# Draft ETSI EN 303 213-1 V1.1.1 (2008-12)

European Standard (Telecommunications series)

Electromagnetic compatibility
and Radio spectrum Matters (ERM);
Community Specification
Advanced Surface Movement Guidance
and Control System (A-SMGCS)
for application under the Single European Sky
Interoperability Regulation EC 552/2004
Part 1: Level 1 including external interfaces

ETSI

Reference

DEN/ERM-TG25-033-1

Keywords

aeronautical, interoperability

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Sous-Préfecture de Grasse (06) N° 7803/88

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC [i.2] (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Community Specification, the reference of which will be published in the Official Journal of the European Communities referencing the Regulation 552/2004 [i.1] of the European Parliament and of the Council relating to the interoperability of the European Air Traffic Management network ("Interoperability Regulation EC 552/2004").

NOTE: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

The present document is part 1 of a multi-part deliverable covering Community Specification Advanced Surface Movement Guidance and Control System (A-SMGCS) Level 1 and 2, as identified below:

Part 1: **"Level 1 including external interfaces";**

Part 2: "Level 2 including external interfaces";

Part 3: "Specification for a deployed cooperative sensor including its interfaces";

Part 4: "Specification for a deployed non-cooperative sensor including its interfaces".

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

Introduction

The European Union launched the Legislation "Single European Sky" (SES) in 2002 which was adopted in 2004.

The SES legislation is based on a framework of 4 regulations, which includes "the Interoperability Regulation" (EC 552/2004 [i.1]). According to the "First Report on the implementation of the Single Sky legislation" issued on the 20th of December 2007, the EC will adopt a new proposal for a second Single Sky package. Depending on the content of this package, there will be an impact on the development work of the present document.

The objective of the Interoperability Regulation is to ensure interoperability of the European Air Traffic Management Network (EATMN) consistent with air navigation services. Under this regulation, the use of a Community Specification (CS) is a means of compliance to the essential requirements of the Regulation and/or the relevant implementing rules for interoperability.

This European Standard has been prepared under a mandate given to the ESOs by the European Commission and developed in cooperation with Eurocae to support Essential Requirements of the Single European Sky Interoperability Regulation [i.1] and/or requirements given in implementing rules for interoperability based on the Single European Interoperability Regulation.

1 Scope

The present document specifies a European Standard for an Advanced Surface Movement Guidance and Control System, A-SMGCS Level 1. This system provides enhanced surveillance functionalities, as well as a display to controllers with accurate and unambiguous identity and position information on the entire manoeuvring and movement area.

The present document provides a European Standard for Air Navigation Service Providers, who have to demonstrate and declare compliance of their systems and procedures to the IOP regulation.

Furthermore, the present document provides a European Standard for manufacturers of the HMI constituents and the Data Fusion Processor constituent, who have to demonstrate and declare conformity for their constituent to the IOP regulation.

Any software elements related to software assurance level of an A-SMGCS System are outside of the scope of the present document and should be subjected to the [i.3] Community Specification for Software Assurance Level, developed by CEN under the Mandate M/390. The essential requirements of the Interoperability Regulation [i.1] are not considered for software elements within the present document.

The present document does not give presumption of conformity related to the maintenance requirements, environmental constraints, procedure level and effect of harmful interference.

Requirements in the present document which refer to "should" statements or recommendations in the normatively referenced material (clause 2.1) are to be interpreted as fully normative ("shall") for the purpose of compliance with the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:

    - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;

    - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1]   EUROCAE ED-87B (01/2008): "MASPS for A-SMGCS Level 1 and 2".

[2]   EUROCAE ED-116 (01/2004): "MOPS for Surface Movement RADAR Sensor Systems for Use in A-SMGCS".

[3]   EUROCAE ED-117 (11/2003): "MOPS for Mode S Multilateration Systems for Use in A-SMGCS".

[4]   EUROCAE ED-128 (08/2007): "Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2".

[5]   EUROCONTROL (07/01/11-04 V2.0: 12/12/2006): "Operational Concept and Requirements for A-SMGCS Implementation Level 1".

[6]   EUROCONTROL (07/01/09-01 V2.0: 11/2006): "A-SMGCS Levels 1 & 2 Preliminary Safety Case".

[7]   EUROCONTROL (06/11/24-16 V1.0: 13/10/2006): "Final Report on the Generic Cost Benefit Analysis of A-SMGCS".

[8]   COMMISSION REGULATION (EC) No 2150/2005 of 23 December 2005 laying down common rules for the flexible use of airspace.

[9]   Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE).

2.2   Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1]   Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (interoperability Regulation), OJ L 96, 31.03.2004.

[i.2]   Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations, OJ L 204, 21.07.1998 (modified by Directive 98/48/EC, OJ L 217, 05.08.1998).

[i.3]   Community Specification Software Assurance Levels (SWAL) for application under the Single European Sky Interoperability Regulation EC 552/2004 (Ground-based systems and constituents only).

[i.4]   ETSI EN 303 213-3: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Advanced Surface Movement Guidance and Control System (A-SMGCS) for application under the Single European Sky Interoperability Regulation EC 552/2004; Part 3: Specification for a deployed cooperative sensor including its interfaces".

[i.5]   ETSI EN 303 213-4: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic compatibility and Radio spectrum Matters (ERM); Advanced Surface Movement Guidance and Control System (A-SMGCS) for application under the Single European Sky Interoperability Regulation EC 552/2004; Part 4: Specification for a deployed non-cooperative sensor including its interfaces".

[i.6]   Regulation (EC) No 549/2004 of the European Parliament and of the Council of 10 March 2004 laying down the framework for the creation of the single European sky (the framework Regulation), OJ L 96, 31.03.2004.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the following terms and definitions apply:

A-SMGCS Level 1: includes a comprehensive Surveillance element capable of the location and classification of all aircraft and vehicles within the area of interest and the identification of cooperative aircraft and vehicles
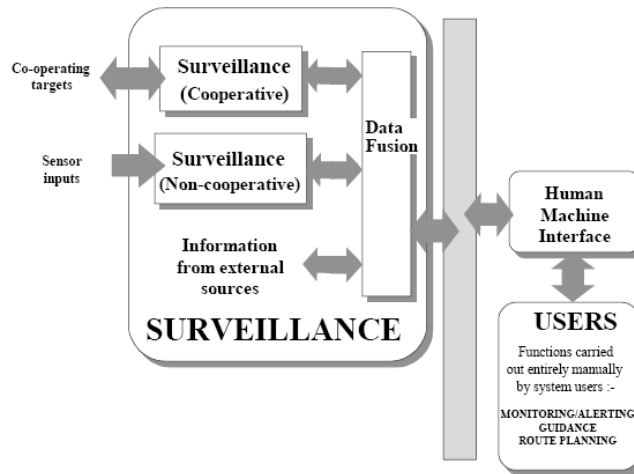
Figure 1: A-SMGCS Level 1 Functional Configuration

A-SMGCS Level 2: includes the capabilities of A-SMGCS Level 1 and uses the comprehensive surveillance data available to monitor the situation in the area of interest against a set of rules which will enable the system to alert the user to hazardous situations
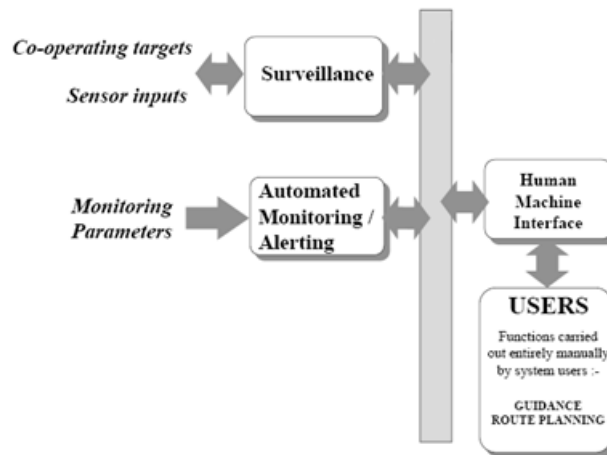
Figure 2: A-SMGCS Level 2 Functional Configuration

Advanced Surface Movement Guidance and Control System (ASMGCS): systems providing routing, guidance, surveillance and control to aircraft and affected vehicles in order to maintain movement rate under all local weather conditions within the Aerodrome Visibility Operational Level (AVOL) whilst maintaining the required level of safety

aerodrome: defined area (including any buildings, installations, and equipment) intended to be used either wholly or in part for arrival, departure and surface movement of aircraft

apron: defined area on an aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance

availability: probability that a system or an item is in a functioning state at a given point in time

classification: function which groups targets into various types (e.g. large, medium, small)

constituents: tangible objects such as hardware and intangible objects such as software upon which the interoperability of the EATMN depends

> NOTE: This is the legally binding definition in the context of Single European Sky [i.6].

manoeuvring area: that part of an aerodrome to be used for take-off, landing and taxiing of aircraft, excluding aprons

movement area: part of an aerodrome to be used for take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and aprons

procedure: standard method for either the technical or operational use of the system, in the context of agreed and validated concepts of operation requiring uniform implementation throughout the EATMN

> NOTE: This is the legally binding definition in the context of Single European Sky [i.6].

system: aggregation of airborne and ground based constituents, as well as space-based equipment, that provides support for air navigation services for all phases of flight

> NOTE: This is the legally binding definition in the context of Single European Sky [i.6].

target: any aircraft, vehicle or obstacle, whether stationary or moving, which is located within the coverage area of the SMR and which is of sufficient size to be operationally significant

update: renewal of target reports relating to all targets under surveillance

> NOTE: Further legally binding definitions in the context of Single European Sky are given in [i.6].

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

A-SMGCS	Advanced Surface Movement Guidance and Control Systems
ATC	Air Traffic Control
ATM	Air Traffic Management
AVOL	Aerodrome Visibility Operational Level
CEN	Comité Européen de Normalization
CS	Community Specification
DFP	Data Fusion Processor
doa	date of announcement
dow	date of withdrawal
EATMN	European Air Traffic Management Network
EC	European Communities
EN	European Norm - (standard)
ER	Essential Requirement
ESO	European Standardization Organization
EUROCAE	EUROpean organization for Civil Aviation Equipment
EUROCONTROL	EUROpean organization for the safety of air navigation
HMI	Human Machine Interface
ICAO	International Civil Aviation Organization
IOP Regulation	InterOPerability Regulation
MASPS	Minimum Aviation Systems Performance Specification
MLAT	MultiLATeration
PRA	Position Registration Accuracy
SES	Single European Sky
SMR	Surface movement radar

4   Requirements for implementing A-SMGCS Level 1

An A-SMGCS Level 1 System shall consist of the following constituents as a minimum for the implementation, operation and maintenance:

1)   Surface Movement Radar

2)   Multilateration (MLAT)

3)   Data fusion processor

4)   Human Machine Interface

4.1   Constituents of an A-SMGCS Level 1 System

The following clauses identify the constituents of an A-SMGCS system.

4.1.1   Constituent - Surface Movement Radar (SMR)

The Surface Movement Radar constituent of an A-SMGCS System is covered in EN 303 213-4 [i.5] (non-cooperative sensors).

4.1.1.1   System Interfaces for SMR

The system interfaces to SMR constituents shall comply with the requirements as defined in ED-116 [2], clause 2.11.

4.1.2   Constituent - Multilateration (MLAT)

The Multilateration constituent of an A-SMGCS System is covered in EN 303 213-3 [i.4] (cooperative sensors).

4.1.2.1   System Interfaces for MLAT

The system interfaces to MLAT constituents shall comply with the requirements as defined in ED-117 [3], clause 2.10.5.

4.1.3   Constituent - Data fusion processor

The data fusion processor of an A-SMGCS System shall comply with the requirements and recommendations as defined in ED-128 [4], clause 3.

4.1.3.1   System Interface for Data fusion processor

The data fusion processor of an A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clause 2.5.1.1.

4.1.4   Constituent - Human Machine Interface (HMI)

The requirements for the Human Machine Interface are further described in clauses 4.2.5 and 4.3.2.4 of the present document.

4.1.4.1   System Interface for HMI

The system interface for the HMI shall be capable to exchange data with the data fusion processor.

4.2 Design Requirements for A-SMGCS Level 1 Systems

4.2.1 Design Requirements on System Level

4.2.1.1 Modularity

The System shall comply with the design requirements as defined in ED-87B [1], clause 1.8.2.

4.2.1.2 System Integrity

The System integrity shall comply with the design requirements as defined in ED-87B [1], clause 3.1.1.1, second and fifth paragraphs.

4.2.1.3 Availability and Continuity of Service

The Availability and continuity of service for A-SMGCS Systems shall comply with the requirements as defined in ED-87B [1], clause 3.1.1.2.

4.2.1.4 Identification

The functional requirement for identification shall comply with the requirements as defined in ED-87B [1], clause 3.2.2.1.

4.2.1.5 Position Registration Accuracy

The functional requirement for position registration accuracy shall comply with the requirements as defined in ED-87B [1], clause 3.4.1.2.

4.2.1.6 System Availability and Continuity of Service

The System Availability and Continuity of Service shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], Op_Perf-10-Availability and Op_Perf-12-Continuity of Service 1.

4.2.1.7 Safety

4.2.1.7.1 Objectives

The safety objectives shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 2.1.

4.2.1.7.2 Benefits

The safety benefits shall be obtained from the methodology as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 2.4, Final Report on the Generic Cost Benefit Analysis of A-SMGCS [7], clause 2.2 and clause 5.2.3.

4.2.1.7.3 ATC Controllers

The use of A-SMGCS Level 1 system shall support ATC Controllers in terms of safety as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 4.1.

4.2.1.7.4 Failure effect

An A-SMGCS Level 1 system shall be designed in such a way, that erroneous data from any constituent would not impact safety.

NOTE: This requirement is taken from clause 7.2.3 Requirement Op_Ds-7-Failure effect "d" [5].

4.2.1.7.5   Reliability

The reliability of the system shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], Op_Ds-5-Self-checking system, Op_Ds-8-Self-restartable, and Op_Env-4-Adverse effects.

4.2.1.7.6   Human capabilities

An A-SMGCS Level 1 system shall be designed in such a way, that the human capabilities shall be compatible with the principals described in ED-87B [1], clause 2.5.2.

4.2.1.7.7   Safety Case

The safety case for A-SMGCS Level 1 system shall follow the methodology from A-SMGCS Levels 1&2 Preliminary Safety Case [6].

4.2.1.8   Capacity and Quality

4.2.1.8.1   Handle Traffic Movements

The handling of traffic movements shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 7.2.3, Op_Range-2-Capacity, Op_Range-1-Visibility conditions, Op_Range-3-Mobile types , Op_Range-4-Mobile types , Op_Range-5-Speeds and Orientation, Op_Range-6-Velocity.

4.2.1.8.2   System capacity

The system design shall take into account that capacity requirements will vary considerably from airport to airport depending on the volume of traffic and the aerodrome complexity. As a minimum, System Capacity shall be sufficient to meet the number of expected targets for the aerodrome with a specified margin of spare capacity to permit safe operation and future growth.

> NOTE: This requirement is taken from ED-87B [1], clause 3.1.2.

4.2.1.8.3   Accuracy

The accuracy shall comply with the requirements as defined in ED-87B [1], clause 3.2.2.3.

4.2.1.8.4   Resolution

The resolution shall comply with the requirements as defined in ED-87B [1], clause 3.3.2.2.

4.2.1.8.5   Update rate

The update rate shall comply with the requirements as defined in ED-87B [1], clause 3.2.2.5.

4.2.1.8.6   Coverage Volume

The coverage volume shall comply with the requirements as defined in ED-87B [1], clause 3.2.1.

4.2.1.8.7   Classification

The classification shall comply with the requirements as defined in ED-87B [1], clause 3.2.2.2.

4.2.1.9   Evolution

The classification shall comply with the requirements as defined in ED-87B [1], clause 1.8.3.

4.2.2 Design Requirements for Surface Movement Radar

The design requirements for Surface Movement Radar as part of an A-SMGCS System are covered in EN 303 213-4 [i.5].

4.2.3 Design Requirements for Multilateration

The design requirements for multilateration as part of an A-SMGCS System are covered in EN 303 213-3 [i.4].

4.2.4 Design Requirements for Data Fusion Processor

The constituent Data Fusion Processor shall comply with the design requirements as defined in ED-128 [4], clause 4.3.

4.2.5 Design Requirements for Human Machine Interface

4.2.5.1 Void

4.2.5.2 HMI

The functional requirement for a HMI shall comply with the requirements as defined in ED-87B [1], clause 2.2.2, first paragraph.

4.2.5.3 General

The general requirements for the Human Machine Interface shall comply with the requirements as defined in ED-87B [1], clause 2.5.2.

4.2.5.4 Capabilities, Label operations, dynamic configuration data and unambiguous presentation

The capabilities, label operations, dynamic configuration data and unambiguous presentation shall comply with the requirements as defined for A-SMGCS Level 1 in ED-87B [1], clause 2.5.2.1.

4.3 Build Requirements for A-SMGCS Level 1 Systems

4.3.1 Build Requirements on System Level

4.3.1.1 General Tests

The system shall perform the build tests as defined in ED-87B [1], clause 4.5.

4.3.1.2 System and data integrity

The system shall include performance and integrity monitoring based on field mounted test targets, enabling the verification of the end-to-end performance of the system.

Test targets shall be monitored by the system both for their presence and for their location with arrangements made to provide an alert in the event of not detecting a test target in the expected area.

An alert to the user should occur within 20 seconds of a test target failing to be detected. This time allows for some delay to prevent false alerts.

Similarly, the alert should be removed within 20 seconds of the test target being re-established.

    NOTE: This requirement is taken from ED-87B [1], clause 3.1.1.1.

4.3.1.3   Tests on modularity and interchangeability

The system shall perform the build tests as defined in ED-87B [1], clause 4.6.

4.3.2   Build Requirements on Constituent Level

4.3.2.1   Build Requirements for Constituent Surface Movement Radar

The build requirements for Surface Movement Radar as part of an A-SMGCS System is covered in EN 303 213-4 [i.5].

4.3.2.2   Build Requirements for Constituent Multilateration

The build requirements for multilateration as part of an A-SMGCS System is covered in EN 303 213-3 [i.4].

4.3.2.3   Build Requirements for Constituent Data Fusion Processor

The Data Fusion Processor constituent shall perform the build tests as defined in ED-87B [1], clause 4.6.

4.3.2.4   Build Requirements for Constituent Human Machine Interface

The constituent Human Machine Interface shall perform the build tests as defined in ED-87B [1], clause 4.8.

4.4   Maintenance Requirements for A-SMGCS Level 1 Systems

The present document does not give presumption of conformity related to the maintenance requirements.

4.5   Requirements for operation of A-SMGCS Level 1 Systems

4.5.1   Requirements for operation on System Level

4.5.1.1   System performance below specified minima

The user shall be informed and appropriate actions shall be defined, if the system performance is below specified minima.

5   Testing

The testing of an A-SMGCS Level 1 System is covered with the build requirements from clause 4.3 of the present document.

Annex A (informative):
Bibliography

ICAO Annex 14: Aerodrome Design and Operations, volume 1.

ICAO Annex 10: Aeronautical communications.

ICAO Doc 9476: Manual of Surface Movements and Guidance Control Systems (SMGCS).

ICAO Doc 9830: Manual of A-SMGCS.

ICAO EUR Manual on A-SMGCS.

Council Resolution of 7 May 1985 on a new approach to technical harmonization and standards, OJ C 136, 04.06.1985.

ETSI EG 201 399: "Electromagnetic compatibility and Radio spectrum Matters (ERM); A guide to the production of candidate Harmonized Standards for application under the R&TTE Directive".

ETSI TR 102 579: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Report providing guidance for the production of Community Specifications for application under the Single European Sky Interoperability Regulation EC 552/2004".

EUROCONTROL (07/01//11-06 Edition 2.0, Edition Date: 12/12/2006): Functional Specification for A-SMGCS Implementation Level 1.

EUROCONTROL (06/11/27-18 V1.1, Edition Date: 27/11/2006): Human Factor Case for A-SMGCS.

EUROCONTROL: European Action Plan for the Prevention of Runway Incursions.

Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (R&TTE Directive) (OJ L 91, 07.04.1999).

Annex B (normative):
Checklist

B.1 Interoperability Regulation Annex II Essential Requirements; Part A: General requirements

1	**ER 1 seamless operation**		
	Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.1	designed	Identify the design documents/clauses which address seamless operation for constituents (e.g. interface design documents).	Identify the design documents/clauses which address seamless operation for systems (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		DFP: EUROCAE ED-128 (ED-128 published 08/2007): Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2 [4], clause 4.3. HMI: EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.2.2 HMI, clause 2.5.2 Human-Machine Interface, first paragraph, clause 2.5.2.1 General Requirements for ATC Workstation HMI.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 1.8.2 Modularity, clause 3.1.1.1 System, paragraph two and five, clause 3.1.1.2 System Availability and Continuity of Service. EUROCONTROL Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 2.1 Objectives, clause 2.4 Benefits, clause 4.1 ATC Controllers, 7.3.2 Quality of Service Requirements Op_Perf-10-Availability and Op_Perf-12-Continuity of Service.
1.2	built	Identify the build documents/clauses which address seamless operation for constituents (e.g. baselined configuration documents).	Identify the build documents/clauses which address seamless operation for systems (e.g. baselined configuration documents).
		DFP: EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 4.6 Surveillance Element Tests. HMI: EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 4.8 Human Machine Interface Tests.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2, clause 4.5 General Tests.
1.3	maintained	n/a.	n/a.
		The present document does not give presumption of conformity.	The present document does not give presumption of conformity.

1	ER 1 seamless operation		
	Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN.		
	Keywords	Evidence on constituent level	Evidence on system level
1.4	operated	n/a.	Identify those procedures and their validation that address seamless operation for all phases of flight (e.g. operations manuals, simulation reports).
		Operation is only applicable at the system level.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.1.1.1 System, paragraph three. The user shall be informed and appropriate actions shall be defined, if the system performance is below specified minima.
1.5	information sharing	Identify the design documents/clauses which address information sharing for constituents (e.g. interface control documents).	Identify the design documents/clauses which address information sharing for systems (e.g. interface control documents).
		DFP: EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.5.1.1 Surveillance. HMI: The system interface for the HMI shall be capable to exchange data with the data fusion processor.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.1.1.1 System, paragraph five, clause 3.2.2.1 Identification, clause 3.4.1.2 Position Registration Accuracy (PRA).

2	ER 2 Support for new concepts of operation		
	The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation.		
	Keywords	Evidence on constituent level	Evidence on system level
2.1	Validated concepts of operation - safety	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in safety terms (e.g. requirements/design specifications).	Identify the documents/clauses which demonstrate that the system is contributing to a valid concept of operation in safety terms (e.g. requirements/design specifications).
		Operation is only applicable at the system level.	EUROCONTROL (07/01/09-01 V2.0, Edition Date: 11/2006, A-SMGCS Levels 1 & 2 Preliminary Safety Case [6].
2.2	Validated concepts of operation - capacity	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in capacity terms (e.g. requirements/design specifications).	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in capacity terms (e.g. requirements/design specifications).
		Operation is only applicable at the system level.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.1.2 System capacity.

2	ER 2 Support for new concepts of operation		
	The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
2.3	Validated concepts of operation - quality	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in quality terms (e.g. requirements/design specifications).	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in quality terms (e.g. requirements/design specifications).
		Operation is only applicable at the system level.	EUROCONTROL (07/01/11-04 Edition 2.0, Edition date 12/12/2006): Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 7.2.3 Requirement Op_Range-2-Capacity, Op_Range-1-Visibility conditions, Op_Range-3-Mobile types , Op_Range-4-Mobile types , Op_Range-5-Speeds and Orientation, Op_Range-6-Velocity. EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.2.2.3 Accuracy, clause 3.2.2.5 Update Rate, clause 3.2.1 Coverage Volume, clause 3.2.2.1 Identification, clause 3.2.2.2 Classification, clause 3.3.2.2 Accuracy and Resolution.

3	ER 3 Safety			
	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
3.1	Design	n/a.	Identify the system design documents/clauses which address safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	Identify the procedure design documents/clauses which address safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).

3	ER 3 Safety			
	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment.			
	Keywords	Evidence on constituent level	Evidence on system level	Evidence at procedure level
			EUROCONTROL (07/01/11-04 Edition 2.0, Edition date 12/12/2006): Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 7.2.3, Op_Ds-5-Self-checking system, Op_Ds-8-Self-restartable, Op_Env-4-Adverse effects. EUROCONTROL (07/01/09-01 V2.0, Edition Date: 11/2006, A-SMGCS Levels 1 & 2 Preliminary Safety Case [6].	The present document does not give presumption of conformity.
3.2	Implementation	n/a.	Identify the documents/clauses which demonstrate that the system meets safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	Identify the documents/clauses which demonstrate that the procedures meet safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).
			EUROCONTROL (07/01/09-01 V2.0, Edition Date: 11/2006, A-SMGCS Levels 1 & 2 Preliminary Safety Case [6].	The present document does not give presumption of conformity.

3	**ER 3 Safety**			
	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
3.3	Maintenance	n/a.	Identify the documents/clauses which demonstrate that the system maintenance requirements ensure that that the system continues to meets safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	n/a.
			The present document does not give presumption of conformity.	
3.4	Operation	n/a.	Identify the documents/clauses which demonstrate that the operation of the system meets safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	Identify the documents/clauses which demonstrate that the procedures meet safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).
			EUROCONTROL (07/01/09-01 V2.0, Edition Date: 11/2006, A-SMGCS Levels 1 & 2 Preliminary Safety Case [6]. The user shall be informed and appropriate actions shall be defined, if the system performance is below specified minima.	The present document does not give presumption of conformity.
3.5	Human capabilities	n/a.	Identify the documents/clauses which demonstrate that human capabilities have been addressed at system level (e.g. human factors reports, HMI requirements, simulation reports, safety case).	Identify the documents/clauses which demonstrate that human capabilities have been addressed at procedure level (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.5.2 Human Machine Interface.	The present document does not give presumption of conformity.

3	**ER 3 Safety**			
	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
3.6	Harmful interference	n/a.	Identify the documents/clauses which demonstrate that the system does not create harmful interference (e.g. RTTE certification).	n/a.
			The present document does not give presumption of conformity.	

4	**ER 4 Civil-military coordination**		
	The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace. To achieve these objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties. Account should be taken of national security requirements.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.1	Flexible use of airspace	Identify how the Regulation (EC) No 2150/2005 [10] is fulfilled.	Identify how the Regulation (EC) No 2150/2005 [11] is fulfilled.
		National requirements will be handled by national annexes to the present document, if necessary.	National requirements will be handled by national annexes to the present document, if necessary.
4.2	Timely sharing	Identify how constituents support the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the system supports the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
		DFP: EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.5.1.1 Surveillance. HMI: The system interface for the HMI shall be capable to exchange data with the data fusion processor.	EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.2.2.3 Accuracy.
4.3	National security requirements	n/a.	Identify how national security requirements are addressed.
			National security requirements will be handled by national annexes to the present document, if necessary.

5	**ER 5 Environmental constraints**			
	Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
5.1	Minimize environmental impact - ATS	n/a.	Identify how environmental impact has been minimized at system level (e.g. environmental impact analysis/studies).	Identify how environmental impact has been minimized at procedure level (e.g. environmental impact analysis/studies).
			The present document does not give presumption of conformity.	The present document does not give presumption of conformity.
5.2	Minimize environmental impact - materials	Identify how environmental impact has been minimized at constituent level (e.g. compliance with the Waste Electrical and Electronic Equipment Directive 2002/96/EC) [9].	Identify how environmental impact has been minimized at system level (e.g. compliance with the Waste Electrical and Electronic Equipment Directive 2002/96/EC) [9].	n/a.
		The present document does not give presumption of conformity.	The present document does not give presumption of conformity.	

6	**ER 6 Principles governing the logical architecture of systems**		
	Systems shall be designed and progressively integrated with the objective of achieving a coherent and increasingly harmonized, evolutionary and validated logical architecture within the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1	Designed and progressively integrated.	n/a.	Identify system level requirements which demonstrate alignment to a coherent and increasingly harmonized, evolutionary and validated logical architecture (e.g. SESAR deliverables).
			EUROCONTROL Operational Concept and Requirements for A-SMGCS Implementation Level 1 [5], clause 2.1 Objectives, clause 2.4 Benefits, clause 4.1 ATC Controllers, 7.3.2 Quality of Service Requirements Op_Perf-10-Availability and Op_Perf-12-Continuity of Service.

7	**ER 7 Principles governing the construction of systems**		
	Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1	Modularity, interchangeability.	n/a.	Identify how the system design ensures modularity and interchangeability of constituents (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 1.8.2 Modularity, clause 3.1.1.1 System Integrity. EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2, clause 4.6 Surveillance Element Tests.
7.2	High availability, Redundancy and fault tolerance.	n/a.	Identify how the system is designed, built and maintained such that they provide the appropriate level of availability (e.g. design specifications, test and performance data).
			EUROCONTROL Operational Concept and Requirements for A8SMGCS Implementation Level 1 [5], clause 2.1 Objectives, clause 2.4 Benefits, clause 4.1 ATC Controllers, 7.3.2 Quality of Service Requirements Op_Perf-10-Availability and Op_Perf-12-Continuity of Service, clause 7.2.3 Requirement Op_Ds-5-Self-checking system, Op_Ds-8-Self-restartable, Op_Env-4-Adverse effects. EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2, clause 3.1.1.2 System Availability and Continuity of Service, clause 3.1.1.1 System Integrity. EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2, clause 4.5 General Tests.

B.2   Interoperability Regulation Annex II Essential Requirements Part B: Specific requirements

B.2.1   Systems and procedures for airspace management

1.1	**ER 1.1 Seamless operation**		
	Information relating to pre-tactical and tactical aspects of airspace availability shall be provided to all interested parties in a correct and timely way so as to ensure an efficient allocation and use of airspace by all airspace users. This should take into account national security requirements.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.1.1	Modularity, interchangeability	n/a.	Identify how the system design ensures modularity and interchangeability of constituents (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
			Not covered by this CS.
1.1.2	High availability	n/a.	Identify how the system is designed, built and maintained such that they provide the appropriate level of availability (e.g. design specifications, configuration records, test data, performance data).
			Not covered by this CS.
1.1.3	Redundancy and fault tolerance	n/a.	Identify how the system design ensures appropriate levels of redundancy and fault tolerance (e.g. design specifications, test and performance data, safety case).
			Not covered by this CS.

B.2.2   Systems and procedures for air traffic flow management

2.1	**ER 2.1 Seamless operation**			
	Systems and procedures for air traffic flow management shall support the sharing of correct, coherent and relevant strategic, pre-tactical and tactical, as applicable, flight information covering all phases of flight and offer dialogue capabilities with a view to achieving optimized use of airspace.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
2.1.1	Strategic	n/a.	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
			Not covered by this CS.	Not covered by this CS.
2.1.2	Pre-tactical	n/a.	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
			Not covered by this CS.	Not covered by this CS.
2.1.3	Tactical	n/a.	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
			Not covered by this CS.	Not covered by this CS.

B.2.3 Systems and procedures for air traffic services

B.2.3.1 Flight data processing systems

3.1.1	**ER 3.1.1 Seamless operation**		
	Flight data processing systems shall be interoperable in terms of the timely sharing of correct and consistent information, and a common operational understanding of that information, in order to ensure a coherent and consistent planning process and resource-efficient tactical coordination throughout the EATMN during all phases of flight. In order to ensure safe, smooth and expeditious processing throughout the EATMN, flight data processing performances shall be equivalent and appropriate for a given environment (surface, terminal manoeuvring area (TMA), en-route), with known traffic characteristics and exploited under an agreed and validated operational concept, in particular in terms of accuracy and error tolerance of processing results.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.1.1.1	Timely sharing	n/a.	Identify how the system supports the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
3.1.1.2	Performance appropriate for environment	n/a.	Identify how the system performance is appropriate for the environment (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
3.1.1.3	Accuracy and error tolerance	n/a.	Identify how the system accuracy and error tolerance is ensured (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.

3.1.2	ER 3.1.2. Support for new concepts of operation		
	Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight. The characteristics of automation-intensive tools must be such as to enable coherent and efficient pre-tactical and tactical processing of flight information in parts of the EATMN. Airborne and ground systems and their constituents supporting new, agreed and validated concepts of operation shall be designed, built, maintained and operated, using appropriate and validated procedures, in such a way as to be interoperable in terms of timely sharing of correct and consistent information and a common understanding of the current and predicted operational situation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.1.2.1	Airborne systems - design	Identify the documents/clauses which demonstrate that the constituent is designed to be interoperable (e.g. interface control documents).	Identify the documents/clauses which demonstrate that the system is designed to be interoperable (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		Not covered by this CS.	Not covered by this CS.
3.1.2.2	Airborne systems - built	Identify the documents/clauses which demonstrate that the constituent is built to be interoperable (e.g. baselined configuration documents).	Identify the documents/clauses which demonstrate that the system is built to be interoperable (e.g. baselined configuration documents).
		Not covered by this CS.	Not covered by this CS.
3.1.2.3	Airborne systems - maintained	Identify the documents/clauses which demonstrate that the constituent is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).	Identify the documents/clauses which demonstrate that the system is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		Not covered by this CS.	Not covered by this CS.
3.1.2.4	Airborne systems - operated	Identify the documents/clauses which demonstrate that the constituent is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).	Identify the documents/clauses which demonstrate that the system is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).
		Not covered by this CS.	Not covered by this CS.
3.1.2.5	Ground systems - design	Identify the documents/clauses which demonstrate that the constituent is designed to be interoperable (e.g. interface control documents).	Identify the documents/clauses which demonstrate that the system is designed to be interoperable (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		Not covered by this CS.	Not covered by this CS.
3.1.2.6	Ground systems - built	Identify the documents/clauses which demonstrate that the constituent is built to be interoperable (e.g. baselined configuration documents).	Identify the documents/clauses which demonstrate that the system is built to be interoperable (e.g. baselined configuration documents).
		Not covered by this CS.	Not covered by this CS.
3.1.2.7	Ground systems - maintained	Identify the documents/clauses which demonstrate that the constituent is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).	Identify the documents/clauses which demonstrate that the system is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		Not covered by this CS.	Not covered by this CS.
3.1.2.8	Ground systems - operated	Identify the documents/clauses which demonstrate that the constituent is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).	Identify the documents/clauses which demonstrate that the system is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).
		Not covered by this CS.	Not covered by this CS.

B.2.3.2   Surveillance data processing systems

3.2.1	**ER 3.2.1 Seamless operation**		
	Surveillance data processing systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to provide the required performance and quality of service within a given environment (surface, TMA, en-route) with known traffic characteristics, in particular in terms of accuracy and reliability of computed results, correctness, integrity, availability, continuity and timeliness of information at the control position. Surveillance data processing systems shall accommodate the timely sharing of relevant, accurate, consistent and coherent information between them to ensure optimized operations through different parts of the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.1.1	Designed	n/a.	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 1.8.2 Modularity, clause 3.1.1.1 System, paragraph two and five, clause 3.1.1.2 System Availability and Continuity of Service, clause 3.3.2.2 Accuracy and Resolution. EUROCAE ED-116 (ED-116 published 01/2004): MOPS for Surface Movement RADAR Sensor Systems for Use in A-SMGCS [2], clause 2.11. EUROCAE ED-117 (ED-117 published 11/2003): MOPS for Mode S Multilateration Systems for Use in A-SMGCS [3], clause 2.10.5 System Interfaces.
3.2.1.2	Built	n/a.	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2, clause 4.5 General Tests.
3.2.1.3	Maintained	n/a.	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
			The present document does not give presumption of conformity.
3.2.1.4	Operated	n/a.	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.1.1.1 System, paragraph two and five, clause 3.1.1.2 System Availability and Continuity of Service, paragraph four. The user shall be informed and appropriate actions shall be defined, if the system performance is below specified minima.

3.2.2	ER 3.2.2. Support for new concepts of operation		
	Surveillance data processing systems shall accommodate the progressive availability of new sources of surveillance information in such a way as to improve the overall quality of service.		
	Keywords	Evidence on constituent level	Evidence on system level
3.2.2.1	Availability of new sources	n/a.	Identify how the system is able to accommodate new sources of surveillance information (e.g. requirements/design specifications).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 1.8.3 Evolution.

B.2.3.3   Human-machine interface systems

3.3.1	ER 3.3.1 Seamless operation		
	Human-machine interfaces of ground air traffic management systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to offer to all control staff a progressively harmonized working environment, including functions and ergonomics, meeting the required performance for a given environment (surface, TMA, en-route), with known traffic characteristics.		
	Keywords	Evidence on constituent level	Evidence on system level
3.3.1.1	Designed	n/a.	Identify the documents/clauses which demonstrate that the system design has addressed human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.2.2 HMI, clause 2.5.2 Human-Machine Interface, first paragraph, clause 2.5.2.1 General Requirements for ATC Workstation HMI.
3.3.1.2	Built	n/a.	Identify the documents/clauses which demonstrate that the system is built to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 4.8 Human Machine Interface Tests.
3.3.1.3	Maintained	n/a.	Identify the documents/clauses which demonstrate that the system is maintained to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			The present document does not give presumption of conformity.
3.3.1.4	Operated	n/a.	Identify the documents/clauses which demonstrate that the system is operated to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 3.1.1.1 System, paragraph three.

3.3.2	**ER 3.3.2. Support for new concepts of operation**		
	Human-machine interface systems shall accommodate the progressive introduction of new, agreed and validated concepts of operation and increased automation, in such a way as to ensure that the tasks assigned to the control staff remain compatible with human capabilities, in both the normal and degraded modes of operation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.3.2.1	Human capabilities	n/a.	Identify the documents/clauses which demonstrate that human capabilities have been addressed at system level for both normal and degraded modes of operation (e.g. human factors reports, HMI requirements, simulation reports, safety case).
			EUROCAE ED-87B (ED-87B published 01/2008): MASPS for A-SMGCS Level 1 and 2 [1], clause 2.5.2 Human Machine Interface.

B.2.4   Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications

4.1	**ER 4.1 Seamless operation**		
	Communication systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to achieve the required performances within a given volume of airspace or for a specific application, in particular in terms of communication processing time, integrity, availability and continuity of function. The communications network within the EATMN shall be such as to meet the requirements of quality of service, coverage and redundancy.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.1.1	Designed	n/a.	Identify how the system design meets the attributes of processing time, integrity, availability and continuity of function (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
4.1.2	Built	n/a.	Identify the documents/clauses which demonstrate that the system is built to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. baselined configuration documents).
			Not covered by this CS.
4.1.3	Maintained	n/a.	Identify how the system is maintained to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
			Not covered by this CS.
4.1.4	Operated	n/a.	Identify how the system is operated to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. safety case and supporting documentation, user manuals).
			Not covered by this CS.
4.1.5	Quality of service, coverage, redundancy	n/a.	identify how the quality of service, coverage and redundancy requirements are met by the system (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.

4.2	ER 4.2 Support for new concepts of operation		
	Communication systems shall support the implementation of advanced, agreed and validated concepts of operation for all phases of flight		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.2.1	Support the implementation	n/a.	Identify how the system satisfies the implementation of advanced, agreed and validated concepts of operation for all phases of flight (e.g. requirements/design specifications, safety case).
			Not covered by this CS.

B.2.5   Navigation systems and procedures

5.1	ER 5.1 Seamless operation		
	Navigation systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to achieve the required horizontal and vertical navigation performance, in particular in terms of accuracy and functional capability, for a given environment (surface, TMA, en-route), with known traffic characteristics and exploited under an agreed and validated operational concept.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
5.1.1	Designed	n/a.	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
5.1.2	Built	n/a.	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
			Not covered by this CS.
5.1.3	Maintained	n/a.	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
			Not covered by this CS.
5.1.4	Operated	n/a.	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
			Not covered by this CS.

B.2.6   Surveillance systems and procedures

6.1	**ER 6.1 Seamless operation**		
	Surveillance systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to provide the required performance applicable in a given environment (surface, TMA, en-route) with known traffic characteristics and exploited under an agreed and validated operational concept, in particular in terms of accuracy, coverage, range and quality of service. The surveillance network within the EATMN shall be such as to meet the requirements of accuracy, timeliness, coverage and redundancy. The surveillance network shall enable surveillance data to be shared in order to enhance operations throughout the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1.1	Designed	n/a.	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
6.1.2	Built	n/a.	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
			Not covered by this CS.
6.1.3	Maintained	n/a.	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
			Not covered by this CS.
6.1.4	Operated	n/a.	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
			Not covered by this CS.

B.2.7   Systems and procedures for aeronautical information services

7.1	**ER 7.1 Seamless operation**		
	Accurate, timely and consistent aeronautical information shall be provided progressively in an electronic form, based on a commonly agreed and standardized data set. Accurate and consistent aeronautical information, in particular concerning airborne and ground-based constituents or systems, shall be made available in a timely manner.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1.1	Accurate, timely and consistent	n/a.	Identify how the system design satisfies the seamless operation attributes for accurate, timely and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.
7.1.2	Standardized data set	n/a.	Identify how the system design satisfies the seamless operation attributes for utilization of a commonly agreed and standardized data set (e.g. requirements/design specifications, standards documents).
			Not covered by this CS.

7.2	ER 7.2 Support for new concepts of operation		
	Increasingly accurate, complete and up-to-date aeronautical information shall be made available and used in a timely manner in order to support continuous improvement of the efficiency of airspace and airport use.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.2.1	Increasingly accurate, complete and up-to-date	n/a.	Identify how the system design supports the continuous improvement of the efficiency of airspace and airport use (e.g. requirements/design specifications, test and performance data, safety case).
			Not covered by this CS.

B.2.8   Systems and procedures for the use of meteorological information

8.1	ER 8.1 Seamless operation			
	Systems and procedures for the use of meteorological information shall improve the consistency and timeliness of its provision and the quality of its presentation, using an agreed data set.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
8.1.1	Consistency and timeliness	n/a.	Identify how the system design supports the improvement in the quality of presentation of meteorological information and uses an agreed data set (e.g. requirements/design specifications, test and performance data, safety case).	Identify how procedures for the use of meteorological information are designed to support the seamless operation attributes above (e.g. operation manuals).
			Not covered by this CS.	Not covered by this CS.

8.2	ER 8.2 Support for new concepts of operation			
	Systems and procedures for the use of meteorological information shall improve the promptness of its availability and the speed with which it may be used, in order to support continuous improvement of the efficiency of airspace and airport use.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
8.2.1	Promptness, speed	n/a.	Identify how the system design supports the improvement attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).	Identify how procedures for the use of meteorological information are designed to support the seamless operation attributes above (e.g. operation manuals).
			Not covered by this CS.	Not covered by this CS.

Annex SA (normative):
Standards Annex System Level

The relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation [i.1] and the requirements given in the following implementing rules for interoperability based on the Single European Interoperability Regulation.

Once the present document is cited in the Official Journal of the European Union under the Interoperability Regulation or an implementing rule based on the Interoperability Regulation, compliance with the clauses of the present document given in table SA confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding Essential Requirements of the Single European Sky Regulation and the requirements given in implementing rules for interoperability based on the Single European Interoperability Regulation.

Table SA: Correspondence between the present document and the Single European Sky Interoperability Regulation [i.1] for A-SMGCS Systems Level 1

SA.1: Traceability from Interoperability Regulation to clauses of the present document.

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A	Clause(s) of the present document	Qualifying remarks/Notes
ER 1 Seamless operation.	4.2.1.1 4.2.1.2 4.2.1.3 4.2.1.4 4.2.1.5 4.2.1.6 4.2.1.7.1 4.2.1.7.2 4.2.1.7.3 4.3.1.1 4.3.1.2	The present document does not give presumption of conformity related to maintenance of the system.
ER 2 Support for new concepts of operation.	4.2.1.4 4.2.1.7.7 4.2.1.8.1 4.2.1.8.2 4.2.1.8.3 4.2.1.8.4 4.2.1.8.5 4.2.1.8.6 4.2.1.8.7	
ER 3 Safety.	4.2.1.7.4 4.2.1.7.5 4.2.1.7.7 4.2.1.7.6	
ER 4 Civil-military coordination.	4.2.1.8.3	National requirements will be handled by national annexes to the present document, if necessary.
ER 5 Environmental constraints.		The present document does not give presumption of conformity.
ER 6 Principles governing the logical architecture of systems.	4.2.1.6	
ER 7 Principles governing the construction of systems.	4.2.1.1 4.2.1.2 4.2.1.3 4.2.1.6 4.2.1.7.1 4.2.1.7.2 4.2.1.7.3 4.2.1.7.4 4.2.1.7.5 4.3.1.1 4.3.1.2 4.3.1.3	

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 1.1 Seamless operation of airspace management.		Not covered by this CS.
ER 2.1 Seamless operation of air traffic flow management.		Not covered by this CS.
ER 3.1.1 Seamless operation of flight data processing.		Not covered by this CS.
ER 3.1.2 Support for new concepts of operation for flight data processing		Not covered by this CS.
ER 3.2.1 Seamless operation surveillance data processing systems.	4.1.1.1 4.1.2.1 4.2.1.1 4.2.1.2 4.2.1.3 4.2.1.8.4 4.3.1.1	
ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.	4.2.1.9	
ER 3.3.1 Seamless operation of Human-machine interface systems.	4.2.5.2 4.2.5.3 4.2.5.4 4.3.1.2 4.3.2.4	
ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	4.2.1.7.6	
ER 4.1 Seamless operation of Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.		Not covered by this CS.
ER 4.2 Support for new concepts of operation for Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.		Not covered by this CS.
ER 5.1 Seamless operation of Navigation systems and procedures.		Not covered by this CS.
ER 6.1 Seamless operation of Surveillance systems and procedures.		Not covered by this CS.
ER 7.1 Seamless operation of Systems and procedures for aeronautical information services.		Not covered by this CS.

SA.2: Traceability from clauses of the present document to Interoperability Regulation.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A and B	Qualifying remarks/Notes
4.1.1.1	ER 3.2.1 Seamless operation surveillance data processing systems.	
4.1.2.1	ER 3.2.1 Seamless operation surveillance data processing systems.	
4.1.3.1		Covered in Annex SB.
4.1.4.1		Covered in Annex SC.
4.2.1.1	ER 1 Seamless operation. ER 7 Principles governing the construction of systems. ER 3.2.1 Seamless operation surveillance data processing systems.	
4.2.1.2	ER 1 Seamless operation. ER 7 Principles governing the construction of systems. ER 3.2.1 Seamless operation surveillance data processing systems.	
4.2.1.3	ER 1 Seamless operation. ER 7 Principles governing the construction of systems. ER 3.2.1 Seamless operation surveillance data processing systems.	
4.2.1.4	ER 1 Seamless operation. ER 2 Support for new concepts of operation.	
4.2.1.5	ER 1 Seamless operation.	
4.2.1.6	ER 1 Seamless operation. ER 6 Principles governing the logical architecture of systems. ER 7 Principles governing the construction of systems.	
4.2.1.7.1	ER 1 Seamless operation. ER 7 Principles governing the construction of systems.	
4.2.1.7.2	ER 1 Seamless operation. ER 7 Principles governing the construction of systems.	
4.2.1.7.3	ER 1 Seamless operation. ER 7 Principles governing the construction of systems.	
4.2.1.7.4	ER 3 Safety. ER 7 Principles governing the construction of systems.	
4.2.1.7.5	ER 3 Safety. ER 7 Principles governing the construction of systems.	
4.2.1.7.6	ER 3 Safety. ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	
4.2.1.7.7	ER 2 Support for new concepts of operation. ER 3 Safety.	
4.2.1.8.1	ER 2 Support for new concepts of operation.	
4.2.1.8.2	ER 2 Support for new concepts of operation.	
4.2.1.8.3	ER 2 Support for new concepts of operation. ER 4 Civil-military coordination.	

4.2.1.8.4	ER 2 Support for new concepts of operation. ER 3.2.1 Seamless operation surveillance data processing systems.	
4.2.1.8.5	ER 2 Support for new concepts of operation.	
4.2.1.8.6	ER 2 Support for new concepts of operation.	
4.2.1.8.7	ER 2 Support for new concepts of operation.	
4.2.1.9	ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.	
4.2.2		Covered in EN 303 213-4 [i.5].
4.2.3		Covered in EN 303 213-3 [i.4].
4.2.4		Covered in Annex SB.
4.2.5.1	Void	
4.2.5.2	ER 3.3.1 Seamless operation of Human-machine interface systems.	
4.2.5.3	ER 3.3.1 Seamless operation of Human-machine interface systems.	
4.2.5.4	ER 3.3.1 Seamless operation of Human-machine interface systems.	
4.3.1.1	ER 1 Seamless operation. ER 7 Principles governing the construction of systems. ER 3.2.1 Seamless operation surveillance data processing systems.	
4.3.1.2	ER 1 Seamless operation. ER 7 Principles governing the construction of systems. ER 3.3.1 Seamless operation of Human-machine interface systems.	
4.3.1.3	ER 7 Principles governing the construction of systems.	
4.3.2.1		Covered in EN 303 213-4 [i.5].
4.3.2.2		Covered in EN 303 213-3 [i.4].
4.3.2.3		Covered in Annex SB.
4.3.2.4	ER 3.3.1 Seamless operation of Human-machine interface systems	
4.5.1.1	ER 1 Seamless operation. ER 3 Safety. ER 3.2.1 Seamless operation surveillance data processing systems.	

NOTE: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

Annex SB (normative):
Standards Annex Constituent Data Fusion Processor

The relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation [i.1] and the requirements given in the following implementing rules for interoperability based on the Single European Interoperability Regulation.

Once the present document is cited in the Official Journal of the European Union under the Interoperability Regulation or an implementing rule based on the Interoperability Regulation, compliance with the clauses of the present document given in table SA confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding Essential Requirements of the Single European Sky Interoperability Regulation [i.1] and the requirements given in implementing rules for interoperability based on the Single European Sky Interoperability Regulation [i.1].

Table SB: Correspondence between the present document and the Single European Sky Interoperability Regulation [i.1] for the Data Fusion Processor constituent of an A-SMGCS Systems

SB.1: Traceability from Interoperability Regulation to clauses of the present document.

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A	Clause(s) of the present document	Qualifying remarks/Notes
ER 1 Seamless operation.	4.1.3.1 4.2.4 4.3.2.3	The present document does not give presumption of conformity related to maintenance of the constituent. Operation is only applicable at the system level.
ER 2 Support for new concepts of operation.		Operation is only applicable at the system level.
ER 3 Safety.	n/a.	
ER 4 Civil-military coordination.	4.1.3.1	National requirements will be handled by national annexes to the present document, if necessary.
ER 5 Environmental constraints.		The present document does not give presumption of conformity.
ER 6 Principles governing the logical architecture of systems.	n/a.	
ER 7 Principles governing the construction of systems.	n/a.	

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 1.1 Seamless operation of airspace management.	n/a.	
ER 2.1 Seamless operation of air traffic flow management.	n/a.	
ER 3.1.1 Seamless operation of flight data processing.	n/a.	
ER 3.1.2 Support for new concepts of operation for flight data processing.		Not covered by this CS.
ER 3.2.1 Seamless operation surveillance data processing systems.	n/a.	
ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.	n/a.	
ER 3.3.1 Seamless operation of Human-machine interface systems.	n/a.	
ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	n/a.	

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 4.1 Seamless operation of Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.	n/a.	
ER 4.2 Support for new concepts of operation for Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.	n/a.	
ER 5.1 Seamless operation of Navigation systems and procedures.	n/a.	
ER 6.1 Seamless operation of Surveillance systems and procedures.	n/a.	
ER 7.1 Seamless operation of Systems and procedures for aeronautical information services.	n/a.	

SB.2: Traceability from clauses of the present document to Interoperability Regulation.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A and B	Qualifying remarks/Notes
4.1.1.1		Covered in Annex SA.
4.1.2.1		Covered in Annex SA.
4.1.3.1	ER 1 Seamless operation. ER 4 Civil-Military Coordination.	
4.1.4.1		Covered in Annex SC.
4.2.1.1		Covered in Annex SA.
4.2.1.2		Covered in Annex SA.
4.2.1.3		Covered in Annex SA.
4.2.1.4		Covered in Annex SA.
4.2.1.5		Covered in Annex SA.
4.2.1.6		Covered in Annex SA.
4.2.1.7.1		Covered in Annex SA.
4.2.1.7.2		Covered in Annex SA.
4.2.1.7.3		Covered in Annex SA.
4.2.1.7.4		Covered in Annex SA.
4.2.1.7.5		Covered in Annex SA.
4.2.1.7.6		Covered in Annex SA.
4.2.1.7.7		Covered in Annex SA.
4.2.1.8.1		Covered in Annex SA.
4.2.1.8.2		Covered in Annex SA.
4.2.1.8.3		Covered in Annex SA.
4.2.1.8.4		Covered in Annex SA.
4.2.1.8.5		Covered in Annex SA.
4.2.1.8.6		Covered in Annex SA.
4.2.1.8.7		Covered in Annex SA.
4.2.1.9		Covered in Annex SA.
4.2.2		Covered in EN 303 213-4 [i.5].
4.2.3		Covered in EN 303 213-3 [i.4].
4.2.4	ER 1 Seamless operation.	
4.2.5.1	Void.	
4.2.5.2		Covered in Annex SA.
4.2.5.3		Covered in Annex SA.
4.2.5.4		Covered in Annex SA.
4.3.1.1		Covered in Annex SA.
4.3.1.2		Covered in Annex SA.
4.3.1.3		Covered in Annex SA.
4.3.2.1		Covered in EN 303 213-4 [i.5].
4.3.2.2		Covered in EN 303 213-3 [i.4].
4.3.2.3	ER 1 Seamless operation.	
4.3.2.4		Covered in Annex SA.
4.5.1.1		Covered in Annex SA.

NOTE: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

Annex SC (normative):
Standards Annex Constituent HMI

The relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation [i.1] and the requirements given in the following implementing rules for interoperability based on the Single European Interoperability Regulation.

Once the present document is cited in the Official Journal of the European Union under the Interoperability Regulation or an implementing rule based on the Interoperability Regulation, compliance with the clauses of the present document given in table SA confers, within the limits of the scope of the present document, a presumption of conformity with the corresponding Essential Requirements of the Single European Sky Regulation and the requirements given in implementing rules for interoperability based on the Single European Interoperability Regulation.

Table SC: Correspondence between the present document and the Single European Sky Interoperability Regulation [i.1] for the Human Machine Interface constituent of an A-SMGCS Systems

SC.1: Traceability from Interoperability Regulation to clauses of the present document.

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A	Clause(s) of the present document	Qualifying remarks/Notes
ER 1 Seamless operation.	4.1.4.1 4.2.5.2 4.2.5.3 4.2.5.4 4.3.2.4	The present document does not give presumption of conformity related to maintenance of the constituent. Operation is only applicable at the system level.
ER 2 Support for new concepts of operation.		Operation is only applicable at the system level.
ER 3 Safety.	n/a.	
ER 4 Civil-military coordination.	4.1.4.1	National requirements will be handled by national annexes to the present document, if necessary.
ER 5 Environmental constraints.		The present document does not give presumption of conformity.
ER 6 Principles governing the logical architecture of systems.	n/a.	
ER 7 Principles governing the construction of systems.	n/a.	

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 1.1 Seamless operation of airspace management.	n/a.	
ER 2.1 Seamless operation of air traffic flow management.	n/a.	
ER 3.1.1 Seamless operation of flight data processing.	n/a.	
ER 3.1.2 Support for new concepts of operation for flight data processing.		Not covered by this CS.
ER 3.2.1 Seamless operation surveillance data processing systems.	n/a.	
ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.	n/a.	
ER 3.3.1 Seamless operation of Human-machine interface systems.	n/a.	
ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	n/a.	

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 4.1 Seamless operation of Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.	n/a.	
ER 4.2 Support for new concepts of operation for Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.	n/a.	
ER 5.1 Seamless operation of Navigation systems and procedures.	n/a.	
ER 6.1 Seamless operation of Surveillance systems and procedures.	n/a.	
ER 7.1 Seamless operation of Systems and procedures for aeronautical information services.	n/a.	

SC.2: Traceability from clauses of the present document to Interoperability Regulation.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A and B	Qualifying remarks/Notes
4.1.1.1		Covered in Annex SA.
4.1.2.1		Covered in Annex SA.
4.1.3.1		Covered in Annex SB.
4.1.4.1	ER 1 Seamless operation ER 4 Civil-Military Coordination.	
4.2.1.1		Covered in Annex SA.
4.2.1.2		Covered in Annex SA.
4.2.1.3		Covered in Annex SA.
4.2.1.4		Covered in Annex SA.
4.2.1.5		Covered in Annex SA.
4.2.1.6		Covered in Annex SA.
4.2.1.7.1		Covered in Annex SA.
4.2.1.7.2		Covered in Annex SA.
4.2.1.7.3		Covered in Annex SA.
4.2.1.7.4		Covered in Annex SA.
4.2.1.7.5		Covered in Annex SA.
4.2.1.7.6		Covered in Annex SA.
4.2.1.7.7		Covered in Annex SA.
4.2.1.8.1		Covered in Annex SA.
4.2.1.8.2		Covered in Annex SA.
4.2.1.8.3		Covered in Annex SA.
4.2.1.8.4		Covered in Annex SA.
4.2.1.8.5		Covered in Annex SA.
4.2.1.8.6		Covered in Annex SA.
4.2.1.8.7		Covered in Annex SA.
4.2.1.9		Covered in Annex SA.
4.2.2		Covered in EN 303 213-4 [i.5].
4.2.3		Covered in EN 303 213-3 [i.4].
4.2.4		Covered in Annex SB.
4.2.5.1	Void.	
4.2.5.2	ER 1 Seamless operation.	
4.2.5.3	ER 1 Seamless operation.	
4.2.5.4	ER 1 Seamless operation.	
4.3.1.1		Covered in Annex SA.
4.3.1.2		Covered in Annex SA.
4.3.1.3		Covered in Annex SA.
4.3.2.1		Covered in EN 303 213-4 [i.5].
4.3.2.2		Covered in EN 303 213-3 [i.4].
4.3.2.3		Covered in Annex SB.
4.3.2.4	ER 1 Seamless operation.	
4.5.1.1		Covered in Annex SA.

NOTE: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

History

Document history			
V1.1.1	December 2008	Public Enquiry	PE 20090405: 2008-12-06 to 2009-04-06