



**Advanced Surface Movement Guidance and
Control System (A-SMGCS);
Part 4: Community Specification for a deployed
non-cooperative sensor including its interfaces;
Sub-part 1: Generic requirements for
non-cooperative sensor**

Reference

REN/ERM-TGAERO-67

Keywords

aeronautical, air traffic management,
interoperability

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

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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 to 4, 7, 8) can only be claimed after ETSI EN 303 213 (parts 1 to 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.7] 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 4, sub-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 A-SMGCS surveillance service 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";

Sub-part 1: "Generic requirements for non-cooperative sensor";

Sub-part 2: "Specific requirements for a deployed Surface Movement Radar sensor";

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 deployed non-cooperative sensor as a constituent of an Advanced Surface Movement Guidance and Control System (A-SMGCS).

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.7].

NOTE 1: The ERs in Annex VIII of Regulation (EU) 2018/1139 [i.7] 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.7], 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 out of scope of the present document. As such the ERs of Regulation (EU) 2018/1139 [i.7] 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 clause 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): "MASPS for A-SMGCS including new Airport safety Support Service Routing Service and Guidance Service".

NOTE: Available at <https://eshop.eurocae.net/eurocae-documents-and-reports/ed-87d/>.

- [2] EUROCAE ED-116 (ED-116 January 2004): "Minimum Operational Performance Specification for Surface Movement Radar Sensor Systems for Use in Advanced Surface Movement Guidance and Control Systems (A-SMGCS)".

NOTE: Available at <https://eshop.eurocae.net/eurocae-documents-and-reports/ed-116/>.

2.2 Informative 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.

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 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 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] Void.
- [i.4] EUROCAE ED-128 (ED-128 published 08/2007): "Guidelines for surveillance data fusion in advanced surface movement guidance and control systems (A-SMGCS) levels 1 and 2".
- [i.5] ICAO Document 9830, AN/452: "Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual", First Edition, 2004.
- [i.6] 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.7] Regulation (EC) 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 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.5].

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: This definition is derived from the ICAO Document 9830 [i.5].

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].

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.5].

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.5].

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].

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:

| | |
|----------------|--|
| A-SMGCS | Advanced Surface Movement Guidance and Control Systems |
| ATM | Air Traffic Management |
| ATS | Air Traffic System |
| 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 |
| SMR | Surface Movement Radar |
| TMA | Terminal Manoeuvring Area |

4 Requirements for implementing non-cooperative sensors for A-SMGCS Systems

4.0 General

Clause 4 defines the minimum requirements for implementing a non-cooperative sensor into an A-SMGCS System.

4.1 Design Requirements for non-cooperative sensors for A-SMGCS Systems

4.1.1 Surveillance Element

The non-cooperative sensor shall be designed as a Surveillance Element for an A-SMGCS System and provide an interface as defined in ED-87D [1], clause 2.1.2.1.

4.1.2 Operation of Controls

The constituent shall be designed in respect of operation of Controls as defined in ED-116 [2], clause 2.3.

4.1.3 Interfaces

4.1.3.1 Equipment Interfaces

The interfaces of the constituent shall be designed as defined in ED-116 [2], clause 2.11, second paragraph.

4.1.3.2 Datafusion

The interfaces for the data fusion in an A-SMGCS shall comply with the requirements as defined in ED-87D [1], clause 2.1.2.1.

NOTE: Guidance for the Data Fusion can be found in ED-128 [i.4].

4.1.4 External time reference

The constituent shall be designed to use an external time reference as defined in ED-116 [2], clause 2.12.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.1.5 Safety

4.1.5.1 Void

4.1.5.2 Grounding

The constituent shall comply with the requirements as defined in ED-116 [2], clause 2.15.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.1.5.3 Lightning protection

The constituent shall comply with the requirements as defined in ED-116 [2], clause 2.16.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.1.6 Power supplies

The constituent shall comply with the requirements as defined in ED-116 [2], clause 2.19.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.1.7 Reliability, availability and integrity

The constituent shall comply with the requirements as defined in ED-116 [2], clause 2.20.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.1.8 Temperature and Humidity

The constituent shall comply with the requirements as defined in ED-116 [2], clause 3.2.1.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.2 Built requirements for non-cooperative sensors for A-SMGCS Systems

4.2.1 Factory testing procedures

The manufacturer shall perform the factory testing procedures as defined in ED-116 [2], clauses 5.2 and 5.4.

NOTE: This requirement is applicable to all non-cooperative sensors.

4.2.2 Site testing procedures

The on site testing procedures shall be performed as defined in ED-116 [2], clauses 6.2 and 6.3.

NOTE: Site tests described in ED-116 [2], clause 6.4 consist of tests which may not be applicable for non-cooperative sensors different from SMR. The site tests for the other cooperative sensors may be described in future sub-parts of the present document.

4.3 Requirements for operation non-cooperative sensors for A-SMGCS Systems

To ensure seamless operation, the constituent shall share and provide its information via the interfaces as defined in ED-116 [2], clause 2.11.

NOTE: This requirement is applicable to all non-cooperative sensors.

5 Testing

The testing of non-cooperative sensors is covered with the build requirements defined in clause 4.2.

Annex A (normative): Regulation (EU) 2018/1139 Essential Requirements mapping and Checklist

A.1 Correspondence between the present document and the relevant Essential Requirements of Annex VIII of Regulation (EU) 2018/1139

This annex provides a relationship between the present document and the Essential Requirements of Annex VIII of Regulation (EU) 2018/1139 [i.7].

An A-SMGCS non-cooperative sensor shall comply with the Essential Requirements of Regulation (EU) 2018/1139 [i.7] as defined and described in the traceability matrixes of this annex (Table A.1 and Table A.2 below).

NOTE: Whenever "n/a" is used, that means that a given ER and/or an associated "keyword" is not applicable for presumption of conformity

Table A.1: Traceability from the Essential Requirements of Annex VIII of Regulation (EU) 2018/1139 [i.7] to clauses of the present document

| Essential requirements (ERs) of Regulation (EU) 2018/1139 | Clause(s) of the present document | Qualifying remarks/Notes |
|---|---|--------------------------|
| ER 1 Use of the airspace | The present document does not give presumption of conformity | |
| ER 2.1 Aeronautical information and data for airspace users for the purpose of air navigation | The present document does not give presumption of conformity | |
| ER 2.2 Meteorological information | The present document does not give presumption of conformity | |
| ER 2.3 Air traffic services | The present document does not give presumption of conformity | |
| ER 2.4 Communication services | The present document does not give presumption of conformity | |
| ER 2.5 Navigation services | The present document does not give presumption of conformity | |
| ER 2.6 Surveillance services | 4.1.1 Surveillance Element | |
| ER 2.7 Air traffic flow management | The present document does not give presumption of conformity | |
| ER 2.8 Airspace management | The present document does not give presumption of conformity | |
| ER 2.9 Flight procedure design | The present document does not give presumption of conformity | |
| ER 3.1 Fit for purpose | 4.1.1 Surveillance Element 4.1.2 Operation of Controls 4.1.3.1 Equipment Interfaces 4.1.3.2 Datafusion 4.2.1 Factory testing procedures 4.2.2 Site testing procedures 5 Testing | |
| ER 3.2 Integrity and safety related performance and reliability | 4.1.2 Operation of Controls 4.1.7 Reliability, availability and integrity | |
| ER 3.3 Seamless operation | 4.1.3.1 Equipment Interfaces 4.1.3.2 Datafusion 4.3 Requirements for operation non-cooperative sensors for A-SMGCS Systems | |
| ER 3.4 Support for new concepts of operation | The present document does not give presumption of conformity | |

| Essential requirements (ERs) of Regulation (EU) 2018/1139 | Clause(s) of the present document | Qualifying remarks/Notes |
|---|--|--------------------------|
| ER 3.5 Civil-military coordination | The present document does not give presumption of conformity | |
| ER 3.6 Design requirements | 4.1.4 External time reference 4.1.5.2 Grounding 4.1.5.3 Lightning protection 4.1.6 Power supplies 4.1.8 Temperature and Humidity | |
| ER 3.7 Continuity of service | 4.1.7 Reliability, availability and integrity 4.1.8 Temperature and Humidity | |
| ER 4 Qualification of Air Traffic Controllers | The present document does not give presumption of conformity | |
| ER 5 Service providers and training organizations | The present document does not give presumption of conformity | |
| ER 6 Aeromedical examiners and aeromedical centres | The present document does not give presumption of conformity | |

Table A.2: Traceability from clauses of the present document to the Essential Requirements of Annex VIII, chapter 3, of Regulation (EU) 2018/1139 [i.7]

| Clause(s) of the present document | (Essential) Requirements (ERs) of Regulation (EU) 2018/1139, Annex VIII | Qualifying remarks/Notes |
|--|---|--------------------------|
| 4.1.1 Surveillance Element | ER 2.6 Surveillance services ER 3.1 Fit for purpose | |
| 4.1.2 Operation of Controls | ER 3.1 Fit for purpose ER 3.2 Integrity and safety related performance and reliability | |
| 4.1.3.1 Equipment Interfaces | ER 3.1 Fit for purpose ER 3.3 Seamless operation | |
| 4.1.3.2 Datafusion | ER 3.1 Fit for purpose ER 3.3 Seamless operation | |
| 4.1.4 External time reference | ER 3.6 Design requirements | |
| 4.1.5.2 Grounding | ER 3.6 Design requirements | |
| 4.1.5.3 Lightning protection Temperature and Humidity | ER 3.6 Design requirements | |
| 4.1.6 Power supplies | ER 3.6 Design requirements | |
| 4.1.7 Reliability, availability and integrity | ER 3.2 Integrity and safety related performance and reliability ER 3.7 Continuity of service | |
| 4.1.8 Temperature and Humidity | ER 3.6 Design requirements ER 3.7 Continuity of service | |
| 4.2.1 Factory testing procedures | ER 3.1 Fit for purpose | |
| 4.2.2 Site testing procedures | ER 3.1 Fit for purpose | |
| 4.3 Requirements for operation non-cooperative sensors for A-SMGCS Systems | ER 3.3 Seamless operation | |
| 5 Testing | ER 3.1 Fit for purpose | |

A.2 Mapping of requirements for the A-SMGCS Surveillance Service to the relevant Essential Requirements of Annex VIII, chapters 2.6 and 3 of Regulation (EU) 2018/1139

The purpose of the present annex is to provide a comprehensive traceability of evidence on constituents and system levels against clauses of the relevant Essential Requirements (ERs) of the Regulation (EU) 2018/1139 [i.7] Annex VIII, analysing 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 Regulation (EU) 2018/1139 [i.7].

An A-SMGCS non-cooperative sensor shall comply with the relevant Essential Requirements specified in Annex VIII of Regulation (EU) 2018/1139 [i.7] as defined and described in Table A.3 to Table A.10. With the applicability determined in clause A.1 the traceability in this clause covers only chapters 2.6 and 3 of Regulation (EU) 2018/1139.

NOTE: Table A.3 to Table A.10 are related only to those Essential Requirements covered by the present document as outlined in Table A.1 above.

Table A.3

| | | | |
|-------|--|--|--|
| 2.6 | ER 2.6 Surveillance services | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 2.6, first paragraph, that: " <i>Surveillance services shall determine the respective position of aircraft in the air and of other aircraft and ground vehicles on the aerodrome surface, with sufficient performance with regard to their accuracy, integrity, legitimacy of the source, continuity and probability of detection</i> ". | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 2.6.1 | Accuracy | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 2.6.2 | Integrity | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 2.6.3 | Legitimacy of source | ED-87D [1], clause 2.1.2.1 | The present document does not give presumption of conformity |
| 2.6.4 | Continuity | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 2.6.5 | Probability of detection | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Table A.4

| | | | |
|-------|--|---|--|
| 3.1 | ER 3.1 Fit for purpose | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.1, first paragraph, that: " <i>ATM/ANS systems and ATM/ANS constituents providing related information to and from the aircraft and on the ground shall be properly designed, produced, installed, maintained, protected against unauthorised interference and operated to ensure that they are fit for their intended purpose</i> ". | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.1.1 | Properly designed | ED-87D [1], clause 2.1.2.1. ED-116 [2], clause 2.3. ED-116 [2], clause 2.11 second paragraph. ED-87 D [1], clause 2.1.2.1. | The present document does not give presumption of conformity |
| 3.1.2 | Produced | ED-116 [2], clauses 5.2 and 5.4. | The present document does not give presumption of conformity |
| 3.1.3 | Installed | ED-116 [2], clauses 6.2 and 6.3. | The present document does not give presumption of conformity |
| 3.1.4 | Maintained | The present document does not give presumption of conformity. | The present document does not give presumption of conformity |
| 3.1.5 | Protected against unauthorised interference | ED-116 [2], clause 2.3. | The present document does not give presumption of conformity |
| 3.1.6 | Operated | ED-116 [2], clause 2.3. | The present document does not give presumption of conformity |

Table A.5

| | | | |
|-----|---|---|--|
| 3.2 | ER 3.2 Integrity and safety-related performance and reliability | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.2, first paragraph, that: " <i>The integrity and safety-related performance of systems and constituents whether on aircraft, on the ground or in space, shall be fit for their intended purpose. They shall meet the required level of operational performance for all their foreseeable operating conditions and for their whole operational life</i> ". | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.2 | All regulatory text | ED-116 [2], clause 2.3. ED-116 [2], clause 2.20. | The present document does not give presumption of conformity |

Table A.6

| | | | |
|-------|--|--|--|
| 3.3 | ER 3.3 Seamless operation | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.2, second paragraph, that: <i>"ATM/ANS systems and ATM/ANS 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 European air traffic management network (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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.3.1 | Designed | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.3.2 | Built | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.3.3 | Maintained | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.3.4 | Operated | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.3.5 | Information sharing | ED-116 [2], clause 2.11. ED-87 D [1], clause 2.1.2.1. | The present document does not give presumption of conformity |

Table A.7

| | | | |
|-------|--|--|--|
| 3.4 | ER 3.4 Support for new concepts of operation | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.2, third paragraph that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.4.1 | Validated concepts of operation - quality | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.4.2 | Validated concepts of operation - sustainability | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.4.3 | Validated concepts of operation - effectiveness | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.4.4 | Validated concepts of operation - safety | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.4.5 | Validated concepts of operation - capacity | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Table A.8

| | | | |
|-------|--|--|--|
| 3.5 | ER 3.5 Civil-military coordination | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.2, fourth and fifth paragraph that: <i>"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 those 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, without prejudice to security or defence policy interests, including requirements on confidentiality"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.5.1 | Flexible use of airspace | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.5.2 | Timely sharing | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.5.3 | No prejudice to security or defence policy interests, including requirements on confidentiality. | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Table A.9

| | | | |
|-------|--|---|--|
| 3.6 | ER 3.6 Design requirements | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.3 that: <i>"Systems and constituents shall be designed to meet applicable safety and security requirements. Systems and constituents, considered collectively, separately and in relation to each other, shall be designed in such a way that an inverse relationship exists between the probability that any failure can result in a total system failure and the severity of its effect on the safety of services. Systems and constituents, considered individually and in combination with each other, shall be designed taking into account limitations related to human capabilities and performance. Systems and constituents shall be designed in a manner that protects them and the data they convey from harmful interactions with internal and external elements. Information needed for production, installation, operation and maintenance of the systems and constituents as well as information concerning unsafe conditions shall be provided to personnel in a clear, consistent and unambiguous manner"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.6.1 | Safety and security requirements | ED-116 [2], clause 2.15. ED-116 [2], clause 2.16. | The present document does not give presumption of conformity |
| 3.6.2 | Failure resistance and safety of service | ED-116 [2], clause 2.15. ED-116 [2], clause 2.16. ED-116 [2], clause 3.2.1. | The present document does not give presumption of conformity |
| 3.6.3 | Usability (take into account limitations related to human capabilities and performance). | ED-116 [2], clause 2.12. ED-116 [2], clause 2.19. | The present document does not give presumption of conformity |
| 3.6.4 | Robustness (protected from harmful interactions) | ED-116 [2], clause 2.15. ED-116 [2], clause 2.16. ED-116 [2], clause 3.2.1. | The present document does not give presumption of conformity |
| 3.6.5 | Documented (clear, consistent and unambiguous provision of information) | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Table A.10

| | | | |
|-------|--|---|--|
| 3.7 | ER 3.7 Continuity of service | | |
| | Regulation (EU) 2018/1139 [i.7] requires in Annex VIII, chapter 3.4 that: <i>"Safety levels of systems and constituents shall be maintained during service and any modifications to service"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.7.1 | All regulatory text | ED-116 [2], clause 2.20. ED-116 [2], clause 3.2.1. | The present document does not give presumption of conformity |

Annex B (informative): SES Interoperability Regulation Essential Requirements mapping and Checklist

B.1 Correspondence between the present document and the Essential Requirements of the Interoperability Regulation as amended by Regulation (EC) 1070/2009

The present annex provides a relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation [i.1] as amended by Regulation (EC) 1070/2009 [i.6].

Table B.1: Traceability from the Interoperability Regulation [i.1] 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 Surveillance Element 4.1.2 Operation of Controls 4.1.3.1 Equipment Interfaces 4.1.3.2 Datafusion 4.1.4 External time reference 4.1.5.1 Void 4.1.5.2 Safety interlocks 4.1.5.3 Grounding 4.1.5.4 Lightning protection 4.1.6 Power supplies 4.1.7 Reliability, availability and integrity 4.1.8 Temperature and Humidity 4.2.1 Factory testing procedures 4.2.2 Site testing procedures 4.3 Requirements for operation non-cooperative sensors for A-SMGCS Systems | |
| ER 2 Support for new concepts of operation | n/a | Operation is only applicable at the system level |
| ER 3 Safety | n/a | |
| ER 4 Civil-military coordination | n/a | 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 | n/a | |
| ER 7 Principles governing the construction of systems | n/a | |

Table B.2: Traceability from clauses of the present document to the Interoperability Regulation [i.1]

| 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 Surveillance Element | ER 1 Seamless operation | |
| 4.1.2 Operation of Controls | ER 1 Seamless operation | |
| 4.1.3.1 Equipment Interfaces | ER 1 Seamless operation | |
| 4.1.3.2 Datafusion | ER 1 Seamless operation | |
| 4.1.4 External time reference | ER 1 Seamless operation | |
| 4.1.5.1 Void | ER 1 Seamless operation | |
| 4.1.5.2 Grounding | ER 1 Seamless operation | |
| 4.1.5.3 Lightning protection | ER 1 Seamless operation | |
| 4.1.6 Power supplies | ER 1 Seamless operation | |
| 4.1.7 Reliability, availability and integrity | ER 1 Seamless operation | |
| 4.1.8 Temperature and Humidity | ER 1 Seamless operation | |
| 4.2.1 Factory testing procedures | ER 1 Seamless operation | |
| 4.2.2 Site testing procedures | ER 1 Seamless operation | |
| 4.3 Requirements for operation non-cooperative sensors for A-SMGCS Systems | ER 1 Seamless operation | |

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

The purpose of the present annex is to provide a comprehensive traceability of evidence on constituents and system levels against clauses of the general Essential Requirements (ERs) of the Interoperability Regulation [i.1] as amended by Regulation (EC) 1070/2009 [i.6], analysing 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 Interoperability Regulation [i.1].

NOTE: Whenever "n/a" is used, that means that a given ER and/or an associated "keyword" is not applicable for presumption of conformity.

Table B.3

| 1 | ER 1 seamless operation | | |
|-----|--|--|--|
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 1.1 | Designed | ED-87 D [1], clause 2.1.2.1 Surveillance ED-116 [2], clause 2.3 Operation of Controls ED-116 [2], clause 2.11 Equipment interfaces ED-116 [2], clause 2.12 External time reference ED-116 [2], clause 2.15 Grounding ED-116 [2], clause 2.16 Lightning protection ED-116 [2], clause 2.19 Power supplies ED-116 [2], clause 2.20 Reliability, availability and integrity ED-116 [2], clause 3.2.1 Temperature and Humidity ED-128 [i.4], clause 2.2.1 Surveillance ED-128 [i.4], clause 3.3.2 Non-Cooperative Sensor Systems | The present document does not give presumption of conformity |
| 1.2 | Built | ED-116 [2], clause 5.2 General conditions for testing (Factory) ED-116 [2], clause 5.4 Performance tests (Factory) ED-116 [2], clause 6.2 General conditions for testing (Site) ED-116 [2], clause 6.3 Basic conformity tests (Site) | The present document does not give presumption of conformity |
| 1.3 | maintained | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 1.4 | Operated | Operation is only applicable at the system level | The present document does not give presumption of conformity |
| 1.5 | information sharing | ED-116 [2], clause 2.11 Equipment interfaces | The present document does not give presumption of conformity |

Table B.4

| | | | |
|-----|--|--|--|
| 2 | ER 2 Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 2.1 | Validated concepts of operation - safety | Operation is only applicable at the system level | The present document does not give presumption of conformity |
| 2.2 | Validated concepts of operation - capacity | Operation is only applicable at the system level | The present document does not give presumption of conformity |
| 2.3 | Validated concepts of operation - quality | Operation is only applicable at the system level | The present document does not give presumption of conformity |

Table B.5

| | | | | |
|-----|--|--------------------------------------|--|--|
| 3 | ER 3 Safety | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | | |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 3.1 | Design | n/a | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.2 | Implementation | n/a | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 3.3 | Maintenance | n/a | The present document does not give presumption of conformity | n/a |
| 3.4 | Operation | n/a | The present document does not give presumption of conformity | The present document does not give presumption of conformity |
| 3.5 | Human capabilities | n/a | The present document does not give presumption of conformity | 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 B.6

| | | | |
|-----|---|--|--|
| 4 | ER 4 Civil-military coordination | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | 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 | The present document does not give presumption of conformity | 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 B.7

| | | | | |
|-----|---|--|--|--|
| 5 | ER 5 Environmental constraints | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation"</i> . | | | |
| | 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 B.8

| | | | |
|-----|--|--------------------------------------|--|
| 6 | ER 6 Principles governing the logical architecture of systems | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 6.1 | Designed and progressively integrated | n/a | The present document does not give presumption of conformity |

Table B.9

| | | | |
|-----|--|--------------------------------------|--|
| 7 | ER 7 Principles governing the construction of systems | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 7.1 | Modularity, interchangeability | n/a | The present document does not give presumption of conformity |
| 7.2 | High availability, Redundancy and fault tolerance | n/a | The present document does not give presumption of conformity |

B.3 Interoperability Regulation, Annex II Essential Requirements, Part B: Specific requirements

B.3.0 Introduction

The purpose of the present annex is to provide a comprehensive traceability of evidence on constituents and system levels against clauses of the specific Essential Requirements (ERs) of the Interoperability Regulation [i.1] as amended by Regulation (EC) 1070/2009 [i.6], analysing 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 Interoperability Regulation [i.1].

NOTE: Whenever "n/a" is used, that means that a given ER and/or an associated "keyword" is not applicable for presumption of conformity.

B.3.1 Systems and procedures for airspace management

Table B.10

| | | | | |
|-------|---|--------------------------------------|---|---|
| 1.1 | ER B 1.1 Seamless operation | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | | |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 1.1.1 | Pre-tactical aspects of airspace availability | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 1.1.2 | Tactical aspects of airspace availability | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 1.1.3 | Correct and timely way | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 1.1.4 | National security requirements | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |

B.3.2 Systems and procedures for air traffic flow management

Table B.11

| | | | | |
|-------|--|--------------------------------------|---|---|
| 2.1 | ER B 2.1 Seamless operation | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | | |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 2.1.1 | Strategic | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 2.1.2 | Pre-tactical | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 2.1.3 | Tactical | n/a | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |

B.3.3 Systems and procedures for air traffic services

B.3.3.1 Flight data processing systems

Table B.12

| | | | |
|---------|--|--------------------------------------|---|
| 3.1.1 | ER B 3.1.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] 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 | The present document does not give presumption of conformity. |
| 3.1.1.2 | Performance appropriate for environment | n/a | The present document does not give presumption of conformity. |
| 3.1.1.3 | Accuracy and error tolerance | n/a | The present document does not give presumption of conformity. |

Table B.13

| | | | |
|---------|---|---|---|
| 3.1.2 | ER B 3.1.2. Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: " <i>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.</i> " | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.1.2.1 | Airborne systems - design | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.2 | Airborne systems - built | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.3 | Airborne systems - maintained | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.4 | Airborne systems - operated | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.5 | Ground systems - design | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.6 | Ground systems - built | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.7 | Ground systems - maintained | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |
| 3.1.2.8 | Ground systems - operated | The present document does not give presumption of conformity. | The present document does not give presumption of conformity. |

B.3.3.2 Surveillance data processing systems

Table B.14

| | | | |
|---------|--|--------------------------------------|--|
| 3.2.1 | ER B 3.2.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: " <i>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.</i> " | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.2.1.1 | Designed | n/a | The present document does not give presumption of conformity |
| 3.2.1.2 | Built | n/a | The present document does not give presumption of conformity |
| 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 B.15

| | | | |
|---------|--|--------------------------------------|--|
| 3.2.2 | ER B 3.2.2. Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.2.2.1 | Availability of new sources | n/a | The present document does not give presumption of conformity |

B.3.3.3 HMI systems

Table B.16

| | | | |
|---------|---|--------------------------------------|--|
| 3.3.1 | ER B 3.3.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"HMIs 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 harmonised working environment, including functions and ergonomics, meeting the required performance for a given environment (surface, TMA, en-route), with known traffic characteristics"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.3.1.1 | Designed | n/a | The present document does not give presumption of conformity |
| 3.3.1.2 | Built | n/a | The present document does not give presumption of conformity |
| 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 B.17

| | | | |
|---------|--|--------------------------------------|--|
| 3.3.2 | ER B 3.3.2. Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"HMI 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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 3.3.2.1 | Human capabilities | n/a | The present document does not give presumption of conformity |

B.3.4 Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications

Table B.18

| | | | |
|-------|--|--------------------------------------|--|
| 4.1 | ER B 4.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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".</i> | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 4.1.1 | Designed | n/a | The present document does not give presumption of conformity |
| 4.1.2 | Built | n/a | The present document does not give presumption of conformity |
| 4.1.3 | Maintained | n/a | The present document does not give presumption of conformity |
| 4.1.4 | Operated | n/a | The present document does not give presumption of conformity |
| 4.1.5 | Quality of service, coverage, redundancy | n/a | The present document does not give presumption of conformity |

Table B.19

| | | | |
|-------|---|--------------------------------------|--|
| 4.2 | ER B 4.2 Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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".</i> | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 4.2.1 | Support the implementation | n/a | The present document does not give presumption of conformity |

B.3.5 Navigation systems and procedures

Table B.20

| | | | |
|-------|--|--------------------------------------|--|
| 5.1 | ER B 5.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 5.1.1 | Designed | n/a | The present document does not give presumption of conformity |
| 5.1.2 | Built | n/a | The present document does not give presumption of conformity |
| 5.1.3 | Maintained | n/a | The present document does not give presumption of conformity |
| 5.1.4 | Operated | n/a | The present document does not give presumption of conformity |

B.3.6 Surveillance systems and procedures

Table B.21

| | | | |
|-------|---|--------------------------------------|--|
| 6.1 | ER B 6.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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.</i> <i>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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 6.1.1 | Designed | n/a | The present document does not give presumption of conformity |
| 6.1.2 | Built | n/a | The present document does not give presumption of conformity |
| 6.1.3 | Maintained | n/a | The present document does not give presumption of conformity |
| 6.1.4 | Operated | n/a | The present document does not give presumption of conformity |
| 6.1.5 | Information Sharing | n/a | The present document does not give presumption of conformity |

B.3.7 Systems and procedures for aeronautical information services

Table B.22

| | | | |
|-------|---|--------------------------------------|--|
| 7.1 | ER B 7.1 Seamless operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 7.1.1 | Accurate, timely and consistent | n/a | The present document does not give presumption of conformity |
| 7.1.2 | Standardized data set | n/a | The present document does not give presumption of conformity |

Table B.23

| | | | |
|-------|---|--------------------------------------|--|
| 7.2 | ER B 7.2 Support for new concepts of operation | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | |
| | Keywords | Evidence on constituent level | Evidence on system level |
| 7.2.1 | Increasingly accurate, complete and up-to-date | n/a | The present document does not give presumption of conformity |

B.3.8 Systems and procedures for the use of meteorological information

Table B.24

| | | | | |
|-------|---|--------------------------------------|--|--|
| 8.1 | ER B 8.1 Seamless operation | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | | |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 8.1.1 | Consistency and timeliness | n/a | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Table B.25

| | | | | |
|-------|--|--------------------------------------|--|--|
| 8.2 | ER B 8.2 Support for new concepts of operation | | | |
| | Regulation (EC) 552/2004 [i.1] as amended by Regulation (EC) 1070/2009 [i.6] requires that: <i>"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"</i> . | | | |
| | Keywords | Evidence on constituent level | Evidence on system level | Evidence at procedure level |
| 8.2.1 | Promptness, speed | n/a | The present document does not give presumption of conformity | The present document does not give presumption of conformity |

Annex C (informative): Bibliography

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History

| Document history | | |
|-------------------------|--------------|---|
| V1.1.1 | October 2010 | Publication |
| V2.0.1 | June 2020 | EN Approval Procedure AP 20200909: 2020-06-11 to 2020-09-09 |
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