Final Technical Specifications

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Abstract

The objective of this document is to describe the Technical System Requirements (functional and non-functional) that specify the development and the implementation of the Surface Routing Server in project 12.03.03.All the sub-systems interacting with the Surface Routing Server are also identified, especially the ones affecting to the SESAR Solution #22 " Automated assistance to controller for surface movement planning and routing", as well as the external conditions and inputs affecting its behaviour and its operations. This is an update of the Phase 3 deliverable (12.03.03-D14) in which the project team has analysed the maturity and status of each requirement at the end of the project as the result of all the development and validation activities.

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10 # Intellectual Property Rights (foreground)

11 This deliverable consists of SJU foreground.

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Executive Summary

This document is mainly focused on the Technical Specifications Requirements which shall guide to the development and implementation of the Surface Routing Functional Block (Surface Routing Server). It is an evolution of the work done during phases 1, 2, and 3 of the project, from which an analysis of their maturity and status has been made according to the development and validation activities carried on along the SESAR programme and more specifically during the different Release 5 validation exercises carried out in WP6 [13].

This document considers the OSED [9] and SPR [11] from project 06.07.02 and OFA04.02.01 as the main inputs of operational requirements. The 12.03.03 Phase 3 document is the basis of this document.

At programme level, this is a key document within OFA04.02.01 "Integrated Surface Management", and more in particular within SESAR Solution #22 "Automated assistance to controller for surface movement planning and routing", as it describes the technical specifications for the software implementation and it also shows the status of each requirement respect to the work done along the project.

The document also addresses the role of the Surface Routing Functional Block within the rest of the functional blocks in the Aerodrome ATC environment, for which the architecture defined in project 12.01.07 TAD [10] has been considered and reviewed.

1   Introduction

1.1 Purpose of the Document

The purpose of "Final Technical Specifications" document is to collect and organize the baseline Technical System Requirements (functional and non-functional) for the Surface Routing Functional Block in the scope of SESAR project 12.03.03 by satisfying needs and expectations of the actors involved in airport surface movement management and planning. It is strongly linked to the operational project P 06.07.02 and OFA04.02.01 for the development of SESAR Solution #22 "Automated assistance to controller for surface movement planning and routing".

This is an update of the Phase 3 deliverable [8], taking into account the operational requirements defined in P06.07.02 and thus leading the implementation of the P12.03.03 Surface Routing Functional Block. The different blocks of requirements have a different maturity level. The project has analysed the maturity of each requirement by the end of the project lifecycle and updated their status to "validated" when consider that the requirements has passed the V3 maturity level. Refer to section 4 for further details [4].

All the sub-systems interacting with the Surface Routing Functional Block are also identified, as well as the external conditions and inputs affecting its behaviour and its operations.

The provided information enabled system engineers to:

- develop the Phase 3 prototype of the Surface Routing Functional Block (Surface Routing Server);
- establish and maintain the traceability between Technical Requirements and Operational Requirements defined in P06.07.02.

Therefore through this document all the actors will be able to map the technical and the operational requirements, to analyse the rationale behind each requirement and, in general, to verify and ensure the overall coherence of the project.

The relations between this technical specification and the other SESAR deliverables are illustrated in the following diagram extracted from the guidelines [2].
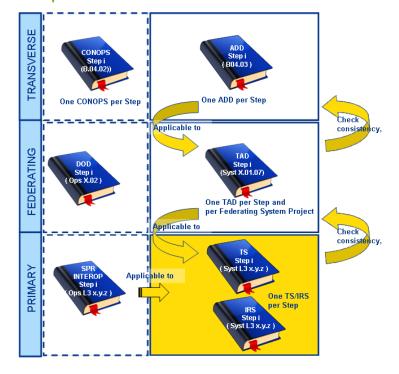
123

Figure 1: TS document with regards to the other SESAR deliverables

125

1.2 Intended Readership

According to the scope of this project:

- **P12.01.07 Airport system specification drafting and maintenance** is interested in the document to identify and maintain the consolidated list of requirements derived from each WP12 projects;
- **P12.03.01 Improved Surveillance for Surface Management** which will monitor aircraft actual routes and will provide aircraft/target data to the Surface Routing Function;
- **P12.03.02 Enhanced Surface Safety Nets** which will monitor aircraft actual routes against their planned routes;
- **P12.03.04 Enhanced Surface Guidance** which will provide aircrafts and vehicles with guidance assistance based on the cleared routes provided by the Surface Routing Function;
- **P12.04.03 Enhanced FDPs at Airports which provides and stores flight and vehicle plan data information.**
- **P12.05.04 Integrated Tower Working Position (iCWP) Design, Specification Prototyping and Test/Validation** which will integrate CWP functionalities for Airport / ATC environment;
- **P06.07.02 Enhanced Surface Routing** as the source of the operational requirements, will need to check the consistency between the expected prototypes and the operational requirements;
- **Any other SESAR project** interested in technical System Requirements may be interested in this document.

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1.3 Inputs from Other Projects

1.3.1 Evolution of A-SMGCS

The term A-SMGCS was adopted in the early 1990s, first by EUROCAE and later by ICAO. It describes a complex, modular system that utilises advanced technology to improve the safety and efficiency of aerodrome surface movements and to increase capacity in low visibility conditions.

Much work has been done on specifying and validating the Surveillance and Control (Safety Net) functions of A-SMGCS and the expected evolutionary development of the concept. During the past decade, the first implementations of A-SMGCS (surveillance and runway incursion monitoring and alerting)) at many major airports have provided tools to improve controllers' situational awareness and to alert them in the event of runway incursions or conflicts in the runway area.

The development of advanced A-SMGCS Routing and Planning functions is the objective of SESAR projects 06.07.02 & 12.03.03, which have been cooperating with the EUROCONTROL A-SMGCS Task Force and with EUROCAE WG-41 in order to support standardisation of the new functions.

1.3.2 Related Standards

- EUROCAE
  - ED-87, 1997: Minimum Aviation System Performance Specification (MASPS) for A-SMGCS (Interim Document)
  - ED-87A, 2000: Revised MASPS, including chapter on test procedures
  - ED-87B, 2008: Revised MASPS, A-SMGCS Levels 1&2 only; higher levels suppressed
  - ED-87C, 2015: Revised MASPS

- ICAO
  - Doc 9476 Manual on SMGCS, 1986
  - Doc 9830 A-SMGCS Manual, 2004

- EUROCONTROL (A-SMGCS team established in 2000)
  - Definition of A-SMGCS Implementation Levels, 2003 (revised 2010)
  - Levels 1&2 Functional and Operational Specifications, 2003 (revised 2010)
  - Levels 1&2 (all 2006):
    - Licensing Requirements for Controllers
    - Training Requirements for Controllers
    - Draft Operating Procedures
    - Human Factor Case
    - Preliminary Safety Case

    These documents will become obsolete when EUROCONTROL completes its current work on the development of a new A-SMGCS Specification that will include new functions developed in SESAR.

1.3.3 Previous Work on Surface Routing

Surface Routing has previously been addressed in several projects under the European Commission Framework Programmes, notably the large-scale A-SMGCS projects DEFAMM (4th Framework), VISION (4th Framework), BETA (5th Framework) and EMMA2 (6th Framework).

EMMA2, being the most recent of these projects, was the main source of input for the system requirements in the first release of this document in Phase 1 of the 12.03.03 project. Initial operational requirements for Surface Routing were taken mainly from the EMMA2 Services, Procedures, and Operational Requirements (SPOR) document [6]. The EMMA2 SPOR analysed existing ICAO, EUROCAE and EUROCONTROL documents to extract relevant operational requirements, which were then supplemented with proposed new requirements generated within the EMMA2 project. Additional sources of input for the requirements below are EUROCONTROL documents describing:

200   ▪ European Airport Collaborative Decision Making (A-CDM) Implementation Manual [7]
201   ▪ Integrated Tower Working Position (ITWP).

202   For this final version of the System Requirements Specifications document, the main sources of input
203   for the system requirements are the latest 06.07.02 OSED [9] and SPR [11] documents.

1.3.4 Definition of Surface Routing

205   Routing (i.e. Surface Routing) is defined by ICAO in Doc 9830 [5] as one of the four primary functions
206   of an A-SMGCS, the other three being Surveillance, Guidance, and Control (including Safety Nets).
207
208   ICAO Doc 9830 defines "Routing" as: *'The planning and assignment of a route to individual aircraft*
209   *and vehicles to provide safe, expeditious and efficient movement from its current position to its*
210   *intended position'*, and "Route" as: '*A track from a defined starting point to a defined end point on the*
211   *movement area*'. Furthermore it states [§2.2.2]: *'In order to achieve the maximum benefits at each*
212   *level of A-SMGCS implementation, a supporting planning function should be included'*
213
214   The EUROCAE MASPS provides a similar definition but integrates routing and planning to one "Route
215   Planning" function, defined as: *'A function of A-SMGCS which provides strategic and tactical*
216   *allocation of routes and times to aircraft and / or vehicles to provide safe, expeditious and efficient*
217   *movements from the current position to the intended position'.*
218
219   The important point is that a taxi route is not only a description of the path to be followed but also the
220   timing of events along that path, in particular the start time, intermediate hold times, and end time for
221   each taxi movement.
222
223   In order to calculate these times, the EUROCONTROL A-CDM Implementation Manual [7] and
224   SESAR project 06.08.04 have defined the term "Variable Taxi Time" as the generic name for both
225   inbound and outbound taxi time parameters, to be used in the calculation of "Target Take Off Time"
226   (TTOT) and "Target Start-up Approval Time" (TSAT). In addition, the "Estimated Inbound Taxi Time"
227   (EXIT) for an arriving aircraft includes runway occupancy and ground movement time, whereas the
228   "Estimated Outbound Taxi Period" (EXOP) is the expected taxi period between Off-Block (TSAT) and
229   Take-Off (TTOT) and it includes pushback and start-up times, ground movement time with no buffer
230   or delay (without the runway pressure time, which is defined by DMAN and not expected to be
231   provided to the routing function).
232
233   It should be noted that the transmission of taxi route information and clearances to flight crews and/or
234   vehicle drivers, whether by voice or by data link, belongs to the Guidance function, not to the Surface
235   Routing function, while monitoring of mobiles conforming to their route belongs to the Control function.
236   However, there needs to be a close connection between the Surface Routing function and the
237   Guidance and Control functions.

1.3.5 Surface Routing Constraints

239   In order to support controllers in designating appropriate taxi routes and assigning them to aircraft and
240   vehicles, the Surface Routing function needs to be flexible and to be continuously aware of current
241   constraints at the airport. Some constraints are indigenous to the aerodrome layout and can therefore
242   be predetermined; others are dynamic due to weather conditions, maintenance activities, inspections,
243   temporary obstacles, etc., which will impose demanding requirements on the associated Human
244   Machine Interface (HMI) in order to keep the decision support tools continuously up-to-date with the
245   correct information. Project 12.03.03 does not include this HMI, but it shall specify the data exchange
246   requirements with the Controller and Supervisor HMIs, which are developed by project 12.05.04.
247

1.4 Structure of the Document

249   This document is divided into five chapters:

250   ▪ **Chapter** 1 is the introduction. It describes the purpose and scope of the document and the
251   methodology used to derive the requirements, including the purpose of the ATM functional
252   block under analysis

253   ▪ **Chapter** 2 gives a general description of the ATM functional blocks

254   ▪ **Chapter** 3 describes the capabilities, conditions and constraints of the ATM functional blocks.
255   In particular it contains the functional and non-functional Technical System Requirements.

256   ▪ **Chapter** 4 describes assumptions

257   ▪ **Chapter** 5 describes the referenced documents

258

1.5 Requirements Definitions – General Guidance

260 The guidelines for writing requirement specifications are described already in the SESAR guidelines
261 document [2], so they need not be repeated here.
262 However, it is worth noting that the identifier used in Chapter 3 to identify each requirement is
263 constructed as follows:
264 REQ-12.03.03-TS-xxxx.yyyy,
265 where   TS indicates that it is a Technical Specification requirement,
266   xxxx is a 4-digit number; the first digit is '0' for a Phase 1 requirement, '2' for a Phase 2
267   requirement and '3' for a Phase 3 requirement. The remaining digits are used to indicate the
268   type of requirement, e.g. 3010 indicates a Phase 3 Route Generation Requirement, 0030
269   indicates a Phase 1 Route Optimisation Requirement.
270   yyyy is a 4-digit number. Requirements are initially numbered 0010, 0020, etc., in order to
271   permit additional requirements to be inserted later without having to re-number existing
272   requirements.
273

1.6 Functional Block Purpose

275 The trajectory management is a key element of the overall strategy for future ATM system and
276 represents one of the cornerstones of the SESAR Concept of Operations.

277 To achieve fully the gate-to-gate scenario taking into account the turn-around process, the airport
278 surface trajectory (3D) shall be even more accurate than the one in the air. This will lead to a better
279 airport planning capacity, a better airport resource usage increasing the overall system capacity.

280 This Project addressed the improvement of the Surface Routing function by means of the
281 development of a Surface Routing Server (SRS). The Surface Routing Server provides strategic
282 planning (for providing optimized taxi routes taking into account flight plan information and predicted
283 traffic situation) and tactical planning (for providing optimized taxi routes taking into account flight plan
284 information and present traffic situation).

285 For both strategic and tactical planning phases the SRS attempts to predict and reduce possible taxi
286 route conflicts and provide alternative routes in order to help in the taxi route assignation and control
287 process.

288 This functional block is a key enabler for some Safety Nets (Aerodrome Safety Nets Functional Block)
289 and Departure Management (Departure Management Functional Block), which are part of the PCP
290 AF#2, together with Surface Routing. According to dataset 15 [15], the Surface Routing Server
291 implements the Enabler "AERODROME-ATC-12 — Provision of the optimised ground route
292 minimising conflicts".

293 The 12.03.03 Project is:

294 • Addressing a planning part limited to providing a 'planned' route together with taxi time duration
295   based on fixed parameters per taxiway segment.

296 • Addressing an integration of both strategic (previously planned route) and tactical planning
297 (route change capabilities in execution phase) with A-SGMCS Safety Net functions for taxi
298 route conformance monitoring.

299 • Not addressing subsequent data link operations including transmission of routing instructions in
300 response to requests by pilots. (These elements are addressed in Project 12.03.04).

301

302 1.7 Functional Block Overview

303 The objective of the Surface Routing Server is to calculate the most suitable route on the movement
304 area for any aircraft or a vehicle taking into account ATCOs inputs and known constraints such as
305 taxiway closures, aircraft type, etc.

306 The route calculation corresponds to the Automatic and Semi-Automatic modes, which are described
307 in sections 2 and 3 of the document. According to ICAO a route describes 'A track from a defined
308 starting point to a defined end point on the movement area'.

309 Benefits deriving from results of this project are:

310 • Improved use of runway and taxiways and reduced taxi times by calculating optimized taxi
311 routes for aircraft and vehicles taking into account fixed parameters.

312 • Improved aerodrome efficiency and capacity because it reduces the time that an aircraft or
313 vehicle spends on taxiways.

314 • Improved (detail) surface route information available in order to use it in other tower functions
315 (safety net alerts, enhanced surface surveillance, surface guidance, etc.).

316 • This function will help controllers in managing all mobiles on the movement area.

317

318 1.8 Glossary of Terms

319 This section reports the glossary of the main terms used in this document.

Term	Definition	Source
Cleared route	The part of a route that has been approved by an ATCO for a mobile in his/her area of responsibility.	SESAR 06.07.02 - OFA04.02.01 OSED [9]
Node	Any point on the airport which has a logical function associated to it, e.g., stands, runway entry/exit/cross points, de-icing bays, holding points, junctions between taxiways/apron taxilanes/runways, etc.	SESAR 12.03.03
Pending route	That part of the route assigned to a mobile that has not yet been cleared by an ATCO (typically, in the next ground sector than where the mobile is).	SESAR 06.07.02 - OFA04.02.01 OSED [9]
Planned route	A route assigned to a mobile that is not yet operating on the movement area of the aerodrome.	SESAR 06.07.02 - OFA04.02.01 OSED [9]
Restricted area	Aerodrome area where the presence of an aircraft or a vehicle is permanently or temporarily forbidden.	ICAO A-SMGCS manual [5]

320

321   ## 1.9 Acronyms and Terminology

Term	Definition
A-CDM	Airport Collaborative Decision Making
AMM	Airport Moving Maps
AoR	Area of Responsibility
APTR	Alternative Parallel Taxi Route
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Traffic Management
CHMIM	Controller Human Machine Interaction Management
ELDT	Estimated Landing Time
EMMA	European Airport Movement Management by A-SMGCS
ETA	Estimated Time of Arrival
EXIT	Estimated Taxi In Time
EXOP	Estimated Outbound Taxi Period
HMI	Human Machine Interface
ICAO	International Civil Aviation Organization
ITWP	Integrated Tower Working Position
LVC	Low Visibility Conditions
OSED	Operational Service and Environment Definition
SESAR	Single European Sky ATM Research Programme
SFPL	System Flight Plan
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SPR	Safety and Performance Requirements
SRS	Surface Routing Server
SSN	Surface Safety Nets
TAD	Technical Architecture Description

Term	Definition
TLDT	Target Landing Time
TS	Technical Specification
TSAT	Target Start Approval Time
TTOT	Target Take Off Time

322

2 General Functional Block Description

2.1 Context

Surface Routing is one of the four primary functional elements of an A-SMGCS, as specified in ICAO Doc 9830 A-SMGCS Manual:

   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

2.2 Functional block Modes and States

2.2.1 Introduction

The routing / planning module of an A-SMGCS is required to implement the following groups of services:

Services to be provided **on-line:**

   1. Routing Function Normal Operation (Routes generation and assignment).
   2. Planning.
   3. On-line Recording
   4. Routing Function Downgraded Operation
   5. System Monitoring

The first two services are the "core" services

Services to be provided **off-line**:

   1. System and Environment Configuration
   2. Route planning strategies definition and optimization
   3. Simulation and Training

Therefore, the system shall provide the necessary capabilities for selecting and controlling each of the above services.

The most extended use of the A-SMGCS Surface Routing Function is, route generation and assignment in real time. Following the recommendations of the ICAO A-SMGCS Manual, three modes of operation shall be implemented, which are further described:

   1. Manual Mode: free route planning by the ATCO, without any assisting functionalities from the system

   2. Semi-Automatic Mode: free route planning by the ATCO, with assisting functionalities from the system to complete the route taking into account constraints such as restricted and construction areas

   3. Automatic Mode: route proposal by the system taking into account information about aircraft type, taxiway rules, restricted and construction areas. Confirmation or modification by the ATCO

367 | shall be possible. This will be the default mode, reverting to one of the others only when
368 | necessary.

369 | As a supplementary function to be provided, the system shall implement Planning capabilities to help
370 | the ATCO to assess the short term situation of the airport, taking into account current constraints.
371 | Also, the system will be prepared to record all the necessary data to playback the routing function
372 | results in order to fulfil the legal requirements and to use these data for simulation, training and testing
373 | purposes.

374 | The modes of operation are directly linked with the operation time horizon. The Planning function
375 | considers three different periods:

376 | • Strategic planning. Predicted traffic situation more than 20 minutes in advance (Strategic
377 | Planning is not addressed by 12.03.03 project).

378 | • Pre-tactical Planning. Predicted traffics situation between a given time depending of
379 | environmental conditions (aerodrome infrastructure/ capacity, weather conditions, etc.) up to
380 | 20 minutes.

381 | • Tactical planning. Indicates the present traffic situation.

382 | Route changes due to sudden new restrictions (e.g. taxiway closure) will cause the routing and
383 | planning function to generate (in the automatic mode) updates for all existing routes.

384 | The following sections explain further the different services system requirements.

385 |
386 | Note: In SESAR the Planning function is limited to providing taxi times to DMAN (OFA04.02.01 OSED
387 | [9])

2.2.2 Routing / Planning Function Normal Operation

389 | This section refers to the standard routing / planning operation of an A-SMGCS in the way it will be
390 | used during real-time operations. This function will be capable to operate in three modes: Manual,
391 | Semi-automatic, and Automatic.

392 | Within ICAO, the criteria whether a Surface Routing function is automated or not depends on the way
393 | to assign a route to an aircraft or vehicle.

394 | The ATCO can designate a route by manually creating, either through the HMI or by typing text, a
395 | route for a mobile. Due to the workload associated with inputting a manual route it is not foreseen that
396 | this form of route calculation will be the standard way of working for all movements on aerodromes
397 | identified by OFA04.02.01 OSED as the operational environment of the SRS.

398 | In the context of SESAR the semi-automatic mode is considered to be an advanced version of the
399 | manual mode, providing the ATCO with a function that will help to predict the completion of the route
400 | based on the known taxiway rules and other operational constraints where the system knows the
401 | destination. The advantage of this being that the designation of the route is quicker than having to
402 | manually select every portion of the route.

403 | In an automatic mode the routing function should also assign routes, and provide adequate
404 | information to enable manual intervention in event of failure or at the discretion of control authority.

405 | The routing function will need data exchange with different systems/information sources, depending
406 | on their local availability.

2.2.3 Planning Service

408 | Aerodrome operations are vulnerable to many factors which must be taken into account when
409 | planning operations. These factors include weather conditions that may require an adjustment of
410 | movement rates or changes in landing/take-off runway configuration. As a consequence the expected
411 | time may be excessive.

412 | While the Routing Function Normal Operation is focused on the "real-time" tactical designation of
413 | routes, the Planning Service is dedicated to the short-term "strategic" assessment of the airport traffic.

414 | This planning function will need data exchange with different systems/information sources, depending
415 | on their local availability.

416 The following recommendations have been identified to allow the proper operation of the A-SMGCS
417 Planning Service:

  a. The Surface Routing function should provide strategic planning (not addressed by project
418 12.03.03) which will indicate the predicted traffic situation some time ahead (typically, 20
419 minutes in advance)
420

  b. To facilitate the ATCO selection of new optimization criteria, the system should make use of
421 the routing strategies created and validated off-line through the planning optimisation service
422

423 Planning facilities should include indication of start-up times for traffic to meet this capacity.

2.2.4 Other On-line Services

425 The Routing/Planning Function, as part of a complete A-SMGCS, needs to implement other on-line
426 services for convergence purposes.

2.2.4.1 System Monitoring

428 As mentioned in the above section, every A-SMGCS is obliged also to implement the adequate
429 system component monitoring capabilities so that the system performance is perfectly monitored and
430 the level of reliability is clearly established and indicated to the controller, to permit the correct working
431 procedures allocation depending on the system actual performance in real-time.

2.2.4.2 Routing/Planning Function Downgraded Operation

433 The A-SMGCS are modular systems that normally depend on a complex set of information sources. It
434 is compulsory for these systems to inform the controller of the loss (even partially) of the capabilities
435 and reliability of the system upon any component failure (as above mentioned in the previous
436 section). Therefore, the routing/planning function must also incorporate the warnings and reports of
437 the whole system capabilities needed to indicate the function mode downgrading when necessary.

438 As already identified in the modes of operation, different systems interfaces and information sources
439 are needed for the semi-automatic and automatic modes, being the manual mode the lowest grade of
440 operation.

441 The system will be able to work in Manual, Automatic or Semi-Automatic Modes depending of the
442 availability of information the system needs to perform its calculations

443   For Manual mode the minimal necessary information will be:

444   • A movement plan to associate the route, containing at least the following information:

445 Mobile Identification

446 Type of mobile

447 Priority information

448 Origin and destination of the taxi route

449 Time at which the route is required

450   • Airport's surface layout information in order to be presented to the controller for the selection of the
451 route manually, containing at least the following information

452 Taxiway, runway and Apron layout including identifiers

453 Indications of closed taxiways

454 Stand manoeuvre information (e.g. push-back, push-pull, etc.)

455 De-icing location (on position or remote) if de-icing is required

456

457 • Airport traffic situation

458   • Low Visibility Procedures in operation

459   • Aerodrome circulation rules

460   In Semi-Automatic and Automatic modes the system will use additional information (constraints and
461   extended data) not used by the Manual mode as:

462   - Runway usage (e.g. if an active runway has to be crossed)

463   - Areas of responsibility

464   - De-icing time

465   In case of missing one or several of the sources or degradation of the quality of information, the
466   system will not be able to work in Automatic Mode nor Semi-Automatic mode. The system will work on
467   Manual Mode

2.2.5 Off-line Services: Configuration Capabilities

469   An A-SMGCS should be designed so that, wherever possible, changes to the aerodrome will not
470   require a major reconfiguration of the A-SMGCS or its components. So, it is necessary to implement a
471   service to allow the configuration of all the parameters of the system, to set it up according to the
472   installation-site constraints and to tune the system behaviour.

473   There are three main groups of data to be taken into account for the system configuration.

474   • Static aerodrome data: Those reference and layout data that change infrequently (several times a
475   year on some airports), although when it happens, it can require a big effort to update it.

476   • Dynamic data: Other configuration data that can change more frequently, such as runway
477   configuration or weather conditions.

478   • Function parameters: Those data that can change the behaviour of the implemented function.

479   Most of the necessary data for the routing/planning function can normally be received from external
480   sources, and some of them must be already implemented at existing A-SMGCS aiports. So, the final
481   configuration requirements will depend on an airport available facilities and systems.

482   Taking all the above into account, the Configuration Capabilities of the Routing/Planning Function
483   shall address the following needs:

484   • It will be possible to characterise the aerodrome elements already available for other A-SMGCS
485   modules, taking into account the new routing /planning functions needs.

486   • It will be possible to include in the routing allocation algorithm, new information coming from
487   different systems, when available, or manually, when an automated source is not available.
488   Normally, every airport will have available an airport operational data base which will be able to
489   send the required information.

490   • It will be possible to establish different routing / planning strategies and criteria, that is, to
491   configure the behaviour of the routing allocation algorithm. This data will depend on the
492   implemented algorithm.

493   Therefore, the system must be capable to allow the configuration of at least the following:

494   • Airport layout: geographical representation of various airport areas and reference points (TWY,
495   RWY, stands, RWY exits and entry points, intermediate waypoints, etc.). The configuration
496   service shall implement the new attributes needed for the routing/planning function algorithms that
497   could be missing in the current A-SMGCS database of a given airport. An example of new
498   attributes could be TWYs preferred direction per aerodrome configuration, if a route is in
499   accordance with standard aerodrome circulation rules or alternatively for the indicated origin and
500   destination, etc.

501   • Variable system parameters needed to adapt the system to local requirements and to changes in
502   aerodrome operations or operational rules at the aerodrome, such as taxi times per route or from
503   a stand to a RWY entry point, priority of information sources when several can input the same
504   kind of data, etc., and

505   • Topological and topographical information and parameters, and a means of transferring selected
506   contents of the database to the respective system elements.

507

2.3 Major Functional block Capabilities

509 Operational requirements coming from OFA04.02.01 concern the overall routing and planning
510 functions of the A-SMGCS, which are distributed between the people, the equipment, and the
511 procedures involved.
512
513 Project 12.03.03 is only responsible for the Surface Routing Server, which is a support tool to assist
514 controllers in planning and assigning taxi routes to aircraft and vehicles using the movement area of
515 the aerodrome. The associated Controller HMI is not included since it is the responsibility of project
516 12.05.04. However, the necessary interfaces to Controller HMI are specified.
517
518 This section describes the major groupings of the requirements of the Surface Routing Server, its
519 sources of information and its data exchanges with other functional blocks and parts of the system.
520
521 The Surface Routing Server requirements are provided in Chapter 3 of this document. They are
522 presented as a list without any hierarchical structure. The requirements are divided into sections
523 according to the TS template, as follows:
524

- Route Generation Requirements;
- Optimisation Requirements;
- De-Icing Requirements;
- ATCO HMI Requirements;
- Performance Characteristics;
- Safety and Security;
- Maintainability;
- Reliability;
- Functional Block Internal Data Requirements;
- Design and Construction Constraints;
- Functional Block Interface Requirements

536
537 A corresponding table that synthesizes the traceability between Technical Requirements (TS) and the
538 Operational, Safety and Performance Requirements is reported in the Appendix A.

2.4 User Characteristics

540

541 "Actors and Services" of a SRS can be identified both as "personnel" and as "automated systems".
542 The main personnel users are controllers, pilots and vehicle drivers, yet other human actors are
543 considered by OFA04.02.01 OSED for interacting [9], including:

- The airport layout used for building taxi paths on AMMs, and potentially by the route
  generator and the ATCO CWP, rely on Airport Mapping Data Bases (AMDB) which are
  constructed by AMDB providers using data published in the respective AIP;

- The taxiway preferred directions and the aerodrome circulation rules, which are the basic
  rules, used by the route generator are defined by the Airport Air Traffic Services;

- The runway and taxiway configuration in use for the time the planned route is generated, as
  well as any runway or taxiway closures, are decided by the Airport Tower Supervisor;

- The aircraft type, which can restrict the taxiways usable for the aircraft, is provided by the
  Aircraft Operator in the flight plan;

- The allocated stand corresponding to the end point of the route for arriving aircraft and to the
  starting point of the route for departing aircraft is defined by the airport Stand Planner;

555
556
557

- When de-icing is required, the time needed to de-ice the aircraft and the bay allocated to the aircraft (in case of remote de-icing) are provided by the De-icing Agent, perhaps using a specific de-icing management tool;

558
559

- The timing information related to a flight is provided by the airport's CDM platform, which is under the responsibility of the CDM Project Manager.

560

561   The main "automated systems" considered as users of the SRS are:

562   - Tower CWP HMI

563   - Airport database

564   - Aircraft database

565   - Surveillance system

566   - Surface Safety Nets system

567   - Surface Guidance system

568   - DMAN Server

569   - FDP

570

571

572   ## 2.5 Operational Scenarios

573   The operational scenarios and their use cases are listed here and deeply defined in OFA04.02.01
574   OSED [9] :

575   - "Surface In" scenario

576   o Plan and Provide Taxi-In Routing for an inbound flight

577   - "Turn Around" scenario:

578   o Plan and provide taxi-out routing for an outbound flight

579   - "Short term planning" scenario

580   o Plan and Provide Routing for a Ground Movement by a Mobile

581   o Route optimisation through avoiding conflicting situations

582

583   ## 2.6 Functional

584   ### 2.6.1 Functional decomposition

585   The current version of 12.01.07 TAD [10] states the following functional block (FB) decomposition:
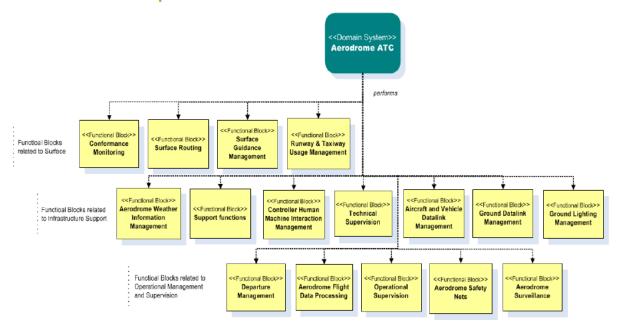
586

587

Figure 2: Aerodrome ATC Domain System - Functional Breakdown

589 Project 12.03.03 develops the Surface Routing FB. The data interactions with other FBs are defined
590 in this table:

Data Flow In/Out	Origin	Destination
Flight or vehicle plans (SFPL)	Aerodrome Flight Data Processing	Surface Routing
Planned and cleared routes (Taxi route data)	Surface Routing	Aerodrome Flight Data Processing
Target Report (Surveillance data) and Ground Correlation information	Aerodrome Surveillance	Surface Routing
Cleared Taxi Route	CHMIM	Surface Routing
Manual Taxi Route Orders	CHMIM	Surface Routing
Planned Taxi Route	Surface Routing	CHMIM
Cleared Taxi Route	Surface Routing	Conformance Monitoring
Surface Routing Server Status	Surface Routing	Technical Supervision
Surface Routing Set-up (Configuration Commands)	Technical Supervision	Surface Routing
Surface Management Configuration	Operational Supervision Aerodrome ATC	Surface Routing
Taxi times (e.g. EXOP)	Surface Routing	Departure Management
Taxi route Data	Surface Routing	Support Functions

591 **Table 1: Data Interactions with Other Functional Blocks**

592

593 Note: At the time this document was produced, project 12.01.07 was consolidating the interactions
594 between the systems in coordination with OFA 04.02.01. A final high-level architecture diagram will be
595 in the Solution Pack.

596

597 ## 2.6.2 Functional Analysis

598 N/A

599

600 ## 2.7 Service View

601 N/A

602 # 3 Functional Block Functional and Non-Functional
603 Requirements

604 ## 3.1 Capabilities

605

606 ### 3.1.1 Route Generation Requirements

607 [REQ]

Identifier	REQ-12.03.03-TS-2010.0100
Requirement	If vehicle movement plans (e.g. A-FDPS) are available, the SRS shall provide taxi routes for vehicles from any requested start point to any requested destination point on the manoeuvring area, taking account of intermediate holding points and waypoints as necessary.
Title	Planning Routes to Vehicles
Status	<Validated>
Rationale	Most critical vehicle movements have to be coordinated with the rest of the taxiing operations in order to operate in an efficient and safe way
Category	<Functional>
Validation Method	
Verification Method	<Test>

608
609 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0022	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

610
611
612 [REQ]

Identifier	REQ-12.03.03-TS-2010.0010
Requirement	The SRS shall provide automatic calculation of taxi routes and interact with the Controller HMI so as to achieve three modes with regard to the different levels of automation: • Automatic mode, whereby the SRS calculates the taxi route for each mobile and the Controller can clear the mobile along its route using his HMI if no modification is required. • Semi-automatic mode, whereby the Controller HMI sends the SRS via points on the taxi route and the SRS calculates the route accordingly and returns it to the Controller HMI for display; • Manual mode, whereby the entire taxi routing operation is carried out at the Controller HMI.
Title	Levels of Automation
Status	<Validated>
Rationale	The operational requirement cannot be met by 12.03.03 project alone, since Controller HMI is not part of the project. The SRS will provide the automated taxi routing functionality and communicate with Controller HMI to achieve the required three modes with regard to the different level of automation.
Category	<Functional>
Validation Method	
Verification Method	<Test>

613
614 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance

<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0001	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATJED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

615
616
617   [REQ]

Identifier	REQ-12.03.03-TS-3010.0020
Requirement	The SRS shall manage automatically a change of the allocated runway data of any flight plan and shall re-compute the route to be assigned according to this new runway allocation.
Title	Airport Configuration Data
Status	<Validated>
Rationale	In case of a planned or ad hoc change of the operational configuration of an airport (e.g. landing and departure direction are swapped), the SRS needs to be able to assist the ATCO in planning the traffic according to the new situation by providing proposals for new routes and by automatically adjusting the operational direction of taxiways that can only be used in one direction at a time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

618
619   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0015	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0002	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0008	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0009	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

620
621
622   [REQ]

Identifier	REQ-12.03.03-TS-3010.0010
Requirement	The SRS shall be able to modify all planned routes automatically in case of a change of runway usage
Title	Change of Runway usage
Status	<Validated>
Rationale	The SRS shall be able to modify all routes after a change of operational direction automatically
Category	<Functional>
Validation Method	
Verification Method	<Test>

623
624   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0019	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

625
626
627   [REQ]

Identifier	REQ-12.03.03-TS-2010.0030
Requirement	On aprons with APTR, the SRS shall calculate taxi routes taking into account aircraft type constraints according to local rules, which shall be configurable from the Technical Supervision.
Title	APTR Integration into Routes
Status	\<Validated\>
Rationale	APTR is a means to increase performance on aprons. It is very important for many airports to have this functionality still available with the future system and automatically applied by the SRS.
Category	\<Functional\>
Validation Method	
Verification Method	\<Test\>

628
629   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<ATMS Requirement\>	REQ-06.07.02-OSED-RGGE.0013	\<Full\>
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA04.02.01	N/A
\<ALLOCATED_TO\>	\<Project\>	12.03.03	N/A
\<SATISFIES\>	\<Enabler\>	AERODROME-ATC-12	\<Partial\>
\<ALLOCATED_TO\>	\<Functional block\>	Surface Routing	N/A

630
631
632   [REQ]

Identifier	REQ-12.03.03-TS-2010.0040
Requirement	For each stand, the SRS shall store information about the possible destination points for pushback, long pushback and push-pull procedures according to local rules, which shall be configurable from the Technical Supervision.
Title	Destination Point of Pushbacks
Status	\<Validated\>
Rationale	On airports with complex apron and terminal layouts, pushback procedures need to be integrated with the other traffic in order to keep the performance at an acceptable level.
Category	\<Functional\>
Validation Method	
Verification Method	\<Test\>

633   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
\<SATISFIES\>	\<ATMS Requirement\>	REQ-06.07.02-OSED-RGGE.0014	\<Full\>
\<APPLIES_TO\>	\<Operational Focus Area\>	OFA04.02.01	N/A
\<ALLOCATED_TO\>	\<Project\>	12.03.03	N/A
\<SATISFIES\>	\<Enabler\>	AERODROME-ATC-12	\<Partial\>
\<ALLOCATED_TO\>	\<Functional block\>	Surface Routing	N/A

634
635
636   [REQ]

Identifier	REQ-12.03.03-TS-2010.0070
Requirement	The SRS shall generate routes defined by nodes, which are geographical points on taxilanes along which the mobile is planned or cleared to proceed.
Title	Route Nodes
Status	\<Validated\>
Rationale	Independent from the mode of operation, the SRS needs to incorporate the capability to link nodes on the aerodrome surface to a route that can be performed by the mobile.
Category	\<Functional\>
Validation Method	
Verification Method	\<Test\>

637
638   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

639
640
641   [REQ]

Identifier	REQ-12.03.03-TS-2010.0080
Requirement	The SRS shall be able to plan routes in more than one AoR.
Title	Multiple AoRs
Status	<Validated>
Rationale	The planning function shall have the capability to cover all the movement, in order to be useful (mainly in the automatic mode).
Category	<Functional>
Validation Method	
Verification Method	<Test>

642
643   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0006	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

644
645
646   [REQ]

Identifier	REQ-12.03.03-TS-3010.0085
Requirement	The SRS shall be capable of determining the runway exit point for arrivals based on the type of aircraft and the landing runway.
Title	Determination of Runway Exit for Arrivals
Status	<Validated>
Rationale	The SRS should be able to predict the runway exit point depending on aircraft type and landing runway condition in order to improve predictability of the planned route
Category	<Functional>
Validation Method	
Verification Method	<Test>

647
648   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0006	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

649
650
651   [REQ]

Identifier	REQ-12.03.03-TS-3010.0095
Requirement	If the runway exit point downlinked from the aircraft is available to the SRS, it shall have highest priority to be used as start point for the planned inbound taxi route.
Title	Downlinked Runway Exit Point
Status	<Validated>
Rationale	Aircraft that are equipped with EBS are able to downlink (via free text message) the intended runway exit point, so this should be used as start-point for planning the inbound taxi route.

Category	<Functional>
Validation Method	
Verification Method	<Test>

652

653   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0028	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0005	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

654

655

656   [REQ]

Identifier	REQ-12.03.03-TS-3010.0096
Requirement	Once the aircraft has begun to exit the runway, the actual exit point shall be determined from Target Reports received from Surveillance, and the taxi route shall be recalculated from that point.
Title	Runway exit point
Status	<Validated>
Rationale	This requirement applies to both EBS and non-EBS equipped aircrafts
Category	<Functional>
Validation Method	
Verification Method	<Test>

657

658   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0028	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0014	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

659

660

661   [REQ]

Identifier	REQ-12.03.03-TS-2010.0110
Requirement	Whenever a new constraint (e.g. closure of a taxiway segment) occurs, the SRS shall automatically calculate new routes and propose them to the Controller HMI for those affected that are already planned or cleared.
Title	Route Recalculation in Case of Constraint
Status	<In Progress>
Rationale	The requirement needs to be more detailed at operational level. The work on the OSED is on-going at the time of writing these technical specifications. There may be different needs depending of the mode of operation (manual, semi-automatic, automatic). There may be different needs depending on the status of the route (planned or cleared). The recovering process –when there is no constraint any more- needs to be detailed. A time parameter may be added to limit the computation of new routes only to the concerned aircraft
Category	<Functional>
Validation Method	
Verification Method	<Test>

662

663   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0020	<Full>

<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0002.0001	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

664
665
666 [REQ]

Identifier	REQ-12.03.03-TS-3010.0025
Requirement	In case the Controller or Supervisor HMI provides means to input, edit, or delete current, recurring or future constraints (e.g. runway configuration/stand change, taxiway closure) on the aerodrome surface, in semi-automatic and automatic mode, these planned changes shall be taken into account by the SRS when the ATCO defines a new route or when a route is modified.
Title	Constraint Editing
Status	<Validated>
Rationale	This requirement assumes that the Controller or Supervisor HMI provides a means to input, edit, or delete current, recurring or future constraints (e.g. runway configuration/stand change, taxiway closure). The SRS can assist the ATCO in the task of planning the future traffic on the aerodrome by providing a means to generate routes conforming to current, recurring, and future constraints.
Category	<Functional>
Validation Method	
Verification Method	<Test>

667
668 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0020	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

669
670
671 [REQ]

Identifier	REQ-12.03.03-TS-2010.0120
Requirement	In semi-automatic mode, the SRS shall be able to receive intermediate waypoints from the Controller HMI and shall generate a complete taxi route to the destination point taking those points as well as aerodrome circulation rules and the current operational configuration into account.
Title	Semi-automatic Mode
Status	<Validated>
Rationale	The semi-automatic route generator shall support the ATCO in completing the taxi route creation
Category	<Functional>
Validation Method	
Verification Method	<Test>

672
673 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0009	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0002	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

674

675
676   [REQ]

Identifier	REQ-12.03.03-TS-3010.0030
Requirement	When in semi-automatic mode, the SRS shall receive from the Controller HMI a message to confirm the proposed route is accepted.
Title	Route Modification Finalization
Status	<Validated>
Rationale	In contrast to the process of defining a new route, the SRS does not have an automatic indication whether or not the modification was completed. Thus, a trigger is needed to allow the ATCO to indicate manually the completion of the modification process.
Category	<Functional>
Validation Method	
Verification Method	<Test>

677
678   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0005	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

679
680
681   [REQ]

Identifier	REQ-12.03.03-TS-2010.0140
Requirement	When calculating taxi routes, the SRS shall take into account the taxiway constraints it has been informed of, i.e. one-way usage, closure, and/or aircraft type restrictions.
Title	Taxiway Constraints
Status	<Validated>
Rationale	Taxiway usage rules, including aircraft type restrictions, have to be taken into account for safety and efficiency reasons.
Category	<Functional>
Validation Method	
Verification Method	<Test>

682
683   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0019	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0011	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

684
685
686   [REQ]

Identifier	REQ-12.03.03-TS-2010.0150
Requirement	The SRS shall compute and distribute to its clients the estimated unimpeded taxi time from start-point to end-point for every taxi route it generates. For departing aircraft, the estimated unimpeded taxi time is calculated from stand to runway holding point. For arriving aircraft, the estimated unimpeded taxi time is calculated from runway exit point to stand.
Title	Estimated Taxi Time from Start
Status	<Validated>

Rationale	The initial estimated taxi time is essential information for airport sequencers. This information is sent to AFDP, which is in charge of its distribution to other clients.
Category	<Functional>
Validation Method	
Verification Method	<Test>

687
688 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0022	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0002.0002	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

689
690
691 [REQ]

Identifier	REQ-12.03.03-TS-2010.0160
Requirement	The SRS shall compute and distribute to its clients the estimated unimpeded taxi time from current position to end-point for every taxi route
Title	Estimated Taxi Time from Current Position
Status	<Validated>
Rationale	The remaining estimated taxi time is essential information for airport sequencers and shall be updated continuously once aircraft start taxiing. This information is sent to AFDP, which is in charge of its distribution to other clients.
Category	<Functional>
Validation Method	
Verification Method	<Test>

692
693 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0023	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0002.0010:	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

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697 The following 3 requirements belong to project 12.04.04 [14] but are included in this document
698 because they directly affect the Surface Routing functional block
699
700 [REQ]

Identifier	REQ-12.04.04-TS-0010.0021
Requirement	The Surface Routing function shall recalculate the planned route and EXOP every time that new TTOT and TSAT are received and send it to the Coupled AMAN/DMAN at least whenever it changes by more than <parameter_1 TBD>.
Title	EXOP update
Status	<In Progress>
Rationale	TOBT and TSAT are used by the Surface Routing function to calculate EXOP updates as the sequences evolves, TSAT and TTOT are also used to predict the future traffic situation. The parameter making the recalculation needs to be validated at operational level, and most likely will depend on local implementations, maybe within some limits. So it is considered TBD (to

	be defined). It has been implemented configurable
Category	<Functional>
Validation Method	N/A
Verification Method	<Test>

701

702 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	AIRPORT-33	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-IOP-0002.0020	<Full>
<SATISFIES>	<ATMS Requirement>	REQ-06.08.04-OSED-2020.0030	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0180	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0190	<Full>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA04.01.01	N/A
<ALLOCATED_TO>	<Project>	12.04.04	N/A

703 [REQ]

Identifier	REQ-12.04.04-TS-0010.0051
Requirement	The Surface Routing function shall send the remaining taxi time of departing aircraft between current position and the runway holding point during taxi-out phase for all flights whenever it changes by more than <parameter_2 TBD>.
Title	Remaining Taxi time
Status	<In Progress>
Rationale	Remaining Taxi Time is used by Coupled AMAN/DMAN to verify if the flight plan will achieve the TTOT. The change parameter needs to be validated, and most likely depends on local implementations, so it is TBD at operational level. It has been implemented configurable.
Category	<Functional>
Validation Method	N/A
Verification Method	<Test>

704 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	AERODROME-ATC-44a	<Partial>
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06-08-04-OSED-2000.0070	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0160	<Full>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A
<APPLIES TO>	<Operational Focus Area>	OFA04.01.01	N/A
<ALLOCATED TO>	<Project>	12.04.04	N/A

705

706 [REQ]

Identifier	REQ-12.04.04-TS-0010.0056
Requirement	The Surface Routing function may initialise the EXOP calculation through static tables or using TOBT.
Title	EXOP initialisation
Status	<In Progress>
Rationale	This requirement refers only to sequence initialisation, to the first iteration of the loop, which will be updated once TSAT and TTOT are received. The status of the requirement (validated or not) depends on the validations over project 12.04.04 prototypes.
Category	<Functional>
Validation Method	N/A
Verification Method	<Test>

707

708 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Enabler>	AIRPORT-33	<Partial>

<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.08.04-OSED-2020.0030	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0100	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0180	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.08.04-OSED-0202.0190	<Full>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A
<APPLIES_TO>	<Operational Focus Area>	OFA04.01.01	N/A
<ALLOCATED_TO>	<Project>	12.04.04	N/A

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715   [REQ]

Identifier	REQ-12.03.03-TS-3010.0040
Requirement	The SRS shall update the estimated unimpeded taxi time when the route is manually modified and the new estimated taxi time changes by more than a locally configurable time. This applies to both initial and remaining estimated unimpeded taxi times.
Title	Taxi Time Update
Status	<Validated>
Rationale	The estimated unimpeded taxi time shall be updated every time there is a route modification that significantly changes it.
Category	<Functional>
Validation Method	
Verification Method	<Test>

716

717   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0024	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

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719

720   [REQ]

Identifier	REQ-12.03.03-TS-2010.0180
Requirement	In Automatic Mode, the SRS shall calculate routes without manual input, based on the information it has received from other systems about flight plans and vehicle movement plans.
Title	Automatic Mode
Status	<Validated>
Rationale	No manual input shall be required
Category	<Functional>
Validation Method	
Verification Method	<Test>

721

722   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0001	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>

<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

723

724

725   [REQ]

Identifier	REQ-12.03.03-TS-2010.0220
Requirement	The SRS shall generate each planned route within a configurable time window before the TLDT for arrivals and TSAT for departures (or ELDT and EOBT if the others are not available)
Title	Planned Route Creation Time Window
Status	<Validated>
Rationale	Each airport has a different variability and different density of operations; thus, how much in advance a route can be calculated may be different in every airport.
Category	<Functional>
Validation Method	
Verification Method	<Test>

726

727   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0002	<Partial>
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0003	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

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729

730   [REQ]

Identifier	REQ-12.03.03-TS-2091.0050
Requirement	The SRS shall generate the routes for the mobiles by taking the standard taxi routes published in the AIP, if available, and provided by another airport system as a basis for the route generation process. The result of this process can either be different or identical compared to the standard taxi route and may lead to a number of different taxi routes kept internal to the system.
Title	Use of Standard Routes
Status	<Validated>
Rationale	The standard routing schemes of airports are not static and may change. As the SRS uses the standard taxi routes for generating routes, it shall be able to cope with an updated routing scheme any time. Standard routes may not be published in the AIP. The SRS should also be able to work without them.
Category	<Functional>
Validation Method	
Verification Method	<Test>

731

732   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0004	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

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735   [REQ]

Identifier	REQ-12.03.03-TS-3010.0060
Requirement	The SRS shall integrate a pre-defined destination for the pushback, pull-out or a push-pull into the taxi-out route including the clear indication on which centreline or taxi lane the destination point and the route are located either

	manually or automatically by taking into account APTR.
Title	Pre-Defined Pushback and Push-Pull
Status	<Validated>
Rationale	In order to allow the ATCO to plan and instruct pushbacks, the pre-defined destination points for pushbacks need to be known to the SRS.
Category	<Functional>
Validation Method	
Verification Method	<Test>

736
737　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0012	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

738
739
740　　[REQ]

Identifier	REQ-12.03.03-TS-3010.0065
Requirement	The SRS shall interface with the Controller HMI via the AFDPS to enable a pre-defined destination for pushback or pull out to be manually incorporated into the taxi-out route.
Title	Pre-Defined Pushback and Pull-Out Destination
Status	<Validated>
Rationale	On many airports, pushback and push-pull procedures are executed with pre-defined destination positions in order to optimise the overall traffic situation.
Category	<Functional>
Validation Method	
Verification Method	<Test>

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742　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0011	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

743
744
745　　[REQ]

Identifier	REQ-12.03.03-TS-3010.0066
Requirement	The SRS shall interface with the Controller HMI via the AFDPS to provide the ATCO with the capability to define the end-point of a pushback, pull out, or push-pull procedure manually and independent from any pre-defined destination point.
Title	Manual Pushback and Push-Pull Destination
Status	<Validated>
Rationale	Sometimes the pre-defined destination positions are not sufficient to optimise a traffic situation. So, the ATCO must always be able to define a destination position free of any limitations.
Category	<Functional>
Validation Method	
Verification Method	<Test>

746
747　　[REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0013	<Full>

<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

748
749
750   [REQ]

Identifier	REQ-12.03.03-TS-3010.0070
Requirement	Via its interface with the Controller HMI and the AFDPS, the SRS shall permit a pushback procedure to be manually combined with a pull-action.
Title	Manual Definition of Push-Pull Route
Status	<Validated>
Rationale	The ATCO must be able to link any manually defined push procedure with any manually defined pull procedure to create a push-pull procedure.
Category	<Functional>
Validation Method	
Verification Method	<Test>

751
752   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0014	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

753
754
755
756   [REQ]

Identifier	REQ-12.03.03-TS-3010.0090
Requirement	If an incompatibility between the aircraft type and specific taxiway capabilities is detected, the SRS shall select another valid segment.
Title	Taxiway Capability Check 2
Status	<Validated>
Rationale	In the process of defining a route, a taxiway segment linking the selected nodes could be incapable of the weight or dimensions of the mobile and shall therefore not be included into the route for safety reasons.
Category	<Functional>
Validation Method	
Verification Method	<Test>

757
758   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0004	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

759
760
761   [REQ]

Identifier	REQ-12.03.03-TS-3010.0100
Requirement	The routes generated by the SRS shall contain information about their respective operational status (planned, pending, or cleared).
Title	Route Operational Status
Status	<Validated>
Rationale	The status of a route may affect how the system deals with it.
Category	<Functional>
Validation Method	

Verification Method	<Test>

762

763 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0004	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

764

765

766 [REQ]

Identifier	REQ-12.03.03-TS-3010.0110
Requirement	The SRS shall allow the generation of routes in manual mode by overriding any constraint or limitation.
Title	Manual Restrictions
Status	<Validated>
Rationale	In manual mode ATCOs have total freedom, so they can use it in situations when is needed to route mobiles through unconventional paths or when the system is failing and the limitations shown are not reliable.
Category	<Functional>
Validation Method	
Verification Method	<Test>

767

768 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAR.0003	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

769

770

771 [REQ]

Identifier	REQ-12.03.03-TS-3010.0120
Requirement	The SRS shall not revert to planned status a cleared or pending route.
Title	Route Status
Status	<Validated>
Rationale	Once a TAXI or PUSH BACK clearance has been received, the mobile enters into the execution phase of its movement and the planned route does not exist any more
Category	<Functional>
Validation Method	
Verification Method	<Test>

772

773 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0005	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

774

775

776 [REQ]

Identifier	REQ-12.03.03-TS-3010.0130
Requirement	The SRS shall take into account the aircraft type to provide the holding points.
Title	Holding Point Dependency on Aircraft Type
Status	<Validated>

Rationale	The SRS needs to receive information to select the appropriate holding point according to the aircraft type in order to give the appropriate runway length for take-off.
Category	<Functional>
Validation Method	
Verification Method	<Test>

777
778 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGIN.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

779
780
781
782 [REQ]

Identifier	REQ-12.03.03-TS-3010.0150
Requirement	The SRS shall plan routes for every vehicle, with a movement plan, operating on or across the runway or on taxiways in LVC or conducting towing operations.
Title	Vehicle Routes
Status	<Validated>
Rationale	Most critical vehicle movements have to be coordinated with the rest of the taxiing operations in order to operate in an efficient and safe way.
Category	<Functional>
Validation Method	
Verification Method	<Test>

783
784 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0022	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

785
786
787 [REQ]

Identifier	REQ-12.03.03-TS-3010.0160
Requirement	The SRS shall treat linked mobiles, which include both cooperative mobiles and non-cooperative ones and which share the same route, as one target for the purpose of taxi route calculation.
Title	Linked Mobiles
Status	<In Progress>
Rationale	To simplify the operations and to avoid giving contradictory instructions, mobiles taking part in the same operation have to be considered one entity. Even though mobiles were able to be linked in different validations, it is not considered as validated because there are different cases that need to be further detailed, such as sweeping or towing
Category	<Functional>
Validation Method	
Verification Method	<Test>

788
789 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0016	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A

<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

790

3.1.2 Conflict Handling

791
792
793 This block of requirements is considered by project 12.03.03 as the starting point to handle conflicting
794 situations so that the SRS tries to solve them. These conflicting situations are not yet explicitly defined
795 and prioritized, yet we could take as examples converging traffic, or crossing traffic. The SRS aims to
796 minimize these kinds of situations. The expectation at this time is to investigate on this field, rather
797 than providing a 100% free-conflict routes. Guidance (project 12.03.04) is the main responsible for
798 handling conflict situations.
799
800 [REQ]

Identifier	REQ-12.03.03-TS-3020.0010
Requirement	The SRS shall optimise routes taking into account possible conflicting situations in the designated area(s) of the airport.
Title	Non-conflicting Routes
Status	<In Progress>
Rationale	It is desirable that taxi routes generated by the SRS should not be in conflict with other routes already assigned. Conflicting situations are being defined in the OSED at the time this document is written. Depending on local implementation, the route optimisation process can either be performed only inside a series of designated Focus Areas or within the whole airport layout.
Category	<Functional>
Validation Method	
Verification Method	<Test>

801
802 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFO.0001	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

803
804
805 [REQ]

Identifier	REQ-12.03.03-TS-3020.0020
Requirement	It shall be possible to define Focus Areas within the entire movement area of an airport.
Title	Focus Area Definition 1
Status	<In Progress>
Rationale	Since each airport layout has its own characteristics, the definition of Focus Areas should be locally configurable.
Category	<Functional>
Validation Method	
Verification Method	<Test>

806
807 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFF.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

808

809
810 [REQ]

Identifier	REQ-12.03.03-TS-3020.0030
Requirement	Focus Areas shall be permanently predefined in the SRS data base.
Title	Focus Area Definition 2
Status	<In Progress>
Rationale	It can be assumed that all Focus Areas permanently exist in the movement area of an airport. Therefore, the SRS shall have pre-defined Focus Areas.
Category	<Functional>
Validation Method	
Verification Method	<Test>

811
812 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFF.0004	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

813
814
815 [REQ]

Identifier	REQ-12.03.03-TS-3020.0040
Requirement	If the optimisation process is limited to Focus Areas, route optimisation shall be limited to taxiways, nodes or route segments located in a Focus Area.
Title	Route optimisation within Focus Areas 1
Status	<In Progress>
Rationale	Route segments that are not optimised will be based on standard routes.
Category	<Functional>
Validation Method	
Verification Method	<Test>

816
817 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFO.0002	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

818
819
820 [REQ]

Identifier	REQ-12.03.03-TS-3020.0050
Requirement	If the optimisation process is limited to Focus Areas, planned routes which are not located within a Focus Area shall not be modified based on other planned movements.
Title	Route Optimisation outside Focus Areas
Status	<In Progress>
Rationale	The main goal of Focus Areas is to ensure taxi route stability.
Category	<Functional>
Validation Method	
Verification Method	<Test>

821
822 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFO.0004	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

823

824

825   [REQ]

Identifier	REQ-12.03.03-TS-3020.0060
Requirement	For the route optimisation process within the Focus Area, the SRS shall find a solution for all planned routes in this area.
Title	Route Optimisation within Focus Areas 2
Status	<In Progress>
Rationale	Inside Focus Areas, the SRS shall find the best solution possible either via re-routing or re-sequencing.
Category	<Functional>
Validation Method	
Verification Method	<Test>

826

827   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFF.0001	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

828

3.1.3 De-icing Requirements

829

830   [REQ]

Identifier	REQ-12.03.03-TS-3040.0010
Requirement	If remote de-icing is requested, the SRS shall propose a route that goes through the relevant de-icing bay.
Title	De-icing
Status	<Validated>
Rationale	The SRS shall adapt to de-icing procedures, as it would do to any other constraint to the route generation process.
Category	<Functional>
Validation Method	
Verification Method	<Test>

831

832   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0026	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

833

834

835   [REQ]

Identifier	REQ-12.03.03-TS-3040.0020
Requirement	When de-icing is requested, the SRS shall take into account the estimated de-icing time for taxi time calculations.
Title	Estimated Taxi Time including De-icing
Status	<In Progress>
Rationale	The estimated unimpeded taxi time computed by the SRS has to include also the expected de-icing time.
Category	<Functional>
Validation Method	
Verification Method	<Test>

836

837   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.00272	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

838

3.1.4 Controller HMI Requirements

840

841 This section describes functional HMI requirements impacting the SRS. Note that fully HMI
842 requirements are out of the scope of this project. The interaction between SRS and the Controller HMI
843 is normally done via the AFDPS, which is in charge of storing and distributing the information.

844
845 [REQ]

Identifier	REQ-12.03.03-TS-3050.0010
Requirement	The ATCO-SRS interaction shall be only possible through the interface to the Controller HMI.
Title	ATCO-SRS Interaction
Status	<Validated>
Rationale	All interaction with the SRS has to be made using the same method to avoid redundancy or an unnecessary increase in the controllers' workload.
Category	<Functional>
Validation Method	
Verification Method	<Test>

846
847 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0001	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

848
849
850
851 [REQ]

Identifier	REQ-12.03.03-TS-3050.0020
Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to modify routes in the semi-automatic mode of operation.
Title	Controller HMI Interface 1
Status	<Validated>
Rationale	The ATCO needs to be able to modify routes proposed by the SRS.
Category	<Functional>
Validation Method	
Verification Method	<Test>

852
853 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0002	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

854
855
856 [REQ]

Identifier	REQ-12.03.03-TS-3050.0030
Requirement	The SRS shall interface to the Controller HMI to permit the display of

	planned, cleared and pending routes.
Title	Controller HMI Interface 2
Status	<Validated>
Rationale	The ATCO may need different information in different traffic situations. Routes partially cleared will be displayed when the ATCO chooses to see "cleared routes" (the whole route will be displayed, pending segments included).
Category	<Functional>
Validation Method	
Verification Method	<Test>

857
858   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0003	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

859
860
861   [REQ]

Identifier	REQ-12.03.03-TS-3050.0040
Requirement	The SRS shall permit the routes for all mobiles to be available for display on the Controller HMI at all times.
Title	Controller HMI Interface 3
Status	<Validated>
Rationale	ATCOs shall have access to the taxi route information at all times.
Category	<Functional>
Validation Method	
Verification Method	<Test>

862
863   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0007	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

864
865
866   [REQ]

Identifier	REQ-12.03.03-TS-3050.0050
Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to request automatically generated alternative routes to a proposed one.
Title	Alternative Routes
Status	<Validated>
Rationale	The SRS shall be able to provide alternative taxi routes as it may be quicker compared to the ATCO modifying the route in semi-automatic mode.
Category	<Functional>
Validation Method	
Verification Method	<Test>

867
868   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0016	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

869

870
871   [REQ]

Identifier	REQ-12.03.03-TS-3050.0060
Requirement	Whenever a new constraint (e.g. closure of a taxiway segment) occurs, the SRS shall propose the new recalculated routes to the Controller HMI.
Title	Route Recalculation to the HMI in Case of Constraint
Status	<In Progress>
Rationale	In case of the appearance of a new constraint, the planned routes of mobiles affected by the automatic re-routing have to be shown to the ATCO. The behaviour of the SRS needs to be more detailed at operational level. For instance, whether all routes need to be recalculated, different constraints cases, or what to do when the constraints is over.
Category	<Functional>
Validation Method	
Verification Method	<Test>

872
873   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0011	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

874
875
876   [REQ]

Identifier	REQ-12.03.03-TS-3050.0070
Requirement	If the SRS recalculates a cleared route in case of an unplanned constraint, it shall send the new proposal to the Controller HMI, in priority to any other route proposal.
Title	Cleared Rerouting Proposal
Status	<In Progress>
Rationale	In case of the appearance of a new constraint, the cleared routes of mobiles affected by the automatic re-routing have to be shown in priority to the ATCO. The modified part of the cleared route becomes a pending route. Similarly to 3050.0060, this concept needs to be further detailed at operational level.
Category	<Functional>
Validation Method	
Verification Method	<Test>

877
878   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0012	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

879
880
881   [REQ]

Identifier	REQ-12.03.03-TS-3050.0080
Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to modify cleared routes within his/her AoR.
Title	Route Modification 1
Status	<Validated>
Rationale	If an airport has multiple AoRs, the responsibility of an ATCO for the modification of a cleared route is limited to a specified geographical area.
Category	<Functional>

Validation Method	
Verification Method	<Test>

882
883   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0007	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

884
885
886   [REQ]

Identifier	REQ-12.03.03-TS-3050.0090
Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to modify planned or pending routes within his/her AoR
Title	Route Modification 2
Status	<Validated>
Rationale	If an airport has multiple AoRs, the ATCO will have the possibility to modify the planned route in his/her AoR without coordination.
Category	<Functional>
Validation Method	
Verification Method	<Test>

887
888   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0008	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

889
890
891   [REQ]

Identifier	REQ-12.03.03-TS-3050.0100
Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to modify planned routes outside his/her AoR, independently of the current mobile position.
Title	Route Modification 3
Status	<In Progress>
Rationale	If an airport has multiple AoRs, the responsibility of an ATCO is limited to a specified geographical area. Planning routes outside the AoR can be done under coordination with the responsible ATCO. This concept needs to be further detailed, like the kind of coordination needed. Validation exercises with multiple and complex AoRs have provided different conclusions.
Category	<Functional>
Validation Method	
Verification Method	<Test>

892
893   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0009	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

894
895
896   [REQ]

Identifier	REQ-12.03.03-TS-3050.0110

Requirement	The SRS shall interface to the Controller HMI to permit the ATCO to clear routes within his/her AoR only.
Title	Route Clearance
Status	<Validated>
Rationale	The SRS needs to limit the ATCO clearances to his AoR
Category	<Functional>
Validation Method	
Verification Method	<Test>

897

898 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGGE.0010	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

899

900

901 [REQ]

Identifier	REQ-12.03.03-TS-3050.0120
Requirement	It shall be possible via the interface to the Controller HMI for the ATCO to define temporary Focus Areas.
Title	Temporary Focus Area Creation
Status	<In Progress>
Rationale	For all temporary constraints in the movement area of an airport, the ATCO shall have the possibility to define Focus Areas. Consequently, the SRS would start optimising route segments within these new defined areas.
Category	<Functional>
Validation Method	
Verification Method	<Test>

902

903 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFF.0005	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

904

905

906 [REQ]

Identifier	REQ-12.03.03-TS-3050.0130
Requirement	It shall be possible, via the interface between the Controller HMI and the SRS, to remove temporary Focus Areas.
Title	Temporary Focus Area Removal
Status	<In Progress>
Rationale	If the ATCO is able to define temporary Focus Areas, he/she shall also have the possibility to remove these areas.
Category	<Functional>
Validation Method	
Verification Method	<Test>

907

908 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RPFF.0006	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

909

910

911   [REQ]

Identifier	REQ-12.03.03-TS-3050.0140
Requirement	The SRS shall interface to the Controller HMI to inform the ATCO if no route is available for this mobile and which data is missing.
Title	Unavailable Route
Status	<Validated>
Rationale	ATCOs shall be informed in case a route has not yet been generated. The information will be filtered or interpreted at HMI level
Category	<Functional>
Validation Method	
Verification Method	<Test>

912

913   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAU.0013	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

914

915

916   [REQ]

Identifier	REQ-12.03.03-TS-3050.0150
Requirement	The SRS shall interface with the Controller HMI and provide a warning if a manual route update overrides existing constraints (e.g. use of direction on a taxiway).
Title	Manual Override Warning
Status	<Validated>
Rationale	Provision of specific warning in case manual route update overrides aerodrome layout rules will support the ATCO to build a reliable picture about surface movements.
Category	<Functional>
Validation Method	
Verification Method	<Test>

917

918   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGED.0008	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

919

920

921

3.2 Adaptability Requirements

923   N/A

3.3 Safety and Security Requirements

925   [REQ]

Identifier	REQ-12.03.03-TS-3060.0010
Requirement	The SRS shall continuously transmit information to the Technical Supervision function to indicate that it is alive and functioning correctly.
Title	Alive Indication 1
Status	<Validated>

Rationale	Continuous monitoring of the SRS status allows detecting possible failures.
Category	<Safety>
Validation Method	
Verification Method	<Test>

926
927   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0001.0010	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0002.0009	<Partial>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

928
929   [REQ]

Identifier	REQ-12.03.03-TS-3060.0020
Requirement	The SRS shall continuously transmit information to the Controller HMI to indicate that it is alive and functioning correctly.
Title	Alive Indication 2
Status	<Validated>
Rationale	The alert will be useful to notify the failure of the SRS to the ATCO who has to apply the foreseen backup procedures.
Category	<Safety>
Validation Method	
Verification Method	<Test>

930
931   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0001.0020	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

932
933   [REQ]

Identifier	REQ-12.03.03-TS-3060.0030
Requirement	Via its interfaces to the Controller HMI and the Technical Supervision function, the SRS shall permit manual intervention by the control authority at any time.
Title	Manual Intervention
Status	<Validated>
Rationale	Manual Intervention during Automatic Operation has to be considered as a mitigation to unexpected events and, as such, might be considered safety relevant.
Category	<Safety>
Validation Method	
Verification Method	<Test>

934
935   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0001.0050	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

936
937   [REQ]

Identifier	REQ-12.03.03-TS-3060.0040
Requirement	All the planned taxi routes proposed by the SRS shall be aligned with the

		actual operational situation described by current and scheduled operational constraints.
	Title	Operational Constraints
	Status	<Validated>
	Rationale	For safety reasons, it is important to take into account the actual operational situation (e.g. runway configuration/stand change, taxiway closure).
	Category	<Safety>
	Validation Method	
	Verification Method	<Test>

938

939 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0001.0110	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

940

941 [REQ]

Identifier	REQ-12.03.03-TS-3060.0050
Requirement	The SRS shall automatically control input data to validate the data format and range.
Title	Data Validation
Status	<Validated>
Rationale	Data shall be validated in format and range to prevent human errors.
Category	<Performance>
Validation Method	
Verification Method	<Test>

942

943 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0002.0030	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

944

945 [REQ]

Identifier	REQ-12.03.03-TS-3060.0060
Requirement	Data manually input to the SRS shall include a source identifier.
Title	Source Identifier
Status	<In Progress>
Rationale	Input data shall be identified with its source to provide a better control of ATCO's work and be capable to predict further conflicts that may incur.
Category	<Performance>
Validation Method	
Verification Method	<Test>

946

947 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0002.0040	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

948

949 [REQ]

Identifier	REQ-12.03.03-TS-3060.0070
Requirement	The SRS shall automatically recalculate routes upon receiving an update in a surface constraint.

Title	Constraint Updates
Status	<Validated>
Rationale	Reaction time in front of an unexpected surface constraint is critical for a correct and agile update of the planned routes.
Category	<Performance>
Validation Method	
Verification Method	<Test>

950

951   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0002.0050	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

952

953   [REQ]

Identifier	REQ-12.03.03-TS-3060.0080
Requirement	The SRS should avoid generating taxi route updates too close (in parameter time) to the TLDT/TSAT.
Title	Time Window
Status	<Validated>
Rationale	It will set an affordable reaction time for both the ATCO and the SRS to answer in front of a request from the flight crew/vehicles, in normal conditions. The parameter depends on local implementations. When interfacing with DMAN, the DMAN protects the sequence by not altering it with "late" route modifications with normally small effects on the expected time at the holding point. It has been implemented configurable, as specified in REQ 2010.0220
Category	<Performance>
Validation Method	
Verification Method	<Test>

954

955   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-SPR-0002.0190	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

956

3.4 Maintainability

958   N/A

3.5 Reliability

960   N/A

3.6 Functional Block Internal Data Requirements

962   N/A

3.7 Design and Construction Constraints

964   N/A

965 ## 3.8 Functional Block Interface Requirements

966

967 [REQ]

Identifier	REQ-12.03.03-TS-0010.0020
Requirement	In order to compute planned taxi routes for aircraft movements, the SRS shall receive time-stamped flight plan information for all aircraft scheduled to arrive or depart the aerodrome within the next <configurable parameter time>. The flight plan data shall include at least the following items: • Aircraft Identification (callsign) • Departure Aerodrome (ADEP) • Destination Aerodrome (ADES) • Runway Allocation • Estimated Time of Arrival or Landing (ETA ELDT or TLDT, if available, for arrivals) • Estimated Off-Block Time or Target Start-up Approval Time (EOBT or TSAT, if available) (for departures) • Aircraft Type (ARCTYP)
Title	Flight Plan Data
Status	<Validated>
Rationale	The SRS needs flight plan information in order to plan taxi routes for arriving and departing aircraft.
Category	<Functional>
Validation Method	
Verification Method	<Test>

968

969 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0016	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0017	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0004	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0012	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

970

971

972 [REQ]

Identifier	REQ-12.03.03-TS-0010.0030
Requirement	In order to compute planned taxi routes for vehicle movements, the SRS shall receive time stamped vehicle movement plan information for all expected vehicle movements within the next <configurable parameter time>. The vehicle movement plan data shall include at least the following items: • Vehicle Identification (callsign) • Type of movement (proceed or tow) • Origin • Destination
Title	Vehicle Movement Plan Data
Status	<Validated>
Rationale	The SRS needs vehicle movement plan information in order to plan taxi routes for vehicles.
Category	<Functional>
Validation Method	

Verification Method	<Test>

973

974 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0016	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

975

976 [REQ]

Identifier	REQ-12.03.03-TS-0010.0130
Requirement	The SRS shall receive all aerodrome topology data needed to designate any taxi route on the aerodrome surface in conformance with AIP terminologies. The data shall include at least the following items: • Runway threshold identifiers and positions; • Runway and taxiway node identifiers and positions; • Stand identifiers and positions; • List of taxiway segments (a segment is a list of nodes that are joined together) and rules for each segment; • Taxiway names and associated segments; • Holding points with their category (CAT I or CAT II/III) identifiers and positions; • Holding bays identifiers and positions; • De-icing and remote de-icing areas identifiers and positions; • Apron identifiers and positions
Title	Aerodrome Topology
Status	<Validated>
Rationale	The SRS needs to know the layout of the aerodrome movement area in order to compute taxi routes.
Category	<Functional>
Validation Method	
Verification Method	<Test>

977

978 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0001	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0007	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0006	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0012	<Partial>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0010	<Partial>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

979

980 [REQ]

Identifier	REQ-12.03.03-TS-0030.0030
Requirement	The SRS shall interface with an external Surveillance function to receive mobiles position information and identification (if possible).
Title	Reception of Surveillance Information
Status	<Validated>
Rationale	When assigning routes, and when it receives a route change request, the SRS needs to know the accurate position of the mobile.

Category	<Functional>
Validation Method	
Verification Method	<Test>

981

982 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0015	<Full>
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0016	<Full>
<APPLIES TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED TO>	<Functional block>	Surface Routing	N/A

983

984

985 [REQ]

Identifier	REQ-12.03.03-TS-3070.0020
Requirement	The Surface Routing Server (SRS) shall receive, from the appropriate source, the estimated de-icing time.
Title	Reception of De-icing Time
Status	<In Progress>
Rationale	The SRS needs the estimated de-icing time in order to calculate the estimated taxi time. The different validations using 12.03.03 prototypes have used simple/fixed de-icing times. There is still a need to mature the concept with complex de-icing management which may include dynamic interactions.
Category	<Functional>
Validation Method	
Verification Method	<Test>

986

987 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0014	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

988

989 [REQ]

Identifier	REQ-12.03.03-TS-3070.0030
Requirement	The SRS shall interface with the SSN server to receive route deviation alerts and compute and propose a new taxi route whenever it receives a route deviation alert.
Title	Reception of Route Deviation Alert
Status	<Validated>
Rationale	Following a route deviation, a new taxi route proposal is required from the current position to the destination. The request normally comes from the AFDPS
Category	<Interface>
Validation Method	
Verification Method	<Test>

990

991 [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<Information Exchange Requirement>	IER-06.07.02-OSED-0001.0015	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A

<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

992

993   [REQ]

Identifier	REQ-12.03.03-TS-3070.0040
Requirement	The SRS shall interface to any authorized client to permit route information to be transmitted.
Title	Client Interface
Status	<Validated>
Rationale	The logical flow of data is shown in section 2.4 of this document.
Category	<Interface>
Validation Method	
Verification Method	<Test>

994

995   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGHM.0007	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

996

997

998   [REQ]

Identifier	REQ-12.03.03-TS-3010.0140
Requirement	The SRS shall record and store the runway exit used per aircraft.
Title	Recording of RWY Exit Used
Status	<Validated>
Rationale	The SRS will use this data to choose the taxi route start-point for arriving aircraft.
Category	<Functional>
Validation Method	
Verification Method	<Test>

999

1000   [REQ Trace]

Relationship	Linked Element Type	Identifier	Compliance
<SATISFIES>	<ATMS Requirement>	REQ-06.07.02-OSED-RGAR.0004	<Full>
<APPLIES_TO>	<Operational Focus Area>	OFA04.02.01	N/A
<ALLOCATED_TO>	<Project>	12.03.03	N/A
<SATISFIES>	<Enabler>	AERODROME-ATC-12	<Partial>
<ALLOCATED_TO>	<Functional block>	Surface Routing	N/A

1001

1002

4 Assumptions

The status of the requirements in section 3 is either "in progress" or "validated". The status "validated" has been set to requirements that the project considers have completed the V3 maturity level by the end of the project. This analysis of maturity has been done mostly over the different Release 5 exercises in which project 12.03.03 has been involved. The Release 5 validation report was not available by the time this analysis was made. The project has held several meetings with the partners and other actors in order to have the most coherent analysis of maturity.

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] ICAO Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual. Doc 9830 AN/452. First Edition (2004).

[6] 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).

[7] EUROCONTROL Airport CDM Implementation Manual (2008)

[8] SESAR P12.03.03 D14 – Phase 3 System Requirements Specifications, December 2014

[9] SESAR P06.07.02 D76 – Second Integrated Surface Management Interim OSED(November 2015)

[10] SESAR P12.01.07 Technical Architecture Description, Step 1 3rd iteration, v00.03.00 (July 2014)

[11] SESAR P06.07.02 D77 – OFA04.02.01 (Integrated Surface Management) Interim SPR (August 2015)

[12] SESAR P06.08.04 D13 – Preliminary OSED, v00.01.02 (October 2013)

[13] SESAR P06.03.01_Release5 VALP (January 2016)

[14] SESAR P12.04.04 D18 – S2V3 System requirements definition (August 2015)

[15] B.01-D83 Integrated Roadmap DS15 Release Note, 00.01.00, 22/12/2015

5.1 Use of copyright / patent material /classified material

N/A

1042 # Appendix A   Traceability

1043

1044 The following table synthesizes the traceability between Technical Requirements (TS) and the
1045 Operational, Safety and Performance Requirements defined in P 6.7.2 D77 OFA04.02.01 (Integrated
1046 Surface Management) Interim SPR [11], and all the Requirements from P 6.7.2 D76 Second
1047 Integrated Surface Management Interim OSED [9]. It includes also the D76 requirements not
1048 considered by 12.3.3.
1049

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
REQ-06.07.02-OSED-RGAU.0016	Alternative Route Proposal Automatic Mode	REQ-12.03.03-TS-3050.0050	Alternative Routes
REQ-06.07.02-OSED-RGAU.0001	Automatic Mode Route Generation Not Requiring ATCO Input	REQ-12.03.03-TS-2010.0180	Automatic Mode
REQ-06.07.02-OSED-RGGE.0001	Three Different Levels of Automation (Operational Modes)	REQ-12.03.03-TS-2010.0010	Levels of Automation
REQ-06.07.02-OSED-RGGE.0015	Capability to Manage Operational Change Automatically	REQ-12.03.03-TS-3010.0020	Airport Configuration Data
REQ-06.07.02-OSED-RGGE.0013	APTR Integration into Routes	REQ-12.03.03-TS-2010.0030	APTR Integration into Routes
REQ-06.07.02-OSED-RGGE.0014	Destination Point of Pushbacks	REQ-12.03.03-TS-2010.0040	Destination Point of Pushbacks
REQ-06.07.02-OSED-RGGE.0009	Route Modification for Routes through Multiple AoRs	REQ-12.03.03-TS-3050.0100	Route Modification 3
REQ-06.07.02-OSED-RGGE.0007	Route Modification for Routes through Multiple AoRs	REQ-12.03.03-TS-3050.0080	Route Modification 1
REQ-06.07.02-OSED-RGGE.0008	Planned route Modification within the ATCO's AoR	REQ-12.03.03-TS-3050.0090	Route Modification 2
REQ-06.07.02-OSED-RGED.0002	Handover Point Adjustment	REQ-12.03.03-TS-2010.0120	Semi-automatic Mode
REQ-06.07.02-OSED-RGGE.0003	Routing and Planning Service Route Generation Capability	REQ-12.03.03-TS-2010.0070	Route Nodes
REQ-06.07.02-OSED-RGGE.0006	Planning scope	REQ-12.03.03-TS-2010.0080	Multiple AoRs
REQ-06.07.02-OSED-RGAU.0002	Planning starting time	REQ-12.03.03-TS-2010.0220	Planned Route Creation Time Window
REQ-06.07.02-OSED-RGAU.0003			
REQ-06.07.02-OSED-RGAU.0006	Starting point for arrivals	REQ-12.03.03-TS-3010.0085	Determination of Runway Exit for Arrivals based on statistical values

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
REQ-06.07.02-OSED-RGGE.0028	Starting point for EBS-equipped arriving aircraft	REQ-12.03.03-TS-3010.0095	Downlinked Runway Exit Point
		REQ-12.03.03-TS-3010.0096	Runway exit point
REQ-06.07.02-OSED-RGIN.0003	Routing and Planning Service – airport data systems interface – holding point	REQ-12.03.03-TS-3010.0130	Holding Point Dependency on Aircraft Type
REQ-06.07.02-OSED-RGAU.0022	Planning routes to vehicles	REQ-12.03.03-TS-2010.0100	Planning routes to vehicles
		REQ-12.03.03-TS-3010.0150	Vehicle Routes
REQ-06.07.02-OSED-RGGE.0020	Rerouting calculation	REQ-12.03.03-TS-2010.0110	Route Recalculation in Case of Constraint
REQ-06.07.02-OSED-RGHM.0011	Rerouting proposal	REQ-12.03.03-TS-3050.0060	Route Recalculation to the HMI in Case of Constraint
REQ-06.07.02-OSED-RGHM.0012	Cleared rerouting proposal	REQ-12.03.03-TS-3050.0070	Cleared Rerouting Proposal
REQ-06.07.02-OSED-RPFG.0023	Linking mobiles	Not Covered (VDS HMI)	
REQ-06.07.02-OSED-RGGE.0016	Linked mobiles management	REQ-12.03.03-TS-3010.0160	Linked Mobiles
REQ-06.07.02-OSED-RGGE.0019	Constraints	REQ-12.03.03-TS-2010.0140	Taxiway Constraints
REQ-06.07.02-OSED-RGGE.0022	Initial estimated unimpeded taxi time calculation	REQ-12.03.03-TS-2010.0150	Estimated Taxi Time from Start
REQ-06.07.02-OSED-RGGE.0023	Remaining estimated unimpeded taxi time calculation	REQ-12.03.03-TS-2010.0160	Estimated Taxi Time from Current Position
REQ-06.07.02-OSED-RGGE.0024	Initial and remaining estimated unimpeded taxi time update	REQ-12.03.03-TS-3010.0040	Taxi Time Update
REQ-06.07.02-OSED-RGED.0009	Route Generation Not Requiring Specific Direction	REQ-12.03.03-TS-2010.0120	Semi-automatic Mode
REQ-06.07.02-OSED-RGED.0015	Route Completion	Not Covered (HMI)	
REQ-06.07.02-OSED-RGED.0016	Route Modification Possible Anytime	Not Covered (HMI)	
REQ-06.07.02-OSED-RGED.0011	Pre-Defined Pushback and Push-Pull Destination Integration in Manual Mode	REQ-12.03.03-TS-3010.0065	Pre-Defined Pushback and Pull-Out Destination
REQ-06.07.02-OSED-RGED.0012	Pre-Defined Pushback and Push-Pull Destination Integration at APTR Airport	REQ-12.03.03-TS-3010.0060	Pre-Defined Pushback and Push-Pull
REQ-06.07.02-OSED-RGED.0013	Free and Manual Pushback and Push-Pull Destination Integration	REQ-12.03.03-TS-3010.0066	Manual Pushback and Push-Pull Destination
REQ-06.07.02-OSED-RGED.0014	Manual Definition of Push-Pull Route	REQ-12.03.03-TS-3010.0070	Manual Definition of Push-Pull Route

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
REQ-06.07.02-OSED-RGAU.0011	Route Generator Checks Aircraft Type	REQ-12.03.03-TS-2010.0140	Taxiway Constraints
REQ-06.07.02-OSED-RGAU.0013	Unavailable route	REQ-12.03.03-TS-3050.0140	Unavailable Route
REQ-06.07.02-OSED-RGED.0003	Route Generator Checks Capabilities of Taxiways	REQ-12.03.03-TS-2010.0140	Taxiway Constraints
REQ-06.07.02-OSED-RGED.0004	Free and Manual Pushback and Push-Pull Destination Integration Manual Mode	REQ-12.03.03-TS-3010.0090	Taxiway Capability Check 2
REQ-06.07.02-OSED-RGED.0005	Route Modification Finished Indication	REQ-12.03.03-TS-3010.0030	Route Modification Finished Indication
REQ-06.07.02-OSED-RGAU.0020	Constraint Table Manager	REQ-12.03.03-TS-3010.0025	Constraint Editing
REQ-06.07.02-OSED-RGAU.0004	Standard Taxi Routes as Basis for Route Generation in Automatic Mode	REQ-12.03.03-TS-2091.0050	Use of Standard Routes
REQ-06.07.02-OSED-RGAU.0019	Automatic Mode Route Modifications in Case of Change of Runway Direction	REQ-12.03.03-TS-3010.0010	Change of Runway usage
REQ-06.07.02-OSED-RGGE.0004	Route Status	REQ-12.03.03-TS-3010.0100	Route Operational Status
REQ-06.07.02-OSED-RGGE.0005	No reverting to planned status	REQ-12.03.03-TS-3010.0120	Route Status
REQ-06.07.02-OSED-RGAR.0003	Manual mode limitations	REQ-12.03.03-TS-3010.0110	Manual Restrictions
REQ-06.07.02-OSED-RPFI.0003	Routes data base	Not Covered (HMI)	
REQ-06.07.02-OSED-RPS2.0002	Linked mobiles definition	Not Covered (VDS HMI)	
REQ-06.07.02-OSED-RGED.0006	Display of Route Elements on the HMI	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0002	Mode selection	REQ-12.03.03-TS-3050.0020	Controller HMI Interface 1
REQ-06.07.02-OSED-RGHM.0003	Route visualisation	REQ-12.03.03-TS-3050.0030	Controller HMI Interface 2
REQ-06.07.02-OSED-RGHM.0007	Route visualisation 2	REQ-12.03.03-TS-3050.0040	Controller HMI Interface 3
		REQ-12.03.03-TS-3070.0040	Client Interface
REQ-06.07.02-OSED-RGHM.0008	Route generation display	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0016	Single ATCO Input for Multiple Routes	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0017	Planned and Cleared Route Depicted Differently	Not Covered (HMI)	

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
REQ-06.07.02-OSED-RGHM.0001	Routing and Planning Service – controller interaction	REQ-12.03.03-TS-3050.0010	ATCO-SRS Interaction
REQ-06.07.02-OSED-RGHM.0018	Complete route display	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0019	Cleared route display starting from current position	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0010	APTR Display of Selected Centre Line	Not Covered (HMI)	
REQ-06.07.02-OSED-RGED.0010	Pre-Defined Pushback and Pull-Out Destination Depiction	Not Covered (HMI)	
REQ-06.07.02-OSED-RGED.0008	Manual override warning	REQ-12.03.03-TS-3050.0150	Manual Override Warning
REQ-06.07.02-OSED-RPS2.0003	Linked mobiles presentation	Not Covered (HMI)	Flight Plan Data Aerodrome Topology
REQ-06.07.02-OSED-RPFO.0001	Detection of conflicting situations during route generation	REQ-12.03.03-TS-3020.0010	Non-conflicting Routes
REQ-06.07.02-OSED-RPFO.0002	Detection of conflicting situations restricted to Focus Areas	REQ-12.03.03-TS-3020.0040	Focus Areas Conflicts
REQ-06.07.02-OSED-RPFO.0004	Route generation outside Focus Areas	REQ-12.03.03-TS-3020.0050	Route Generation outside Focus Areas
REQ-06.07.02-OSED-RPFF.0001	Resolution of conflicting situations in Focus Areas	REQ-12.03.03-TS-3020.0060	Route Optimisation within Focus Areas 2
REQ-06.07.02-OSED-RPFF.0003	Airport as a Focus Area	REQ-12.03.03-TS-3020.0020	Focus Area Definition 1
REQ-06.07.02-OSED-RPFF.0004	Definition of layout-related Focus Areas	REQ-12.03.03-TS-3020.0030	Focus Area Definition 2
REQ-06.07.02-OSED-RGGE.0010	Route Validation for Routes through Multiple AoRs	REQ-12.03.03-TS-3050.0110	Route Clearance
REQ-06.07.02-OSED-RPFF.0005	Temporary Focus Areas definition	REQ-12.03.03-TS-3050.0120	Temporary Focus Area Creation
REQ-06.07.02-OSED-RPFF.0006	Temporary Focus Area removal	REQ-12.03.03-TS-3050.0130	Temporary Focus Area Removal
REQ-06.07.02-OSED-RGGE.0012	ATCO Route Modification of Planned Route Triggers Route Update	Not Covered (GUIDANCE)	
REQ-06.07.02-OSED-DTXI.0001	Limit on provision of planned route	Not Covered (GUIDANCE)	
REQ-06.07.02-OSED-DTXI.0002	Continuity of uplinked route	Not Covered (GUIDANCE)	
REQ-06.07.02-OSED-DTXI.0005	Use of standardised AMDB for airport layout	Not Covered (PROCEDURAL & HMI)	
REQ-06.07.02-OSED-DTXI.0006	Update of standardised AMDB for airport layout	Not Covered (PROCEDURAL & HMI)	
REQ-06.07.02-OSED-RGAR.0004	Runway exits data base	REQ-12.03.03-TS-3010.0140	RWY Exit Used

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
REQ-06.07.02-OSED-RGHM.0004	Flight crew interface	Not Covered (HMI)	
REQ-06.07.02-OSED-RGHM.0005	Driver interface	Not Covered (VDS HMI)	
REQ-06.07.02-OSED-DTXI.0609	Unable sender functionality	Not Covered (CDS HMI)	
REQ-06.07.02-OSED-DTXI.0610	Unable sender functionality	Not Covered (VDS HMI)	
REQ-06.07.02-OSED-RPS2.0004	Linked mobiles presentation in VDS	Not Covered (VDS HMI)	
REQ-06.07.02-OSED-RGTR.0001	Training requirements	Not Covered (TRAINING)	.
REQ-06.07.02-OSED-RGGE.0026	De-Icing procedures 1	REQ-12.03.03-TS-3040.0010	De-icing
REQ-06.07.02-OSED-RGGE.0027	De-Icing procedures 2	REQ-12.03.03-TS-3040.0020	Estimated Taxi Time including De-icing
IER-06.07.02-OSED-0001.0001	Airport layout	REQ-12.03.03-TS-0010.0130	Aerodrome Topology
IER-06.07.02-OSED-0001.0002	Taxiway preferred directions	REQ-12.03.03-TS-3010.0020	Airport Configuration Data
IER-06.07.02-OSED-0001.0003	Standard routes	REQ-12.03.03-TS-2010.0180	Automatic Mode
IER-06.07.02-OSED-0001.0004	Aircraft type	REQ-12.03.03-TS-0010.0020	Flight Plan Data
IER-06.07.02-OSED-0001.0005	Runway exit	REQ-12.03.03-TS-3010.0095	Downlinked Runway Exit Point
IER-06.07.02-OSED-0001.0006	Allocated stand	REQ-12.03.03-TS-0010.0130	Aerodrome Topology
IER-06.07.02-OSED-0001.0007	Runway holding point	REQ-12.03.03-TS-0010.0130	Aerodrome Topology
IER-06.07.02-OSED-0001.0008	Runway configuration	REQ-12.03.03-TS-3010.0020	Airport Configuration Data
IER-06.07.02-OSED-0001.0009	Scheduled runway configuration change	REQ-12.03.03-TS-3010.0020	Airport Configuration Data
IER-06.07.02-OSED-0001.0010	Taxiway configuration	REQ-12.03.03-TS-0010.0130	Aerodrome Topology
IER-06.07.02-OSED-0001.0012	TSAT	REQ-12.03.03-TS-0010.0020	Flight Plan Data
		REQ-12.03.03-TS-0010.0130	Aerodrome Topology
IER-06.07.02-OSED-0001.0014	Expected De-Icing Time	REQ-12.03.03-TS-3070.0020	Reception of Surveillance Information
IER-06.07.02-OSED-0001.0015	Target report	REQ-12.03.03-TS-3070.0030	Reception of Route Deviation Alert

06.07.02 OSED / SPR Requirement		12.03.03 TS Requirement	
Identifier	**Title**	**Identifier**	**Title**
		REQ-12.03.03-TS-0030.0030	Reception of Surveillance Information
		REQ-12.03.03-TS-3010.0096	Runway Exit Point
IER-06.07.02-OSED-0001.0016	Mobile Id	REQ-12.03.03-TS-0010.0020	Flight Plan Data
		REQ-12.03.03-TS-0010.0030	Vehicle Movement Plan Data
		REQ-12.03.03-TS-0030.0030	Reception of Surveillance Information
IER-06.07.02-OSED-0001.0017	ELDT	REQ-12.03.03-TS-0010.0020	Flight Plan Data
IER-06.07.02-OSED-0002.0001	Planned route	REQ-12.03.03-TS-2010.0110	Route Recalculation in Case of Constraint
IER-06.07.02-OSED-0002.0002	Estimated taxi time	REQ-12.03.03-TS-2010.0150	Estimated Taxi Time from Start
IER-06.07.02-OSED-0002.0009	Status of the Routing and Planning Service	REQ-12.03.03-TS-3060.0010	Alive Indication 1
IER-06.07.02-OSED-0002.0010	Remaining taxi time	REQ-12.03.03-TS-2010.0160	Estimated Taxi Time from Current Position
REQ-06.07.02-SPR-0001.0010	Connection with the supervision function	REQ-12.03.03-TS-3060.0010	Alive Indication 1
REQ-06.07.02-SPR-0001.0020	Alert notification on the controller HMI	REQ-12.03.03-TS-3060.0020	Alive Indication 2
REQ-06.07.02-SPR-0001.0050	Manual intervention	REQ-12.03.03-TS-3060.0030	Manual Intervention
REQ-06.07.02-SPR-0001.0110	Actual operational situation	REQ-12.03.03-TS-3060.0040	Operational Constraints
REQ-06.07.02-SPR-0002.0030	Input data validation tools	REQ-12.03.03-TS-3060.0050	Data Validation
REQ-06.07.02-SPR-0002.0040	Input data identifier	REQ-12.03.03-TS-3060.0060	Source Identifier
REQ-06.07.02-SPR-0002.0050	Surface constraints update	REQ-12.03.03-TS-3060.0070	Constraint Updates
REQ-06.07.02-SPR-0002.0190	Request time-margin	REQ-12.03.03-TS-3060.0080	Time Window

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1053 **-END OF DOCUMENT-**

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