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Airport Collaborative Decision Making (A-CDM); Community Specification for application under the Single European Sky Interoperability Regulation EC 552/2004

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Aeronautics (AERO), and is now submitted for the Vote phase of the ETSI standards Two-step Approval Procedure.

The present document has been produced by ETSI in response to European Commission mandate M/390 for the Interoperability of the European Air Traffic Management Network.

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

The presumption of conformity which is linked to the full application of the present document can only be claimed after the present document has been listed in the Official Journal of the European Union as Community Specification.

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

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

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	18 months after doa

Introduction

The European Union launched the Legislation "Single European Sky" (SES) in 2002 which was adopted in 2004 and amended by Regulation (EC) No 1070/2009 [i.1].

The SES legislation is based on a framework of 4 regulations, which includes the Interoperability Regulation [i.1]. The objective of the Interoperability Regulation is to ensure interoperability of the European Air Traffic Management Network (EATMN) consistent with air navigation services. Under this regulation, the use of a European Standard referenced in the Official Journal of the European Union as Community Specification (CS) is a means of compliance to the essential requirements of the Regulation and/or the relevant implementing rules for interoperability.

The present document takes into account the Council Decision 2009/320/EC [i.4] endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project [i.4].

Figure 1 shows the high level relationship between the Eurocontrol and Eurocae which were developed in parallel.

EUROCONTROL Documents	EUROCAE Documents
Concept of Operations	System Requirements Document (ED-141)
Functional Requirements Document	Interface Definition Document (ED-145)
Implementation Manual	Test and Validation Document (ED-146)
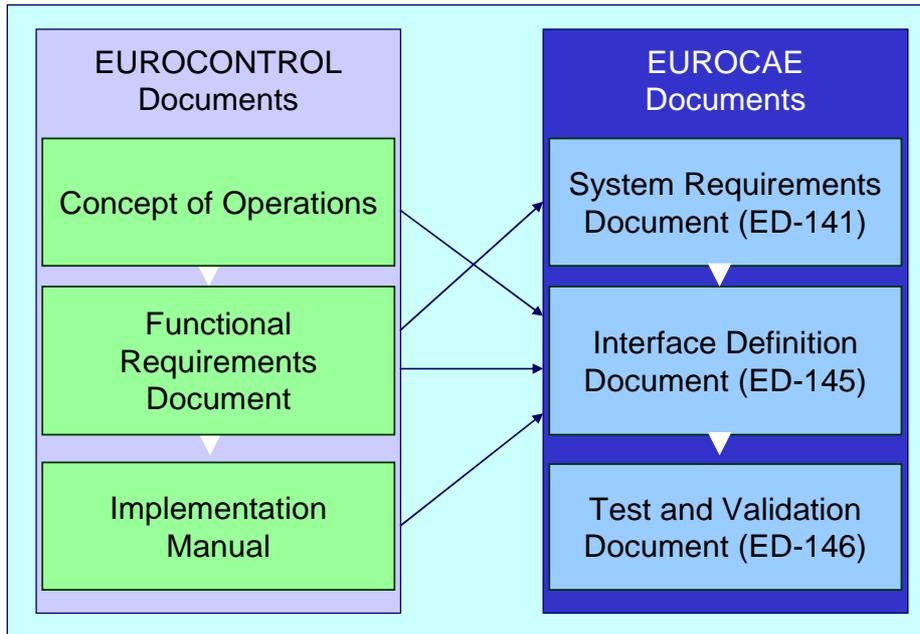
Figure 1: Eurocontrol and Eurocae Document Relationship

1 Scope

The present document is applicable to Air Traffic Management Airport Collaborative Decision Making (A-CDM).

The present document addresses the specific roles, responsibilities, procedures, systems and interfaces needed to fulfil the Airport CDM (A-CDM) Operating Concept as requested by Mandate M/390 of the European Commission. It references existing documentation where necessary to clarify the more detailed aspects of a procedure or system implementation requirement to avoid unnecessary repetition.

Airport Collaborative Decision making (A-CDM) is about improving the way operational partners at airports and European ATFCM (Air Traffic Flow and Capacity Management, Air Traffic Control, Airlines, Ground Handling Agents/Units and Airports) work together at an operational level.

A-CDM allows an Airport CDM partner to make the right decisions for a flight during the whole Airport CDM process in collaboration with other Airport CDM partners, knowing their preferences and constraints and the actual and predicted situation. The decision making by the Airport CDM partners is dependent upon the sharing of accurate and timely information and upon adapted Airport CDM procedures, mechanisms and tools.

Any software elements related to the software assurance level of an A-CDM System are outside of the scope of the present document. As such the essential requirements of the Interoperability Regulation are not considered for software elements within the present document.

The present document does not give a presumption of conformity related to maintenance requirements, safety, civil/military coordination or environmental constraints.

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

Requirements in the present document which refer to "should" statements or recommendations in the normatively referenced material (clause 2.1) are to be interpreted as fully normative ("shall") for the purpose of compliance with the present document.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:

  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;

  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

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

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] Eurocontrol: "Airport CDM Operational Concept Document" (Version 3.0, Sept 2006).

NOTE: See figure 1.

[2]   Eurocontrol: "Airport CDM Functional Requirements Document" (Version 4.0 May 2009).

NOTE: See figure 1.

[3]   Eurocontrol: "CFMU DPI Implementation Guide" (Version 1.3).

NOTE: See figure 1.

[4]   Eurocontrol: "CFMU Flight Progress Messages" (Version 1.6).

NOTE: See figure 1.

[5]   Eurocae: "Minimum Technical Specification for the Airport Collaborative Decision Making (Airport-CDM)" - ED141 - (Version 1, October 2008).

NOTE: See figure 1.

[6]   Eurocae: "Airport-CDM Interface Specification" - ED145 - (Version 1, October 2008).

NOTE: See figure 1.

2.2   Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area. For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1]   Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European Air Traffic Management network (the Interoperability Regulation), OJ L 96, 31.03.2004 p.26 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009 p.34.

[i.2]   Eurocontrol: "Airport CDM Implementation Manual" (Version 3).

NOTE: See figure 1.

[i.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 p.1 as amended by Regulation (EC) No 1070/2009, OJ L 300, 14.11.2009 p.34.

[i.4]   Council Decision 2009/320/EC endorsing the European Air Traffic Management Master Plan of the Single European Sky ATM Research (SESAR) project, 30.03.2009 published in OJ L95, p.41, 9.4.2009.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in the Framework Regulation [i.3], Interoperability Regulation [i.1], in the Functional Requirements Document [2] and the following apply:

ground handling: covers a complex series of processes that are required to separate an aircraft from its load (passengers, baggage, cargo and mail) on arrival and combine it with its load prior to departure

NOTE: Source: www.iata.org.

3.2   Abbreviations

For the purposes of the present document, the abbreviations given in Functional Requirements Document [2] and the following apply:

A-CDM	Airport CDM
ACIS	Airport CDM Information Sharing
ACISP	Airport CDM Information Sharing Platform
ATC	Air Traffic Control
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
CDAC	CDM in Adverse Conditions
CDM	Collaborative Decision Making
CEN	Comité Européen de Normalization
CFMU	Central Flow Management Unit
COFU	COllaborative management of Flight Updates
CPDS	Collaborative Pre-Departure Sequence
CS	Community Specifications
CTOT	Calculated Take Off Time (CFMU)
CTRP	CDM Turn-Round Process
DPI	Departure Planning Information message
EATMN	European Air Traffic Management Network
EC	European Community
EDDM	Munich International Airport
EEC	EUROCONTROL Experimental Centre
EEZT	Estimated End of De-icing Time
ER	Essential Requirement
ERZT	Estimated Ready for De-icing Time
ETSI	European Telecommunications Standards Institute
EU	European Union
EUROCAE	EURopean Organization for Civil Aviation Equipment
EUROCONTROL	European Organization for the Safety of Air Navigation
FUM	Flight Update Message
HMI	Human-Machine Interface
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IPR	Intellectual Property Rights
MST	Milestone
SES	Single European Sky
TMA	Terminal Manoeuvring Area
TOBT	Target Off-Block Time
TSAT	Target Start-Up Approval Time
TTOT	Target Take Off Time
VTTC	Variable Taxi Time Calculation

4 Role, Responsibility and Interrelation requirements

All parties listed in the following table **shall** comply with the requirements of the present document related to their specific role within the Airport CDM process. Collectively, the parties below are referred to within the present document as the Airport CDM Partners. The column "interrelation with respect to the present document" of the following table has to be considered as the minimum requirements. Further relations may differ and depend on local Airport CDM Partners responsibilities.

Ref	Role	Responsibility	Interrelation with respect to the present document
4.1	Air Traffic Control (ATC)	A civil or military unit responsible for providing Air Traffic Control services. In case of Airport CDM it is mainly the Air Traffic Control Tower at the CDM Airport.	ATC needs: 1. Updated CDM situational information such as planned, TOBT, Gate/stand number. ATC provides: 2. Updated planned, estimated and actual landing, in-blocks, TSAT and TTOT.
4.2	Airport Operations	Airport Operations is an organization providing Airport Management, Airport Traffic Operations Centre, and Stand & Gate Management.	Airport Operations needs: 3. Updated CDM situational information such as planned, estimated and actual landing, in-blocks, TOBT, TSAT and TTOT. Airport Operations provide: 4. Airport Schedule information, Airport resources allocation.
4.3	Ground handling agents	Ground Handling can provide a subset of the data normally delivered by the Aircraft Operator, depending on the agreement between the particular Aircraft Operator and Ground Handling Agents as mentioned above.	Ground Handling needs: 5. Updated CDM situational information such as planned, estimated and actual landing, in-blocks, TSAT and TTOT. Ground Handling can provide: 6. Flight Plan and other data related to the flight, planned, estimated and actual times related to progress of turn-around such as TOBT.
4.4	Aircraft Operator	A person, organization or enterprise engaged in, or offering to engage in, an aircraft operation. This includes the flight operator or a nominated representative.	Aircraft Operations need: 7. Updated CDM situational information such as planned, estimated and actual landing, in-blocks, TSAT and TTOT. Aircraft Operations provide: 8. Flight Plan and other data related to the flight, planned, estimated and actual times related to progress of turn-around such as TOBT.
4.5	Eurocontrol Central Flow Management Unit (CFMU)	CFMU provides flight plan data and ATFCM data. Depending on local/national implementation, information to and from the CFMU may pass through the ATC system.	ATFCM needs: 9. Departure Planning Information (DPIs). ATFCM provides: 10. Flight Plan Data, Calculated Take-off Times (Departure slots), Flight Update Messages (FUM).
4.6	De Icing Operations	A person or organization which provides all services related to the de icing of an aircraft.	De-icing Operations needs: 11. Updated information about aircraft requesting de-icing and the ERZT and TSAT. De-icing Operations can provide: 12. Status of De-icing for the particular aircraft. 13. Prediction of EEZT (Estimated End of De-icing Time).

5   Functional, Technical, Interface and Validation Requirements

5.1   Introduction

This clause describes the essential functional, technical and interface requirements associated with implementing an A-CDM. Each A-CDM concept element is formed of at least one functional requirement. All requirements have an associated test and validation requirement which describes the method of demonstrating compliance to the present document.

5.1.1   Test and validation methods

The methods of Inspection, Demonstration and Analysis are chosen as suitable for showing compliance to each specific functional, technical and interface requirement. The following table provides guidance for each method:

- Inspection:

    - Does the system under test embody the expected characteristics as described within the requirement?

- Demonstration:

    - Does the system under test produce the output required?

- Analysis:

    - Does the system under test provide calculated results or operate in accordance to performance values as required?

5.2   Airport CDM Elements

The required Airport CDM capabilities have been grouped into key elements and shall be met as defined in Airport CDM Operational Concept Document [1], and Functional Requirements Document [2], with regard to:

- Airport CDM - Information Sharing - ACIS.

- Airport CDM - Collaborative Turn-Round Process - CTRP.

- Airport CDM - Variable Taxi Time Calculation - VTTC.

- Airport CDM - Collaborative Management of Flight Updates - COFU.

- Airport CDM - Collaborative Pre-Departure Sequence - CPDS.

- Airport CDM - CDM in Adverse Conditions - CDAC.

5.3   Airport CDM Information Sharing - ACIS

5.3.1   Background

The Airport CDM Information Sharing (ACIS) provides the overall environment through which Airport CDM Partners can interact with shared information securely, with the assurance that data is accurate, relevant, timely and authoritative. The ACIS is the foundation for implementing all remaining A-CDM Elements. There are two purposes of the ACIS; firstly it provides a consistent display and security approach for all of the A-CDM Elements, and secondly it creates the environment for the sharing of all relevant events. This clause details the functional, technical, interface and validation requirements associated with the ACIS Element.

5.3.2   ACIS Functional Requirements

5.3.2.1   ACIS Display of identical information

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Display of identical information at all working positions in accordance with Requirements 20 and 230 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.2   ACIS User access

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Positive identification, validation and authorization of users with regard to data entry and modification in accordance with Requirements 30, 40, 50 and 60 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.3   Alert messaging and handling

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Provision and handling of alert messages in accordance with Requirements 90, 100, 800, 810 and 820 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.4   ACIS Manual data entry

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Manual data entry and modification of system parameters in accordance with Requirements 110 and 120 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.5   ACIS Flight information sharing

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Collection, collation, correlation and distribution of relevant arriving and departing flight information to and from all A-CDM Partners in accordance with Requirements 210, 220, 230, 240, 250, 530, 540, 550, 570 and 780 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.3.2.6   ACIS Aeronautical and meteorological information sharing

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Access to aeronautical and meteorological information relevant to A-CDM Partners in accordance with Requirement 270 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.7   ACIS Archiving

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Archiving capability in accordance with Requirements 280, 290 and 310 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.3.2.8 ACIS Filtering of information

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Filtering of information for onward processing by originator and timeliness in accordance with Requirements 320, 330, 380, 390 and 730 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.3.3 ACIS Technical Requirements

5.3.3.1 ACIS Data validation

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Validation of data appropriate to the known phase of flight in accordance with Requirement ED141-0120 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration.

5.3.3.2 ACIS Data protection

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Ensuring that commercially sensitive information remains confidential and that information presented to users is relevant in accordance with Requirement ED141-0790 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration.

5.3.3.3 ACIS Parameter and performance supervision

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Capability for operational and technical supervisors to add, modify and monitor platform parameters and performance in accordance with Requirements ED141-0010, ED141-0020, ED141-0060, ED141-0061, ED141-0064, ED141-0065, ED141-0066 and ED141-0068 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration.

5.3.3.4 ACIS Input data prioritization

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Prioritization of data sources in accordance with Requirement 730 within the Functional Requirements Document [2] and ED141-0063 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration.

5.3.3.5 ACIS System time

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- System time reference and accuracy in accordance with Requirements ED141-0870 and ED141-0895 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration and analysis.

5.3.3.6 ACIS Data timeliness

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Timeliness of information flows between Partners in accordance with Requirement ED141-0900 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration and analysis.

5.3.3.7   ACIS System availability

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Local agreement of system availability targets with Partners in accordance with Requirement ED141-0930 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration.

5.3.3.8   ACIS System capacity

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- System capacity requirements to meet expected levels of messages, data storage needs and number of users in accordance with Requirements ED141-0940, ED141-0960, ED141-0970, ED141-0980, ED141-0990 and ED141-1000 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration and analysis.

5.3.4   ACIS Interface Requirements

5.3.4.1   ACIS Flight identification

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Unique identification of flight to which each message relates in accordance with Requirement ED145-08 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and analysis.

5.3.4.2   ACIS Message formatting

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Formatting of messages using ICAO and IATA data formats in accordance with Requirements ED145-09 and ED145-10 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration.

5.3.4.3   ACIS Data source identification

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identification of originators and modifiers of any data item transmitted to or from the A-CDM system in accordance with Requirement ED145-11 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and analysis.

5.3.4.4   ACIS Information exchange

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identifying and enabling information to be exchanged between partners in accordance with Requirements ED145-01, ED145-02, ED145-03, ED145-04, ED145-05, ED145-06 and ED145-07 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration.

5.3.4.5   ACIS Event identification

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identification of events and their associated times and dates, formatting and quality of service in accordance with Requirements ED145-12, ED145-13, ED145-14, ED145-16, ED145-17, ED145-18, ED145-20, ED145-21, ED145-22, ED145-23, ED145-24, ED145-25, ED145-26, ED145-27, ED145-28, ED145-29, ED145-30 and ED145-31 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration, inspection and analysis.

5.3.4.6   ACIS Duration parameters

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identification of estimated and minimum durations parameters with their associated times and formatting in accordance with Requirements ED145-32 and ED145-33 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and inspection.

5.3.4.7   ACIS Airport resources identification

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identification of airport resources in accordance with Requirements ED145-35, ED145-36, ED145-37, ED145-38, ED145-39, ED145-40, ED145-41 and ED145-42 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and inspection.

5.3.4.8   ACIS Alert identification

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Identification of A-CDM Alerts and quality of service in accordance with Requirements ED145-44, ED145-46, ED145-47, ED145-48 and ED145-49 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and inspection.

5.3.4.9   ACIS Key flight information

Where Airport CDM is implemented, the Airport CDM Information Sharing **shall** be implemented with regard to:

- Provision of relevant key flight data to:

    - assist in the positive identification and correlation of flights held in differing formats by partners;

    - enable COFU and CPDS processing;

    in accordance with Requirements ED145-50, ED145-51, ED145-52, ED145-53, ED145-54, ED145-55, ED145-56, ED145-57, ED145-58, ED145-59, ED145-60, ED145-61, ED145-62, ED145-63, ED145-64, ED145-65 and ED145-66 within the Airport CDM Interface Specification [6], and shall be tested and validated by demonstration and analysis.

5.4   Airport CDM Collaborative Turn-Round Process - CTRP

5.4.1   Background

CTRP is based on the realization that there are important events and associated activities in the progress of a flight which impact subsequent events and activities. By identifying such important events and defining them as milestones, it is possible to establish their effects on future events related to the flight.

A milestone is therefore an event of significant importance, which marks a point in time where the progress of a flight can be established by new data becoming available with sufficient accuracy to make reliable predictions of subsequent milestones. The milestones span the entire flight and include also milestones associated with the previous flight to be performed by the same aircraft or the same crew or with which the passengers on the first flight connect. The defined milestones therefore enable Airport CDM partners to assess the impact of events across several flights and hence make more efficient and timely decisions. This clause details the functional and validation requirements associated with the CTRP Element.

5.4.2   CTRP Functional Requirements

5.4.2.1   A-CDM CTRP Milestone approach

Where Airport CDM is implemented, the A-CDM Turn-Round Process **shall** be implemented and operated with regard to:

- Implementation of Milestone Approach in accordance with requirement 851, Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.4.2.2   A-CDM CTRP Milestone processing

Where Airport CDM is implemented, the A-CDM Turn-Round Process **shall** be implemented and operated with regard to:

- Milestone Processing and its "highly recommended" Milestones, mentioned in table 1, in accordance with requirement 940 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

Table 1: "Highly recommended" milestones

MST1	ATC Flight Plan Activated
MST2	EOBT-2hrs
MST3	Take Off Outstation
MST4	Local Radar Update
MST5	Final Approach
MST6	Landing
MST7	In-Blocks
MST10	ATC issues TSAT
MST15	Off-Blocks
MST16	Take-Off

NOTE 1:   The milestones have been included on the basis of being the most common. Local circumstances may require the inclusion of additional milestones or by not using one or more of the milestones included in this list.

NOTE 2:   Guidance material for Milestone processing can be found in the Eurocontrol: Airport CDM Implementation Manual [i.2].

5.4.2.3   A-CDM CTRP Milestone updating

Where Airport CDM is implemented the A-CDM Turn-Round Process **shall** be implemented and operated with regard to:

- Updating of Milestones in accordance with requirement 960 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.4.2.4   A-CDM CTRP Operational alerting

Where Airport CDM is implemented the A-CDM Turn-Round Process **shall** be implemented and operated with regard to:

- Operational Alerting in accordance with requirement 970 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and inspection.

5.4.3 CTRP Technical Requirements

5.4.3.1 Void

5.4.4 CTRP Interface Requirements

5.4.4.1 Void

5.5 Airport CDM Variable Taxi Time Calculation - VTTC

5.5.1 Background

The period an aircraft spends taxing after landing or before takeoff is an important parameter affecting estimated times associated with the flight concerned. At large and complicated Airports, accurate taxi times are not easy to calculate. Inaccurate calculations or the use of default values that do not take into account the prevailing circumstances can adversely affect estimated times and consequently the efficient use of available Airport and en-route capacity. The use of VTTC ensures accurate taxi time calculations. This Element contains several methods of calculating taxi times, suitable to meet the needs of Airports with different complexities and physical characteristics. This clause details the functional and validation requirements associated with the VTTC Element.

5.5.2 VTTC Functional Requirements

5.5.2.1 A-CDM VTTC Variable taxi time calculation implementation

Where Airport CDM is implemented the Variable Taxi Time Calculation **shall** be implemented with regard to:

- Implementation of Variable Taxi time Calculation in accordance with requirement 980 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.5.2.2 A-CDM VTTC Automatic taxi time calculation and Update

Where Airport CDM is implemented the Variable Taxi Time Calculation **shall** be implemented with regard to:

- Automatic Taxi Time calculation and update of Variable Taxi Time in accordance with requirement 1 000, 1 011, 1 050 and 1 060 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.5.2.3 A-CDM VTTC Data timeliness

Where Airport CDM is implemented the Variable Taxi Time Calculation **shall** be implemented with regard to:

- Data timeliness in accordance with requirements 1 100 and 1 110 within Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.5.2.4 A-CDM VTTC Input data

Where Airport CDM is implemented the Variable Taxi Time Calculation **shall** be implemented with regard to:

- Data for Taxi Time Calculations in accordance with requirements 1 151, 1 160 and 1 170 within the Functional Requirements Document [2], and shall be tested and validated by demonstration, inspection and analysis.

5.5.2.5   A-CDM VTTC Methods

Where Airport CDM is implemented the Variable Taxi Time Calculation **shall** be implemented with regard to:

- Methods of Taxi Time Calculation in accordance with requirements 1 180 within the Functional Requirements Document [2], and shall be tested and validated by inspection.

5.5.3   VTTC Technical Requirements

5.5.3.1   Void

5.5.4   VTTC Interface Requirements

5.5.4.1   Void

5.6   Airport CDM Collaborative Management of Flight Updates - COFU

5.6.1   Background

COFU will improve the coordination between Air Traffic Flow Management (ATFM) activities of the Central Flow Management Unit (CFMU) and Airport CDM Operations. This will result in timely updating of flight data, more consistent CTOT calculation and improved CTOT adherence. CDM Airports and the CFMU exchange Departure Planning Information (DPI) and Flight Update Messages (FUM), with the purpose of ensuring use of identical data in both the ATFCM and CDM Airport operation processes. This clause details the functional, technical, interface and validation requirements associated with the COFU Element.

5.6.2   COFU Functional Requirements

5.6.2.1   A-CDM COFU Collaborative Management of Flight Updates Implementation

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Implementation of Collaborative Management of Flight Updates in accordance with requirements 1 190, 1 200, 1 201 and 1 210 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.6.2.2   A-CDM COFU Data timeliness

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Data timeliness in accordance with requirements 1 260 within the Functional Requirements Document [2], and shall be tested and validated by analysis.

5.6.2.3   A-CDM COFU Data Operations

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Data Operations in accordance with requirements 1 270 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.6.2.4   A-CDM COFU Message processing

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirement 1 310 within the Functional Requirements Document [2] and shall be tested and validated by demonstration.

5.6.2.4.1   A-CDM COFU Message processing - Generic DPI process

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirements [URE.ACDM.DPI.GEN003], [URE.ACDM.DPI.GEN005] and [URE.ACDM.DPI.GEN006] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.4.2   A-CDM COFU Message processing - Early DPI process

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirements [URE.ACDM.DPI.EDPI.001], [URE.ACDM.DPI.EDPI.004], [URE.ACDM.DPI.EDPI.009], [URE.ACDM.DPI.EDPI.010], [URE.ACDM.DPI.EDPI.011], [URE.ACDM.DPI.EDPI.014] and [URE.ACDM.DPI.EDPI.017], within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.4.3   A-CDM COFU Message processing - Target DPI process

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirements [URE.ACDM.DPI.TDPI.007], [URE.ACDM.DPI.TDPI.009], [URE.ACDM.DPI.TDPI.011], [URE.ACDM.DPI.TDPI.012], [URE.ACDM.DPI.TDPI.013], [URE.ACDM.DPI.TDPI.014], [URE.ACDM.DPI.TDPI.015], [URE.ACDM.DPI.TDPIS.005], [URE.ACDM.DPI.TDPIS.006], [URE.ACDM.DPI.TDPIS.007], [URE.ACDM.DPI.TDPIS.008], [URE.ACDM.DPI.TDPIS.009], [URE.ACDM.DPI.TDPIS.011], [URE.ACDM.DPI.TDPIS.012], [URE.ACDM.DPI.TDPIS.013], [URE.ACDM.DPI.TDPIS.014], [URE.ACDM.DPI.TDPIS.015] and [URE.ACDM.DPI.TDPIS.017] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.4.4   A-CDM COFU Message processing - ATC DPI process

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirements [URE.ACDM.DPI.ADPI.002], [URE.ACDM.DPI.ADPI.006], [URE.ACDM.DPI.ADPI.007], [URE.ACDM.DPI.ADPI.008], [URE.ACDM.DPI.ADPI.009], [URE.ACDM.DPI.ADPI.010], [URE.ACDM.DPI.ADPI.011], [URE.ACDM.DPI.ADPI.012] and [URE.ACDM.DPI.ADPI.013] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.4.5   A-CDM COFU Message processing - Cancel DPI process

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing in accordance with requirement [URE.ACDM.DPI.CDPI.002] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.4.6 A-CDM COFU Message processing - Sequence of DPI messages

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Processing with regard to the sequence of DPI messages in accordance with requirement [URE.ACDM.DPI.SEQ.001], [URE.ACDM.DPI.SEQ.003], [URE.ACDM.DPI.SEQ.004], [URE.ACDM.DPI.SEQ.005], [URE.ACDM.DPI.SEQ.006], [URE.ACDM.DPI.SEQ.007] and [URE.ACDM.DPI.SEQ.008], [URE.ACDM.DPI.SEQ.009] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration and analysis.

5.6.2.5 A-CDM COFU Message Content

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented and operated with regard to:

- Message Content in accordance with requirements [URE.ACDM.DPI.GEN002], [URE.ACDM.DPI.GEN005], [URE.ACDM.DPI.GEN006], [URE.ACDM.DPI.EDPI.001], [URE.ACDM.DPI.EDPI.003], [URE.ACDM.DPI.EDPI.005], [URE.ACDM.DPI.EDPI.007], [URE.ACDM.DPI.TDPI.003], [URE.ACDM.DPI.TDPI.005], [URE.ACDM.DPI.TDPIS001], [URE.ACDM.DPI.TDPIS.003], [URE.ACDM.DPI.TDPIS.004], [URE.ACDM.DPI.TDPIS.005], [URE.ACDM.DPI.ADPI.004], [URE.ACDM.DPI.ADPI.005], [URE.ACDM.DPI.SEQ.007], [URE.ACDM.DPI.DEICING.001], [URE.ACDM.DPI.DEICING.005] and [URE.ACDM.DPI.DEICING.006] within the CFMU DPI Implementation Guide [3], and shall be tested and validated by demonstration and analysis.

5.6.3 COFU Technical Requirements

5.6.3.1 Void

5.6.4 COFU Interface Requirements

5.6.4.1 A-CDM COFU Collaborative Management of Flight Updates Implementation

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented with regard to:

- Implementation of Collaborative Management of Flight Updates interface in accordance with requirements [ED145-07] within the Airport CDM Interface Specification - ED145 - [6], and shall be tested and validated by demonstration.

5.6.4.2 A-CDM COFU Data item identifier

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented with regard to:

- Data Item Identifier in accordance with requirements [ED145-67] within the Airport CDM Interface Specification - ED145 - [6], and shall be tested and validated by demonstration and inspection.

5.6.4.3 A-CDM COFU Data format

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented with regard to:

- Data format in accordance with requirements [ED145-68] within the Airport CDM Interface Specification - ED145 - [6] and requirements [URE.ACDM.DPI.GEN007], [URE.ACDM.DPI.EDPI.002], [URE.ACDM.DPI.TDPI004], [URE.ACDM.DPI.TDPIS.002], [URE.ACDM.DPI.ADPI.003] and [URE.ACDM.DPI.CDPI.001] within the CFMU DPI Implementation Guide [3] and shall be tested and validated by demonstration.

NOTE: Departure Planning Information Message (DPI) and Flight Update Message (FUM) detailed data format descriptions are specified in the CFMU Flight Progress Messages Document [4].

5.6.4.4   A-CDM COFU Quality

Where Airport CDM is implemented the Collaborative Management of Flight Updates **shall** be implemented with regard to:

- Quality of service in accordance with requirements ED145-69, ED145-70, ED145-71 and ED145-72 within the Airport CDM Interface Specification - ED145 - [6], and shall be tested and validated by demonstration and analysis.

5.7   Airport CDM Collaborative Pre-Departure Sequence - CPDS

5.7.1   Background

CPDS provides the most efficient order in which aircraft can depart from their stands/parking positions through the provision of a Target Start-up Approval Time (TSAT) taking into account operational constraints and Partners' preferences. This helps reduce outbound taxi-times, including waiting times at the departure holding points before take-off. It also reduces the number of aircraft operating at the same time on the airport surface, resulting in more efficient use of the apron and the taxiways. CPDS allows for Aircraft Operators to express their priority of flights by manually inserting a TOBT or by swapping flights. CPDS also supports the operation of the runway Departure Management process. This clause details the functional, technical, interface and verification requirements associated with the ACIS Element.

5.7.2   CPDS Functional Requirements

5.7.2.1   A-CDM CPDS Collaborative Pre-Departure Sequence Implementation

Where Airport CDM is implemented the Collaborative Pre-Departure Sequence **shall** be implemented and operated with regard to:

- Implementation of Collaborative Pre-Departure Sequence in accordance with requirements 1 321, within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.7.2.2   A-CDM CPDS Distribution and Display

Where Airport CDM is implemented the Collaborative Pre-Departure Sequence **shall** be implemented and operated with regard to:

- Distribution and display of Collaborative Pre-Departure Sequence in accordance with requirements 1 340 within the Functional Requirements Document [2], and shall be tested and validated by demonstration and analysis.

5.7.2.3   A-CDM CPDS TSAT calculation

Where Airport CDM is implemented the Collaborative Pre-Departure Sequence **shall** be implemented and operated with regard to:

- TSAT Calculation in accordance with requirements 1 350 and 1 400 within the Functional Requirements Document [2] and requirement ED141-0630 within the Minimum Technical Specification for the Airport CDM Systems [5], and shall be tested and validated by demonstration and analysis.

5.7.3   CPDS Technical Requirements

5.7.3.1   Void

5.7.4   CPDS Interface Requirements

5.7.4.1   Void

5.8   Airport CDM in Adverse Conditions - CDAC

5.8.1   Background

This functional group provides the means for Airport CDM Partners to anticipate and collaboratively manage periods of reduced overall Airport capacity caused by adverse conditions. This clause details the functional and verification requirements associated with the CDAC Element.

5.8.2   CDM CDAC Functional Requirements

5.8.2.1   A-CDM CDAC A-CDM in adverse conditions implementation

Where Airport CDM is implemented the Airport CDM in Adverse Conditions **shall** be implemented and operated with regard to:

- Implementation of Airport CDM in Adverse Conditions in accordance with requirements 1 421, 1 450, 1 460 and 1 470 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.8.2.2   A-CDM CDAC Flight cancellations and delay

Where Airport CDM is implemented the Airport CDM in Adverse Conditions **shall** be implemented and operated with regard to:

- Flight cancellations and delays in accordance with requirements 1 550 and 1 560 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.8.2.3   A-CDM CDAC Resource availability

Where Airport CDM is implemented the Airport CDM in Adverse Conditions **shall** be implemented and operated with regard to:

- Resource availability in accordance with requirements 1 570 within the Functional Requirements Document [2], and shall be tested and validated by demonstration.

5.8.3   CDAC Technical Requirements

5.8.3.1   Void

5.8.4   CDAC Interface Requirements

5.8.4.1   Void

Annex SA (normative):
Standards Annex

The present annex provides a relationship between the present document and the Essential Requirements of the Single European Sky Interoperability Regulation [i.1].

A-CDM shall comply with the Essential Requirements of the Interoperability Regulation [i.1] as defined and described in the traceability matrixes of the present annex (table SA.1 and table SA.2 below).

SA.1   Correspondence between this European Standard and the Single European Sky Interoperability Regulation (as amended) for A-CDM

**Table SA.1: Traceability from Interoperability Regulation (as amended) 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.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.8 5.3.3.1 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4	For design and build only.
	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2	For operation only.

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part A	Clause(s) of the present document	Qualifying remarks/Notes
	5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3	
ER 2 Support for new concepts of operation.	5.2 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.6.2.1 5.6.2.2 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3	Up to Capability Level 1 of the ATM Master Plan.
ER 3 Safety.		The present document does not give presumption of conformity.
ER 4 Civil-military coordination.		The present document does not give presumption of conformity.
ER 5 Environmental constraints.		The present document does not give presumption of conformity.
ER 6 Principles governing the logical architecture of systems.		The present document does not give presumption of conformity.
ER 7 Principles governing the construction of systems.	5.3.3.7	Concerning high availability only For design and build only.

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 1.1 Seamless operation of airspace management.		Not covered by the present document.
ER 2.1 Seamless operation of air traffic flow management.		Not covered by the present document.
ER 3.1.1 Seamless operation of flight data processing.	5.3.2.1 5.3.2.2 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.7 5.3.2.8 5.3.3.1 5.3.3.5 5.3.3.6 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3	"timely sharing of correct and consistent information and common operational understanding of this information".

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
	5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2	
	5.3.2.8 5.3.3.3 5.3.3.6 5.3.3.7 5.3.3.8 5.3.4.5 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2	"processing performance appropriate for a given environment".
	5.3.2.8 5.3.3.1 5.3.3.3 5.3.3.5 5.3.3.6 5.3.3.8 5.3.4.5 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3	"accuracy and error tolerance of processing results".

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
ER 3.1.2 Support for new concepts of operation for flight data processing.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.8 5.3.3.1 5.3.3.3 5.3.3.5 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4	"ground systems supporting new concepts of operation shall be designed, built…. to be interoperable in terms of timely sharing of correct and consistent information and a common understanding of the … operational situation". Up to Capability Level 1 of the ATM Master Plan.
	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2	"ground systems supporting new concepts of operation shall be operated…. to be interoperable in terms of timely sharing of correct and consistent information and a common understanding of the … operational situation". Up to Capability Level 1 of the ATM Master Plan.
ER 3.2.1 Seamless operation surveillance data processing systems.		Not covered by the present document.
ER 3.2.2 Support for new concepts of operation for surveillance data processing systems.		Not covered by the present document.
ER 3.3.1 Seamless operation of Human-machine interface systems.	5.3.2.1 5.3.2.2 5.3.2.3 5.3.2.4 5.3.3.2 5.3.3.3 5.3.3.4 5.3.3.5 5.3.3.6 5.3.3.7 5.3.4.8 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4	"shall be designed, built….. to offer progressively harmonized working environment meeting required performance".

(Essential) Requirements (ERs) of SES Interoperability Regulation, Annex II, Part B	Clause(s) of the present document	Qualifying remarks/Notes
	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.7.2.2 5.8.2.1 5.8.2.2	"shall be operated….. to offer progressively harmonized working environment meeting required performance".
ER 3.3.2 Support for new concepts of operation for Human-machine interface systems.	5.3.2.3 5.3.2.4 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.7.2.2 5.8.2.1 5.8.2.2	"that the tasks assigned to control staff remain compatible with human capabilities".
ER 4.1 Seamless operation of Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.		Not covered by the present document.
ER 4.2 Support for new concepts of operation for Communications systems and procedures for ground-to-ground, air-to-ground and air-to-air communications.		Not covered by the present document.
ER 5.1 Seamless operation of Navigation systems and procedures.		Not covered by the present document.
ER 6.1 Seamless operation of Surveillance systems and procedures.		Not covered by the present document.
ER 7.1 Seamless operation of systems and procedures for aeronautical information services.		Not covered by the present document.
ER 7.2 Support for new concepts of operation for systems and procedures for aeronautical information services.		Not covered by the present document.
ER 8.1 Seamless operation of systems and procedures for the use of meteorological information.		Not covered by the present document.
ER 8.2 Support for new concepts of operation for systems and procedures for the use of meteorological information.		Not covered by the present document.

Table SA.2: Traceability from clauses of the present document to Interoperability Regulation (as amended)

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.2	ER 2 Support of new concepts of operation.	
5.3.2.1	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.3.2.2	ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.2.3	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design and build only.
5.3.2.4	ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design and build only.
5.3.2.5	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.2.6	ER 1 Seamless Operation.	All ERs: For design and build only.
5.3.2.7	ER 3.1.1 Seamless operation Flight data processing systems.	All ERs: For design and build only.
5.3.2.8	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.3.1	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.3.2	ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.3.3	ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.3.4	ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.3.5	ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.3.6	ER 3.1.1 Seamless operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.3.3.7	ER 7 Principles governing the construction of systems. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	Concerning high availability only. All ERs: For design and build only.
5.3.3.8	ER 3.1.1 Seamless operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.1	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.2	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.3	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.4	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.5	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.6	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.7	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.3.4.8	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface.	All ERs: For design and build only.
5.3.4.9	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.4.2.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.4.2.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.4.2.3	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.4.2.4	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.4.3.1	Void.	
5.4.4.1	Void.	
5.5.2.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.5.2.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.5.2.3	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only..

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.5.2.4	ER 1 Seamless Operation ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.5.2.5	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.5.3.1	Void.	
5.5.4.1	Void.	
5.6.2.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.3	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4.1	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4.2	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4.3	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4.4	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.4.5	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.6.2.4.6	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.2.5	ER 1 Seamless Operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.6.3.1	Void.	
5.6.4.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.6.4.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.6.4.3	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.6.4.4	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design and build only.
5.7.2.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.
5.7.2.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.7.2.3	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems.	All ERs: For design, build and operation only.

Clause(s) of the present document	(Essential) Requirements (ERs) of SES Interoperability Regulation (as amended), Annex II, Parts A and B	Qualifying remarks/Notes
5.7.3.1	Void.	
5.7.4.1	Void.	
5.8.2.1	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.8.2.2	ER 1 Seamless Operation. ER 2 Support of new concepts of operation. ER 3.1.1 Seamless operation Flight data processing systems. ER 3.1.2 Support for new concepts of operation Flight data processing systems. ER 3.3.1 Seamless operation Human machine interface. ER 3.3.2 Support of new concepts of operation Human machine interface.	All ERs: For design, build and operation only.
5.8.2.3	ER 1 Seamless Operation. ER 2 Support of new concepts of operation.	All ERs: For design, build and operation only.
5.8.3.1	Void.	
5.8.4.1	Void.	

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

Annex A (normative):
Checklist

The purpose of the present annex is to provide a comprehensive traceability of evidence on constituents and system levels against sub-clauses of the Essential Requirements (ERs) of the Interoperability Regulation [i.1], analyzing keywords of these same essential requirements.

These keywords mainly address the phases of design, build, operation and maintenance of systems and constituents as well as specifically required qualities or attributes as defined in the ERs of the Interoperability Regulation [i.1].

A-CDM shall comply with the Essential Requirements of the Interoperability Regulation [i.1] as defined and described in the tables of the present annex.

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

1	**ER 1 seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.1	Designed	The present document does not give presumption of conformity.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.8 5.3.3.1 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4

1	**ER 1 seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.2	Built	The present document does not give presumption of conformity.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.8 5.3.3.1 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4
1.3	Maintained	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.

1	**ER 1 seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.4	Operated	Operation is only applicable at the system level.	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3

1	ER 1 seamless operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Air traffic management systems and their constituents shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to ensure the seamless operation of the EATMN at all times and for all phases of flight. Seamless operation can be expressed, in particular, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performances agreed for the whole or parts of the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
1.5	Information sharing	The present document does not give presumption of conformity.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.8 5.3.3.1 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3

2	**ER 2 Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "The EATMN, its systems and their constituents shall support, on a coordinated basis, new agreed and validated concepts of operation that improve the quality, sustainability and effectiveness of air navigation services, in particular in terms of safety and capacity. The potential of new concepts, such as collaborative decision-making, increasing automation and alternative methods of delegation of separation responsibility, shall be examined taking due account of technological developments and of their safe implementation, following validation".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
2.1	Validated concepts of operation - safety	Operation is only applicable at the system level.	The present document does not give presumption of conformity.
2.2	Validated concepts of operation - capacity	Operation is only applicable at the system level.	5.2 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.6.2.1 5.6.2.2 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3
2.3	Validated concepts of operation - quality	Operation is only applicable at the system level.	5.2 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.6.2.1 5.6.2.2 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2 5.8.2.3

3	ER 3 Safety			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems and operations of the EATMN shall achieve agreed high levels of safety. Agreed safety management and reporting methodologies shall be established to achieve this. In respect of appropriate ground-based systems, or parts thereof, these high levels of safety shall be enhanced by safety nets which shall be subject to agreed common performance characteristics. A harmonized set of safety requirements for the design, implementation, maintenance and operation of systems and their constituents, both for normal and degraded modes of operation, shall be defined with a view to achieving the agreed safety levels, for all phases of flight and for the entire EATMN. Systems shall be designed, built, maintained and operated, using the appropriate and validated procedures, in such a way that the tasks assigned to the control staff are compatible with human capabilities, in both the normal and degraded modes of operation, and are consistent with required safety levels. Systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to be free from harmful interference in their normal operational environment".			
	Keywords	Evidence on constituent level	Evidence on system level	Evidence at procedure level
3.1	Design	n/a	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.
3.3	Maintenance	n/a	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.
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.	The present document does not give presumption of conformity.

4	ER 4 Civil-military coordination		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace. To achieve these objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties. Account should be taken of national security requirements".		
	Keywords	Evidence on constituent level	Evidence on system level
4.1	Flexible use of airspace	n/a	The present document does not give presumption of conformity.
4.2	Timely sharing	n/a	The present document does not give presumption of conformity.
4.3	National security requirements	n/a	The present document does not give presumption of conformity.

5	**ER 5 Environmental constraints**			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems and operations of the EATMN shall take into account the need to minimize environmental impact in accordance with Community legislation".			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
5.1	Minimize environmental impact - ATS	n/a	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.
5.2	Minimize environmental impact - materials	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.	The present document does not give presumption of conformity.

6	**ER 6 Principles governing the logical architecture of systems**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems shall be designed and progressively integrated with the objective of achieving a coherent and increasingly harmonized, evolutionary and validated logical architecture within the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1	Designed and progressively integrated	n/a	The present document does not give presumption of conformity.

7	**ER 7 Principles governing the construction of systems**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems shall be designed, built and maintained on the grounds of sound engineering principles, in particular those relating to modularity, enabling interchangeability of constituents, high availability, and redundancy and fault tolerance of critical constituents".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1	Modularity, interchangeability.	n/a	The present document does not give presumption of conformity.
7.2	High availability, Redundancy and fault tolerance	n/a	Concerning high availability only; For design and build only; 5.3.3.7.

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

A.2.1 Systems and procedures for airspace management

1.1	**ER 1.1 Seamless operation**			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Information relating to pre-tactical and tactical aspects of airspace availability shall be provided to all interested parties in a correct and timely way so as to ensure an efficient allocation and use of airspace by all airspace users. This should take into account national security requirements."			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence on procedure level**
1.1.1	Pre-tactical aspects of airspace availability	n/a	Not covered by this CS.	Not covered by this CS.
1.1.2	tactical aspects of airspace availability	n/a	Not covered by this CS.	Not covered by this CS.
1.1.3	Correct and timely way	n/a	Not covered by this CS.	Not covered by this CS.
1.1.4	National security requirements	n/a	Not covered by this CS.	Not covered by this CS.

A.2.2 Systems and procedures for air traffic flow management

2.1	**ER 2.1 Seamless operation**			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems and procedures for air traffic flow management shall support the sharing of correct, coherent and relevant strategic, pre-tactical and tactical, as applicable, flight information covering all phases of flight and offer dialogue capabilities with a view to achieving optimized use of airspace".			
	Keywords	**Evidence on constituent level**	**Evidence on system level**	**Evidence at procedure level**
2.1.1	Strategic	n/a.	Not covered by this CS.	Not covered by this CS.
2.1.2	Pre-tactical	n/a.	Not covered by this CS.	Not covered by this CS.
2.1.3	Tactical	n/a.	Not covered by this CS.	Not covered by this CS.

A.2.3   Systems and procedures for air traffic services

A.2.3.1   Flight data processing systems

3.1.1	**ER 3.1.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 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	5.3.2.1 5.3.2.2 5.3.2.3 5.3.2.5 5.3.2.6 5.3.2.7 5.3.2.8 5.3.3.1 5.3.3.5 5.3.3.6 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3

3.1.1	ER 3.1.1 Seamless operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 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**
			5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2
3.1.1.2	Performance appropriate for environment	n/a	5.3.2.8 5.3.3.3 5.3.3.6 5.3.3.7 5.3.3.8 5.3.4.5 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2

3.1.1	**ER 3.1.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 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**
3.1.1.3	Accuracy and error tolerance	n/a	5.3.2.8 5.3.3.1 5.3.3.3 5.3.3.5 5.3.3.6 5.3.3.8 5.3.4.5 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4 5.6.2.1 5.6.2.2 5.6.2.3

3.1.2	**ER 3.1.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM Master Plan. The characteristics of automation-intensive tools must be such as to enable coherent and efficient pre-tactical and tactical processing of flight information in parts of the EATMN. Airborne and ground systems and their constituents supporting new, agreed and validated concepts of operation shall be designed, built, maintained and operated, using appropriate and validated procedures, in such a way as to be interoperable in terms of timely sharing of correct and consistent information and a common understanding of the current and predicted operational situation".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.1.2.1	Airborne systems - design	Not covered by this CS.	Not covered by this CS.
3.1.2.2	Airborne systems - built	Not covered by this CS.	Not covered by this CS.
3.1.2.3	Airborne systems - maintained	Not covered by this CS.	Not covered by this CS.
3.1.2.4	Airborne systems - operated	Not covered by this CS.	Not covered by this CS.

3.1.2	**ER 3.1.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM Master Plan. 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**
3.1.2.5	Ground systems - design	Not covered by this CS.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.8 5.3.3.1 5.3.3.3 5.3.3.5 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4

3.1.2	ER 3.1.2. Support for new concepts of operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM Master Plan. 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
3.1.2.6	Ground systems - built	Not covered by this CS.	5.3.2.1 5.3.2.3 5.3.2.5 5.3.2.8 5.3.3.1 5.3.3.3 5.3.3.5 5.3.4.1 5.3.4.2 5.3.4.3 5.3.4.4 5.3.4.5 5.3.4.6 5.3.4.7 5.3.4.8 5.3.4.9 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.5.2.1 5.5.2.2 5.5.2.3 5.5.2.4
3.1.2.7	Ground systems - maintained	Not covered by this CS.	Not covered by this CS.

3.1.2	**ER 3.1.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Flight data processing systems shall accommodate the progressive implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM Master Plan. 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**
3.1.2.8	Ground systems - operated	Not covered by this CS.	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.6.2.1 5.6.2.2 5.6.2.3 5.6.2.4 5.6.2.4.1 5.6.2.4.2 5.6.2.4.3 5.6.2.4.4 5.6.2.4.5 5.6.2.4.6 5.6.2.5 5.7.2.1 5.7.2.2 5.7.2.3 5.8.2.1 5.8.2.2

A.2.3.2   Surveillance data processing systems

3.2.1	ER 3.2.1 Seamless operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Surveillance data processing systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to provide the required performance and quality of service within a given environment (surface, TMA, en-route) with known traffic characteristics, in particular in terms of accuracy and reliability of computed results, correctness, integrity, availability, continuity and timeliness of information at the control position. Surveillance data processing systems shall accommodate the timely sharing of relevant, accurate, consistent and coherent information between them to ensure optimized operations through different parts of the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.1.1	Designed	n/a	Not covered by this CS.
3.2.1.2	Built	n/a	Not covered by this CS.
3.2.1.3	Maintained	n/a	The present document does not give presumption of conformity.
3.2.1.4	Operated	n/a	Not covered by this CS.

3.2.2	ER 3.2.2. Support for new concepts of operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Surveillance data processing systems shall accommodate the progressive availability of new sources of surveillance information in such a way as to improve the overall quality of service, in particular as envisaged in the ATM Master Plan."		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.2.2.1	Availability of new sources	n/a	Not covered by this CS.

A.2.3.3   Human-machine interface systems

3.3.1	**ER 3.3.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Human-machine interfaces of ground air traffic management systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to offer to all control staff a progressively harmonized working environment, including functions and ergonomics, meeting the required performance for a given environment (surface, TMA, en-route), with known traffic characteristics".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.3.1.1	Designed	n/a	5.3.2.1 5.3.2.2 5.3.2.3 5.3.2.4 5.3.3.2 5.3.3.3 5.3.3.4 5.3.3.5 5.3.3.6 5.3.3.7 5.3.4.8 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4
3.3.1.2	Built	n/a	5.3.2.1 5.3.2.2 5.3.2.3 5.3.2.4 5.3.3.2 5.3.3.3 5.3.3.4 5.3.3.5 5.3.3.6 5.3.3.7 5.3.4.8 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4
3.3.1.3	Maintained	n/a	The present document does not give presumption of conformity.
3.3.1.4	Operated	n/a	5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.7.2.2 5.8.2.1 5.8.2.2

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3.3.2	**ER 3.3.2. Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Human-machine interface systems shall accommodate the progressive introduction of new, agreed and validated concepts of operation and increased automation, in such a way as to ensure that the tasks assigned to the control staff remain compatible with human capabilities, in both the normal and degraded modes of operation".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
3.3.2.1	Human capabilities	n/a	5.3.2.3 5.3.2.4 5.4.2.1 5.4.2.2 5.4.2.3 5.4.2.4 5.7.2.2 5.8.2.1 5.8.2.2

A.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**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Communication systems shall be designed, built, maintained and operated using the appropriate and validated procedures, in such a way as to achieve the required performances within a given volume of airspace or for a specific application, in particular in terms of communication processing time, integrity, availability and continuity of function. The communications network within the EATMN shall be such as to meet the requirements of quality of service, coverage and redundancy".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.1.1	Designed	n/a	Not covered by this CS.
4.1.2	Built	n/a	Not covered by this CS.
4.1.3	Maintained	n/a	Not covered by this CS.
4.1.4	Operated	n/a	Not covered by this CS.
4.1.5	Quality of service, coverage, redundancy	n/a	Not covered by this CS.

4.2	**ER 4.2 Support for new concepts of operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Communication systems shall support the implementation of advanced, agreed and validated concepts of operation for all phases of flight, in particular as envisaged in the ATM Master Plan."		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
4.2.1	Support the implementation	n/a	Not covered by this CS.

A.2.5   Navigation systems and procedures

5.1	**ER 5.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Navigation systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to achieve the required horizontal and vertical navigation performance, in particular in terms of accuracy and functional capability, for a given environment (surface, TMA, en-route), with known traffic characteristics and exploited under an agreed and validated operational concept".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
5.1.1	Designed	n/a	Not covered by this CS.
5.1.2	Built	n/a	Not covered by this CS.
5.1.3	Maintained	n/a	Not covered by this CS.
5.1.4	Operated	n/a	Not covered by this CS.

A.2.6   Surveillance systems and procedures

6.1	**ER 6.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Surveillance systems shall be designed, built, maintained and operated using appropriate and validated procedures in such a way as to provide the required performance applicable in a given environment (surface, TMA, en-route) with known traffic characteristics and exploited under an agreed and validated operational concept, in particular in terms of accuracy, coverage, range and quality of service. The surveillance network within the EATMN shall be such as to meet the requirements of accuracy, timeliness, coverage and redundancy. The surveillance network shall enable surveillance data to be shared in order to enhance operations throughout the EATMN".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
6.1.1	Designed	n/a	Not covered by this CS.
6.1.2	Built	n/a	Not covered by this CS.
6.1.3	Maintained	n/a	Not covered by this CS.
6.1.4	Operated	n/a	Not covered by this CS.

A.2.7   Systems and procedures for aeronautical information services

7.1	**ER 7.1 Seamless operation**		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Accurate, timely and consistent aeronautical information shall be provided progressively in an electronic form, based on a commonly agreed and standardized data set. Accurate and consistent aeronautical information, in particular concerning airborne and ground-based constituents or systems, shall be made available in a timely manner".		
	Keywords	**Evidence on constituent level**	**Evidence on system level**
7.1.1	Accurate, timely and consistent	n/a	Not covered by this CS.
7.1.2	Standardized data set	n/a	Not covered by this CS.

7.2	ER 7.2 Support for new concepts of operation		
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Increasingly accurate, complete and up-to-date aeronautical information shall be made available and used in a timely manner in order to support continuous improvement of the efficiency of airspace and airport use".		
	Keywords	Evidence on constituent level	Evidence on system level
7.2.1	Increasingly accurate, complete and up-to-date	n/a	Not covered by this CS.

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

8.1	ER 8.1 Seamless operation			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems and procedures for the use of meteorological information shall improve the consistency and timeliness of its provision and the quality of its presentation, using an agreed data set".			
	Keywords	Evidence on constituent level	Evidence on system level	Evidence at procedure level
8.1.1	Consistency and timeliness	n/a	Not covered by this CS.	Not covered by this CS.

8.2	ER 8.2 Support for new concepts of operation			
	Regulation (EC) 552/2004 as amended by Regulation (EC) 1070/2009 requires that: "Systems and procedures for the use of meteorological information shall improve the promptness of its availability and the speed with which it may be used, in order to support continuous improvement of the efficiency of airspace and airport use".			
	Keywords	Evidence on constituent level	Evidence on system level	Evidence at procedure level
8.2.1	Promptness, speed	n/a	Not covered by this CS.	Not covered by this CS.

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

Language	EN title
Bulgarian	
Czech	
Danish	
Dutch	
English	
Estonian	
Finnish	
French	
German	
Greek	
Hungarian	
Icelandic	
Italian	
Latvian	
Lithuanian	
Maltese	
Norwegian	
Polish	
Portuguese	
Romanian	
Slovak	
Slovenian	
Spanish	
Swedish	

Annex C (informative):
Bibliography

Eurocontrol: Airport CDM Munich EEC-Note 3/2006.

Airport CDM Munich: Brief Description (Version 4).

Airport CDM Munich: - Flight Crew Briefing (Version 4).

European Airport CDM portal: http://www.euro-cdm.org.

Eurocontrol Airport Operations Program: http://www.eurocontrol.int/airports.

Munich Airport: http://www.munich-airport.de/cdm.

German Aeronautical information publication, Volume Aerodromes, Section EDDM.

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

Eurocae: "Guidelines for Test and Validation Related to Airport CDM Interoperability" - ED146 - (Version 1, October 2008).

NOTE: See figure 1.

History

Document history				
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