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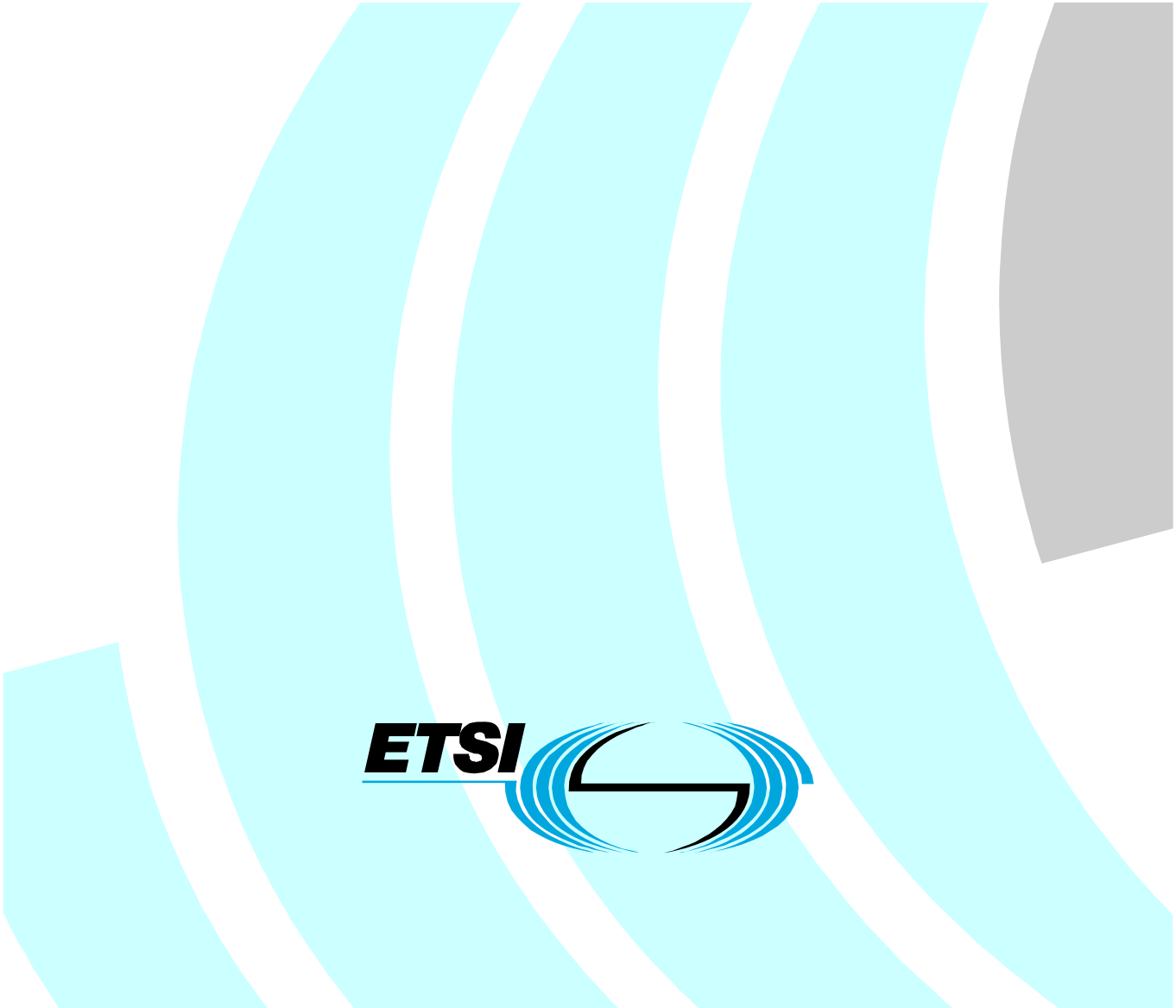
Technical Report

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



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Contents

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Electromagnetic compatibility and Radio spectrum Matters (ERM).

Introduction

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

The SES legislation is based on a framework of 4 regulations, which includes "the Interoperability Regulation" (EC 552/2004).

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

The present document providing guidance for the production of European CS provides a framework for procedural and general content during all phases of the CS development. This will ensure commonality and make it easier and more cost effective for the working groups to draft clauses in the CSs and provide traceability to the Essential Requirements of the Interoperability Regulation.

1 Scope

The present document has been prepared to assist ETSI technical bodies in the preparation of Community Specifications for application under the Interoperability Regulation [1]. Where clauses 4 and 5 deliver useful background information on the CS role and generation process, the clauses 6 and 7 establish a methodology to allow those technical bodies to have a consistent production workflow for CSs and a given interpretation of the essential requirements of the Interoperability Regulation [1].

The present document is focussed on ETSI deliverables but is also a suitable basis for Community Specifications produced by other bodies. The existing CEN Guidance Material [2] was noted during the production of the present document. The document may also help other bodies to understand the relationship between various standards and procedural documents produced by the EATMN stakeholders.

NOTE: The scope of the present document is to capture guidance for standardization bodies. It is not intended to provide guidance for those, e.g. ANSPs and manufactures, who have to demonstrate and certify compliance of systems, constituents and procedures to the IOP regulation.

2 References

For the purposes of this Technical Report (TR), the following references apply:

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

[1] Regulation (EC) No 552/2004 of the regulation 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.

[2] http://www.cen.eu/boss/supporting/guidance+documents/gd032+-+relation+between+ens+and+er+of+nad/index.asp.

[3] 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.

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

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

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

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

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document and Community Specifications produced in accordance with it, the following terms and definitions apply:

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 [3].

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 [3] interoperability Regulation [1].

system: aggregation of airborne and groundbased 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 [3].

Further legally binding definitions in the context of Single European Sky are given in [3].

3.2 Abbreviations

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

ANSP	Air Navigation Service Provider
ATM	Air Traffic Management
ATMSCG	Air Traffic Management Standards Coordination Group
CEN	Comité Européen de Normalization
CS	Community Specification
doa	date of announcement
dow	date of withdrawal
EASA	European Aviation Safety Agency
EATMN	European Air Traffic Management Network
EC	European Communities
EFTA	European Free Trade Association
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
ICAO	International Civil Aviation Organization
ICB	Industry Consultation Body (for the Single European Sky)
IOP Regulation	InterOPerability Regulation
IR	Implementing Rule for interoperability
OJEU	Official Journal of the European Union
SES	Single European Sky
SSC	Single European Sky committee
TB	Technical Body
TWP	Technical Working Procedures
VHF	Very High Frequency

4 Purpose of Community Specifications

4.1 Background to the Interoperability Regulation

The interoperability Regulation (EC) 552/2004 [1] is one of the four regulations put in place to bring about the Single European Sky. It states that "measures should be adopted in relation to systems, constituents and associated procedures with the objective of ensuring the interoperability of the European air traffic management network (EATMN)…"; and it refers also to the EC Council Resolution of 7 May 1985 on the "New Approach" [4]. The regulation contains essential requirements, which should apply to the European air traffic management network, its systems, constituents and associated procedures. They are split into general requirements, valid for all systems and constituents, and additional specific requirements, referring to defined systems.

In addition to the four basic regulations, Implementing Rules (IRs) for interoperability should be drawn up whenever necessary to complement or further refine the essential requirements. Those IRs should also be drawn up where necessary to facilitate the coordinated introduction of new, agreed and validated concepts of operation or technologies; compliance with those IRs shall be permanently maintained; those IRs should rely on standards and specifications developed by international organizations such as EUROCONTROL or ICAO.

NOTE: Standards developed according to [4] under other EC directives/regulations are not within the scope of the present document; there may be separate guidance material to be used for such products (e.g. [5] in case of products under the R&TTE directive [6]).

4.2 Origination of Community Specifications

CS will be established either by the European standardization bodies in cooperation with EUROCAE for systems and constituents together with the relevant procedures on a mandate from the Commission, or by EUROCONTROL on matters of operational coordination between air navigation service providers, in response to a request from the Commission.

4.3 Role of Community Specifications in Presumption of Conformity

A CS is a means of defining the technical and operational conditions necessary to meet the essential requirements and relevant implementing rules for interoperability. Compliance with published CS, which remain voluntary, creates a presumption of conformity with the essential requirements and the relevant implementing rules for interoperability.

For legal clarity, it is important that each CS contains a statement clarifying that compliance with it confers a presumption of conformity only if all the relevant clauses of the CS have been applied.

NOTE: Although compliance with a CS is voluntary, the statement above ensures that a stakeholder using a CS as a means of compliance must meet all of the requirements of the CS. In practice this means that there can be no selection or deselection of a clause, or clauses, of a CS for compliance purposes **unless** that clause(es) is not applicable. However, segmentation of a CS in parts, each part being reflected in the ETSI TWP and having its scope statement and own standards annex (see clause 6.2.7) is acceptable.

For clarity and ease of use ENs or parts of ENs developed under a mandate of the European Commission based on article 4 (1) of the IOP Regulation [1] as a means of compliance to the ERs of [1] and/or implementing rules for interoperability based on [1] should be subtitled as "Community Specification".

5 Procedure for the generation of Community Specifications

5.1 Standardization need

The need for CSs is driven by the stakeholders. The Industry Consultation Body (ICB) which advices the EC on technical aspects of the implementation of the SES [3] and its Interoperability Sub-group are the appropriate fora at which this need is discussed and agreed. Final coordination before the EC issues the standardization mandate will take place in the Air Traffic Management Standards Coordination Group (ATMSCG).

5.2 Standardization mandate

EC/EFTA standardization mandates for systems or constituents and relevant provisions under the IOP Regulation [1] are officially proposed by the European Commission, after consultation with the ICB and ATMSCG, to the 98/34 Committee [7].

NOTE: CS on matters of operational coordination between Air Navigation Service Providers will be developed by EUROCONTROL. Standardization mandates in this case are proposed to the Single Sky Committee instead of the 98/34 Committee.

5.3 The drafting process

Guidance of the drafting process is addressed separately in clause 6.

5.4 Adoption of candidate Community Specifications

Candidate CSs are adopted according to specific procedures under the ETSI TWP.

The standard should be finally examined to ascertain that the conditions imposed by the IOP Regulation [1], the conditions of the standardization mandate (in particular the cooperation with EUROCAE, the other ESOs and other appropriate organizations, e.g. EUROCONTROL, EASA, ICAO), and the conditions stemming from the present document are met.

NOTE: ETSI may establish procedures to ensure that this is always the case.

The CS then will be subject to public enquiry by the relevant stakeholders.

5.5 Submission to European Commission and Publication in the OJEU

After public acceptance, the CSs will be sent to the Commission by ETSI secretariat.

The Commission will decide whether or not the CS is acceptable in whole or in part as suitable for establishing a presumption of conformity against the relevant essential requirements. The EC may decide whether or not to cite the CS or its revision in the OJEU.

NOTE: ENs cannot be quoted in the OJEU as CSs unless they have been developed under an EC standardization mandate and followed the procedure indicated above.

The ETSI secretariat will set the date of withdrawal (dow) of conflicting national standards to eighteen months after date of announcement (doa) unless the relevant ETSI TB advises otherwise.

5.6 Revision of Community Specifications

Revisions of CSs developed under IOP Regulation [1] mandate do not require a specific modification to the standardization mandate. However, publication of the revised standard in the OJ is necessary to amend the requirements which give a presumption of conformity with the IOP Regulation [1]. The TB should consider the cost and other implications on industry and other parties before proposing non-essential revisions to CSs.

NOTE 1: When a new implementing Rule based on [1] is published, its effect on existing CS should be analyzed by the TB.

If an ETSI TB considers that technical modifications to a CS are required, it should raise a work item according to the ETSI TWP and coordinate the action with the European Commission.

NOTE 2: The legal requirement that a CS has to be developed in cooperation with EUROCAE should be considered for revisions of CS as well, including the possible need to initiate the creation of a related new work item in the EUROCAE work programme. This may also apply for coordination with other parties identified in the standardization mandate.

Drafting, adoption and submission of revisions of (candidate) CSs are as specified in clauses 5.3 to 5.5.

5.7 Withdrawal of Community Specifications

Where a Member State or the Commission considers that a CS does not ensure compliance with the essential requirements and/or implementing rules for interoperability the committee established under the IOP Regulation [1] (SSC) will be consulted using its advisory procedure.

In the case of shortcomings of published European standards, partial or total withdrawal of the standards concerned from the publications containing them, or amendments thereto, the 98/34 Committee will decide upon in accordance with the procedure under the terms of Directive 98/34/EC [7].

NOTE: As it is the task of the ICB to advice the European Commission on technical matters of the Single European Sky it could reasonably be assumed that the European Commission will seek the advice of the ICB also in that case.

If, following the Commission's action, the relevant ETSI TB considers that the CS should be withdrawn; the standard shall follow the withdrawal procedures of the ETSI TWP. The ETSI Secretariat shall ensure that the standard is archived so as to remain available if requested, including traceability that the standard had been published in the OJ, with the relevant dates of publication and withdrawal.

6 Production of a Community Specification

6.1 Guiding principles

6.1.1 Level of technological independence

ETSI technical bodies should take note, as a principal goal, that wherever possible, CSs which are technology independent are preferred; i.e. a CS should only specify the detail of what is required and how it is to be met to an appropriate level. Users of the CS must not be unnecessarily constrained when developing their solution to the requirement(s). The level of technological independence should remain the responsibility of the appropriate TB.

NOTE: As an example a CS for Ground-based VHF hand-held, mobile and fixed radio transmitters, receivers and transceivers will specify the technical characteristics and performance requirements together with the associated methods of measurement; it will not detail the design solution that delivers the characteristics and performance.

In producing CSs for application under the IOP-Regulation [1], ETSI shall ensure that the standards do not exceed the degree of regulation envisaged by the Commission, and shall apply discernment in order not to inhibit technological innovation or the meeting of the needs of a free-market economy.

6.1.2 Assumption

It is assumed, that before a mandate is being issued, the consultation process to determine that a new CS is needed has taken into account that there is existing reference material to it.

6.1.3 Cooperation

Due to its safety needs, aviation has always been a highly regulated sector. Although the safety of citizens is primarily a state task, voluntary bodies on the European level have been in place for more than forty years to ensure a harmonized European approach, mostly but not always, outside of the European standardization bodies.

With aviation policy now being a Community competence, the Community mechanisms for standardization have now to be applied to aviation and with [1] to ATM in particular. Therefore, and in order to build on the existing distributed knowledge, cooperation is a basic principle for the development of CSs. This includes the cooperation of the European standardization bodies among each other (one ESO being the "lead ESO", the other(s) being "supporting ESO") and the cooperation with organizations like EASA, EUROCONTROL, EUROCAE and the relevant aviation stakeholder.

The lead ESO is the one mainly in charge of the mandate. In addition to its technical work, it is the responsibility of the lead ESO to act as the coordinator between the parties mentioned above, to set up the necessary working arrangements and to act as the interface to the Commission.

If ETSI takes the role of lead ESO the applicable TB shall consider the impact on resources and timelines. It should be considered that resources from supporting organizations are needed for drafting, comment resolution and maintenance of the CS.

Under the legally required cooperation with EUROCAE the applicable TB shall consider to take advantage of the following options when producing a Community Specification:

- (re-)use of existing EUROCAE documents;
- (re-)use of EUROCAE documents under development; this includes the possibility to participate in the EUROCAE working groups drafting documents which are (possibly) relevant for a mandated Community Specification;
- proposal for new work-items in the EUROCAE working programme to fill identified gaps.

6.1.4 General methodology

This methodology is based on the evaluation of applicable documentation for systems, constituents and procedures, which is supposed to contain compliance to the ER or parts thereof, against the essential requirements.

The evaluation takes place at two levels:

1) A detailed evaluation conducted by the CS drafting group results in a checklist, providing comprehensive traceability of evidence against sub-clauses of the ER/IR.
   This evidence is derived from analysing key words of the essential requirements and relevant IRs, as explained in clause 7. Those keywords mainly address the phases of design, build, operation and maintenance of systems and constituents as well as specifically required qualities or attributes.
   The analysis provides the WHAT is required from the CS. If the existing document that is evaluated provides the corresponding HOW then the relevant reference shall be captured as evidence in the traceability table.

NOTE 1: The application of this generic guidance has to be dependent upon the subject matter/nature of the CS and upon the existence of any applicable IRs. However, it is important that the drafting group provides the TB with sufficient detail to justify the claim that the CS has satisfied all the applicable ERs/IRs, the mandate under which the CS is produced and to support the legal presumption of conformity claim for the CS (see 2 below).

2) An aggregated statement in the compulsory attachment "Standards Annex(es)" to the CS. Each Standards Annex SA, SB, etc. in this attachment contains the compliance table at ER/IR level with a brief commentary. Each annex shall indicate to which regulation (SES Interoperability Regulation, Regulation laying down requirements on air-ground voice channel spacing, etc.) it applies and map the requirements (ER/IR) to Clause(s)/sub/clause(s)of the CS. If the CS covers more than one Regulation/Implementing Rule then separate annexes SA, SB, etc. shall be used; separate annexes for "system", "constituents" and "procedure"-level shall be used; if more than one "constituent" has been identified separate annexes SA, SB, etc. could be used for each "constituent". All Standards Annexes contained in this compulsory attachment, together with the scope statement, confer legally the presumption of conformity.

NOTE 2: For identifying the applicable regulatory baseline see clause 6.2.2.

As a matter of principle, the decision of precisely how to demonstrate compliance with ERs and/or IRs should remain the duty of the applicable TB. However, it is important that a common set of principles be made available to guide the TB when making decisions on the content. The present document provides those principles. The ETSI Technical Officer attached to the TB should take an active role in advising the TB on this guidance.

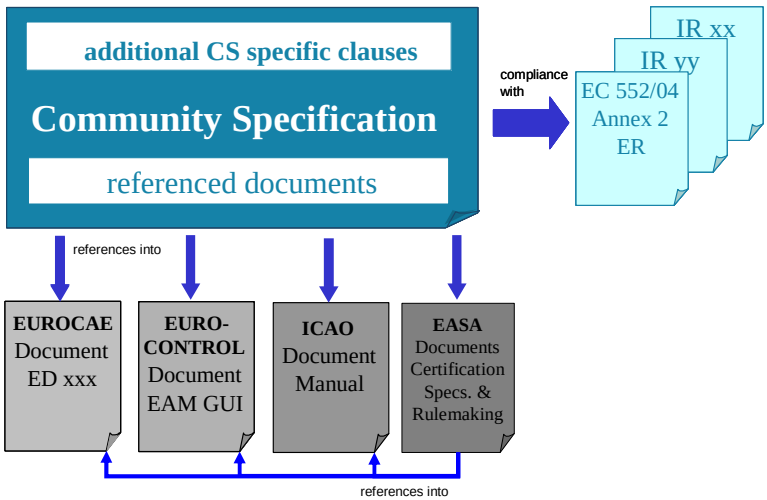
NOTE 3: In early phases of a CS development (e.g. work planning, segmentation planning, assessment of existing documentation) a compliance matrix as depicted in annex C may be a useful planning tool.

6.1.5 Evaluation principles

The documents that shall serve as providing the required evidence and therefore being a means of compliance to the essential requirements and relevant Implementing Rules, contain information that is expressed in terms of quantifiable technical values or qualitative statements, measurable against a given baseline.

As a common understanding for CSs, the information from existing documents should be re-used. Re-used information shall only be documented by reference into the relevant part of that document containing the information. It is the task of the standards drafting group as well as of the TB to evaluate existing material (such as EASA, EUROCAE, EUROCONTROL, ICAO documents) whether it provides information that serve to cover the evidence and therewith fulfil the applicable essential requirements.

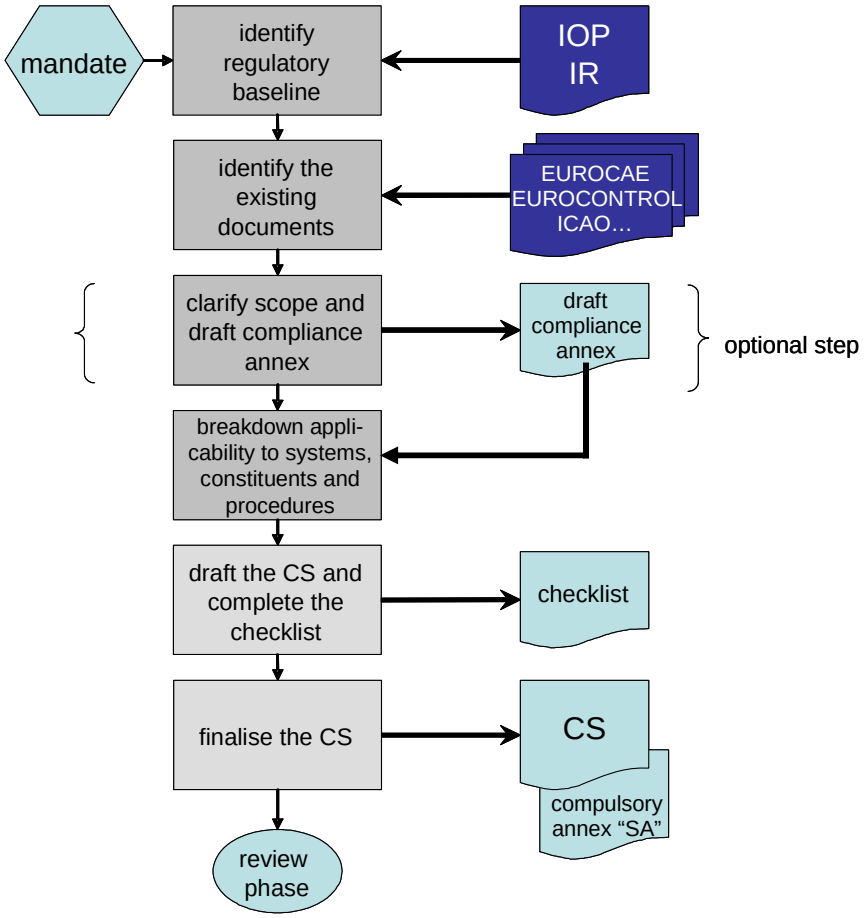
If the evaluation results in a lack of available material which satisfies the scope of the mandate, then the relevant technical or procedural information has to be drafted. This information then could either be directly inserted into the CS presented or be drafted in a new document which then will be referenced in the CS. It is recommended to work closely on this with the participation of aviation bodies.



6.2 Method for approaching the Community Specification

6.2.1 Overview

The following figure shows the workflow and recommended steps that should be followed and that are provided in the next clauses in order to create a CS.



When preparing a CS it is important to:

- understand the terms of the standardization mandate concerned;
- determine if a related implementing rule exists or is being prepared;
- understand the ERs of the IOP regulation [1] and the applicable requirements of the implementing rules to the IOP regulation;
- identify relevant existing documentation (especially from EASA, EUROCAE, EUROCONTROL and stakeholder) and the supportive material from the (other) ESOs (see clause 6.2.3); if documentation is not be publicly available, it shall not be referenced in a CS;
- identify relevant documentation under development (especially from EASA, EUROCAE, EUROCONTROL and stakeholder) and the supportive material from the (other) ESOs (see clause 6.2.3); documentation that will not be publicly available, shall not be referenced in a CS;
- identify the possible gaps and/or overlap with other standards or draft standards;
- assess the conformity of the CS in preparation with these requirements (by use of a draft compliance annex for comparison between the list of ERs/IRs and the list of existing documentation - see note in clause 6.1.4);
- determine whether the scope of the CS in preparation covers "systems" (as defined in [1] and [3]), "constituents" (as defined in [1] and [3]) and/or "procedures" (as defined in [1] and [3]) (see clause 6.2.5);

- understand the added value of the CS in preparation compared to the ERs and/or provisions of the implementing rules.

When producing a CS it is important to:

- draft additional CS-specific clauses or to propose appropriate new work items to be included in the EUROCAE work programme if necessary to fill identified gaps (see clause 6.2.6.1);
- complete clauses and references (see clause 6.2.6.1);
- assess the conformity of the CS in preparation with the applicable requirements (by use of the checklist for comparing the list of ERs/IRs and the list of technical answers proposed in the draft - see clauses 6.2.6.2 and 7) in parallel to the above activities;
- complete compulsory attachment "Standards Annex(es)" (from the draft compliance annex and the checklist, see clauses 6.1.4 and 6.2.7).

NOTE: The Standards Annex(es) SA, SB, etc. and the checklist need to be maintained during the whole document review phase(s).

6.2.2 Identify regulatory baseline

The Essential Requirements (ERs) of the IOP regulation [1] Annex II part A and part B as well as the appropriate Implementing Rules (IRs) relevant to the mandate and title of the CS are to be outlined. The scope of the part B ERs is only relevant to those system(s) addressed in the mandate. The published Implementing Rules will be found in the Official Journal of the EU, the subject of those under development are available from the ETSI secretariat (minutes of the ICB and ICB interop-subgroup meeting).

NOTE: Some mandates are not system-specific. In that case, the scope of systems has to be identified.

6.2.3 Identify the existing documents

The task of this step is to determine which existing documents provide information relevant to the topic of the CS.

It is important to understand that a CS is not limited to a technical part, but may address:

- technical aspects;
- operational aspects;
- procedures;
- certification and/or institutional considerations;
- system and/or constituent maintenance aspects;
- implementation guidance material;

and includes an attachment "Standards Annex(es)" (compulsory part of a CS).

NOTE: "compulsory part of a CS" means that each CS will have such an attachment. An EN or part of an EN not having such an attachment cannot be quoted in the OJEU as CS; only ENs or parts of ENs having such an attachment should be subtitled "Community Specification".

6.2.4 Optional: clarify scope and draft compliance annex

Reach a common understanding between the key stakeholders on the scope of the CS to be developed.

Assess the conformity of the CS in preparation with the identified regulatory baseline requirements by use of a draft compliance annex for comparison between the list of ERs/IRs and the list of existing documentation.

6.2.5 ER/IR breakdown across systems/constituents/procedures

The goal is to detect the key requirements and the corresponding evidence that relate to either the constituent, the system and/or the associated procedure or to several or all of them. The need to annotate the CS parts and annexes so that it is clear which requirements (and supporting evidence) are applicable to ground-based constituents, to ground-based systems, to aircraft constituents, to aircraft systems and to (airborne or ground) procedures should be considered and planned if it is appropriate.

6.2.6 Draft the body of the CS and complete the checklist

6.2.6.1 Draft the body of the CS

The body of a CS shall consist of headlines meaningful to the subject of the CS. These headlines shall be supported by specific references to the external document(s).

The references of the external document(s) shall contain version number, date of issue and the relevant pages or clause where the specific information can be found. In case of a new version of the referenced document, it is the task of the TB to verify that it still meets the essential requirements and/or the relevant Implementing Rules and then to trigger an update process for the CS according to clause 5.

Where a lack of available material which satisfies the scope of the mandate was identified, the relevant technical or procedural information has to be drafted. This information then could either be directly inserted into the CS presented or be drafted in a new document which then will be referenced in the CS.

6.2.6.2 Complete the checklist

Technical bodies drafting CS in support of the IOP Regulation [1] should consider using a checklist, documenting the relationship between the ERs/IRs and the clauses of the referenced documentation.

This checklist enables the drafting technical body to have a clear view of the appropriate coverage of the relevant ERs/IRs, by listing the relevant ERs/IRs and the solution(s) offered in the referenced documentation.

In parallel to the completion of the ER/IR compliance checklist it is necessary to determine whether the sub-clause of the requirement is relevant to the constituents and to be regarded by manufacturers and/or to the system and to be regarded by the air navigation service providers.

This checklist can be useful for evaluation of the draft during enquiry and should be kept by the ETSI Secretariat and the national members, for answering information requests as well as the maintenance process.

Details of the ER compliance checklist are given in clause 7.

The checklist shall not be confused with the compulsory Standards Annex.

6.2.7 Finalize the CS

6.2.7.1 The foreword clause

The foreword clause of all standards that will be sent by ETSI to the EC for citation in the Official Journal of the European Communities under the IOP Regulation [1] shall include the following sentences:

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

For relationship with Single European Sky Interoperability Regulation and the implementing rules based on it, see compulsory attachment "Standards Annex(es)" contained in archive en_3xxxxxvyyyyyyp0.zip which accompanies the present document".

6.2.7.2 The scope clause

The scope clause shall define without ambiguity the subject of the CS and the aspect(s) covered, thereby indicating the limits of applicability. It shall not contain requirements.

The "Scope" shall be succinct so that it can be used as a summary for bibliographic purposes.

This element shall be worded as a series of statements of fact. Forms of expression such as the following shall be used:

"The present document

(the functional requirements for…"

- *specifies* *(a method of…"*

  (the characteristics of…"

- *establishes* *(a system for…"*

  (general principles for …"

- *gives guidelines for…"*
- *gives terms and definitions…"*

Statements of applicability of the ETSI deliverable shall be introduced by the following wording:

"The present document is applicable to …"

6.2.7.3 The Standards Annex(es) SA, SB, etc.

The existing documentation is matched against the ER/IR and the result provided in the compulsory attachment "Standards Annex", i.e. the applicability of the whole or parts of the documents to the whole, single or parts of the ER/IR will be identified and checkmarked there.

Four results for compliance are possible:

1) "applicable";
2) "applicable with constraints";
3) "not applicable";
4) "not covered by this CS".

All Standard Annexes SA, SB, etc. of a Community Specification are grouped into one compulsory attachment "Standard Annex(es)" and form an integral part of the Community Specification.

The format of the Standards Annex is given in annex A to the present document.

An example and extract of such a Standards Annex is shown below:

EC 552/04 Annex 2 Part A	Requirement text	Clauses of the present document	Rationale
ER 1 Seamless operation	Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN.	None	Not covered by this CS.
ER 2 Support for new concepts of operation	The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation.	None	Not covered by this CS.
ER 3 Safety	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment.	None	Not covered by this CS.
ER 4 Civil-military coordination	The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace. To achieve these objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties. Account should be taken of national security requirements.	None	Not covered by this CS.
ER 5 environmental constraints	Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation.	None	Not covered by this CS.

EC 552/04 Annex 2 Part A	Requirement text	Clauses of the present document	Rationale
ER 6 Principles governing the logical architecture of systems	Systems shall be designed and progressively integrated with the objective of achieving a coherent and increasingly harmonized, evolutionary and validated logical architecture within the EATMN.	None	Not covered by this CS.
ER 7 Principles governing the construction of systems	Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents.	x.yyy.zz n.mn a.b d	applicable with constraints ; presumption of conformity limited to: - availability; - fault; - tolerance.

7 Analysis of the requirements (ER and IR)

7.1 Principle of the analysis

The rules for establishing the checklist are:

1) evidence should not by its nature provoke questions of intellectual property rights in any form;

2) evidence describes what is required by the system/constituent/procedure with respect to a key word or phrase of the essential requirement of the IOP-Regulation or relevant IRs.

Subject to the above constraints, the objective is to establish evidence which collectively covers all essential requirements and relevant IRs or parts thereof to systems/constituents/procedures falling under the IOP Regulation.

A system/constituent/procedure can have more than one item of evidence corresponding to an essential requirement.

Changes to a published CS will have to follow the change process according to the ETSI directives. In practice that could mean that TG25 will issue a new work item.

NOTE: The requirement that a CS has to be developed in cooperation with EUROCAE should be considered for revisions of CS as well. This may also apply for coordination with other parties identified in the standardization mandate.

Each ER is given in plain text together with its origin, i.e. the IOP Regulation [1] Annex II part A or part B or an Implementing Rule.

The key words are drawn from the text and the corresponding required evidences listed, separated with regard to constituent, system and procedure relevance.

The enumeration of the tables is consistent with the numeration of the IOP regulation. Where sub-clauses are identified, because of the breakdown of a requirement into keywords, the next layer of enumeration is used. Therefore not all enumeration starts by "1" but by the number and level given in the regulation or IR.

All information for one ER is collected in a table such that definite allocation of evidences to this essential requirement or parts thereof as well as differentiation of constituent, system or procedure relevance is provided.

7.2 Example of the checklist

The layout of the table is as follows. For the purpose of a better readability the checklist tables as laid down in annex B are in landscape format.

5	**ER 5 Environmental constraints**			
	Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
5.1	minimize environmental impact	n/a	Identify how environmental impact has been minimized at system level	Identify how environmental impact has been minimized at procedure level
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

Annex A:
Standards Annex

The relationship between this European Standard and the Essential Requirements of the Single European Sky Interoperability Regulation and the requirements given in the following implementing rules for interoperability based on the Single European Interoperability Regulation.

NOTE 1: The previous sentence has to be adapted for each CS, see clause 6.1.4 (2) for guidance.

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

Table SA: Correspondence between this European Standard and [the Single European Sky Interoperability Regulation/[in implementing rules for interoperability based on the Single European Interoperability Regulation] for [system…]/[constituent…]/[procedure]

SA.1: Traceability from [legal base] to clauses of the present document.

(Essential) Requirements (ERs) of …	Clause(s) of the present document	Qualifying remarks/Notes

SA.2: Traceability from clauses of the present document to [legal base].

Clause(s) of the present document	(Essential) Requirements (ERs) of …	Qualifying remarks/Notes

NOTE 2: All Standards Annexes SA, SB etc. of a Community Specification are grouped into one compulsory attachment and form an integral part of the Community Specification.

NOTE 3: Other requirements and other EU Regulations and/or Directives may be applicable to the product(s) falling within the scope of the present document.

Annex B: Checklist

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

1	**ER 1 seamless operation**		
	Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.1	designed	Identify the design documents/clauses which address seamless operation for constituents (e.g. interface design documents).	Identify the design documents/clauses which address seamless operation for systems (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.2	built	Identify the build documents/clauses which address seamless operation for constituents (e.g. baselined configuration documents).	Identify the build documents/clauses which address seamless operation for systems (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.3	maintained	n/a	n/a
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.4	operated	n/a	Identify those procedures and their validation that address seamless operation for all phases of flight (e.g. operations manuals, simulation reports).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.5	information sharing	Identify the design documents/clauses which address information sharing for constituents (e.g. interface control documents).	Identify the design documents/clauses which address information sharing for systems (e.g. interface control documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

2	**ER 2 Support for new concepts of operation**		
	The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
2.1	Validated concepts of operation - safety	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in safety terms (e.g. requirements/design specifications).	Identify the documents/clauses which demonstrate that the system is contributing to a valid concept of operation in safety terms (e.g. requirements/design specifications).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
2.2	Validated concepts of operation - capacity	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in capacity terms (e.g. requirements/design specifications).	Identify the documents/clauses which demonstrate that the constituent is contributing to a valid concept of operation in capacity terms (e.g. requirements/design specifications).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

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

	Keywords	Evidence on constituent level	Evidence on system level	Evidence at procedure level
3.3	Maintenance	n/a	Identify the documents/clauses which demonstrate that the system maintenance requirements ensure that that the system continues to meets safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	n/a
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.4	Operation	n/a	Identify the documents/clauses which demonstrate that the operation of the system meets safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).	Identify the documents/clauses which demonstrate that the procedures meet safety requirements for normal and degraded modes of operation (e.g. safety case and supporting documentation).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.5	Human capabilities	n/a	Identify the documents/clauses which demonstrate that human capabilities have been addressed at system level (e.g. human factors reports, HMI requirements, simulation reports, safety case).	Identify the documents/clauses which demonstrate that human capabilities have been addressed at procedure level (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.6	Harmful interference	n/a	Identify the documents/clauses which demonstrate that the system does not create harmful interference (e.g. RTTE certification).	n/a
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

4	**ER 4 Civil-military coordination**		
	The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace. To achieve these objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties. Account should be taken of national security requirements.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.1	Flexible use of airspace	Identify how Regulation 2150/2005 is fulfilled.	Identify how Regulation 2150/2005 is fulfilled.
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.2	Timely sharing	Identify how constituents support the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the system supports the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.3	National security requirements	n/a	Identify how national security requirements are addressed.
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

5	**ER 5 Environmental constraints**			
	Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
5.1	Minimize environmental impact - ATS	n/a	Identify how environmental impact has been minimized at system level (e.g. environmental impact analysis/studies).	Identify how environmental impact has been minimized at procedure level (e.g. environmental impact analysis/studies).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
5.2	Minimize environmental impact - materials	Identify how environmental impact has been minimized at constituent level (e.g. compliance with the Waste Electrical and Electronic Equipment Directive 2002/96/EC).	Identify how environmental impact has been minimized at system level (e.g. compliance with the Waste Electrical and Electronic Equipment Directive 2002/96/EC).	n/a
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

6	**ER 6 Principles governing the logical architecture of systems**		
	Systems shall be designed and progressively integrated with the objective of achieving a coherent and increasingly harmonized, evolutionary and validated logical architecture within the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1	Designed and progressively integrated	n/a	Identify system level requirements which demonstrate alignment to a coherent and increasingly harmonized, evolutionary and validated logical architecture (e.g. SESAR deliverables).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

7	**ER 7 Principles governing the construction of systems**		
	Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1	Modularity, interchangeability	n/a	Identify how the system design ensures modularity and interchangeability of constituents (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
7.2	High availability	n/a	Identify how the system is designed, built and maintained such that they provide the appropriate level of availability (e.g. design specifications, test and performance data).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
7.3	Redundancy and fault tolerance	n/a	Identify how the system design ensures appropriate levels of redundancy and fault tolerance (e.g. design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

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

B.2.1 Systems and procedures for airspace management

1.1	**ER 1.1 Seamless operation**		
	Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.1.1	Modularity, interchangeability	n/a	Identify how the system design ensures modularity and interchangeability of constituents (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.1.2	High availability	n/a	Identify how the system is designed, built and maintained such that they provide the appropriate level of availability (e.g. design specifications, configuration records, test data, performance data).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
1.1.3	Redundancy and fault tolerance	n/a	Identify how the system design ensures appropriate levels of redundancy and fault tolerance (e.g. design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.2 Systems and procedures for air traffic flow management

2.1	**ER 2.1 Seamless operation**			
	Systems and procedures for air traffic flow management shall support the sharing of correct, coherent and relevant strategic, pre-tactical and tactical, as applicable, flight information covering all phases of flight and offer dialogue capabilities with a view to achieving optimized use of airspace.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
2.1.1	Strategic	n/a	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
2.1.2	Pre-tactical	n/a	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
2.1.3	Tactical	n/a	Identify how the ATFM system supports the sharing of flight information (e.g. requirements/design specifications, test and performance data, safety case).	Identify how the ATFM procedures support the sharing of flight information (e.g. operational manuals, letters of agreement).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.3 Systems and procedures for air traffic services

B.2.3.1 Flight data processing systems

3.1.1	**ER 3.1.1 Seamless operation**		
	Flight data processing systems shall be interoperable in terms of the timely sharing of correct and consistent information, and a common operational understanding of that information, in order to ensure a coherent and consistent planning process and resource-efficient tactical coordination throughout the EATMN during all phases of flight. In order to ensure safe, smooth and expeditious processing throughout the EATMN, flight data processing performances shall be equivalent and appropriate for a given environment (surface, terminal manoeuvring area (TMA), en-route), with known traffic characteristics and exploited under an agreed and validated operational concept, in particular in terms of accuracy and error tolerance of processing results.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.1.1.1	Timely sharing	n/a	Identify how the system supports the timely sharing of correct and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.1.2	Performance appropriate for environment	n/a	Identify how the system performance is appropriate for the environment (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.1.3	Accuracy and error tolerance	n/a	Identify how the system accuracy and error tolerance is ensured (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

3.1.2	**ER 3.1.2. Support for new concepts of operation**		
	Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight. The characteristics of automation-intensive tools must be such as to enable coherent and efficient pre-tactical and tactical processing of flight information in parts of the EATMN. Airborne and ground systems and their constituents supporting new, agreed and validated concepts of operation shall be designed, built, maintained and operated, using appropriate and validated procedures, in such a way as to be interoperable in terms of timely sharing of correct and consistent information and a common understanding of the current and predicted operational situation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.1.2.1	Airborne systems - design	Identify the documents/clauses which demonstrate that the constituent is designed to be interoperable (e.g. interface control documents).	Identify the documents/clauses which demonstrate that the system is designed to be interoperable (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.2	Airborne systems - built	Identify the documents/clauses which demonstrate that the constituent is built to be interoperable (e.g. baselined configuration documents).	Identify the documents/clauses which demonstrate that the system is built to be interoperable (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.3	Airborne systems - maintained	Identify the documents/clauses which demonstrate that the constituent is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).	Identify the documents/clauses which demonstrate that the system is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.4	Airborne systems - operated	Identify the documents/clauses which demonstrate that the constituent is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).	Identify the documents/clauses which demonstrate that the system is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.5	Ground systems - design	Identify the documents/clauses which demonstrate that the constituent is designed to be interoperable (e.g. interface control documents).	Identify the documents/clauses which demonstrate that the system is designed to be interoperable (e.g. interface design documents to the constituents as well as the external interfaces to other systems).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.6	Ground systems - built	Identify the documents/clauses which demonstrate that the constituent is built to be interoperable (e.g. baselined configuration documents).	Identify the documents/clauses which demonstrate that the system is built to be interoperable (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.7	Ground systems - maintained	Identify the documents/clauses which demonstrate that the constituent is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).	Identify the documents/clauses which demonstrate that the system is maintained to be interoperable (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.1.2.8	Ground systems - operated	Identify the documents/clauses which demonstrate that the constituent is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).	Identify the documents/clauses which demonstrate that the system is operated in order to be interoperable (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.3.2 Surveillance data processing systems

3.2.1	**ER 3.2.1 Seamless operation**		
	Surveillance data processing systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to provide the required performance and quality of service within a given environment (surface, TMA, en-route) with known traffic characteristics, in particular in terms of accuracy and reliability of computed results, correctness, integrity, availability, continuity and timeliness of information at the control position. Surveillance data processing systems shall accommodate the timely sharing of relevant, accurate, consistent and coherent information between them to ensure optimized operations through different parts of the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.1.1	Designed	n/a	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.2.1.2	Built	n/a	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.2.1.3	Maintained	n/a	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.2.1.4	Operated	n/a	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

3.2.2	**ER 3.2.2. Support for new concepts of operation**		
	Surveillance data processing systems shall accommodate the progressive availability of new sources of surveillance information in such a way as to improve the overall quality of service.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.2.1	Availability of new sources	n/a	Identify how the system is able to accommodate new sources of surveillance information (e.g. requirements/design specifications).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.3.3 Human-machine interface systems

3.3.1	**ER 3.3.1 Seamless operation**		
	Human-machine interfaces of ground air traffic management systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to offer to all control staff a progressively harmonized working environment, including functions and ergonomics, meeting the required performance for a given environment (surface, TMA, en-route), with known traffic characteristics.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.3.1.1	Designed	n/a	Identify the documents/clauses which demonstrate that the system design has addressed human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.3.1.2	Built	n/a	Identify the documents/clauses which demonstrate that the system is built to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.3.1.3	Maintained	n/a	Identify the documents/clauses which demonstrate that the system is maintained to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
3.3.1.4	Operated	n/a	Identify the documents/clauses which demonstrate that the system is operated to address human-machine interfaces with the attributes identified above (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

3.3.2	**ER 3.3.2. Support for new concepts of operation**		
	Human-machine interface systems shall accommodate the progressive introduction of new, agreed and validated concepts of operation and increased automation, in such a way as to ensure that the tasks assigned to the control staff remain compatible with human capabilities, in both the normal and degraded modes of operation.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.3.2.1	Human capabilities	n/a	Identify the documents/clauses which demonstrate that human capabilities have been addressed at system level for both normal and degraded modes of operation (e.g. human factors reports, HMI requirements, simulation reports, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

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

4.1	**ER 4.1 Seamless operation**		
	Communication systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to achieve the required performances within a given volume of airspace or for a specific application, in particular in terms of communication processing time, integrity, availability and continuity of function. The communications network within the EATMN shall be such as to meet the requirements of quality of service, coverage and redundancy.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.1.1	Designed	n/a	Identify how the system design meets the attributes of processing time, integrity, availability and continuity of function (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.1.2	Built	n/a	Identify the documents/clauses which demonstrate that the system is built to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.1.3	Maintained	n/a	Identify how the system is maintained to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.1.4	Operated	n/a	Identify how the system is operated to satisfy the attributes of processing time, integrity, availability and continuity of function (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
4.1.5	Quality of service, coverage, redundancy	n/a	identify how the quality of service, coverage and redundancy requirements are met by the system (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

4.2	**ER 4.2 Support for new concepts of operation**		
	Communication systems shall support the implementation of advanced, agreed and validated concepts of operation for all phases of flight		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.2.1	Support the implementation	n/a	Identify how the system satisfies the implementation of advanced, agreed and validated concepts of operation for all phases of flight (e.g. requirements/design specifications, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.5 Navigation systems and procedures

5.1	**ER 5.1 Seamless operation**		
	Navigation systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to achieve the required horizontal and vertical navigation performance, in particular in terms of accuracy and functional capability, for a given environment (surface, TMA, en-route), with known traffic characteristics and exploited under an agreed and validated operational concept.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
5.1.1	Designed	n/a	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
5.1.2	Built	n/a	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
5.1.3	Maintained	n/a	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
5.1.4	Operated	n/a	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.6 Surveillance systems and procedures

6.1	**ER 6.1 Seamless operation**		
	Surveillance systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to provide the required performance applicable in a given environment (surface, TMA, en-route) with known traffic characteristics and exploited under an agreed and validated operational concept, in particular in terms of accuracy, coverage, range and quality of service. The surveillance network within the EATMN shall be such as to meet the requirements of accuracy, timeliness, coverage and redundancy. The surveillance network shall enable surveillance data to be shared in order to enhance operations throughout the EATMN.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1.1	Designed	n/a	Identify how the system design satisfies the seamless operation attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
6.1.2	Built	n/a	Identify how the system is built to satisfy the seamless operation attributes identified above (e.g. baselined configuration documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
6.1.3	Maintained	n/a	Identify how the system is maintained to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, maintenance schedules, spares lists).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
6.1.4	Operated	n/a	Identify how the system is operated to satisfy the seamless operation attributes identified above (e.g. safety case and supporting documentation, user manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

B.2.7 Systems and procedures for aeronautical information services

7.1	**ER 7.1 Seamless operation**		
	Accurate, timely and consistent aeronautical information shall be provided progressively in an electronic form, based on a commonly agreed and standardized data set. Accurate and consistent aeronautical information, in particular concerning airborne and ground-based constituents or systems, shall be made available in a timely manner.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1.1	Accurate, timely and consistent	n/a	Identify how the system design satisfies the seamless operation attributes for accurate, timely and consistent information (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers
7.1.2	Standardized data set	n/a	Identify how the system design satisfies the seamless operation attributes for utilization of a commonly agreed and standardized data set (e.g. requirements/design specifications, standards documents).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

7.2	**ER 7.2 Support for new concepts of operation**		
	Increasingly accurate, complete and up-to-date aeronautical information shall be made available and used in a timely manner in order to support continuous improvement of the efficiency of airspace and airport use.		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.2.1	Increasingly accurate, complete and up-to-date	n/a	Identify how the system design supports the continuous improvement of the efficiency of airspace and airport use (e.g. requirements/design specifications, test and performance data, safety case).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

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

8.1	**ER 8.1 Seamless operation**			
	Systems and procedures for the use of meteorological information shall improve the consistency and timeliness of its provision and the quality of its presentation, using an agreed data set.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
8.1.1	Consistency and timeliness	n/a	Identify how the system design supports the improvement in the quality of presentation of meteorological information and uses an agreed data set (e.g. requirements/design specifications, test and performance data, safety case).	Identify how procedures for the use of meteorological information are designed to support the seamless operation attributes above (e.g. operation manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

8.2	**ER 8.2 Support for new concepts of operation**			
	Systems and procedures for the use of meteorological information shall improve the promptness of its availability and the speed with which it may be used, in order to support continuous improvement of the efficiency of airspace and airport use.			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
8.2.1	Promptness, speed	n/a	Identify how the system design supports the improvement attributes identified above (e.g. requirements/design specifications, test and performance data, safety case).	Identify how procedures for the use of meteorological information are designed to support the seamless operation attributes above (e.g. operation manuals).
		rationale field to be filled in by CS writers	rationale field to be filled in by CS writers	rationale field to be filled in by CS writers

Annex C:
Compliance annex for planning purposes

EC 552/04 Annex 2 Part A	requirement text	compliant?	Rationale
ER 1 Seamless operation	Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN.	not applicable	
ER 2 Support for new concepts of operation	The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation.	not applicable	
ER 3 Safety	Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment	not applicable	
ER 4 Civil-military coordination	The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace. To achieve these objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties. Account should be taken of national security requirements.	not applicable	

EC 552/04 Annex 2 Part A	requirement text	compliant?	Rationale
ER 5 Environmental constraints	Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation.	not applicable	
ER 6 Principles governing the logical architecture of systems	Systems shall be designed and progressively integrated with the objective of achieving a coherent and increasingly harmonized, evolutionary and validated logical architecture within the EATMN.	Not applicable	
ER 7 Principles governing the construction of systems	Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents.	applicable with constraints	only for - availability - fault tolerance
	To be continued with Specific Essential Requirements from Annex II, part B [1] and/or Requirements of Implementing Rules if appropriate		

History

Document history		
V1.1.1	August 2007	Publication