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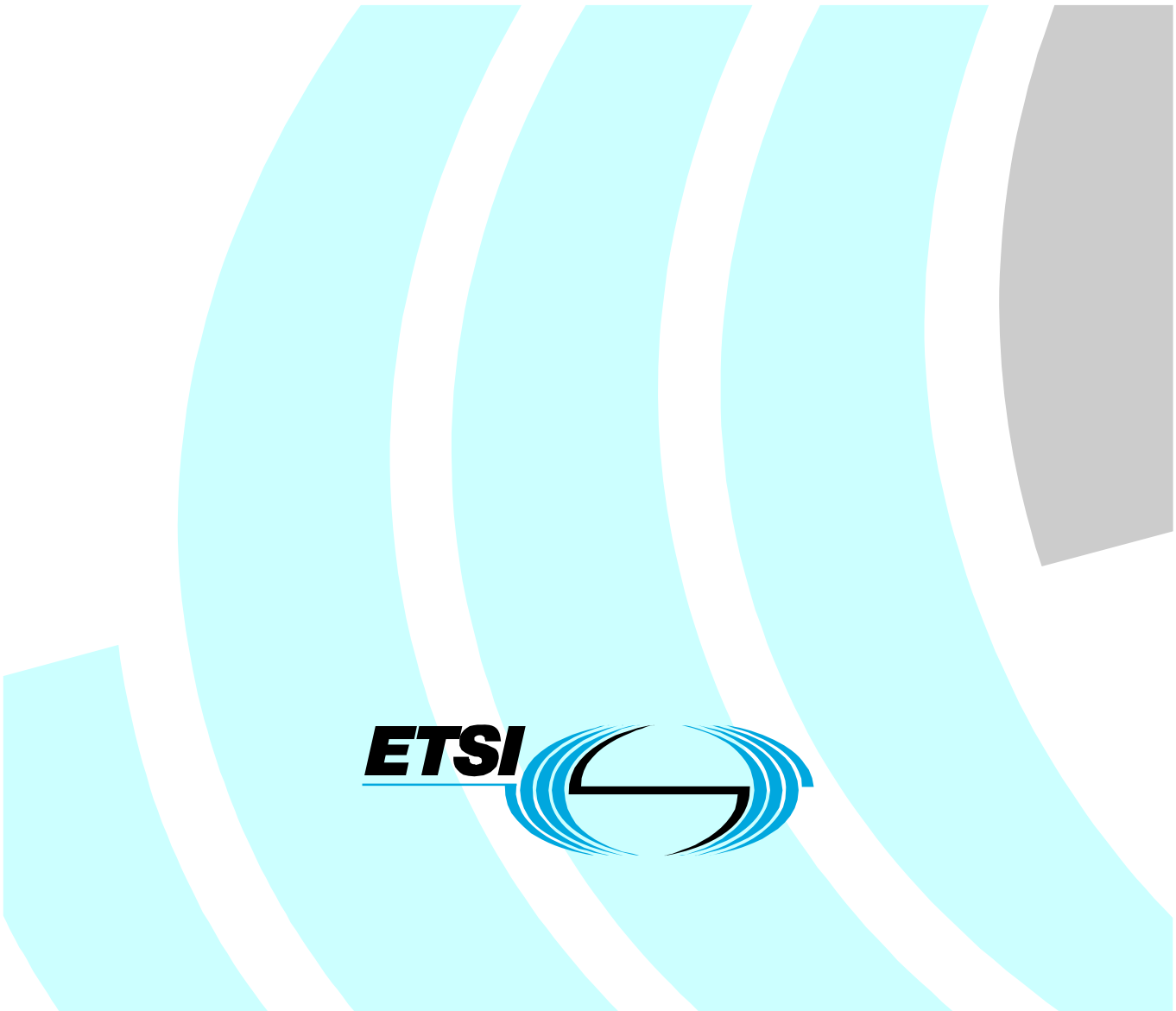
European Standard (Telecommunications series)

Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 2: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 2 including external interfaces



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Contents

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Aeronautics (AERO), 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 European Commission mandate M/390 for the Interoperability of the European Air Traffic Management Network.

The present document has been developed in cooperation with Eurocae for compliance with the Essential Requirements and/or of the Single European Sky Interoperability Regulation 552/2004 [i.1] and/or requirements given in implementing rules for the Single European Sky Interoperability Regulation.

The presumption of conformity which is linked to the full application of EN 303 213 (parts 1 to 4) can only be claimed after EN 303 213 (parts 1 to 4) has been listed in the Official Journal of the European Union as Community Specification.

General and specific requirements for presumption of conformity to SES Interoperability Regulation 552/2004 [i.1] as amended by Regulation 1070/2009 [i.5] are given in the normative annexes of the present document.

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 2 of a multi-part deliverable covering Advanced Surface Movement Guidance and Control System (A-SMGCS), as identified below:

Part 1: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 1 including external interfaces";

Part 2: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 2 including external interfaces";

Part 3: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed cooperative sensor including its interfaces";

Part 4: "Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed non-cooperative sensor including its interfaces";

Part 5: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for transmitters used in multilateration equipment";

Part 6: "Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for deployed surface movement radar sensors".

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 and amended by Regulation (EC) No 1070/2009 [i.5].

The SES legislation is based on a framework of 4 regulations, which includes the Interoperability Regulation [i.1]. 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 European Standard referenced in the Official Journal of the European Union as Community Specification (CS) is a means of compliance to the essential requirements of the Regulation and/or the relevant implementing rules for interoperability.

The present document takes into account the Council Decision 2009/320/EC endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project [i.3].

1 Scope

The present document is applicable to Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Level 2. This system provides enhanced surveillance functionalities such as advanced monitoring and alerting functions.

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.

Any software elements related to the software assurance level of an A-SMGCS are outside of the scope of the present document. As such the essential requirements of the Interoperability Regulation 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, effect of harmful interference and civil/military coordination.

NOTE: For these ERs, please refer to the Air Navigation Service Provider procedures.

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.

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 (ED-87B including Amendment No 1 published 01/2009): "MASPS for Advanced Surface Movement Guidance and Control Systems".

[2] EUROCONTROL 07/01/11-05 (V2.0: December 2006): "Operational Concept and Requirements for A-SMGCS Implementation Level 2".

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

[4] EUROCONTROL 07/01/11-07 (V2.0: December 2006): "Functional Specification for A-SMGCS Implementation Level 2".

[5] ETSI EN 303 213-1: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 1: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 1 including external interfaces".

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 as amended by Regulation (EC) No 1070/2009.

[i.2] 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 as amended by Regulation (EC) No 1070/2009.

[i.3] Council Decision 2009/320/EC endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project, 30.03.2009.

[i.4] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.

[i.5] Regulation (EC) No 1070/2009 of the European Parliament and of the Council of 21 October 2009 amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system, OJ L 300, 14.11.2009.

[i.6] 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.

[i.7] ETSI EN 303 213-3: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed cooperative sensor including its interfaces".

[i.8] ETSI EN 303 213-4: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for a deployed non-cooperative sensor including its interfaces".

[i.9] ETSI EN 303 213-5: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 5: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for transmitters used in multilateration equipment".

[i.10] ETSI EN 303 213-6: "Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 6: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive for deployed surface movement radar sensors".

3 Definitions and abbreviations

3.1 Definitions

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

alert situation: any situation relating to aerodrome operations which has been defined as requiring particular attention or action

A-SMGCS Level 1: A-SMGCS including 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

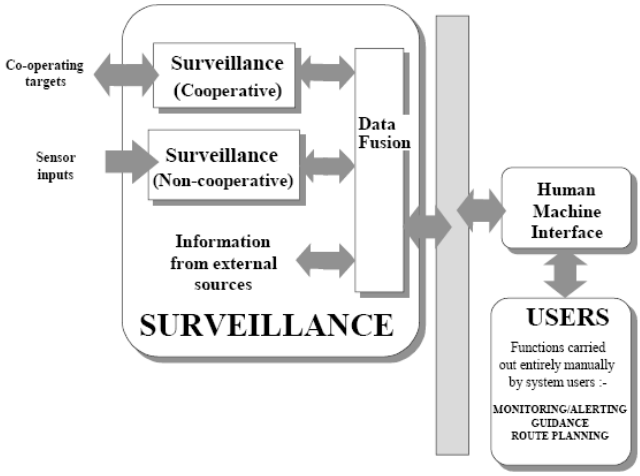

Figure 1: A-SMGCS Level 1 Functional Configuration

A-SMGCS Level 2: A-SMGCS including 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

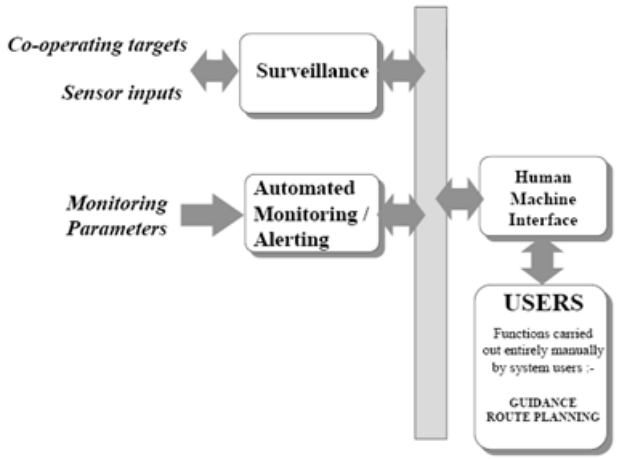

Figure 2: A-SMGCS Level 2 Functional Configuration

Advanced Surface Movement Guidance and Control System: system providing routing, guidance, surveillance for the control to aircraft and vehicles in order to maintain the declared surface movement rate under all local weather conditions within the aerodrome visibility operational Level (AVOL) while maintaining the required level of safety

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

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

NOTE 1: This definition is derived from the ICAO Document 9830 [i.4].

NOTE 2: De-icing platforms, including remote de-icing areas, are considered as apron areas.

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.2].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

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.2].

Reported Velocity Accuracy: difference, at a specified confidence level, between the reported Target velocity and the actual Target velocity at the time of the report

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.2].

target: aircraft, vehicle or obstacle that is displayed on a surveillance display

NOTE: This definition is derived from the ICAO Document 9830 [i.4].

test targets: form of either fixed reflectors or active devices transponders, mounted at fixed positions within the Coverage Volume

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

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
ATCO	Air Traffic Controller
ATM	Air Traffic Management
AVOL	Aerodrome Visibility Operational Level
CS	Community Specification
doa	date of announcement
dow	date of withdrawal
EATMN	European Air Traffic Management Network
EC	European Communities
EN	European Norm - (standard)
ER	Essential Requirement
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
SES	Single European Sky
SESAR	Single European Sky ATM Research

4 Requirements for design, implement, built, maintain and operate an A-SMGCS Level 2 System

4.1 Requirements for implementing A-SMGCS Level 2 Systems

4.1.1 Monitoring and alerting

The monitoring and alerting function shall comply with the requirements as defined in ED-87B [1], clause 2.5.1.2.

4.1.2 Velocity

The A-SMGCS System shall provide a Reported Velocity Accuracy as defined in ED-87B [1], clause 3.2.2.6.

4.1.3 Alert situation

The A-SMGCS System shall be able to distinguish between alert situations as defined in ED-87B [1], clause 3.3.1.

4.1.4 Safety

4.1.4.1 Safety assessment

A safety assessment for A-SMGCS Level 2 system shall be provided. The safety objectives shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 2.1.

NOTE: The safety assessment may follow the methodology from A-SMGCS Levels 1&2 Preliminary Safety Case [3].

4.1.4.2 Service requirements

The A-SMCS System shall comply with the services as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 9.3.1 references Op_Serv-14-Service, Op_Serv-15-User, Op_Serv-16-Conflicts/infringements on runway, Op_Serv-17-Restricted area incursions,Op_Serv-18-Runway protection area, Op_Serv-19-Ground boundary, Op_Serv-20-Air boundary, Op_Serv-21-Traffic Context Update, Op_Serv-22-Alert, Op_Serv-27-Stages of alert, Op_Serv-28-Alert priority, Op_Serv-29-Adaptation to local procedures, Op_Serv-30-Traffic Information Update

4.1.4.3 Safety net

The A-SMGCS System shall provide a safety net as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 4 and clause 9.3.1 Op_Serv-29-Adaptation to local procedures.

4.1.4.4 Information to Vehicle Drivers

The A-SMGCS System shall provide information to the Vehicle Driver as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 6.3.

4.1.5 Human capabilities

4.1.5.1 Presentations of alert

The A-SMGCS System shall provide alerts to ATCOs as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.2.1.

4.1.5.2 Human-Machine Interface

The HMI of the A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clause 2.5.2.

4.2 Design Requirements for A-SMGCS Level 2 Systems

4.2.1 Requirements for ATC Workstation HMI

The ATC Workstation HMI of the A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clauses 2.5.2 and 2.5.2.1.

4.2.2 Alerts

The A-SMGCS System shall provide the stages of alerts as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.2.2.

4.2.3 Performance

The performance of the A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clause 3.2.3.2.

4.2.4 Monitoring and Alerting Parameters

The monitoring and alerting parameters shall comply with the requirements as defined in ED-87B [1], clause 3.3.2.

4.2.4.1 Probability of Detection of an Alert Situation

The Probability of Detection requirement shall comply with the requirement as defined in ED-87B [1], clause 3.3.2.1.

4.2.4.2 Accuracy and Resolution

The Accuracy and Resolution requirement shall comply with the requirement as defined in ED-87B [1], clause 3.3.2.2.

4.2.4.3 Probability of False Alert

The Probability of False Alert requirement shall comply with the requirement as defined in ED-87B [1], clause 3.3.2.3.

4.2.5 Presentation of Alerts

The Presentation of Alerts requirement shall comply with the requirement as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.2.1.

4.2.6 Procedures and Working Methods

The procedures and Working Methods shall comply with the requirement as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.3 and clause 9.3.1 Op_Serv-29-Adaptation to local procedures.

4.2.7 Control service

The A-SMGCS System shall provide the Control services as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 9.3.1 reference Op_Serv-14-Service, Op_Serv-16-Conflicts/infringements on runway, Op_Serv-17-Restricted area incursions, Op_Serv-21-Traffic Context Update, Op_Serv-22-Alert, Op_Serv-27-Stages of alert, Op_Serv-28-Alert priority, Op_Serv-29-Adaptation to local procedures, Op_Serv-30-Traffic Information Update.

4.2.8 Pre-requisite

The A-SMGCS System shall comply with the pre-requisite as defined in EN 303 213-1 [5] and A-SMGCS Levels 1 & 2 Preliminary Safety Case [3].

4.2.9 Interface to Vehicle Driver

The A-SMGCS System shall provide an Interface to the Vehicle Driver as defined in Functional Specification for A-SMGCS Implementation Level 2 [4], clause 7.2.3.

4.3 Logical Architecture and Construction of the system

4.3.1 Surveillance Services and Conflict detection

The surveillance services and the conflict detection shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 2.1.

4.3.2 Pre-requisite for A-SMGCS Level 2

The A-SMGCS System shall comply with the pre-requisite as defined in EN 303 213-1 [5].

4.3.3 Control service

The A-SMGCS System shall provide the Control services as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 9.3.1 reference Op_Serv-16-Conflicts/infringements on runway, Op_Serv-17-Restricted area incursions, Op_Serv-18-Runway protection area, Op_Serv-19-Ground boundary, Op_Serv-20-Air boundary, Op_Serv-21-Traffic Context Update, Op_Serv-22-Alert, Op_Serv-27-Stages of alert, Op_Serv-28-Alert priority, Op_Serv-29-Adaptation to local procedures, Op_Serv-30-Traffic Information Update.

4.3.4 HMI and Vehicle HMI

The logical architecture of the A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clause 2.5.2.

4.3.5 Guidance Service to Vehicle Drivers

The A-SMGCS System shall comply with requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.5.

4.4 Acceptance testing requirements for A-SMGCS Level 2 System

4.4.1 Probability of Detection

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.2.

4.4.2 Probability of False Detection

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.3.

4.4.3 Probability of Identification

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.4.

4.4.4 Probability of False Identification

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.5.

4.4.5 Reported Position Accuracy

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.6.

4.4.6 Reported Velocity Accuracy

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.7.

4.4.7 Target Report Update Rate

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.8.

4.4.8 Position Renewal Time-Out Period

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.9.

4.4.9 Identification Renewal Time-Out Period

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.10.

4.4.10 Track Continuity

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.6.11.

4.4.11 Monitoring and Alerting

The A-SMGCS System shall perform the test as defined in ED-87B [1], clause 4.7.

NOTE: This test shall also performed for the HMI.

4.5 Maintenance Requirements for A-SMGCS Level 2 Systems

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

4.6 Requirements for operation of A-SMGCS Level 2 Systems

4.6.1 Compliance with ATC Procedures and Working Methods

The ATC Procedures and Working Methods shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 3.3.

4.6.2 Operational procedures

The operational procedures shall comply with the requirements as defined in Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2], clause 7.

4.6.3 Safety

The operational procedures on safety shall comply with the requirements as defined in clause 4.1.4.1.

4.6.4 Vehicle identifier

The A-SMGCS System shall comply with the requirements as defined in ED-87B [1], clause 3.2.2.1.

5 Testing

The testing of an A-SMGCS Level 2 System is covered with the build requirements from clause 4.4.

Annex SA (normative): Standards Annex

This annex provides a relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation.

A-SMGCS Systems Level 2 shall comply with the Essential Requirements of the Interoperability Regulation as defined and described in the traceability matrixes of this annex (tables SA1 and SA2).

SA1 Correspondence between this European Standard and the Single European Sky Interoperability Regulation for A-SMGCS Systems Level 2

Table SA1: 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.	4.1.1 Monitoring and alerting 4.1.2 Velocity 4.1.3 Alert situation 4.1.4.2 Service requirements 4.1.4.3 Safety net 4.1.5.1 Presentations of alert 4.1.5.2 Human-Machine Interface 4.2.1 Requirements for ATC Workstation HMI 4.2.2 Alerts 4.2.3 Performance 4.2.4 Monitoring and Alerting Parameters 4.2.4.1 Probability of Detection of an Alert Situation 4.2.4.3 Probability of False Alert 4.2.5 Presentation of Alerts 4.2.6 Procedures and Working Methods 4.2.7 Control service 4.2.8 Pre-requisite 4.2.9 Interface to Vehicle Driver 4.3.2 Pre-requisite for A-SMGCS Level 2 4.3.4 HMI and Vehicle HMI 4.4.11 Monitoring and Alerting 4.6.1 Compliance with ATC Procedures and Working Methods 4.6.2 Operational procedures 4.6.4 Vehicle identifier	The present document does not give presumption of conformity related to maintenance of the system.
ER 2 Support for new concepts of operation.	4.1.4.1 Safety assessment 4.1.4.4 Information to Vehicle Drivers	
ER 3 Safety.	4.1.4.1 Safety assessment 4.1.4.3 Safety net 4.1.5.1 Presentations of alert 4.1.5.2 Human-Machine Interface 4.2.8 Pre-requisite	
ER 4 Civil-military coordination.		The present document does not give presumption of conformity.
ER 5 Environmental constraints.		The present document does not give presumption of conformity.
ER 6 Principles governing the logical architecture of systems.	4.3.1 Surveillance Services and Conflict detection 4.3.3 Control service	
ER 7 Principles governing the construction of systems.	4.3.5 Guidance Service to Vehicle Drivers	

(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 EN 303 213 (parts 1 to 4)
ER 2.1 Seamless operation of air traffic flow management.		Not covered by EN 303 213 (parts 1 to 4)
ER 3.1.1 Seamless operation of flight data processing.		Not covered by EN 303 213 (parts 1 to 4)
ER 3.1.2 Support for new concepts of operation for flight data processing.		Not covered by EN 303 213 (parts 1 to 4)
ER 3.2.1 Seamless operation surveillance data processing systems.	4.2.4.2 Accuracy and Resolution 4.4.1 Probability of Detection 4.4.2 Probability of False Detection 4.4.3 Probability of Identification 4.4.4 Probability of False Identification 4.4.5 Reported Position Accuracy 4.4.6 Reported Velocity Accuracy 4.4.7 Target Report Update Rate 4.4.8 Position Renewal Time-Out Period 4.4.9 Identification Renewal Time-Out Period 4.4.10 Track Continuity 4.4.11 Monitoring and Alerting	
ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.	4.2.8 Pre-requisite	
ER 3.3.1 Seamless operation of Human-machine interface systems.	4.3.4 HMI and Vehicle HMI 4.4.11 Monitoring and Alerting	
ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	4.3.4 HMI and Vehicle HMI	
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 EN 303 213 (parts 1 to 4)
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 EN 303 213 (parts 1 to 4)
ER 5.1 Seamless operation of Navigation systems and procedures.		Not covered by EN 303 213 (parts 1 to 4)
ER 6.1 Seamless operation of Surveillance systems and procedures.		Not covered by EN 303 213 (parts 1 to 4)
ER 7.1 Seamless operation of Systems and procedures for aeronautical information services.		Not covered by EN 303 213 (parts 1 to 4)
ER 7.2 Support for new concepts of operation for systems and procedures for aeronautical information services.		Not covered by EN 303 213 (parts 1 to 4)
ER 8.1 Seamless operation of systems and procedures for the use of meteorological information.		Not covered by EN 303 213 (parts 1 to 4)
ER 8.2 Support for new concepts of operation for systems and procedures for the use of meteorological information.		Not covered by EN 303 213 (parts 1 to 4)

Table SA2: 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, Parts A and B	Qualifying remarks/Notes
4.1.1 Monitoring and alerting	ER 1 Seamless operation	
4.1.2 Velocity	ER 1 Seamless operation	
4.1.3 Alert situation	ER 1 Seamless operation	
4.1.4.1 Safety assessment	ER 2 Support for new concepts of operation ER 3 Safety	
4.1.4.2 Service requirements	ER 1 Seamless operation	
4.1.4.3 Safety net	ER 1 Seamless operation ER 3 Safety	
4.1.4.4 Information to Vehicle Drivers	ER 2 Support for new concepts of operation	
4.1.5.1 Presentations of alert	ER 1 Seamless operation ER 3 Safety	
4.1.5.2 Human-Machine Interface	ER 1 Seamless operation ER 3 Safety	
4.2.1 Requirements for ATC Workstation HMI	ER 1 Seamless operation	
4.2.2 Alerts	ER 1 Seamless operation	
4.2.3 Performance	ER 1 Seamless operation	
4.2.4 Monitoring and Alerting Parameters	ER 1 Seamless operation	
4.2.4.1 Probability of Detection of an Alert Situation	ER 1 Seamless operation	
4.2.4.2 Accuracy and Resolution	ER 3.2.1 Seamless operation surveillance data processing systems	
4.2.4.3 Probability of False Alert	ER 1 Seamless operation	
4.2.5 Presentation of Alerts	ER 1 Seamless operation	
4.2.6 Procedures and Working Methods	ER 1 Seamless operation	
4.2.7 Control service	ER 1 Seamless operation	
4.2.8 Pre-requisite	ER 1 Seamless operation ER 3 Safety ER 3.2.2 Support for new concepts of operation for surveillance data processing systems	
4.2.9 Interface to Vehicle Driver	ER 1 Seamless operation	
4.3.1 Surveillance Services and Conflict detection	ER 6 Principles governing the logical architecture of systems	
4.3.2 Pre-requisite for A-SMGCS Level 2	ER 1 Seamless operation	
4.3.3 Control service	ER 6 Principles governing the logical architecture of systems	
4.3.4 HMI and Vehicle HMI	ER 1 Seamless operation ER 3.3.1 Seamless operation of Human-machine interface systems ER 3.3.2 Support for new concepts of operation for Human-machine interface systems	
4.3.5 Guidance Service to Vehicle Drivers	ER 7 Principles governing the construction of systems	
4.4.1 Probability of Detection	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.2 Probability of False Detection	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.3 Probability of Identification	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.4 Probability of False Identification	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.5 Reported Position Accuracy	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.6 Reported Velocity Accuracy	ER 3.2.1 Seamless operation surveillance data processing systems	

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Parts A and B	Qualifying remarks/Notes
4.4.7 Target Report Update Rate	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.8 Position Renewal Time-Out Period	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.9 Identification Renewal Time-Out Period	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.10 Track Continuity	ER 3.2.1 Seamless operation surveillance data processing systems	
4.4.11 Monitoring and Alerting	ER 1 Seamless operation ER 3.2.1 Seamless operation surveillance data processing systems ER 3.3.1 Seamless operation of Human-machine interface systems	
4.6.1 Compliance with ATC Procedures and Working Methods	ER 1 Seamless operation	
4.6.2 Operational procedures	ER 1 Seamless operation	
4.6.4 Vehicle identifier	ER 1 Seamless operation	

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 A (normative): Checklist

The purpose of this annex is to provide a comprehensive traceability of evidence on constituents and system levels against sub-clauses of the Essential Requirements (ERs) of the Interoperability Regulation (EC 552/2004 [i.1]) as amended by Regulation EC 1070/2009 [i.5], analyzing keywords of these same essential requirements.

These keywords mainly address the phases of design, build, operation and maintenance of systems and constituents as well as specifically required qualities or attributes as defined in the ERs of the SES Interoperability Regulation.

A-SMGCS Systems Level 2 shall comply with the Essential Requirements of the Interoperability Regulations as defined and described in the tables of this annex.

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

Table A.1

1	**ER 1 seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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	n/a	ED-87B [1] Clause 2.5.2 Human-Machine Interface Clause 2.5.2.1 General Requirements for ATC Workstation HMI Clause 3.2.2 Stages of alert Clause 3.2.3.2 Level 2 Systems Clause 3.3.2 Definition of Monitoring/Alerting Parameters Clause 3.3.2.1 Probability of Detection of an Alert Situation (PDAS) Clause 3.3.2.3 Probability of False Alert (PFA) Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 3.2.1 Presentation of alerts to ATCOs Clause 3.3 Compliance with ATC Procedures and Working Methods Clause 9.3.1 Service Requirements Op_Serv-14-Service Op_Serv-16-Conflicts/infringements on runway Op_Serv-17-Restricted area incursions Op_Serv-18-Runway protection area Op_Serv-19-Ground boundary Op_Serv-20-Air boundary Op_Serv-21-Traffic Context Update, Op_Serv-22-Alert Op_Serv-27-Stages of alert Op_Serv-28-Alert priority Op_Serv-29-Adaptation to local procedures Op_Serv-30-Traffic Information Update EN 303 213-1 [5] Functional Specification for A-SMGCS Implementation Level 2 [4] Clause 7.2.3 Interface with driver
1.2	Built	n/a	ED-87B [1] Clause 4.7 Monitoring/alerting element tests
1.3	Maintained	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.

1	**ER 1 seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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	Operation is only applicable at the system level.	Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 3.3 Compliance with ATC Procedures and Working Methods Clause 9.3.1 Service Requirements Op_Serv-29-Adaptation to local procedures Clause 7 Operational procedures ED-87B [1] Clause 2.5.1.2 Monitoring/Alerting Clause 3.2.2.1 Identification
1.5	Information sharing	n/a	Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 3.2.1 Presentation of alerts to ATCOs ED-87B [1] Clause 2.5.1.2 Monitoring/Alerting Clause 2.5.2 Human-Machine Interface Clause 3.2.2.6 Velocity Clause 3.3.1 Alert Situation

Table A.2

2	**ER 2 Support for new concepts of operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality, sustainability 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	Operation is only applicable at the system level.	A-SMGCS Levels 1 & 2 Preliminary Safety Case [3] Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 6.3 Vehicle driver
2.2	Validated concepts of operation - capacity	Operation is only applicable at the system level.	Covered by EN 303 213-1 [i.5]
2.3	Validated concepts of operation - quality	Operation is only applicable at the system level.	Covered by EN 303 213-1 [i.5]

Table A.3

3	**ER 3 Safety** Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	A-SMGCS Levels 1 & 2 Preliminary Safety Case [3] EN 303 213-1 [i.5]	The present document does not give presumption of conformity.
3.2	Implementation	n/a.	A-SMGCS Levels 1 & 2 Preliminary Safety Case [3] Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 9.3.1 Service Requirements Op_Serv-29-Adaptation to local procedures Clause 4. Runway safety net	The present document does not give presumption of conformity.
3.3	Maintenance	n/a.	The present document does not give presumption of conformity	n/a.
3.4	Operation	n/a.	A-SMGCS Levels 1 & 2 Preliminary Safety Case [3] Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 2.1 Objectives	The present document does not give presumption of conformity.
3.5	Human capabilities	n/a.	Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 3.2.1 Presentation of alerts to ATCOs ED-87B [1] Clause 2.5.2 Human Machine Interface	The present document does not give presumption of conformity.
3.6	Harmful interference	n/a.	The present document does not give presumption of conformity	n/a.

Table A.4

4	**ER 4 Civil-military coordination**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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	The present document does not give presumption of conformity	The present document does not give presumption of conformity
4.2	Timely sharing	n/a	The present document does not give presumption of conformity.
4.3	National security requirements	n/a	The present document does not give presumption of conformity.

Table A.5

5	**ER 5 Environmental constraints**			
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.
5.2	Minimize environmental impact - materials	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.	n/a.

Table A.6

6	**ER 6 Principles governing the logical architecture of systems**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 2.1 Objectives Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 3.5 Guidance Service to Vehicle Drivers (Optional)

Table A.7

7	**ER 7 Principles governing the construction of systems**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Operational Concept and Requirements for A-SMGCS Implementation Level 2 [2] Clause 9.3.1 Service Requirements Op_Serv-16-Conflicts/infringements on runway Op_Serv-17-Restricted area incursions Op_Serv-18-Runway protection area Op_Serv-19-Ground boundary Op_Serv-20-Air boundary Op_Serv-21-Traffic Context Update Op_Serv-22-Alert Op_Serv-27-Stages of alert Op_Serv-28-Alert priority Op_Serv-29-Adaptation to local procedures Op_Serv-30-Traffic Information Update
7.2	High availability, Redundancy and fault tolerance.	n/a.	Covered by EN 303 213-1 [i.5]

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

A.2.1 Systems and procedures for airspace management

Table A.8

1.1	**ER 1.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
1.1.2	High availability	n/a.	Not covered by EN 303 213 (parts 1 to 4)
1.1.3	Redundancy and fault tolerance	n/a.	Not covered by EN 303 213 (parts 1 to 4)

A.2.2 Systems and procedures for air traffic flow management

Table A.9

2.1	**ER 2.1 Seamless operation**			
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 part 1 to 4 deliverables	Not covered by EN 303 213 (parts 1 to 4)
2.1.2	Pre-tactical	n/a.	Not covered by EN 303 213 part 1 to 4 deliverables	Not covered by EN 303 213 (parts 1 to 4)
2.1.3	Tactical	n/a.	Not covered by EN 303 213 part 1 to 4 deliverables	Not covered by EN 303 213 (parts 1 to 4)

A.2.3 Systems and procedures for air traffic services

A.2.3.1 Flight data processing systems

Table A.10

3.1.1	**ER 3.1.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
3.1.1.2	Performance appropriate for environment	n/a.	Not covered by EN 303 213 (parts 1 to 4)
3.1.1.3	Accuracy and error tolerance	n/a.	Not covered by EN 303 213 (parts 1 to 4)

Table A.11

3.1.2	**ER 3.1.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM MasterPlan. 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	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.2	Airborne systems - built	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.3	Airborne systems - maintained	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.4	Airborne systems - operated	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.5	Ground systems - design	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.6	Ground systems - built	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.7	Ground systems - maintained	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)
3.1.2.8	Ground systems - operated	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)

A.2.3.2 Surveillance data processing systems

Table A.12

3.2.1	**ER 3.2.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	ED-87B [1] Clause 3.3.2.2 Accuracy and Resolution
3.2.1.2	Built	n/a.	ED-87B [1] Clause 4.6.2 Probability of Detection Test Clause 4.6.3 Probability of False Detection Test Clause 4.6.4 Probability of Identification Test Clause 4.6.5 Probability of False Identification Test Clause 4.6.6 Reported Position Accuracy Test Clause 4.6.7 Reported Velocity Accuracy Test Clause 4.6.8 Target Report Update Rate Test Clause 4.6.9 Position Renewal Time-Out Period Test Clause 4.6.10 Identification Renewal Time-Out Period Test Clause 4.6.11 Track Continuity Test Clause 4.7 Monitoring/alerting element tests
3.2.1.3	Maintained	n/a.	The present document does not give presumption of conformity.
3.2.1.4	Operated	n/a.	The present document does not give presumption of conformity.

Table A.13

3.2.2	**ER 3.2.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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, in particular as envisaged in the ATM MasterPlan."		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.2.1	Availability of new sources	n/a.	A-SMGCS Levels 1 & 2 Preliminary Safety Case [3]

A.2.3.3 Human-machine interface systems

Table A.14

3.3.1	**ER 3.3.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	ED-87B [1] Clause 2.5.2 Human-Machine Interface
3.3.1.2	Built	n/a.	ED-87B [1] Clause 4.7 Monitoring/alerting element tests
3.3.1.3	Maintained	n/a.	The present document does not give presumption of conformity.
3.3.1.4	Operated	n/a.	The present document does not give presumption of conformity.

Table A.15

3.3.2	**ER 3.3.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	ED-87B [1] Clause 2.5.2 Human Machine Interface

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

Table A.16

4.1	**ER 4.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
4.1.2	Built	n/a.	Not covered by EN 303 213 (parts 1 to 4)
4.1.3	Maintained	n/a.	Not covered by EN 303 213 (parts 1 to 4)
4.1.4	Operated	n/a.	Not covered by EN 303 213 (parts 1 to 4)
4.1.5	Quality of service, coverage, redundancy	n/a.	Not covered by EN 303 213 (parts 1 to 4)

Table A.17

4.2	**ER 4.2 Support for new concepts of operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "Communication systems shall support the implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM MasterPlan."		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.2.1	Support the implementation	n/a.	Not covered by EN 303 213 (parts 1 to 4)

A.2.5 Navigation systems and procedures

Table A.18

5.1	**ER 5.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
5.1.2	Built	n/a.	Not covered by EN 303 213 (parts 1 to 4)
5.1.3	Maintained	n/a.	Not covered by EN 303 213 (parts 1 to 4)
5.1.4	Operated	n/a.	Not covered by EN 303 213 (parts 1 to 4)

A.2.6 Surveillance systems and procedures

Table A.19

6.1	**ER 6.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
6.1.2	Built	n/a.	Not covered by EN 303 213 (parts 1 to 4)
6.1.3	Maintained	n/a.	Not covered by EN 303 213 (parts 1 to 4)
6.1.4	Operated	n/a.	Not covered by EN 303 213 (parts 1 to 4)

A.2.7 Systems and procedures for aeronautical information services

Table A.20

7.1	**ER 7.1 Seamless operation**		
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)
7.1.2	Standardized data set	n/a.	Not covered by EN 303 213 (parts 1 to 4)

Table A.21

7.2	**ER 7.2 Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)

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

Table A.22

8.1	**ER 8.1 Seamless operation**			
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)

Table A.23

8.2	**ER 8.2 Support for new concepts of operation**			
	Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.5] requires that: "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.	Not covered by EN 303 213 (parts 1 to 4)	Not covered by EN 303 213 (parts 1 to 4)

Annex B (informative): The EN title in the official languages

Language	EN title
Bulgarian	
Czech	
Danish	
Dutch	
English	Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 2: Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004 for A-SMGCS Level 2 including external interfaces
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Romanian	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative): Bibliography

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

ICAO Annex 10: "Aeronautical communications".

ICAO Document 9476: "Manual of Surface Movements and Guidance Control Systems (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, December 2006): "Functional Specification for A-SMGCS Implementation Level 1".

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

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

History

Document history			
V1.1.1	December 2009	Public Enquiry	PE 20100420: 2009-12-21 to 2010-04-20