the value. E.g., if 60 cm is the 95th percentile of the maximum leg space at foot level, then 5% of the group would need a larger leg space.

A.2.1.2 Standards on Gaze Angles and Head Movement

A.2.1.2.1Viewing Distance

The **minimum** comfortable viewing distance is **500 mm**.
The **optimum** comfortable viewing distance is **700 mm**.
[DEF STAN 00-250 part3 section9]

The **optimum** ratio between viewing distance to screen diagonal is **3.0** to **6.0.**
The **maximum** ratio between viewing distance to screen diagonal is **2.0** to **10**.
[MIL-STD-1472G]

Minimum viewing distance for large-screen displays.
The display shall not be closer than one-half the display width or height, whichever is greater.
[MIL-STD-1472G]

A.2.1.2.2Horizontal Gaze Angles

The **maximum** horizontal gaze angle is **30°** on either side.
[DEF STAN 00-250 part3 section15]

The **optimum** horizontal gaze angle is **15°** on either side.
The **maximum** horizontal gaze angle is **35°** on either side.
[ISO 9241-5:1998]

[MIL-STD-1472G]

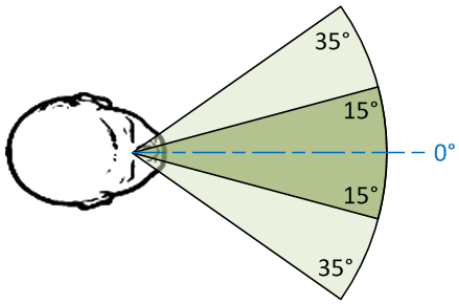


Figure 5-2: Horizontal gaze angles

A.2.1.2.3Horizontal Head Rotation

The **optimum** head rotation angle is **45°** on either side.
["The Measure of Man and Woman", Henry Dreyfuss Associates; John Wiley & Sons]
*Note: No ISO standards describe the **optimum** horizontal head rotation angle.*

The **maximum** head rotation angle is **60°** on either side.
[MIL-STD-1472G]

A.2.1.2.4Horizontal Zones

Combining the standards for gaze angles (from A.2.1.2.2) and head rotation (from A.2.1.2.3) leads to three different horizontal viewing zones. Content should be placed within the appropriate borders, according to its importance and frequency of use. E.g. content of high importance, which needs to be frequently viewed or interacted with, should be placed within viewing zone A.

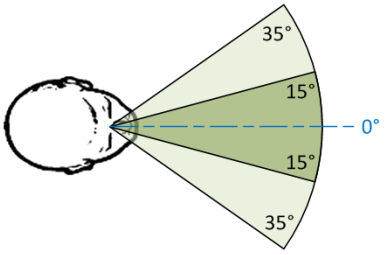


Figure 5-3: Viewing zone A

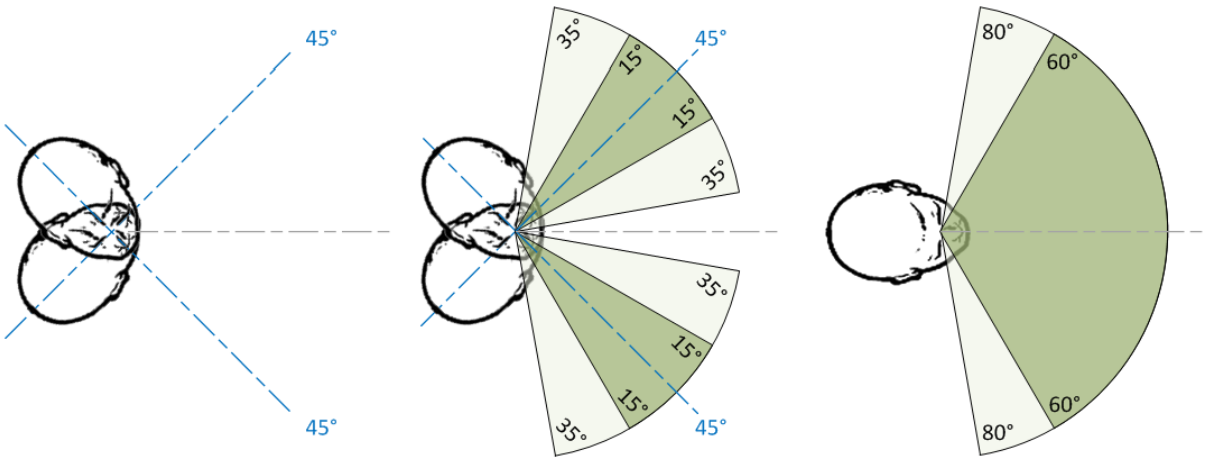


Figure 5-4: Progression of viewing zone B

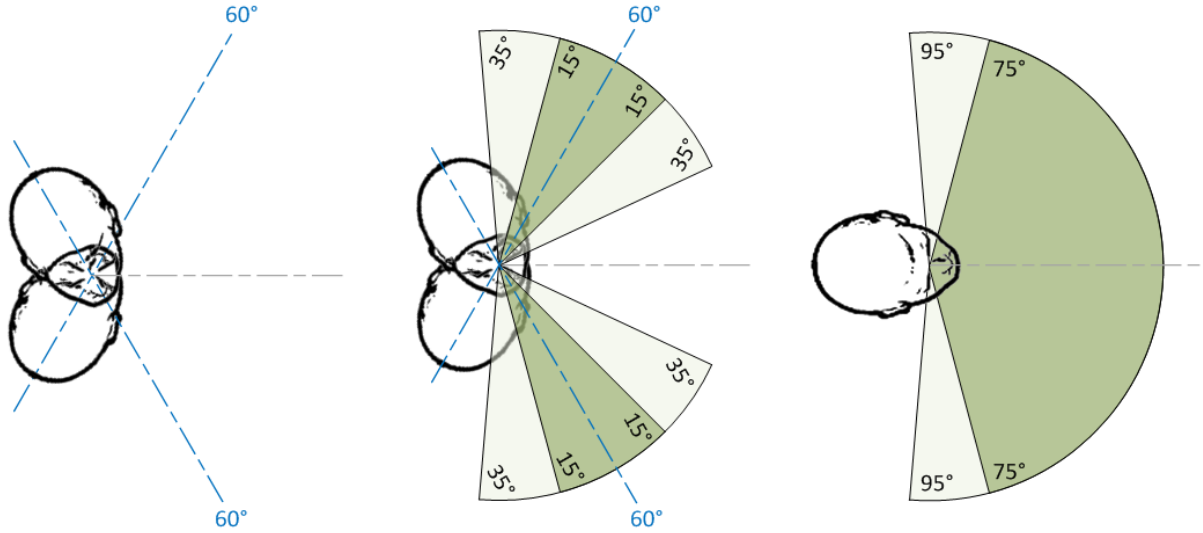


Figure 5-5: Progression of viewing zone C

A.2.1.2.5 Vertical Line of Sight

Vertical angles within this chapter refer to a horizontal line drawn at eye level.

Normal line of sight may be as much as **30**° below the horizontal.
[DEF STAN 00-250 part3 section15]

The **normal line of sight** falls into the range between **10°** and **30°** below the horizontal.
[DEF STAN 00-250 part3 section9]

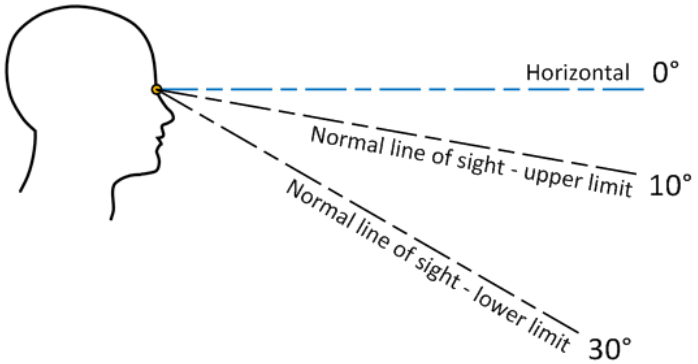


Figure 5-6: Range of "Normal line of sight" across different standards

A.2.1.2.6Vertical Gaze Angles

Vertical gaze angles are the result from the combination of head and eye movement.

The **optimum** vertical gaze angles are within **40° above** and **20° below** the viewer's **line of sight**.
[DEF STAN 00-250 part3 section15]

Combining the values for the line of sight (cf. A.2.1.2.5) translates to **optimum** gaze angles between **30° above** and **50° below** the horizontal.
(Comment:
30° above horizontal, i.e. 40° above a line of sight leading 10° downwards;
50° below horizontal, i.e. 20° below a line of sight leading 30° downwards)

The **optimum** vertical gaze angle is between **0° to 45° down**.
[ISO 13406-2:2001]
[ISO 9241-302:2008]

The **maximum** vertical gaze angle is **70° down**.
[ISO 13406-2:2001]

A.2.1.2.7Vertical Zones

Zone V1: for frequently used information
Zone V2 + V3: for less frequently used information

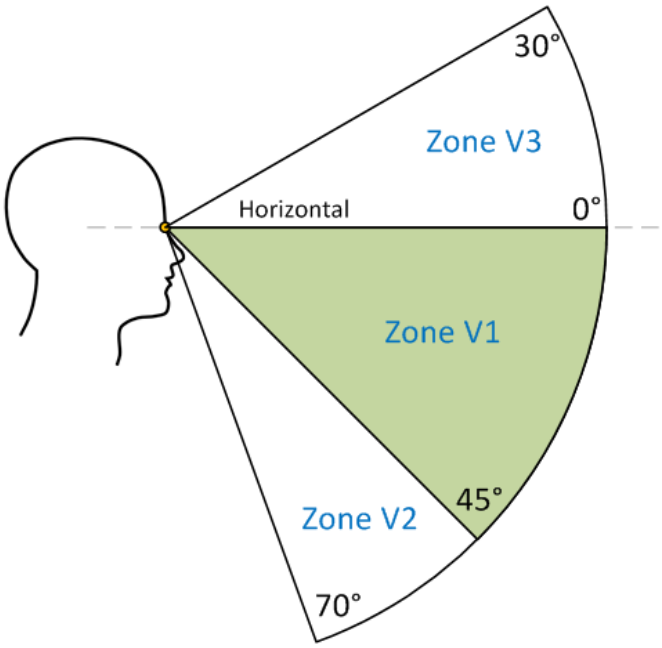


Figure 5-7: Vertical zones

A.2.2 Reach Areas

Following requirements apply:

- Working positions should be designed by taking into account the 5th percentile up to the 95th percentile of the designated user group.
  [REQ-10.10.02-HFDD-2002.0036]

- Space within reach should be the 5th percentile.
  [REQ-10.10.02-HFDD-2002.0037]

- Reach area measurements according to DEF STAN 00-250 (*Figure 5-8.*)
  The measurements provided are valid for the underlying sample group only. To get values tailored to a specific RTC, anthropometric data of the target group can be taken into account.

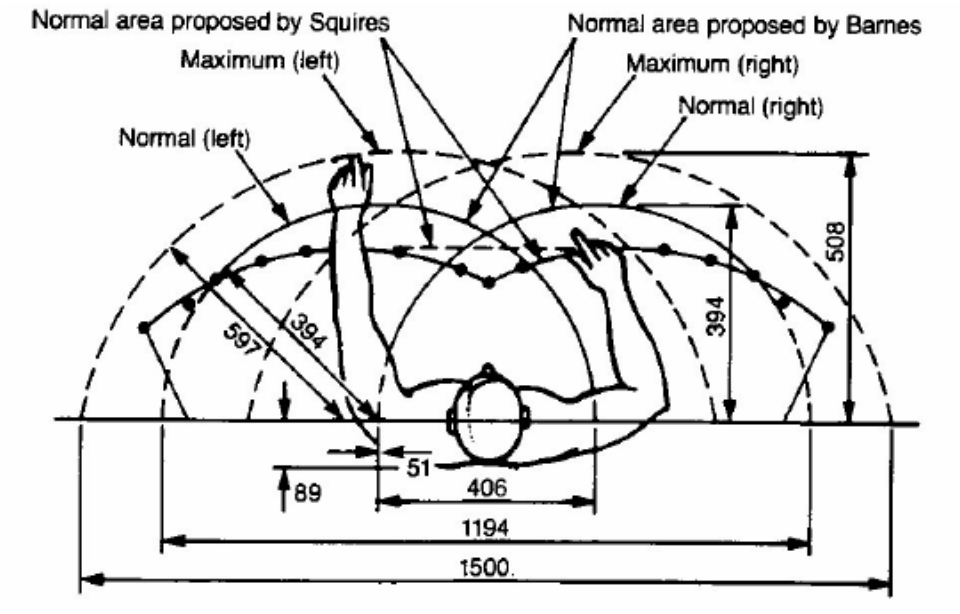


Figure 5-8: Reach areas of the 5th percentile [in mm]
[DEF STAN 00-250 part3 section13]

Combining the reach area and the information in A.2.1.2.4 lead to horizontal zones, where the most often used interaction objects need to be found (e.g. on an interactive surface).

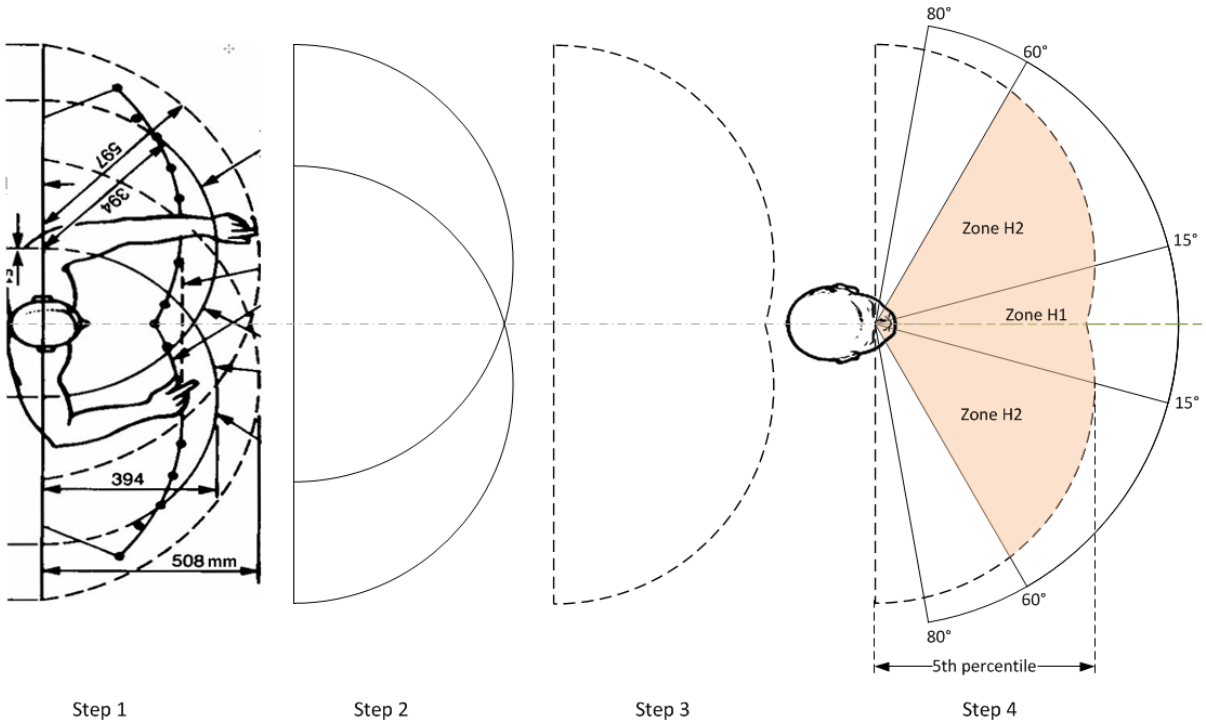


Figure 5-9: Horizontal reach area zones
[DEF STAN 00-250 part3 section13]

Combining the reach area and the information in A.2.1.2.4 lead to horizontal zones, where the most often used interaction objects need to be found (e.g. on an interactive surface).

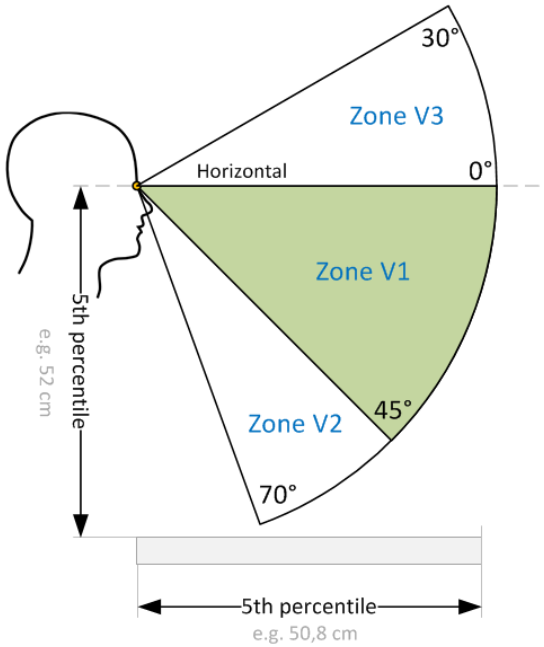


Figure 5-10: Horizontal maximum reach area combined with vertical viewing area zones

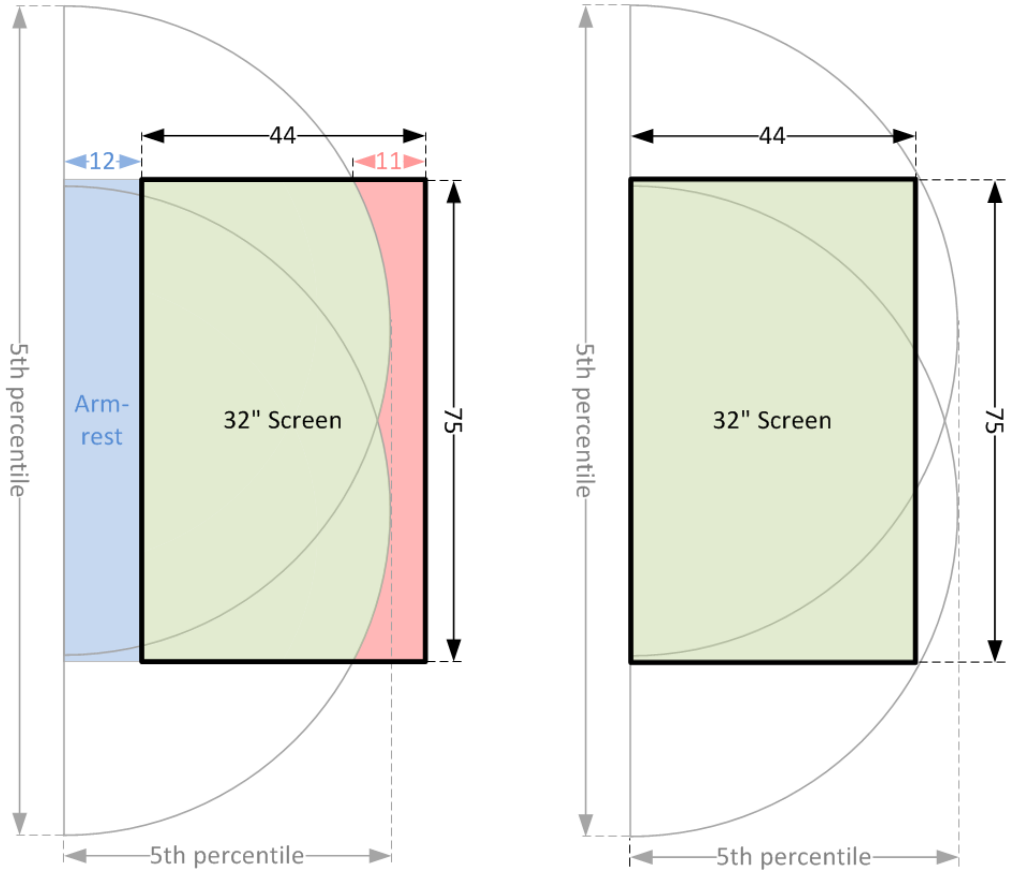


Figure 5-11: Example: 32” control device with (left), and w/o an armrest (right); overlain with reach areas

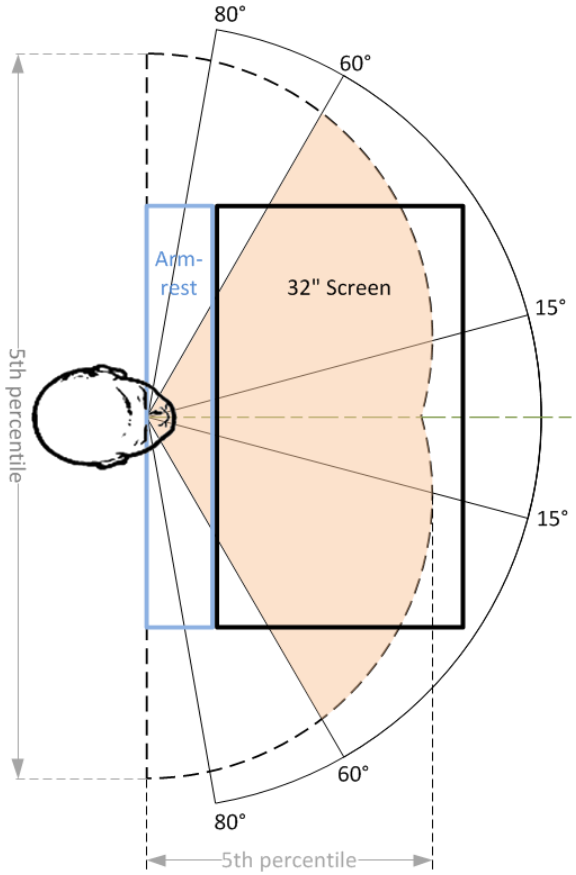


Figure 5-12: Example: 32” control device with armrest;
overlain with reach areas and horizontal viewing angles.

A.3 Control Device Positioning

A.3.1 Non-adjustable Positioning

When the position for the control devices should be non-adjustable, it must be placed within the reach area as shown in A.2.2, *Figure 5-8*.

A non-adjustable positioning of the control device is a trade-off between neck ache or arm ache (among others - see subhead “Touch-screen viewing angle” in Ch. A.2.1.1.2 Viewing Angles):

- For relaxed arms, the control device should be positioned as flat as possible and provided with an arm rest (see *Figure 5-13*)

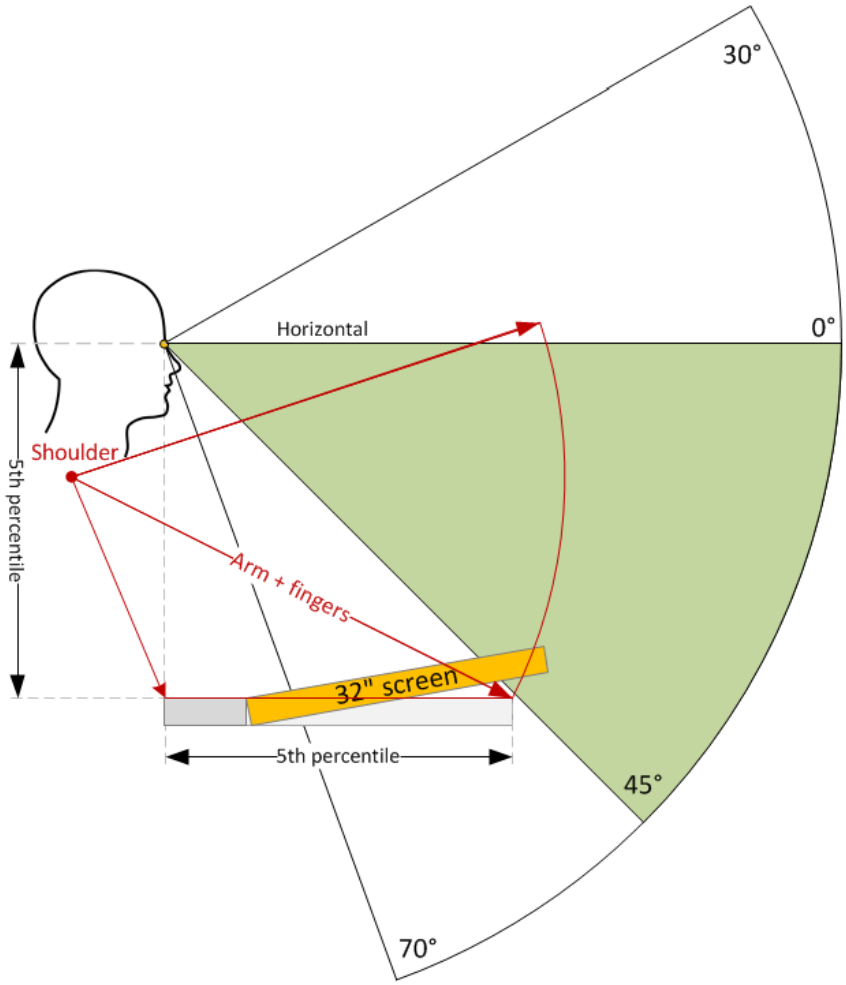


Figure 5-13: Example positioning of control device (orange) for relaxed arms

- For a relaxed neck, the control device should be positioned at, and perpendicular to, the line of sight (see *Figure* 5-12)

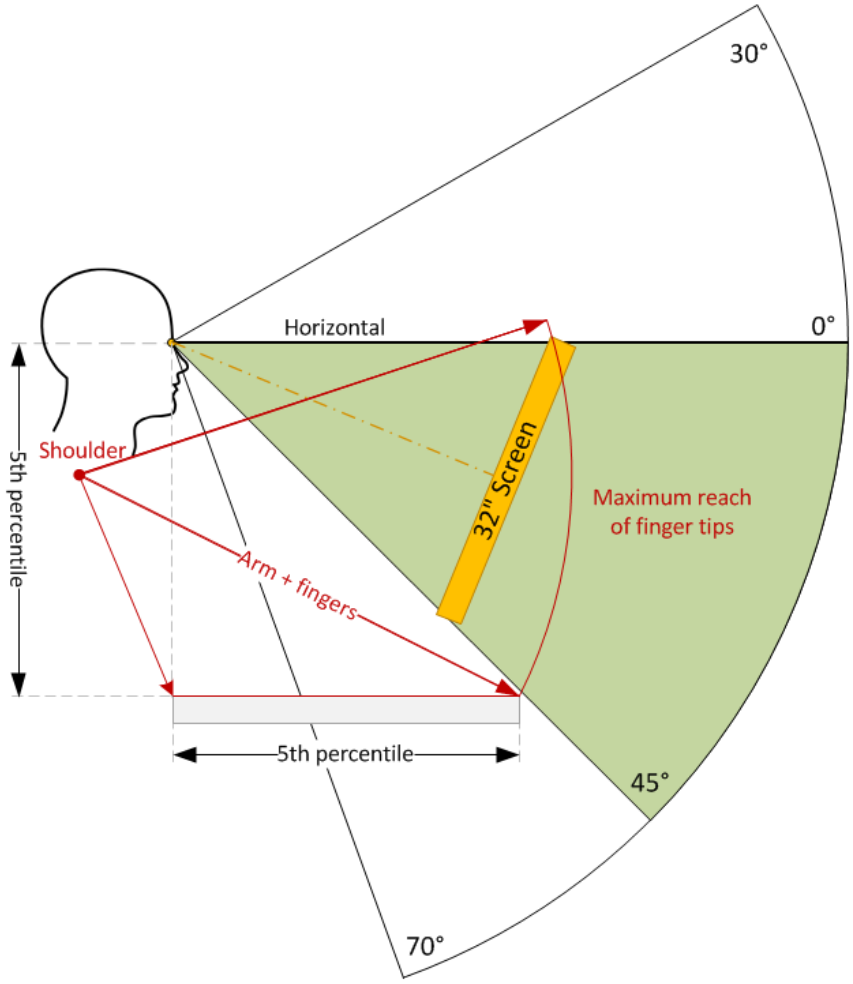


Figure 5-14:Example positioning of control device (orange) for a relaxed neck

A.3.2 Adjustable Positioning

To avoid this trade-off between neck ache or arm ache – and thus reducing the physical stress and subsequently fatigue of the operator – the RTM could be designed to be adjustable to the operator's needs:

- a height-adjustable desktop would allow the operator to switch between a seated and standing working posture
- a distance- and angular-adjustable control device would allow the operator to switch between different sitting postures which have different eye points (see *Figure 5-15*)

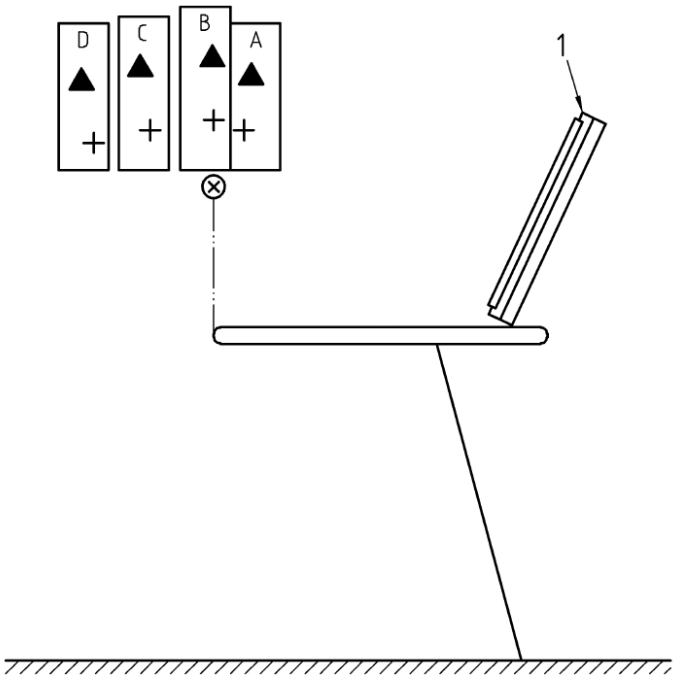


Figure 5-15:Eye points for different sitting positions [ISO 11064-4]

Legend for *Figure 5-15*:
A Eye point when leaning forward
B Eye point when in a upright sitting position
C Eye point when in a leaning sitting position
D Eye point when in a relaxed sitting position
▲ 95th percentile
+ 5th percentile

A.3.3 Control Device Examples

Depending on the interaction concept, a number of interactive devices in varying numbers and dimensions can be utilized.

Figure 5-16:One Touch Screen

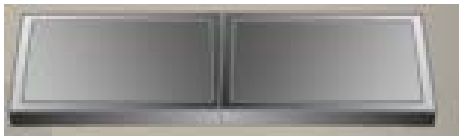


Figure 5-17:Two Touch Screens side by side

Figure 5-18:Three touch screens side by side.

Figure 5-19:One horizontal and one vertical touch screen

Regarding the PTZ, the operator should be able to control the PTZ's elementary functions (pan, tilt, zoom) without having to watch the PTZ control area (or control device) itself.

A.4 OTW Views – Large and Medium Sized Layouts

This chapter presents a set of large and medium sized OTW view layouts. For each layout, the main benefits and drawbacks are noted. The numbers of benefits or drawbacks for a given layout varies due to differences in the level of detail. Benefits and drawbacks (*Table 2)* are listed in no specific order.

Benefits -- Drawbacks	Description
Use of standard-size displays / projection equipment" -- [*unused*] Use of non-standard equipment	The use of standard equipment reduces capital expenditures.
Conventional space requirements per RTM -- Increased space requirements per RTM	The more space an RTM requires within an RTC, the more capital expenditures are increased.
Large OTW presentation area -- Small OTW presentation area	The bigger the presentation area (with a given pixel density) the more details are visible.
[*unused*] Standard office lighting -- Dark ambient lighting or strong projection needed	[*Projector only*] Dark ambient lighting tires the operator.
Good gross overview -- Poor gross overview	The more of the operator controlled are is within the visual field, the better the gross overview.
Little head/body movements needed -- Extensive head/body movements needed	Fatigue will take place either if too much, or if virtually no eye/head/body movements are necessary.
Familiar representation -- Unfamiliar representation	Familiar means that this kind of representation is known from local towers. Congruence with compass directions is given (if North is in front, South is in the back) [During validations, operators were able to perform mental conversions quickly, regardless of where the compressed information were presented – so this characteristic may not play a that big role]
Seamless representation -- Visible seams	With current technology at least small seams are visible.
Entrance available -- Entrance needed	Using a door for entering briefly disturbs a part of the OTW view. The content if the image on the disturbed part is undeterminable in its momentarily importance to the operator.
[*unused*] Additional viewers can watch easily -- Additional viewers cannot watch unless they enter	The closed layout prohibits viewing.
[*unused*] N/A -- Lifespan of lamps	[*Projector only*] Service intervals depend on the number of projectors and the amount of hours used per day. Lifespan: xenon lamp ~2000h, LEDs ~30.000h

Benefits -- Drawbacks	Description
[*unused*] No adaption of room ventilation needed -- Possibly adaption of room ventilation needed	Conventional room ventilation is interrupted within the cylindrical layout.

Table 2 – Benefits and Drawbacks Overview

A.4.1 Layout P1: Projection Screen 360° /360°

360° of the OTW view are seamlessly projected onto a 360° cylindrical screen. Measures have to be taken that objects within the projection cylinder (e.g. a person standing near the screen) do not hide important information, e.g. by casting shadows.

For this setup, the ISO 9241-307, 5.4 applies.

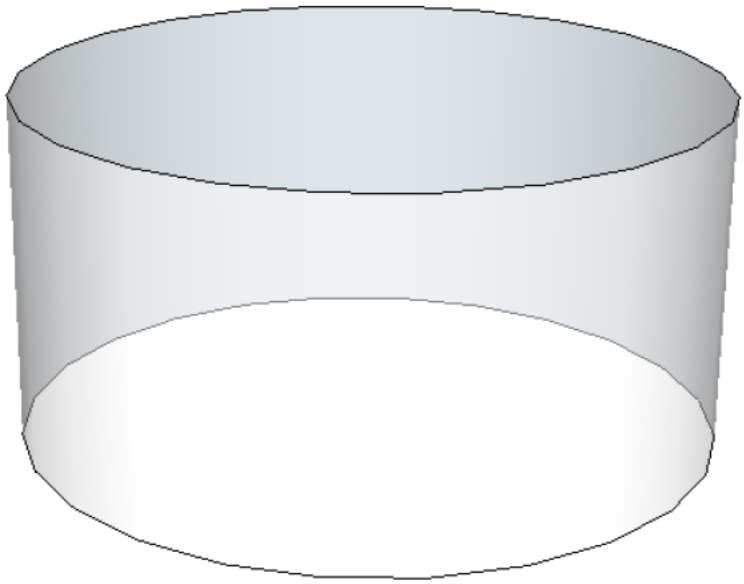


Figure 5-20:360° Cylindrical projection screen

Benefits:

- Familiar representation
- Large OTW presentation area
- Seamless representation

Drawbacks:

- Poor gross overview
- Extensive eye/head/body movements needed
- Lifespan of lamps
- Increased space requirements per RTM
- Entrance needed

- possibly adaption of room ventilation needed
- additional viewers cannot watch unless they enter
- Dark ambient lighting or strong projection needed

A.4.2 Layout P2: Large Screen Array 360° /360°

360° of the OTW view are presented on a 360° cylinder made up of large screens. Measures have to be taken that persons entering or leaving the central area do not hide important information, e.g. by "opening" a screen door.

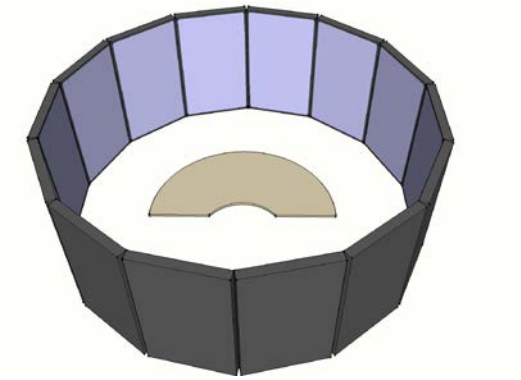


Figure 5-21:360° Large Screen Array

Benefits:

- Familiar representation
- Large OTW presentation area

Drawbacks:

- Poor gross overview
- Extensive eye/head/body movements needed
- Increased space requirements per RTM
- Entrance needed
- possibly adaption of room ventilation needed
- additional viewers cannot watch unless they enter
- Visible seams

A.4.3 Layout P3: Large Screen Array 360°/280°

360° of the OTW view are presented on a 270° cylindrical surface made up of large screens that features a 80° wide opening.

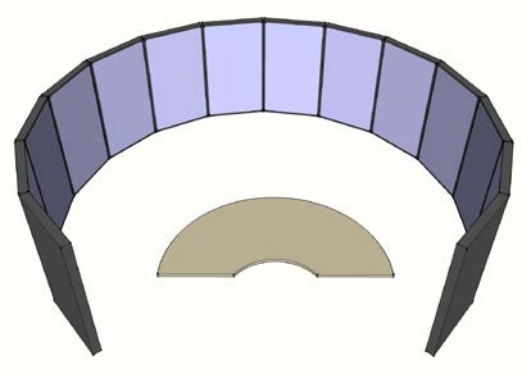


Figure 5-22:280° Large Screen Array

Benefits:

- Somewhat familiar representation
- Large OTW presentation area
- Entrance available

Drawbacks:

- Visible seams
- Somewhat extensive eye/head/body movements needed
- Increased space requirements per RTM
- Possibly adaption of room ventilation needed

A.4.4 Layout P4: Split Large Screen Arrays 360° /360°

360° of the OTW view are presented on a split 360° cylinder made up of large screens.

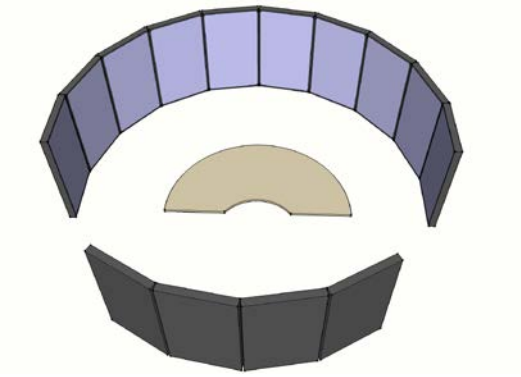


Figure 5-23:360° Split Large Screen Arrays

Main benefits:

- Somewhat familiar representation
- Large OTW presentation area
- Entrance available

Drawbacks:

- Visible seams
- Poor gross overview
- Extensive eye/head/body movements needed
- Increased space requirements per RTM
- The split introduces discontinuities in the representation

A.4.5 Layout P5: Medium Sized Screen Array 360° /180°

360° of the OTW view are presented on a 180° cylindrical surface made up of medium sized screens.

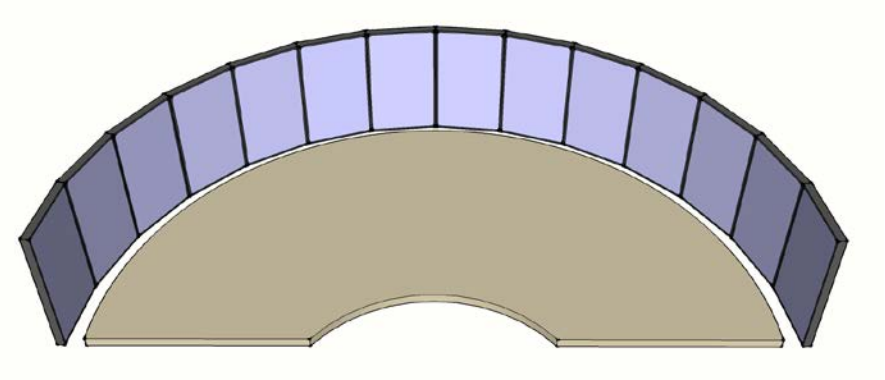


Figure 5-24:180° Small Screen Array

Main benefits

- Large OTW presentation area

Drawbacks

- Somewhat increased space requirements per RTM
- Unfamiliar representation
- Visible seams

A.4.6 Layout P6: Medium Sized Screen Array 180° /180°

180° of the OTW view are presented on a 180° cylindrical surface made up of medium sized screens.

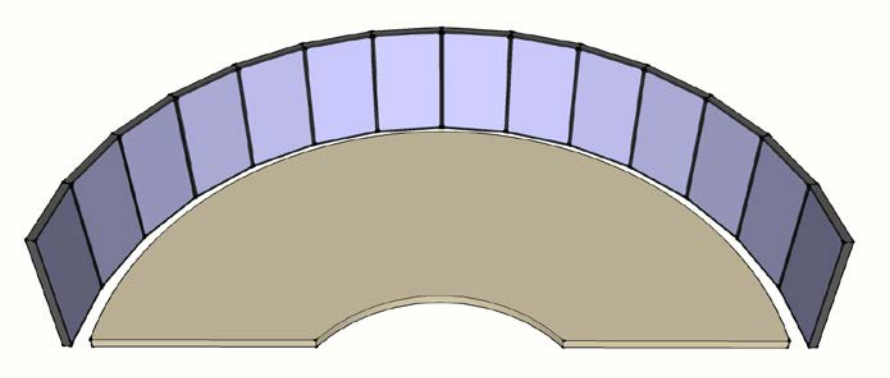


Figure 5-25:180° Small Screen Array

Main benefits:

- Large OTW presentation area
- Familiar representation

Drawbacks:

- Somewhat increased space requirements per RTM
- Visible seams

A.5 OTW Views – Small Sized Layouts

Up to 360° of the OTW view are presented on an array of small screens. Representing a full 360° OTW view can be used for overview purposes only. Therefore, this setup is best used if a monitor row (e.g. a row of four monitors) presents a certain section, e.g. 180°.

A.5.1 Layout P7: Monitors in Rows

The usage of four monitors in a row provides mainly the view to the runway or another selected section. If the user needs a 360° view, the system has to provide a possibility to **switch** or **rotate** the view.

Figure 5-26:Four monitors in a row

Figure 5-27:Three monitors in a row

Figure 5-28:Four monitors in two rows

Main benefits:

- Use of standard-size displays
- Conventional space requirements per CWP
- Good gross overview
- Little eye/head/body movements needed

Drawbacks:

- Small OTW presentation area
- Unfamiliar representation
- Visible seams
- Dark ambient lighting or strong projection needed

A.5.2 Layout P8: Flat Projection Screen

Figure 5-29:Projection Screen

Main benefits:

- Use of standard projection equipment
- Conventional space requirements per CWP
- Good gross overview
- Little eye/head/body movements needed

Drawbacks:

- Small OTW presentation area
- Unfamiliar representation
- Dark ambient lighting or strong projection needed

A.6 Examples

This chapter includes some examples of combinations between the OTW view, control device, and information view. The aim is not completeness in examples (as possibilities of combinations are huge) but to get insight on the advantages and disadvantages the combinations bear.

A.6.1 Example A

The background shows an airport OTW view of 360°, positioned around the controller. In front of the operator there is a vertical screen with Radar, and a somewhat flat multi-touch panel for direct interactions (e.g. Strips, Voice, PTZ control, MET, display handling, etc.).

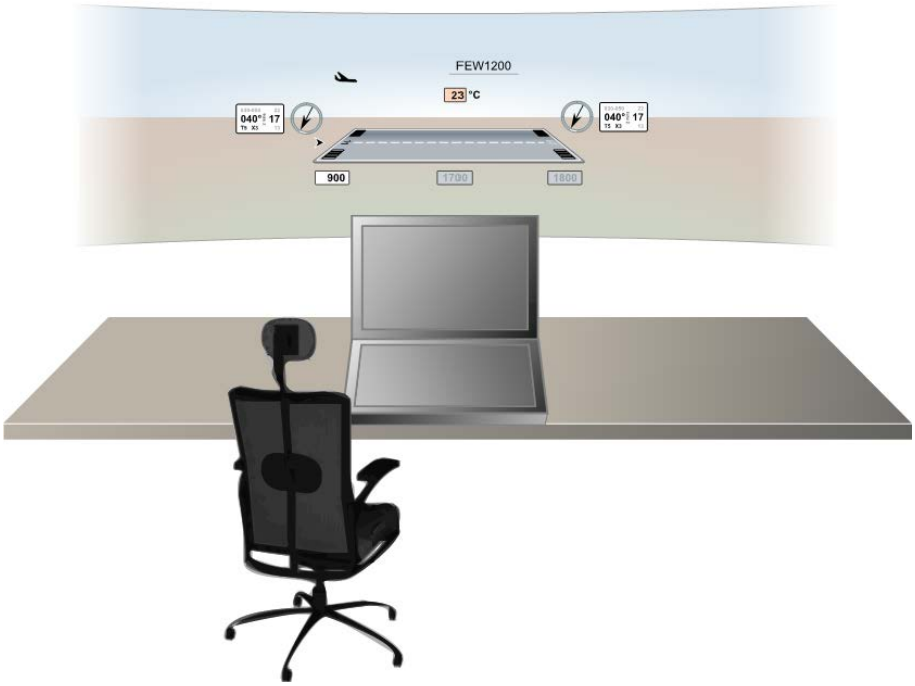


Figure 5-30:360° Setup A

A.6.2 Example B

Using two multi-touch screens would makes the mouse or trackball for radar unnecessary. Additionally, the line of sight to the OTW view is undisturbed.

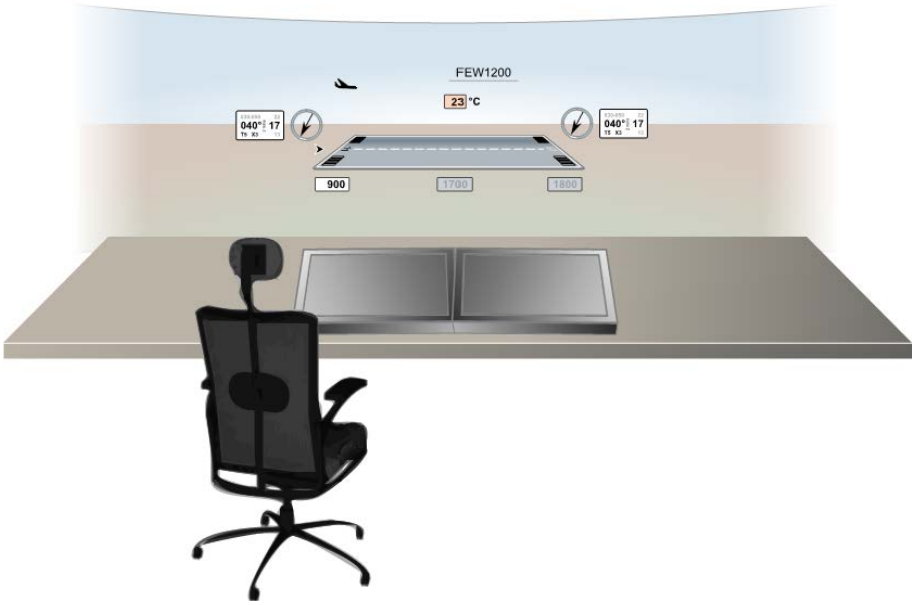


Figure 5-31:360° Setup B

A.6.3 Example C

Figure 5-32:Setup C 1

Figure 5-33:Setup C2

A.6.4 Example D

When using two rows of monitors, or one row and a small projection screen, most of the important information can be seen all the time (vertical and horizontal viewing angle). The disadvantage lies more in the ergonomics, because the user has to look up and move his head backwards, to fully see the top of the above information.

Figure 5-34:Setup D1

Figure 5-35:Setup D2

A.7 Comparison of Layouts

The big dimensions of some layouts put emphasis on following topics:

- **Display of information**: Critical information (e.g. alarms, warnings) should be made perceivable regardless of the operators' current focus area (gaze direction) within the RTM.
- **Casting shadows**: If front projection is used, a person standing close to the OTW view should not interfere with the visualization presented. E.g. the operator should be able to move quite close to the OTW view without casting a shadow on the screen.
- **Reflections**: Especially layouts featuring OTW view screens in the back of the operator (when having a horizontal gaze angle of 0°) have a high risk of producing reflections on other screens of the RTM.
- **Pixelation**: As the visual reproduction should be free of noticeable pixelation, the resolution of the OTW view screens / projection (for the set viewing distance) must be chosen accordingly.

From the P06.09.03 validations, there is strong evidence for the following:

- Operators are more concerned with the total horizontal visual angle than they are with compass directions. As long as they are able to tell which direction they are currently looking at the RT (e.g. based on objects / topology / overlay of compass directions), they prefer a total horizontal visual angle of 360° on a "compressed" screen setup (e.g. 200°).
- "finding North is Low Priority"
- Operators do not want to have to look behind them.
- Image compression is accepted within a certain range: (see Ch. A.7.1.7)
  - 1:8 (e.g. 240° on 30°) is beyond the acceptable range
  - 1:4 (e.g. 360° on 90°) still seem to be within the acceptable range

A.7.1 Comparison Parameters

To put the different OTW view setups in relation to each other, the following set of characteristics is the base for comparison.

A.7.1.1 Accommodation

The lens of the human eye accommodates each time the distance to an object in view changes.

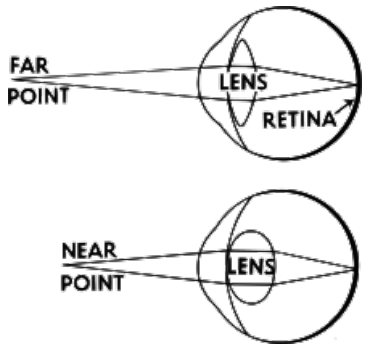


Figure 5-36:Accommodation of the eye

"Accommodation" indicates, how much accommodation is necessary to switch from the interaction area to the OTW view surface. Additionally, the more viewing distances a setup for a given task consists of, the more often the operator has to accommodate her eyes.

The combination of high accommodation values with the repetitiveness of accommodation necessary for a given task increases fatigue.

Compared to a local tower, where the operator's eyes have to accommodate to hundreds and thousands of metres, even the largest values (of some metres) of some OTW view layouts appear negligible as far as solely accommodation is concerned.

[The influence of this characteristic has to be evaluated during the prototyping phase.]

Note:

OTW views use digital representation techniques. Properties of digital representation techniques include flicker, artificial light sources with spectral gaps and peaks, as well as contrast and brightness values very different from natural light. These properties - in combination with accommodation - may play a role in straining the operator's eyes.

A.7.1.2 Distance Between Operators

The distance between operators is influenced by the size and layout of the OTW view.

This characteristic may only apply in special situations, where there is a need that operators need to talk to each other in person across different RTMs.

A.7.1.3 RTC Space Used

The space used by one RTM influences the number of RTMs that can be installed within a given space (i.e. the available space within a building or room).

This characteristic may only apply in special situations, where the available space is given, or the financial resources for creating new space are limited.

A.7.1.4 Familiarity

Familiarity indicates the change an remote tower OTW view represents in comparison to the OTW view on a local tower. According to the 06.09.03 validations, this characteristic does not have too much of an impact on operator performance.

[The influence of this characteristic has to be evaluated during the prototyping phase.]

A.7.1.5 Capital Expenditures

Capital expenditures describes the equipment cost for setting up the solution.

This characteristic may only apply in special situations, when the number of RTMs necessary is large compared to the financial resources.

[This characteristic will not be evaluated for the time being.]

A.7.1.6 Operational Expenditures

Operational expenditures describes the cost for running and maintaining the solution.

This characteristic may only apply in special situations, when the number of RTMs necessary is large compared to the financial resources.

[This characteristic will not be evaluated for the time being.]

A.7.1.7 Horizontal Image Compression

Horizontal Image Compression indicates the resulting compression factor when presenting an OTW view on a given layout.

E.g., a 360° OTW view presented on a 360° layout results in *no* horizontal image compression (1:1). On the other hand, a 360° OTW view presented on a 180° layout results in a 360°/180° = 2:1 horizontal image compression.

As a factor of 8:1 was deemed too much compression by operators during the P06.09.03 validations, this factor will mark the upper limit in this list.

[Impact values provided in

Table *3* below are in accordance with the definition of impact values in

*Table **4*** on page 132]

Compression	Impact
1:1	0
2:1	1
3:1	2
4:1	3
> 5:1	4

Table 3 – Impact of horizontal image compression

A.7.2 Comparison Overview

Each characteristic is rated by how much impact a given solution imposes on the characteristic on a scale from zero to four (with zero being the lowest), according to following table:

Value	Impact
0	Not present / Negligible
1	Limited
2	Moderate
3	Substantial
4	Serious

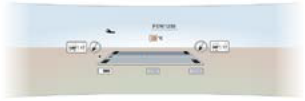
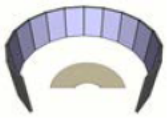
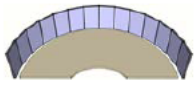
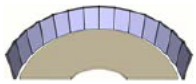
Table 4 –Impact values

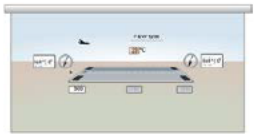
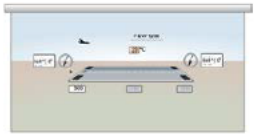
The reader has to evaluate for the *own situation*:

- What emphasis a certain characteristic is given within a project
- Whether the characteristic and its impact represent an advantage or a disadvantage

*[Values within in **Error! Reference source not found.** are an estimate and hence subject for further refinement]*

Reference No.	OTW View Setup	Accommodation (eyes)	Distance btw. Operators	Space Used (RTC)	Familiarity	Capital Expenditures	Operational Expenditures	Horizontal Image Compression
P1	Projector 360°/360°	2	3	3	0	tbd	tbd	0

Reference No.	OTW View Setup	Accommodation (eyes)	Distance btw. Operators	Space Used (RTC)	Familiarity	Capital Expenditures	Operational Expenditures	Horizontal Image Compression
								
P2	Screens 360°/360° 	2	3	3	0	tbd	tbd	0
P3	Screens 360°/split 360° 	2	3	3	0	tbd	tbd	0-1
P4	Screens 360°/280° 	2	2	3	1	tbd	tbd	0-1
P5	Screens 360°/180° 	1	1	2	3	tbd	tbd	1
P6	Screens 180°/180° 	1	1	2	0	tbd	tbd	0
P7.1	4 monitors, 360° 	1	0	1	3	1	1	2
P7.2	4 monitors, 180° 	1	0	1	1	1	1	1
P7.3	3 monitors, 360° 	1	0	0	3	1	1	3
P7.4	3 monitors, 180° 	1	0	0	2	1	1	2

Reference No.	OTW View Setup	Accommodation (eyes)	Distance btw. Operators	Space Used (RTC)	Familiarity	Capital Expenditures	Operational Expenditures	Horizontal Image Compression
P7.5	2 monitors (one row), 360° 	1	0	0	4	1	1	4
P7.6	2 monitors (one row), 180° 	1	0	0	4	1	1	3
P8.1	Projector, 360° 	1	0	1	3-4	tbd	tbd	2-4 *depending on projection screen dimensions*
	Projector, 180° 	1	0	1	2-3	tbd	tbd	1-3 *depending on projection screen dimensions*

Appendix B Deleted requirements

The following requirements have been included in previous editions, but have been deleted during the course of P12.04.07 as part of requirement updating and refinement.

Reasons for deletion are one or more of the following:

- Requirement not supported by OSED requirements.
- Requirement is Virtual Tower specific, which has not been validated
- Requirement has been redefined or split into multiple requirements.
- Requirement was a duplicate of another requirement.

[REQ]

Identifier	REQ-12.04.07-TS-0102.0015
Requirement	The RTM shall provide access to live video image of flight operations on and in the vicinity of the aerodrome as well as vehicles and personnel on the manoeuvring area through the use of static camera(s) and manoeuvrable camera(s), to the ATCO/AFISO.
Title	RTWR-RFR-VIS-1
Status	<Deleted>
Rationale	Deleted. Not in line with OSED. REQ-12.04.07-TS-0102.0009 updated. In order to fulfil the task of keeping watch by visual observation while not being physically present at the aerodrome, a technical solution is needed that presents visual sensor data - collected from the aerodrome and its vicinity and transmitted to the remote tower facility - to the ATCO/AFISO in a way that provides him/her with the situational awareness required for conducting the associated services.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BF03.1503	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0003
Requirement	The visual presentation shall provide a clear view of the manoeuvring area, in order to make it possible for the ATCO/AFISO to be able to prevent collisions between aircraft and obstructions
Title	RTWR-RFR-VIS-6
Status	<Deleted>
Rationale	Deleted. Redundant by REQ-12.04.07-TS-0110.0048
Category	<Design><Safety>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3003	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Out the Window	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0010.0002
Requirement	Each RTM shall allow an AFISO to provide Aerodrome Flight Information Service (AFIS) for the active Remote Airport(s).
Title	RTWR-BCR-2
Status	<Deleted>
Rationale	Deleted since reference removed from OSED. Requirement applicable for the AFIS SINGLE aerodrome environment only. Aerodrome Flight Information Service (AFIS) is herein implicit to also include Alerting Service. This requirement defines part of the concept baseline. Aerodrome Flight Information Service (AFIS) as defined in EUROCONTROL's Manual for AFIS
Category	<Design><Operational>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0006
Requirement	The RTM visual presentation shall allow an ATCO/AFISO to observe the visual communication from aircraft that are on the aerodrome manoeuvring area, if meteorological conditions permits.
Title	RTWR-GSFR-COM-6
Status	<Deleted>
Rationale	Deleted since reference removed from OSED. Fulfilment of this requirement is to be achieved by using the visual presentation, in combination with the binocular functionality when needed. The vicinity of an aerodrome is defined in Doc 4444 as: "aircraft in, entering or leaving an aerodrome traffic circuit". ICAO Doc 4444 12.3.4 "Phraseologies for use on and in the vicinity of the aerodrome" defines rocking wings and flashing / showing landing lights as a possible means of acknowledgement of visual communication. The fulfilment of this requirement will be dependent on distance to aircraft and meteorological conditions - as already implicit in current ICAO regulations. OSED Use Case 5.5 Scenario A.
Category	<Design><Functional><Safety>
Validation Method	
Verification Method	<Analysis><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CO02.1006	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0011
Requirement	During daylight CAVOK conditions, the visual presentation shall enable the ATCO/AFISO to visually detect irregularities during landing or take-off of aircraft that requires the ATCO/AFISO to perform alerting service (e.g. engine fire/smoke, collapsing nose-wheel).
Title	RTWR-RFR-VIS-14
Status	<Deleted>
Rationale	Deleted. Reference removed from OSED. The purpose of the requirement parameters is to define a quantifiable environment for system validation. A graceful degradation performance of the system is assumed when operating in less favourable conditions Originates from expectations on the service as this is possible in today's operations. But else also originates from the requirement in Doc 4444, which states "visual observation"
Category	<Safety>
Validation Method	
Verification Method	<Review of Design><Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1204	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0008
Requirement	The voice distribution ***shall*** be compliant with EUROCAE Working Group 67 recommendations if it is an IP-solution.
Title	RVT-GEN-VOICE-1
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements EUROCAE compliant voice distribution
Category	<Design>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A

<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0009
Requirement	The voice distribution system ***shall*** support a hierarchical side tone generation configuration.
Title	RVT-GEN-VOICE-2
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Local side tones improve audio quality since the round trip time from the CWP to the radio has no influence. Especially in the remote TWR setting network delays may occur, which shall not influence the audio experience of the controller.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0010
Requirement	The voice distribution system ***shall*** support shared access to the radio infrastructure.
Title	RVT-GEN-VOICE-3
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Radios have to be accessed in parallel by a local and remote CWP.
Category	<Design>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Parallel	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0011
Requirement	The voice distribution system ***shall*** support different priorities for radio access.
Title	RVT-GEN-VOICE-4
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.

	Voice distribution provides support for different priorities for radio access
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0012
Requirement	The voice distribution system ***shall*** support a pre-emption mechanism at the radio (gateway).
Title	RVT-GEN-VOICE-5
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Radios have to be accessed in parallel by a local and remote CWP.. Clear rules based on priorities ensure the operational correct access to a shared radio in case the local and remote ATCO/AFISO are logged in.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Parallel	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0013
Requirement	The voice distribution system ***should*** provide an HMI that combines A/G and G/G communications on one controller working position.
Title	RVT-GEN-VOICE-6
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Voice distribution provide combined A/G and G/G HMI
Category	<HMI>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0101.0002
Requirement	The RVT ***shall*** present continuously to the ATCO/AFISO the current MET report with actual wind information.
Title	RVT-GEN-MET-2
Status	<Deleted>
Rationale	Deleted. Replaced by REQ-12.04.07-TS-0101.0003 and REQ-12.04.07-TS-0101.0007 MET report and wind continuously present to ATCO/AFISO
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MT02.2002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Weather Information Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0001
Requirement	The RVT ***shall*** provide a presentation enabling the ATCO/AFISO to maintain a continuous watch on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel on the manoeuvring area.”
Title	RVT-GEN-VIS-1
Status	<Deleted>
Rationale	Deleted. Replaced by REQ-12.04.07-TS-0102.0015 Requirement shall apply to both ICAO Doc 4444, Chapter 7.1.1.2 and Eurocontrol Manual for AFIS, Chapter 3.1.2.
Category	<Design>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0002
Requirement	The RVT ***shall*** provide a presentation enabling the AFISO to maintain a

	continuous watch by visual observation on all flight operations on and in the vicinity of an aerodrome as well as vehicles and personnel on the manoeuvring area.
Title	
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0003 and REQ-12.04.07-TS-0102.0009
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0102.0004
Requirement	How much of the tower field of view is replicated ***shall*** be specified in the implementation requirement specifications.
Title	RVT-GEN-VIS-3
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Tower field of view
Category	<Metadata>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0007
Requirement	The RVT ***shall*** provide means to monitor all voice communication equipment centrally from the RTC.
Title	RVT-GEN-ATS-7
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. All VCS related components, such as CWPs, radios, radio gateways, shall be monitored from the RTC.
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5006	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Technical Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0104.0008
Requirement	The RVT ***shall*** provide remote CWP monitoring.
Title	RVT-GEN-ATS-8
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. If local CWPs at the airport or remote CWPs at the RTC may monitor each other, either for training/supervisor purposes or during the briefing before handover of responsibility.
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN02.5006	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1006	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1007	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Technical Supervision	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Parallel	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0001
Requirement	The RVT ***shall*** have a voice recording system/function.
Title	RVT-GEN-REC-1
Status	<Deleted>
Rationale	Replaced by REQ-12.04.07-TS-0105.0003 Voice recording functionality
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0002
Requirement	The RVT ***shall*** have necessary data recording systems/functions.
Title	RVT-GEN-REC-2

Status	<Deleted>
Rationale	Deleted. Replaced by REQ-12.04.07-TS-0105.0004 Necessary data recording functionality
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0003
Requirement	The RVT ***shall*** provide an analogue legal recording output at each CWP.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0105.0004
Requirement	The RVT ***shall*** provide an IP legal recording output at each CWP.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Partial>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0001
Requirement	The RVT ***shall*** provide visual surveillance by a reproduction of the aerodrome view.
Title	RVT-REM-VIS-1
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Visual surveillance reproduction from several viewpoints
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0100.0007
Requirement	The virtual tower ***shall*** receive surveillance data from the controlled aerodrome to feed the OTW with live traffic.
Title	RVT-REM-VIS-2
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated. Receive surveillance data from controlled aerodrome
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0030
Requirement	The virtual tower ***shall*** provide the visualization of the remote aerodrome through its 3D syntetic visual reproduction
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0031
Requirement	The RVT ***shall*** provide surveillance of the ground traffic by a reproduction of the manoeuvring area.
Title	RVT-REM-VIS-4
Status	<Deleted>
Rationale	Deleted. Already covered by REQ-12.04.07-TS-0110.0049 Provide surveillance of the ground traffic
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0032
Requirement	The virtual tower visual reproduction of the remote aerodrome ***shall*** reproduce environmental data as day, night, rain, fog and sun position.
Title	RVT-REM-VIS-5
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated. Virtual tower visual reproduction reproduces environmental data
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0004
Requirement	The RVT ***shall*** adequately indicate in the visual reproduction any existing discontinuities or non-uniformities in terms of the presented scale, orientation and field of view of the area under observation by the ATCO/AFISO, so as not to cause any misleading impressions regarding the spatial geometry of the area of responsibility.
Title	RVT-REM-CHAR-2

Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Indicate existing discontinuities or non-uniformities
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1001	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0009
Requirement	The RVT ***should*** provide functions to visually judge the position of a light aircraft in the traffic pattern and in published VFR holdings.
Title	RVT-REM-QUAL-2
Status	<Deleted>
Rationale	Deleted. Replaced by REQ-12.04.07-TS-0110.0051 When meteorological conditions and the topography of the surrounding terrain so permit, the RVT should provide functions to visually judge the position of a light aircraft (e.g. C172 or P28A) in the traffic pattern and in published VFR holdings.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1202	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0010
Requirement	When meteorological conditions so permit, the RVT ***should*** provide functions to visually judge gear down on an aircraft in the vicinity of the aerodrome.
Title	RVT-REM-QUAL-3
Status	<Deleted>
Rationale	Deleted. Replaced by REQ-12.04.07-TS-0110.0051 Visually judge gear down in the vicinity of the aerodrome when meteorological conditions permit
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1203	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0012
Requirement	In low visibility conditions, the RVT ***may*** provide functions to monitor an aircraft vacating the runway.
Title	RVT-REM-ENH-1
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Provide, in low visibility, functions to monitor an aircraft vacating the runway
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VE03.1301	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0013
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate the detection and recognition of aircraft.
Title	RVT-REM-ENH-2
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0002 Visual reproduction incorporates features that facilitate the detection and recognition of an aircraft
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0014
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate the identification of aircraft (i.e. correlation with flight plans or position reporting).
Title	RVT-REM-ENH-3
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 and REQ-12.04.07-TS-0110.0002 Visual reproduction incorporates features that facilitate the identification of an aircraft
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0015
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate tracking of aircraft (i.e. labels directly in the visual reproduction).
Title	RVT-REM-ENH-4
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 and REQ-12.04.07-TS-0110.0002 Visual reproduction incorporates features that facilitate tracking of an aircraft
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0016
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate the detection and recognition of vehicles on the manoeuvring area.
Title	RVT-REM-ENH-5
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 and REQ-12.04.07-TS-

	0110.0002 Visual reproduction incorporates features that facilitate the detection and recognition of vehicles
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0017
Requirement	The RVT visual reproduction ***shall*** incorporate features that facilitate the identification of vehicles on the manoeuvring area (i.e. correlation with position reporting).
Title	RVT-REM-ENH-6
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Visual reproduction incorporates features that facilitate the identification of vehicles
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0018
Requirement	The RVT visual reproduction ***should*** incorporate features that facilitate tracking of vehicles on the manoeuvring area (i.e. labels directly in the visual presentation).
Title	RVT-REM-ENH-7
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 and REQ-12.04.07-TS-0110.0002 Visual reproduction incorporates features that facilitate tracking of vehicles
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-FN03.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0019
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate the detection and recognition of obstructions / foreign objects on the manoeuvring area (e.g. personnel or large animals).
Title	RVT-REM-ENH-8
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0003, REQ-12.04.07-TS-0102.0009, REQ-12.04.07-TS-0110.0050 Visual reproduction incorporates features that facilitate the detection and recognition of obstructions or foreign objects
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0020
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate the identification of obstructions / foreign objects on the manoeuvring area (e.g. personnel or large animals).
Title	RVT-REM-ENH-9
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0003, REQ-12.04.07-TS-0102.0009, REQ-12.04.07-TS-0110.0050 Visual reproduction incorporates features that facilitate the identification of obstructions or foreign objects
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0021
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate tracking of obstructions / foreign objects on the manoeuvring area (e.g. personnel or large animals).
Title	RVT-REM-ENH-10
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0003, REQ-12.04.07-TS-0102.0009, REQ-12.04.07-TS-0110.0050 Visual reproduction incorporates features that facilitate tracking of obstructions or foreign objects
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0022
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate judging aircraft position (depth of vision for the ATCO/AFISO).
Title	RVT-REM-ENH-11
Status	<Deleted>
Rationale	Deleted. Covered by REQ-06.09.03-OSED-VG03.1003 Visual reproduction incorporates features that facilitate judging of aircraft position
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0023
Requirement	The RVT visual reproduction ***may*** incorporate features that facilitate judging aircraft altitude.
Title	RVT-REM-ENH-12
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 Visual reproduction incorporates features that facilitate judging of aircraft altitude
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0024
Requirement	The RVT visual reproduction ***may*** incorporate overlaid information to indicate specific parts of the aerodrome, in order to increase the awareness of such objects in darkness or low visibility conditions.
Title	RVT-REM-ENH-13
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0050 Specific parts of the aerodrome - such as the runway, taxiways and any building, obstruction or terrain of interest.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-53	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0025
Requirement	The RVT visual reproduction ***may*** incorporate overlaid information in order to assist the ATCO/AFISO (e.g. current wind and RVR values, status of airport systems such as runway and approach lighting),
Title	RVT-REM-ENH-14
Status	<Deleted>

Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0034 Assisting the ATCO/AFISO with information like wind, weather, RVR values, status of systems, etc.
Category	<Functional>
Validation Method	<Real-Time Simulation> <Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VG03.1003	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0110.0026
Requirement	The RVT visual reproduction ***shall*** provide functionality corresponding to the binoculars in a local Tower (including a moveable zoom feature with a visual indication of the direction of boresight).
Title	RVT-REM-ENH-15
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0052 and REQ-12.04.07-TS-0110.0040 Functionality corresponding to the binoculars in a local tower, including moveable zoom feature with a visual indication of the direction of sight
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3004	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0001
Requirement	The RVT ***may*** have a function for distributing the actual outdoor sound from the airport.
Title	RVT-REM-SOUND-1
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0111.0004, REQ-12.04.07-TS-0111.0005, REQ-12.04.07-TS-0111.0006, REQ-12.04.07-TS-0111.0007 Distributing the actual outdoor sound from the airport
Category	<functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0111.0002
Requirement	The virtual tower ***may*** have a function for distributing the actual outdoor sound from the airport.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated.
Category	<functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-AS03.2001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	<Full>
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0113.0002
Requirement	The RVT voice and data recording ***may*** include actual outdoor sound from the airport.
Title	RVT-REM-REC-2
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Outdoor sound data included in the voice and data recording
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0001
Requirement	The RVT design ***shall*** be modular in the sense that no major design change shall be necessary to meet specific operational requirements of an aerodrome.
Title	
Status	<Deleted>

Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0002
Requirement	The RVT equipment ***shall*** comprise hardware and software modules.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0003
Requirement	The RVT consists of many elements which, when integrated, are designed to meet the specific operational requirements of an aerodrome. In order to cover a wide range of requirements any element design ***should*** comply with the modularity concept.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0004
Requirement	The RVT ***shall*** be modular so that the appropriate level of service can be provided to different aerodromes as well as to different areas of an aerodrome.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0005
Requirement	The RVT system ***shall*** be modular with respect to applications.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Deleted>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0201.0006
Requirement	The RVT system ***shall*** be modular allowing procurement of modules from different suppliers.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A

<ALLOCATED TO>	<Implementation type>	R / V	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0202.0001
Requirement	The RVT ***should*** be such that further components can be added in order to expand the system in terms of functionality and numbers of users
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED TO>	<Functional block>		N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Implementation type>	R / V	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0202.0002
Requirement	The modules ***should*** be such that the RVT can be dimensioned according to the needs of different aerodromes.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED TO>	<Functional block>		N/A
<APPLIES TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED TO>	<Implementation type>	R / V	N/A
<ALLOCATED TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0202.0003
Requirement	The RVT ***should*** be scalable with respect to voice communication equipment (radios, radio gateways, controller working positions).
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>

<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0202.0004
Requirement	The RVT ***should*** be scalable with respect to operated airports/heliports.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0203.0001
Requirement	Adaptation of the equipment to different local site configurations, procedures and working methods ***should*** be done through an appropriate database (sensor positions, airport topography/topology, etc.).
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0203.0002
Requirement	The RVT services ***should*** be configurable to adapt to local ATC procedures and working methods.
Title	RVT-ADAPT-1
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Operate on the basis of uniformity throughout Europe Applying standards and uniform principles, and ensuring the technical and operational interoperability of aircraft and ATM systems.

	Operating methods and procedures are today often varying according to aerodrome.
Category	<Design>
Validation Method	<Expert Group (Judgement Analysis)>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MB04.0005	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0203.0003
Requirement	The RVT design ***shall*** take into account the working environment of the user under various operational conditions. In this respect, the RVT working positions shall be adaptable to the various circumstances of the user. Specific requirements need to be added.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0203.0004
Requirement	The RVT ***should*** provide a role management system that unites all functions in CWP.
Title	RVT-ADAPT-2
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Operate on the basis of uniformity throughout Europe Applying standards and uniform principles, and ensuring the technical and operational interoperability of aircraft and ATM systems. Today there is a lack of standardisation of systems and equipment according to aerodrome. CWP and HMI can be very different from one tower to another. Also in order to ensure flexibility within an RTC regarding airport and CWP allocation, and for ATCO/AFISO licensing & training reasons.
Category	<Functional>
Validation Method	<Expert Group (Judgement Analysis)>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MB04.0006	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0203.0005
Requirement	The role system ***shall*** be independent from the physical controller working position.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0204.0001
Requirement	The RVT visual reproduction ***shall*** be configurable in order to accommodate any change in the layout of the aerodrome (runways, taxiways and aprons), without modifying the core processing.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0204.0002
Requirement	The RVT ***should*** provide means to define the radio layout (HMI).
Title	

Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0204.0003
Requirement	The RVT ***should*** provide means to define the phone layout (HMI).
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<HMI>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0001
Requirement	The amount of access to aeronautical mobile service (air-ground communications) for the RVT ***shall*** be specified in the implementation requirement specifications.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0002
Requirement	The amount of access to aeronautical fixed service (ground-ground communications) for the RVT ***shall*** be specified in the implementation requirement specifications.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0003
Requirement	What capabilities the RVT CWP must provide ***should*** be specified in the implementation requirement specifications.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Controller Human Machine Interaction Management	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0004
Requirement	It ***shall*** be defined how much of the "normal" tower view to be replicated
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A

<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0005
Requirement	The visual reproduction in the virtual tower ***shall*** provide the ATCO/AFISO with the real time 3D visualisation of the airport traffic.
Title	RVT-PERF-CAP-1
Status	<Deleted>
Rationale	Deleted. Virtual Tower specific. In accordance with High Level Architecture (HLA) 1516 and Distributed Interactive Simulation (DIS) data protocols. A standard data interface from CWP and 3D visualizer is required to communicate the airport traffic entities to the 3D modeller and visualizer to grant independent development of CWP and 3D in virtual tower. 3D visualizer evolves faster than CWP.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0006
Requirement	The visual reproduction in the virtual tower ***shall*** be able to provide a realistic visualization of the airport and its surrounding area.
Title	RVT-PERF-CAP-2
Status	<Deleted>
Rationale	Deleted. Virtual Tower specific. The Visualization model for 3D representation of the airport is defined inside the Implementation requirement specification document. The model depends on sun position, time of day, visibility range, wind direction and speed, cloud coverage, cloud height, rain, snow.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0000

Requirement	The RVT ***shall*** provide a DR&A to record and playback the last TBD minutes of the complete RVT data. Air to Ground communications, Ground to Ground communications, Surveillance data, live video OTW, DIS/HLA entities for 3D Visualizer.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	<Real Time Simulation>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V / R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0008
Requirement	The RVT ***shall*** provide the DR&A “Data Recording and Analysis” function to record and playback RVT data. The Implementation requirement specification document defines the data set and the time period for the recording.
Title	RVT-PERF-REC-1
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0113.0001, REQ-12.04.07-TS-0113.0003 The recorded data are a defined subset of: Air to Ground communications, Ground to Ground communications, Surveillance data, live video OTW, live Video for zoom function, Data entities for the 3D Visualizer, virtual 3D representation video.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0009
Requirement	Maximum number of aerodromes to which remote service can be offered ***shall*** be defined by the Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>

Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0010
Requirement	Maximum number of aerodromes to which remote service can be offered *simultaneously* ***shall*** be defined by the Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0011
Requirement	The RVT ***shall*** have access to aeronautical mobile service for each aerodrome which the ATC / AFIS service could be offered to.
Title	RVT-PERF-CAP-3
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0100.0001 The ATCO / AFISO should have access to air to ground required communications for each airport he could offer services to.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A

<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0012
Requirement	The RVT ***shall*** have access to aeronautical fixed service (ground-ground communications) for each aerodrome which the ATC / AFIS service could be offered to.
Title	RVT-PERF-CAP-4
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0100.0002 The ATCO / AFISO should have access to air to ground required communications for each airport he could offer services to.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-CM02.1002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MC04.2002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-MH04.1001	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0013
Requirement	For each aerodrome which the ATC / AFIS service could be offered to, the RVT CWP ***should*** offer the capabilities specified in the implementation requirement specifications related to that aerodrome.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0014
Requirement	For each aerodrome the ATC/AFIS service could be offered to, a defined

	replica of the OTW view of the local tower ***shall*** be presented in the RTC.
Title	RVT-PERF-CAP-5
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0015, REQ-12.04.07-TS-0102.0009, REQ-12.04.07-TS-0102.0010, REQ-12.04.07-TS-0102.0011 Implementation requirement specification shall define the minimum field of view for the RVT tower if the full 360° field of view cannot be reproduced.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0015
Requirement	The visual reproduction in the virtual tower ***should*** USE standard data protocols in order to provide the ATCO/AFISO with the real time 3D visualisation of each airport under management of RTC.
Title	
Status	<Deleted>
Rationale	Deleted. Virtual tower specific.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0016
Requirement	The visual reproduction in the virtual tower ***shall*** be able to provide a realistic visualization of each airport and its surrounding area, under management of the RTC.
Title	RVT-PERF-CAP-6
Status	<Deleted>
Rationale	Deleted. Virtual tower specific. The Visualization model for 3D representation of the airport is defined inside the Implementation requirement specification document. The model depends on sun position, time of day, visibility range, wind direction and

	speed, cloud coverage, cloud height, rain, snow.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0017
Requirement	The RVT ***shall*** provide the DR&A "Data Recording and Analysis" function to record and playback RVT data related to each aerodrome under management of the RTC. The Implementation requirement specification document defines the data set and the time period for the recording.
Title	RVT-PERF-REC-2
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0113.0001, REQ-12.04.07-TS-0113.0003 The recorded data are a defined subset of: Air to Ground communications, Ground to Ground communications, Surveillance data, live video OTW, live Video for zoom function, Data entities for the 3D Visualizer, virtual 3D representation video.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0018
Requirement	The DR&A "Data Recording and Analysis" function offered by the RVT system ***shall*** record data for each aerodrome managed by the RTC also when the airport is not undergoing active control.
Title	RVT-PERF-REC-3
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Data Recording shall be independent from the active provision of ATC

	service.
Category	<Functional>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6001	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-DR02.6002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Support Functions	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0301.0019
Requirement	Capacity requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the OSED, so requirements from Single Aerodrome configuration are applied.
Category	<Functional>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0001
Requirement	The visual reproduction in the remote tower ***shall*** provide a visual detail that match OTW direct vision. Requirements on the visual detail in the remote tower need to be specified.
Title	RVT-PERF-ACC-1
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0102.0010 and REQ-12.04.07-TS-0102.0011, REQ-12.04.07-TS-0102.0012 The visual reproduction in the remote tower provides a visual detail matching OTW direct vision
Category	<Performance>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1201	<Full>

<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1202	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1203	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1204	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1205	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0002
Requirement	The visual reproduction in the virtual tower ***shall*** provide a visual detail that match OTW direct vision. Requirements on the visual detail in the virtual tower need to be specified.
Title	RVT-PERF-ACC-2
Status	<Deleted>
Rationale	Deleted. Virtual tower specific. The visual reproduction in the virtual tower provides a visual detail matching OTW direct vision
Category	<Performance>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0008	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1201	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1202	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1203	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1204	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VQ03.1205	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0003
Requirement	The visual reproduction in the virtual tower ***shall*** allow a user to reduce the visualised detail of Entities in order to improve run time performance of the 3D System Viewer. Requirements on this in the virtual tower need to be specified
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A

<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0004
Requirement	Accuracy in visualization of the remote video stream in the remote tower for each airport managed by the RTC ***shall*** match that of single aerodrome visualisation.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0005
Requirement	Visual detail in 3D reproduction of the OTW view from each remotely managed aerodrome ***shall*** match that of single aerodrome reproduction.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0302.0006
Requirement	Accuracy requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0001
Requirement	The maximum delay in mobile aeronotical services (ground to air) and fixed aeronotical services (ground to ground) ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0002
Requirement	The delay of the visual reproduction images ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0003
Requirement	The RVT ***shall*** provide the CWP with surveillance data from the remote controlled aerodrome with a maximum delay that shall be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.

Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0004
Requirement	The virtual tower ***shall*** provide the visual reproduction with surveillance data from the remote controlled aerodrome with a maximum delay that shall be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0005
Requirement	The RVT visual reproduction ***shall*** provide the virtual 3D visualization of ground traffic on the remote airport with a maximum delay that shall be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific, which has not been validated.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0006
Requirement	If redundancy exists, requirements on maximum automatic reconfiguration time on resuming the service in case of a single fault ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0007
Requirement	The RVT ***shall*** sustain at least for X minutes,Y % workload minutes a temporary workload exceeding its maximum standard workload by X minutes,Y % workload. Requirements on X minutes and Y % workload shall be specified
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0008
Requirement	The RVT time delay variation between image capture and presentation on the visual reproduction ***shall not*** differ in a way that it affects the ability to perform the ATS service. Requirements on time delay need so be specified.
Title	RVT-PERF-TIME-1
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0007 The ATCO/AFISO must be able to trust the information presented. Time delay must be small enough (negligible) and fairly constant in order to be able to perform the service.

Category	<Performance>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1105	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0009
Requirement	For each RTM present in the RTC, maximum time needed to connect the RTM to a new airport ***shall*** be defined by the Implementation Requirements Specifications.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0010
Requirement	Maximum delay introduced in access to aeronautical mobile service (air-ground communications) and to aeronautical fixed service (ground-ground communications) by the RVT ***shall*** be specified in the Implementation Requirement Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Air-Ground Voice Communication	N/A
<ALLOCATED_TO>	<Functional block>	Ground-Ground Voice Communication	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0011
Requirement	Maximum delay of images introduced in the visual reproduction for each remotely managed aerodrome ***shall*** be specified in the Implementation Requirement Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0012
Requirement	Maximum delay introduced in providing surveillance data to CWPs for each remotely managed aerodrome ***shall*** be specified in the Implementation Requirement Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	<Full>
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0013
Requirement	Maximum delay introduced in providing surveillance data to the visual reproduction for each remotely managed aerodrome ***shall*** be specified in the Implementation Requirement Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0014
Requirement	The maximum delay for 3D visualisation of each remotely managed aerodrome ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0015
Requirement	For each remotely managed aerodrome, the RVT ***shall*** ensure that the delay introduced in visual reproduction for each remotely managed aerodrome *does n*ot affect the ability to perform the ATC/AFIS service. Requirement on time delay need to be specified.
Title	RVT-PERF-TIME-2
Status	<Deleted>
Rationale	Deleted. Covered by REQ-12.04.07-TS-0110.0007 The ATCO/AFISO must be able to trust the information presented. Time delay must be small enough (negligible) and fairly constant in order to be able to perform the service.
Category	<Performance>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1105	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-54	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0016

Requirement	Timing performance requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0303.0017
Requirement	Maximum time needed to switch service from the main tower to the contingency tower ***shall*** be defined by the Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0001
Requirement	The requirement of resolution ***shall*** be specified.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>

<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0002
Requirement	The visual reproduction in the virtual tower ***shall*** be capable of visualising within a 3D scenario environment as 3D object models all surveillance tracks visualized on the CWP.
Title	RVT-PERF-USE-1
Status	<Deleted>
Rationale	Deleted. Virtual tower specific Requirement shall apply to both ICAO Doc 4444, Chapter 7.1.1.2 and Eurocontrol Manual for AFIS, Chapter 3.1.2.
Category	<Performance>
Validation Method	<Live-Trial><Shadow-Mode>
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3001	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VS02.3002	<Full>
<SATISFIES>	<Enabler>	AERODROME-ATC-52	<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0003
Requirement	The maximum number of tracks visualized on CWP ***shall*** be specified for RVT
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements The maximum number of tracks visualized on CWP is defined inside the Implementation requirement specification document.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0004
Requirement	The visual reproduction in the virtual tower ***shall*** be capable of refreshing its 3D Visualisation Window at a rate of 30Hz +/- a 25% tolerance.

Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-VC03.1104	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0005
Requirement	The refresh rate of the presented video stream ***shall*** be defined by the Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0006
Requirement	The RVT hardware/software usage ***shall*** be lower than X% of the maximum available resources when running a load scenario Requirements on load scenario need to be specified. Requirements on X shall be specified.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0007
Requirement	The RVT 3D visualization system hardware/software usage ***shall*** be lower than X% of the maximum available resources when running a load scenario.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0008
Requirement	For each remotely managed aerodrome, the Implementation Requirements Specification ***shall*** specify requirements about screen resolution.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0009
Requirement	For each remotely managed aerodrome, the visual reproduction in the virtual tower ***shall*** visualize as many 3D objects as would be visible from the ATCO/AFISO point of view in the local tower. Definition on 3D objects need to be defined in the requirement.
Title	
Status	<Deleted>
Rationale	Requirement is Virtual Tower specific
Category	<Performance>
Validation Method	
Verification Method	<Analysis>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>

<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0010
Requirement	Maximum number of tracks visualized on CWP for each remotely managed aerodrome ***shall*** be specified in Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0011
Requirement	The visual reproduction of the virtual tower ***shall*** be capable of refresh its presentation for each remotely managed aerodrome at a rate specified in the Implementation Requirement Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0012
Requirement	The frame rate of the video stream from each remotely managed aerodrome ***shall*** be specified in the Implementation Requirements Specification.
Title	
Status	<Deleted>

Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>	Aerodrome Surveillance	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0013
Requirement	Hardware/software resources used for each remotely managed aerodrome within the RVT system ***shall not*** exceed a value defined within the Implementation Requirements Specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0014
Requirement	Software and Resource Usage requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Performance>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0304.0015
Requirement	Software and Resources used by the contingency tower ***may*** be used for training purpose when not needed for exceptional situations.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0305.0001
Requirement	The RVT ***shall*** sustain a temporary workload exceeding a percent its maximum standard workload, that percent ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Performance>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0001
Requirement	The redundancy requirement of the RVT and components ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. No single point of failure or requirement could be on subfunction level include all hardware and software.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>

<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0002
Requirement	All critical elements of the RVT ***should*** be provided with timely audio and/or visual indications of failure.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0003
Requirement	The system design ***should*** prevent failures that result in erroneous data for operationally significant time periods
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0004
Requirement	The RVT ***should*** have the ability to provide continuous validation of data and timely alerts to the user when the system must not be used for the intended operation. The validity of data should be assessed by the system in accordance with the assigned priority given to these data
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.

Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0005
Requirement	A self-checking system with failure alerts ***should*** be included in the system design.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0006
Requirement	The RVT ***shall*** follow Safety Case according to Eurocontrol SAMv2.1
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Safety>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0007
Requirement	The RVT ***shall*** support authentication in its components for management

	access.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0008
Requirement	The RVT ***shall*** support confidentiality in its components for management access.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0009
Requirement	The RVT ***shall*** support authentication at each controller working position.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0010
Requirement	The radio gateway ***shall*** only allow access from known clients (white list).
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0011
Requirement	The RVT ***shall*** support monitoring mechanisms that ensures confidentiality.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0012
Requirement	The RVT ***shall*** support monitoring mechanisms that ensures integrity.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0013
Requirement	The RVT ***shall*** support monitoring mechanisms that provides confidentiality.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0014
Requirement	The RVT shall support monitoring mechanisms that provides integrity.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0306.0015
Requirement	The RVT ***shall*** support monitoring mechanisms that provides authentication.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Security>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0001
Requirement	Requirements regarding maximum downtime for total OTW ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Maintainability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0002
Requirement	Requirements regarding maximum downtime for a single OTW monitor ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Maintainability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0003
Requirement	Requirements regarding maximum downtime for PTZ ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Maintainability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>

<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0004
Requirement	Requirements regarding maximum downtime for communication between RTC and airport ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Maintainability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0005
Requirement	Requirements regarding maximum downtime for total system and sub-system ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Maintainability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0307.0006
Requirement	Maintanability requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Maintainability>

Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0001
Requirement	Requirements regarding maximum MTBF for total OTW ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Reliability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0002
Requirement	Requirements regarding maximum MTBF for a single OTW monitor ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Reliability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0003
Requirement	Requirements regarding maximum MTBF for PTZ ***shall*** be specified in the implementation requirement specification.

Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Reliability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0004
Requirement	Requirements regarding maximum MTBF for XXX ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Reliability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0005
Requirement	The RVT ***shall*** provide the ATCO/AFISO with warning indicating if a visual reproduction image is frozen.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0006
Requirement	The RVT ***shall*** provide the ATCO/AFISO with warning indicating if a visual reproduction image is corrupt.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0007
Requirement	The RVT ***shall*** provide the ATCO/AFISO with warning indicating if a visual reproduction image is delayed.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.09.03-OSED-BC01.0001	<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0008
Requirement	Requirements regarding maximum delay in the visual reproduction ***shall*** be specified in the implementation requirement specification.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Metadata>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A

<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0308.0009
Requirement	Reliability requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Reliability>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0001
Requirement	All constructions at the local airport ***should*** follow the guidelines defined in the applicable ICAO Standards.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. e.g. ICAO Annex 14
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0002
Requirement	All major system components ***shall*** be decoupled and separated by clear defined interfaces.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0003
Requirement	The system construction ***shall*** utilize COTS hardware products on standarized products.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Provide flexibility in terms of hardware procurement and avoid bespoken hardware solution.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0004
Requirement	Network QoS monitoring and usage ***shall*** be taken into account in the design of system function. Requirements on Network QoS monitoring and usage ***shall*** be specified
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Some critical RVT functionalities rely on wide-area network capacity. So the network in this case could be subject to degradation which has an immediate impact on operation unlike systems based solely on local network which are by construction more predictable. Possibly some function could automatically decide to self-deactive because the quality of the information they use is not good enough to be processed and would provide the user with bad quality information which can lead to wrong decisions.
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A

<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0005
Requirement	The design ***shall*** allow the distribution of the network traffic to different communication infrastructure or providers.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. This provides service contingency in case of network provider failure (for example having data trafficking in one infrastructure, and voice (VoIP) through another one)
Category	<Design>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0006
Requirement	The design for a multiple remote tower setup ***shall*** assure that a malfunction at a dedicated airport has no effect on control capabilities of other airports.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Assures decoupling of functional building blocks..
Category	<Design>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0309.0007
Requirement	Design and Construction constraints satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are

	applied.
Category	<Design>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0001
Requirement	The design ***shall*** allow local or centralized deployment of interfaces
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Some interfaces could be provided locally or directly at the remote TWR site. The design shall not constraint a certain deployment solution.
Category	<Interface>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0002
Requirement	The RVT ***shall*** provide an interface to needed local surveillance sensors.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0003
Requirement	The RVT ***shall*** provide an interface to local cameras.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. Applicable standard e.g. ONVIF could be supported.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0004
Requirement	The RVT ***shall*** provide an interface to local VHF radios via analogue interface or IP.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. The interface shall be compliant with ED137.
Category	<Interface>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0005
Requirement	The RVT ***shall*** provide an interface to local airport systems.
Title	
Status	<Deleted>
Rationale	Requirement has been redefined or split into multiple requirements. Airport systems such as Airfield Lights, Met System and Nav Aids.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A

<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0006
Requirement	The RVT ***may*** provide an interface to specific partners at the local airport (e.g. Airport Operator …) allowing read-only access to information the RTS can provider,
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0007
Requirement	The RVT ***shall*** provide a central interface for telephone lines
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0008
Requirement	The RVT ***should*** provide a central interface to the SWIM network for services MET, Flight Plan, Surveillance and AIM
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0009
Requirement	The RVT ***shall*** provide a central interface to the AFTN or other legacy FDP systems for flight data exchange.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0010
Requirement	The RVT ***should*** provide a central interface to FDP systems in order to exchange sectorization data
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements. The RTS shall inform or being informed about the airfields (and thus jurisdiction) it takes overs.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0011
Requirement	Requirement not supported by OSED requirements. IP-based voice communication and recording ***shall*** be compliant with EUROCAE Working Group 67 recommendations.
Title	
Status	<Deleted>

Rationale	
Category	<Interface>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	All	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0012
Requirement	The RVT shall support handling of multiple instances of airport interfaces (cameras, met system. AFL control…)
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Test>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0013
Requirement	Scenario handling of information for multiple airports provided via centralized interfaces ***shall*** be supported.
Title	
Status	<Deleted>
Rationale	Requirement not supported by OSED requirements.
Category	<Interface>
Validation Method	
Verification Method	<Review of Design>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.07	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Sequential, Simultaneous	N/A

[REQ]

Identifier	REQ-12.04.07-TS-0310.0014

Requirement	Functional Block Interface Requirements satisfied by RVT in contingency configuration ***shall*** match those defined for the Single Aerodrome Configuration.
Title	
Status	<Deleted>
Rationale	No operational requirements are defined for contingency configuration by the P06.09.03, so requirements from Single Aerodrome configuration are applied.
Category	<Interface>
Validation Method	
Verification Method	<Inspection>

[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>		<Full>
<SATISFIES>	<Enabler>		<Full>
<ALLOCATED_TO>	<Functional block>		N/A
<APPLIES_TO>	<Operational Focus Area>	OFA06.03.01	N/A
<ALLOCATED_TO>	<Project>	12.04.08	N/A
<ALLOCATED_TO>	<Implementation type>	R / V	N/A
<ALLOCATED_TO>	<Configuration>	Contingency	N/A

END OF DOCUMENT-