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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.

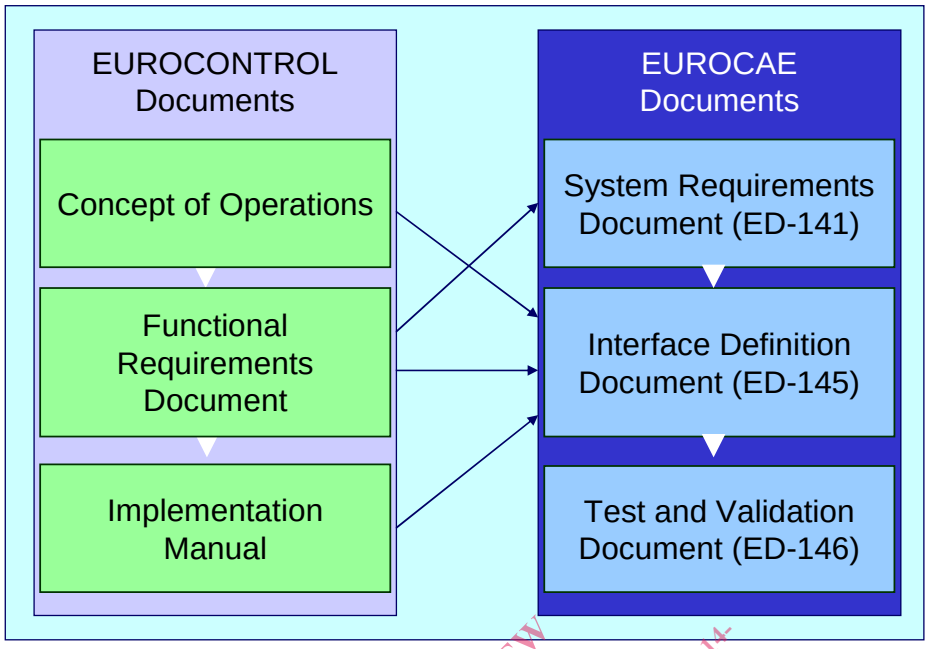

Figure 1: Eurocontrol and Eurocae Document Relationship

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.