# Phase 3 - Technical Specifications - Final Report

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**Abstract**

The document describes the Final Technical Requirements (functional and non-functional) of project 12.03.02 which guided the development and implementation of prototypes for a Surface Safety Nets Server. Such System Requirements are derived from the Operational Requirements collected by OFA 01.02.01 the specification of previous R&D projects and from SESAR project 06.07.01.

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This deliverable consists of SJU foreground

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# Executive summary

The document describes the Final Technical Requirements (functional and non-functional) which guided the development and implementation of Surface Safety Nets Server prototypes in the context of project 12.03.02. Such requirements were taken from:

- The current state of the art for Surface Control function, resulting from previous projects and developments.

- New functionalities studied by SESAR Project 06.07.01: "Conflicting ATC Clearances" and "Conformance Monitoring". These functionalities have been developed during SESAR programme considering the feedback of several validation exercises using the prototypes from the previous phases of 12.03.02. The OSED and SPR from project 06.07.01 considered as inputs for this document took into account the feedback from all the validation exercises but the Release 5 ones. In fact, at the time of writing this document, both Validation Report and Operational Requirements after Release 5 validation are not yet ready.

The project 12.03.02 technically contributed to SESAR Solution #2 "Airport safety nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances"

According to ATM Master Plan Data Set 15 [18], the following system enablers, belonging to Deployment Baseline and to Step 1, were addressed by the requirements listed in the document:

- AERODROME-ATC-03 – Surface movement control workstation equipped with tools for runway incursion detection and alerting (Baseline)

- AERODROME-ATC-06 - Surface movement control workstation equipped with tools for conflicting ATC clearances detection and alerting for Runway operations (Step 1)

- AERODROME-ATC-07 - Surface movement control workstation equipped with tools for detection and alerting of non-conformance to ATC instructions or procedures for surface movements, including apron and taxiways (Step 1)

All the ATM components interacting with a Surface Safety Nets Server are identified, as well as the external conditions and inputs affecting its behaviour and its operations.

System and Performance Requirements are derived from SESAR Operational requirements, but also collected by the analysis of specifications of consolidated R&D projects such as EMMA2 [13],[14], and from ICAO standards [16], EUROCONTROL [10] and EUROCAE A-SMGCS [11] documents.

Requirements are also provided for the external interfaces and to satisfy the installation-related constraints.

A section of the document is dedicated to non-functional requirements, focused on Performance Characteristics and Interfaces.

This final version of Technical Specifications comes after the development of the prototypes based on the technical specification of Phase 3. The prototypes were part of validation exercises of SESAR Release 5.

When the verification of the requirement was successful in the frame of the SESAR R&D activities (until V3) and the requirement had positively supported one or more V3 validation exercise, the same requirement has been tagged in "validated" status.

It is important to highlight that the validation results (Validation Report) are still under production at the time of writing of this document, so there are possibilities of misalignments.

# 1  Introduction

The Technical Specification document contains descriptions and requirements that define functional and non-functional specifications of Surface Safety Nets Server.

## 1.1  Purpose of the document

The purpose of this document is to provide information regarding the Specification and the System Requirements of a Surface Safety Nets (SSN) Server which satisfies the needs and expectations of the Tower Controllers.

The requirements are specified according to the following inputs: operational (coming from previous external studies - [10], [13], [14] - and P06.07.01) and technical aspects (coming from the related technical projects). HMI requirements are in charge of project 12.05.04.

## 1.2  Intended readership

The following could be interested in reading the document and will be part of the formal review of the final draft:

- 06.07.01 as operational project providing requirements and validation activities

- 06.03.01 as manager of operational activities

- 12.01.07, as responsible of Airport Technical Architecture definition

- 12.03.01, as technical project defining and developing Improved Surveillance

- 12.03.03 and 12.03.04, as technical project defining and developing Surface Routing and Guidance

- 12.05.04, as technical project defining and developing Controller Working Position

- 09.14, as technical project defining and developing on board alerting system

The figure below is a schematic diagram showing the interactions between the 12.03.02 project (i.e. this document) and other SESAR projects:
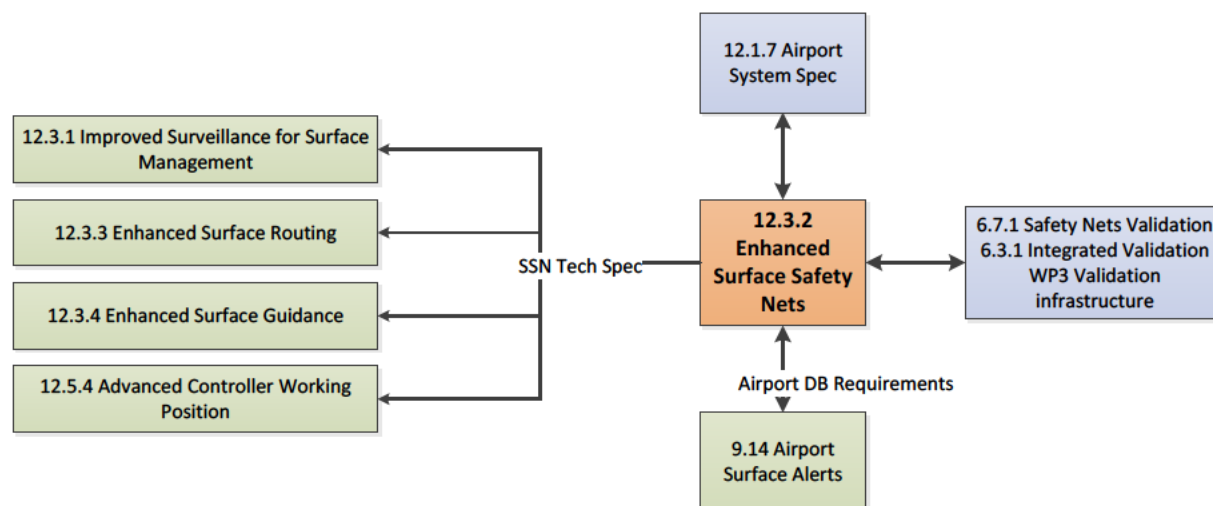


**Figure 1: Interactions between P12.03.02 and other SESAR projects**

## 1.3  Inputs from other projects

In the context of the SESAR project P12.03.02, the following documents were used as input for the System Specifications:

- P06.07.01-D29 SPR for "Conflicting ATC Clearances" and "Conformance Monitoring" [7]

- P06.07.01-D32 Interim OSED for Conflicting ATC Clearances and Conformance Monitoring for Controllers [8]

The specifications for the HMI part of the SSN server were written by P12.05.04 with close collaboration of P12.03.02.

The listed documents have been analysed with the purpose to get a set of operational requirements to produce the technical specifications that belongs to the scope of this project. The result of this analysis is the set of technical requirements shown in section 3.

It should be noticed that this Final Technical Specification document was written prior to the availability of Release 5 Validation Results and prior to the updated of final 06.07.01-D32 Final OSED.

## 1.4 Structure of the document

Section 1 is the introduction. It describes the purpose and scope of the document and the methodology used to derive the requirements, including the purpose of the system under analysis.

Section 2 gives a general description of the SSN Server.

Section 3 describes the capabilities, conditions and constraints of the SSN Server. In particular it contains the functional and non-functional requirements.

Section 4 describes the assumptions taken for this document.

Section 5 describes the referenced documents.

## 1.5 Requirements Definitions – General Guidance

The requirements were produced to describe both functional and non-functional requirements at system level. The purpose of technical specification is to transform the operational requirements and safety recommendations identified through analysis of external input into a coherent description of SSN component and its capabilities.

Requirements are structured by their types, and then:

- Functional Requirements
- Non-Functional Requirements
  - o Adaptability Requirements
  - o Performance Requirements
  - o Safety Requirements
  - o Interface Requirements

These requirements address the "what" and not the "how", therefore they do not aim at specifying the physical design of the component, but the functional description and the necessary logical interfaces with other functional blocks.

The Functional requirements can be further decomposed in other sub-sections, according to component capabilities (see section 2.3).

### 1.5.1 Requirements Properties

The requirements are written according to the following statements

| Property | Comment |
|---|---|
| Necessary | The requirement cannot be deleted without changing the scope: The requirement describes an essential function, characteristic or quality. If it were removed, then a deficiency would exist which would not be met by any other capability of the system. |
| Justifiable | A clear link exists with an initial need or with another requirement. |
| Feasible | The concept is realistic: technically and legally possible and can be |

| | |
|---|---|
| | accomplished within affordable cost and schedule. |
| Measurable | A V&V method (e.g. testing) is defined. |
| Clear and Concise | The requirement is concise, unambiguous and lends itself to a single interpretation. |
| Consistent | The requirement is not in conflict with other requirements. |
| Complete | The requirement expresses in itself a single whole idea without need for further explanation. |

**Table 1: Requirements properties**

The technical requirements are written following the document "Requirements and VV Guidelines" (see [2])

In particular, all requirements must contain at least a subject and a statement where the subject is the object under discussion (e.g. system), and the statement is a condition, action, intended result or target objective.

The generic way to write a requirement is: <Object> shall OR should OR may <verb> <Statement> (standard ISO/IEC 15288)

- Requirements are marked by the use of the verb "shall".

- Recommendations are marked by the use of the verb "should".

- Permissions are marked by the use of the verb "may".

## 1.5.2 Writing Requirements

The naming convention of the requirements is as follows:

REQ-12.03.02-TS-xxxx.yyyy, where

xxxx is the section of requirement

- 2001 for general requirements

- 2002 for runway incursion

- 2003 for area intrusion

- 2004 for conformance monitoring

- 2005 for conflicting ATC clearances

- 2007 for performance

- 2009 for interfaces

yyyy is an order number.

In this document "Validation Method" item of each requirement is blank, because the validation is not covered by technical projects, but by the operational ones.

The traceability between technical requirements and operational requirements was established both with OSED and SPR requirements.

## 1.6 Functional block Purpose

The purpose of Surface Safety Nets is to support controllers in detecting alert situations. The impacted functional blocks are "Aerodrome Safety Nets" and "Conformance Monitoring" (see section 2.6.1).

The SSN server aims to detect alert situations that are not currently addressed by deployed A-SMGCS systems and, in particular, to be able to detect and provide warning of potential conflicts earlier than current systems can do. The alerts generated by the SSN are then broadcasted to all the interested controller HMI positions.

## 1.7 Functional block Overview

The SSN server contributes to address:

- Runway Incursion: Runway is by far the most critical area for airport surface safety nets. Enhanced algorithms improve runway incursion detection involving each unauthorised entry by an aircraft or a vehicle in presence of contemporary movements within the Runway Protected Volume (RPV). These situations will be detected only with Aerodrome Surveillance data, without any correlation with received clearances. This functional area is considered deployment baseline and it is part of Runway Monitoring and Conflict Alerting (RMCA). The requirements belonging to this function are not traced with any SESAR operational requirements.

- Area Intrusion: Enhanced algorithms will improve the detection of unauthorised entry by an aircraft or a vehicle into predefined areas. These situations will be detected only with Aerodrome Surveillance data. This functional area is considered deployment baseline and it is part of RMCA. The requirements belonging to this function are not traced with any SESAR operational requirements.

- Conformance Monitoring Alert for Controllers (CMAC): New algorithms and services to detect non-conformance to ATC instructions or aerodrome procedures. Conformance monitoring systems need to be assessed in accordance to complex airport layout and new procedures. These situations are detected combining Aerodrome Surveillance data with data about given clearances and assigned taxi routes.

- Conflicting ATC Clearances (CATC): New algorithms detect conflicting ATC clearances input by the controller (i.e. when ATC provides clearances to a mobile that would result in a conflict with other mobiles). The scope is to provide an early prediction of situations that if not corrected would end up in hazardous situations. These situations are detected combining Aerodrome Surveillance data with data about given clearances. This functional area can be considered an early prediction of possible runway incursion conflicts.

These alerts are sent to controllers' HMI developed in the project 12.05.04. In addition, the alert reports can be considered by other clients, like Operational Supervision component, etc.

## 1.8 Glossary of terms

| Term | Definition | Source |
|------|------------|--------|
| **Alert Situation** | An indication of an existing or pending situation during aerodrome operations, or an indication of abnormal A-SMGCS operation, that requires attention/action. | ICAO-A-SMGCS Manual 9830 [16] |
| **Information** | It is used to inform the controller that a situation which is potentially dangerous may occur and he/she needs to be made aware of. According to the situation, the controller receiving a stage 1 alert (typically in yellow colour) may take a specific action to resolve the alert if needed | SESAR 06.07.01 D32 [8] |
| **Alarm** | It is used to inform the controller that a critical situation is developing which needs immediate action. Typically it is displayed in red colour. | SESAR 06.07.01 D32 [8] |
| **Obstacle** | Any object, or part thereof, or terrain which rises far enough above the surrounding surface or above a specified height to create a hazard to aircraft operations.. Obstacle objects may be fixed (whether temporary or permanent) or mobile. | EUROCONTROL ATM Lexicon |

| Term | Definition | Source |
|---|---|---|
| **Runway Incursion** | Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take-off of aircraft | ICAO (2005) ICAO Document 4444 "Air Traffic Management - Procedures for Air Navigation Services" |
| **Runway Protection Volume** | A defined volume including the runway and stop way, if provided, intended:<br><br>• to reduce the risk of damage to aircraft running off a runway; and<br><br>• to protect aircraft flying over it during take-off or landing operations<br><br>The RPV is composed of two boundaries:<br><br>• Ground boundary to detect mobiles on the surface<br><br>• Air boundary to detect airborne aircraft | N.A. |
| **Taxi Plan** | Information associated to a mobile regarding Clearances and Cleared taxi route if available. | N.A. |
| **Type of alert** | A specific conflict detected by the SSN server. It is one of the alerts defined in the section 3.1. | N.A. |

## 1.9  Acronyms and Terminology

| Term | Definition |
|---|---|
| **A-FDPS** | Aerodrome Flight Data Processing System |
| **A-SMGCS** | Advanced Surface Movement Guidance and Control System |
| **ATC** | Air Traffic Control |
| **ATCO** | Air Traffic Controller |
| **ATC system** | In the context of this document the term ATC system refers to a combination of the A-SMGCS (Surveillance and Control) and the Electronic Flight Strips |
| **ATM** | Air Traffic Management |
| **CATC** | Conflicting ATC Clearances |
| **CMAC** | Conformance Monitoring Alerts for Controllers |
| **DOD** | Detailed Operational Description |
| **FB** | Functional Block |
| **HMI** | Human-Machine Interaction |

| Term | Definition |
|---|---|
| **HP** | Holding Point |
| **HW** | Hardware |
| **ICAO** | International Civil Aviation Organization |
| **LVC** | Low Visibility Condition |
| **LVP** | Low Visibility Procedure |
| **OSED** | Operational Service and Environment Definition |
| **R&D** | Research and Development |
| **RIMS** | Runway Incursion Monitoring System |
| **RMCA** | Runway Monitoring and Conflict Alerting |
| **RPA** | Runway Protected Area |
| **RPV** | Runway Protection Volume. |
| **RWSL** | Runway Status Light |
| **RWY** | Runway |
| **SESAR** | Single European Sky ATM Research Programme |
| **SJU** | SESAR Joint Undertaking (Agency of the European Commission) |
| **SJU Work Programme** | The programme which addresses all activities of the SESAR Joint Undertaking Agency. |
| **SESAR Programme** | The programme which defines the Research and Development activities and Projects for the SJU. |
| **SPR** | Safety and Performance Requirements |
| **SSN** | Surface Safety Nets |
| **SSR** | Secondary Surveillance Radar |
| **SW** | Software |
| **TS** | Technical Specification |
| **TAD** | Technical Architecture Description |
| **TWY** | Taxiway |
| **WP** | Work Package |

# 2 General Functional block Description

## 2.1 Context

Control, which includes enhanced Surface Safety Nets, is one of the four primary functional elements of an A-SMGCS, as specified in ICAO Doc 9830 A-SMGCS Manual [16]:

a) **Surveillance**: to provide accurate position information on all movements within the movement area and to provide identification and labelling of authorized movements;

b) **Routing** (including Planning): to permit designation of a route for each aircraft or vehicle within the movement area;

c) **Guidance**: to provide clear indications to pilots and vehicle drivers to allow them to follow their assigned routes; and

d) **Control**: to provide continuous interpretation of the traffic situation, including verification of planned events and detection and alerting of potential conflicts and other hazardous situations.

The diagram below (EUROCAE ED-87B [10]) illustrates the interaction between these functional elements.
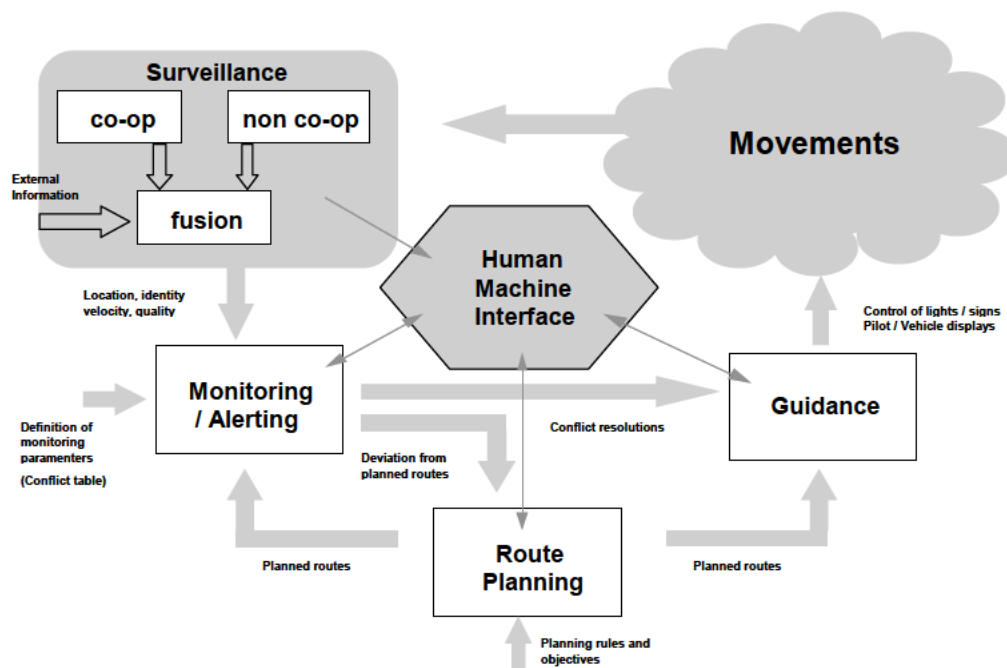


**Figure 2: Interaction among different A-SMGCS functional elements**

The current definition of an A-SMGCS control function (ICAO Doc 9830) has to be improved through the implementation and the continuous updating of tools for predicting, detecting, and resolving conflicts giving the appropriate alerts.

As far as SESAR is concerned, one of the programme targets is to enable a 3-fold increase in capacity; this issue will become even more critical in the future if no new safety support tool is implemented. This project also aimed at contributing to another SESAR objective, which is increasing the safety by a factor 10.

According to EUROCONTROL studies [17], the most frequent runway incursions are:

- Aircraft enters or crosses a runway without a clearance
- Airside vehicle driver enters or crosses a runway without a clearance

Other airport incidents include:

- Non-conformance of aircrafts movements to ATC instruction or procedures

- Conflicting ATC clearances

Therefore, additional safety support tools are needed to reduce the incidents probability and increase safety during airport operations (in particular on the runway) which can increase airport capacity.

The objective of Project 12.03.02 was the improvement of all aspects of Surface Safety Nets addressing runway incursion, area intrusion, non-conformance to ATC procedures and instructions and conflict alerts distribution.

The performance of the SSN is largely dependent upon the input data received from the Aerodrome Surveillance element, but also flight data, including given clearances and assigned taxi routes.

## 2.2  Functional block Modes and States

The Surface Safety Nets (SSN) function is a modular component of an A-SMGCS. Its role is to continuously monitor the aerodrome traffic situation and clearances given by ATC, and to detect and report when any of the monitoring rules programmed into the system are not adhered to.

The two main inputs required by the SSN to trigger alerts, in its normal mode of operation, are:

- Traffic situation information is received by the SSN as target report messages in an agreed data format (normally ASTERIX Category 011 or Category 062) from the A-SMGCS Aerodrome Surveillance system. The target report data shall meet (or preferably exceed) the minimum requirements regarding latency, accuracy of position and accuracy of velocity, as specified in [11], and be continuously available throughout the required coverage volume at the aerodrome. The target report data shall include information about target identification and target type (aircraft type or vehicle fleet type),

- Data describing clearances given, and cleared taxi routes assigned, by ATC. This data will come from the Aerodrome Flight Data Processing System (A-FDPS).

Other types of data (Airports layout, Runway status…) are also needed by the SSN. They are described in section 3.9.

### 2.2.1 Configurability

The SSN has a built-in set of monitoring rules that may be configured and adapted to the specific needs of any aerodrome. The overall rule set is described by the set of capability requirements in section 3.1 of this document.

There are separate rule sets for the four different functional areas that the SSN can address:

1. Runway Incursion

2. Area Intrusion

3. Non-Conformance to ATC Instructions or ATC Procedures

4. Conflicting ATC Clearances

Within each of these rule sets, it should be possible to enable or disable any specific rule and to configure parameters and geographical areas, if any, associated with each rule.

Parameters associated with each rule are specified in the requirements in section 3.1.

### 2.2.2 Degraded Modes of Operation

The SSN function has one degraded mode of operation, the surveillance-only mode

In this mode, the SSN is missing the input of ATC clearance data, but it is able to continue to monitor the traffic situation, and to give alerts in the event of conflicts, based purely on Aerodrome Surveillance data, i.e. the system degrades to RMCA. Only alerts related to runway incursion

(requirements of section 3.1.2) and to area intrusion (requirements of section 3.1.3) are available in this mode.

## 2.3 Major Functional block Capabilities

The purpose of SSN server is to detect and foresee the conflicts on the airport (both ground and final approach) related to mobiles. Data related to each detected conflict will be distributed to Controller HMI, and to any other client system that needs the data.

The main functions, in which the functional requirements can be grouped, are:

- General
- Runway Incursion
- Area Intrusion
- Conformance Monitoring
- Conflicting ATC Clearances

## 2.4 User Characteristics

P12.03.02 developed several safety support tools for controllers:

Tower Controllers provide an Air Traffic Service at controlled aerodromes. They are responsible for the safe and efficient flow of aircraft and vehicles on the runways (Tower Runway Controllers) and on the manoeuvring areas (Tower Ground Controllers).

## 2.5 Operational Scenarios

The following use cases are taken as examples of the ones defined by project 06.07.01 in its OSED document. The scope of project 06.07.01 is wider than just those examples regarding the ATCO's alerting needs.

### 2.5.1 Runway Incursion

#### 2.5.1.1 Preamble

Runway incursion is the most critical situation for airport SSN: it shall be dealt with accordingly, through enhanced algorithms for detection of unauthorized entry by aircraft or vehicles into runway protection areas.

The following scenario is based on the Use case 1 from the P06.07.01 draft OSED for RWSL (see Ref [9]); even if the SSN and RWSL are two separate and independent systems.

Note : Runway Incursions can occur in various ways, involving either a vehicle or an aircraft entering a runway, whatever movement is in progress on that runway (take-off, landing, or even no movement at all). The runway incursion severity may be different in either case.

#### 2.5.1.2 Scenario for a departure flight

**Pre-Conditions**

The ATC system is equipped with A-SMGCS Aerodrome Surveillance and the controller HMI is connected to a Surface Safety Nets server which raises Runway Incursion alerts.

**Actors**

Runway Controller / Pilot / Vehicle drivers

**Trigger**

An aircraft is taking-off and a vehicle is crossing the stop bar.

**Main Flow**

1. Aircraft A is waiting at a holding point HP1 for RWY1.
2. Runway controller allows the aircraft to line up on RWY1.
3. Aircraft A is entering RWY1 and is lining on RWY1.
4. Runway controller allows the aircraft to take-off on RWY1.
5. A vehicle enters the runway from the other side of the runway
6. The ATC system sends an alert to the controller HMI and a sound is played to alert the controller of a dangerous situation
7. The controller acknowledges the alert, evaluates the situation and takes the right decision (either by cancelling the take-off or asking the driver to clear the runway)
8. End of the scenario.

## 2.5.2 Area Intrusion

### 2.5.2.1 Preamble

The area intrusion is the entry of a mobile either to a Restricted Area or to Limited Access Area.

### 2.5.2.2 Scenario for a Restricted Area

**Pre-Conditions**

- The ATC system is equipped with A-SMGCS Aerodrome Surveillance and the Controller HMI is connected to a Surface Safety Nets server which raises area intrusion alerts
- Area D is a restricted area

**Actors**

Ground Controller / Vehicle driver

**Trigger**

A vehicle is entering a restricted area.

**Main Flow**

1. Inspection Vehicle going to runway enters Area D
2. The ATC system sends an alert to the controller HMI to alert the controller of entry of a restricted area
3. The controller acknowledges the alert, evaluates the situation and asks the driver to stop immediately or gives him the authorization to proceed.
4. End of the scenario

## 2.5.3 Conflicting ATC Clearances

### 2.5.3.1 Preamble

The aim for the detection of Conflicting Clearances by this component is to provide an early detection of situations that if not corrected would end up in hazardous situations. Rather than replacing the existing deployed A-SMGCS RMCA, the Conflicting Clearances Detection Function shall complement it and provide an extra layer of safety to prevent accidents from occurring.

It will be based on the knowledge of the clearances given to aircraft or vehicles by controllers, as well as in some cases on A-SMGCS Aerodrome Surveillance data from mobiles' position on the airport surface or on short final.

Different types of conflicting clearances are identified and explained in the P06.07.01 Interim OSED (see Ref [8]). The P06.07.01 OSED provides also some scenarios, the following paragraph provides an example of scenario, and others can be found in the OSED:

## 2.5.3.2 Scenario "Cleared to Land versus Line-Up"

**Pre-Conditions**

The ATC system is equipped with Electronic Flight Strips (and A-SMGCS Aerodrome Surveillance for alternative flow), and the Controller HMI is connected to a Surface Safety Nets server which raises Conflicting ATC Clearances alerts.

**Post Conditions**

A "Conflicting ATC Clearance" alert (Cleared to Land versus Line-Up) is presented on the Runway Controller's HMI.

**Actors**

Runway Controller / Pilots

**Trigger**

The input of the 'line up' ATC Clearance by the ATCO

**Main Flow**

1. Aircraft A is on final for RWY1 and receives from the Tower Runway Controller its landing clearance on this runway via R/T.
2. The Tower Runway Controller makes an input 'Cleared to Land on runway 1' on the Human Machine Interface (HMI) for Aircraft A,
3. Aircraft B is ready for departure, waiting at a Holding Point HP1 for RWY1.
4. The Tower Runway Controller clears aircraft B to line up on RWY1 and makes an input 'Line-Up RWY1' on the HMI for Aircraft B.
5. The ATC system verifies the relative position of both aircraft based on A-SMGCS Aerodrome Surveillance data.
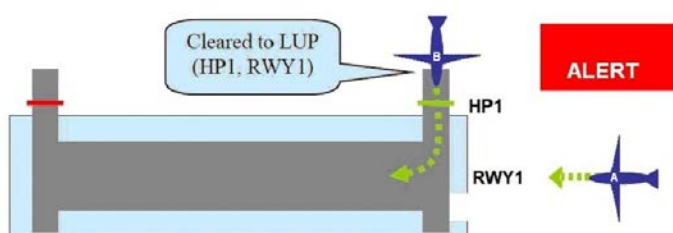


6. The ATC system detects that the aircraft A has not passed the HP1 for the runway where aircraft B is waiting and then triggers an alarm, informing the Tower Runway Controller, that an alert situation has been detected by the ATC system.
7. The alarm triggered by the ATC system, is displayed on the Tower Runway Controller's HMI, and clearly identifies the pair of aircraft involved and the reason for the alarm.
8. Simultaneously with [7], an audio alarm sounds on the CWP to warn the Tower Runway Controller
9. The Tower Runway Controller cancels the 'line up' clearance by R/T to aircraft B and cancels the 'line up' input on the HMI.
10. The ATC system cancels the Conflicting ATC clearance alarm and removes the Conflicting ATC clearance from the Tower Runway Controller's HMI.
11. The Use Case ends.

**Alternative Flows**

[6] -The ATC system detects that the landing aircraft A has already passed the HP1 for the runway where aircraft B is waiting and then no alarm is triggered.
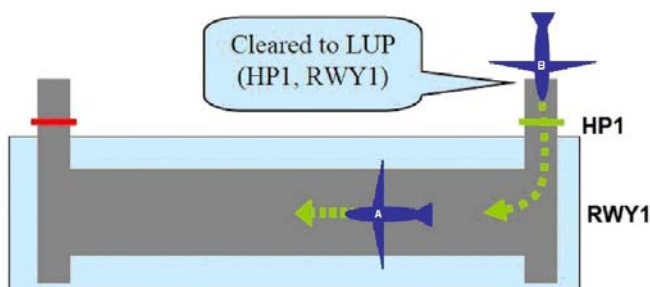
No alarm is triggered
The Use Case ends.


[9] - The Tower Runway Controller considers the situation still safe and ignores the triggered alarm.


The Tower Runway Controller informs the ATC system, via an input, that he/she ignores the triggered alarm.

The flow continues at step 10.

## 2.5.4 Non-conformance to ATC Instructions

### 2.5.4.1 Preamble

A non-conformance to ATC instructions alert is generated by the ATC system when a mobile's behaviour is not conforming to ATC clearances given by the controller. The inputs of the Controller in the ATC system via the Controller Human Machine Interface are compared with the Surveillance data from the A-SMGCS Aerodrome Surveillance function.

The following is an example of Non-conformance to ATC instructions scenario. Other examples can be found in P06.07.01 D32: P06.07.01 OSED for "Conflicting ATC Clearances" and "Conformance Monitoring for Controllers".

### 2.5.4.2 Scenario "route deviation"

**Pre-Conditions**

> The ATC system is equipped with A-SMGCS Aerodrome Surveillance and the Controller HMI is connected to a Surface Safety Nets server which raises route deviation alerts (it is able to compare the current position with the cleared one).

**Actors**

Ground Controller / Pilot

**Trigger**

An aircraft is deviating from its cleared route.

**Main Flow**

1. The Pilot asks for Taxi clearance (Aircraft A is waiting at apron after finishing pushback.)
2. The Ground controller allows the aircraft to TAXI to holding point HP1 of RWY1 via A-B-C-E. (another alternative route to HP1 is A-B-C-D)
3. Aircraft A arrives to the junction and has the choice between D and E
4. The Pilot chooses taxiway D (and Aircraft A continues taxiing on taxiway D)
5. The SSN server sends an alert to the HMI to alert the controller of route deviation: it is a non-conformance to ATC instruction.

6. The controller acknowledges the alert, evaluates the situation and asks the pilot to hold immediately or to change the route.
7. End of the scenario.

## 2.5.5 Non-conformance to ATC Procedures

### 2.5.5.1 Preamble

The A-SMGCS Aerodrome Surveillance function and elements of the Flight Plan Data (such as aircraft flight type) are checked against published ATC procedures. Alerts shall be generated for infringements to any explicit ATC procedures.

The following is an example of Non-conformance to ATC procedures scenario. Other examples can be found in P06.07.01 D32: P06.07.01 OSED for "Conflicting ATC Clearances" and "Conformance Monitoring for Controllers".

### 2.5.5.2 Scenario "High speed"

**Pre-Conditions**

The ATC system is equipped with A-SMGCS Aerodrome Surveillance and the Controller HMI is connected to a Surface Safety Nets server which raises high speed alerts (it is able to compare the current aircraft speed with the airport standard rules).

**Actors**

Ground Controller / Pilot

**Trigger**

An aircraft is taxiing with a speed higher than the maximum speed limit for the airport taxiways.

**Main Flow**

1. The Pilot asks for Taxi clearance (Aircraft A is waiting at apron after finishing pushback.)
2. The Ground controller allows the aircraft to taxi to holding point HP1 of RWY1 via A-B-C-E.
3. Aircraft A is in a long taxiway (B) and reaches the airport taxiway maximum speed limit
4. The pilot continues to accelerate
5. A "High Speed" alarm is raised in the HMI "High Speed" for Aircraft A
6. The controller asks the pilot of Aircraft A to reduce the speed.

End of scenario.

## 2.6  Functional

## 2.6.1 Functional decomposition

The current version of TAD document [15], produced by P12.01.07, decomposes the Aerodrome ATC Domain System in several Functional Blocks, according to Figure 3
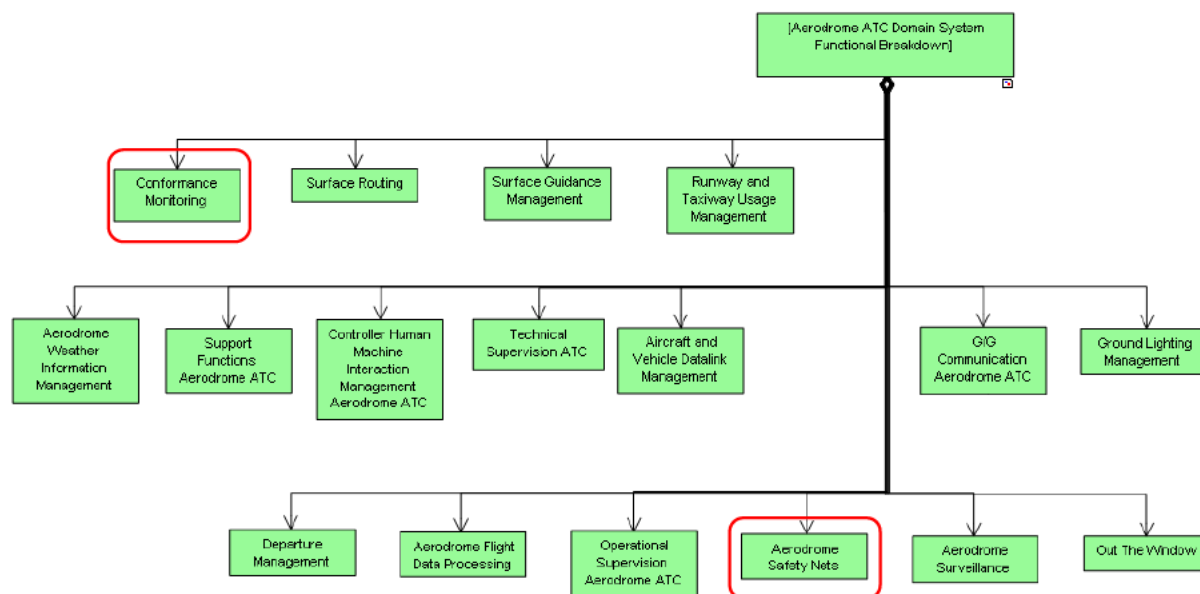
**Figure 3: Aerodrome ATC Domain System - Functional Breakdown**

In this picture, the "Conformance Monitoring" and "Aerodrome Safety Nets" functional blocks are circled because they are the two functional blocks addressed in this document. The "Surface Safety Nets" server described all along the document is then considered as the composition of the two functional blocks "Conformance Monitoring" and "Aerodrome Safety Nets". For this reason, the data flows and the requirements refer to the mentioned functional blocks.

## 2.6.2 Functional analysis

The Surface Safety Nets is a part of Aerodrome ATC System and its role is to monitor the traffic situation and the flight plans and to detect any of the monitoring rules programmed into the system are violated.

12.1.7 TAD [15] reflects the principal data flows of the two functional blocks. The following tables import and review these flows.

Conformance Monitoring FB data flow:

| Data Flow In/Out | Origin | Destination |
|---|---|---|
| SFPL | Aerodrome Flight Data Processing | Conformance Monitoring |
| Conformance Monitoring Alerts | Conformance Monitoring | CHMIM |
| Surveillance Data | Aerodrome Surveillance | Conformance Monitoring |
| Ground Correlation Information | Aerodrome Surveillance | Conformance Monitoring |
| Taxi Route Data | Surface Routing | Conformance Monitoring |
| Runway/Taxiway Status | Runway and Taxiway Usage Management | Conformance Monitoring |
| Conf Mon data for recording | Conformance Monitoring | Support Functions Aerodrome ATC |
| Status Information | Conformance Monitoring | Technical Supervision ATC |
| Configuration Command | Technical Supervision ATC | Conformance Monitoring |

| Airport Configuration | Operational Supervision Aerodrome ATC | Conformance Monitoring |
| Airport Configuration | Operational Supervision Aerodrome ATC | Conformance Monitoring |
| VBC Status | Surface Guidance Management | Conformance Monitoring |
| Conformance Monitoring Alert | Conformance Monitoring | Surface Guidance Management |

Aerodrome Safety Nets FB data flow:

| Data Flow In/Out | Origin | Destination |
| --- | --- | --- |
| Aerodrome Safety Nets Alerts | Aerodrome Safety Nets | CHMIM |
| Surveillance Data | Aerodrome Surveillance | Aerodrome Safety Nets |
| Ground Correlation information | Aerodrome Surveillance | Aerodrome Safety Nets |
| Runway and Taxiway Status | Runway and Taxiway Usage Management | Aerodrome Safety Nets |
| Aerodrome Conflict data for recording | Aerodrome Safety Nets | Support Functions Aerodrome ATC |
| Configuration Command | Technical Supervision ATC | Aerodrome Safety Nets |
| Status Information | Aerodrome Safety Nets | Technical Supervision ATC |
| Airport Configuration | Operational Supervision Aerodrome ATC | Aerodrome Safety Nets |
| SFPL | Aerodrome Flight Data Processing | Aerodrome Safety Nets |

Figure 4 shows the SSN (the coupling of Taxi Conformance Monitoring and Aerodrome Safety Nets functional blocks) in the context of its relationship with the other functional blocks of Aerodrome ATC.
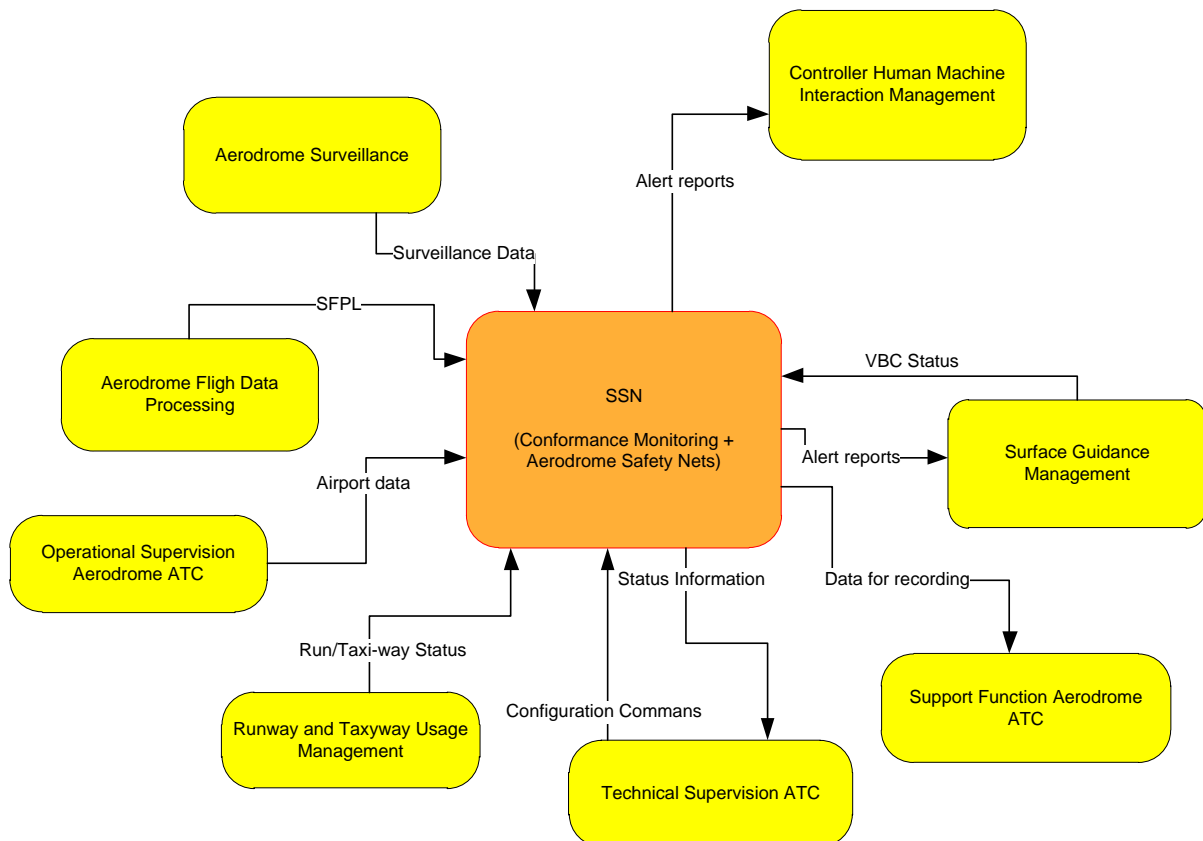
**Figure 4: SSN interfaces**

## 2.7 Service View

N.A.

# 3 Functional block Functional and non-Functional Requirements

## 3.1 Capabilities

### 3.1.1 General Requirements

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0010 |
| Requirement | The SSN server shall continuously process the target reports coming from the Aerodrome Surveillance function, related clearances and cleared routes coming from the AFDPS to compare the traffic situation in real time with the set of predefined alert situations (specified in following requirements). |
| Title | SSN processing |
| Status | <Validated> |
| Rationale | Essential inputs for the SSN server are tracks and related Flight Plan Data (clearances, routes, assigned runways…). |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0001 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0003 | <Partial> |
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| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0020 |
| Requirement | The SSN server, in case of unavailability of clearances and/or of cleared routes from AFDPS (Degraded Mode), shall continuously process the target reports only, to compare the traffic situation with a sub-set of predefined alert situations. |
| Title | SSN degraded processing 1 |
| Status | <Validated> |
| Rationale | SSN processing without AFDPS needed inputs. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
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| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0007 | <Partial> |
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| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |

| | | | |
|---|---|---|---|
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0045 |
| Requirement | The SSN server shall generate Alert Reports that include data about the severity of the alert. The severity for each type of alert shall be configurable for INFORMATION or ALARM levels, according to the alert type and the location of the mobile. |
| Title | Alert severity |
| Status | <Validated> |
| Rationale | The classification of alerts allows the Controller to better understand the severity of the situation.<br>The configurability of each alert reported in this requirement is partially contradictory with others prescribing a fixed severity (e.g. REQ-12.03.02-TS-2002.0010 states that the stop-bar overrun is always in Alert. It is recommended to operational experts to clarify. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
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| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-GENL.0008 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0031 | <Partial> |
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| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0059 | <Partial> |
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| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0050 |
| Requirement | Whenever it detects a mobile or mobiles in a predefined alert situation, the SSN server shall create and broadcast alert reports with at least the following information:<br>• Alert report identifier<br>• Type of alert<br>• Alert severity level<br>• Time of alert<br>• Identity of target(s) in alert situation<br>    o Track number (if available)<br>    o Target ID (call-sign, SSR code, or registration) (if available) |
| Title | Alert report content |
| Status | <Validated> |

| | |
|---|---|
| Rationale | The alert report with right information is essential to correctly notify the Controller. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.02-DOD-6200.0003 | <Partial> |
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| <ALLOCATED  TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES  TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0070 |
| Requirement | The SSN server shall generate the Alert Report as long as the alert situation exists. |
| Title | Alert termination 1 |
| Status | <Validated> |
| Rationale | The alert reports shall be sent only for valid conflicting situations. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-GENL.0013 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED  TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2001.0080 |
| Requirement | The SSN server shall generate an Alert Termination Report when the alert situation ceases. |
| Title | Alert termination 2 |
| Status | <Validated> |
| Rationale | The alert reports shall be sent only for valid conflicting situations. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-02 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED  TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES  TO> | <Operational Focus Area> | OFA01.02.01 | N/A |

| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2001.0090 |
|---|---|
| Requirement | The SSN server shall have, in its internal database, airport layout and topology information, including reference points (holding positions, stop bars, RWY thresholds) and fixed obstacles. |
| Title | Airport layout |
| Status | <Validated> |
| Rationale | SSN needs to know airport topology to detect the conflicts |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0006 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0037 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.1.2 Runway Incursion Requirements

The requirements listed in this section do not directly come from operational requirements of P06.07.01, because they are considered as Baseline (previous of SESAR). Anyhow, project 12.3.2 prefers to include them for completeness of definition of SSN server.

This functional area, in fact, is considered mature enough to not be considered further investigated by the interested projects. The alerts generated considering the requirements of this section are based only on surveillance data, without any correlation with given clearances and movement plans.

The requirements are not traced to any SESAR operational requirement.

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0020 |
|---|---|
| Requirement | The SSN server shall trigger an alert (INFORMATION) if an aircraft is detected approaching to land and its expected time to reach the runway threshold is T1 (or less, T1 being configurable) and another mobile or obstacle is in the RPV. |
| Title | Arrival aircraft with traffic 1 |
| Status | <Validated> |
| Rationale | This situation can create a potential risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

| <ALLOCATED  TO> | <Functional block> | Aerodrome Safety Nets | N/A |
|---|---|---|---|

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0025 |
|---|---|
| Requirement | The SSN server shall terminate the alert related to arrival aircraft with traffic when the mobile leaves the RPV |
| Title | Arrival aircraft with traffic termination |
| Status | <Validated> |
| Rationale | The runway incursion alert ends when the runway is no more occupied |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED  TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0030 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if an aircraft is detected approaching to land and its expected time to reach the runway threshold is T2 (or less, T2 being configurable and T2<T1) and another mobile or obstacle is in the RPV. |
| Title | Arrival aircraft with traffic 2 |
| Status | <Validated> |
| Rationale | This situation can create a potential risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED  TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0040 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if an aircraft is detected taking off and another mobile is in the RPV, ahead of the taking-off aircraft. |
| Title | Departure aircraft with traffic |
| Status | <Validated> |
| Rationale | This situation can create a potential risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |

| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0045 |
|---|---|
| Requirement | The SSN server shall terminate the alert related to departure aircraft with traffic when the mobile leaves the RPV or it is behind the taking-off aircraft. |
| Title | Departure aircraft with traffic termination |
| Status | <Validated> |
| Rationale | The runway incursion alert ends when the runway is no more occupied |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0050 |
|---|---|
| Requirement | The SSN server shall trigger an alert (INFORMATION) if 2 mobiles approaching, or on, 2 different converging or intersecting runways have converging trajectories, that would bring them closer than D meters to each other within T1 seconds (D and T1 being configurable parameters). |
| Title | Arrival aircraft with converging traffic 1 |
| Status | <Validated> |
| Rationale | This situation can create a disturbance of traffic on ground or affect the safety with regard to the other traffic on the airport surface |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0055 |
|---|---|
| Requirement | The SSN server shall terminate the alert related to arrival aircraft with converging traffic when the trajectories of the two mobiles are no more converging |
| Title | Arrival aircraft with converging traffic termination |
| Status | <Validated> |
| Rationale | When the two mobiles are no more converging, the associated conflicting situation ends. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0060 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if 2 mobiles approaching, or on, 2 different converging or intersecting runways have converging trajectories, that would bring them closer than D meters to each other within T2 seconds (D and T2 being configurable parameters, and T2<T1). |
| Title | Arrival aircraft with converging traffic 2 |
| Status | <Validated> |
| Rationale | This situation can create a disturbance of traffic on ground or affect the safety with regard to the other traffic on the airport surface. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0070 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if an aircraft is detected landing, and an opposite direction approaching aircraft with expected time to reach the runway threshold is T (or less). |
| Title | Opposite direction arrival |
| Status | <Validated> |
| Rationale | This situation can affect the safety of the aircraft or with regard to the other traffic on the airport surface. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0075 |
|---|---|
| Requirement | The SSN server shall terminate the alert related to opposite direction arrival when the trajectories of the two mobiles are no more converging. |
| Title | Opposite direction arrival termination |
| Status | <Validated> |

| Rationale | The runway incursion alert ends when the runway is no more occupied |
|---|---|
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0090 |
|---|---|
| Requirement | The SSN server shall trigger an alert (INFORMATION) when an aircraft is detected approaching to a closed runway and its expected time to reach the runway threshold is T (or less) from the runway threshold. |
| Title | Closed Runway Incursion 1 |
| Status | <Validated> |
| Rationale | If an aircraft proceeds to a closed runway it can create a disturbance of traffic on ground or a possible risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0100 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if an aircraft is detected taking off on a closed runway. |
| Title | Closed Runway Incursion 2 |
| Status | <Validated> |
| Rationale | This situation can affect the safety with regard to the other traffic on the airport surface. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0105 |
|---|---|
| Requirement | The SSN server shall terminate the alert related to closed runway when the mobile is no more approaching or taking off or the status of the runway is |

| | |
|---|---|
| | "open". |
| Title | Closed Runway termination |
| Status | <Validated> |
| Rationale | The closed runway alert ends when the conditions are no more valid |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.1.3 Area Intrusion

The requirements listed in this section do not directly come from operational requirements of P06.07.01, because they are considered as Baseline (previous of SESAR). Anyhow, project 12.3.2 prefers to include them for completeness of definition of SSN server.

The requirements are not traced to any SESAR operational requirement.

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2003.0010 |
| Requirement | The SSN server shall trigger an alert if it detects penetration by any tracked target (any mobile) into an area defined as a Restricted Area. |
| Title | Monitoring of Restricted Areas |
| Status | <Validated> |
| Rationale | If a mobile enters a Restricted Area it may collide with an obstacle or disturb radio navigation aids. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2003.0015 |
| Requirement | The SSN server shall terminate the restricted area alert when the mobile leaves the area. |
| Title | Restricted Area termination |
| Status | <Validated> |
| Rationale | The alerts have to be terminated when the conditions are no more valid. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2003.0020 |
|---|---|
| Requirement | The SSN server shall permit to configure (via a configuration database) each Restricted Area with at least the following information:<br>• Geographical locations (defining the area size and shape) and the name of the Restricted Area<br>• Visibility criterion: LVP/non-LVP<br>• Restricted Area Alert severity: information or alarm |
| Title | Restricted Area configuration |
| Status | <Validated> |
| Rationale | The alerting rule needs to be adaptable according to prevailing conditions and local procedures. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2003.0030 |
|---|---|
| Requirement | The SSN server shall trigger an alert if it detects penetration by any tracked target (any mobile) that is not authorised to enter into an area defined as a Limited Access Area. Mobile types shall be checked against the allowed access criteria for the Limited Access Area. |
| Title | Monitoring of Limited Access Areas |
| Status | <Validated> |
| Rationale | If a mobile enters a Limited Access Area it may collide with an obstacle or disturb landing systems. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2003.0035 |
|---|---|
| Requirement | The SSN server shall terminate the limited area alert when the mobile leaves the area. |

| Title | Limited Area termination |
|---|---|
| Status | <Validated> |
| Rationale | The alerts have to be terminated when the conditions are no more valid. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2003.0040 |
|---|---|
| Requirement | The SSN server shall permit to configure (via a configuration database) each Limited Access Area with at least the following information:<br>• The geographical locations (defining the area size and shape) and the name of the Limited Access Area<br>• Visibility criterion: LVP/non-LVP<br>• Authorised mobile type(s)<br>• Authorised entry point(s)<br>• The Limited Access Area Alert severity: Stage 1 (INFORMATION) or Stage 2 (ALARM). |
| Title | Limited Access Area configuration |
| Status | <Validated> |
| Rationale | The alerting rule needs to be adaptable according to prevailing conditions and local procedures. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.1.4 Conformance Monitoring Requirements

[REQ]

| Identifier | REQ-12.03.02-TS-2002.0010 |
|---|---|
| Requirement | The SSN server shall trigger an alert (ALARM) if a mobile is detected crossing a red stop bar (wherever the location of the stop bar is). |
| Title | Red stop bar |
| Status | <Validated> |
| Rationale | If a mobile crosses a red stop bar, it can create a possible risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0012 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0041 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0010 |
|---|---|
| Requirement | The SSN server shall generate an alert if an aircraft is approaching to land on a runway and is less than D meters from the runway threshold without having received a Landing clearance (D being a configurable parameter). |
| Title | No Landing Clearance |
| Status | <Validated> |
| Rationale | Inform that an aircraft is landing without authorisation. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0010 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0052 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0020 |
|---|---|
| Requirement | The SSN server shall trigger an alert if an aircraft is moving from its stand without having received a Push-back clearance. <br> NOTE: This only applies for aircraft on stands that require push-back, otherwise REQ-12.03.02-TS-2004.0035 applies. |
| Title | No Push-back clearance |
| Status | <Validated> |
| Rationale | Inform that an aircraft is pushing back without authorisation. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0002 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0016 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0035 |
|---|---|
| Requirement | The SSN server shall trigger an alert if a mobile is moving inside a taxiway |

| | |
|---|---|
| | without having received a Taxi clearance. |
| Title | No Taxi clearance |
| Status | <Validated> |
| Rationale | Inform that a mobile is taxiing without authorisation.<br>The requirement in itself is considered validated, but the operational project 06.07.01 should clarify the behaviour in case of allowed movements inside a taxiway without taxi clearance (e.g. when the aircraft vacates the runway after landing). A possible solution is to configure several taxi areas of exclusion of "no taxi clearance" alert. In addition is not very clear whether the alert should terminate when the mobile stops moving or should continue to be raised. Operational experts should clarify it. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0003 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0017 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0021 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0023 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0054 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2004.0042 |
| Requirement | The SSN server shall trigger an alert (ALARM) if an aircraft is detected lining-up on a runway without having received a line-up clearance. |
| Title | No Line-up clearance |
| Status | <Validated> |
| Rationale | Inform that an aircraft is entering the Runway Protection Volume without authorisation.<br>The requirement in itself is considered validated. However it is ambiguous whether the alert should terminate when the mobile stops moving, or whether the alert should continue to be raised in this case. Operational experts should clarify it. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0038 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0049 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0008 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0006 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0039 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0044 |
|---|---|
| Requirement | The SSN server shall trigger an alert if a mobile is detected crossing a runway without having received a cross clearance. |
| Title | No Cross clearance |
| Status | <Validated> |
| Rationale | Inform that a mobile is entering the Runway Protection Volume without authorisation.<br>The requirement in itself is considered validated. However it is ambiguous whether the alert should terminate when the mobile stops moving, or whether the alert should continue to be raised in this case. Operational experts should clarify it. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0038 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0039 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0046 |
|---|---|
| Requirement | The SSN server shall trigger an alert if a vehicle is detected entering a RPV without having received an enter clearance. |
| Title | No Enter clearance |
| Status | <Validated> |
| Rationale | Inform that a mobile is entering the Runway Protection Volume without authorisation.<br>The requirement in itself is considered validated. However it is ambiguous whether the alert should terminate when the mobile stops moving, or whether the alert should continue to be raised in this case. Operational experts should clarify it. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0038 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0008 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0039 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0050 |
|---|---|
| Requirement | The SSN server shall generate an alert, if an aircraft is taking off without having received a Take-Off clearance. |
| Title | No Take-off Clearance |

| | |
|---|---|
| Status | <Validated> |
| Rationale | Inform that an aircraft is taking-off without authorisation. The requirement in itself is considered validated. However it is ambiguous whether the alert should terminate when the mobile stops moving, or whether the alert should continue to be raised in this case. Operational experts should clarify it. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0009 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0051 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2004.0060 |
| Requirement | The SSN server shall generate an alert if an aircraft is detected as approaching to land on a runway that is not the assigned one (the one contained in relevant flight plan), and is less T seconds from the runway threshold (T being a configurable parameter). |
| Title | Landing on wrong runway |
| Status | <Validated> |
| Rationale | Inform that an aircraft is aligned to land on the wrong runway. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0024 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0056 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2004.0070 |
| Requirement | The SSN server shall trigger an alert if an aircraft is cleared to line up but the aircraft is lining-up on a runway that differs from the assigned one. |
| Title | Lining-up on wrong runway |
| Status | <Validated> |
| Rationale | Inform that an aircraft is lining-up on a wrong runway. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |

| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0011 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0045 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0105 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a closed runway has been assigned to an aircraft and the aircraft has not yet entered the runway. |
| Title | Closed Runway Assigned |
| Status | <Validated> |
| Rationale | Inform that a closed runway is assigned to an aircraft. |
| | This requirement is considered "validated" but it could lead to a nuisance alert because if there is a planned change of runway direction at some point in the future, it should be quite normal for the new runway direction to already be assigned to some aircraft, even though it is still closed at the current time. It also quite normal that a runway is closed for a short time (e.g. for inspection or snow clearing) A possible solution could be to specify a time parameter so that the alert is only raised if the aircraft is less than x seconds (or distance parameter) from entering the RPV, to decrease nuisance alert. Operational experts should clarify the operational requirement. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0016 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0043 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0110 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a taxiway is closed after it has been assigned to an aircraft as part of its cleared route and the aircraft has not yet entered the taxiway. |
| Title | Closed Taxiway |
| Status | <Validated> |
| Rationale | Inform that a closed taxiway is assigned to an aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0015 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0120 |
|---|---|
| Requirement | The SSN server shall trigger an alert for an arriving aircraft, when there has been no "Contact indication", and the arriving aircraft is at less than D1 meters from threshold.<br>Note: D1 should be configurable, depending upon optimisation at the aerodrome. |
| Title | No Contact |
| Status | <Validated> |
| Rationale | Inform that an aircraft is about to land without having established contact with the Tower controller. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0005 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0125 |
|---|---|
| Requirement | The SSN server shall trigger an alert for a departure aircraft, when there has been no "transfer of control indication", and the departing aircraft is more than X NM from runway or more than a configurable altitude.<br>Note: X should be configurable, depending upon optimisation at the aerodrome. |
| Title | No transfer out |
| Status | <Validated> |
| Rationale | Inform the Tower Runway Controller that an aircraft has departed and has not received the instruction to change to the next frequency within a certain distance or altitude. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0028 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0130 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an excessive speed of an aircraft in taxi phase is detected (speed > X).<br>Note: X value shall be configurable. |

| Title | Excessive Taxi Speed |
|---|---|
| Status | <Validated> |
| Rationale | Inform that an aircraft is taxing too fast on a taxiway. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0017 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0024 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0145 |
|---|---|
| Requirement | The SSN server shall trigger an alert as soon as a mobile has deviated by x or more metres (configurable parameter) horizontally from its cleared taxi route. |
| Title | Taxi Route Deviation |
| Status | <Validated> |
| Rationale | Inform that a mobile is deviating from its cleared taxi route. If the mobile goes beyond its clearance limit, this alert will not be triggered. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0001 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0018 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0020 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0026 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0046 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0047 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0048 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0160 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile does not move after X seconds (configurable parameter), having received an instruction to push-back, taxi, line-up, cross, enter or take-off. |
| Title | Stationary after clearance |
| Status | <Validated> |
| Rationale | Inform that a mobile is stationary after having received an instruction to proceed. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0004 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0027 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0050 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0180 |
|---|---|
| Requirement | The SSN server shall trigger an Alert Report when a mobile that has vacated a runway has stopped within the runway protection volume for more than T seconds (parameter). |
| Title | Stationary in RPV alert |
| Status | <Validated> |
| Rationale | The Controller requires immediate awareness for a stationary situation in proximity of runway area. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0029 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0195 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft doesn't receive a take-off clearance after x seconds (parameter) having received the line-up clearance. |
| Title | Delayed take-off clearance |
| Status | <Validated> |
| Rationale | Remind the controller to giving the take-off clearance to an aircraft on the runway |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0071 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0200 |
|---|---|
| Requirement | The SSN server shall trigger an alert whenever the longitudinal separation between two aircraft on a TWY in LVC is less than X metres (parameter). |
| Title | TWY separation infringement in LVC |
| Status | <Deleted> |
| Rationale | Inform that two aircraft are too close longitudinally during taxiing operations in LVC. This requirement is considered as "deleted" because the last SPR from OFA01.02.01 does not include this kind of requirement. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0025 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0230 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an unsuitable taxiway has been assigned to an aircraft as part of its cleared route and the aircraft has not yet entered the taxiway. |
| Title | Unsuitable Taxiway on Taxi route |
| Status | <Validated> |
| Rationale | Inform the controller that his/her clearance is not compliant with the aircraft |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0013 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0028 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2004.0240 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an unsuitable runway has been assigned to an aircraft and the aircraft has not yet entered the runway. |
| Title | Unsuitable Runway Assigned |
| Status | <Validated> |
| Rationale | Inform the controller that his/her clearance is not compliant with the aircraft |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |

| | | | |
|---|---|---|---|
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CMAC.0014 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0057 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.1.5 Conflicting ATC Clearances Requirements

Note: In the requirements for Conflicting ATC Clearances (CATC) where there is reference to Line Up this refers to a direct Line Up instruction and does not take into account Conditional Line Up inputs.

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2005.0010 |
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to line up on the same runway on the opposite threshold. |
| Title | "Line-Up vs. Line-Up" opposite threshold |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to line up, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0002 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2005.0020 |
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to line up on the same runway and their holding points are opposing. |
| Title | "Line-Up vs. Line-Up" opposing holds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to line-up, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0003 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0030 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to line up on the same runway and their holding points are the same or neighbouring, and multiple line ups are not permitted. |
| Title | "Line-Up vs. Line-Up" same or neighbouring hold |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to line-up, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0001 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0040 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another mobile is cleared to cross the same runway and holding points are opposite each other. |
| Title | "Line-Up vs. Cross" opposing holds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to cross a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0004 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0050 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another mobile is cleared to enter the same runway and holding points are opposite each other. |
| Title | "Line-Up vs. Enter" opposing holds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |

| Validation Method | |
|---|---|
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0005 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0055 |
|---|---|
| Requirement | The SSN server shall stop the "Line-up vs. enter" at opposite holding points alert when the mobile having received the enter clearance enters the runway and goes in front of the aircraft. |
| Title | "Line-up vs. enter" opposite holding points end of conflict |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0005 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0060 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to take-off and the cleared runway entry point for the aircraft receiving the line-up clearance is in front of the aircraft receiving the take-off clearance on the same runway. |
| Title | "Line-Up vs. Take-Off" Take-off behind Line-up |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0006 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0070 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to take-off from the opposite threshold of the same runway. |
| Title | "Line-Up vs. Take-Off" opposite threshold |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0007 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0080 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to land, and the planned runway entry point for the aircraft receiving the Line-Up clearance is in front of the aircraft receiving the landing clearance on the same runway. |
| Title | "Line-Up vs. Land" at same threshold |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0008 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0090 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to line up and another aircraft is cleared to land at the opposite threshold of same runway. |
| Title | "Line-Up vs. Land" opposite thresholds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0009 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0105 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to cross a runway and another mobile is cleared to cross the same runway and their holding points are opposite each other. <br> Note: the alert shall not be triggered if the two mobiles are both vehicles |
| Title | "Cross vs. Cross" opposing holds |
| Status | <Validated> |
| Rationale | If a mobile is cleared to cross a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile (at least one of the two shall be an aircraft). |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0010 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0110 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to enter a runway and another mobile is cleared to cross the same runway and their holding points are opposite each other. <br> Note: Alarm shall not trigger if the first mobile entered the runway and the second one can cross behind the first one. |
| Title | "Enter vs. Cross" opposing holds |
| Status | <Validated> |
| Rationale | If a mobile is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0011 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0115 |
|---|---|
| Requirement | The SSN server shall stop the "Enter vs. cross" at opposite holding points alert when the mobile having received the enter clearance enters the runway and goes in front of the other aircraft. |
| Title | "Enter vs. cross" at opposite holding point end of conflict |
| Status | <Validated> |
| Rationale | If a mobile is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0011 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0120 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to enter a runway and another mobile is cleared to enter the same runway and their holding points are opposite each other. |
| Title | "Enter vs. Enter" opposing holds |
| Status | <Validated> |
| Rationale | If a mobile is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with another mobile. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0012 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0135 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to cross a runway and another aircraft is cleared to take-off on the same runway and it is behind of the planned entry point for the crossing mobile. |
| Title | "Cross vs. Take-off" same runway |
| Status | <Validated> |
| Rationale | If a mobile is cleared to cross on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |

| Verification Method | <Test> |
|---|---|

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0013 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0145 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to enter a runway and another aircraft is cleared for take-off on the same runway behind the planned entry point for the entering mobile. |
| Title | "Enter vs. Take-off" on same runway |
| Status | <Validated> |
| Rationale | If a mobile is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with an aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0014 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0155 |
|---|---|
| Requirement | The SSN server shall trigger an alert when a mobile is cleared to cross and another aircraft is cleared to land and it has not landed yet or has landed and its speed is greater than a configurable threshold and the distance between the two mobiles is less than a configurable threshold. |
| Title | "Cross vs. Land" on same runway |
| Status | <Validated> |
| Rationale | If a mobile is cleared to cross on a runway, the SSN server should detect if this clearance can create a risk of collision with an aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0015 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0165 |
|---|---|
| Requirement | The SSN server shall trigger and alert when a mobile is cleared to enter an another aircraft is cleared to land and it has not landed yet or has landed and its speed is greater than a configurable threshold and the distance between the two mobiles is less than a configurable threshold |
| Title | "Enter vs. Land" on same runway |
| Status | <Validated> |
| Rationale | If a mobile is cleared to enter on a runway, the SSN server should detect if this clearance can create a risk of collision with an aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0016 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0170 |
|---|---|
| Requirement | The SSN server shall trigger an alert when two aircraft are cleared to take off on the same runway, and the planned runway entry point for the second aircraft (or its position if it is already on the runway) is in front of the first aircraft. |
| Title | "Take –off vs. Take-off" same runway |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take off on a runway, the SSN server should detect if this clearance can create a risk of collision with an aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0017 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0180 |
|---|---|
| Requirement | The SSN server shall trigger an alert when two aircraft are cleared to take-off on converging runways and their trajectories are converging. |
| Title | "Take-off vs. Take-off" Converging runways and converging trajectories |
| Status | <In Progress> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. The requirement is considered as "in progress" because it was not subject of any validation, and the related OSED requirement is still "in progress". |
| Category | <Functional> |

| Validation Method | |
|---|---|
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0018 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0190 |
|---|---|
| Requirement | The SSN server shall trigger an alert when two aircraft are cleared to take-off on intersecting runways and their trajectories are converging. |
| Title | "Take-off vs. Take-off" Intersecting runways and converging trajectories |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0019 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0200 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to take-off on a runway and another aircraft is cleared to take-off on the same runway but on opposite thresholds. |
| Title | "Take-off vs. Take-off" opposite thresholds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0020 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0212 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared for take-off and another aircraft is cleared to land on the same runway. |
| Title | "Land vs. Take-off" on same runway |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0021 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0215 |
|---|---|
| Requirement | The SSN server shall stop "Take-off vs Land" on same runway alert when the aircraft taking off has reached a configurable position and its speed is greater than a configurable threshold. |
| Title | "Land vs. Take-off" on same runway end of conflict |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0021 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0056 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0220 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to take-off and another aircraft is cleared to land on the same runway at the opposite threshold. |
| Title | "Take-off vs. Land" at opposite thresholds |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0023 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0232 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared for take-off on a runway and another aircraft is cleared to land on an intersecting runway and their ground trajectories are converging. |
| Title | "Take-off vs. Land" on intersecting runways |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0022 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0057 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0235 |
|---|---|
| Requirement | The SSN server shall stop "Take-off vs Land" on intersecting runway when the aircraft having received the clearance first has reached a configurable position and its speed is greater than a configurable threshold. |
| Title | "Take-off vs. Land" on intersecting runways |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0022 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0242 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared for take-off |

| | |
|---|---|
| | and another aircraft is cleared to land on a converging runway, with the air trajectories of the two aircrafts are converging and the landing aircraft has started the go around procedure. |
| Title | "Take-off vs. land" on converging runways |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0055 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0245 |
|---|---|
| Requirement | The SSN server shall stop "Take-off vs Land" on converging runways when the "taking off" aircraft has reached a configurable position and its speed is greater than a configurable threshold. |
| Title | "Take-off vs. land" on converging runways end of conflict |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0055 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0058 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0255 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to land and another aircraft is cleared to take-off on a different but closely spaced parallel runway not independent. |
| Title | "Take-off vs. Land" on closely spaced runways |
| Status | <In Progress> |
| Rationale | If an aircraft is cleared to take-off on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. The requirement is considered as "in progress" because it was not subject of any validation, and the related OSED requirement is still "in progress". |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0059 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0260 |
|---|---|
| Requirement | The SSN server shall trigger an alert when two aircraft are cleared to land on the same runway. |
| Title | "Land vs. Land" same runway |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. The requirement is considered as "validated" but this conflict is not applicable on all the airports(some airports accept to have several aircraft cleared to land on the same runway) |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0024 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0272 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to land and another aircraft is cleared to land on an intersecting runway and the two trajectories on the ground are converging. |
| Title | "Land vs. land" on intersecting runway |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0025 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0275 |
|---|---|
| Requirement | The SSN server shall trigger an alert when an aircraft is cleared to land and another aircraft is cleared to land on a converging runway and the two air trajectories are converging each other in case of go around. |
| Title | "Land vs. land" on converging runway |
| Status | <In Progress> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. The requirement is considered as "in progress" because it was not subject of any validation, and the related OSED is still considered "in progress". |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0060 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2005.0280 |
|---|---|
| Requirement | The SSN server shall trigger an alert when two aircraft are cleared to land on the same runway at opposite thresholds. |
| Title | "Land versus Land" opposite threshold |
| Status | <Validated> |
| Rationale | If an aircraft is cleared to land on a runway, the SSN server should detect if this clearance can create a risk of collision between aircraft. |
| Category | <Functional> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-OSED-CATC.0061 | <Full> |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.2 Adaptability

Adaptability requirements are stated within the functional requirements in section 3.1.

They are REQ-12.03.02-TS-2001.0090, REQ-12.03.02-TS-2003.0020, REQ-12.03.02-TS-2003.0040 and all the functional requirements with specified a configurable threshold have a part of adaptability.

## 3.3 Performance Characteristics

The requirements in this section are the only performance requirements available at the moment from P06.07.01. Since they can only be verified by extensive long-term testing of a real implementation in a live aerodrome environment, those requirements were neither verified nor validated.

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0010 |
|---|---|
| Requirement | The SSN should detect Runway Incursion conflicts with a probability of false alert less than 10E-3 per movement. |
| Title | PfA of Runway Incursions |
| Status | <In Progress> |
| Rationale | This requirement comes from previous study and it is considered as baseline. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a long time testing. |
| Category | <Performance> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0020 |
|---|---|
| Requirement | The SSN should detect Conflicting ATC Clearances with a probability of false alert less than 10E-4 per movement. |
| Title | PfA of Conflicting ATC Clearances |
| Status | <In Progress> |
| Rationale | The PfA is defined to avoid hazardous situations. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a long time testing. |
| Category | <Performance> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0030 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0031 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0032 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0039 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0040 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0041 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0042 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0025 |
|---|---|
| Requirement | The SSN should detect Conformance Monitoring with a probability of false alert less than 5x10E-5 per movement. |
| Title | PfA of Conformance Monitoring |
| Status | <In Progress> |
| Rationale | The PfA is defined to avoid hazardous situations. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of |

| | exercise, but in a long time testing. |
|---|---|
| Category | \<Performance> |
| Validation Method | |
| Verification Method | \<Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| \<SATISFIES> | \<Enabler> | AERODROME-ATC-07 | \<Full> |
| \<SATISFIES> | \<ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0069 | \<Full> |
| \<SATISFIES> | \<ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0070 | \<Full> |
| \<ALLOCATED TO> | \<Functional block> | Conformance Monitoring | N/A |
| \<APPLIES TO> | \<Operational Focus Area> | OFA01.02.01 | N/A |
| \<ALLOCATED TO> | \<Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0035 |
|---|---|
| Requirement | The SSN server shall detect a Conflicting ATC Clearances situation with a probability of detection of 99,9% per movement. |
| Title | PD of Conflicting ATC Clearances |
| Status | \<In Progress> |
| Rationale | Almost all the conflicts have to be detected to avoid hazardous situations. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a long time testing. |
| Category | \<Performance> |
| Validation Method | |
| Verification Method | \<Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| \<SATISFIES> | \<Enabler> | AERODROME-ATC-06 | \<Full> |
| \<SATISFIES> | \<ATMS Requirement> | REQ-06.07.01-SPR-CATC.0019 | \<Full> |
| \<ALLOCATED_TO> | \<Functional block> | Conformance Monitoring | N/A |
| \<APPLIES TO> | \<Operational Focus Area> | OFA01.02.01 | N/A |
| \<ALLOCATED_TO> | \<Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0040 |
|---|---|
| Requirement | The SSN shall provide alerts no more than 1 second after the reception of the conflicting clearances. |
| Title | Conflicting ATC clearances detection time |
| Status | \<Validated> |
| Rationale | It is crucial that the SSN server immediately detects any conflicting ATC clearances. |
| Category | \<Performance> |
| Validation Method | |
| Verification Method | \<Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| \<SATISFIES> | \<Enabler> | AERODROME-ATC-06 | \<Full> |
| \<SATISFIES> | \<ATMS Requirement> | REQ-06.07.01-SPR-CATC.0010 | \<Full> |
| \<ALLOCATED TO> | \<Functional block> | Aerodrome Safety Nets | N/A |
| \<APPLIES TO> | \<Operational Focus Area> | OFA01.02.01 | N/A |
| \<ALLOCATED_TO> | \<Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0050 |
|---|---|
| Requirement | The probability of an undetected loss of the SSN server shall not be greater than 10-4 per event. |
| Title | Detection probability of system loss |
| Status | <In Progress> |
| Rationale | To avoid hazardous situation. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a long time testing. |
| Category | <Performance> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0063 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0060 |
|---|---|
| Requirement | The probability of a partial alert detection with missing information due to SSN server shall not be greater than 10-4 per event. |
| Title | Detection probability of system partial loss |
| Status | <In Progress> |
| Rationale | To avoid hazardous situation. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a long time testing. |
| Category | <Performance> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0065 | <Full> |
| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2007.0070 |
|---|---|
| Requirement | The probability of a partial alert detection with incorrect information due to SSN server shall not be greater than 10-4 per event. |
| Title | Detection probability of partial system incorrect information |
| Status | <In Progress> |
| Rationale | To avoid hazardous situation. The requirement has considered as "in progress" because it cannot be validated in a 1-2 weeks of exercise, but in a |

| | |
|---|---|
| | long time testing. |
| Category | <Performance> |
| Validation Method | |
| Verification Method | <Test> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0067 | <Full> |
| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

## 3.4 Safety & Security

N.A.

## 3.5 Maintainability

N.A.

## 3.6 Reliability

N.A.

## 3.7 Functional block Internal Data Requirements

N.A.

## 3.8 Design and Construction Constraints

N.A.

## 3.9 Functional block Interface Requirements

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0015 |
|---|---|
| Requirement | The SSN server shall receive target reports related to both aircraft and cooperative vehicles within the A-SMGCS Coverage Volume from Aerodrome Surveillance. |
| Title | Interface with Surveillance |
| Status | <Validated> |
| Rationale | Without target report, the SSN Server cannot perform its job. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0005 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0006 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0016 | <Full> |

| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
|---|---|---|---|
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0025 |
|---|---|
| Requirement | The SSN server shall receive Airport operational data (Airport Configuration, LVP operations…) from the Operational Supervision functional block. |
| Title | Operational data interface |
| Status | <Validated> |
| Rationale | The SSN Server need of airport operational information to set the alerting rules. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0002 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0040 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0030 |
|---|---|
| Requirement | The SSN server shall continuously transmit a regular, up-to-date status report to Technical Supervision functional block. |
| Title | Interface with Technical Supervision 1 |
| Status | <In Progress> |
| Rationale | Technical Supervision needs of system status of SSN Server, as well as other Airport systems, to fully monitor Aerodrome ATC system. This requirement is considered as "in progress" because the interface needs to be better detailed: how often is the check, what information, the impact of surveillance, etc. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0007 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0008 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0035 |
|---|---|
| Requirement | The SSN server shall be able to receive technical commands (Start, Stop…) from Technical Supervision functional block. |
| Title | Interface with Technical Supervision 2 |
| Status | <In Progress> |
| Rationale | The SSN Server receives technical commands from Technical Supervision. This requirement is considered as "in progress" because it was not subject of any validation, being a function not operationally relevant. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0007 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0008 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0045 |
|---|---|
| Requirement | The SSN server shall receive the flight plans data, the information related to the given clearances, the assigned runways and the taxi routes from the Aerodrome Flight Data Processing functional block. |
| Title | Reception of flight plans and related clearances from A-FDP FB. |
| Status | <Validated> |
| Rationale | The given clearances, taxi routes and assigned runways are needed inputs for SSN server to perform its job. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0003 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0004 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0023 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0004 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0015 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0022 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0036 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0044 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0053 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0055 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0055 |
| --- | --- |
| Requirement | The SSN server shall receive the vehicle movement plans and the given clearances from Aerodrome Flight Data Processing functional block. |
| Title | Reception of vehicle plans and related clearances from A-FDP FB. |
| Status | <Validated> |
| Rationale | The given clearances and routes for vehicles are needed inputs for SSN server to perform its job. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
| --- | --- | --- | --- |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0014 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0015 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0023 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0034 | <Full> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0065 |
| --- | --- |
| Requirement | The SSN server shall broadcast the alert reports every x seconds (x configuration parameter) to all defined clients. |
| Title | Sending of alert reports |
| Status | <Validated> |
| Rationale | The alert reports are received by all interested clients for their scope. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
| --- | --- | --- | --- |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-GENL.0002 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0007 | <Partial> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CATC.0017 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| Identifier | REQ-12.03.02-TS-2009.0075 |
| --- | --- |
| Requirement | The SSN server shall receive the status and suitability of Runways and Taxiways from Runway & Taxiway Usage Management functional block. |
| Title | Status and Usage of Runways and Taxiways interface |

| | |
|---|---|
| Status | <Validated> |
| Rationale | The status of runways and taxiways on the airport are given by the "Runway and Taxiway Usage Management". |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0005 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0019 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0043 | <Full> |
| <ALLOCATED  TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES  TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED  TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2009.0080 |
| Requirement | The SSN server shall continuously transmit the Data for Recording (Alert reports and status reports) to the Support Functions functional block. |
| Title | Interface with Support Functions |
| Status | <In Progress> |
| Rationale | The SSN Server sends data for recording to the Support Functions. This requirement is considered as "in progress" because it was not subject of any validation, being a function not operationally relevant.. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-02 | <Full> |
| <SATISFIES> | <Enabler> | AERODROME-ATC-03 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.02-DOD-6200.0003 | <Partial> |
| <ALLOCATED_TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED  TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

[REQ]

| | |
|---|---|
| Identifier | REQ-12.03.02-TS-2009.0090 |
| Requirement | The SSN server shall receive the flight status information for each flight from the Airport FDPS |
| Title | Flight Status input |
| Status | <Validated> |
| Rationale | The SSN Server needs of flight status from A-FDPS. |
| Category | <Interface> |
| Validation Method | |
| Verification Method | <Review of Design> |

[REQ Trace]

| Relationship | Linked Element Type | Identifier | Compliance |
|---|---|---|---|

| <SATISFIES> | <Enabler> | AERODROME-ATC-06 | <Full> |
|---|---|---|---|
| <SATISFIES> | <Enabler> | AERODROME-ATC-07 | <Full> |
| <SATISFIES> | <ATMS Requirement> | REQ-06.07.01-SPR-CMAC.0003 | <Partial> |
| <ALLOCATED TO> | <Functional block> | Aerodrome Safety Nets | N/A |
| <ALLOCATED_TO> | <Functional block> | Conformance Monitoring | N/A |
| <APPLIES_TO> | <Operational Focus Area> | OFA01.02.01 | N/A |
| <ALLOCATED_TO> | <Project> | 12.03.02 | N/A |

# 4  Assumptions

The operational project 06.07.01 was composed of several Work Areas. Two of them correspond to functionalities in the scope of 12.03.02:

- Conformance Monitoring Alerts for Controllers

- Conflicting ATC Clearances

The other functionalities in 12.03.02's scope (Runway Incursions, Area Intrusions) were standard A-SMGCS RMCA functions and therefore not directly addressed by 06.07.01, or other SESAR projects, but they were assumed to be present in the deployment baseline. Therefore, the following documents have been used as input to specify the SSN server:

- EUROCONTROL – Functional Requirements for A-SMGCS Implementation Level 2, Ed. 2.1, 30/06/2010

- EMMA2 A-SMGCS Services, Procedures, and Operational Requirements (SPOR) "A Preliminary Concept and Framework for Validation Activities in EMMA2". 2-D111_SPOR_V1.0.doc (02/12/2008).

- EMMA2 A-SMGCS Technical Requirements – Ground. 2-D112a_ATR_GND_V1.0.pdf

All the specifications coming from these documents have been analysed. The purpose of this analysis has been a set of operational requirements in order to produce the technical specifications that belong to the scope of this project.

About the 06.07.01 available documentation ([7] and [8]), several requirements were not considered, due to reasons below (the requirements that have impact on the HMI are reported in Appendix A.

| Requirement ID | Requirement Title | Reason |
|---|---|---|
| REQ-06.07.01-OSED-GENL.0001 | Replay of Alert | The coverage of this requirement is demanded to Support Function. |
| REQ-06.07.01-OSED-CMAC.0025 | Non conformance to ATC instruction or procedure | This operational requirement is too generic, and there are others more specific on the same item. |
| REQ-06.07.01-SPR-GENL.0001 | Replay of Alerts | The coverage of this requirement is demanded to Support Function. |
| REQ-06.07.01-SPR-CATC.0011 | Solving the runway conflict | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0020 | Accuracy of A-SMGCS | This requirement is for Surveillance |
| REQ-06.07.01-SPR-CATC.0024 | Acceptation of conflicting clearances without runway conflict | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0027 | Clearance Correction | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0028 | Clearance Cancellation | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0029 | Accepting ATC clearances | This requirement is for human behaviour |

| | | |
|---|---|---|
| REQ-06.07.01-SPR-CATC.0033 | Comparison given ATC clearances provided to aircraft or vehicle | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0036 | Entering Wrong Clearance | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0037 | No Entering a clearance | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0038 | Entering a clearance too late | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0043 | Not handle/interpret alarm by accepting | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CATC.0044 | Not handle/interpret alarm by cancelling | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0010 | Provision of training | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0011 | Visual scan of non-conformance | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0014 | Timely input of given taxi clearances | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0032 | Revert to taxiway-related standard practices. | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0032 | Timely input of given runway clearances | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0061 | Revert to runway-related standard practices | This requirement is for human behaviour |
| REQ-06.07.01-SPR-CMAC.0062 | Corrupted/loss data probability | This requirement does not deal with SSN, but other systems |
| REQ-06.07.01-SPR-CMAC.0064 | Detection probability of loss of data input. | This requirement does not deal with SSN, but other systems |
| REQ-06.07.01-SPR-CMAC.0066 | Detection probability of partial loss of data input | This requirement does not deal with SSN, but other systems |
| REQ-06.07.01-SPR-CMAC.0068 | Probability of inappropriate controller reaction | This requirement is for human behaviour |

**Table 2: P06.07.01 not considered requirements**

# 5   References

**[1]**  Template Toolbox 03.00.00
https://extranet.sesarju.eu/Programme%20Library/SESAR%20Template%20Toolbox.dot

**[2]**  Requirements and V&V Guidelines 03.00.00
https://extranet.sesarju.eu/Programme%20Library/Requirements%20and%20VV%20Guidelines.doc

**[3]**  Templates and Toolbox User Manual 03.00.00
https://extranet.sesarju.eu/Programme%20Library/Templates%20and%20Toolbox%20User%20Manual.doc

**[4]**  EUROCONTROL ATM Lexicon
https://extranet.eurocontrol.int/http://atmlexicon.eurocontrol.int/en/index.php/SESAR

**[5]**  12.03.02-D35 Phase3 - System specification - Report, Edition 00.01.00, 14/11/2014

**[6]**  12.03.02-D51 Phase3 – Consolidated Verification Report, Edition 00.01.00, 03/06/2016

**[7]**  06.07.01-D29 SPR for Conflicting ATC Clearances and Conformance Monitoring for Controllers, version 00.01.00, 17/04/2014

**[8]**  06.07.01-D32 Interim (Final) OSED for Conflicting ATC Clearance and Conformance Monitoring for Controllers, version 00.00.04, 15/09/2014

**[9]**  06.07.01-D07 Operational Service and Environment Definition (OSED) for RWSL, Edition 00.01.00, 19/03/2012

**[10]**EUROCAE ED-87B Minimum Aviation System Performance Specification for A-SMGCS, with Amendment 1, November 2008

**[11]**EUROCAE ED-87C Minimum Aviation System Performance Specification for A-SMGCS, January 2009

**[12]**EUROCONTROL – Functional Requirements for A-SMGCS Implementation Level 2, Ed. 2.1, 30/06/2010

**[13]**EMMA2 A-SMGCS Services, Procedures, and Operational Requirements (SPOR) "A Preliminary Concept and Framework for Validation Activities in EMMA2". 2-D111_SPOR_V1.0.doc (02/12/2008).

**[14]**EMMA2 A-SMGCS Technical Requirements – Ground. 2-D112a_ATR_GND_V1.0.pdf

**[15]**12.01.07 – D30 SESAR 1 Airport Technical Architecture Description, version 00.02.00, 17/06/2016

**[16]**ICAO – Doc 9830 AN/452 – Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual

**[17]**EUROCONTROL (2009) ESARR 2 Reporting and Assessment of Safety Occurrences in ATM

**[18]**WPB.01 Integrated Roadmap Dataset 15 Release Note, D83, Edition 00.01.00, 21/12/2015

## 5.1  Use of copyright / patent material /classified material

N.A.

# Appendix A   Operational Requirements for HMI

This appendix includes all the operational requirements related to HMI to be considered by project 12.05.04

| Requirement ID | Requirement Title | Requirement Text |
|---|---|---|
| REQ-06.07.01-OSED-GENL.0002 | Display of CATC, CMAC and RIMS alerts | The Tower controller shall receive CATC and CMAC alerts together with RIMS alerts |
| REQ-06.07.01-OSED-GENL.0003 | Priority of CATC, CMAC and RIMS alerts | The Tower controller shall receive RIMS alerts on the HMI with a higher priority than CATC and CMAC alerts |
| REQ-06.07.01-OSED-GENL.0004 | Display of multiple alerts on HMI | The Tower controller shall have a means to see multiple alerts displayed on the HMI for either one mobile or more than one mobile within his/her AOR. |
| REQ-06.07.01-OSED-GENL.0005 | Display of alerts on the mobile/s concerned | The Tower controller shall have a means to see an alert on the HMI associated with the mobile position and identification |
| REQ-06.07.01-OSED-GENL.0006 | Alert Window | The Tower controller / supervisor shall have the means to see all active alerts via a dedicated alert window. |
| REQ-06.07.01-OSED-GENL.0007 | Alert on mobiles planned to enter an AOR | The Tower controller shall be able to see alerts on mobiles that are planned to enter his/her AOR.  The alert may be shown as soon as it is triggered or within a certain distance or time before the AOR (local implementation rule) |
| REQ-06.07.01-OSED-GENL.0009 | Audio Alert associated to a detected ALARM | The Tower controller shall receive an audio warning when the ATC system detects an ALARM alert. The type of audio warning and length of time it sounds for are matters of local implementation but it is recommended that the warning is different to other audio sounds in use in the Tower. |
| REQ-06.07.01-OSED-GENL.0010 | A-SMGCS – ALARM alert colour | The Tower Runway, Ground or Apron Controller shall receive an ALARM alert on the HMI with an "ALARM colour" (recommendation Red). |
| REQ-06.07.01-OSED-GENL.0011 | A-SMGCS – INFORMATION alert colour | The Tower Runway, Ground or Apron Controller shall receive an INFORMATION alert on the HMI with an "INFORMATION colour" (recommendation Yellow) |
| REQ-06.07.01-OSED-GENL.0012 | De-activation of CATC and CMAC alerts | The Tower Supervisor or Tower controller shall be able to deactivate the detection (display) of CATC and CMAC alerts |
| REQ-06.07.01- | A-SMGCS – Suppression of | The Tower controller may have a means via the HMI to toggle between displaying or suppressing an INFORMATION alert message that is displayed on the radar/track label |

| OSED-GENL.0014 | an INFORMATION alert | and EFS (suppression will be independent of other CWPs). (Note: When suppressed the details of the alert shall still be shown in the alert window). |
|---|---|---|
| REQ-06.07.01-OSED-GENL.0015 | A-SMGCS – Suppression of the ALARM Buzzer | The Tower controller shall have a means via the HMI to cancel an ALARM alert audio buzzer that has been triggered. All details of the alert remain in the alert window and mobile labels until the situation has been resolved. Note: If a different ALARM is triggered after the buzzer has been turned off then the buzzer will be reactivated |
| REQ-06.07.01-OSED-GENL.0016 | Alert on mobiles having left an AOR but still on frequency | The Tower controller shall be able to see alerts on mobiles that have left his/her AOR but are still on his/her frequency. |
| REQ-06.07.01-OSED-GENL.0017 | Alert Window for Supervisor | The Supervisor shall have the means to see all active alerts via a dedicated alert window. |
| REQ-06.07.01-OSED-CATC.0026 | Line-Up clearance Input | The Tower Runway Controller shall be able to input Line-Up clearance in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0027 | Conditional Line-Up clearance Input | The Tower Runway Controller shall be able to input Conditional Line-Up clearance together with the conditional aircraft in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0028 | Take-Off clearance Input | The Tower Runway Controller shall be able to input Take-Off clearance in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0029 | Land clearance Input | The Tower Runway Controller shall be able to input a Cleared to Land clearance in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0030 | Cross clearance Input | The Tower Runway Controller shall be able to input a Cross clearance in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0031 | Enter clearance Input | The Tower Runway Controller shall be able to input an Enter clearance in the ATC system via the HMI. |
| REQ-06.07.01-OSED-CATC.0052 | Display of CATC on the Tower Runway Controller HMI | The Tower Runway Controller shall be able to see on his HMI the conflicting ATC clearances and the callsigns of mobiles involved |
| REQ-06.07.01-OSED-CATC.0062 | Indicator for a potential CATC on the Tower Runway Controller HMI | The Tower Runway Controller shall be able to see an indicator next to a clearance button that signifies that if that specific clearance is input it will trigger a CATC alert |
| REQ-06.07.01-OSED- | Confirmation for a potential CATC on the Tower | The Tower Runway Controller may be asked to confirm via the HMI that if that specific clearance is input it will trigger a CATC alert |

| CATC.0063 | Runway Controller HMI | |
|---|---|---|
| REQ-06.07.01-OSED-CMAC.0023 | A-SMGCS – Non-Conformance Messages on the Controller HMI | For every non-conformance to ATC procedure or instruction detected by the A-SMGCS, the Tower controller shall receive an alert message indicating the mobile(s) involved and the type of non-conformance (according to local procedures). |
| REQ-06.07.01-OSED-CMAC.0039 | A-SMGCS – Text on controller HMI for Non Conformance Alerts in radar label | The Tower controller shall have a means via the text displayed on the HMI to identify the type of non-Conformance detected by the system.<br>The text should be clear and unambiguous and may be one of the two possibilities presented hereunder. Other options may be defined based on local implementation preferences.<br><br>*(see table below)* |

| Conformance Monitoring alerts | Text 1 | Text 2 |
|---|---|---|
| Route deviation alert | ROUTE DEV | ROUTE DEV |
| No pushback approval | NO CLEARANCE | NO PUSH CLR |
| No taxi approval | NO CLEARANCE | NO TAXI CLR |
| Stationary (outside RPA) | STATIONARY | STATIONARY |
| Stationary (inside RPA) | STATIONARY | STATIONARY RPA |
| No contact | NO CONTACT | NO CONTACT |
| No transfer | NO TRANSFER | TRANSFER? |
| No line-up clearance | RWY INCURSION | NO LUP CLR |
| No crossing clearance | RWY INCURSION | NO CROSS CLR |
| No enter clearance | RWY INCURSION | NO ENTER CLR |
| No take-off clearance | NO CLEARANCE | NO TOF CLR |
| No landing clearance | NO CLEARANCE | NO LND CLR |
| Landing on wrong runway | WRONG RWY | LND WRONG RWY? |
| Red stop bar crossed (intermediate HP) | NO CLEARANCE | RED STOP BAR CROSSED |
| Red stop bar crossed (runway HP) | RWY INCURSION | NO LUP CLR |
| Lining up on wrong runway | WRONG RWY | LUP WRONG RWY? |
| Runway incursion | RWY INCURSION | RWY INCURSION |
| Taxiway type | TWY TYPE | TWY TYPE |
| Runway type | RWY TYPE | RWY TYPE |
| Taxiway closed | TWY CLOSED | TWY CLOSED |
| Runway closed | RWY CLOSED | RWY CLOSED |
| High speed | HIGH SPEED | HIGH SPEED |

| REQ-06.07.01-OSED-CMAC.0040 | A-SMGCS – Priorities of Alert text on controller HMI for Non Conformance Alerts in radar label | When several alerts are detected for the same mobile, the Tower controller shall be presented, in the mobile radar label on the HMI, with the text of the alert having the highest priority.<br>The priorities may be defined as presented hereunder. Other options may be defined based on local implementation preferences.<br><br>Priority 1 is higher than priority 2 etc.; |

|  |  | Alerting situations | Proposed Priority of Text in radar label |
|---|---|---|---|
|  |  | RIMS ALARM | 1 |
|  |  | RIMS INFORMATION | 2 |
|  |  | No take-off clearance | 3 |
|  |  | Runway incursion | 4 |
|  |  | Runway closed Alarm | 5 |
|  |  | Runway or taxiway type (runway type) | 6 |
|  |  | Stationary (inside RPA) | 7 |
|  |  | No landing clearance Alarm | 8 |
|  |  | Landing on wrong runway | 9 |
|  |  | Lining up on wrong runway | 10 |
|  |  | Route deviation Alarm | 11 |
|  |  | Red stop bar crossed (intermediate HP) | 12 |
|  |  | Runway or taxiway type (taxiway type) | 13 |
|  |  | Taxiway closed Alarm | 14 |
|  |  | High speed Alarm | 15 |
|  |  | Runway closed Information | 16 |
|  |  | Runway or taxiway type (runway type) Alarm | 17 |
|  |  | No landing clearance Information | 18 |
|  |  | No transfer | 19 |
|  |  | No contact | 20 |
|  |  | Route deviation Information | 21 |
|  |  | Runway or taxiway type (taxiway type) Information | 22 |
|  |  | Taxiway closed Information | 23 |
|  |  | Stationary (outside RPA) | 24 |
|  |  | High speed Information | 25 |
|  |  | No taxi approval | 26 |
|  |  | No pushback approval | 27 |
| REQ-06.07.01-SPR-GENL.0003 | Higher priority of RIMS alert | The ATCO must be able to recognize that RIMS alerts have a higher priority compared to CATC and CMAC alerts. | |
| REQ-06.07.01-SPR-GENL.0004 | Display of multiple alerts | The ATC system shall be able to display alerts for either one mobile or more than one mobile. | |
| REQ-06.07.01-SPR-GENL.0005 | Display of alerts on the mobile/s concerned | The ATCO shall have a means to see alerts on the HMI associated with the mobile position and identification. | |
| REQ-06.07.01-SPR-CATC.0001 | Entering of Clearances Case 1 | Tower Runway Controller shall input in the Electronic Flight Strip System (EFS) the clearances given to the aircraft to line up, land on, take off from, go around, hold short of, cross, taxi and backtrack on the runway | |

| REQ-06.07.01-SPR-CATC.0002 | | Tower Runway Controller shall provide to the Electronic Flight Strip System (EFS) the aircraft information relative to the assigned Runway and the holding point |
|---|---|---|
| REQ-06.07.01-SPR-CATC.0008 | RIMS and conflicting ATC System alerts | The different alerts of the CATC system and RIMS shall be distinguishable for the Tower Runway Controller. |
| REQ-06.07.01-SPR-CATC.0009 | Entering of Clearances Case 2 | The Tower Runway Controller shall input clearances given to the aircraft/vehicles in the Electronic Flight Strip System (EFS) as soon as practicable and within less than 3 seconds. |
| REQ-06.07.01-SPR-CATC.0012 | Entering of Clearances Case 3 | The Tower Runway Controller shall input in the Electronic Flight Strip System (EFS) the clearances given to the vehicle to enter or to cross the runway |
| REQ-06.07.01-SPR-CATC.0013 | Entering of Clearances Case 4 | The Tower Runway Controller shall provide to the Electronic Flight Strip System (EFS) the vehicle information relative to the assigned Runway and the holding point. |
| REQ-06.07.01-SPR-CATC.0022 | Information of EFS when ATC conflict was cancelled by user | When the Tower Runway Controller decides to cancel detected conflicting ATC clearances, he/she shall inform the Electronic Flight Strip System about this cancelation |
| REQ-06.07.01-SPR-CATC.0025 | Acceptation of conflicting clearances | When a detected conflicting clearance is accepted by the Tower Runway Controller, he/she shall inform the conflicting ATC clearances System about this acceptation. |
| REQ-06.07.01-SPR-CATC.0026 | Providing of clearances case 4 | The Electronic Flight Strip System (EFS) shall provide to the Conflicting ATC Clearances System any clearance entered by the Tower Runway Controller within 0.5 second. |
| REQ-06.07.01-SPR-CATC.0034 | Situational awareness Complete information | The Tower Runway Controller shall verify that the triggered alert provides complete information for the conflicting ATC clearances situation. |
| REQ-06.07.01-SPR-CMAC.0012 | ATCO input of aircraft taxiway clearances | The Tower Ground Controller shall enter all clearances given to aircraft relative to their push-back, taxi-out and taxi-in in the FDP(EFS) |
| REQ-06.07.01-SPR-CMAC.0013 | ATCO input of vehicle taxiway clearances | The Tower Ground Controller shall enter all clearances given to vehicles relative to their taxi clearances in the FDP(EFS) |
| REQ-06.07.01-SPR-CMAC.0031 | Taxiway-related alerts compatibility with other safety nets. | The Ground ATC Conformance Monitoring System alerts and other airport safety net alerts (A-SMGCS level 2, RIMCAS) shall be compatible each other to facilitate Tower Ground Controller recognition and problem resolution. If necessary an alert priority scheme between these systems should be defined. |
| REQ- | ATCO input of | The Tower Runway Controller shall enter all clearances given to aircraft relative to their |

| 06.07.01-SPR-CMAC.0033 | aircraft runway clearances | line-up, take-off, landing and runway crossing in the FDP(EFS) |
|---|---|---|
| REQ-06.07.01-SPR-CMAC.0034 | ATCO input of vehicle runway clearances | The Tower Runway Controller shall enter all clearances given to vehicles relative to the runway crossing in the FDP(EFS) |
| REQ-06.07.01-SPR-CMAC.0060 | Runway-related alerts compatibility with other safety nets | The Ground ATC Conformance Monitoring System alerts and other airport safety net alerts (A-SMGCS level 2, RIMCAS, Conflicting ATC clearances,..) shall be compatible each other to facilitate Tower Runway Controller recognition and problem resolution. If necessary an alert priority scheme between these systems should be defined. |
|  |  |  |

**-END OF DOCUMENT-**