

## P04.07.07 Safety and Performance Requirements (SPR)

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#### Abstract

This report addresses the Safety and Performance Requirements (SPR) for the Dynamic Capacity Management in a High Density Area for Step 1. This is the Final edition, which is an enhancement of the Preliminary edition (04.07.07.D22) and contains Safety and Performance Requirements derived from the P04.07.07.D25 OSED Operational Requirements.

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#### Rational for rejection

None.

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| 00.01.02 | 03/04/2013 | Final  |        | Change to REQ Trace:<br>from 4.7.7 to 04.07.07 |
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## **Executive summary**

This document is the final version that specifies the Safety and Performance Requirements for Dynamic Capacity Management in a High Density Area within the context of the Single European Sky Air Traffic Management (ATM) Research and Development Programme (SESAR) Concept Story Board - Step 1. The SESAR concept envisages managing capacity in high-density airspace. P04.07.07 provides part of the solution to addressing a mismatch of demand and capacity in high density airspace.

AENA has developed a prototype tool that assesses predicted demand and provides advice on matching capacity to this demand. The tool recommends a sector configuration at Barcelona Area Control Centre (ACC), utilising bandboxing and splitting sectors to best match forecast demand. This has been validated at V3 using the scenario of Northbound summer traffic from the Balearics to the UK and Germany (that can overload French sectors) as it leaves the Barcelona FIR.

NATS has validated at V2 three complementary concept 'layers' to progressively reduce forecast complexity in a pre-tactical to near-tactical time-scale using the scenario of Eastbound traffic on the North Atlantic (NAT) tracks that interferes with the first rotation of UK domestic and other short haul traffic. The concept layers are an oceanic clearance optimiser that recommends optimised clearances based on forecast demand, replacing clearances based on the basis of first come, first served. The second concept element is High Level Direct Routing (HLDR) that permits aircraft overflying the UK to take a more direct track to their destination, thereby saving fuel and reducing traffic bunching. The third concept element is Inbound Longitudinal Streaming, which uses an extended Arrival Manager (AMAN) horizon concept developed in SESAR project P05.06.04. However, whereas P05.06.04 developed this streaming concept for benefits in Terminal Control Area (TMA) and approach airspace, P04.07.07 seeks to integrate the same concept for a benefit in en route airspace well before the descent phase.

While the scenarios above have been validated in airspace specific to the project partners, the concepts have a wider European applicability. The Barcelona ACC sector configuration tool could be used in many ACCs throughout Europe. Similarly, while the NATS layered planning concept is set in domestic airspace adjacent to the North Atlantic, the concepts could be used in any airspace where long haul overflights interact with aircraft that will shortly be descending to their destination airports.

This document details the Safety and Performance Requirements (SPRs) and provides traceability to the operational requirements (ORs), functional blocks (FBs) and Operational Focus Areas (OFAs) based on the P04.07.07 Operational Service and Environment Definition (OSED) Ref.[7] Operational Requirements and using the Air Navigation System Safety Assessment Methodology Ref [6].

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## **1** Introduction

## **1.1 Purpose of the document**

This Safety and Performance Requirements (SPR) document provides the safety and performance requirements for Services related to the operational Processes defined in the P04.07.07 OSED Dynamic Capacity Management in a High Density Area Ref [7]. The SPR also provides their allocation to Functional Blocks. It identifies the requirements needed to fulfil each KPA and include, or reference, the sources justifying those requirements. This document is used to provide the basis for ensuring that these SPR requirements are applicable during initial implementation and continued operation.

## 1.2 Scope

This document supports the operational services and concept elements identified in the Operational Service and Environment Definition (OSED), Ref.[7]. These services are expected to be operational in the 2014-2020 timeframe.

It was originally intended that Performance Requirements should be defined using the Top-down principle, originating at the level of Work Package - WP B.4.1 Key Performance Areas (KPAs), cascaded down from strategic targets to operational SWP 4.2 project level and subsequently to primary projects. However at the time of developing and refining the initial requirements during the production of the Preliminary SPR the B.4.1 Performance Framework document (Ref [5]) and SWP 04.02 Detailed Operational Description (DOD) (Ref.[8]) and SWP07.02 DOD (Ref.[9]) were not sufficiently mature in order to allow the adoption of this approach. As the V2 and V3 validations have now been conducted it is considered that adjusting the requirements at this late stage in the lifecycle of P04.07.07 would prove nugatory.

Consequently this document includes safety and performance requirements and system integrity requirements based on the P04.07.07 OSED (Ref.[7]) Operational Requirements.

Likewise at the time of definition of the requirements the Safety Reference Material was not available and therefore their definition has utilised the EUROCAE Air Navigation System Safety Assessment Methodology (Ref. [6]).

Traceability between the OSED requirements and the SPRs has been generated. The relationship of the various levels of documents is identified in Figure 1.



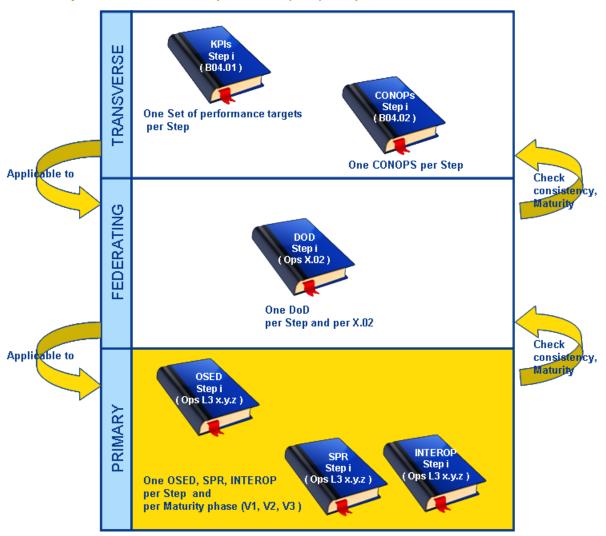


Figure 1: SPR document with regards to other SESAR deliverables

In Figure 1, the Steps are driven by the OI Steps addressed by the project in the Integrated Roadmap document Ref [11]

## 1.3 Intended readership

The intended audience for this document is the following:

- Primary Projects:
  - o WP4: P04.07.01, P04.07.07
  - o WP5: P05.06.04
  - o WP7: P07.06.03
  - o WP7: P07.06.05
  - o WP10: P10.08.01
  - o WP13: P13.02.03
- Federating Projects:
  - o 4.2, 5.2, and 7.2 for Consolidation;
  - o 4.3 for cross WP integrated validation

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## **1.4 Structure of the document**

Section 1: Introduces the document purpose, objectives and scope; the structure (this section) and includes the Glossary

Section 2: Summarizes the operational concept, based on the descriptions provided in the corresponding OSED [Ref[7]].

**Section 3**: Provides the Safety and Performance Requirements and System Integrity Requirements and their traceability to the Operational Requirements found in the OSED [Ref[7]].

Section 4: Lists the Applicable and Referenced Documents

**Appendix A:** Provides details of the safety objective classes and the requirement assessment and lists the assumptions

## **1.5 Background**

This Final SPR document builds upon the Preliminary SPR document Ref.[10] by providing traceability links to the Final OSED Operational Requirements

## **1.6 Glossary of terms**

| Term/Source  | Definition   |
|--|--|
| Airspace Configuration<br>SOURCE: SWP 7.2          | Is a pre-defined and coordinated organisation of ATS routes and/or<br>terminal routes and their associated airspace structures, including<br>airspace reservations/restrictions (ARES), if appropriate, and ATC<br>sectorisation.  |
| Airspace Management<br>SOURCE: SWP 7.2 and SWP 4.2 | Airspace Management is integrated with Demand and Capacity<br>Balancing activities and aims to define, in an inclusive, synchronised<br>and flexible way, an optimised airspace configuration that is relevant<br>for local, sub-regional and regional level activity to meet users<br>requirements in line with relevant performance metrics.   |
|  | Airspace Management primary objective is to optimise the use of<br>available airspace, in response to the users demands, by dynamic<br>time-sharing and, at times, by the segregation of airspace among<br>various airspace users on the basis of short-term needs.  |
|  | It aims at defining and refining, in a synchronised and a flexible way,<br>the most optimum airspace configuration at local, sub-regional and<br>regional levels in a given airspace volume and within a particular<br>timeframe, to meet users requirements while ensuring the most<br>performance of the European Network and avoiding as much as<br>possible any disruption. Airspace Management in conjunction with<br>AFUA is an enabler to improve civil-military co-operation and to<br>increase capacity for the benefit of all users. |
| Dynamic Capacity Management<br>SOURCE: 04.07.07    | Concept proposed by P04.07.07 to adapt the capacity to the traffic load by grouping and de-grouping sectors and managing the staff resources.  |
| Dynamic sectorisation<br>SOURCE: SWP 4.2           | The geographical and vertical limits of a control sector will be<br>adapted to the traffic flow to optimise the capacity in real-time.<br>Flexible sectorisation does not imply that ATC will be faced with<br>sector configurations that are not known either to them or to the<br>supporting FDP and RDP systems. Sector configurations will be part<br>of the pre-determined scenarios of the ACC and will be simulated<br>and training will be provided prior to usage.  |

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| Term/Source  | Definition  |
|--|---|
| Layered Planning<br>SOURCE: 04.07.07                           | Concept proposed by P04.07.07 to support complexity reduction by<br>a series of separate actions or 'layers' that cumulatively reduce<br>complexity. The actions would be: A NATS-developed Oceanic<br>Domestic Interface Manager (ODIM), High Level Direct Routing and<br>an inbound longitudinal streaming concept.   |
| Network Operations Plan (NOP)<br>SOURCE: SWP 7.2               | A set of information and actions derived and reached collaboratively<br>both relevant to, and serving as a reference for, the management of<br>the Pan-European network in different timeframes for all ATM<br>stakeholders, which includes, but is not limited to, targets, objectives,<br>how to achieve them, anticipated impact. The NOP has a dynamic<br>and rolling lifecycle starting in the strategic phase and progressively<br>updated up to and including the execution and post-operations<br>phases. |
|  | It supports and reflects the result of the collaborative ATM planning<br>process: at each phase, stakeholders collaborate at developing<br>common view of the planned network situation, allowing each of<br>them to take informed decisions considering the network effect and<br>the Network Manager to ensure the overall coordination of individual<br>decisions needed to support network performance.   |
| Nominal/Non-Nominal/Exception<br>Conditions<br>SOURCE: SWP 4.2 | Nominal conditions relate to flight circumstances which are optimal<br>and fully reflect the SESAR objectives for flying and adhering to an<br>agreed reference trajectory, in accordance with all ATC clearances<br>and constraints. As Step 1 progresses towards Step 2 and onwards<br>to Step 3 the flight conditions should increasingly tend towards the<br>nominal case.  |
|  | Non-nominal conditions relate to circumstances which are to be<br>expected in the Step 1 timeframe because of shortfalls in the various<br>concepts, equipages and procedures. Typically they will involve<br>various ATC measures such as conflict avoidance and complexity<br>reduction. They also include situations where a dialogue or<br>negotiation process is rejected for some reason.   |
|  | Exception conditions relate to circumstances which should not<br>normally occur. For example this includes any failure (air or ground)<br>to reply to an operational request or dialogue. They also include<br>situations where flight behaviour is found to be in significant<br>contradiction to the agreed course of action, with the exception of<br>certain unavoidable circumstances, such as unexpected weather<br>conditions which will be regarded as non-nominal.                                       |
| <b>PERSEO</b><br><b>SOURCE:</b> 04.07.07                       | Web-based local tool where the forecast demand is based on the<br>processing of massive historical data obtained from multiple sources<br>of information or a mix of real traffic data and these historical data.<br>This tool includes an optimization algorithm to provide the most<br>suitable airspace configuration.   |
| Sector<br>SOURCE: 04.07.01                                     | A sector is the area of responsibility assigned to a Unit of Control. A sector is composed of one or several elementary sector.   |
| Sector Cluster<br>SOURCE: 04.07.07                             | A sector cluster represents a group of adjoining airspace blocks that<br>are treated as a single ATM airspace. A sector cluster consists of<br>several ATC sectors and multi-sectors.   |
| Sector configuration   | Airspace configuration in the Centre of Control (ACC)/ Sector Cluster   |

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| Term/Source                                       | Definition   |
|---|--|
| SOURCE: 04.07.01                                  | i.e. the relation between the Units of Control and sectors.  |
| Sector configuration schedule<br>SOURCE: 04.07.01 | List of planned sector configurations with their time of activation.   |
| Target Sector Flow<br>SOURCE: 04.07.07            | It is a level below that the sector can safely handle to allow for the inefficiencies inherent to the CFMU process and the vagaries of the subsequent control process, providing some headroom /protection of overloads. |

## **1.7 Acronyms and Terminology**

| Term    | Definition   |
|---------|--|
| ACC     | Area Control Centre                                |
| AMAN    | Arrival Manager/Management                         |
| ANSP    | Airspace Navigation Service Provider               |
| ATC     | Air Traffic Control                                |
| АТМ     | Air Traffic Management                             |
| ATMS    | Air Traffic Management Service                     |
| ATS     | Air Traffic Services                               |
| ATSU    | Air Traffic Service Unit                           |
| CONOPS  | Concept of Operations                              |
| DCM     | Dynamic Capacity Management                        |
| DOD     | Detailed Operational Description                   |
| ЕТА     | Estimated Time of Arrival                          |
| EUROCAE | European Organisation for Civil Aviation Equipment |
| FB      | Functional Block                                   |
| FIR     | Flight Information Region                          |
| FMP     | Flow Management Position                           |
| HLDR    | High Level Direct Routing/Routes                   |
| нмі     | Human Machine Interface                            |

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| Term   | Definition                                     |
|--------|--|
| iFACTS | Interim Future Area Control Tools Support.     |
| IER    | Information Exchange Requirements              |
| КРА    | Key Performance Area                           |
| NAT    | North Atlantic                                 |
| ODIM   | Oceanic Domestic Interface Management          |
| ODIMS  | Oceanic Domestic Interface Management System   |
| OFA    | Operational Focus Area                         |
| ОІ     | Operational Improvement                        |
| OR     | Operational Requirement                        |
| OSED   | Operational Service and Environment Definition |
| ΟΤS    | Organised Track Structure                      |
| Р      | Project  |
| REQ    | Requirement                                    |
| SESAR  | Single European Sky ATM Research Programme     |
| SIR    | System Integrity Requirement                   |
| SJU    | SESAR Joint Undertaking                        |
| SPR    | Safety and Performance Requirement             |
| ТМА    | Terminal Control Area                          |
| UK     | United Kingdom                                 |
| SWP    | Sub-Work Package                               |
| TMA    | Terminal Control Area                          |
| UK     | United Kingdom                                 |
| V&V    | Verification and Validation                    |
| WP     | Work Package                                   |



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## 2 Summary of Operational Concept (from OSED)

## 2.1 Description of the Concept Element

P04.07.07 is addressing the issue of dynamic capacity management in high density airspace. In order to achieve this objective, two operational concepts have been developed:

- 1. <u>Dynamic Capacity Management</u>: This aims to vary capacity to match forecast demand using an ACC sector configuration optimisation tool.
- 2. Layered planning: This comprises a series of layered planning measures to reduce complexity. These measures involve reducing the complexity of traffic presentation of aircraft departing the North Atlantic (NAT) track structure. This starts with the use of an Oceanic Domestic Interface Management System (ODIM) that aims to take account of aircraft destination when allocating cleared tracks and levels when appropriate and without penalising the aircraft. Subsequently aircraft transiting UK airspace at high level en route to non-UK destinations will be able to take up direct routing through UK airspace, producing a lateral 'fanning out' effect. Aircraft inbound to UK airports, which may also conduct an element of direct routing to a common descent point for their flow, will be longitudinally streamed through use of an extended Arrival Management (AMAN) horizon. This latter concept is being developed through P05.06.04 Tactical TMA and En Route Queue Management. However the focus of 05.06.04 with respect to controller workload and complexity is to produce a predominantly TMA benefit. The focus of this project is to demonstrate how this concept also produces a complexity reduction effect in the target en route airspace. A combination of all these measures should reduce the complexity faced by controllers, thereby enabling further performance improvements in line with overall SESAR goals. It is acknowledged that in SESAR Step 2, such layered planning measures are likely to be made more dynamic and more responsive to user demand. As a Step 1 SESAR project, P04.07.07 is developing the concepts that will lay the path for further refinements.

The concepts are described in detail in the P04.07.07 Final OSED Ref [7]

## 2.2 Description of Operational Services

The high-level process and service diagram for traffic complexity is detailed in the 4.2 DOD Ref [8] and repeated below. Further diagrams are set out in the 4.2 DOD.

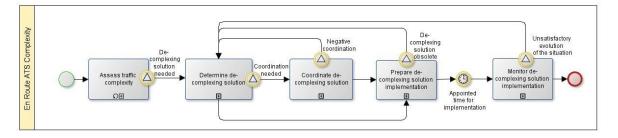


Figure 2: Traffic Complexity Process Diagram

## 2.3 Description of Operational Environment

The expected Operational Environments for both the Dynamic Capacity Management and the Layered Planning aspects of the P04.07.07 concepts are described in detail in Section 4 of the P04.07.07 OSED [Ref [7]].

## 3 Requirements

## 3.1 Introduction

As the SESAR Safety Reference Material (SRM) was not available at the time of definition of the safety requirements the safety requirements have been defined using the Safety Objective Classes from the Air Navigation System Safety Assessment Methodology, Ed. 2.0, ref. AF.ET1.ST03.1000-MAN-01, 30 April 2004 Ref [6]. To redefine the requirements in accordance with the SRM after this became available would be a very large task needing input from all partners and exceeding the effort available for the project. Consequently it is considered that such a change is not possible and also not essential as a recognised safety objective methodology has been used.

The Safety Objective Classes are reproduced in Table 1 which can be found in Appendix A. This should be referred to prior to reading the requirements as it provides the quantitative meaning of the qualitative words 'likely', 'occasional' etc.

The use of terms 'too many', ' too much', 'too soon', 'too late' etc cannot be quantified at this stage. Such words are normal terminology used in a safety hazard identification to define safety requirements. The exact parameters of what constitutes 'too many' etc need to be set by the ATC Unit using the system/tool/procedure. The value attached to 'too many' etc will certainly vary between ATC units and most likely between ATC sectors at any one unit. The values may also vary depending on time of year, time of day, serviceability of other tools/systems, experience and number of staff on duty etc.

Appendix A.1.3 Requirements Definition provides more information on the process used to derive the requirements and also includes the assessments on which the requirements are based. The performance requirements were defined simultaneously with the safety requirements and many requirements apply to both safety and performance. In some cases failing to comply with a requirement may maintain or even increase safety but compromise performance and vice versa. Therefore it is considered that separation of safety and performance requirements is not feasible and consequently they are presented together in this document.

Some Operational Requirements were removed from the a previous version of the OSED and consequently corresponding SPRs have also been removed from this version of the SPR Document as they are no longer relevant.

The SPRs are divided into two sections based on Operational Scenarios. Section 3.2 provides SPRs for 'Dynamic Capacity Management – Short Term' for which a prototype of the tool has been validated to V3 level in Barcelona ACC. In Section 3.3 SPRs for the UK/Irish Oceanic are detailed. This Operational Scenario has been validated to V2 and encompasses three elements of layered planning:

- Oceanic Domestic Interface Manager
- High Level Direct Routing
- Inbound Longitudinal Streaming
  - As stated in the OSED Ref [7] this concept is being developed by P05.06.04. which seeks to produce a benefit within the TMA, whereas this P04.07.07 seeks to use the same concept to measure the benefit on the target en route airspace. All requirements relating to Inbound Longitudinal Streaming have been developed by P05.06.04 and are not therefore repeated in either the P04.07.07. OSED or this SPR document

The wording of each SPR requirements remains as close as possible to the wording of the corresponding OR to which it relates.



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## 3.2 Operational Scenario: Dynamic Capacity Management -Short Term – Safety & Performance Requirements

| Identifier  | REQ- | 04.07.07-SPR-DCM1.0005 |  |
|-------------|------|------------------------|--|
| Requirement |      |                        |  |
|             |      |                        |  |
|             |      | OFA05.03.04            |  |
| Identifier  | REQ- | 04.07.07-SPR-DCM1.0006 |  |
| Requirement |      |                        |  |

|             |    | OFA05.03.04              |
|-------------|----|--------------------------|
| Identifier  | RE | Q-04.07.07-SPR-DCM1.0007 |
| Requirement |    |                          |

|             | OFA05.03.04                |
|-------------|----------------------------|
| Identifier  | REQ-04.07.07-SPR-DCM1.0008 |
| Requirement |                            |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0010  |
| Requirement | The probability of the DCM system displaying only some of the expected demand indicators per sector for a given operational environment (sector configuration) shall be no greater than <b>Likely</b> |

|              | OFA05.03.04  |
|--------------|--|
| Identifier F | REQ-04.07.07-SPR-DCM1.0015   |
| c            | he probability of the undetected incorrect calculation of the expected<br>lemand indicators per sector for a given operational environment (sector<br>onfiguration) by the DCM System shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0016  |
| Requirement | The probability of the undetected incorrect display of the expected demand indicators per sector for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Occasional</b>            |
|             | OFA05.03.04   |
| Identifier  | REQ-04.07.07-SPR-DCM1.0017  |
| Requirement | The probability of the undetected incorrect calculation of the expected demand indicators per time interval for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0018  |
| Requirement | The probability of the undetected incorrect display of the expected demand indicators per time interval for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0020   |
| Requirement | The probability of the detected incorrect calculation of the expected demand indicators per sector for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Likely</b> |

|             | OFA05.03.04  |    |
|-------------|--|----|
| Identifier  | EQ-04.07.07-SPR-DCM1.0021  |    |
| Requirement | he probability of the detected incorrect calculation of the expected demar | าป |



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| indicators per time interval for a given operational environment (sector |
|--|
| configuration) by the DCM System shall be no greater than Likely         |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0022   |
| Requirement | The probability of the detected incorrect display of the expected demand indicators per sector for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Likely</b> |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | EQ-04.07.07-SPR-DCM1.0023   |  |
| Requirement | he probability of the detected incorrect display of the expected demand |  |
| -           | dicators per time interval for a given operational environment (sector  |  |
|             | onfiguration) by the DCM System shall be no greater than Likely         |  |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0025   |
| Requirement | The probability of the late calculation of the expected demand indicators per sector for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Likely</b> |

|            | OFA05.03.04   |
|------------|---|
| Identifier | REQ-04.07.07-SPR-DCM1.0026  |
|            | The probability of the late calculation of the expected demand indicators per time interval for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Likely</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0027   |
| Requirement | The probability of the late display of the expected demand indicators per sector for a given operational environment (sector configuration) by the DCM System shall be no greater than <b>Likely</b> |

|            | OFA05.03.04  |  |
|------------|--|--|
| Identifier | EQ-04.07.07-SPR-DCM1.0028  |  |
|            | ne probability of the late display of the expected demand indicators per terval for a given operational environment (sector configuration) by the CM System shall be no greater than <b>Likely</b> |  |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0030   |
| Requirement | The probability of the failure of all predicted demand indicators to be<br>compared against the maximum reference level configured as acceptable for<br>each of the sectors shall be no greater than <b>Likely</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0035   |
| Requirement | The probability of the failure of some of the predicted demand indicators being compared against the maximum reference level configured as acceptable for each of the sectors shall be no greater than <b>Likely</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR- DCM1.0040  |
| Requirement | The probability of the undetected incorrect predicted demand indicators<br>being compared against the maximum reference level configured as<br>acceptable for each of the sectors shall be no greater than <b>Occasional</b> |

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|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0045   |
| Requirement | The probability of the detected incorrect predicted demand indicators being<br>compared against the maximum reference level configured as acceptable for |
|             | each of the sectors shall be no greater than <b>Likely</b>   |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0050  |
| Requirement | The probability of the predicted demand indicators being compared late against the maximum reference level configured as acceptable for each of |
|             | the sectors shall be no greater than <b>Likely</b>  |

|            | OFA05.03.04  |  |
|------------|--|--|
| Identifier | REQ-04.07.07-SPR-DCM1.0055   |  |
|            | The probability of the failure of the DCM system to calculate the predicted demand for each operative sector in all the operational sector configurations available shall be no greater than <b>Likely</b> |  |

|            | OFA05.03.04  |  |
|------------|--|--|
| Identifier | REQ-04.07.07-SPR-DCM1.0060   |  |
|            | The probability of the DCM system calculating a greater than likely predicted demand for each operative sector in all the operational sector configurations available shall be no greater than <b>Occasional</b> |  |

|              | OFA05.03.04   |
|--------------|---|
| Identifier R | EQ-04.07.07-SPR-DCM1.0065   |
| pi           | ne probability of the DCM system calculating an undetected less than likely<br>edicted demand for each operative sector in all the operational sector<br>onfigurations available shall be no greater than <b>Occasional</b> |

|            | OFA05.03.04  |  |
|------------|--|--|
| Identifier | REQ-04.07.07-SPR-DCM1.0070   |  |
|            | The probability of the DCM system calculating a detected less than likely predicted demand for each operative sector in all the operational sector configurations available shall be no greater than <b>Occasional</b> |  |

|              | OFA05.03.04   |  |
|--------------|---|--|
| Identifier R | REQ-04.07.07-SPR-DCM1.0075  |  |
| d            | he probability of the failure of the DCM system to calculate the predicted<br>emand for some of the operative sectors in all the operational sector<br>onfigurations available shall be no greater than <b>Likely</b> |  |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0100   |
| Requirement | The probability of the failure of the DCM system to propose the optimal configurations from a predefined list of all possible sector configurations, based of the workload indicators shall be no greater than <b>Likely</b> |

|             |                            | OFA05.03.04  |         |
|-------------|----------------------------|--|---------|
| Identifier  | REQ-04.07.07-SPR-DCM1.0110 |  |         |
| Requirement | less than the optimal conf | A system proposing a (detected or undetect<br>iguration from a list of predefined list of all p<br>ed on the workload indicators shall be no g | ossible |

|             |                    | OFA05.03.04  |            |
|-------------|--------------------|--|------------|
| Identifier  | REQ-04.07.07-SF    | SPR-DCM1.0120                                      |            |
| Requirement | The probability of | of the DCM system to propose a partial optimal cor | figuration |



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| from a list of predefined list of all possible sector configurations, based on the |
|--|
| workload indicators available shall be no greater than Likely                      |

|             | OFA05.03.04  |  |
|-------------|--|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0125   |  |
| Requirement | The probability of the DCM system proposing a (detected or undetected) incorrect configuration from a predefined list of all possible sector configurations, based on the workload indicators available shall be no greater than <b>Occasional</b> |  |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0145  |  |
| Requirement | When proposing an optimal solution, the probability of the undetected failure by the DCM system to consider all of the applicable operational restrictions shall be no greater than <b>Occasional</b> |  |
|             | no more than a fixed number of configurations changes in a time interval;<br>a minimum sector configuration time when no more changes can be done   |  |

|             | OFA05.03.04  |  |
|-------------|--|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0150   |  |
| Requirement | en proposing an optimal solution, the probability of the undetected          |  |
|             | onsideration by the DCM system of more operational restrictions than         |  |
|             | quired shall be no greater than Occasional                                   |  |
|             | no more than a fixed number of configurations changes in a time interval; or |  |
|             | a minimum sector configuration time when no more changes can be done.        |  |
|             | onsideration of more than are appropriate could result in a less than        |  |
|             | optimum configuration affecting performance                                  |  |

|             |     | OFA05.03.04  |     |
|-------------|-----|--|-----|
| Identifier  | RE  | Q-04.07.07-SPR-DCM1.0155   |     |
| Requirement |     | nen proposing an optimal solution, the probability of the undetected |     |
|             | cor | sideration by the DCM system of fewer operational restrictions than  |     |
|             | req | quired shall be no greater than <b>Occasional</b>                    |     |
|             |     | more than a fixed number of configurations changes in a time in      |     |
|             |     | ninimum sector configuration time when no more changes can be        |     |
|             |     | nsideration of fewer than are appropriate could result in a less th  | nan |
|             | opt | imum configuration affecting safety and performance                  |     |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0165   |
| Requirement | When proposing an optimal solution, the probability of the consideration by the DCM system of undetected incorrect operational restrictions shall be no greater than <b>Occasional</b>   |
|             | no more than a fixed number of configurations changes in a time interval; or<br>a minimum sector configuration time when no more changes can be done.<br>Incorrect could be those that apply later or earlier than required,<br>inappropriate for the sectors or just totally incorrect. |

|             | OFA05.03.04  |  |
|-------------|--|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0180   |  |
| Requirement | The probability of the detected failure of the DCM system to simultaneously take into account for its demand prediction both historical traffic data and actual system data (as available in advance) shall be no greater than <b>Likely</b> |  |
|             | historical traffic data and actual system data   |  |

|             |     | OFA05.03.04  |
|-------------|-----|--|
| Identifier  | RE  | Q-04.07.07-SPR-DCM1.0185   |
| Requirement | The | e probability of the DCM system to take into account, undetected, less |

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| simultaneous historical traffic data and actual system data (as available in advance) than required for its demand prediction shall be no greater than <b>Occasional</b> |
|--|
| historical traffic data and actual system data than required   |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0195  |
| Requirement | The probability of the DCM system to take into account, undetected,<br>incorrect simultaneous historical traffic data and actual system data (as<br>available in advance) for its demand prediction shall be no greater than<br><b>Occasional</b> |
|             | historical traffic data and actual system data  |

|            | OFA05.03.04  |
|------------|--|
| Identifier | REQ-04.07.07-SPR-DCM1.0200   |
|            | The probability shall be no greater than <b>Occasional</b> that the DCM system takes into account, undetected, historical traffic data and actual system data (as available in advance) that is too late for its demand prediction |

|            | OFA05.03.04  |                   |
|------------|--|-------------------|
| Identifier | EQ-04.07.07-SPR-DCM1.0205  |                   |
|            | ne probability shall be no greater than <b>Occasional</b> that the kes into account, undetected, historical traffic data and a savailable in advance) that is too early for its demand p | ctual system data |

|            | OFA05.03.04  |
|------------|--|
| Identifier | REQ-04.07.07-SPR-DCM1.0210   |
|            | The probability of the failure of the DCM system to define different mixes of historical data and actual system data (configurable) shall be no greater than <b>Likely</b> |

|            | OFA05.03.04   |
|------------|---|
| Identifier | REQ-04.07.07-SPR-DCM1.0225  |
|            | The probability of the DCM system to define an undetected incorrect mix of historical data and actual system data (configurable) shall be no greater than <b>Occasional</b> |

|              | OFA05.03.04   |
|--------------|---|
| Identifier R | EQ-04.07.07-SPR-DCM1.0245   |
| a            | he probability that the DCM system receives undetected a list of fewer than<br>Il possible operational sector configurations (pre-defined) shall be no<br>reater than <b>Likely</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0255   |
| Requirement | The probability that the DCM system receives undetected an incorrect list of possible operational sector configurations (pre-defined) shall be no greater than <b>Likely</b> |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0260  |  |
| Requirement | The probability of the undetected failure of the DCM system to reconfigure individual sector capacities (thresholds) as a reaction to some sector operational restrictions (eg. weather, military) shall be no greater than <b>Occasional</b> |  |

|            | OFA05.03.04                |
|------------|----------------------------|
| Identifier | REQ-04.07.07-SPR-DCM1.0280 |

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| Requirement | The probability of the failure of the DCM system to provide more than one  |
|-------------|--|
|             | proposal of sectorisation plans, according to the future time period under |
|             | consideration shall be no greater than Likely                              |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | REQ-04.07.07-SPR-DCM1.0295  |  |
| Requirement | The probability of detected DCM system failure to take into account the network effects locally or at a sub-regional level, in making recommendations for sectorisation, shall be no greater than <b>Likely</b> |  |
|             | To optimise the DCM, limitations of configuration such as availability of voice<br>and data communications shall be taken into account  |  |

|             |     | OFA05.03.04  |    |
|-------------|-----|--|----|
| Identifier  | RE  | Q-04.07.07-SPR-DCM1.0300   |    |
| Requirement | net | The probability of undetected DCM system failure to take into account the network effects locally or at a sub-regional level, in making recommendations for sectorisation shall be no greater than <b>Occasional</b> |    |
|             |     | optimise the DCM, limitations of configuration such as availability of voic<br>I data communications shall be taken into account   | ce |

|             |     | OFA05.03.04  |
|-------------|-----|--|
| Identifier  | REQ | 0-04.07.07-SPR-DCM1.0305   |
| Requirement |     | probability of the failure of the DCM system to perform data acquisition matically from all the available sources shall be no greater than <b>Likely</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM1.0310  |
| Requirement | The probability of the undetected failure of the DCM system to perform acquired data storage automatically shall be no greater than <b>Occasional</b> |

|             |    | OFA05.03.04   |
|-------------|----|---|
| Identifier  | RE | Q-04.07.07-SPR-DCM1.0315  |
| Requirement |    | e probability of the detected failure of the DCM system to perform uired data storage automatically shall be no greater than Likely |

|                     | OFA05.03.04   |
|---------------------|---|
| [REQ]               |   |
| Identifier          | REQ-04.07.07-SPR-DCM1.0320  |
| Requirement         | Agreements for the opening and closing of restricted airspace structures shall<br>be defined in such a way as to ensure the required level of integrity of the<br>process |
| Title               | Agreements for Opening and Closing of Restricted Airspace   |
| Status              | <in progress=""></in>   |
| Rationale           | Current safety of permanent restricted airspace must not be compromised if such airspace becomes subject to opening and closing   |
| Category            | <safety></safety>   |
| Validation Method   | ·   |
| Verification Method |   |

#### [REQ Trace]

| Relationship            | Linked Element Type          | Identifier                 | Compliance |
|-------------------------|------------------------------|----------------------------|------------|
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-DCM.0014 |            |
|                         |                              | OFA05.03.04                |            |
|                         |                              |                            |            |
|                         |                              |                            |            |

| Identifier  | REQ-04.07.07-SPR-DCM2.0005   |
|-------------|--|
| Requirement | The probability that the DCM system fails to display graphically the predicted |
|             |  |

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#### demand and capacity shall be no greater than Likely

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM2.0010  |
| Requirement | The probability that the DCM system partially displays graphically the predicted demand and capacity and that this is detected shall be no greater than <b>Likely</b> |

|            | OFA05.03.04   |
|------------|---|
| Identifier | REQ-04.07.07-SPR-DCM2.0020  |
|            | The probability that the DCM system partially displays graphically the predicted demand and capacity and that this remains undetected, shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | REQ-04.07.07-SPR-DCM2.0025  |  |
| Requirement | The probability of failure of the DCM system to be able to provide the predicted demand for each sector as tables, showing the values per time intervals shall be no greater than <b>Likely</b> |  |

|             |                       | OFA05.03.04   |  |
|-------------|-----------------------|---|--|
| Identifier  | REQ-04.07.07-SPR-DCM2 | .0030   |  |
| Requirement |                       | system showing more values than actu<br>predicted demand per sector, shall be |  |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM2.0031  |
| Requirement | The probability of the DCM system showing longer time intervals than actual in the tables for the predicted demand per sector, shall be no greater than <b>Likely</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM2.0035  |
| Requirement | The probability of the DCM system not being available both in the FMP position and in the ATC supervisor position, shall be no greater than <b>Likely</b> |

|              | OFA05.03.04   |
|--------------|---|
| Identifier R | EQ-04.07.07-SPR-DCM2.0040   |
| de           | ne probability of a failure of the DCM system causing the implantation of a<br>etected incorrect sector configuration from the system HMI shall be no<br>eater than <b>Likely</b> |

|             |                       | OFA05.03.04  |  |
|-------------|-----------------------|--|--|
| Identifier  | REQ-04.07.07-SPR-DCM2 | 2.0045   |  |
| Requirement |                       | of the DCM system causing the implant<br>onfiguration from the system HMI which<br>er than <b>Likely</b> |  |

|               | OFA05.03.04  |
|---------------|--|
| Identifier RI | EQ-04.07.07-SPR-DCM2.0050  |
| pa            | ne probability of a failure of the DCM system causing the implantation of a<br>intially incorrect sector configuration from the system HMI which is<br>indetected shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM2.0055   |
| Requirement | The probability that the DCM system is not capable of displaying errors, |

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#### warnings and system messages shall be no greater than Likely

| OFA05.03.04                |  |
|----------------------------|--|
| REQ-04.07.07-SPR-DCM2.0060 |  |
|                            |  |
|                            |  |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM2.0065   |
| Requirement | The probability that the DCM system displays fewer errors, warnings and system messages that actual shall be no greater than <b>Likely</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-DCM2.0070  |
| Requirement | The probability that the DCM system displays errors, warnings and system messages later than actually apply shall be no greater than Likely |

|             | OFA05.03.04                |  |
|-------------|----------------------------|--|
| Identifier  | REQ-04.07.07-SPR-DCM2.0075 |  |
| Requirement |                            |  |
|             |                            |  |

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# 3.3 Operational Scenario: UK/ Irish Oceanic Airspace - Safety & Performance Requirements

| Identifier  | REQ-04.07.07-SPR-ODIM.0005   |  |  |
|-------------|--|--|--|
| Requirement | The probability of 'too many' ODIM clearances being proposed for one               |  |  |
|             | aircraft shall be no greater than Likely   |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0010   |  |  |
| Requirement | The probability of loss of proposed ODIM clearances for some but not all           |  |  |
|             | aircraft shall be no greater than Likely   |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0015   |  |  |
| Requirement | The probability of undetected incorrect ODIM clearances being proposed             |  |  |
| Requirement | shall be no greater than <b>Occasional</b>   |  |  |
|             | Undetected Incorrect ODIM Clearances   |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0020   |  |  |
| Requirement | The probability of detected incorrect ODIM clearances being proposed shall         |  |  |
|             | be no greater than Likely  |  |  |
|             | Detected Incorrect ODIM Clearances   |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0030   |  |  |
| Requirement | The probability of ODIM losing the ability to receive current flight plan data     |  |  |
|             | and details of clearances already issued shall be no greater than Likely           |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0035   |  |  |
| Requirement | The probability of ODIM receiving 'too much' current flight plan data and          |  |  |
|             | detail of clearances already issued shall be no greater than Likely                |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0040   |  |  |
| Requirement | The probability of undetected loss of receipt of ODIM current flight plan data     |  |  |
| Requirement | and details of clearances already issued for some but not all aircraft shall be    |  |  |
|             | no greater than <b>Occasional</b>  |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0045   |  |  |
| Requirement | The probability of detected loss of receipt of ODIM current flight plan data       |  |  |
|             | and details of clearances already issued for some but not all aircraft shall be    |  |  |
|             | no greater than Likely   |  |  |
|             |  |  |  |
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0050   |  |  |
| Requirement | The probability of undetected loss of receipt of ODIM current flight plan data     |  |  |
|             | or details of clearances already issued for all aircraft potentially affecting the |  |  |
|             | aircraft for which clearance is requested shall be no greater than Occasional      |  |  |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-ODIM.0055  |
| Requirement | The probability of detected loss of receipt of ODIM current flight plan data or detail of clearances already issued for all aircraft shall be no greater than <b>Likely</b> |

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|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-ODIM.0060   |
| Requirement | The probability of undetected incorrect ODIM current flight plan data and/or |
|             | details of clearances already issued shall be no greater than Occasional     |
|             | Undetected Incorrect ODIM Flight Plan Data/Issued Clearances                 |

|             | OFA05.03.04  |  |
|-------------|--|--|
| Identifier  | REQ-04.07.07-SPR-ODIM.0065   |  |
| Requirement | The probability of detected incorrect ODIM current flight plan data and/or |  |
|             | details of clearances already issued shall be no greater than Occasional   |  |
|             | Detected Incorrect ODIM Flight Plan Data/Issued Clearances                 |  |

|             | OFA05.03.04   |  |
|-------------|---|--|
| Identifier  | REQ-04.07.07-SPR-ODIM.0070  |  |
| Requirement | The probability of failure of the ODIM to take into account the aircraft level in relation to its destination when optimising oceanic clearances shall be no greater than <b>Likely</b> |  |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-ODIM.0075  |
| Requirement | The probability of undetected incorrect aircraft level data in relation to its destination being taken into account in the ODIM when optimising oceanic clearances shall be no greater than <b>Occasional</b> |

|             | OFA05.03.04   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-ODIM.0175  |
| Requirement | The probability of failure of the ODIM to ensure that all Proposed Clearances are issued within a time frame defined by the OSED shall be no greater than <b>Likely</b> |

|             | OFA05.03.04  |
|-------------|--|
| Identifier  | REQ-04.07.07-SPR-ODIM.0180   |
| Requirement | The probability of the failure of the ODIM to ensure that some, but not all, of the required Proposed Clearances are issued within a time frame defined by the OSED shall be no greater than <b>Likely</b> |

|             |    | OFA05.03.04               |
|-------------|----|---------------------------|
| Identifier  | RE | 2Q-04.07.07-SPR-ODIM.0215 |
| Requirement |    |                           |

|             | REQ-   | 04.07.07-OSED-ODIM.0005 |
|-------------|--|-------------------------|
|             | REQ-   | 04.07.07-OSED-ODIM.0015 |
|             | REQ-   | 04.07.07-OSED-ODIM.0004 |
|             | OFA05  | 5.03.04                 |
|             |  |                         |
| Identifier  | REQ-04.07.07-SPR-ODIM.02   | 20                      |
| Requirement | The allocation of clearances shall be in accordance with the separation standards in place at the time |                         |

|             | REQ-04.07.07-OSED-ODIM.0015  |  |
|-------------|--|--|
|             | REQ-04.07.07-OSED-ODIM.0005  |  |
|             | OFA05.03.04  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0225   |  |
| Requirement | The allocation of clearances shall take into consideration the capacity limitations applicable to the airspace at the time of planned aircraft |  |

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transit

|             | REQ-04.07.07-OSED-ODIM.0005   |  |
|-------------|---|--|
|             | OFA05.03.04   |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0230  |  |
| Requirement | The accuracy of entry and exit times to/from the OTS shall be             |  |
| -           | specified at a level that is consistent with the required accuracy of the |  |
|             | DIM   |  |
|             | REQ-04.07.07-OSED- ODIM.0005  |  |
|             | OFA05.03.04   |  |
| Identifier  | REQ-04.07.07-SPR-HLDR.0005  |  |
| Requirement | Direct routing of over flights shall ensure required separation is        |  |
| -           | maintained  |  |

|             | REQ-04.07.07-OSED-HLDR-0060  |  |  |
|-------------|--|--|--|
|             | OFA05.03.04  |  |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0235   |  |  |
| Requirement | Tools and processes shall use consistent units of measurement for data |  |  |
|             | exchange   |  |  |

| OFA05.03.04 |  |                             |  |
|-------------|--|-----------------------------|--|
|             |  | REQ-04.07.07-OSED-ODIM.0005 |  |
| Identifier  | RE   | REQ-04.07.07-SPR-ODIM.0240  |  |
| Requirement | Data exchanged between tools, processes and their respective |                             |  |
|             | interfaces shall be synchronized                             |                             |  |

| OFA05.03.04 |  |      |
|-------------|--|------|
|             | REQ-04.07.07-OSED-ODIM.                                      | 0005 |
| Identifier  | REQ-04.07.07-SPR-ODIM.0245                                   |      |
| Requirement | Data exchanged between tools, processes and their respective |      |
|             | interfaces shall be to the same required accuracy.           |      |

| OFA05.03.04 |   |                             |  |
|-------------|---|-----------------------------|--|
|             |   | REQ-04.07.07-OSED-ODIM.0005 |  |
| Identifier  | REQ-04.07.07-SPR-ODIM.0255  |                             |  |
| Requirement | equirement Data exchanged between tools, processes and their respective interfaces shall be to the highest required integrity |                             |  |

|  | OFA05.03.04                 |  |
|--|-----------------------------|--|
|  | REQ-04.07.07-OSED-ODIM.0005 |  |

| [REQ]       |   |
|-------------|---|
| Identifier  | REQ-04.07.07-SPR-ODIM.0285  |
| Requirement | In issuing Proposed Clearances the ODIM shall ensure it uses the<br>current time and position boundaries of restricted airspace |
| Title       | Avoidance of Restricted Airspace  |
| Status      | <in progress=""></in>   |
| Rationale   | It is assumed that current mitigation against intrusion into restricted airspace will be maintained                             |
| Category    | <safety></safety>   |

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| Validation Method |  |
|-------------------|--|
| Verification      |  |
| Method            |  |

#### [REQ Trace]

| []                      |                              |                             |            |
|-------------------------|------------------------------|-----------------------------|------------|
| Relationship            | Linked Element Type          | Identifier                  | Compliance |
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-ODIM.0010 |            |
|                         |                              | OFA05.03.04                 |            |

#### [REQ]

| Identifier        | REQ-04.07.07-SPR-ODIM.0290   |
|-------------------|--|
| Requirement       | In issuing Proposed Clearances the ODIM shall ensure it uses the up-<br>to-date sectorisation times and position boundaries. |
|                   | to-date sectorisation times and position boundaries.   |
| Title             | Up-to-date sectorisation times and position boundaries.  |
| Status            | <in progress=""></in>  |
| Rationale         | Latest times and positions are required for proposed clearances to be  |
|                   | valid  |
| Category          | <safety></safety>  |
| Validation Method |  |
| Verification      |  |
| Method            |  |

#### [REQ Trace]

| Relationship            | Linked Element Type          | Identifier                  | Compliance |
|-------------------------|------------------------------|-----------------------------|------------|
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-ODIM.0010 |            |
|                         |                              | OFA05.03.04                 |            |

#### [REQ]

| Identifier          | REQ-04.07.07-SPR-ODIM.0300   |
|---------------------|--|
| Requirement         | Following implementation of the ODIM, any improvements,              |
|                     | expansions or variations in its use proposed by controllers and      |
|                     | considered for introduction shall be assessed for safety impact.     |
| Title               | Improvements in Implementation of the ODIM                           |
| Status              | <in progress=""></in>  |
| Rationale           | Whenever a change is suggested it must always be assessed for safety |
| Category            | <safety></safety>  |
| Validation Method   |  |
| Verification Method |  |

#### [REQ Trace]

| Relationship            | Linked Element Type          | Identifier                  | Compliance |
|-------------------------|------------------------------|-----------------------------|------------|
|                         |                              | OFA05.03.04                 |            |
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-ODIM.0005 |            |

#### [REQ]

| Identifier  | REQ-04.07.07-SPR-ODIM.0305                                       |  |
|-------------|--|--|
| Requirement | Future changes to ODIM requirements shall be analysed for safety |  |
|             | requirements.  |  |

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| Title               | Future Changes for ODIM  |
|---------------------|--|
| Status              | <in progress=""></in>  |
| Rationale           | Whenever a change is suggested it must always be assessed for safety |
| Category            | <safety></safety>  |
| Validation Method   |  |
| Verification Method |  |

| [REQ Trace]             |                              |                             |            |
|-------------------------|------------------------------|-----------------------------|------------|
| Relationship            | Linked Element Type          | Identifier                  | Compliance |
|                         |                              | OFA05.03.04                 |            |
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-ODIM.0005 |            |

#### [REQ]

| Identifier          | REQ-04.07.07-SPR-ODIM.0310  |  |
|---------------------|---|--|
| Requirement         | The optimisation for all relevant flights shall be reconfirmed whenever |  |
|                     | changes are made to Oceanic Clearances through receipt of information   |  |
|                     | sent by any route not inherent to ODIM.                                 |  |
| Title               | Reconfirmed optimisation Using Data External to ODIM                    |  |
| Status              | <in progress=""></in>   |  |
| Rationale           | Previous safe clearances may be compromised when new clearances         |  |
|                     | are issued if previous clearances are not rechecked                     |  |
| Category            | <safety></safety>   |  |
| Validation Method   |   |  |
| Verification Method |   |  |

#### [REQ Trace]

| Relationship            | Linked Element Type          | Identifier                  | Compliance |
|-------------------------|------------------------------|-----------------------------|------------|
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-ODIM.0005 |            |
|                         |                              | OFA05.03.04                 |            |

#### [REQ]

| Identifier        | REQ-04.07.07-SPR-HLDR.0010                                      |
|-------------------|---|
| Requirement       | The HLDR shall be supported by iFACTS and other relevant tools. |
| Title             | Functional Interoperability of ODIM with iFACTS and Other Tools |
| Status            | <in progress=""></in>   |
| Rationale         | HLDR cannot work without support from other tools               |
| Category          | <safety></safety>   |
| Validation Method |   |
| Verification      |   |
| Method            |   |

# [REQ Trace] Relationship Linked Element Type Identifier Compliance OFA05.03.04 OFA05.03.04 <SATISFIES> <ATMS Requirement> REQ-04.07.07-OSED-HLDR.0025

#### [REQ]

| Identifier  | REQ-04.07.07-SPR-HLDR.0015  |
|-------------|---|
| Requirement | Procedures for the transition of aircraft between 'free route' type |



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|                   | airspace and the traditional ATS route structure below shall be assessed<br>for safety impact. |  |
|-------------------|--|--|
|                   | <b>v</b> 1   |  |
| Title             | Safety Impact of Procedures for the transition of aircraft                                     |  |
| Status            | <in progress=""></in>  |  |
| Rationale         | Separation as aircraft transit from free route to traditional route                            |  |
|                   | structure must not be compromised  |  |
| Category          | <safety></safety>  |  |
| Validation Method |  |  |
| Verification      |  |  |
| Method            |  |  |

#### [REQ Trace]

| Relationship            | Linked Element Type          | Identifier                  | Compliance |
|-------------------------|------------------------------|-----------------------------|------------|
|                         |                              | OFA05.03.04                 |            |
| <satisfies></satisfies> | <atms requirement=""></atms> | REQ-04.07.07-OSED-HLDR-0005 |            |

#### [REQ]

| Identifier        | REQ-04.07.07-SPR-HLDR.0020  |
|-------------------|---|
| Requirement       | In assigning flight level allocations, the safety benefit that was provided |
|                   | through the adoption of east and westbound routes shall be protected        |
| Title             | Protection of Safety Benefits of East/Westbound routes                      |
| Status            | <in progress=""></in>   |
| Rationale         | Existing safety benefits will not be compromised                            |
| Category          | <safety></safety>   |
| Validation Method |   |
| Verification      |   |
| Method            |   |

| [REQ Trace]               |   |                                 |               |
|---------------------------|---|---------------------------------|---------------|
| Relationship              | Linked Element Type                             | Identifier                      | Compliance    |
| <applies_to></applies_to> | <operational focus<br="">Area&gt;</operational> | OFA05.03.04                     | N/A           |
| <satisfies></satisfies>   | <atms requirement=""></atms>                    | REQ-04.07.07-OSED-HLDR-<br>0065 | <full></full> |



## **3.4 Information Exchange Requirements (IER)**

Not applicable

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## **4** References and Applicable Documents

This section identifies the documents (name, reference, source project) the SPR has to comply to or to be used as additional inputs for the SPR.

## 4.1 Applicable Documents

This SPR complies with the requirements set out in the following documents:

- [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

## **4.2 Reference Documents**

1

The following documents were used to provide input / guidance / further information / other:

- [5] B4.1 [Initial] Baseline Performance Framework (Edition 0) D12
- [6] AIR NAVIGATION SYSTEM SAFETY ASSESSMENT METHODOLOGY, Ed. 2.0, ref. AF.ET1.ST03.1000-MAN-01-01-C, 30 April 2004
- [7] 04.07.07 D25 Final Operational Service and Environment Definition (OSED), Implementation of Dynamic Capacity Management in a High Density Area, 00.02.00 (19 April 2013)
- [8] SESAR WP04.02 D07 Detailed operational description, Version 00.05.00, 29<sup>th</sup> October 2012.
- [9] SESAR WP07.02 D07 Detailed operational description, Version 00.01.00, 15<sup>th</sup> October 2011.
- [10]P04.07.07 D22 Preliminary Safety and Performance Requirements (SPR), Implementation of Dynamic Capacity Management in a High Density Area, 00.01.00,

[11]WPB.01 Integrated Roadmap, DS8

<sup>&</sup>lt;sup>1</sup> The EUROCAE ED-78A has been used as an initial guidance material. ED-78A is useful, but is not an applicable document, because it mostly addresses the V4-V5 phases, whilst the SESA provide the Sesa provide

## Appendix A Assessment / Justifications

## A.1 Safety and Performance Assessments

### A.1.1 Safety assessment

At the time of defining the safety requirements the SESAR Safety Reference Material was not available so the safety requirements have been defined using the following table which defines the Safety Objective Classes. It should be used when reading the Safety and Performance Requirements. The table is an extract of Air Navigation System Safety Assessment Methodology, Ed. 2.0, ref. AF.ET1.ST03.1000-MAN-01, 30 April 2004 Ref[6]

| Table 1. Safety | Qualitative Safety<br>Objective | Quantitative Safety<br>Objective | Comment   | Objective Classes |
|-----------------|---------------------------------|----------------------------------|---|-------------------|
| Table 1: Safety | Extremely Rare                  | 5.27x10-8 /h                     | Shall never happen during the building operational lifetime   | Objective Classes |
| A.1.2           | Rare                            | 5.27x10-7 /h                     | As approximately 10 of such safety objectives have been<br>identified, it means that one single event (severity 2) is<br>accepted to occur once during the building operational<br>lifetime |                   |
|                 | Occasional                      | 5.27x10-6 /h                     | As approximately 10 of such safety objectives have been identified, it means that one single event (severity 3) is accepted to occur once every 2 years.                                    |                   |
|                 | Likely                          | 5.27x10-4 /h                     | As approximately 10 of such safety objectives have been identified, it means that it can happen that one single event (severity 4) is accepted to occur once every week.                    |                   |

#### **Performance assessment**

The performance requirements were defined as part of the safety assessment as many of the requirements relate to both safety and performance. Consequently they have been grouped together in Section 3



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#### A.1.3 Requirements Definition 1

This appendix provides the information, data and process used to derive the Safety and Performance Requirements found in Section 3 of this document. 2

3 The first step was to collate all Operational Requirements from the OSED (Ref. [7] in a table format. Each requirement was then considered by applying standard safety hazard identification guide words against it. Under each guide word,

a Severity number (based on Table 1: Safety Objective Classes from extract of AIR NAVIGATION SYSTEM SAFETY ASSESSMENT METHODOLOGY, Ed. 2.0, ref. AF.ET1.ST03.1000-MAN-01, 30 April 2004 Ref [6]) was applied. Not all 4

guide words were deemed pertinent to all Requirements and hence some were given a Severity of N/A. Some requirements have been given two severity numbers for the same guide word. These have been differentiated as the 5

failure/occurrence identified by the guide words being 'Detected' [D] and 'Undetected' [U]. Detected refers to when a controller (or personnel in charge) identifies the risk in good time and manages it accordingly. Undetected refers to 6

7 when a controller (or personnel in charge) does not identify the risk and allows it to become an issue which needs to be resolved. Each guide word and severity was then converted into a Safety Requirement adjacent to its Operational

8 high level requirement.

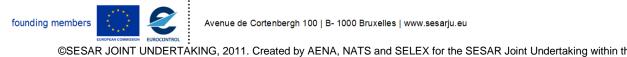
9 Safety Requirements are identified by S and Performance Requirements by P.

10 Note that this appendix contains the raw data as originally defined. In some cases this has been refined after a review and some requirements have been adjusted and some repetition deleted.

| OSED REQS  |          |           |    |     |    |     |     |            |   | (    | GUIDE V     | VORD | S   |            |     |     |    |    |     |     |                |             |   |
|--|----------|-----------|----|-----|----|-----|-----|------------|---|------|-------------|------|-----|------------|-----|-----|----|----|-----|-----|----------------|-------------|---|
|  | TO<br>LO | TAL<br>SS | МС | DRE | LE | ESS |     | WELL<br>AS |   | TIAL | INCOR       | RECT |     | HER<br>IAN | EA  | RLY | LA | TE | BEF | ORE | AF             | TER         |   |
|  | S        | Р         | S  | Р   | S  | Р   | S   | Р          | S | Ρ    | S           | Ρ    | S   | Р          | S   | Ρ   | S  | Р  | S   | Ρ   | S              | Ρ           |   |
|  |          |           |    |     |    |     |     |            |   |      |             | N    | ATS | SCE        | ENA | RIO |    |    |     |     |                |             |   |
| The ODIM shall propose OTS track, entry time, exit time, speed and flight level. | 5        | 5         | 4  | 4   | 5  | 4   | N/A | N/A        | 5 | 5    | D: 5<br>U:3 | 4    | N/A | N/A        | 5   | 5   | 5  | 5  | 5   | 5   | D:<br>5<br>U:3 | D: 5<br>U:3 | The probabil<br>being propos<br>greater than<br>The probabil<br>clearances fu<br>be no greate |
|  |          |           |    |     |    |     |     |            |   |      |             |      |     |            |     |     |    |    |     |     |                |             | The probabil<br>clearances b<br>greater than  |
|  |          |           |    |     |    |     |     |            |   |      |             |      |     |            |     |     |    |    |     |     |                |             |   |

The probability of detected incorrect ODIM clearances being proposed shall be no greater than Likely (P)

| ODIM shall calculate the fuel<br>burn difference in kilograms<br>that ODIM proposal<br>clearances would result in for<br>each flight. | N/A | 5 | N/A | 5 | N/A |
|---|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| each flight.  |     |   |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |



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SIRs

#### **SPRs**

ability of too many ODIM clearances posed for one aircraft shall be no an Likely (S P)

ability of loss of proposed ODIM es for some but not all aircraft shall ater than L kely (P)

ability of undetected incorrect ODIM s being proposed shall be no an Occasional (S)

The probability of undetected arrival ODIM clearances being proposed shall be no greater than Occasional (S P)

In the allocation of clearances, the ODIM shall take into account the relevant flight parameters [aircraft identification, destination, cleared or requested oceanic track (as appropriate), flight planned domestic routing, ETA for NAT, cleared or requested level (as appropriate), speed] that may impact upon the decision algorithms critical to providing required separation and reducing complexity

The accuracy of entry and exit times to/from the OTS shall be specified at a level that is consistent with the required accuracy of the ODIM

Future changes to ODIM requirements shall be analysed for safety impact.

Following implementation of the ODIM any improvements, expansions or variations in its use proposed by controllers and considered for introduction shall be assessed for safety impact.

The introduction of DCM shall ensure that controller workload is not increased by resectorisation.

#### Edition 00.02.00

## Project Number 04.07.07

| D26 - Safety and Performan   | ce Rec   | quiren | nents ( | SPR) 1 | <b>Fempla</b> | te  |     |            |             |              |             |      |     |            |     |     | .untion | 00.02. | 00  |     |     |     |   |
|--|----------|--------|---------|--------|---------------|-----|-----|------------|-------------|--------------|-------------|------|-----|------------|-----|-----|---------|--------|-----|-----|-----|-----|---|
| OSED REQS  |          |        |         |        |               |     |     |            |             | (            | GUIDE V     | VORD | S   |            |     |     |         |        |     |     |     |     |   |
|  | TO<br>LO |        | МС      | ORE    | LE            | SS  |     | VELL<br>NS |             | RTIAL<br>DSS | INCOF       | RECT |     | HER<br>IAN | EA  | RLY | LA      | TE     | BEF | ORE | AF  | TER |   |
|  | S        | P      | S       | Р      | S             | Р   | S   | P          | S           | P            | S           | Ρ    | S   | Р          | S   | Ρ   | S       | Р      | S   | Р   | S   | Ρ   |   |
| ODIM shall be able to receive<br>current flight plan data and<br>details of clearances already<br>issued               | 5        | 4      | 5       | 4      | D: 5<br>U:3   | 4   | N/A | N/A        | D: 5<br>U:3 | 4            | D: 5<br>U:3 | 4    | N/A | N/A        | N/A | N/A | N/A     | N/A    | N/A | N/A | N/A | N/A | The proba<br>ability to r<br>and detail<br>shall be n   |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>much curr<br>of clearan<br>greater th  |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>receipt of<br>and detail<br>for some l<br>greater th   |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>receipt of<br>and detail<br>for some l<br>greater th   |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>receipt of<br>or details<br>shall be n   |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>receipt of<br>plan data<br>already is<br>Likely (P)  |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba<br>ODIM cur<br>details of<br>shall be n   |
| ODIM shall take aircraft level<br>in relation to its destination<br>into account when optimising<br>oceanic clearances | 5        | 4      | N/A     | N/A    | N/A           | N/A | N/A | N/A        | N/A         | N/A          | D: 5<br>U:3 | 4    | N/A | N/A        | N/A | N/A | N/A     | N/A    | N/A | N/A | N/A | N/A | The proba<br>ODIM curr<br>details of o<br>shall be no<br>The proba<br>to take into<br>relation to<br>optimising<br>no greater |
|  |          |        |         |        |               |     |     |            |             |              |             |      |     |            |     |     |         |        |     |     |     |     | The proba   |

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#### SIRs

bability of ODIM losing the receive current flight plan data ails of clearances already issued no greater than Likely (P)

bability of ODIM receiving too urrent flight plan data and detail ances already issued shall be no than Likely (P)

bability of undetected loss of of ODIM current flight plan data ails of clearances already issued e but not all aircraft shall be no than Occasional (S)

bability of detected loss of of ODIM current flight plan data ails of clearances already issued e but not all aircraft shall be no than Likely (P)

bability of undetected loss of of ODIM current flight plan data Is of clearances already issued no greater than Occasional (S)

bability of detected loss of of the ODIM either current flight ta or details of clearances issued shall be no greater than

bability of undetected incorrect urrent flight plan data and/or of clearances already issued no greater than Occasional (S)

bability of detected incorrect urrent flight plan data and/or of clearances already issued no greater than Occasional (P) bability of failure of the ODIM nto account the aircraft level in to its destination when ing oceanic clearances shall be ter than Likely (P)

The probability of undetected incorrect aircraft level data in relation to its destination being taken into account in the ODIM when optimising oceanic clearances shall be no greater than Occasional (S)

#### SPRs

The tool shall check flight plan data for consistency

The tool shall identify inconsistent data

Data exchanged between tools, processes and their respective interfaces shall be to the highest required integrity

The performance of the ODIM shall not be degraded by the number of flight plans being considered for the optimisation of clearances.

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| OSED REQS   |  |   |             |   |   |   |     |            |     |              | GUIDE V     |      | 5   |            |             |     |             |    |     |     |     |     |  |
|---|--|---|-------------|---|---|---|-----|------------|-----|--------------|-------------|------|-----|------------|-------------|-----|-------------|----|-----|-----|-----|-----|--|
|   | TOTAL MORE LESS<br>LOSS<br>S P S P S P |   |             |   |   |   |     | NELL<br>AS |     | RTIAL<br>DSS | INCOR       | RECT |     | HER<br>IAN | EAF         | RLY | LA          | TE | BEF | ORE | AF  | TER |  |
|   | S                                      | Р | S           | Р |   | Ρ | S   | Р          | S   | Ρ            | S           | Ρ    | S   | Р          | S           | Р   | S           | Ρ  | S   | Р   | S   | Р   |  |
| ODIM shall take number of<br>aircraft absolute rate into<br>account when optimising<br>oceanic clearances | 5                                      | 4 | D: 5<br>U:3 | 5 | 5 | 3 | N/A | N/A        | N/A | N/A          | D: 5<br>U:3 | 5    | N/A | N/A        | D: 5<br>U:3 | 5   | D: 5<br>U:3 | 5  | N/A | N/A | N/A | N/A | The probabil<br>take into acc<br>rate when of<br>clearances s<br>Likely (P)  |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>account an u<br>actual aircra<br>optimising of<br>no greater th  |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>account an u<br>actual aircra<br>optimising of<br>no greater th  |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>aircraft abso<br>account in th<br>oceanic clea<br>than Occasie   |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>being taken<br>ODIM and n<br>optimising of<br>no greater th  |
| ODIM shall take number of<br>aircraft relative rate into<br>account when optimising<br>oceanic clearances | 5                                      | 4 | D: 5<br>U:3 | 5 | 5 | 3 | N/A | N/A        | N/A | N/A          | D: 5<br>U:3 | 5    | N/A | N/A        | D: 5<br>U:3 | 5   | D: 5<br>U:3 | 5  | N/A | N/A | N/A | N/A | The probabil<br>being taken<br>ODIM and n<br>optimising of<br>no greater th<br>The probabil<br>take into acc<br>rate when op<br>clearances s<br>Likely (P) |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>account an u<br>actual aircra<br>optimising of<br>no greater th  |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>account an u<br>actual aircra<br>optimising of<br>no greater th  |
|   |  |   |             |   |   |   |     |            |     |              |             |      |     |            |             |     |             |    |     |     |     |     | The probabil<br>aircraft relati<br>account in th   |

bability of undetected incorrect relative rate being taken into account in the ODIM when optimising oceanic clearances shall be no greater than Occasional (S)

The probability of aircraft relative rate being taken into account too soon in the ODIM and not being detected when



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#### SIRs

#### SPRs

bability of failure of the ODIM to account the aircraft absolute en optimising oceanic ces shall be no greater than

bability of the ODIM taking into an undetected higher than aircraft absolute rate when ing oceanic clearances shall be tter than Occasional (S)

bability of the ODIM taking into t an undetected lower than aircraft absolute rate when ing oceanic clearances shall be tter than Occasional (P)

bability of undetected incorrect absolute rate being taken into in the ODIM when optimising clearances shall be no greater ccasional (S)

bability of aircraft absolute rate aken into account too soon in the and not being detected when ing oceanic clearances shall be ter than Occasional (S)

bability of aircraft absolute rate aken into account too late in the and not being detected when ing oceanic clearances shall be ter than Occasional (S) bability of failure of the ODIM to account the aircraft relative en optimising oceanic ces shall be no greater than

bability of the ODIM taking into an undetected higher than aircraft relative rate when ing oceanic clearances shall be tter than Occasional (S)

bability of the ODIM taking into an undetected lower than aircraft relative rate when ing oceanic clearances shall be tter than Occasional (P)

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| OSED REQS  | тот | - ~ 1 | М   | ORE |             |     | 461 | WELL |   |    | GUIDE V<br>INCOF |     |     |     |     | RLY |     | тс  | DEE |     | ۸ <del>۲</del> | TER |  |
|--|-----|-------|-----|-----|-------------|-----|-----|------|---|----|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------|-----|--|
|  | LO  | SS    |     |     |             | SS  | A   | AS   |   | SS |                  |     | TH  |     |     |     |     | TE  |     | ORE |                |     |  |
|  | S   | Ρ     | S   | Ρ   | S           | Р   | S   | Ρ    | S | Ρ  | S                | Ρ   | S   | Ρ   | S   | Ρ   | S   | Ρ   | S   | Ρ   | S              | Ρ   | optimising o<br>no greater th  |
|  |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | The probabi<br>being taken<br>ODIM and n<br>optimising o<br>no greater th  |
|  |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     |  |
| ODIM shall take the number<br>of routes to destination into<br>account when optimising | 5   | 4     | 5   | 3   | D: 5<br>U:3 | 5   | N/A | N/A  | 5 | 3  | D: 5<br>U:3      | 5   | N/A            | N/A | The probabi<br>take into acc<br>to destinatio  |
| oceanic clearances   |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | clearances<br>Likely (P)   |
|  |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | The probabi<br>account a hi<br>routes to de<br>oceanic clea<br>than Occasi   |
|  |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | The probabi<br>account an<br>actual numb<br>when optimi<br>shall be no g   |
|  |     |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | The probabi<br>number of ro<br>taken into ac<br>optimising o<br>no greater th  |
| ODIM shall display proposed<br>clearances on a standalone<br>display                   | 5   | 4     | N/A | N/A | N/A         | N/A | N/A | N/A  | 5 | 4  | N/A              | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A            | N/A | The probabi<br>number of ro<br>taken into a<br>optimising o<br>no greater th<br>The probabi<br>display prop<br>standalone o<br>than Likely ( |
|  | :   |       |     |     |             |     |     |      |   |    |                  |     |     |     |     |     |     |     |     |     |                |     | The probabi<br>display som<br>standalone   |

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#### SIRs

SPRs

oceanic clearances shall be than Occasional (S)

ability of aircraft relative rate en into account too late in the d not being detected when oceanic clearances shall be than Occasional (S)

ability of failure of the ODIM to account the number of routes ation when optimising oceanic es shall be no greater than

ability of the ODIM taking into a higher than actual number of destination when optimising clearances shall be no greater asional (P)

ability of the ODIM taking into an undetected lower than mber of routes to destination imising oceanic clearances no greater than Occasional (S)

ability of the partial loss of the f routes to destination being account in the ODIM when oceanic clearances shall be than Occasional (P)

ability of undetected incorrect f routes to destination being account in the ODIM when oceanic clearances shall be r than Occasional (S) ability of failure of the ODIM to roposed clearances on a ne display shall be no greater ly (P)

ability of failure of the ODIM to ome proposed clearances on a standalone display shall be no greater

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#### Project Number 04.07.07 D26 - Safety and Performance Requirements (SPR) Template

| OSED REQS   | тот | - ^ 1 | MC   | DRE |                            | SS                         |     | VELL |     |       | INCO     |          |     | HER |     | RLY | 1.4                 | те  | DEE | ODE | ۸ <b>с</b> . | ΓER |  |
|---|-----|-------|------|-----|----------------------------|----------------------------|-----|------|-----|-------|----------|----------|-----|-----|-----|-----|---------------------|-----|-----|-----|--------------|-----|--|
|   | LO  |       | IVIC |     | LC                         | 33                         |     | S    |     | SS SS |          |          |     |     | EAI |     | LA                  | IE  | DEF | ORE | АГ           | IER |  |
|   | S   | Ρ     | S    | Ρ   | S                          | Ρ                          | S   | Ρ    | S   | Ρ     | S        | Ρ        | S   | Ρ   | S   | Ρ   | S                   | Ρ   | S   | Ρ   | S            | Ρ   | than Likely  |
| ODIM shall send proposed<br>clearances in a form capable<br>of being integrated into<br>SAATS/GAATS   | 4   | 4     | N/A  | N/A | sam<br>e as<br>part<br>ial | sam<br>e as<br>part<br>ial | N/A | N/A  | 4   | 4     | D4<br>U4 | D4<br>U4 | N/A | N/A | N/A | N/A | sam<br>e as<br>loss |     |     |     |              |     | The probab<br>exchange (<br>in a format<br>wih SAATS<br>than Likely      |
|   |     |       |      |     | loss                       | loss                       |     |      |     |       |          |          |     |     |     |     |                     |     |     |     |              |     | The probab<br>clearances<br>that is only<br>integrated v<br>no greater t |
|   |     |       |      |     |                            |                            |     |      |     |       |          |          |     |     |     |     |                     |     |     |     |              |     | The probab<br>proposed cl<br>a format un<br>integrated v<br>no greater t |
| The ODIM optimisation   |     |       | N/A  | 5   |                            |                            | N/A | N/A  | N/A | N/A   | N/A      | N/A      | N/A | N/A | N/A | N/A | N/A                 | N/A | N/A | N/A | N/A          | N/A | The probab<br>proposed cl<br>a format wh<br>integrated v<br>no greater t |
| process shall balance<br>performance against<br>accuracy and currency of<br>flight plan information.  |     |       |      |     |                            |                            |     |      |     |       |          |          |     |     |     |     |                     |     |     |     |              |     |  |
| The tool shall plan routes,<br>clearances and altitude<br>distributions in order to<br>minimise the need to descend<br>aircraft past overflying aircraft<br>and consequently the need<br>for tactical deconfliction |     |       |      |     |                            |                            |     |      |     |       |          |          |     |     |     |     |                     |     |     |     |              |     |  |
| The tool shall ensure that<br>Proposed Clearances are<br>issued within a time frame<br>defined by the OSED.   | 4   | 4     | N/A  | N/A | N/A                        | N/A                        | N/A | N/A  | 4   | 4     | N/A      | N/A      | N/A | N/A | N/A | N/A | 4                   | 4   | N/A | N/A | N/A          | N/A | The probab<br>ensure that<br>issued with<br>the OSED s<br>Likely (S P)   |
|   |     |       |      |     |                            |                            |     |      |     |       |          |          |     |     |     |     |                     |     |     |     |              |     | The probab<br>ODIM to en<br>Proposed C<br>a time fram<br>be no great     |

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#### SIRs

SPRs

ely (P)

bability of being unable to e ODIM proposed clearances nat capable of being integrated TS/GAATS shall be no greater ely (SP)

ability of ODIM proposed es being proposed in a format ly partially capable of being d with SAATS/GAATS shall be er than Likely (S P)

ability of detected ODIM clearances being provided in unable to be capable of being ed with SAATS/GAATS shall be er than Likely (S P)

bability of undetected ODIM clearances being provided in which is unable to be ed with SAATS/GAATS shall be er than Occasional (S)

Tools, processes and their respective interfaces shall use consistent units of measurement for data exchange

Data exchanged between tools, processes and their respective interfaces shall be to the highest required integrity

The ODIM shall define its window of consideration based upon all possible flight related parameters.

The optimisation for all relevant flights shall be reconfirmed whenever changes are made to Flight Plans and Oceanic Clearances. Procedures for use of ODIM shall be assessed for their safety impact

bability of failure of the ODIM to hat Proposed Clearances are vithin a time frame defined by D shall be no greater than 5 P)

bability of the failure of the ensure that some but not all Clearances are issued within ame defined by the OSED shall eater than Likely (S P)

Edition 00.02.00

| OSED REQS   |          |   |     |     |     |    |     |            |           |      |     | NORDS | 5   |            |     |     |     |     |     |     |     |     |   |
|---|----------|---|-----|-----|-----|----|-----|------------|-----------|------|-----|-------|-----|------------|-----|-----|-----|-----|-----|-----|-----|-----|---|
|   | TO<br>LO |   | МС  | ORE | LE  | SS |     | VELL<br>\S | PAR<br>LO | TIAL |     | RRECT | ОТ  | HER<br>IAN | EA  | RLY | LA  | TE  | BEF | ORE | AF  | TER |   |
|   | S        | Р | S   | Р   | S   | Ρ  | S   | Р          | S         | Р    | S   | Р     | S   | Р          | S   | Р   | S   | Ρ   | S   | Р   | S   | Ρ   |   |
| There shall be a mechanism<br>for managing multiple<br>Clearance Requests   | 4        | 3 | N/A | N/A | 4   | 3  | N/A | N/A        | 4         | 3    | N/A | N/A   | N/A | N/A        | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | The proba<br>to manage<br>shall be no   |
|   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     | The proba<br>manage fe<br>Requests<br>greater tha   |
| The receipt of multiple<br>clearance requests shall not<br>result in unecessary delay to<br>the issue of proposed<br>clearances           | N/A      | 3 | N/A | N/A | N/A | 3  | N/A | N/A        | N/A       | 3    | N/A | N/A   | N/A | N/A        | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | The proba<br>to manage<br>Clearance<br>no greater<br>The proba<br>multiple cl<br>ODIM not<br>to the issu<br>shall be no |
|   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     | The proba<br>multiple cl<br>ODIM res<br>the issue of<br>shall be no   |
|   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     | The proba<br>some of th<br>by the OD<br>delay to th<br>clearances<br>Occasiona  |
| The HLDR design shall<br>enable users to fly their<br>preferred trajectories to the<br>greatest extent possible                           |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     | Condition   |
| The HLDR concept will be applied above an agreed Divisional Flight Level.   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     |   |
| The HLDR concept shall take<br>account of military needs.<br>The HLDR concept shall take<br>account of airline operator<br>routing needs. |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     |   |
| The HLDR concept shall take account of the interface with neighbouring ANSPs.   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     |   |
|   |          |   |     |     |     |    |     |            |           |      |     |       |     |            |     |     |     |     |     |     |     |     |   |



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#### SIRs

bability of the mechanism failing age multiple Clearance Requests no greater than Occasional (P)

bability of the mechanism to fewer multiple Clearance sts than required shall be no than Occasional (P)

bability of the mechanism failing age some of the multiple nce Requests required shall be ter than Occasional (P) bability of failure to receive e clearance requests by the not to result in unecessary delay ssue of proposed clearances e no greater than Occasional (P)

bability that the receipt of e clearance requests by the results in unecessary delay to le of some proposed clearances e no greater than Occasional (P)

bability that the failure to receive f the multiple clearance requests ODIM that results in unecessary the issue of some proposed ces shall be no greater than onal (P)

#### SPRs

The mechanism for managing multiple Clearance Requests shall not reduce the window of consideration.

Following implementation of the ODIM any improvements, expansions or variations in its use proposed by controllers and considered for introduction shall be assessed for safety impact.

The definition of preferred trajectories shall ensure that airspace complexity is reduced with associated reduction in controller workload

Data exchanged between tools, processes and their respective interfaces shall be synchronised

Data exchanged between tools, processes and their respective interfaces shall be to the same required accuracy

Data exchanged between tools, processes and their respective interfaces shall be to the highest required integrity

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| OSED REQS |    |     |    |     |    |    |    |           |     | (  |      | NORDS |    |     |    |     |    |    |     |     |    |     |
|-----------|----|-----|----|-----|----|----|----|-----------|-----|----|------|-------|----|-----|----|-----|----|----|-----|-----|----|-----|
|           |    | TAL | MC | DRE | LE | SS | AS | NELL      | PAR |    | INCO | RRECT |    | HER | EA | RLY | LA | TE | BEF | ORE | AF | ΓER |
|           | LO | SS  |    |     |    |    | A  | <b>NS</b> | LO  | SS |      |       | TH | AN  |    |     |    |    |     |     |    |     |
|           | S  | Р   | S  | Р   | S  | Р  | S  | Р         | S   | Р  | S    | Р     | S  | Р   | S  | Р   | S  | Р  | S   | Ρ   | S  | Р   |

The HLDR concept shall not generate increased operational resource cost.

The HLDR concept shall be flexible enough to provide ATC capacity to meet major demand flows.

The HLDR concept shall be flexible with regards to variable DFL

The HLDR concept shall avoid funnelling traffic flows as much as possible by enabling traffic dispersal.

The HLDR concept shall be compatible with envisaged ANSP tools and systems.

The HLDR concept shall not adversely affect the accuracy of network management demand tools including TLPD and CFMU.

The HLDR concept shall take into account the transition of aircraft between high level sectors and underlying airspace structures

The HLDR concept shall optimise level allocation and not be constrained by unidirectional flight levels.



#### SIRs

#### SPRs

Safety Mitigations, including procedures, shall be sufficiently robust to support the overall required reduction in hazard occurrence

The HLDR SHALL BE SUPPORTED BY IFACTS and other tools.

Procedures for the movement of aircraft between 'free route' type airspace and the traditional ATS route structure below shall be assessed for safety impact. In assigning flight level allocations, the safety benefit that was provided through the adoption of east and westbound routes shall be protected

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| OSED REQS   |          |   |     |     |     |     |     |            |           | C | <b>JUIDE V</b> | VORDS | 5   |            |     |     |    |    |     |     |     |     |  |
|---|----------|---|-----|-----|-----|-----|-----|------------|-----------|---|----------------|-------|-----|------------|-----|-----|----|----|-----|-----|-----|-----|--|
|   | TO<br>LO |   | МС  | DRE | LE  | SS  |     | VELL<br>\S | PAR<br>LO |   | INCOF          | RECT  |     | HER<br>IAN | EA  | RLY | LA | TE | BEF | ORE | AF  | TER |  |
|   | S        | Ρ | S   | Ρ   | S   | Ρ   | S   | Ρ          | S         | Ρ | S              | Ρ     | S   | Ρ          | S   | Р   | S  | Ρ  | S   | Ρ   | S   | Ρ   |  |
|   |          |   |     |     |     |     |     |            |           |   |                | AE    | ENA | SCI        | ENA | RIO |    |    |     |     |     |     |  |
| The System shall calculate<br>and display the expected<br>demand indicators per sector<br>and per time interval for a<br>given operational<br>environment (sector<br>configuration) | 4        | 4 | N/A | N/A | N/A | N/A | N/A | N/A        | 4         | 4 | D:4<br>U:3     | 3     | N/A | N/A        | N/A | N/A | 4  | 4  | N/A | N/A | N/A | N/A | The p<br>Syste<br>expect<br>and p<br>opera<br>config<br>Likely |
|   |          |   |     |     |     |     |     |            |           |   |                |       |     |            |     |     |    |    |     |     |     |     | There  |

The probability of the System calculating and displaying only some of the expected demand indicators per sector and per time interval for a given operational environment (sector configuration) shall be no greater than Likely (S P)

The probability of the detected or undetected incorrect calculation or display of the expected demand indicators per sector and per time interval for a given operational environment (sector configuration) by the System shall be no greater than Occasional (P) The probability of the detected incorrect

The probability of the detected incorrect calculation of display of the expected demand indicators per sector and per time interval for a given operational environment (sector configuration) by the System shall be no greater than Likely (S)

The probability of the late calculation of display of the expected demand indicators per sector and per time interval for a given operational environment (sector configuration) by the System shall be no greater than Likely (S P)



#### SIRs

ne probability of the failure of the ystem to calculate and display the spected demand indicators per sector nd per time interval for a given perational environment (sector onfiguration) shall be no greater than kely (S P)

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| OSED REQS   |           |   |     |     |     |     |     |            |           | C | <b>SUIDE V</b> | VORDS | S   |            |     |     |    |    |     |     |     |     |  |
|---|-----------|---|-----|-----|-----|-----|-----|------------|-----------|---|----------------|-------|-----|------------|-----|-----|----|----|-----|-----|-----|-----|--|
|   | TOT<br>LO |   | МС  | DRE | LE  | SS  |     | WELL<br>AS | PAR<br>LO |   | INCOF          | RECT  |     | HER<br>HAN | EA  | RLY | LA | ΓE | BEF | ORE | AF  | TER |  |
|   | S         | Ρ | S   | Ρ   | S   | Р   | S   | Р          | S         | Ρ | S              | Ρ     | S   | Р          | S   | Р   | S  | Ρ  | S   | Ρ   | S   | Ρ   |  |
| The predicted demand<br>indicators shall be compared<br>against the maximum<br>reference level configured as<br>acceptable for each of the<br>sectors | 4         | 4 | N/A | N/A | N/A | N/A | N/A | N/A        | 4         | 4 | D: 4<br>U:3    | 4     | N/A | N/A        | N/A | N/A | 4  | 4  | N/A | N/A | N/A | N/A | The proba<br>predicted of<br>compared<br>reference<br>acceptable<br>be no grea |
|   |           |   |     |     |     |     |     |            |           |   |                |       |     |            |     |     |    |    |     |     |     |     | The proba<br>predicted of<br>compared<br>reference<br>acceptable<br>be no grea |
|   |           |   |     |     |     |     |     |            |           |   |                |       |     |            |     |     |    |    |     |     |     |     | The proba<br>undetecte   |

Some (if not all) demand indicators shall be calculated in terms of occupancy.



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#### SIRs

#### SPRs

bability of the failure of the ed demand indicators to be ed against the maximum ce level configured as able for each of the sectors shall reater than Likely (S P)

bability of only some of the ed demand indicators being ed against the maximum ce level configured as able for each of the sectors shall reater than Likely (S P)

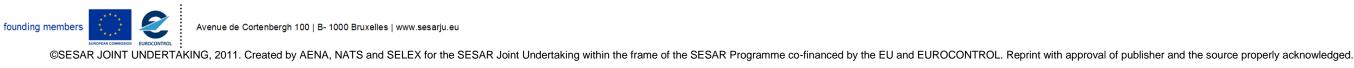
bability of the detected or cted incorrectly predicted demand indicators being compared against the maximum reference level configured as acceptable for each of the sectors shall be no greater than Occasional (P)

The probability of the detected incorrectly predicted demand indicators being compared against the maximum reference level configured as acceptable for each of the sectors shall be no greater than Likely (S)

The probability of the predicted demand indicators being compared late against the maximum reference level configured as acceptable for each of the sectors shall be no greater than Likely (S P)

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| •   |            |   | •  | · · · · |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     |  |
|---|------------|---|----|---------|----|-------------|-----|------------|-----------|---|-------------|-------|----|------------|-----|----|----|----|-----|-----|----|-----|--|
| OSED REQS   |            |   |    |         |    |             |     |            |           | ( |             | WORDS | 5  |            |     |    |    |    |     |     |    |     |  |
|   | TOT<br>LOS |   | MO | RE      | LE | SS          |     | WELL<br>AS | PAR<br>LO |   |             | RRECT | от | HER<br>HAN | EAR | LY | LA | ГΕ | BEF | ORE | AF | TER |  |
|   | S          | P | S  | Р       | S  | Р           | S   | P          | s         | P | S           | Р     | S  | P          | S   | Р  | S  | Р  | S   | Р   | S  | Р   |  |
| The system shall calculate<br>the predicted demand for<br>each operative sector in all<br>the operational sector<br>configurations available. | 4          | 4 | 5  | 3       |    | D: 3<br>U:4 | N/A | N/A        | 4         | 4 | D: 4<br>U:3 | 3     |    | N/A        | 4   | 4  | 4  | 4  |     |     |    |     | The prob<br>system to<br>demand<br>the opera<br>available<br>(S P)         |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>a greater<br>each ope<br>operatior<br>available<br>Occasior    |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>an undet<br>demand<br>the opera<br>available<br>Occasior       |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>a detected<br>for each<br>operation<br>available<br>Occasion   |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>system to<br>predicted<br>sector in<br>configura<br>greater to |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>an undet<br>demand<br>the opera<br>available<br>Occasion       |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>an incorr<br>operative<br>sector co<br>no greate               |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>an earlie<br>each ope<br>operatior<br>available<br>(S P)       |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     | The prob<br>a later th<br>operative<br>sector co<br>no greate              |
|   |            |   |    |         |    |             |     |            |           |   |             |       |    |            |     |    |    |    |     |     |    |     |  |



#### SIRs

#### SPRs

robability of the failure of the the m to calculate the predicted nd for each operative sector in all perational sector configurations ble shall be no greater than Likely

robability of the system calculating ter than predicted demand for operative sector in all the tional sector configurations ble shall be no greater than ional (P)

robability of the system calculating detected less than predicted nd for each operative sector in all perational sector configurations ble shall be no greater than ional (S)

robability of the system calculating ected less than predicted demand ch operative sector in all the tional sector configurations ble shall be no greater than ional (P)

robability of the failure of the the m to calculate some of the ted demand for each operative in all the operational sector urations available shall be no er than Likely (S P)

robability of the system calculating detected incorrect predicted nd for each operative sector in all perational sector configurations ble shall be no greater than ional (S)

robability of the system calculating orrect predicted demand for each tive sector in all the operational configurations available shall be ater than Occasional (P)

robability of the system calculating lier than predicted demand for operative sector in all the ional sector configurations ble shall be no greater than Likely

robability of the system calculating than predicted demand for each tive sector in all the operational configurations available shall be ater than Likely (S P)

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| OSED REQS   |            |   |    |    |             |             |     |            |           | C | GUIDE       | WORDS       | 5   |            |     |    |    |    |     |     |     |     |  |
|---|------------|---|----|----|-------------|-------------|-----|------------|-----------|---|-------------|-------------|-----|------------|-----|----|----|----|-----|-----|-----|-----|--|
|   | TOT<br>LO: |   | MO | RE | LE          | SS          |     | NELL<br>AS | PAR<br>LO |   | INCO        | RRECT       |     | HER<br>HAN | EAR | LY | LA | TE | BEF | ORE | AF  | TER |  |
|   | S          | Ρ | S  | Р  | S           | Р           | S   | Р          | S         | Р | S           | Р           | S   | Р          | S   | Ρ  | S  | Р  | S   | Ρ   | S   | Р   |  |
| The system shall be able to<br>propose the optimal<br>configurations from a list of<br>predefined list of all possible<br>sector configurations, based<br>of the workload indicators. | 4          | 4 | 5  | 3  | D: 4<br>U:3 | D: 3<br>U:4 | N/A | N/A        | 4         | 4 | D: 4<br>U:3 | D: 3<br>U:3 | N/A | N/A        | 4   | 4  | 4  | 4  | N/A | N/A | N/A | N/A | The prol<br>system t<br>configur<br>list of all<br>based o<br>be no gr             |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>a greate<br>from a li<br>possible<br>the work<br>greater t             |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>a less th<br>from a li<br>possible<br>the work<br>greater t            |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>a detect<br>configur<br>list of all<br>based o<br>be no gr             |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>a partial<br>of prede<br>configur<br>indicato<br>than Like             |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>an unde<br>configur<br>list of all<br>based o<br>available<br>Occasio  |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>an incor<br>configur<br>list of all<br>based o<br>available<br>Occasio |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>an earlie<br>configur<br>list of all<br>based o<br>available<br>(S P)  |
|   |            |   |    |    |             |             |     |            |           |   |             |             |     |            |     |    |    |    |     |     |     |     | The prol<br>a later th<br>configur   |

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#### SIRs

probability of the failure of the the m to propose the optimal gurations from a list of predefined all possible sector configurations, d of the workload indicators shall greater than Likely (S P)

probability of the system proposing ater than optimal configuration a list of predefined list of all ble sector configurations, based of orkload indicators shall be no er than Occasional (P)

probability of the system proposing than the optimal configuration a list of predefined list of all ble sector configurations, based of orkload indicators shall be no er than Occasional (S)

probability of the system proposing ected less than the optimal guration from a list of predefined all possible sector configurations, of the workload indicators shall greater than Occasional (P)

probability of the system to propose tial optimal configuration from a list defined list of all possible sector gurations, based of the workload ators available shall be no greater Likely (S P)

probability of the system proposing detected incorrect optimal guration from a list of predefined all possible sector configurations, d of the workload indicators able shall be no greater than sional (S)

robability of the system proposing correct predicted optimal guration from a list of predefined all possible sector configurations, l of the workload indicators able shall be no greater than sional (P)

probability of the system proposing rlier than predicted optimal guration from a list of predefined all possible sector configurations, l of the workload indicators bleshall be no greater than Likely

probability of the system proposing r than predicted optimal configuration from a list of predefined

#### Project Number 04.07.07 **D2**

Edition 00 02 00

| Project Number 04.07.07<br>D26 - Safety and Performar   | nce Re      | quiren      | nents (     | SPR) 1      | Fempla      | ite         |     |            |             |              |             |             |     |            |             | E           | Edition     | 00.02.      | .00 |     |     |     |  |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-----|------------|-------------|--------------|-------------|-------------|-----|------------|-------------|-------------|-------------|-------------|-----|-----|-----|-----|--|
| OSED REQS   |             |             |             |             |             |             |     |            |             | (            |             | WORDS       | 3   |            |             |             |             |             |     |     |     |     |  |
|   |             | TAL<br>SS   | MC          | ORE         | LE          | SS          |     | NELL<br>AS |             | RTIAL<br>DSS | INCO        | RRECT       |     | HER<br>HAN | EA          | RLY         | LA          | ΤE          | BEF | ORE | AF  | TER |  |
|   | S           | P<br>P      | S           | Ρ           | S           | Ρ           | S   | 45<br>P    | S           | P            | S           | Ρ           | S   | P          | S           | Ρ           | S           | Ρ           | S   | Ρ   | S   | Ρ   | list of all pos<br>based of the<br>availablesha<br>(S P)   |
| The system shall provide<br>output with the sufficient level<br>of granularity<br>When proposing an optimal<br>solution, the system shall be<br>able to consider operational<br>restrictions (i.e, no more than<br>a fixed number of<br>configurations changes in a<br>time interval, or a minimum<br>sector configuration time<br>when no more changes can | D: 4<br>U:3 | N/A | N/A        | D: 4<br>U:3 | D: 4<br>U:3  | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A        | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A | N/A | N/A | When proporting probabilities of the probabilities of the system operational than a fixed changes in a minimum set when no more shall be no shall be n |



be done)

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#### SIRs

SPRs

possible sector configurations, the workload indicators shall be no greater than Likely

oposing an optimal solution, bility of the undetected failure stem to be able to consider al restrictions (i.e, no more ed number of configurations in a time interval, or a sector configuration time more changes can be done) shall be no greater than Occasional

When proposing an optimal solution, the probability of the undetected consideration of the system of more operational restrictions than required (i.e, no more than a fixed number of configurations changes in a time interval, or a minimum sector configuration time when no more changes can be done) shall be no greater than Occasional (SP)

(SP)

When proposing an optimal solution, the probability of the undetected consideration of the system of fewer operational restrictions than required (i.e, no more than a fixed number of configurations changes in a time interval, or a minimum sector configuration time when no more changes can be done) shall be no greater than Occasional (SP)

#### Edition 00.02.00

Project Number 04.07.07 D26 - Safety and Performance Requirements (SPR) Template

| FTER | AF | ORE | BEF |   | LA |   | EAR | HER<br>IAN | RECT | GUIDE \<br>INCOF | TIAL | PAR<br>LO | S WI<br>AS | SS |   | RE | MO | TOTAL<br>LOSS | D REQS |
|------|----|-----|-----|---|----|---|-----|------------|------|------------------|------|-----------|------------|----|---|----|----|---------------|--------|
|      | S  | Ρ   | S   | Ρ | S  | Ρ | S   |            | Ρ    | S                |      | LOS       | AS         | Ρ  | S | Ρ  | S  | LOSS<br>S P   |        |



#### SIRs

#### SPRs

poposing an optimal solution, ability of the undetected failure stem to be able to consider erational restrictions (i.e, no n a fixed number of tions changes in a time or a minimum sector tion time when no more can be done) shall be no nan Occasional (SP)

oposing an optimal solution, ability of the undetected consideration by the system of hal restrictions (i.e, no more ked number of configurations in a time interval, or a sector configuration time more changes can be done) no greater than Occasional

poposing an optimal solution, ability of the undetected ation by the system of nal restrictions later than (i.e, no more than a fixed of configurations changes in a rval, or a minimum sector tion time when no more can be done) shall be no nan Occasional (SP)

poposing an optimal solution, ability of the undetected ation by the system of nal restrictions earlier than (i.e, no more than a fixed of configurations changes in a rval, or a minimum sector tion time when no more can be done) shall be no nan Occasional (SP)

Edition 00.02.00

| OSED REQS   |            |   |     |     |             |             |     |            |             | C           |             | WORDS       | 5   |           |             |             |             |             |     |     |     |     |   |
|---|------------|---|-----|-----|-------------|-------------|-----|------------|-------------|-------------|-------------|-------------|-----|-----------|-------------|-------------|-------------|-------------|-----|-----|-----|-----|---|
|   | TOT<br>LOS |   | MC  | DRE |             | SS          |     | NELL<br>AS |             | TIAL<br>SS  | INCO        | RRECT       |     | HER<br>AN | EA          | RLY         | LÆ          | ΑΤΕ         | BEF | ORE | AF  | TER |   |
|   | S          | Ρ | S   | Р   | S           | Р           | S   | Р          | S           | Р           | S           | Р           | S   | Р         | S           | Ρ           | S           | Р           | S   | Ρ   | S   | Ρ   |   |
| The system shall take into<br>account for its demand<br>prediction both historical<br>traffic data and actual system<br>data (that available in<br>advance) | 4          | 4 | N/A | N/A | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A        | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A       | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A | N/A | N/A | The pr<br>system<br>deman<br>data ar<br>availab<br>greater                    |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     | The pr<br>detect<br>its dem<br>traffic c<br>availab<br>greater                |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     | The pr<br>failure<br>accour<br>historic<br>data (th<br>no grea                |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     | The pr<br>detect<br>its dem<br>historic<br>data (th<br>no grea                |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     | The product of the detect late its historic data (the no greater of the data) |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     | The products of the detect early it historic data (the no greater)            |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     |   |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     |   |
|   |            |   |     |     |             |             |     |            |             |             |             |             |     |           |             |             |             |             |     |     |     |     |   |

#### SIRs

e probability of the failure of the em to take into account for its and prediction both historical traffic and actual system data (that lable in advance) shall be no ater than Likely (S P)

e probability of the system not to act that it has taken into account for emand prediction less historical ic data and actual system data (that lable in advance) shall be no ater than Occasional (S P)

probability of the undetected re of the system to take into point for its demand prediction some prical traffic data or actual system (that available in advance) shall be reater than Occasional (S P)

probability of the system not to ct that it has taken into account for emand prediction incorrect orical traffic data and actual system (that available in advance) shall be reater than Occasional (S P)

probability of the system not to ct that it has taken into account too its demand prediction undetected orical traffic data and actual system (that available in advance) shall be reater than Occasional (S P)

probability of the system not to ct that it has taken into account too / its demand prediction undetected prical traffic data and actual system (that available in advance) shall be reater than Occasional (S P)

#### SPRs

The tool shall ensure that whenever a Proposed Clearance is generated the latest data is used

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| OSED REQS  |            |   |     |     |             |             |     |            |             | (           |             | NORDS       | 6   |            |             |             |             |             |     |     |     |     |  |
|--|------------|---|-----|-----|-------------|-------------|-----|------------|-------------|-------------|-------------|-------------|-----|------------|-------------|-------------|-------------|-------------|-----|-----|-----|-----|--|
|  | TOT<br>LOS |   | МС  | ORE | LE          | SS          |     | WELL<br>NS |             | TIAL<br>SSS | INCO        | RRECT       |     | HER<br>IAN | EA          | RLY         | LA          | TE          | BEF | ORE | AF  | TER |  |
|  | S          | Ρ | S   | Ρ   | S           | Ρ           | S   | Ρ          | S           | Ρ           | S           | Ρ           | S   | Ρ          | S           | Ρ           | S           | Ρ           | S   | Ρ   | S   | Р   |  |
| The system shall be able to<br>define different mixes of<br>historical data and actual<br>system data (configurable)   | 4          | 4 | N/A | N/A | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A        | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A        | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | D: 4<br>U:3 | N/A | N/A | N/A | N/A | The pro<br>system t<br>mixes of<br>system o<br>greater t     |
|  |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     | The pro<br>detect th<br>historica<br>(configu<br>Occasio     |
|  |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     | The pro<br>system t<br>historica<br>(configu<br>Occasio      |
|  |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     | The pro<br>detect th<br>mix of hi<br>data (co<br>than Oce    |
|  |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     | The prob<br>detect th<br>of histori<br>data (co<br>greater t |
|  |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     | The prob<br>detect th<br>of histori<br>data (co<br>greater t |
| The system shall be able to<br>work with only one of the two<br>sources of information<br>available.   |            |   |     |     |             |             |     |            |             |             |             |             |     |            |             |             |             |             |     |     |     |     |  |
| The system shall be able to<br>predict demand with a<br>configurable advance,<br>according to the available<br>information.  | 5          | 5 | N/A | N/A | N/A         | N/A         | N/A | N/A        | N/A         | N/A         | D: 5<br>U:4 | D: 5<br>U:4 | N/A | N/A        | N/A         | N/A         | N/A         | N/A         | N/A | N/A | N/A | N/A | The prob<br>demand<br>configur<br>available<br>than Like     |
| The system shall be able to<br>provide a what-if demand<br>calculation for every possible<br>pre-defined sector<br>configuration, after manual<br>selection of it. | 5          | 5 | N/A | N/A | N/A         | N/A         | N/A | N/A        | N/A         | N/A         | D: 5<br>U:4 | D: 5<br>U:4 | N/A | N/A        | N/A         | N/A         | N/A         | N/A         | N/A | N/A | N/A | N/A |  |



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#### SIRs

probability of the failure of the m to be able to define different s of historical data and actual m data (configurable) shall be no er than Likely (S P)

probability of the system not to that it has defined a lesser mix of ical data and actual system data gurable)) shall be no greater than sional (S P)

probability of the failure of the m to detec a partial loss of mix of ical data and actual system data gurable)) shall be no greater than sional (S P)

probability of the system not to that it has defined an incorect historical data and actual system configurable) shall be no greater Occasional (S P)

robability of the system not to that it has defined different mixes torical data and actual system configurable) too late shall be no er than Occasional (S P)

robability of the system not to that it has defined different mixes torical data and actual system (configurable) too early shall be no er than Occasional (S P)

> The system shall detect and alert when its using only one source of information

robability of the system predicting ind with an undetected incorrect gurable advance, according to the ble information shall be no greater \_ikely (S P)

#### SPRs

The tool shall identify inconsistent data

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| OSED REQS  |             |             |          |          |                  |                  |          |            |                  |                  |                  | VORDS            |          |           |          |          |          |          |          |          |          |          |   |
|--|-------------|-------------|----------|----------|------------------|------------------|----------|------------|------------------|------------------|------------------|------------------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|---|
|  |             | TAL<br>SS   |          | DRE      |                  | SS               | A        | VELL<br>\S | PAR<br>LO        | SS               | INCO             |                  | TH       | HER<br>AN | EAF      |          | LA       |          | BEF      | ORE      |          | ΓER      |   |
| The system shall be capable<br>of receiving the list of<br>possible operational sector<br>configurations (pre-defined)   | S<br>5      | P<br>5      | S<br>N/A | P<br>N/A | S<br>D: 5<br>U:4 | P<br>D: 5<br>U:4 | S<br>N/A | P<br>N/A   | S<br>D: 5<br>U:4 | P<br>D: 5<br>U:4 | S<br>D: 5<br>U:4 | P<br>D: 5<br>U:4 | S<br>N/A | P<br>N/A  | S<br>N/A | P<br>N/A | S<br>N/A | P<br>N/A | S<br>N/A | P<br>N/A | S<br>N/A | P<br>N/A | The probab<br>detect that<br>than all pos<br>configuratic<br>greater than   |
|  |             |             |          |          |                  |                  |          |            |                  |                  |                  |                  |          |           |          |          |          |          |          |          |          |          | The probab<br>detect that<br>of possible<br>configuratio<br>greater thar  |
| Individual sector capacities<br>(thresholds) shall be<br>configurable manually, as a<br>reaction to some sector<br>operations restrictions (i.e.,<br>weather, military,) | D: 4<br>U:3 | D: 4<br>U:3 | N/A      | N/A      | D: 4<br>U:3      | D: 4<br>U:3      | N/A      | N/A        | D: 4<br>U:3      | D: 4<br>U:3      | D: 4<br>U:3      | D: 4<br>U:3      | N/A      | N/A       | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | The probab<br>detect that i<br>list of possil<br>configuratio<br>greater than<br>The probab<br>failure of th<br>manually in<br>(thresholds)<br>sector oper<br>weather, mi<br>than Occas |
|  |             |             |          |          |                  |                  |          |            |                  |                  |                  |                  |          |           |          |          |          |          |          |          |          |          | The probab<br>detect that is<br>capacities (<br>configured<br>some secto<br>weather, mit<br>than Occas  |
|  |             |             |          |          |                  |                  |          |            |                  |                  |                  |                  |          |           |          |          |          |          |          |          |          |          | The probab<br>partial failur<br>manually in<br>(thresholds)<br>sector oper<br>weather, mi<br>than Occas   |
| The system shall be able to<br>provide several proposals of<br>sectorizations plan, according<br>to the time advance<br>considered                                       | 5           | 4           | 5        | 5        | 5                | 4                | N/A      | N/A        | 5                | 4                | N/A              | N/A              | N/A      | N/A       | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | N/A      | The probab<br>incorrect mass<br>system of in<br>(thresholds)<br>sector oper<br>weather, mit<br>than Occas<br>The probab<br>system to p<br>sectorizatio<br>time advance<br>greater than  |
|  |             |             |          |          |                  |                  |          |            |                  |                  |                  |                  |          |           |          |          |          |          |          |          |          |          | The probab<br>fewer propo<br>according tr<br>considered<br>Likely (P)   |
|  |             |             |          |          |                  |                  |          |            |                  |                  |                  |                  |          |           |          |          |          |          |          |          |          |          | The probab  |

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bability that the system does not hat is has received a list of fewer possible operational sector rations (pre-defined) shall be no than Likely (S P)

bability that the system does not hat is has received a partial list ible operational sector rations (pre-defined) shall be no than Likely (S P)

bability that the system does not hat is has received an incorrect ossible operational sector rations (pre-defined) shall be no than Likely (S P) bability of the undetected of the system to configure ly individual sector capacities olds) as a reaction to some operations restrictions (i.e., , military, ...) shall be no greater casional (S P)

bability of the system not to hat fewer individual sector ies (thresholds) can be red manually, as a reaction to ector operations restrictions (i.e., , military, ...) shall be no greater casional (S P)

bability of the undetected ailure of the system to configure ly individual sector capacities olds) as a reaction to some operations restrictions (i.e., , military, ...) shall be no greater ccasional (SP)

bability of the undetected ct manual configuration of the of individual sector capacities olds) as a reaction to some operations restrictions (i.e., , military, ...) shall be no greater casional (S P)

bability of the failure of the to provide several proposals of ations plan, according to the vance considered shall be no than Likely (P)

bability of the system providing roposals of sectorizations plan, ng to the time advance red shall be no greater than

bability of the system providing me proposals of sectorizations

D4

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|-----------|---|------------|----|---|---|---|------------|---|------------|------|-------|-------|------------|----|-----|----|----|-----|-----|----|-----|---|-----------|
|           |   | TAL<br>DSS | MC |   |   |   | NELL<br>AS |   | TIAL<br>SS | INCO | RRECT |       | HER<br>IAN | EA | RLY | LA | TE | BEF | ORE | AF | TER |   |           |
|           | S | Ρ          | S  | Ρ | S | Р | S          | Р | S          | Р    | S     | Р     | S          | Ρ  | S   | Ρ  | S  | Ρ   | S   | Ρ  | S   | Р |           |
|           |   |            |    |   |   |   |            |   |            |      |       |       |            |    |     |    |    |     |     |    |     |   | plan, acc |

according to the time advance considered shall be no greater than Likely (P)

| account the network effects<br>locally or at a sub-regional<br>level                        | U3 |   |      |     |     |     |     |     | loss            |     |     |     |     |     |     |     |     |     |     |     |     | take into acco<br>recommenda<br>network effec<br>regional level<br>limitation of c<br>data channels<br>no greater tha                  |
|---|----|---|------|-----|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
|   |    |   |      |     |     |     |     |     |                 |     |     |     |     |     |     |     |     |     |     |     |     | The probabili<br>take into acco<br>recommenda<br>network effect<br>regional level<br>limitation of c<br>data channels<br>be no greater |
| The system shall allow to<br>increase the level of<br>information displayed to a<br>maximum |    |   |      |     |     |     |     |     |                 |     |     |     |     |     |     |     |     |     |     |     |     | be no greater  |
| The system shall perform data acquisition automatically from all the available sources      | 5  | 2 | ∮n/a | n/a | n/a | n/a | n/a | n/a | same as<br>loss | n/a | The probabili<br>system to per<br>automatically<br>sources shall<br>(P)  |

Z founding members

The system shall take into

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The probability that the system fails to iccount in making ndations for sectorisations the ffects locally or at a subevel, i.e.does not recognise of configuration of comms and nels and is decteted, shall be than likely (S P)

> bility that the system fails to ccount in making ndations for sectorisations the ffects locally or at a subvel, i.e.does not recognise f configuration of comms and nels and is undecteted, shall ater than Occasional (S)

bility of the failure of the perform data acquisition ally from all the available nall be not greater than Likely The status of configuration capability status shall be made available to the controller

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|---|----------|------------|-------|-----|-----|-----|-----|------------|-------------|--------------|----------|----------|-----|------------|-----|-----|-----|-----|-----|-----|-----|-----|---|
|   |          | TAL<br>DSS | N     | ORE | LE  | ESS |     | WELL<br>AS |             | RTIAL<br>DSS | INCO     | RRECT    |     | HER<br>HAN | EA  | RLY | L   | ATE | BEF | ORE | AF  | TER |   |
|   | s        | P          | S     | Р   | S   | Р   | S   | P          | S           | P            | S        | Р        | S   | P          | S   | Р   | S   | Р   | S   | Р   | S   | Р   |   |
| The system shall perform<br>acquired data storage<br>automatically with no user<br>intervention   | D4<br>U3 | D4<br>U3   | n/a   | n/a | n/a | n/a | n/a | n/a        | sam<br>loss | e as         | n/a      | n/a      | n/a | n/a        | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | The probab<br>of the syste<br>storage aut<br>greater tha  |
| The system shall display<br>graphically the predicted<br>demand for each sector of a<br>selected sector configuration<br>incl the declared capacity | 5        | 2          | ↓ n/a | n/a | n/a | n/a | n/a | n/a        | D5<br>U3    | D4<br>U3     | n/a      | n/a      | n/a | n/a        | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | The probab<br>the system<br>storage aut<br>greater that<br>The probab<br>display grap<br>demand an<br>greater that  |
| value as a line   |          |            |       |     |     |     |     |            |             |              |          |          |     |            |     |     |     |     |     |     |     |     | The probab<br>displays gra<br>demand an<br>only some s<br>than Likely(  |
|   |          |            |       |     |     |     |     |            |             |              |          |          |     |            |     |     |     |     |     |     |     |     | The probab<br>graphically<br>demand an<br>only some s<br>detected sh<br>Likely(P)   |
| The system shall be able to<br>provide the predicted demand<br>for each sector as tables,<br>showing the values per time<br>intervals               | 5        | 2          | 4 5   | 5 4 | 5   | 4   | n/a | n/a        | D5<br>U3    | D4<br>U3     | D5<br>U3 | D4<br>U3 | n/a | n/a        | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | The probab<br>graphically<br>demand an<br>only some s<br>undetected<br>Occasional<br>The probab<br>be able to p<br>demand for<br>showing the<br>shall be no |
|   |          |            |       |     |     |     |     |            |             |              |          |          |     |            |     |     |     |     |     |     |     |     | The probab<br>predicted de<br>tables, show<br>per time inte<br>interval is lo<br>than Likely  |
|   |          |            |       |     |     |     |     |            |             |              |          |          |     |            |     |     |     |     |     |     |     |     | The probab<br>predicted de<br>tables, show<br>actual per ti   |

than Likely (P) The probability that the system provides the predicted demand for each sector as tables, showing the only partial values per time intervals and that this is detected shall be no greater than Likely (P)

The probability that the system provides the predicted demand for each



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obability of the undetected failure system to perform acquired data e automatically shall be not r than Occasional (S P)

obability of the detected failure of stem to perform acquired data e automatically shall be not than Likely(S P) robability that the system fails to graphically the predicted nd and capacity shall be no r than Likely (P)

obability that the system partially ys graphically the predicted nd and capacity, i.e. dispalying ome sectors shall be no greater ikely(P)

robability that the system displays cally only a partial predicted nd and capacity, i.e. dispalying ome sectors and that this is ed shall be no greater than

obability that the system displays cally only a partial predicted nd and capacity, i.e. dispalying ome sectors and that this is ected shall be no greater than ional (S P)

robability of failure of system to be e to provide the predicted nd for each sector as tables, ng the values per time intervals e no greater than Likely (P)

obability of system providing the ted demand for each sector as showing more values than actual ne intervals, or that the time I is longer shall be no greater ikely (P)

obability of system providing the ted demand for each sector as showing fewer values than actual per time intervals, or that the time interval is shorter shall be no greater

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|---|--------|------------|---------|---------|--------|-----|-----|------------|----------|--------------|------|-------|-----|-------------|-----|-----|---------|-------|-----|------|-----|-----|---|
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|   | S      | Ρ          | S       | Ρ       | S      | Ρ   | S   | Ρ          | S        | Р            | S    | Ρ     | S   | Ρ           | S   | Р   | S       | Р     | S   | Р    | S   | Ρ   |   |
|   |        |            |         |         |        |     |     |            |          |              |      |       |     |             |     |     |         |       |     |      |     |     | sector as ta<br>partial valu<br>this is unde<br>than Occas              |
| The system shall be able both<br>in the FMP position and in the<br>ATC supervisor position                    | 5      | 4          | N/a     | N/a     | N/a    | N/a | N/a | N/a        | 5        | 4            | n/a  | n/a   | n/a | n/a         | n/a | n/a | n/a     | n/a   | n/a | n/a  | n/a | n/a | The probat<br>unable to b<br>position an<br>position, or                |
| The calculation of the optimal<br>sector configuration shall be<br>short -(i.e.no more than<br>3mins)         | n/a    | n/a        | 5       | 5       | 5      | 5   | n/a | n/a        | n/a      | n/a          | n/a  | n/a   | n/a | n/a         | n/a | n/a | n/a     | n/a   | n/a | n/a  | n/a | n/a | no greater  |
| the system shall avoid the<br>possibility of implantation of a<br>sector configuration from the<br>system HMI | 5      | 4          | n/a     | n/a     | n/a    | n/a | n/a | n/a        | D5<br>U3 | D4<br>U3     | n/a  | n/a   | n/a | n/a         | n/a | n/a | n/a     | n/a   | n/a | n/a  | n/a | n/a | The probab<br>system cau<br>incorrect se<br>system HM<br>Likely (P)     |
|   |        |            |         |         |        |     |     |            |          |              |      |       |     |             |     |     |         |       |     |      |     |     | The probat<br>system cas<br>partially inc<br>from the sy<br>detected sh |

The probability of the failure of the system causing the implantation of a partially incorrect sector configuration from the system HMI and that it is undetected shall be no greater than Occasional (S P)



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tables, showing the only lues per time intervals and that ndetected shall be no greater casional (S P)

bability of the system being be provided both in the FMP and in the ATC supervisor , or in just one position shall be er than Likely (P)

bability of the failure of the causing the implantation of an t sector configuration from the HMI shall be no greater than

bability of the failure of the casuing the implantation of a incorrect sector configuration detected shall be no greater than Likely (P) system HMI and that it is

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|-----------|---|-----------|----|----|----|----|---|------------|---|------------|---------|-------|-----------|-----------|-----|-----|----|----|-----|-----|----|-----|
|           |   | TAL<br>SS | MC | RE | LE | SS |   | VELL<br>\S |   | TIAL<br>SS | INCOF   | RECT  | OTH<br>TH | HER<br>AN | EAI | RLY | LA | TE | BEF | ORE | AF | TER |
|           | S | Р         | S  | Р  | S  | Р  | S | Р          | S | Ρ          | S       | Р     | S         | Р         | S   | Р   | S  | Р  | S   | Р   | S  | F   |
|           |   |           |    |    |    |    |   |            |   |            |         |       |           |           |     |     |    |    |     |     |    |     |
|           |   |           |    |    |    |    |   |            |   |            |         |       |           |           |     |     |    |    |     |     |    |     |
|           |   |           |    |    |    |    |   |            |   |            |         |       |           |           |     |     |    |    |     |     |    |     |

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|----|---|---------|-------|----------|-------|----------------|---|-----|-----|----|----|---|-----|---|-----|-----|-----|-----|--------|--------|-----|---|-----|---|--|
| 12 | The system shall have an<br>analysis function to compare<br>the actual sector<br>configurations operated<br>against those proposed by<br>the system | 5       | 5     | 5        | 5     | 5              | 5 | 5   | 5   |    | 5  | 5 | 5   | 5 | 5   | 5   | 5   | 5   | 5      | 5      | 5   | 5 | 5   | 5 |  |
|    | The system must provide<br>recording facilities with a level<br>of granularity compatible with<br>after runs analysis                               | N/A     | 5     | N/A      | 5     | N/A            | 5 | N/A | 5   | N/ | /Α | 5 | N/A | 5 | N/A | 5   | N/A | 5   | N/A    | 5      | N/A | 5 | N/A | 5 |  |
| 13 | The system shall be capable<br>of displaying errors, warnings<br>and system messages.   | 4       | 4     | 4        | 4     | 4              | 4 | N/A | N/A |    | 4  | 4 | 4   | 4 | N/A | N/A | N/A | N/A | 4      | 4      | 4   | 4 | 4   | 4 | The probab<br>capable of o<br>and system<br>greater thar<br>The probab<br>displays mo<br>system mes<br>no greater t<br>The probab<br>displays fev<br>system mes<br>no greater t<br>The probab<br>displays err<br>messages I<br>greater thar<br>The probab<br>displays err<br>messages i<br>be no great |
|    | In the case of errors, a visual indication shall be available. (SPR)  |         |       |          |       |                |   |     |     |    |    |   |     |   |     |     |     |     |        |        |     |   |     |   |  |
|    | The system shall provide a<br>way to compare indicators in<br>certain periods of time, for<br>different data sources                                | 5       | 5     | 5        | 5     | 5              | 5 | 5   | 5   |    | 5  | 5 | 5   | 5 | 5   | 5   | 5   | 5   | 5      | 5      | 5   | 5 | 5   | 5 |  |



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bability that the system is not of displaying errors, warnings em messages shall be no nan Likely (S P) bability that the systems more errors, warnings and nessages than actual shall be er than Likely (S P) pability that the systems fewer errors, warnings and nessages than actual shall be er than Likely (S P) bability that the systems errors, warnings and system es later than actual shall be no han Likely (S P) bability that the systems errors, warnings and system es in the incorrect priority shall eater than Likely (S P)

# A.2 Assumptions

## A.2.1 Assumptions Associated with Requirements

Some requirements in this SPR document are based on assumptions. These are listed below in Table 2:

| Requirement ID             | Assumption ID               | Assumption  |
|----------------------------|-----------------------------|---|
| REQ-04.07.07-SPR-ODIM.0285 | ASP – 04.07.07 – SPR - 0001 | It is assumed that current mitigation<br>against intrusion into restricted<br>airspace will be maintained |

#### Table 2: Assumptions Related to Requirements

# A.2.2 General Assumptions

Error! Reference source not found. below lists general assumptions:

| Assumption ID               | Assumption  |
|-----------------------------|---|
| ASP – 04.07.07 – SPR - 0002 | It is assumed that flexible sectorisation does not<br>exceed acceptable levels of controller workload as<br>defined by mathematical modelling and simulations.  |
| ASP – 04.07.07 – SPR – 0003 | It is assumed that the impact of free route airspace will<br>not impact negatively upon the safety performance of<br>TLPD and CFMU.   |
| ASP – 04.07.07 – SPR – 0004 | It is assumed that safety will be included in the impact<br>assessment of point to point route structures with<br>regard to tracks and great circle routes  |
| ASP – 04.07.07 – SPR – 0005 | It is assumed that the Target Level of Safety for the concept will be supported by HLS airspace and Maastricht FRAM including their definition as one airspace block                                      |
| ASP – 04.07.07 – SPR - 0006 | It is assumed that the creation or revision of sectors will<br>take into account the workload associated with co-<br>ordination, such that workload is not negatively<br>impacted                         |
| ASP – 04.07.07 – SPR - 0007 | It is assumed that the Target Level of Safety for the concept will be supported by all FDPs within the FAB and neighbouring ANSPs   |
| ASP – 04.07.07 – SPR - 0008 | It is assumed that safety has been included in the analysis of the effect of extending the AMAN horizon.  |
| ASP – 04.07.07 – SPR – 0009 | It is assumed that the failure of the ODIM does not prevent timely allocation of clearances.  |
| ASP – 04.07.07 – SPR – 0010 | It is assumed that the controller will be aware of the fact that the ODIM has not provided a clearance of an aircraft.  |
| ASP – 04.07.07 – SPR – 0011 | It is assumed that if ODIM provides only partial clearance that it will be treated as a loss for that aircraft and it is not credible to be undetected.   |
| ASP – 04.07.07 – SPR - 0012 | It is assumed that early arrival of information does not result in the controller taking any further action   |
| ASP – 04.07.07 – SPR – 0013 | It is assumed that there will be an alternative means of proposing clearances in the case of ODIM failure.  |
| ASP – 04.07.07 – SPR - 0014 | It is assumed that future changes to ODIM requirements will be analysed for safety impact.  |
| ASP – 04.07.07 – SPR - 0015 | It is assumed that an increase in flexibility of controller validation shall not adversely impact safety.   |
| ASP – 04.07.07 – SPR - 0016 | it is assumed that the standalone ODIM position shows<br>both proposed and SAATS/GAATS extant clearance<br>as a result of which the acceptance of the proposed<br>clearance decision is made              |
| ASP – 04.07.07 – SPR - 0017 | It is assumed that the controllers at Gander OACC will<br>compare requested flight plan data against the ODIM<br>proposed data to ensure that the data has not been<br>plausibly (or otherwise) corrupted |
| ASP – 04.07.07 – SPR - 0018 | It is assumed that by virtue of training and experience<br>the Gander OACC controller will not knowingly issue a<br>clearance that is unsafe (i.e. that will result in loss of<br>separation standard)    |
| ASP – 04.07.07 – SPR - 0019 | It is assumed that current mitigation against intrusion<br>into restricted airspace will be maintained<br>In issuing Proposed Clearances the ODIM shall ensure  |

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| Assumption ID               | Assumption  |
|-----------------------------|---|
|                             | it uses the current time and position boundaries of restricted airspace   |
| ASP – 04.07.07 – SPR - 0020 | It is assumed that flexible sectorisation will not exceed<br>acceptable levels of controller workload as defined by<br>mathematical modelling and simulations.                |
| ASP – 04.07.07 – SPR - 0021 | It is assumed that any increase in flexibility of controller validation which may be required will not adversely impact safety  |
| ASP – 04.07.07 – SPR - 0022 | It is assumed that flexible sectorisation does not<br>exceed acceptable levels of controller workload as<br>defined by mathematical modelling and simulations.                |
| ASP – 04.07.07 – SPR - 0023 | It is assumed that the creation or revised sectors will<br>take into account the workload associated with co-<br>ordination, such that workload is not negatively<br>impacted |
| ASP – 04.07.07 – SPR - 0024 | Network effects are assumed to be the communication<br>or data exchange paths. ie: communications are able<br>to be configured for any sectorisation                          |
|                             |   |

#### **Table 3: General Assumptions**

# A.3 Security risk assessment

Not applicable

# A.4 Environment impact assessment

Not applicable

## A.5 OPA

Not applicable



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