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Advanced Surface Movement Guidance and Control System (A-SMGCS); Part 2: Community Specification for A-SMGCS airport safety support service

Reference

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Foreword

This draft European Standard (EN) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM), and is now submitted for the combined Public Enquiry and Vote phase of the ETSI standards EN Approval Procedure.

The presumption of conformity which is linked to the full application of ETSI EN 303 213 (parts 1-4, 7, 8) can only be claimed after ETSI EN 303 213 (parts 1-4, 7, 8) has been listed in the Official Journal of the European Union as Community Specification.

General requirements for presumption of conformity to Regulation EU 2018/1139 [i.4] are given in the normative annex 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 A-SMGCS airport safety support service";

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

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

Part 5: "Harmonised Standard for access to radio spectrum for Multilateration (MLAT) equipment";

Part 6: "Harmonised Standard for access to radio spectrum for deployed surface movement radar sensors";

Part 7: "Community Specification for A-SMGCS routing service";

Part 8: "Community Specification for A-SMGCS guidance service".

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):	6 months after doa

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

1 Scope

The present document is applicable to the Advanced Surface Movement Guidance and Control System (A-SMGCS) airport safety support service. This service is based on the A-SMGCS surveillance service (as specified in ETSI EN 303 213-1 [3]) and provides safety net functionalities to controllers with timely, accurate and unambiguous information and alerts covering the entire manoeuvring and movement area of aerodromes.

The present document provides a European Standard for manufacturers, Air Navigation Service Providers and/or Airport Operators, who have to demonstrate and declare compliance of their systems and constituents to the Essential Requirements (ERs) of Annex VIII of Regulation EU 2018/1139 [i.4].

NOTE 1: The ERs in Annex VIII of Regulation EU 2018/1139 [i.4] covered by the present document are outlined in Table A.1.

NOTE 2: Although the ERs of the SES Interoperability Regulation [i.1] have been repealed with effect from 11 September 2018 [i.4], a mapping of the requirements for the A-SMGCS Surveillance Service to this same regulation [i.1] is provided in Annex B.

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 ERs of Regulation EU 2018/1139 [i.4] 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 3: For these ERs, the Air Navigation Service Provider will need to provide supplementary compliance within their Interoperability Technical Files.

The present document does not give presumption of conformity to any current interoperability Implementing Rules (IRs).

NOTE 4: Currently there are no relevant Implementing Rules for A-SMGCS.

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 if they are unambiguously referred to from the present document.

The reference to particular requirements is done either by citing the unambiguous requirement number or range of numbers (e.g. "[REQ 30.] to [REQ 35.]") or, if no requirement numbers are available, by indicating the paragraph and chapter of the reference material where the requirement can be found.

NOTE 5: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://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.

The following referenced documents are necessary for the application of the present document.

[1] EUROCAE ED-87D (June 2019): "Minimum Aviation System Performance Standard for Advanced Surface Movement Guidance and Control Systems (A-SMGCS)".

[2] EUROCONTROL-SPEC-171 (Edition 1.0, 01/03/2018): "EUROCONTROL Specification for Advanced-Surface Movement Guidance and Control System (A-SMGCS) Services".

[3] 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

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[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, p. 26 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009, p. 34.

[i.2] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.

[i.3] 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.4] Regulation EU No 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, EU No 996/2010, EU No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91.

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in EUROCAE ED-87D [1] and the following apply:

Advanced Surface Movement Guidance and Control System (A-SMGCS): system providing as a minimum Surveillance and which can include Airport Safety Support, Routing and Guidance to aircraft and vehicles in order to maintain the airport throughput under all local weather conditions whilst maintaining the required level of safety

NOTE: This definition is derived from EUROCAE ED-87D [1].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.2].

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 1: This definition is derived from the ICAO Document 9830 [i.2].

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

availability: probability that the system will operate satisfactorily at a given point in time when used under stated conditions in an ideal support environment

NOTE: This definition is derived from EUROCAE ED-87D [1].

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

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.2].

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

NOTE: This definition is derived from the ICAO Document 9830 [i.2].

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

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

target: aircraft, vehicle or other obstacle, whose image is displayed on a surveillance display

NOTE: This definition is derived from EUROCAE ED-87D [1].

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

NOTE: This definition is derived from EUROCAE ED-87D [1].

3.2 Symbols

Void.

3.3 Abbreviations

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

APL	Alert Processing Latency
APTRT	Accuracy of Predicted Time to Runway Threshold
ART	Alert Response Time
A-SMGCS	Advanced Surface Movement Guidance and Control Systems
ATM	Air Traffic Management
ATS	Air Traffic Service
CATC	Conflicting ATC clearances
CMAC	Conformance Monitoring for Controllers
EATMN	European Air Traffic Management Network
EC	European Communities
ED-87D	EUROCAE Document ED-87D
EN	European Norm - (standard)
ER	Essential Requirement
EU	European Union
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
IMRT	Integrity Monitor Response Time
IPR	Intellectual Property Rights
MTBCF	Mean Time Between Critical Failures
MTTR	Mean Time To Repair
PDAS	Probability of Detection of an Alert Situation
PFAS	Probability of False Alert Situation
RMCA	Runway Monitoring and Conflict Alerting
SA	Standards Annex
SES	Single European Sky
SMGCS	Surface Movement Guidance and Control System
TMA	Terminal Manoeuvring Area

4 Requirements for the A-SMGCS airport safety support service

4.1 Dependency on the A-SMGCS surveillance service

The A-SMGCS airport safety support service is based on the A-SMGCS surveillance service as defined in ETSI EN 303 213-1 [3].

Both, the surveillance and airport safety support services are constituents of the A-SMGCS. Hence requirements on the system level related to system safety, reliability, system security and documentation are already specified in ETSI EN 303 213-1 [3] and will not be duplicated in the present document.

The A-SMGCS surveillance service shall comply with the requirements as defined in ETSI EN 303 213-1 [3].

4.2 Airport safety support service basic functionality

4.2.1 Operating principles of the airport safety support service

The operating principles of the airport safety support service are defined in ED-87D [1], chapter 2.1.3.

The parameters of the airport safety support service shall be configurable as defined in EUROCONTROL-SPEC-171 [2] chapter 6.3.1, ASMGCS-[SAFE]-[040].

The display of the airport safety support service shall be set up as defined in EUROCONTROL-SPEC-171 [2], chapter 6.3.1, ASMGCS-[SAFE]-[050].

The airport safety support service shall provide INFORMATION and ALARM alerts as defined in EUROCONTROL-SPEC-171 [2], chapter 3.3.2 and chapter 6.3.1, ASMGCS-[SAFE]-[070].

The alerts of the airport safety support service shall be linked to a priority as defined in EUROCONTROL-SPEC-171 [2] chapter 6.3.1, ASMGCS-[SAFE]-[080].

The airport safety support service shall comply with the requirements as defined as defined in ED-87D [1], chapter 2.1.3, requirements [REQ 4.], [REQ 5.] and [REQ 6.], and chapter 3.4, requirements [REQ 7.], [REQ 8.], [REQ 9.], [REQ 21.] and [REQ 22.].

In addition, the airport safety support service shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.3.1, requirements ASMGCS-[SAFE]-[010], ASMGCS-[SAFE]-[020], ASMGCS-[SAFE]-[030], ASMGCS-[SAFE]-[040], ASMGCS-[SAFE]-[050], ASMGCS-[SAFE]-[060], ASMGCS-[SAFE]-[070], ASMGCS-[SAFE]-[080], ASMGCS-[SAFE]-[090], ASMGCS-[SAFE]-[100], ASMGCS-[SAFE]-[110], ASMGCS-[SAFE]-[120], ASMGCS-[SAFE]-[130], ASMGCS-[SAFE]-[140], ASMGCS-[SAFE]-[150], ASMGCS-[SAFE]-[160], ASMGCS-[SAFE]-[170], ASMGCS-[SAFE]-[190], and ASMGCS-[SAFE]-[200].

4.2.2 RMCA basic functionality

If the A-SMGCS airport safety support service provides RMCA, it shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.3.2, ASMGCS-[SAFE]-[210], ASMGCS-[SAFE]-[220], ASMGCS-[SAFE]-[230], ASMGCS-[SAFE]-[240], ASMGCS-[SAFE]-[250], ASMGCS-[SAFE]-[260], ASMGCS-[SAFE]-[270] and ASMGCS-[SAFE]-[280].

4.2.3 CATC basic functionality

If the A-SMGCS airport safety support service provides CATC, it shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.3.3, ASMGCS-[SAFE]-[290], ASMGCS-[SAFE]-[300], ASMGCS-[SAFE]-[310], ASMGCS-[SAFE]-[320].

4.2.4 CMAC basic functionality

If the A-SMGCS airport safety support service provides CATC, it shall comply with the requirements as defined in the EUROCONTROL Specification for A-SMGCS Services [2], chapter 6.3.4, ASMGCS-[SAFE]-[330], ASMGCS-[SAFE]-[340], ASMGCS-[SAFE]-[350], ASMGCS-[SAFE]-[360], ASMGCS-[SAFE]-[370], ASMGCS-[SAFE]-[380], ASMGCS-[SAFE]-[390], ASMGCS-[SAFE]-[400], ASMGCS-[SAFE]-[410], ASMGCS-[SAFE]-[420], ASMGCS-[SAFE]-[430], ASMGCS-[SAFE]-[440], ASMGCS-[SAFE]-[450], ASMGCS-[SAFE]-[460], ASMGCS-[SAFE]-[470], ASMGCS-[SAFE]-[480] and ASMGCS-[SAFE]-[490].

4.3 Design Requirements for the A-SMGCS airport safety support service

4.3.1 Design Requirements on System Level

The design requirements for the A-SMGCS airport safety support service regarding Modularity, System Integrity, and Safety shall be identical to the design requirements for the A-SMGCS surveillance service as defined in ETSI EN 303 213-1 [3].

The airport safety support service performance and capacity parameters shall comply with the requirements as defined in ED-87D [1], chapter 3.4, requirements [REQ 21.] and [REQ 22.] and chapter 3.3.2 [REQ 17.].

4.3.2 Software design

The Software and the design of the airport safety support service shall comply with the requirements as defined in ED-87D [1], chapter 2.1.3 [REQ 4.], [REQ 5.], [REQ 6.].

4.3.3 Service PDAS

The Service Probability of Detection of an Alert Situation of the airport safety support service shall comply with the requirements as defined in ED-87D [1], chapter 3.4.3.2 and meet the Service PDAS required in ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

4.3.4 System PDAS

The System Probability of Detection of an Alert Situation of the airport safety support service shall comply with the requirements as defined in ED-87D [1], chapter 3.4.3.3 and meet the System PDAS required in ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

4.3.5 PFAS

The Probability of False Alert Situation of the airport safety support service should comply with the requirements as defined in ED-87D [1], chapter 3.4.4 and meet the PFAS required ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

4.3.6 Latencies

The Alert Processing Latency (APL) of the airport safety support service shall comply with the requirements as defined in ED-87D [1], chapter 3.4.5.2 and meet the APL required in ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

The Alert Response Time (ART) of the airport safety support service should comply with the requirements as defined in ED-87D [1], chapter 3.4.5.3 and meet the ART required in ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

4.3.7 APTRT

The Accuracy of Predicted Time to Runway Threshold (APTRT) of the airport safety support service shall comply with the requirements as defined in ED-87D [1], chapter 3.4.6 and meet the APTRT required in ED-87D [1], Table 3-2 [REQ 21.] and [REQ 22.].

4.3.8 Capacity

The capacity of the airport safety support service shall comply with the requirements as defined in ED-87D [1] 3.3.2, [REQ 17.].