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European Standard (Telecommunications series)

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

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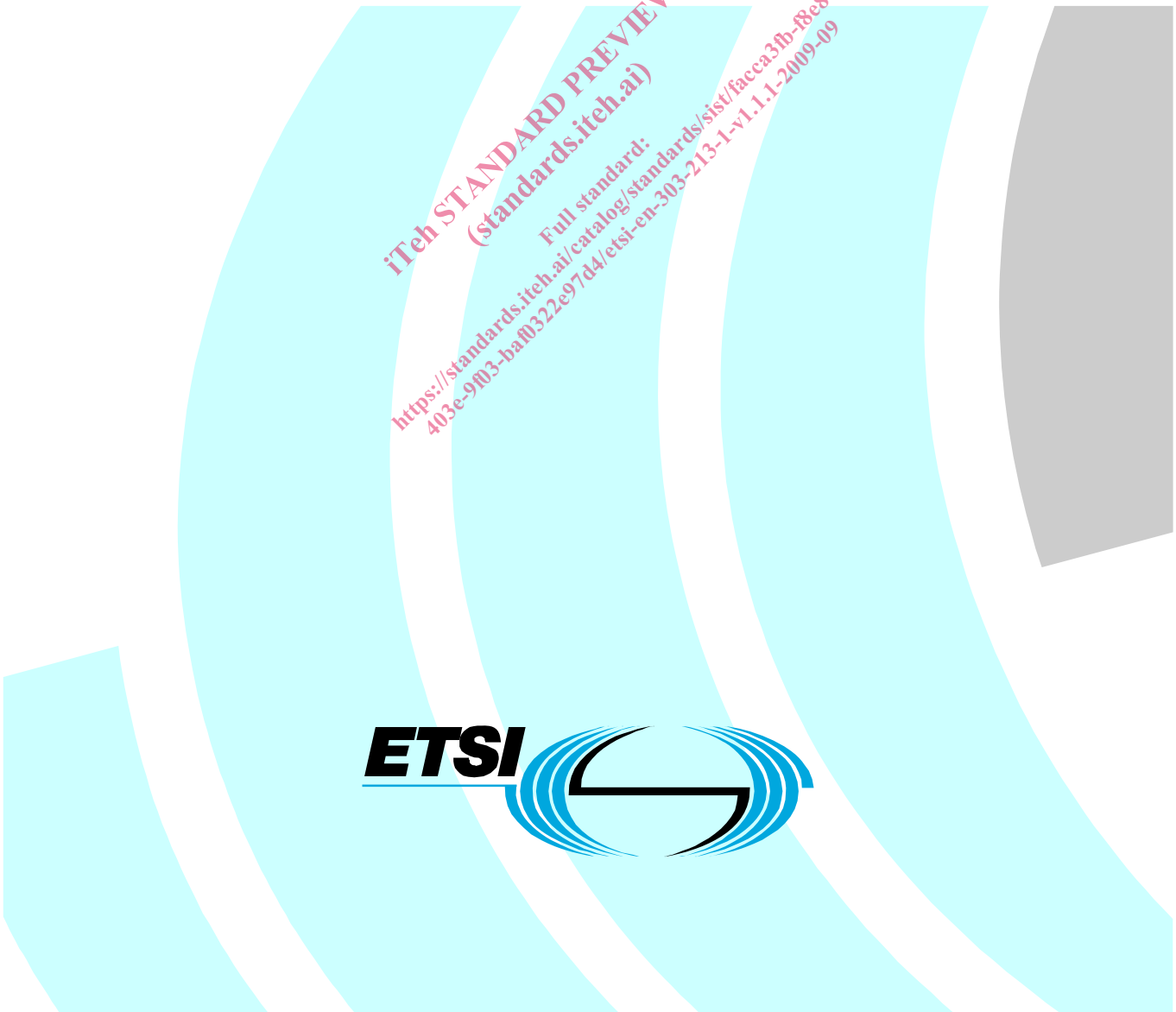

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Contents

Intellectual Property Rights 5
Foreword 5
Introduction 6
1 Scope 7
2 References 7
2.1 Normative references 7
2.2 Informative references 8
3 Definitions and abbreviations 8
3.1 Definitions 8
3.2 Abbreviations 10
4 Requirements for implementing A-SMGCS Level 1 10
4.1 Constituents of an A-SMGCS Level 1 System 10
4.1.1 Constituent - Surface Movement Radar (SMR) 10
4.1.1.1 Interfaces for SMR 11
4.1.2 Constituent - Multilateration (MLAT) 11
4.1.2.1 Interfaces for MLAT 11
4.1.3 Interface for Data fusion 11
4.1.4 Human Machine Interface (HMI) 11
4.1.4.1 Interface for HMI 11
4.2 Design Requirements for A-SMGCS Level 1 Systems 11
4.2.1 Design Requirements on System Level 11
4.2.1.1 Modularity 11
4.2.1.2 System Integrity 11
4.2.1.3 Availability and Continuity of Service 11
4.2.1.4 Identification 11
4.2.1.5 Position Registration Accuracy 12
4.2.1.6 Logical architecture 12
4.2.1.7 Safety 12
4.2.1.7.1 Failure effect 12
4.2.1.7.2 Reliability 12
4.2.1.7.3 Human capabilities 12
4.2.1.7.4 Safety Assessment 12
4.2.1.8 Capacity and Quality 12
4.2.1.8.1 Handle Traffic Movements 12
4.2.1.8.2 System capacity 12
4.2.1.8.3 Accuracy 12
4.2.1.8.4 Resolution 13
4.2.1.8.5 Update rate 13
4.2.1.8.6 Coverage Volume 13
4.2.1.8.7 Classification 13
4.2.1.9 Evolution 13
4.2.2 Design Requirements for Surface Movement Radar 13
4.2.3 Design Requirements for Multilateration 13
4.2.4 Design Requirements for Data Fusion 13
4.2.5 Design Requirements for HMI 13
4.3 Acceptance testing requirements for A-SMGCS Level 1 System 13
4.3.1 Acceptance testing requirements on System Level 13
4.3.1.1 General Tests 13
4.3.1.2 Tests on modularity and interchangeability 13
4.3.1.3 Acceptance testing requirements for Data Fusion 14
4.3.1.4 Acceptance testing requirements for HMI 14
4.3.2 Acceptance testing requirements on Constituent Level 14
4.3.2.1 Acceptance testing requirements for Constituent Surface Movement Radar 14

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4.3.2.2 Acceptance testing requirements for Constituent Multilateration 14
4.4 Maintenance Requirements for A-SMGCS Level 1 Systems 14
4.5 Requirements for operation of A-SMGCS Level 1 Systems 14
4.5.1 Requirements for operational responsibility 14
4.5.1.1 System performance below specified minima 14

5 Testing 14

Annex SA (normative): Standards Annex 15

SA.1 Correspondence between the present document and the Single European Sky Interoperability Regulation for A-SMGCS Systems Level 1 16

Annex A (normative): Checklist 20

A.1 Interoperability Regulation Annex II Essential Requirements; Part A: General requirements 21

A.2 Interoperability Regulation Annex II Essential Requirements Part B: Specific requirements 25
A.2.1 Systems and procedures for airspace management 25
A.2.2 Systems and procedures for air traffic flow management 26
A.2.3 Systems and procedures for air traffic services 26
A.2.3.1 Flight data processing systems 26
A.2.3.2 Surveillance data processing systems 28
A.2.3.3 HMI systems 29
A.2.4 Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications 29
A.2.5 Navigation systems and procedures 30
A.2.6 Surveillance systems and procedures 30
A.2.7 Systems and procedures for aeronautical information services 31
A.2.8 Systems and procedures for the use of meteorological information 31

Annex B (informative): The EN title in the official languages 32

Annex C (informative): Bibliography 34

History 35

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

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 of the Single European Sky Interoperability Regulation [i.1] and/or requirements given in implementing rules for interoperability based on the Single European Sky Interoperability Regulation.

The presumption of conformity which is linked to the full application of EN 303 213 multi-part deliverable can only be claimed after it 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 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 1 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".

National transposition dates	
Date of adoption of this EN:	23 September 2009
Date of latest announcement of this EN (doa):	31 December 2009
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Date of withdrawal of any conflicting National Standard (dow):	30 June 2011

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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 [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.

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1 Scope

The present document is applicable to 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.

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 this EN 303 213-1 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 (01/2008): "MASPS for A-SMGCS Level 1 & 2".

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

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

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

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

[i.3] ETSI EN 303 213-4: "Advanced Surface Movement Guidance and Control System (A-SMGCS) 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".

[i.4] 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.

[i.5] EUROCAE ED-128 (08/2007): "Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2".

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

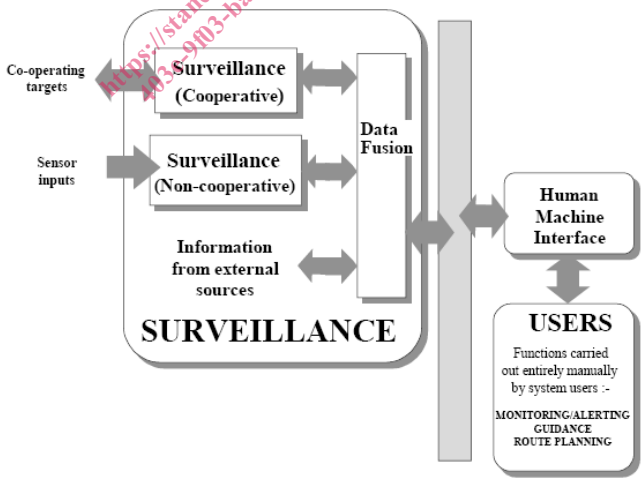

Figure 1: A-SMGCS Level 1 Functional Configuration

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

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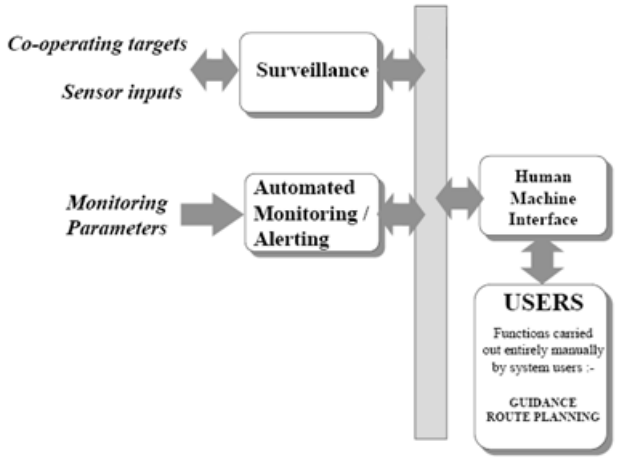

Figure 2: A-SMGCS Level 2 Functional Configuration

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

NOTE: 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.4].

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.4].

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.4].

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

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

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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

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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).

Data Fusion and HMI are considered as part of the System but are not at this time defined as constituents.

NOTE 1: Guidance for the Data Fusion can be found in ED-128 [i.5].

NOTE 2: The Data fusion could be part of a larger data fusion processor providing other ATS functions.

NOTE 3: The Data fusion may be a separate part of the cs in the future.

4.1 Constituents of an A-SMGCS Level 1 System

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

NOTE: Data Fusion and HMI are currently defined at System level, however they have been included here, since they may become constituents in the future.

4.1.1 Constituent - Surface Movement Radar (SMR)

The Surface Movement Radar constituent of an A-SMGCS is covered in EN 303 213-4 [i.3] (non-cooperative sensors).

4.1.1.1 Interfaces for SMR

The interfaces for SMR constituents shall comply with the requirements as defined in ED-87B [1], clause 2.5.1.1.

4.1.2 Constituent - Multilateration (MLAT)

The Multilateration constituent of an A-SMGCS is covered in EN 303 213-3 [i.2] (cooperative sensors).

4.1.2.1 Interfaces for MLAT

The interfaces for MLAT constituents shall comply with the requirements as defined in ED-87B [1], clause 2.5.1.1.

4.1.3 Interface for Data fusion

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

NOTE: Guidance for the Data Fusion can be found in ED-128 [i.5].

4.1.4 Human Machine Interface (HMI)

The requirements for the HMI are further described in clauses 4.2.5 Design Requirements for HMI and 4.3.1.4 Acceptance testing requirements for HMI of the present document.

NOTE 1: The HMI could be part of a lager HMI, providing other ATS functions.

NOTE 2: The HMI could be a separate part of the cs in the future.

4.1.4.1 Interface for HMI

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

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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 shall comply with the requirements as defined in ED-87B [1], clause 3.1.1.2 and Operational Concept and Requirements for A-SMGCS Implementation Level 1 [2], Op_Perf-10-Availability and Op_Perf-12-Continuity of Service 1.

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.