EUROCONTROL

# EUROCONTROL Specification for Data Quality Requirements

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EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION

# EUROCONTROL
# Specification for Data Quality Requirements

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**Abstract**

The EUROCONTROL Specification for Data Quality Requirements is written as a possible Means of Compliance for Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 in respect of setting data quality requirements for aeronautical data and aeronautical information. For this purpose this Specification includes in the Harmonised List which sets the minimum requirements for accuracy, resolution and integrity for the relevant data items within the scope of Commission Regulation (EU) 73/2010.

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# EXECUTIVE SUMMARY

The European Commission Regulation No 549/2004 (as amended by Regulation No 1070/2009) [RD 1] mandates the development of Interoperability Implementing Rules (IR) together with Community Specifications (CS) and, as applicable, supporting Guideline documents for interoperability within the European ATM network, which includes Aeronautical Data Quality (ADQ).

European Commission Regulation (EU) 73/2010[1] [RD 3], laying down requirements on the quality of aeronautical data and aeronautical information for the single European sky aims at improving the quality of aeronautical data/information made available by States, such that both current and future air navigation are supported.

The EUROCONTROL Specification for Data Quality Requirements is considered as a possible Means of Compliance for Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 [RD 3] in respect of setting data quality requirements for aeronautical data and aeronautical information. For this purpose this Specification includes in ANNEX E the Harmonised List which sets the minimum requirements for accuracy, resolution and integrity for the relevant data items within the scope of Commission Regulation (EU) 73/2010 [RD 3]. Timeliness and traceability requirements are addressed generally in the ICAO Annex 15 [RD 4] and in the provisions of Commission Regulation (EU) 73/2010 [RD 3] and are, as such, not addressed specifically by this Specification.

The ICAO requirements are considered to provide a sufficient baseline for current data quality requirements and the initial values for accuracy, resolution and integrity published in the Harmonised List stemming from ICAO Annex 15 [RD 4] and other relevant ICAO SARPs. However, it is acknowledged that these data quality requirements have known deficiencies that should be addressed, notably to support future concepts of operations. Consequently, this Specification includes requirements to define a common methodology to derive and validate new or updated data quality requirements enabling to subsequently revise the Harmonised List.

This Specification is primarily addressed to the Member States providing a means to establish the set of data quality requirements which may become mandatory within its area of responsibility. This should be achieved through the formal adoption of the Harmonised List. However, the provisions of Commission Regulation (EU) 73/2010 [RD 3] only address the Air Navigation Service Provider (ANSP) directly. Therefore, it is up to the Member State to put in place the necessary, complementary national legal elements to extend this obligation to all other regulated and/or non-regulated parties, as required.

[1] as amended by Commission Implementing Regulation (EU) No 1029/2014

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# 1. Introduction

The EUROCONTROL Specification for Data Quality Requirements (DQR) supports part of the provisions for data quality requirements of the Commission Regulation (EU) No 73/2010[2] of 26 January 2010 laying down requirements on the quality of aeronautical data and information for the single European sky [RD 3] (hereinafter referred as ADQ IR). The ADQ IR was developed in response to the European Commission Aeronautical Data Integrity (ADI[3]) mandate which was handed over to EUROCONTROL in 2005. The final mandate report was delivered to the European Commission in October 2007.

The DQR Specification provides the Member State with clear and unambiguous requirements for the development and maintenance of data quality requirements. An initial set of data quality requirements is published as the Harmonised List (HL), included in ANNEX E of this Specification.

## 1.1 Background

The ADQ IR [RD 3] states that aeronautical data and information of appropriate quality is required to ensure safety and support new operational concepts throughout the European Air Traffic Management Network (EATMN). The International Civil Aviation Organisation (ICAO) currently defines data quality in terms of:

- Accuracy
- Resolution
- Integrity

These requirements must be met and maintained within the EATMN when originating and processing aeronautical data and information. The ICAO requirements are considered to provide a sufficient baseline for current data quality requirements and the DQR Specification recognises this assumption by literarily transposing to the HL the values for accuracy, resolution and integrity already published in the ICAO SARPs. However, it should be noted that the ADQ IR [RD 3] also recognises that there are known deficiencies, notably to support future applications, and prompt the process to derive and validate new data quality requirements or to update existing ones. This need is addressed in the DQR Specification translating the relevant provisions of the ADQ IR [RD 3] to the requirements.

Furthermore, the ADQ IR [RD 3] adds timeliness to the data quality requirements and reiterates the requirement to determine the origin of data. However, the latter ones are considered to represent process related requirements which support overall interoperability and performance drivers and as they are addressed by other Articles of the ADQ IR [RD 3] those cannot be specifically covered in the DQR Specification.

## 1.2 Context

### 1.2.1 EUROCONTROL Specifications

Under the EUROCONTROL Regulatory and Advisory Framework (ERAF), a EUROCONTROL Specification is defined as:

> *Detailed technical specifications for physical characteristic, configuration, material, performance, personnel or procedure, the compliance with which is recognised as meeting requirements of safe and efficient systems and services related to ATM in the EUROCONTROL Member States, as defined by EUROCONTROL regulatory material.*

[2] as amended by Commission Implementing Regulation (EU) No 1029/2014

[3] ADI was the initial mandate title. During the rule drafting stage it was revised to ADQ (Aeronautical Data Quality) mandate.

The ERAF introduced a set of documents comprising the EUROCONTROL Rule (mandatory), Specification (voluntary), and Guidelines (voluntary). These documents aim to support the Single European Sky (SES) regulatory material, notably the SES Implementing Rules such as the ADQ IR [RD 3]. EUROCONTROL specifications are developed in accordance with the EUROCONTROL Notice of Proposed Rulemaking (ENRPM) process.

The DQR Specification is written as a EUROCONTROL Specification primarily to address Article 6(1) of the ADQ IR [RD 3] and the requirements in Annex IV, Part A. It has been developed under full consideration of the ADQ IR [RD 3] provisions and is, therefore, considered as a possible Means of Compliance (MoC). The DQR Specification took full account of the Conformity Assessment (CA) Guidelines [RD 7] which, in turn, will support the achievement of the relevant CA provisions.

The DQR Specification content is voluntary in status but National authorities may decide to employ the Specification either as voluntary material or to implement it as mandatory material within their own regulatory frameworks. The manner in which they are used will depend on nationally assessed requirements.

### 1.2.2 Community Specifications and EUROCONTROL Specifications

In the context of the SES interoperability Regulation [RD 2], EUROCONTROL Specifications may be recognized as offering a MoC with identified SES regulatory material when they provide an implementation solution for the regulatory material and if they can be traceable to the provisions. The reference numbers of these specifications would then be published in the Official Journal of the European Union (OJEU), recognising them as Community Specifications. When an EATMN system achieves compliance with such specifications, it is presumed to conform to the relevant regulatory provisions.

EUROCONTROL Specifications are a possible MoC and it is fully accepted that parties may choose whether or not to implement the DQR Specification. However, it is possible that the regulatory functions within a State could determine that a specific Specification is the MoC for the State, therefore resulting in the application of the Specification becoming mandatory.

The Specification will certainly assist with implementation of the ADQ IR [RD 3]. It has been developed in full consideration of the ADQ IR [RD 3] and in accordance with the adapted ENPRM process, which has been designed to satisfy the requirements of rule-making within the European Union context. Therefore, later formal recognition as CS is possible in principle; however this requires separate process stages.

## 1.3 Purpose

The primary aim of the DQR Specification is to address Article 6(1) of the ADQ IR [RD 3]:

> *Member States shall ensure that air navigation service providers comply with the data quality requirements laid down in Annex IV, Part A.*

The DQR Specification establishes the HL as the baseline for accuracy, resolution and integrity requirements for aeronautical data and information within the scope of the ADQ IR [RD 3] and provides a common set of procedural requirements for the derivation, validation and maintenance of these requirements.

The HL identifies the data quality requirements defined in Appendix 7 of ICAO Annex 15 [RD 9] (as referred to in point 11 of Annex III of the ADQ IR [RD 3]) as the primary source for its values, and it is then complemented by ICAO Annexes 14 [RD 5] [RD 10] and Annex 11 [RD 6][4]. The requirements in Section 3 of this Specification define the methodology to maintain and enhance the HL.

# 1.4 Scope

## 1.4.1 Overview

The scope of the ADQ IR [RD 3] is wide ranging and applies to EATMN systems, their constituents and associated procedures involved in the origination, production, storage, handling, processing, transfer and distribution of aeronautical data and information. However, the DQR Specification addresses only part of the ADQ IR [RD 3] provisions whilst the remaining provisions would be addressed by other means.

The scope of the DQR Specification is limited to those aspects related to point 1 of Article 6 *'Data Quality'* of the ADQ IR [RD 3] and Annex IV, Part A, which are the derivation, validation and maintenance of aeronautical data and aeronautical information quality requirements.

The traceability requirements, indicated in Annex IV, Part A 5(c), are already covered by Article 1 and Annex I, Part C and the timeliness requirements, indicated in Annex IV, Part A 5(d), are already addressed by Articles 7(3) and 7(4) of the ADQ IR [RD 3]. Therefore, these requirements are only addressed in general terms by this Specification.

A number of other specifications are being produced by EUROCONTROL to satisfy other articles of the ADQ IR [RD 3]. One of these specifications is the EUROCONTROL Specification for Data Assurance Levels (DAL Specification) [RD 8], which mainly addresses Article 6(2) of the ADQ IR [RD 3] and provides a means for demonstrating that the integrity levels assigned herein are satisfied.

## 1.4.2 Applicable Parties

The ADQ IR [RD 3] is applicable to the following parties as defined in Article 2(2):

1) air navigation service providers;
2) operators of those aerodromes and heliports, for which instrument flight rules (IFR) or Special-visual flight rules (VFR) procedures have been published in national aeronautical information publications;
3) public or private entities providing, for the purpose of this Regulation:
    a) services for the origination and provision of survey data;
    b) procedure design services;
    c) electronic terrain data;
    d) electronic obstacle data.

Compliance with the data quality requirements laid down in Annex IV, Part A of the ADQ IR [RD 3] is directly mandatory for ANSPs and it is the responsibility of the Member State to ensure this compliance. Accordingly, the DQR Specification is primarily targeted at the Member State to address its obligation to adopt a specific set of data quality requirements and to ensure that the ANSP complies with them. Consequently, if the Member State decides to formally adopt the DQR Specification, the ANSP will have to put in place the adequate processes to comply with the data quality requirements from the HL.

[4] Whenever inconsistencies in the definition of data quality requirements are found within ICAO Annexes the value(s) defined in ICAO Annex 15 will be used.

Moreover, the Member State should also exercise effective management and control over all aeronautical data and aeronautical information origination activities to ensure that data is provided with sufficient quality to meet its intended use. As such, the Member State may want to extend the applicability of the data quality requirements contained in the HL to the other parties. The method to do so will certainly vary from State to State and, therefore, this is outside the scope of the DQR Specification.

### 1.4.3 Applicable Data

Considering the current operational services within the EATMN systems, the data quality requirements of the ADQ IR [RD 3] apply primarily to geospatial and other navigation data and notably to those data items listed in ICAO Annex 15, Appendix 7 [RD 9]. This is supported by the recitals and the provisions of Annex IV, Part A of the ADQ IR [RD 3].

Existing ICAO requirements are considered to provide sufficient baseline for the current data quality requirements. The safety assessment performed during the development of the regulation, was predicated on the assumption that the current EATMN systems operating on the basis of the existing data quality requirements are tolerably safe.

Consequently, the DQR Specification is initially published with a HL mainly limited to those data items that are included, at the date of publication, in ICAO Annex 15, Appendix 7 [RD 9]. These data items are published with their corresponding requirements for resolution and integrity and are complemented by the requirements for accuracy stemming from ICAO Annex 11 [RD 6] and Annex 14 [RD 5] [RD 10]. A few additional data items were added to the HL which are not covered in ICAO Annex 15, Appendix 7 [RD 9]. Those elements, stemming either from ICAO Annex 11 [RD 6] or ICAO Annex 14 [RD 5] [RD 10], with an assigned data integrity level were included with their corresponding accuracy and integrity level for reasons of completeness.

The ADQ IR [RD 3] also recognises the shortcomings of the ICAO SARPs, notably for future concepts of operations. The safety assessments associated with new or enhanced operations may identify the need for the revision of existing data items or the addition of new data items with associated data quality requirements beyond the current coverage of Appendix 7 [RD 9].

The non-inclusion of a specific data item or dataset in the harmonised list does by no means exclude it from the scope of the ADQ IR [RD 3] itself. Regulated parties remain responsible to comply with each provision of the ADQ IR [RD 3] deemed relevant for particular data items or datasets.

### 1.4.4 Limitations in Applicability

The limitations in the applicability of the ADQ IR [RD 3] are defined in Article 2(3) as including all of the activities up to the point where the aeronautical data and/or information is delivered by the aeronautical information service provider to the next intended user.

## 1.5 Conventions and Requirement Characterisation

Adoption of this Specification is voluntary, however, the requirements are written using the following conventions:

- Requirements using the operative verb "**shall**" must be implemented to achieve the minimum objectives of this specification.
- Requirements using the operative verb "**should**" are *recommended* to achieve the best possible implementation of this specification.
- Requirements using the operative verb "**may**" indicate options.

Keywords are highlighted in the specification text using **red bold** as shown above.

Each requirement is individually referenced in the main body of this specification in the form **DQR-REQ-XXX**. ANNEX B lists all requirements and indicates whether the requirement is Mandatory (M), Recommended (R) or Optional (O).

ANNEX C provides a regulatory traceability matrix from the provisions of the ADQ IR [RD 3] to the detailed technical requirements of this specification.

## 1.6 Document Structure

The individual sections of the DQR Specification are:

- Executive Summary – provides a foreword and context;
- Section 1 - Introduction: presents the introductory material;
- Section 2 - Management of Data Quality Requirements**:** describes the overall process for the maintenance of the HL;
- Section 3 - Specification of Data Quality Requirements**:** defines the requirements for the adoption and maintenance of the HL;
- Annexes: providing additional supporting information as listed below:

  ANNEX A - CONFIGURATION CONTROL

  ANNEX B - CONFORMITY MATERIAL

  ANNEX C - TRACEABILITY TO REGULATORY PROVISIONS

  ANNEX D - SPECIFICATION UPDATE PROCEDURES

  ANNEX E - HARMONISED LIST

  ANNEX F - AMENDMENTS TO SPECIFICATION

## 1.7 Referenced Documents

Referenced documents are indicated in the text in their short form with a reference number such as ADQ IR [RD 3].

**[RD 1]** 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 dingle European sky (the framework regulation) as amended by REGULATION (EC) No 1070/2009 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system;

**[RD 2]** 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);

**[RD 3]** COMMISSION REGULATION (EU) No 73/2010 of 26 January 2010 laying down requirements on the quality of aeronautical data and aeronautical information for the single European sky, as amended by Commission Implementing Regulation (EU) No 1029/2014;

**[RD 4]** Annex 15 to the Convention on International Civil Aviation – Aeronautical Information Services (Fourteenth Edition, July 2013, incorporating Amendment 38);

**[RD 5]** Annex 14 to the Convention on International Civil Aviation – Aerodromes, Volume I Aerodrome Design and Operations (Sixth Edition, July 2013);

**[RD 6]** Annex 11 to the Convention on International Civil Aviation – Air Traffic Services (Thirteenth Edition, July 2001);

**[RD 7]** EUROCONTROL Guidelines on conformity assessment for the interoperability Regulation of the single European sky (Edition Number 3.0, 20 February 2002);

**[RD 8]** EUROCONTROL Specification for Data Assurance Levels (Edition Number 1.0, 15 March 2012);

**[RD 9]** Appendix 7 (Aeronautical data quality requirements) of Annex 15 to the Convention on International Civil Aviation – Aeronautical Information Services (Fourteenth Edition, July 2013, incorporating Amendment 38);

**[RD 10]** Annex 14 to the Convention on International Civil Aviation – Aerodromes, Volume II Heliports (Fourth Edition, July 2013).

## 1.8 Relationship to other Documents

The relationship between EU Regulations, the ADQ IR [RD 3], the DQR Specification and other documents is represented in Figure 1.

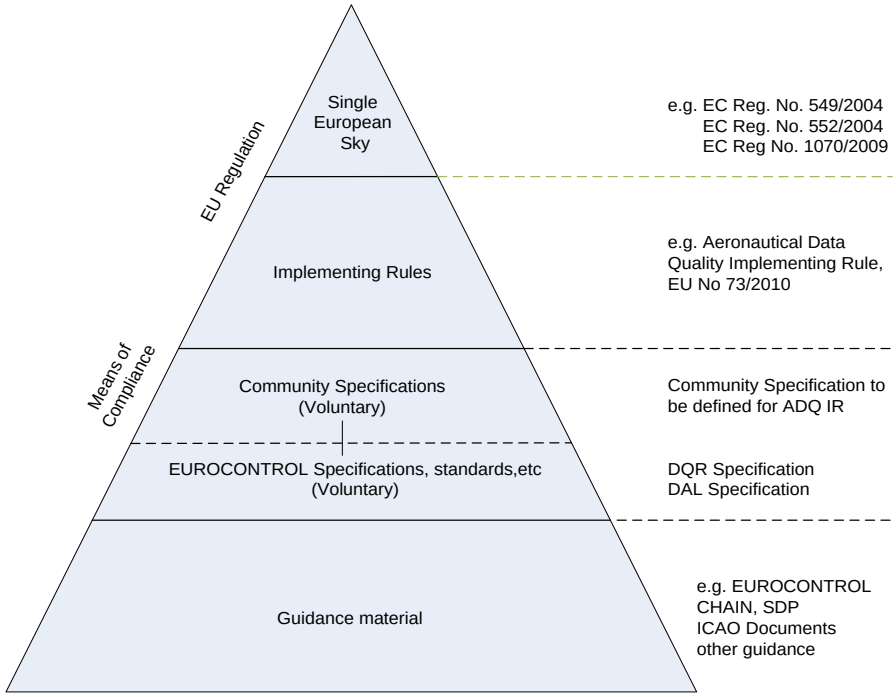


Figure 1: Relationship of the DQR Specification with other documents

## 1.9 Abbreviations and Definitions

To aid readability, a number of abbreviations are used throughout the DQR Specification.

| | |
|---|---|
| **ADQ** | Aeronautical Data Quality |
| **AISP** | Aeronautical Information Service Provider |
| **ANSP** | Air Navigation Service Provider |
| **ATM** | Air Traffic Management |
| **CA** | Conformity Assessment |
| **CS** | Community Specification |
| **DAL** | Data Assurance Level |
| **DQR** | Data Quality Requirement |
| **EATMN** | European Air Traffic Management Network |
| **EC** | European Community |
| **ENPRM** | EUROCONTROL Notice of Proposed Rulemaking |
| **ERAF** | EUROCONTROL Regulatory and Advisory Framework |
| **EU** | European Union |

| | |
|---|---|
| **EUROCONTROL** | European Organisation for the Safety of Air Navigation |
| **HL** | Harmonised List |
| **ICAO** | International Civil Aviation Organisation |
| **IR** | Implementing Rule |
| **MoC** | Means of Compliance |
| **OJEU** | Official Journal of the European Union |
| **SARPs** | (ICAO) Standards And Recommended Practices |
| **SES** | Single European Sky |

The ADQ IR [RD 3] references Article 2 of Regulation (EC) No 549/2004 (as amended by Regulation No 1070/2009) [RD 1] as the main source of terminology. In addition, the ADQ IR [RD 3] defines in Article 3 a number of other terms which shall also apply. The DQR Specification adopts both lists of definitions.

# 2. Management of Data Quality Requirements

## 2.1 Overview

Air traffic services provided in the EATMN are already today dependent on the provision of suitable aeronautical data and information. The importance of the quality of this data, defined in terms of accuracy, resolution, integrity, timeliness, completeness, consistency and traceability is increasing as automation becomes more widespread. In addition, interoperability requirements and the development and support of future applications, ground based and airborne, are dependent on a commonly agreed and standardised data set.

At present, the definition of data quality relating to aeronautical data and information and its associated data quality requirements is known to have some deficiencies which should be addressed. For example, ICAO Annex 15 [RD 4] indicates numerous requirements for data integrity (that are related to safety) but the coverage is not comprehensive, nor is it consistent throughout the document.

Stakeholder consultation carried out in support of the ADQ mandate identified the need, in the short term, to develop a harmonised set of data quality requirements. This would be published and managed by a designated party and could trigger, if required, parallel ICAO amendment proposals. This has resulted in the HL in ANNEX E of this Specification which will be maintained by EUROCONTROL.

In the medium term, it is anticipated that Member States will collectively identify changes to data quality requirements in support of future applications. This Specification defines the requirements associated with this activity as well as the consequential maintenance of the HL.

## 2.2 Data Quality Requirements – Roles

This section details the roles, responsibilities and relationships of the different organisations/actors that have an interest in data quality requirements and the HL, respectively.

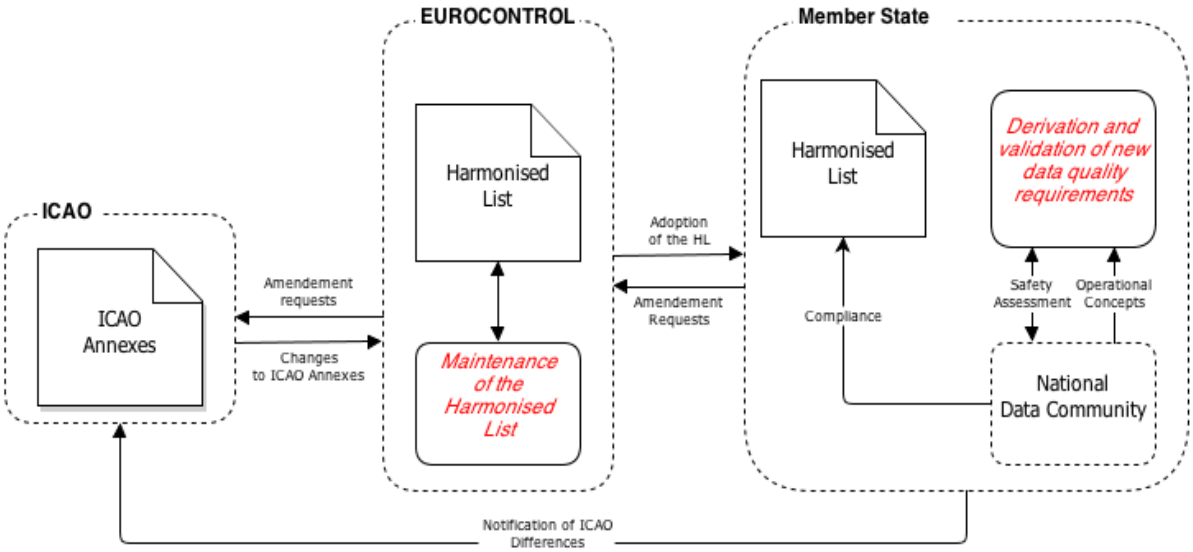


Figure 2: Maintenance of the Harmonised List

There are several actors involved in the development and management of data quality requirements, as shown in Figure 2 above:

- EUROCONTROL – responsible for the HL – see section 2.2.1;
- ICAO – see section 2.2.2;

- Member States – see section 2.2.3;
- National Data Community – see section 2.2.4.

Each of these actors is covered in more detail below. The requirements applicable to each of the actors are also identified.

### 2.2.1 EUROCONTROL

The HL has been produced by EUROCONTROL and is included within this Specification. It provides a baseline set of data quality requirements mainly as defined in Appendix 7 of ICAO Annex 15 [RD 9] and other relevant ICAO SARPs.

EUROCONTROL will be responsible for the maintenance of the HL. This includes:

- managing the process for change requests from the Member States and facilitation of discussions with Member States whether the proposed changes should be reflected in the HL;
- consolidation of the Member States' views concerning potential proposals to amend ICAO Annexes;
- monitoring of eventual amendment proposals to ICAO Annex 15 [RD 4] and other relevant SARPs.

### 2.2.2 International Civil Aviation Organisation

This section does not place any requirements on ICAO; this would be beyond the scope of this specification.

ICAO, through Annex 15 [RD 4], defines how the Aeronautical Information Service shall be provided such that it is consistent throughout the world. The following is quoted directly from the ICAO Annex 15 [RD 4] Chapter 1:

> *The role and importance of aeronautical information/data changed significantly with the implementation of area navigation (RNAV), required navigation performance (RNP), airborne computer based navigation systems and data link systems. Corrupt or erroneous aeronautical information/data can potentially affect the safety of air navigation.*

As shown in Figure 2 above, ICAO will define amendments to the ICAO Annexes; this may in turn have an impact on the HL. But ICAO will also receive amendment requests directly from the Member States, or perhaps those which were consolidated through EUROCONTROL in conjunction with the HL maintenance. In addition, ICAO collates Member State responses in terms of 'State differences' to the Annexes.

### 2.2.3 Member States

Each Member State is responsible for the formal adoption of the HL as the basis of compliance with Article 6(1) and Annex IV, Part A of the ADQ IR [RD 3].

The Member State should, as far as practicable, use their national regulatory framework to extend the obligation to comply with the HL data quality requirements to the entire national aeronautical data and aeronautical information community.

Member States should consolidate the views of the national data community in terms of identifying new or updated data quality requirements elicited by new or revised concepts of operations. This means that each Member State must have arrangements in place to coordinate and manage the views properly and to liaise with the data user community within its jurisdiction.

When new or updated data quality requirements are identified, the Member State should oversee the required safety assessments applied to derive and validate new or updated data quality requirements.

The data user community may not naturally be inclined to communicate with each other at this level. The users may be industry and their considerations may for example not align with the cost of data collection. The Member State may therefore need to be proactive in the liaison with the data user community.

Member States may have to apply some form of Cost Benefit Analysis when assessing changes to data quality requirements proposed by data users. It should also be considered to coordinate this with EUROCONTROL as the entity responsible for the HL, particularly in the case when global changes to the HL become apparent.

Member States maintain, of course, their responsibility for providing details of State differences with ICAO Annexes.

### 2.2.4 National Data Community

The ADQ IR [RD 3] requires that the ANSP demonstrates that the data quality requirements in Annex IV, Part A are satisfied. As such the ANSP, within the jurisdiction of a Member State which has formally adopted the HL as the basis for compliance with Article 6(1) of the ADQ IR [RD 3], shall put in place the necessary processes to comply with the data quality requirements of the HL.

It is recommended that the ANSP ensures that any other party, regulated by the ADQ IR [RD 3] or not, involved in the origination, production, storage, handling, processing, transfer or distribution of aeronautical data and aeronautical information and which the ANSP interacts with, is made aware of the HL data quality requirements and adheres to them. This can be done through formal arrangements and should, in principle, be supported by the Member State.

The national data community should transmit to the Member State their requirements for new or updated data quality requirements which may result from the safety assessments for new or updated concepts of operations. The national data community should collaborate with the Member State during the derivation and validation of new data quality requirements.

## 2.3 Maintenance of the AIP Harmonised List

As stated in Section 1, the HL provides a consolidated list of data quality requirements associated with data items within the scope of aeronautical data or aeronautical information referred to in the second subparagraph of Article 2(1) of the ADQ IR [RD 3]. The list is originally based on the ICAO set of data quality requirements but it is envisaged to evolve the HL to address known deficiencies plus to support future concepts of operations.

### 2.3.1 Maintenance – State Level

Once a Member State has formally adopted the HL, it needs to be maintained to reflect any changes instigated at national level. Member States may perform any of the following:

- **Add** new aeronautical data items and associated data quality requirements, which are not in the HL or ICAO Annexes.
- **Modify** data quality requirements for data items identified as having more or less stringent data quality requirements.
- **Remove** data items and/or their associated data quality requirements.

### 2.3.2 Maintenance – European/Global Level

The HL in ANNEX E of this Specification will be maintained by EUROCONTROL so that it is kept up to date in relation to changes to ICAO SARPs and justified changes stemming from safety assessment results identified by Member States.

# 3. Specification of Data Quality Requirements

## 3.1 General Requirements

**[DQR-REQ-010]** The Member State **shall** notify EUROCONTROL if they formally adopt the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Regulation (EU) 73/2010, indicating the correspondent version.

Note 1: The formal adoption of the EUROCONTROL Specification for Data Quality Requirements will also automatically presume the endorsement and the adoption of the Harmonised List as the set of data quality requirements to which air navigation service providers shall comply under the context of Article 6(1) of Regulation (EU) 73/2010.

Note 2: EUROCONTROL will maintain and publish a list of all Member States that adopted the EUROCONTROL Specification for Data Quality Requirements.

**[DQR-REQ-020]** If the Member State formally adopts the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010, it **shall** ensure through its national legal framework that the air navigation service provider complies with the data quality requirements of the Harmonised List.

Note: The methods used to implement the obligation to comply with the data quality requirements from the Harmonised List to the air navigation service provider will vary from State to State and are outside the scope of this Specification.

**[DQR-REQ-030]** If the Member State formally adopts the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010, it **should** ensure through its national legal framework that any party involved in the origination, production, storage, handling, processing, transfer or distribution of aeronautical data or aeronautical information complies with the data quality requirements of the Harmonised List.

Note: The methods used to extend the obligation to comply with the data quality requirements from the Harmonised List to all regulated parties and/or any other national entity will vary from State to State and are outside the scope of this Specification.

**[DQR-REQ-040]** If the Member State formally adopts the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 the ANSPs within the responsibility of the Member State **shall** implement the appropriate processes to comply with the data quality requirements of the Harmonised List.

**[DQR-REQ-050]** The formal adoption and subsequent implementation of the EUROCONTROL Specification for Data Quality Requirements **shall** be made without prejudice of compliance with any other relevant provision of Regulation (EU) 73/2010.

Note: It should be noted that the provisions of Regulation (EU) 73/2010 take precedence over the requirements of this Specification. The non-inclusion of a specific data item or dataset in the harmonised list does not exclude it from the scope of the Regulation (EU) 73/2010. Regulated parties remain responsible to comply with each provision of the Regulation (EU) 73/2010 deemed relevant to that data item or dataset.

**[DQR-REQ-060]** The Member State that formally adopted the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 **shall** notify EUROCONTROL of any difference concerning the data quality requirements from ICAO Annex 15 (Appendix 7), ICAO Annex 11 (Appendix 5), ICAO Annex 14 Volume I (Appendix 5) or ICAO Annex 14 Volume II (Appendix 1) that are submitted to ICAO after the formal adoption of the EUROCONTROL Specification for Data Quality Requirements.

Note: EUROCONTROL will maintain and publish a list of all notified differences submitted by the Member States to ICAO concerning the data quality requirements from the relevant ICAO Annexes as indicated above.

**[DQR-REQ-070]** When exchanging aeronautical data and/or aeronautical information between themselves the parties within the responsibility of a Member State that formally adopted the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 **shall** include the version of the Harmonised List which is applied in the Formal Arrangements.

Note: It is likely that, in the future, the Harmonised List will be revised without the need to revise the text of the Specification itself. Therefore, the version control of the HL will be independent of the version control of the Specification. A mechanism will be implemented to ensure consistency.

**[DQR-REQ-080]** If the Member State considers that the traceability and timeliness requirements generally covered by ICAO Annex 15 and/or the Regulation (EU) 73/2010 are insufficient for their operations, the Member State **shall** define the data quality requirements to cover the following for each data item if deemed relevant:

1) the ability to determine the origin of the data;
2) the level of assurance that the data is made available to the next intended user prior to its effective start date/time and not deleted before its effective end date/time.

Note: The text of the items 1 and 2 above is repeated verbatim from the provisions of Commission Regulation (EU) 73/2010. These specific data quality requirements were not included in the Harmonised List because they are already generally addressed in the provisions of the Commission Regulation (EU) 73/2010, namely in Articles 4 and Annex I, Part C and in Articles 7(3) and 7(4). Therefore demonstrating compliance with those particular articles shall be considered sufficient for compliance with this requirement. However, the Member State still has the possibility to strengthen the data quality requirements for specific data items or sets of data items (e.g. Critical data items). This can be done either by defining specific data quality requirements by their own means (e.g. trough formal arrangements) or by adopting the EUROCONTROL Specification for Data Assurance Levels which indicating objectives that address the processes to ensure traceability, consistency and timeliness of aeronautical data and aeronautical information for each data integrity level (Routine, Essential and Critical).

**[DQR-REQ-090]** Each Member State that formally adopts the EUROCONTROL Specification for Data Quality Requirements as the basis for compliance with Article 6(1) and Annex IV, Part A of Commission Regulation (EU) 73/2010 **shall** implement the adequate processes that will allow to monitor the validity of the data quality requirements of the HL, within its national context, in order to be able to identify new or updated requirements which may be triggered by new or enhanced concepts of operation..

**[DQR-REQ-100]** When analysing and defining data quality requirements the Member State **should**, as far as is practicable, consider the views expressed by data users within that Member State to ensure that data quality requirements are both appropriate and consistent at a global level.

## 3.2 Addition of Individual Data Items or Datasets

**[DQR-REQ-110]** Any Member State **may** propose the addition of a new individual data item or application dataset to the Harmonised List.

**[DQR-REQ-120]** Addition of individual data items or datasets **shall** only be made after the Member State has ensured that an appropriate safety assessment in accordance with the requirement **[DQR-REQ-300]** had been carried out.

**[DQR-REQ-130]** Member States **should** seek advice and assistance from other Member States, ICAO or from EUROCONTROL if they consider that this would support the process of assessing the feasibility of these additions.

**[DQR-REQ-140]** The proposal for the addition of individual data items or datasets **shall** be sent to EUROCONTROL accompanied, as a minimum, by:

1) The rationale supporting the proposal;
2) The description of the data item or dataset to be added;
3) The proposed Textual ID of the data item or dataset;
4) In case of an dataset, the description and proposed Textual ID of all individual data items needed to support it;
5) Identification of all relevant uses of the data item or dataset;
6) The proposed values for accuracy and resolution of the data item or dataset, where relevant;
7) The proposed data integrity level of the data item or dataset, according to the ICAO DIL classification (Routine, Essential or Critical);
8) The description of the methodology that was used to derive and validate the data quality requirements;
9) The documentation of the safety assessment process.

Note: EUROCONTROL will consult on these proposals for additions with all Member States that had formally adopted the EUROCONTROL Specification for Data Quality Requirements. If the outcome of this consultation is positive, EUROCONTROL will publish a new version of the Specification which will include the new data items or datasets.

**[DQR-REQ-150]** When carrying out the required safety assessments to establish new data quality requirements the Member State **should**, as far as is practicable, involve the relevant data users.

**[DQR-REQ-160]** Any party involved in the origination, production, storage, handling, processing, transfer or distribution of aeronautical data or aeronautical information who considers that the range of individual data items or datasets included in the Harmonised List is incomplete **should** report any such concerns to the relevant Member State.

## 3.3 Modification of Data Quality Requirements

*The following requirements only apply to changes to data items or datasets that are included in the HL.*

**[DQR-REQ-170]** Any Member State **may** propose the modification of the values for the accuracy, resolution or integrity level of the data items or datasets that are included in the Harmonised List.

**[DQR-REQ-180]** Modification of the values for the accuracy, resolution or integrity level of the data items or datasets that are included in the Harmonised List **shall** only be made after the Member State has ensured that an appropriate safety assessment in accordance with the requirement **[DQR-REQ-300]** had been carried out.

**[DQR-REQ-190]** Member States **should** seek advice and assistance from other Member States, ICAO or from EUROCONTROL if they consider that this would assist in the process of assessing the feasibility of these modifications.

**[DQR-REQ-200]** The proposal for the modification of data quality requirements of data items or datasets included in the Harmonised List **shall** be sent to EUROCONTROL accompanied, as a minimum, by:

1) The rationale supporting the proposal;
2) The Reference ID of the data item or dataset to be modified;
3) In case of an dataset, the identification of all individual data items that are modified;
4) Identification of all relevant uses of the data item or dataset that triggered the request for modification;
5) The new proposed values for accuracy and resolution of the data item or dataset, where relevant;
6) The new proposed data integrity level of the data item or dataset, according to the ICAO DIL classification (Routine, Essential or Critical);
7) The description of the methodology that was used to derive and validate the new data quality requirements;
8) The documentation of the safety assessment process.

Note: EUROCONTROL will consult on these proposals for modifications with all Member States that had formally adopted the EUROCONTROL Specification for Data Quality Requirements. If the outcome of this consultation is positive, EUROCONTROL will publish a new version of the Specification which will include the new values.

**[DQR-REQ-210]** When carrying out the required safety assessments to establish updated data quality requirements the Member State **should**, as far as is practicable, involve the relevant data users.

**[DQR-REQ-220]** Any party involved in the origination, production, storage, handling, processing, transfer or distribution of aeronautical data or aeronautical information who considers that the data quality requirements defined in the Harmonised List are incorrect or incomplete **should** report any such concerns to the relevant Member State.

## 3.4 Removal of Individual Data Items

**[DQR-REQ-230]** Any Member State **may** propose the removal of an individual data item from the Harmonised List or the dataset.

**[DQR-REQ-240]** Member States **should** seek advice and assistance from other Member States, ICAO or from EUROCONTROL if they consider that this would assist in the process of assessing the feasibility of these removals.

**[DQR-REQ-250]** The proposal for the removal from the Harmonised List of individual data items or datasets **shall** be sent to EUROCONTROL accompanied, as a minimum, by:

1) The rationale supporting the proposal;
2) The Reference ID of the data item or dataset to be removed.

Note: EUROCONTROL will consult on these proposals for modifications with all Member States that had formally adopted the EUROCONTROL Specification for Data Quality Requirements. If the outcome of this consultation is positive, EUROCONTROL will publish a new version of the Specification which will include the new values.

## 3.5 Safety Assessment

**[DQR-REQ-300]** The safety assessment process to support the establishment of new or updated data quality requirements **shall** be documented and include all the necessary steps to derive the data quality requirements to ensure data of sufficient quality are provided to meet the intended use for each data item under consideration, as a minimum:

1) Identify all relevant uses for the aeronautical data item or dataset.
2) Conduct Hazard Identification and Analysis.
3) Determine accuracy and resolution requirements taking into consideration:
   a) The functionality, performance and availability required by the intended use to achieve an acceptable level of safety.
   b) The inherent limitations in originating the data item or dataset.
4) Determine the data integrity level, based on the results of step 1 and step 2, for the most stringent use.
5) Consider the necessity to assign requirements for the ability to determine the origin of the data, other than the ones already defined in Annex I Part C of Commission Regulation (EU) 73/2010.
6) Consider the necessity to assign requirements for the level of assurance that the data is made available to the next intended user prior to its effective start date/time and not deleted before its effective end date/time, other than the ones already defined in Article 7(3) and Article 7(4) of Commission Regulation (EU) 73/2010.

Note 1: The steps described above are compatible with the EUROCONTROL Safety Assessment Methodology[5] and are therefore considered to be representative of an internationally recognised standard.

Note 2: The safety assessment process has been defined at a high level, effectively defining the 'what' needs to be done. This allows a degree of flexibility in the 'how' this will have to be carried out.

Note 3: Specific guidance material can also be found in the document "EUROCONTROL Guidance for the implementation of safety management objectives and safety assessments falling within the scope of EU Regulation 73/2010"; Edition 2.0, dated November 2014. Consult online: http://www.eurocontrol.int/articles/adq-library

[5] Refer to http://www.eurocontrol.int/articles/safety-assessment-methodology-sam

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# ANNEX A - CONFIGURATION CONTROL

## A.1 MoC Element Identification

| MoC_Name | MoC_ID | MoC_Edition |
|---|---|---|
| EUROCONTROL Specification for Data Quality Requirements | EUROCONTROL-SPEC-152 | 1.2 |

## A.2 MoC Element Change Record

| Specification Document Identifier | Edition Number | Edition Date | Reason for Change | Sections Affected |
|---|---|---|---|---|
| EUROCONTROL-SPEC-152 | 1.2 | 25/02/2016 | Released Issue | All |

## A.3 MoC Element Traceability Towards Regulatory Provisions

| Specification Document Identifier | Edition Number | Implementing Rule References | References of Regulatory Provisions | Validation Date |
|---|---|---|---|---|
| EUROCONTROL-SPEC-152 | 1.2 | Commission Regulation (EU) 73/2010 | Article 6(1) | 25/02/2016 |

# ANNEX B - CONFORMITY MATERIAL

This section specifies the conformity assessment material available for this EUROCONTROL Specification.

| **Identifier** | **Feature** | **Compliance Standard**<br>M = Mandatory<br>R= Recommended<br>O = Optional |
|---|---|---|
| DQR-REQ-010 | Notification of the formal adoption (Member State) | M |
| DQR-REQ-020 | Ensure compliance of air navigation service providers (Member State) | M |
| DQR-REQ-030 | Ensure compliance of other parties (Member State) | R |
| DQR-REQ-040 | Implementation of processes to comply with the data quality requirements (ANSP) | M |
| DQR-REQ-050 | Adoption and implementation without prejudice of compliance with other provisions of Commission Regulation (EU) 73/2010 (Member States and ANSP) | M |
| DQR-REQ-060 | Notification to EUROCONTROL of ICAO differences (Member State) | M |
| DQR-REQ-070 | Inclusion of the Harmonised List version in the Formal Arrangements (ANSP) | M |
| DQR-REQ-080 | Additional traceability and timeliness requirements (Member State) | M |
| DQR-REQ-090 | Monitor validity of data quality requirements (Member State) | M |
| DQR-REQ-100 | Consider views expressed by data users (Member State) | R |
| DQR-REQ-110 | Propose additions of data items to the HL (Member State) | O |
| DQR-REQ-120 | Additions supported by safety assessment (Member State) | M |
| DQR-REQ-130 | Seek advice and assistance from other Member States, ICAO or from EUROCONTROL to assess additions (Member State) | R |

| Identifier | Feature | Compliance Standard<br>M = Mandatory<br>R= Recommended<br>O = Optional |
|---|---|---|
| DQR-REQ-140 | Material to support proposals for additions (Member State) | M |
| DQR-REQ-150 | Involve data users in safety assessment of additions (Member State) | R |
| DQR-REQ-160 | Report concerns for additions (All Parties) | R |
| DQR-REQ-170 | Propose modification to the data quality requirements of the HL (Member State) | O |
| DQR-REQ-180 | Modifications supported by safety assessment (Member Sate) | M |
| DQR-REQ-190 | Seek advice and assistance from other Member States, ICAO or from EUROCONTROL to assess modifications (Member State) | R |
| DQR-REQ-200 | Material to support proposals for modifications (Member State) | M |
| DQR-REQ-210 | Involve data users in safety assessment of modifications (Member State) | R |
| DQR-REQ-220 | Report concerns for modifications (All Parties) | R |
| DQR-REQ-230 | Propose removals from the Harmonised List (Member State) | O |
| DQR-REQ-240 | Seek advice and assistance from other Member States, ICAO or from EUROCONTROL to assess removals (Member State) | R |
| DQR-REQ-250 | Material to support proposals for removals (Member State) | M |
| DQR-REQ-300 | Safety assessment methodology (All Parties) | M |

# ANNEX C - TRACEABILITY TO REGULATORY PROVISIONS

This Annex provides traceability from the provisions of Commission Regulation (EU) 73/2010 to the detailed technical requirements of the EUROCONTROL Specification for Data Quality Requirements.

| **ADQ IR Reference** | **Requirement** | **DQR Requirement** |
|---|---|---|
| Article 6(1) | *Member States shall ensure that air navigation service providers comply with the data quality requirements laid down in Annex IV, Part A.* | DQR-REQ-010<br>DQR-REQ-020 |
| Annex IV, Part A (1) | *Data quality requirements for each data item within the scope of aeronautical data and aeronautical information referred to in Article 1(2) shall be as defined by the ICAO standards referred to in Annex III point (11) and other relevant ICAO standards without prejudice to point 2 of this Annex.* | DQR-REQ-010<br>DQR-REQ-020 |
| Annex IV, Part A (2) | *Data quality requirements for a data item within the scope of aeronautical data and aeronautical information referred to in Article 1(2) shall be established based on a safety assessment of the intended uses of the data item where:*<br>*(a) a data item is not defined by the ICAO data quality standards referred to in Annex III point (11) and other relevant ICAO standards; or*<br>*(b) the data quality requirements for a data item are not met by the ICAO data quality standards referred to in Annex III point (11) and other relevant ICAO standards.* | DQR-REQ-110<br>DQR-REQ-120<br>DQR-REQ-140<br>DQR-REQ-170<br>DQR-REQ-180<br>DQR-REQ-200<br>DQR-REQ-300 |
| Annex IV, Part A (3) | *The data quality requirements for the data items referred to in point 2 shall be developed in accordance with a standardised process describing the methodology for the derivation and validation of these requirements prior to publication, taking due* | DQR-REQ-090<br>DQR-REQ-140<br>DQR-REQ-200 |

| ADQ IR Reference | Requirement | DQR Requirement |
|---|---|---|
| | *account of the potential impact on relevant ICAO provisions.* | |
| Annex IV, Part A (4) | *Where a data item has more than one intended use, only the most stringent data quality requirements, arising from the safety assessment referred to in point 2, shall be applied to it.* | DQR-REQ-140<br>DQR-REQ-200<br>DQR-REQ-300 |
| Annex IV, Part A (5) | *Data quality requirements shall be defined to cover the following for each data item within the scope of aeronautical data and aeronautical information referred to in Article 1(2):*<br>*(a) the accuracy and resolution of the data;*<br>*(b) the integrity level of the data;*<br>*(c) the ability to determine the origin of the data;*<br>*(d) the level of assurance that data is made available to the next intended user prior to its effective start date/time and not removed before its effective end date/time.* | DQR-REQ-010<br>DQR-REQ-020<br>DQR-REQ-080 |
| Annex IV Part, A (6) | *All of the data items needed to support each dataset and/or a valid sub-set of the dataset shall be defined.* | DQR-REQ-140<br>DQR-REQ-200 |

# ANNEX D - SPECIFICATION UPDATE PROCEDURES

It is necessary to periodically check this EUROCONTROL Specification for consistency with referenced material, notably ICAO international and regional SARPs and manuals. It is also expected to evolve following real project and field experience, as well as advances in technology.

The main objectives of the continuous review are:

- to improve the quality of the requirements (e.g. clarity, testability, etc.);
- to verify that the level of detail published is adequate;
- to ensure that design-oriented requirements, imposing unnecessary constraints to technical solutions, have been avoided;
- to ensure that advances in technology are properly reflected;
- to make the supplying industry aware of the developments and directions in Aeronautical Information systems and prepared to cover and supply the appropriate systems.

Updates will follow EUROCONTROL Notice of Proposed Rule Making (ENPRM) procedures[6] using the process outlined in this section.

The update process for this EUROCONTROL Specification may be summarised as follows:

1) All change proposals and issued changes to referenced documents will be checked in detail by an Impact Assessment Group. An Impact Assessment Report will be generated.
2) A new Internal Draft will be composed to propose changes, covering the impact assessment, for internal discussion.
3) The new Internal Draft will be assessed for conformance against the regulations, any relevant ICAO policies and safety considerations.
4) If necessary further Internal Drafts will be produced.
5) In case of substantial changes a new Intermediate Draft will be issued for review by Stakeholders in accordance with ENPRM mechanisms. Workshops may need to be conducted depending on the extent of the changes.
    a) Following the reception of comments, further Intermediate Drafts will be produced, as necessary, and distributed for confirmation of correct update (optional).
    b) Following a suitable period for further response, assuming that no objections have been raised, the resulting draft will be upgraded to the new Baseline Version. Approval and document change record sections will be updated accordingly. A date will be negotiated with Stakeholders and set for applicability of the revised facilities. The new baseline document will be considered to be in force from that date onwards.
6) Where appropriate, a recommendation will be made to the European Commission to update the reference in the Official Journal of the European Union to recognise this new version as a European Community Specification acceptable as a MoC with the European Community Regulations.
7) In case of minor maintenance, such as smaller revisions to the Harmonised List, the Specification will be published and the stakeholders (based on the ENPRM distribution list) will be informed about the existence of the new version of the Specification.

[6] ENPRM procedures can be found at: http://www.eurocontrol.int/articles/enprm-consultation-process .

# ANNEX E - HARMONISED LIST

| Data Quality Requirements Harmonised List (DQR HL) | Version 1.2 | 25/02/2016 |
|---|---|---|

**NOTE: An Excel spreadsheet version of the DQR Harmonised List is available via: http://www.eurocontrol.int/articles/adq-library**

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| **LATITUDE AND LONGITUDE** | | | | | | | |
| LL001 | Flight information region boundary points | 1 min | Annex 15 | 2 km | Annex 11 | declared | routine |
| LL002 | P, R, D area boundary points (outside CTA/CTR boundaries) | 1 min | Annex 15 | 2 km | Annex 11 | declared | routine |
| LL003 | P, R, D area boundary points (inside CTA/CTR boundaries) | 1 sec | Annex 15 | 100 m | Annex 11 | calculated | essential |
| LL004 | CTA/CTR boundary points | 1 sec | Annex 15 | 100 m | Annex 11 | calculated | essential |
| LL005 | En-route NAVAIDS, intersections and waypoints, and holding, and STAR/SID points | 1 sec | Annex 15 | 100 m | Annex 11 | surveyed/calculated | essential |
| LL007 | Aerodrome reference point | 1 sec | Annex 15 | 30 m | Annex 14 V1 | surveyed/calculated | routine |
| LL008 | Heliport reference point | 1 sec | Annex 15 | 30 m | Annex 14 V2 | surveyed/calculated | routine |
| LL009 | NAVAIDS located at the aerodrome | 1/10 sec | Annex 15 | 3 m | Annex 14 V1 | surveyed | essential |
| LL010 | NAVAIDS located at the heliport | 1/10 sec | Annex 15 | 3 m | Annex 14 V2 | surveyed | essential |
| LL016 | Final approach fixes/points and other essential fixes/points comprising the instrument approach procedure | 1/10 sec | Annex 15 | 3 m | Annex 11 | surveyed/calculated | essential |

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| LL017 | Runway threshold | 1/100 sec | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LL018 | Runway end | 1/100 sec | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LL019 | Runway holding position | 1/100 sec | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | critical |
| LL020 | Runway centre line points | - | - | 1 m | Annex 14 V1 | surveyed | critical |
| LL021 | Taxiway centre line/parking guidance line points | 1/100 sec | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | essential |
| LL022 | Helicopter ground taxiway centre line points and helicopter air taxiway points | - | - | 0.5 m | Annex 14 V2 | surveyed/calculated | essential |
| LL042 | Helicopter ground taxiway intersection marking line | - | - | 0.5 m | Annex 14 V2 | surveyed | essential |
| LL023 | Taxiway intersection marking line | 1/100 sec | Annex 15 | 0.5 m | Annex 14 V1, V2 | surveyed | essential |
| LL025 | Exit guidance line | 1/100 sec | Annex 15 | 0.5 m | Annex 14 V1, V2 | surveyed | essential |
| LL027 | Aircraft stand points/INS checkpoints | 1/100 sec | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | routine |
| LL028 | Helicopter stand points/INS checkpoints | - | - | 0.5 m | Annex 14 V2 | surveyed | routine |
| LL029 | Geometric centre of TLOF or FATO thresholds | 1/100 sec | Annex 15 | 1 m | Annex 14 V2 | surveyed | critical |
| LL030 | Apron boundaries (polygon) | 1/10 sec | Annex 15 | 1 m | Annex 14 V1, V2 | surveyed | routine |
| LL032 | De-icing/anti-icing facility (polygon) | 1/10 sec | Annex 15 | 1 m | Annex 14 V1, V2 | surveyed | routine |
| LL034 | Obstacles in Area 1 | 1 sec | Annex 15 | 50 m | Annex 15[7] | surveyed[8] | routine |

[7] LL034-LL037: Horizontal accuracy ref. ICAO Annex 15, Appendix 8, table A8-2

[8] LL034-LL035: Data Type ref. ICAO Annex 11, Appendix 5

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| LL035 | Obstacles in Area 2 | 1/10 sec | Annex 15 | 5 m | Annex 15 | surveyed | essential |
| LL036 | Obstacles in Area 3 | 1/10 sec | Annex 15 | 0.5 m | Annex 15 | - | essential |
| LL037 | Obstacles in Area 4 | - | - | 2.5 m | Annex 15 | - | essential |
| LL038 | Terrain in Area 1 | - | - | 50 m | Annex 15[9] | - | routine |
| LL039 | Terrain in Area 2 | - | - | 5 m | Annex 15 | - | essential |
| LL040 | Terrain in Area 3 | - | - | 0.5 m | Annex 15 | - | essential |
| LL041 | Terrain in Area 4 | - | - | 2.5 m | Annex 15 | - | essential |
| LL042 | FPAP for SBAS Procedures | 5/10000 | DOC 8168 | 0.3 m | DOC 8168 | calculated | critical |
| LL043 | LTP/FTP for SBAS Procedures | 5/10000 | DOC 8168 | 0.3 m | DOC 8168 | calculated | critical |
| **ELEVATION / ALTITUDE / HEIGHT** | | | | | | | |
| EH001 | Aerodrome elevation | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | essential |
| EH002 | Heliport elevation | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V2 | surveyed | essential |
| EH003 | WGS-84 geoid undulation at aerodrome elevation position | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | essential |
| EH004 | WGS-84 geoid undulation at heliport elevation position | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V2 | surveyed | essential |
| EH005 | Runway threshold, non-precision approaches | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | essential |
| EH006 | FATO threshold, for heliports with or without a PinS approach | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V2 | surveyed | essential |
| EH007 | WGS-84 geoid undulation at runway threshold, non-precision approaches | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V1 | surveyed | essential |

[9] LL038-LL041: Horizontal accuracy ref. ICAO Annex 15, Appendix 8, table A8-1

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| EH008 | WGS–84 geoid undulation at FATO threshold, TLOF geometric centre, for heliports with or without a PinS approach | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V2 | surveyed | essential |
| EH009 | Runway threshold, precision approaches | 0.1 m or 0.1 ft | Annex 15 | 0.25 m | Annex 14 V1 | surveyed | critical |
| EH010 | FATO threshold, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.1 m or 0.1 ft | Annex 15 | 0.25 m | Annex 14 V2 | surveyed | critical |
| EH011 | WGS-84 geoid undulation at runway threshold, precision approaches | 0.1 m or 0.1 ft | Annex 15 | 0.25 m | Annex 14 V1 | surveyed | critical |
| EH012 | WGS–84 geoid undulation at FATO threshold, TLOF geometric centre, for heliports intended to be operated in accordance with ICAO Annex 14, Appendix 2 | 0.1 m or 0.1 ft | Annex 15 | 0.25 m | Annex 14 V2 | surveyed | critical |
| EH013 | Runway centre line points | - | - | 0.25 m | Annex 14 V1 | surveyed | critical |
| EH014 | Taxiway centre line/parking guidance line points | - | - | 1 m | Annex 14 V1 | surveyed | essential |
| EH015 | Helicopter ground taxiway centre line points and helicopter air taxiway points | - | - | 1 m | Annex 14 V2 | surveyed | essential |
| EH016 | Threshold crossing height (reference datum height), precision approaches | 0.1 m or 0.1 ft | Annex 15 | 0.5 m | Annex 11 | calculated | critical |
| EH023 | Obstacle clearance altitude/height (OCA/H) | - | - | as specified in PANS-OPS (Doc 8168) | Annex 11 | - | essential |
| EH024 | Distance measuring equipment/precision (DME/P) | 3 m (10 ft) | Annex 15 | 3 m | Annex 14 V1, V2 | surveyed | essential |

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| EH026 | Distance measuring equipment (DME) | 30 m (100 ft) | Annex 15 | 30 m or 100 ft | Annex 11 | surveyed | essential |
| EH027 | Instrument approach procedures altitude | - | - | as specified in PANS-OPS (Doc 8168) | Annex 11 | - | essential |
| EH028 | Minimum altitudes | 50 m or 100 ft | Annex 15 | 50 m | Annex 11 | calculated | routine |
| EH029 | Obstacles in Area 1 | 1m | Annex 15[10] | 30 m | Annex 15[11] | surveyed[12] | routine |
| EH030 | Obstacles in Area 2 | 0.1 m | Annex 15 | 3 m | Annex 15 | surveyed | essential |
| EH031 | Obstacles in Area 3 | 0.01 m | Annex 15 | 0.5 m | Annex 15 | - | essential |
| EH032 | Obstacles in Area 4 | 0.1 m | Annex 15 | 1 m | Annex 15 | - | essential |
| EH033 | Terrain in Area 1 | 1 m | Annex 15[13] | 30 m | Annex 15[14] | - | routine |
| EH034 | Terrain in Area 2 | 0.1 m | Annex 15 | 3 m | Annex 15 | - | essential |
| EH035 | Terrain in Area 3 | 0.01 m | Annex 15 | 0.5 m | Annex 15 | - | essential |
| EH036 | Terrain in Area 4 | 0.1 m | Annex 15 | 1 m | Annex 15 | - | essential |
| EH037 | GBAS Reference Point | 1 m or 1 ft | Annex 15 | - | - | - | essential |
| EH038 | Heliport crossing height, PinS approaches | 1 m or 1 ft | Annex 15 | 0.5 m | Annex 14 V2 | calculated | essential |

[10] EH029-EH032: Vertical resolution ref. Annex 15, App 8, Table A8-2

[11] EH029-EH032: Vertical accuracy ref. Annex 15, App 8, Table A8-2

[12] EH029-EH030: Data Type ref. ICAO Annex 11, Appendix 5

[13] EH033-EH036: Vertical resolution ref. Annex 15, App 8, Table A8-1

[14] EH033-EH036: Vertical accuracy ref. Annex 15, App 8, Table A8-1

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| **DECLINATION AND MAGNETIC VARIATION** | | | | | | | |
| DM001 | VHF NAVAID station declination used for technical line-up | 1 degree | Annex 15 | 1 degree | Annex 11 | surveyed | essential |
| DM002 | NDB NAVAID magnetic variation | 1 degree | Annex 15 | 1 degree | Annex 11 | surveyed | routine |
| DM003 | Aerodrome magnetic variation | 1 degree | Annex 15 | 1 degree | Annex 14 V1 | surveyed | essential |
| DM004 | Heliport magnetic variation | 1 degree | Annex 15 | 1 degree | Annex 14 V2 | surveyed | essential |
| DM005 | ILS localizer antenna magnetic variation | 1 degree | Annex 15 | 1 degree | Annex 14 V1, V2 | surveyed | essential |
| DM007 | MLS azimuth antenna magnetic variation | 1 degree | Annex 15 | 1 degree | Annex 14 V1, V2 | surveyed | essential |
| **BEARING** | | | | | | | |
| BR001 | Airway segments | 1 degree | Annex 15 | 1/10 degree | Annex 11 | calculated | routine |
| BR002 | Bearing used for the formation of an en-route and of a terminal fix | 1/10 degree | Annex 15 | 1/10 degree | Annex 11 | calculated | routine |
| BR003 | Terminal arrival/departure route segments | 1 degree | Annex 15 | 1/10 degree | Annex 11 | calculated | routine |
| BR004 | Bearing used for the formation of an instrument approach procedure fix | 1/100 degree | Annex 15 | 1/100 degree | Annex 11 | calculated | essential |
| BR005 | ILS localizer alignment (True) | 1/100 degree | Annex 15 | 1/100 degree | Annex 14 V1, V2 | surveyed | essential |
| BR007 | MLS zero azimuth alignment (True) | 1/100 degree | Annex 15 | 1/100 degree | Annex 14 V1, V2 | surveyed | essential |
| BR009 | Runway bearing (True) | 1/100 degree | Annex 15 | 1/100 degree | Annex 14 V1 | surveyed | routine |

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| BR010 | FATO bearing (True) | 1/100 degree | Annex 15 | 1/100 degree | Annex 14 V2 | surveyed | routine |
| **LENGTH / DISTANCE / DIMENSION** | | | | | | | |
| LD001 | Airway segment length | 1/10 km or 1/10 NM | Annex 15 | 1/10 km | Annex 11 | calculated | routine |
| LD002 | Distance used for the formation of an en-route fix | 1/10 km or 1/10 NM | Annex 15 | 1/10 km | Annex 11 | calculated | routine |
| LD003 | Terminal arrival/departure route segment length | 1/100 km or 1/100 NM | Annex 15 | 1/100 km | Annex 11 | calculated | essential |
| LD004 | Distance used for the formation of a terminal and instrument approach procedure fix | 1/100 km or 1/100 NM | Annex 15 | 1/100 km | Annex 11 | calculated | essential |
| LD005 | Runway length | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LD006 | FATO length, TLOF dimensions | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V2 | surveyed | critical |
| LD007 | Runway width | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | essential |
| LD008 | Displaced threshold distance | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | routine |
| LD009 | Clearway length and width | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1, V2 | surveyed | essential |
| LD011 | Stopway length and width | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LD012 | Landing distance available | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1, V2 | surveyed | critical |
| LD014 | Take-off run available | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LD015 | Take-off distance available | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1, V2 | surveyed | critical |

| REF ID | Data Item | RESOLUTION | *SOURCE* | ACCURACY | *SOURCE* | Data Type | INTEGRITY CASSIFICATION |
|---|---|---|---|---|---|---|---|
| LD017 | Rejected take-off distance available | - | - | 1 m | Annex 14 V2 | surveyed | critical |
| LD018 | Accelerate-stop distance available | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | critical |
| LD019 | Runway shoulder width | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | essential |
| LD020 | Taxiway width (aerodrome) | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | essential |
| LD021 | Helicopter ground or air taxiway/taxi-route width | - | - | 1 m | Annex 14 V2 | surveyed | essential |
| LD022 | Taxiway shoulder width | 1 m or 1 ft | Annex 15 | 1 m | Annex 14 V1 | surveyed | essential |
| LD023 | ILS localizer antenna-runway end, distance | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1 | calculated | routine |
| LD024 | ILS localizer antenna-FATO end, distance | - | - | 3 m | Annex 14 V2 | calculated | routine |
| LD025 | ILS glide slope antenna-threshold, distance along centre line | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1,V2 | calculated | routine |
| LD027 | ILS marker-threshold distance | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1, V2 | calculated | essential |
| LD029 | ILS DME antenna-threshold, distance along centre line | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1,V2 | calculated | essential |
| LD031 | MLS azimuth antenna-runway end, distance | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1 | calculated | routine |
| LD032 | MLS azimuth antenna-FATO end, distance | - | - | 3 m | Annex 14 V2 | calculated | routine |
| LD033 | MLS elevation antenna-threshold, distance along centre line | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1, V2 | calculated | routine |
| LD035 | MLS DME/P antenna-threshold, distance along centre line | 1 m or 1 ft | Annex 15 | 3 m | Annex 14 V1, V2 | calculated | essential |

# ANNEX F - AMENDMENTS TO SPECIFICATION

**Amendments applied to Version 1.2:**

- No major changes overall and no changes to the requirements contained in chapter 3. Some revisions related to editorial changes and document configuration.
- Following items were added into the HL in coordination with the ARWG:
  - LL0042
  - LL0043
  - EH0037
  - EH0038
- For traceability of main revisions a new Annex F has been added.

**Amendments applied to Version 1.1:**

- No major changes were applied to the main body of the DQR Specification. Some revisions related to editorial changes, consistency and updates on document configuration management.
- Most (still minor) changes occurred in Annex E - Harmonised List:
  - Requirements were brought in line with the latest editions of the relevant ICAO Annexes:
    - Annex 15: Fourteenth edition, July 2013 (incorporating AMDT 38).
    - Annex 14:
      Volume I - Sixth edition, July 2013 (incorporating AMDT 11A incl. Corr 1 dated 20/12/13); Appendix 5.
      Volume II - Fourth edition, July 2013 (incorporating AMDT 5); Appendix 1.
    - Annex 11: Thirteenth edition, July 2001 (incorporating AMDT 49 dated 14/11/13); Appendix 5.

    *Note 1: In most cases the requirements are based on Annex 15 as baseline, however those were complemented by some requirements stemming from Annex 11 and Annex 14.*
  - Columns renamed to be more consistent with ICAO. Note: The term "integrity level" in the body of the Specification has been retained because this term is used in the ADQ IR. However, in the context of the DQR Spec the term "integrity level" means the same as the ICAO term “integrity classification".
  - The numbering of the HL (REF ID) retained the sequence of original Ref IDs, meaning that deletions are now void (e.g. LL006 is not used anymore) and new items were allocated the next available number from within a specific sub-section. For example LL042 has been added but follows LL022 due to subject matter relevance.
  - Concerning deletion of whole rows, most of those are linked with grouping all Terrain and Obstacle data items at the end and within the relevant subsection. E.g.: removal of LL011-0015; addition of LL034-LL041.
  - Obstacle and Terrain data items were added (moved) consistently and requirements are mainly based on Appendix 8 of Annex 15 - example LL034-LL041. Footnotes in the respective cells indicate the specific source applied.
  - In case of combined subjects without identical data item text or with differing requirements, for ease of usability, those were split into separate rows for aerodromes and

heliports. Specific requirement sources were added - example: LL007, LL008.
*Note: for the same case but where the data item text was identical, the lines were merged and the distinction into "(airports)"vs "heliports" was removed. If needed, specific sources were defined (Annex 14, Vol. I or Vol. II) – example LL023, LL024.*

- In some instances, the data item text merged/edited Annex 15 text with Annex 14 data item text – example EH008, EH010.
- New data items were added for consistency: LL042.

Note: A listing of main deletions, additions, modifications applied to the Harmonised List can also be found in the ADQ library.

- End of document -

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