UK Civil Aviation Authority

Aeronautical Data Quality – Guidance for the provision and maintenance of aeronautical data and aeronautical information in UK Aeronautical Information Products

CAP 1054

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Revision History

Edition 1 June 2015

CAP 1054 was first published in 2015 to notify United Kingdom policy and provide guidance for the origination, management, transmission and distribution of aeronautical data and aeronautical information published in the Integrated Aeronautical Information Package (IAIP).

Edition 2 January 2022

CAP 1054 was fundamentally revised between 2019-2021 to reflect all relevant policy decisions made in relation to the implementation of the ADQ IR (EU No. 73/2010) in the UK, the adoption of Amendment 40, 41 and 42 to ICAO Annex 15 and the implementation of UK Reg (EU) 2017/373 (including amendments effective on 27th January 2022).

Edition 3 May 2024

CAP 1054 was routinely reviewed and revised to reflect current regulatory environment and to include all relevant policy decisions made since Edition 2 was published. Annex A and B were moved to a separate file. Other minor amendments and clarifications were also included.

Foreword

Civil Aviation Authority (CAA) Civil Aviation Publications (CAPs) are based upon national legislation and non-legislative regulatory material, such as ICAO Standards and Recommended Practices. They are published in order to provide UK industry with:

a) guidance and clarification on the means of achieving compliance with global, and UK regulatory requirements, and where applicable:

b) details of any additional UK national requirements, and

c) Additional details regarding procedures and administrative processes to complement the applicable UK Regulations (and the Acceptable Means of Compliance and Guidance Material to the Regulations).

In publishing CAPs, the CAA satisfies the obligations placed upon it by the Transport Act 2000 [1], Chapter 1 Article 2 'CAA's general duty', which in paragraph 2(a) requires the CAA to exercise its functions under the Act in the manner it thinks best calculated, to further the interests of operators and owners of aircraft, owners and managers of aerodromes, persons travelling in aircraft and persons with rights in property carried in them. The only interests to be considered under subsection (2)(a) are interests regarding the range, availability, continuity, cost, and quality of air traffic services.

Publication of CAPs additionally satisfies the requirements set out by the Civil Aviation Authority (Chicago Convention) Directions 2007 to ensure that it acts consistently with the obligations placed on the UK under the Chicago Convention. The CAA is obliged to consider whether it is necessary to amend United Kingdom aviation legislation to ensure appropriate implementation of an ICAO provision.

Where (a) the CAA considers it inappropriate to transpose an ICAO provision into domestic legislation and (b) the CAA has discretionary power to enforce the requirements of such a provision through a certificate, licence, or other means of approval, the Civil Aviation Authority (Chicago Convention) Directions 2007 obliges the CAA to develop and publish such requirements as are necessary to implement the ICAO provision and shall ensure that it is able to verify adherence to those requirements.

CAPs are subject to periodic revision to take account of changes to source regulatory material, feedback from industry, and recognised best practice. CAP 1054 provides applicable guidance and clarification relating to – and is to be read in conjunction with - the regulatory material referenced below. Non-inclusion of source regulatory material within this CAP does not preclude the end user from either the need to be aware of, or the need

[1] http://www.legislation.gov.uk/ukpga/2000/38/contents or http://www.legislation.gov.uk/ukpga/2000/38/data.pdf

to comply with, the requirements contained within the source regulatory materials unless otherwise exempted from those requirements.

It is the policy of the UK government that, unless a Difference (from an ICAO requirement) has been established, compliance with relevant international (i.e., ICAO and applicable equivalents such as International Telecommunications Union) regulatory material is required to the extent mandated in law. Additionally, compliance with national requirements that are not addressed by international regulations is also required.

The words 'must', 'shall' and 'will' indicate that compliance with applicable regulatory requirements is necessary. In the case of Acceptable Means of Compliance, the word 'should' indicates that compliance is required, unless complying with a CAA approved alternative means of compliance.

Regulatory References

CAP 1054 is published to assist all parties involved in the data chain, understanding of, and compliance with the applicable requirements pertaining to origination, processing and distribution of aeronautical data and aeronautical information published in Aeronautical Information Products.

The following references are provided for convenience and are not exhaustive:

ICAO

- Annex 15 to the Convention on International Civil Aviation – Aeronautical Information Services (ICAO Annex 15)
- Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM)
- Annex 4 to the Convention on International Civil Aviation – Aeronautical Charts (ICAO Annex 4)

UK/EUROCONTROL/EUROCAE:

- Assimilated Regulation (EU) 2017/373, laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight ('ATM/ANS IR')[2]
- Assimilated Regulation (EU) No 139/2014, laying down requirements and administrative procedures related to aerodromes ('ADR IR')

[2] The applicability of UK Reg (EU) 2017/373 goes beyond ATM/ANS requirements, in relation to Article 3(5), see paragraphs 2.19-2.20.

- EUROCONTROL Guidelines Supporting the Implementation of Aeronautical Information Requirements (“the AIR Guide”) – Edition 1.0 (7 Dec 2020)
- EUROCONTROL Guidelines Operating Procedures for AIS Dynamic Data (OPADD) – Edition 4.1 (7 Dec 2020)
- EUROCONTROL Specification for the Electronic Aeronautical Information Publication (eAIP) – Edition 3.0 (30 November 2021)
- EUROCONTROL Specification for the Origination of Aeronautical Data: Guidance Material (DO) – Edition 2.0 (16 December 2021)
- EUROCONTROL Terrain and Obstacle Data Manual (‘TOD Manual’) – Edition 3.0 (4 May 2021)
- EUROCONTROL Guidelines on the Implementation of Safety Support Assessment for AIS – Edition 1.0 (7 Dec 2020)
- EUROCONTROL Guidelines for the provision of Metadata to support the Exchange of Aeronautical Data – Edition 1.0 (28 November 2019)
- EUROCONTROL Guidelines for harmonized AIP publication and data set provision – Edition 2.1 (31 May 2022)
- European Route Network Improvement Plan (ERNIP) - Part 1, Airspace Design Methodology Guidelines – General Principles and Technical Specifications for Airspace Design – Edition 2.7 (5 July 2023)
- CAA Publication CAP 1732 – Aerodrome Survey Guidance
- CAA Publication CAP 232 – Aerodrome Survey Information[3]
- CAA Publication CAP 738 – Aerodrome Safeguarding
- CAA Publication CAP 779 – Regulation of Aeronautical Information Management Services
- CAA Publication CAP 785 - Approval Requirements for Instrument Flight Procedures for use in UK Airspace
- CAA Publication CAP 1616 - Airspace Change Process
- CAA Publication CAP 722C - Unmanned Aircraft Systems – UK Airspace Restrictions

[3] Only applicable to aerodromes which are not in the scope of CAP 1732.

- CAA Publication CAP 1649 - Air Traffic Safety Electronics Personnel Training & Competence Requirements
- CAA Publication CAP 1430 – UK Air Traffic Management Vocabulary
- EUROCAE ED-76A Standards for Processing Aeronautical Data

Glossary of terms and recognised acronyms

In CAP 1054, where a term is used, which is defined by UK Regulation (EU) 2017/373 or by CAP 1430 UK Air Traffic Management Vocabulary, that definition will apply unless:

- the contrary is indicated; or
- there is a different definition in the Air Navigation Order.

The terms below have been listed for convenience or have been defined to avoid ambiguity or misunderstanding, or to provide definition of words or phrases which have specific meanings within this document. In some cases, they may be slight modifications of definitions in other documents.

Aeronautical Chart

A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

Aeronautical Information (AI)

Information resulting from the assembly, analysis, and formatting of aeronautical data.

Sponsor

The person nominated by the Authorised Source (party) to provide data to the UK AISP. The Authorised Source may nominate one or more individuals as Sponsors and the Authorised Source (person) may act as the Sponsor. See the definition of “Authorised Source”.

UK Aeronautical Information Service Provider (UK AISP)

The Air Navigation Service Provider (NATS (En Route) plc) certified by the CAA to provide the UK Aeronautical Information Service.

Air Defence Identification Zone (ADIZ)

Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services.

Application

Manipulation and processing of data in support of user requirements

Aurora

The Aeronautical Information Management System used by the UK AISP to receive, process, publish and store aeronautical data and aeronautical information.

Aurora Data Originators Portal

An integral part of the Aurora AIM System providing a single interface between Authorised Sources (and their nominated Sponsors) and the AISP.

Authorised Source

The party responsible for the provision of aeronautical data to AIS and the person (role) nominated to represent the organization, ultimately accountable for the provision and maintenance of aeronautical data and aeronautical information published by the organisation in the Aeronautical Information Products. Normally the Accountable Manager or a competent person formally appointed by the Accountable Manager is directly responsible for all aeronautical data activities and aeronautical information provision activities in the organisation. The Authorised Source can sign a Formal Arrangement with AIS on the provision of aeronautical data/information on behalf of the organisation. The Authorised Source can nominate individuals (“Sponsors”), who are responsible for submitting changes to AIS products within a clearly defined scope of authorised changes (data items).

Calendar

Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day

Constituents

Tangible objects such as hardware and intangible objects such as software upon which the interoperability of the EATMN depends. In context of the ADQIR, the constituents are those that specifically make up the systems for AIS.

Critical Data

ICAO integrity level equivalent to a Data Assurance Level of DAL 1.

Database (db)

One or more files of data so structured that appropriate applications may draw from the files and update them.

Data Chain

Describes all the elements of the Controlled and Harmonised Aeronautical Information Network from origination through to publication.

Data Item

A single attribute of a complete data set, which is allocated a value that defines its current status.

Data Origination

The creation of a new data item with its associated value, the modification of the value of an existing data item or the deletion of an existing data item.

Data Originator (DO)

Person or persons authorised to originate aeronautical data on behalf of the 'Authorised Source'.

Data Product

Data set or data set series that conforms to a data product specification.

Data Set Series

Collection of data sets sharing the same product specification

Declared Distances

The distances declared by the aerodrome authority for the purpose of application of the requirement of the Air Navigation (General) Regulations in respect of airplanes flying for the purpose of public transport.

Derived Data

Co-ordinate data selected through human interaction from source data that has been defined in WGS-84 rather than surveyed or calculated. For example:

- Manually selected points along a line of longitude or latitude;
- Manually selected points determined "by definition" (typical examples for such objects are restricted airspaces or danger areas.)

Digital Elevation Model (DEM)

The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

Note.— Digital Terrain Model (DTM) is sometimes referred to as DEM

Digital NOTAM

A data set that contains the information included in a NOTAM in a structured format which can be fully interpreted by an automated computer system without human interpretation.

Direct Electronic Connection

A digital connection between computer systems such that data may be transferred between them without manual interaction with the data itself (thus avoiding error prone copy/paste actions).

Electronic aeronautical chart display

An electronic device by which flight crews are enabled to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information.

Ellipsoid height (geodetic height)

The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

European Air Traffic Management Network (EATMN)

Network of constituents and systems that together form the interoperable functions of the Single European Sky.

Essential Data

ICAO integrity level equivalent to a Data Assurance Level of DAL 2.

Extensible Mark-up Language (XML)

A version of SGML that allows design of a customized mark-up language, used to allow for easy interchange of documents and data on the World Wide Web or between software components.

Feature Catalogue

Catalogue containing definitions and descriptions of the feature types, feature attributes, and feature associations occurring in one or more sets of geographic data, together with any feature operations that may be applied.

Feature Operation

Operation that every instance of a feature type may perform.

Feature Relationship

Relationship that links instances of one feature type with instances of the same or a different feature type.

Format (data format)

A structure of data elements, records and files arranged to meet standards, specifications, or data quality requirements.

Geodesic Distance

The shortest distance between any two points on a mathematically defined ellipsoidal surface.

Geodetic Datum

A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

Geospatial

Information that identifies where particular features are in relation to the earth's surface.

Gregorian Calendar

Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar.

Note: In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

Magnetic Variation

The angular difference between True North and Magnetic North.

Note: The value given indicates whether the angular difference is East or West of True North.

Mean Sea Level (MSL)

The Sea Level halfway between the mean levels of high and low water.

Minimum En-Route Altitude (MEA)

The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

Minimum Obstacle Clearance Altitude (MOCA)

The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

Navigation Specification

A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

- **Required navigation performance (RNP) specification.** A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g., RNP 4, RNP APCH.
- **Area navigation (RNAV) specification.** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g., RNAV 5, RNAV 1.

Next Intended User

The entity that receives the aeronautical data or information from the aeronautical information service.

Notified Body

A body listed in the Official Journal of the European Union who has been appointed to carry out tasks pertaining to the assessment of conformity and declaration of suitability for use of constituents.

Origination (aeronautical data or aeronautical information)

The creation of the value associated with new data or information or the modification of the value of existing data or information.

Originator (Authorised Source)

An entity that is accountable for data or information origination and/or from which the AIS organization receives aeronautical data and aeronautical information.

Orthometric Height

Height of a point related to the geoid, generally presented as an MSL elevation.

Period of Validity

The period between the date and time on which aeronautical information is published and the date and time on which the information ceases to be effective.

Portrayal

Presentation of information to humans

Post Spacing

Angular or linear distance between two adjacent elevation points.

Precision

The smallest difference that can be reliably distinguished by a measurement process.

Note: In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.

Pre-flight Information Bulletin (PIB)

A presentation of current NOTAM information of operational significance, prepared prior to flight.

Quality Control

Part of quality management focused on fulfilling quality requirements.

Procedure Design

The combination of aeronautical data with specific flight instructions to define instrument arrival and/or departure procedures that ensures adequate standards of flight safety.

Requirement

Need or expectation that is stated, generally implied or obligatory

Note 1: “Generally implied” means that it is custom or common practice for the organization, its customers, and other interested parties, that the need or expectation under consideration is implied.

Note 2: A qualifier can be used to denote a specific type of requirement, e.g., regulatory requirement, product requirement, quality management requirement, customer requirement.

Note 3: A specified requirement is one which is stated, for example, in a document.

Note 4: Based on the qualifier, requirements can be generated by different interested parties.

Resolution

A number of units or digits to which a measured or calculated value is expressed and used.

Routine Data

ICAO integrity level equivalent to a Data Assurance Level of DAL 3.

Safety Management System (SMS)

A safety management system (SMS) is an organised approach to managing safety including the necessary organisational structure, accountabilities, policies, and procedures.

Single European Sky (SES)

A legislative framework for European Aviation development.

Sponsor

The person nominated by the Authorised Source (party) to provide data to the UK AISP. The Authorised Source may nominate one or more individuals as Sponsors and the Authorised Source (person) may act as the Sponsor. See the definition of “Authorised Source”.

Standard Generalised Mark- up Language (SGML)

A standardised mark-up language for describing the logical structure of a computer document.

Station Declination

An alignment variation between the zero-degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

Terrain Data

Data about the surface of the earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice, and snow obstacles;

Traceability Ability to trace the history, application, or location of that which is under consideration.

Note: When considering product, traceability can relate to:

- the origin of materials and parts;
- the processing history; and
- the distribution and location of the product after delivery.

Validation

Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.

Verification

Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

Note: The term “verified” is used to designate the corresponding status.

Unified Modelling Language (UML)

UML is an ISO Standard for modeling objects and a refinement of earlier Oriented Design and Object-Oriented Analysis methodologies.

1 Aeronautical Information Management in the UK

Background to Aeronautical Information Provision

Role of UK CAA and UK AIS and obligations placed on the United Kingdom under the Chicago Convention

1.1 The Transport Act 2000, and Air Navigation Directions 2023 (as amended) made under section 66 of that Act (the Directions) placed upon the UK Civil Aviation Authority (UK CAA) by the Secretary of State, require the provision of an Aeronautical Information Service (AIS) in accordance with the UK's international obligations (including Annex 15 of the International Convention on Civil Aviation), and any additional requirements the CAA may determine from time to time.

1.2 The Secretary of State for Transport has additionally given the CAA the Civil Aviation Authority (Chicago Convention) Directions 2007, in order to ensure that the CAA, when exercising its statutory functions, acts consistently with the obligations placed on the United Kingdom under the Chicago Convention (1944).

1.3 The CAA's Safety & Airspace Regulation Group (SARG) carries out the CAA's functions under the Directions, and the Aeronautical Information Management section undertakes this function in respect of the UK AIS on behalf of the CAA.

1.4 The Secretary of State has granted a licence to NATS (En Route) Plc (NATS for the purposes of this document) under Section 6(1) of the Transport Act 2000 authorising NATS to provide Air Traffic Services (ATS) in the United Kingdom and certain other international airspace for which the UK is responsible, including the Shanwick Oceanic FIR.

1.5 Under this licence NATS is required to make available Specified Services which include the UK Aeronautical Information Service (AIS), aeronautical chart production and data management tasks.

1.6 The UK AIS provider is certified in accordance with Assimilated Regulation (EU) 2017/373, laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight ('ATM/ANS IR')

1.7 The objective of the AIS is to ensure the provision of aeronautical data and aeronautical information necessary for the safety, regularity, and efficiency of air navigation. This is achieved by the provision of aeronautical information products and services in accordance with the national and international requirements and specifications agreed between the UK CAA and UK AIS.

1.8 Regulation of UK AIS is described in detail in CAP 779.

National requirements

1.9 Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, entered into EU law on 1 March 2017 and took effect on 2 January 2020 replacing Commission Implementing Regulations (EU) 1034/2011, 1035/2011 and 482/2008.

1.10 EU Regulation 2017/373 is based on ATM-related ICAO Standards, Recommended Practices (SARPs) and Procedures for Air Navigation Services (PANS).

1.11 UK Regulation (EU) 2017/373 ('ATM/ANS IR') was amended by the UK Statutory Instrument 2019 No. 459, which came into force on the EU Exit Day.

1.12 Commission Regulation (EU) No. 139/2014 of February 2014 laying down requirements and administrative procedures related to aerodromes took effect on 31 December 2017.

1.13 UK Regulation (EU) 139/2014 ('ADR IR') was amended by the UK Statutory Instrument 2019 No. 645, which came into force on the EU Exit Day.

1.14 UK Statutory Instrument 2021 No 1203 amended UK Reg (EU) 2017/373 and UK Reg (EU) No. 139/2014 to include complete package of requirements on the quality of aeronautical data and aeronautical information and data quality applicable in the UK.

1.15 Therefore, the amended ATM/ANS IR and ADR IR provide all the requirements on aeronautical information and data quality.

1.16 The CAA recognizes that the term 'ADQ' (which was originally associated with European Commission Regulation (EU) No 73/2010 'ADQ IR') is widely used and commonly understood, therefore, to maintain consistency between the 'old' and the 'new', all data quality requirements are referred to throughout this CAP as 'ADQ' requirements.

1.17 As well as providing guidance on meeting data quality requirements, CAP 1054 also includes CAA policy for the provision of aeronautical information. This ensures that all aspects of aeronautical information management have been considered by the CAA.

EUROCONTROL Specifications supporting compliance with 'ADQ' requirements

1.18 EUROCONTROL Specifications supporting compliance with the amended UK Reg (EU) 2017/373 and UK Reg (EU) 139/2014 are described below:

- EUROCONTROL Specification for the Origination of Aeronautical Data (DO) – Specification provides guidance and comprehensive requirements which should be met when originating aeronautical data in order to comply with requirements concerning the quality of aeronautical data and aeronautical information.
- EUROCONTROL Specification for the Electronic Aeronautical Information Publication (eAIP) – The Specification is designed to enable the harmonised visualisation of the contents of the AIP, which has to be provided by the national Aeronautical Information Services (AIS) in accordance with European legislation and the Convention on Civil Aviation, in electronic form. The objective is to define a specification that supports the interoperability and the quality of aeronautical data and aeronautical information aiming at visualising the electronic AIP in a consistent and harmonised way.

1.19 In addition to the Specifications listed above, EUROCONTROL also provided comprehensive guidance material, which is recommended to be used by all Stakeholders while implementing and/or demonstrating their compliance with aeronautical information and data quality requirements:

- EUROCONTROL Guidelines Supporting the Implementation of Aeronautical Information Requirements (‘the AIR Guide’) - This document supports affected Stakeholders in their transitioning to, and achieving compliance with, the amended regulations.
- EUROCONTROL Guidelines Operating Procedures AIS Dynamic Data (OPADD) - This document describes operating procedures for AIS dynamic data.
- EUROCONTROL Terrain and Obstacle Data Manual (‘TOD Manual’) - This Manual is intended to be used by those bodies involved in the origination, processing and provision of electronic terrain and obstacle data, from the point at which the need for origination is identified, through to the point when the State makes it available in accordance with the requirements of ICAO Annex 15.
- EUROCONTROL Guidelines on the Implementation of Safety Support Assessment for AIS/AIM - This document provides guidance to ensure a common understanding of requirements for the implementation of Safety Support Assessment applicable to AIS providers.

- EUROCONTROL 'Guidelines for the provision of Metadata to support the Exchange of Aeronautical Data' - This document provides guidance to ensure a common understanding of requirements for the collection and provision of metadata. It is mainly aimed at supporting aeronautical data originators and data providers in the upstream data supply chain.

1.20 EUROCONTROL Specifications and other guidelines supporting the harmonised application and implementation of data quality requirements are available to download from the Aeronautical Data Quality area of the EUROCONTROL web site[4].

UK 'ADQ' Compliance status (2024)

1.21 UK Aeronautical Information Products that fall within the scope of the 'ADQ' requirements (i.e., the UK Aeronautical Information Publication, AIP Supplements, Aeronautical Charts, NOTAM, and digital data sets) are provided in accordance with the 'ADQ' requirements and other relevant ICAO Annex 4 and Annex 15 requirements (unless a difference has been filed to ICAO – as per UK AIP GEN 1.7).

1.22 In October 2018 NATS AIM implemented a new Aeronautical Information Management System called Aurora. The system is used by the UK AIS to receive, process, publish and store aeronautical data and aeronautical information in compliance with the 'ADQ' requirements.

1.23 The Aurora Data Originators Portal (an integral part of Aurora, providing the interface between the UK AISP and Authorised Sources) was opened on the 3 January 2019. Since then, UK Aeronautical Information Product Change Request submissions have been made via the portal and received directly in the Aurora system. To gain access to the portal all Authorised Sources were required to sign Formal Arrangements with AIS. More information about Formal Arrangements, Authorised Sources and Sponsors can be found in Chapter 3.

1.24 Following implementation of the Aurora system the UK AIS is considered to be fully 'ADQ' compliant by the CAA. The UK AIS provider is required to demonstrate continuous compliance with all applicable requirements in order to ensure the flow of aeronautical data and aeronautical information necessary for global air traffic management (ATM) system safety, regularity, economy and efficiency in an environmentally sustainable manner.

1.25 The UK CAA verifies all regulated stakeholder's compliance with the 'ADQ' requirements as part of the certification and oversight processes. More about the

[4] https://www.eurocontrol.int/service/aeronautical-data-and-information-quality

parties in the scope of the ‘ADQ’ requirements and the CAA Oversight and Verification of ‘ADQ’ compliance can be found in Chapter 2.

2 Applicability of the data quality requirements

Data in the scope of the 'ADQ' requirements

2.1 Requirements on the quality of aeronautical data and aeronautical information apply to aeronautical data and aeronautical information with an ICAO integrity level and/or intended for use in IFR traffic and which are included in the following products made available by or through the UK AISP:

- Aeronautical Information Publication (AIP), including Amendments and Supplements;
- aeronautical charts;
- NOTAM; and
- digital data sets.

2.2 Compliance with data quality requirements shall not inhibit the urgent distribution of aeronautical information necessary to ensure the safety of flight via NOTAM.

2.3 Aeronautical Information Circulars (AIC) and Briefing Sheets are exempt from the data quality requirements.

Note 1: Briefing Sheets are UK-specific products, which are published to notify temporary changes of operational significance, when there is not sufficient time for the distribution of an AIC. Briefing Sheets contain the full text and graphics detailing a temporary change promulgated via NOTAM (as per Doc 8126 para 3.1.4.2 NOTAM may refer to other locations e.g. AIC or Briefing Sheets).

Note 2: AICs and Briefing Sheets alone cannot be used to promulgate aeronautical data marked as in the scope of the 'ADQ' requirements. As per Note 1 above, AIC or Briefing Sheets can provide the full text and graphics detailing a temporary change promulgated via NOTAM, which may contain data in the scope of the 'ADQ' requirements.

2.4 Integrity requirements apply to all numerical and non-numerical data and information published in AIS products listed in paragraph 2.1 above.

2.5 The table included in Annex A identifies all data items published in the AIP which are in the scope of the data quality requirements (that includes requirements and UK-specific policies).

Note 1: All data items marked in Annex A as in the scope of data quality requirements, are considered as intended for use in IFR traffic.

Note 2: Annex A includes UK-specific input to the requirements included in the ICAO Data Catalogue.

Parties in the scope of the 'ADQ' requirements

2.6 Requirements on the quality of aeronautical data and aeronautical information apply to all parties involved in the upstream data chain (for data in the scope of the 'ADQ' requirements, as per paragraph 2.1 above) from the point of origination to the point of publication by AIS. This includes aerodrome operators, air navigation service providers, entities providing services for the origination and provision of survey data, airspace structure design and flight procedure design services and entities providing electronic terrain and obstacle data and any other parties originating, processing, or providing data in the scope of the data quality requirements (as described in paragraphs 2.1-2.5).

2.7 Requirements on the quality of aeronautical data and aeronautical information do not apply to operators of aerodromes and heliports for which no IFR (or SVFR) procedure is published in the AIP, even if those aerodromes/heliports are referenced in any part of the AIP, unless they are originating, processing or providing to UK AIS aeronautical data or aeronautical information intended for use in IFR traffic.

2.8 All parties originating, processing or transmitting aeronautical data or aeronautical information intended for use in IFR traffic, shall meet the minimum set of data quality requirements (see paragraphs 2.19 and 2.20).

Note 1: All data items marked in Annex A as in the scope of data quality requirements, are considered as intended for use in IFR traffic.

Note 2: Aeronautical information and data are necessary for the safety of air navigation and operators of aerodromes and heliports which are out of scope of the 'ADQ' requirements should, where applicable, use the guidance in this document as best practice on a proportionate basis when processing aeronautical information and data.

Note 3: Some provisions described in this CAP are not mandatory for organisations other than regulated ATM/ANS providers (including airspace structure design and flight procedure design services) or certified/licensed aerodrome operators. Appropriate notes regarding applicability are included at the beginning of each relevant section or within specific requirements.

2.9 For each section of the AIP there is an Authorised Source that is responsible for the provision and maintenance of data items published in their associated section of the AIP. The table included in Annex A identifies the Authorised Sources and the sections of the AIP for which they are responsible.

2.10 Only compliant parties can deliver compliant data and information (data items which are in the scope of the 'ADQ' requirements are described above) for inclusion in UK Aeronautical Information Products.

Applicability of CAP 1054

2.11 This CAP applies to all parties described in paragraph 2.6 above.

2.12 The guidance in this CAP (and the associated requirements) applies up to the moment when the aeronautical data and/or aeronautical information are made available to the users by the aeronautical information service provider.

1. In the case of provision via the AISP website, this CAP applies up to the moment the information has been made available for download to a user's web browsing device.
2. In the case of distribution by physical means, this CAP applies up to the moment when the aeronautical data and/or information has been published and made available to the organisation responsible for providing the physical distribution service.
3. In the case of automatic distribution through the use of a direct electronic connection between the aeronautical information service provider and the entity receiving the data, this CAP applies up to the moment the aeronautical data and/or information is made available by the aeronautical information service provider.

2.13 Where applicable, all parties in the "downstream" data chain, including organisations and other third parties that provide data services and/or process data using information sourced from official UK Aeronautical Information Products, and who then make this information available to users within their own products and services (with or without charge), should use this document as guidance on best practice (see also CAP 779, Chapter 1, Data Providers and Third-Party Service Providers).

CAA Oversight & Verification of 'ADQ' compliance

2.14 In accordance with the requirements, and in its capacity as the UK Competent Authority, the CAA carries out oversight to verify that parties within the scope of the 'ADQ requirements (including any party referred to in formal arrangements – see Chapters 3 and 4) are compliant with its requirements, and that aeronautical data and aeronautical information origination activities are able to provide data with sufficient quality to meet its intended use.

2.15 Oversight is achieved through periodic audits and assessments carried out by auditors from the CAA section relevant to the party being inspected e.g., Aerodrome, AIM Regulation or Airspace Regulation. Wherever possible, the

regulatory oversight activities necessary to ensure 'ADQ' compliance are subsumed into existing CAA oversight arrangements.

2.16 All parties within the scope of the 'ADQ' requirements are required to declare whether their data meets the requirements at the point of submission to the UK AISP by completing the "compliance/non-compliance" checkbox for each data item with defined data quality requirements (see Annex A), submitted into the Aurora Data Originators Portal.

2.17 When requested by the CAA, all parties within the scope of the 'ADQ' requirements (including any party referred to in formal arrangements – see Chapters 3 and 4) should be able to provide sufficient evidence that the organisation and the data that it processes meet the relevant requirements. The ultimate responsibility for the compliance of data provided to AIS shall always remain with the Authorised Source (see Chapter 3 and 4).

2.18 Certain aeronautical data and aeronautical information submitted to the UK AISP require regulatory approval by the CAA before it is published in AIS products (see Chapter 4). Aeronautical data and aeronautical information requiring approval by the CAA is identified in the table at Annex A which also provides details on the CAA regulatory department that is responsible for the approval of each data item, and also indicates which party (Authorised Source) is responsible for the provision and maintenance of this data.

The minimum set of data quality requirements

2.19 ATM/ANS IR Article 3, paragraph 5 defines the minimum set of requirements applicable to all parties in the scope of the 'ADQ' requirements, with no exemptions. For convenience those requirements are listed below.

2.20 All parties in the scope of the 'ADQ' requirements shall:

- ensure that aeronautical data conforms to the specifications included in Annex A.
- ensure that the following data quality requirements are met:

1. the accuracy of aeronautical data is as specified in Annex A;
2. the integrity of aeronautical data is maintained;
3. based on the integrity classification specified in the aeronautical data catalogue, procedures are put in place so that:
    i. for routine data, corruption is avoided throughout the processing of the data;
    ii. for essential data, corruption does not occur at any stage of the entire process and additional processes are included, as needed, to address

potential risks in the overall system architecture to further assure data integrity at this level;

iii. for critical data, corruption does not occur at any stage of the entire process and additional integrity assurance processes are included to fully mitigate the effects of faults identified as potential data integrity risks by thorough analysis of the overall system architecture;

4. the resolution of aeronautical data is commensurate with the actual data accuracy;
5. the traceability of aeronautical data is ensured;
6. the timeliness of the aeronautical data is ensured, including any limits on the effective period of the data;
7. the completeness of the aeronautical data is ensured;
8. the delivered data meet the specified format requirements.

- transmit aeronautical data by electronic means;
- establish formal arrangements with ATM/ANS providers or aerodrome operators when exchanging aeronautical data and aeronautical information;
- ensure that the information listed in point AIS.TR.505(a) is provided in due time to the UK AIS;
- collect and transmit metadata which include as a minimum:

1. the identification of the organisations or entities performing any action of originating, transmitting or manipulating the aeronautical data;
2. the action performed;
3. the date and time the action was performed.

- ensure that digital data error detection techniques are used during the transmission or storage of aeronautical data, or both, in order to support the applicable data integrity levels;
- ensure that the transfer of aeronautical data is subject to a suitable authentication process such that recipients are able to confirm that the data has been transmitted by an authorised source;
- ensure that errors identified during data origination and after data delivery are addressed, corrected, or resolved and that priority is given to managing errors in critical and essential aeronautical data.
- for the purpose of air navigation, use:

1. the World Geodetic System – 1984 (WGS-84) as the horizontal reference system;
2. the mean sea level (MSL) Newlyn datum as the vertical reference system;
3. the Gregorian calendar and coordinated universal time (UTC) as the temporal reference systems.

- ensure that aeronautical data and aeronautical information are originated, processed, and transmitted by adequately trained, competent and authorised personnel.

3 Authorised Sources of Aeronautical Information

Authorised Sources & Sponsors

3.1 Aeronautical data and aeronautical information published in UK Aeronautical Information Products are submitted to the AISP by various sources.

3.2 Annex A identifies parties which are considered as ‘Authorised Sources’ of information published in each section of the AIP and also a list of additional data items in the scope of the requirements. Parties not currently listed in Annex A, if/when relevant, can approach the CAA or AISP and if accepted become Authorised Sources for a whole AIP section or its part or a specific data item, in addition to those listed in Annex A.

3.3 Each Authorised Source must nominate a person (role) acting on behalf of the whole organisation, to be directly responsible for all aeronautical data and aeronautical data activities in the organisation, and who is ultimately accountable for providing specific aeronautical data and aeronautical information to AIS for publication in the Aeronautical Information Products. This may be the Accountable Manager, or a competent person formally appointed by the Accountable Manager.

3.4 Authorised Sources are required to ensure that their organisation declares whether in scope data meets ‘ADQ’ requirements at the point of submission to the AISP by completing the “compliance/non-compliance” checkbox for each data item with defined ICAO data quality requirements (see Annex A) entered in the Aurora Data Originators Portal.

3.5 Details of the responsibilities for the provision of aeronautical data and aeronautical information for the Aeronautical Information Products are identified in UK legislation and CAA licensing, guidance, and policy documents.

3.6 All parties submitting data to the AISP are required to have Formal Arrangements with the AISP for the provision of aeronautical data and aeronautical information and access to the Aurora Data Originators Portal. Formal Arrangements must be signed by the Authorised Source (see paragraph 3.2 and 3.3)

3.7 The Authorised Source holds ultimate responsibility for sponsoring changes to Aeronautical Information Products and must notify the AISP if their contact details change or if the responsibilities of the Authorised Source are transferred to another party.

Formal Arrangements remain valid and do not need to be re-established as a result of changes to the personnel representing the Authorised Source.

3.8 Formal Arrangements are described in greater detail at Chapter 4.

3.9 The Accountable Manager (or a person formally appointed by the Accountable Manager) who has signed the Formal Arrangement with the AISP can appoint individuals ('Sponsors'), who are responsible for submitting changes to Aeronautical Information Products in accordance with a clearly defined scope of authorised changes (data items). Sponsors compliance with the defined scope is overseen by the Authorised Source, as the permissions set in the Aurora Data Originators Portal will be the same for all Sponsors acting on behalf of the same Authorised Source.

3.10 The Authorised Source must provide a list of all nominated Sponsors to the AISP ('Sponsors List') and is also responsible for notifying the AISP of any changes to the List.

3.11 Once notified to the AISP each individual Sponsor is required to register on the Aurora Data Originators Portal as a portal 'user'. As a result of the registration process users will be assigned with authorisations and responsibilities in accordance with the details contained in their organisation's formal arrangement. Each registered Sponsor is submitting aeronautical data and aeronautical information to UK AIS on behalf of the Authorised Source and will be considered the point of contact for queries on changes they raise (unless requested otherwise).

Note: Once registered, an AIS Portal User Guide and Portal user training videos can be accessed via the Portal. Users can also contact the AISP during office hours by phone or email if experiencing any difficulties in accessing or using the portal:

Phone: 01489 88 7000/7462/7463/7506

Email: support.aissupervisor@nats.co.uk

3.12 The AISP shall ensure that the most current aeronautical information publication cycles applicable to AIP amendments and AIP supplements and AIC are made publicly available with submission cut-off dates.

3.13 Aeronautical data and aeronautical information shall be delivered by Sponsors to the AISP prior to their effective date and in accordance with the printing and publication schedules made available by the AISP.

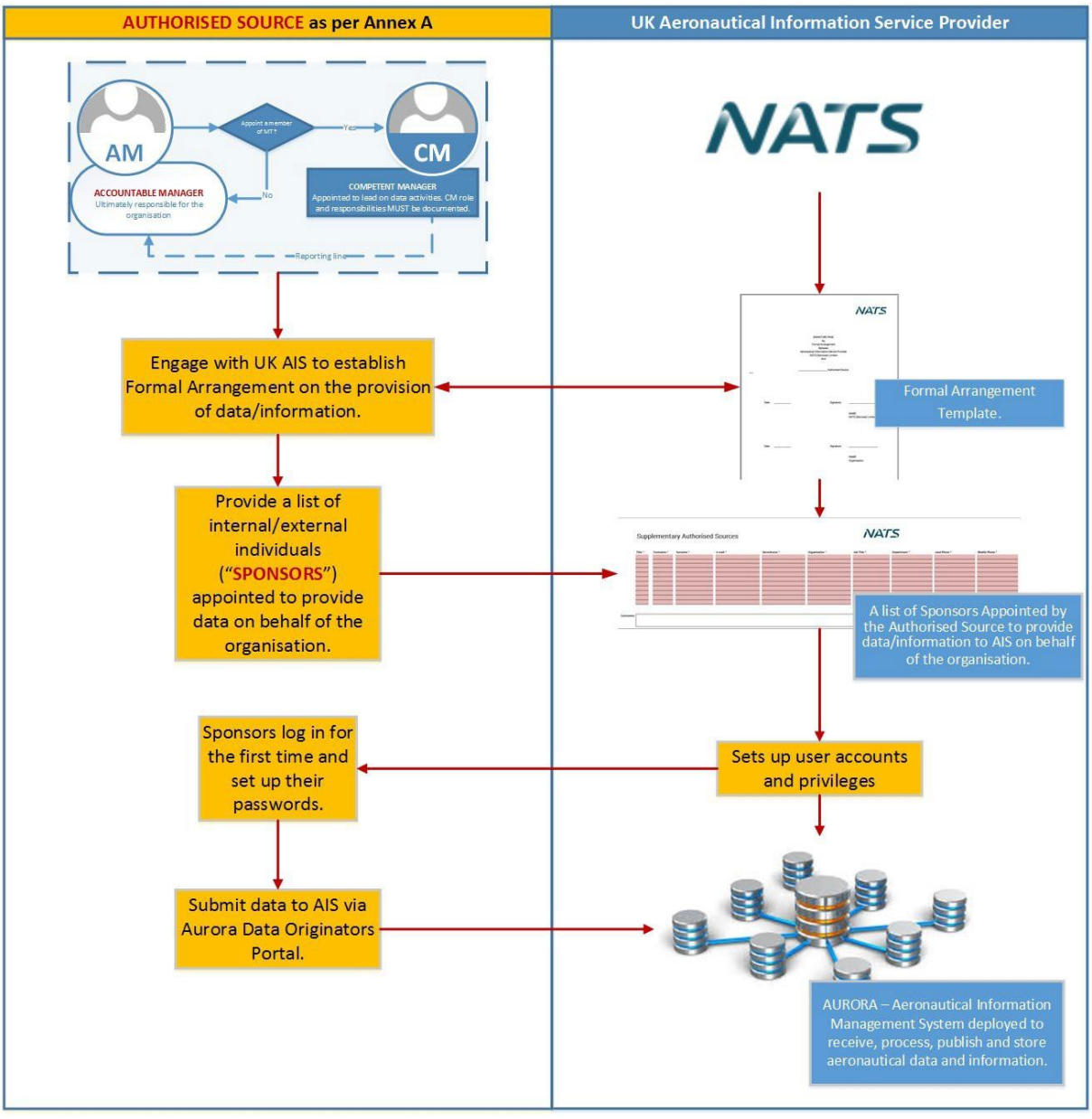
Note: AIP publication schedules include an AIRAC "cut-off date" which is the last date by which Change Requests must be submitted. Where possible, Change Requests should be submitted ahead of the cut-off date. It is not possible to select a specific AIRAC after its' associated cut-off date.

3.14 The ultimate responsibility for the data and information provided to the AISP always remains with the Authorised Source.

3.15 Aeronautical information should be delivered by Sponsors to the AISP without copyright of license restrictions. Aeronautical information which cannot be redistributed or stored by the AISP must not be supplied. If relevant, details of how the information may be obtained by the users can be provided, e.g. GEN 3.1.6 Digital data sets may include information about aerodrome terrain datasets which can be obtained directly from the aerodrome operator.

3.16 The relationship between the Authorised Source, Sponsors and AIS is depicted on the flowchart below:

Flowchart 1. The relationship between the Authorised Source, Sponsors and AIS. Credit: Flowchart provided by NATS AIM.



4 Regulatory Approval of Aeronautical Information

Regulatory Approval

4.1 It should be noted that aeronautical information may be subject to an approval process before it is submitted to the UK AISP (e.g. as part of an airspace change process - CAP 1616; or in the scope of the changes to a UK Certificated Aerodrome - SRG 2011); and/or may also be subject to an approval by the relevant party approving, verifying, regulating, or overseeing data item after it is submitted to the UK AISP (before it is published in AIS products).

4.2 Aeronautical data or information requiring approval by the CAA every time it is submitted to AISP, includes but is not limited to:

- Aerodrome Runway Declared Distances (RDD)
- Aerodrome Rescue & Fire Fighting categories (RFF)
- NavAid position (NAVAID)

4.3 The table included in Annex A indicates which data items and/or sections of the AIP are in the scope of the regulatory approvals and identifies party approving, verifying, regulating, or overseeing those data items.

Note: Any data item or AIP section listed in Annex A, for which “AR”, “IFP” or “ENV” is identified as the party approving, verifying, regulating, or overseeing data item, should be considered as in the scope of the ACP process and a DAP 1916 should be submitted in the first instance. See CAP 1616 for more information or contact airspace.policy@caa.co.uk. Should the change be ultimately authorised, a ‘Change Request Authority’ will be issued which must be included with the Change Request as an attachment to confirm that the change has been assessed by the CAA and is ready to be submitted to AIS.

4.4 For items listed in paragraph 4.2, upon submission of a Change Request in Aurora Data Originators Portal, UK AISP generate an approval task for the appropriate party (in accordance with Annex A). The approver can either:

- “Pass” and approve the Change Request and aeronautical data for further processing by AISP; or
- “Fail” and reject the Change Request and aeronautical data – in this case the Change Request is redirected in Aurora Data Originators Portal to the Sponsor.

The approver may also leave additional comments to accompany any decision made at this stage.

4.5 The AISP may create additional approval tasks for the relevant party (as per Annex A), when requested by the Sponsor or when the submission raises any concerns. In any case, it remains the Sponsor's responsibility to provide compliant data and – if required - complete any necessary regulatory approval processes before the Change Request is submitted to UK AISP.

4.6 Some changes also require an approval from the CAA at the draft-product[5] stage, which include but are not limited to the following Airspace Change Proposals identified by a CAA ACP Number:

- Introduction, amendment, or withdrawal of any details in relation to Instrument Flight Procedure Charts or Coding Tables.
- Any Airspace Changes for which the Sponsor or the party approving, verifying, regulating, or overseeing has made a bespoke request to approve the draft product.

4.7 For items listed in paragraph 4.6, UK AISP generate a task for the appropriate party to review the draft-product and provide comments, clearly indicating if the draft is accepted or rejected.

4.8 Compliance with regulatory approval requirements shall not inhibit the urgent distribution of aeronautical information necessary to ensure the safety of flight. When a data item in the scope of the Regulatory Approvals is being changed via NOTAM, the Sponsor should notify the relevant CAA Regulatory Department as per Annex A. Whilst the responsibility for notifying the CAA about any temporary changes to data items requiring regulatory approval, remain the responsibility of the Sponsor, the UK NOTAM Office may be asked for assistance or coordination.

4.9 Authorised Sources should take account that the regulatory approval process may introduce delays to the data process and could affect the Change Request success of meeting the requested AIRAC. Authorised Sources shall always follow the publication schedules (and associated submission cut-off dates) available on the AIS website.

Regulatory Notifications

4.10 The table included in Annex A also indicates which data items and/or sections of the AIP are in the scope of the regulatory notifications. Notifications are set up at the feature level – e.g. any change to a NavAid would be notified to all parties approving, verifying, regulating or overseeing any of the attributes of NavAids (as indicated in Annex A).

[5] draft-product – draft of an amendment to the AIP or an AIP SUP ready to be reviewed by the CAA or the AIS Supervisor before publication.

4.11 Upon submission of the aeronautical data to the AISP, the UK AIS notifies the appropriate party approving, verifying, regulating, or overseeing data item (as per Annex A) if submitted change is affecting one or more data items or AIP sections which require notification. If the data is delivered to the AISP in a data set, the notification is being sent later in the data process (at the point of identification). No response from the notified party is required. However, if the notified party identifies any issues with the Change Request, they should contact the AIS Supervisor within 3 working days and request further actions.

Summary

4.12 Depending on the content of the Change Request submitted to AIS, approval tasks and notifications which can be generated by the AISP in the Aurora Data Originators Portal include but are not limited to:

- Approval tasks for the relevant party approving, verifying, regulating, or overseeing data items identified in Annex A (as described in paragraph 4.2);
- Additional approval tasks requested by the Sponsor or generated by AISP (as described in paragraph 4.5);
- Draft-product approvals taks for the relevant party approving, verifying, regulating, or overseeing data item (as described in paragraph 4.6);
- Notifications to the relevant party approving, verifying, regulating or overseeing data items identified in Annex A (as described in paragraph 4.11);
- Additionally, any Authorised Source will be asked to confirm (using the approval task in Aurora) that changes proposed by another Authorised Source are correct if the submitted Change Request amends data items within their area of responsibility (as per the Formal Arrangement with the AISP) or after the AISP has processed data or data set on behalf of this Authorised Source and identified consequential changes to the Aeronautical Information Products.

Note 1: Notwithstanding the above, if the information submitted to the UK AISP is airspace related (any data item or AIP section listed in Annex A, for which “AR”, “IFP” or “ENV” is identified as the party approving, verifying, regulating, or overseeing data item, should be considered as in the scope of the ACP process), a ‘Change Request Authority’ must be attached to the Change Request in order for the information to be published in AIS products.

Note 2: It is possible that a data item is notified to the CAA at the point of submission or identification, then sent to the CAA for approval and also notified

to the CAA at a draft-product stage. All of these tasks are conducted independently.

5 Common Elements of Compliance

This chapter is relevant to all parties in the scope of the 'ADQ' requirements (as described in Chapter 2), within this Chapter referred to as 'parties', unless stated otherwise.

Management System

Applicability: Specific requirements on Management System apply only to ATM/ANS providers and Aerodrome Operators, it must be noted that necessary processes and procedures should be established by all parties in the scope of the 'ADQ' requirements to ensure their compliance with the minimum set of requirements as per paragraphs 2.19 and 2.20.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.B.005; ATS.OR.200; ADR.OR.D.005; ADR.OR.D.007

Relevant objectives from the AIR Guide: Implement and Maintain Management System; Define and Implement Processes and Procedures; Self-Assess and Monitor Compliance with Relevant Regulations; Provide and Maintain Operations Manuals

5.1 Parties shall implement and maintain a Management System (MS) which addresses quality, safety and security objectives and covers all of their aeronautical data and aeronautical information provision activities.

5.2 A management system is a set of policies, processes and procedures used by an organization to ensure that it can fulfil the tasks required to achieve its objectives. The established quality management system shall provide the necessary assurance and confidence that distributed aeronautical data and aeronautical information satisfy the aeronautical data quality requirements.

5.3 An EN ISO 9001 certificate, issued by an appropriately accredited organisation is considered an Acceptable Means of Compliance but it is not mandatory.

5.4 All parties should identify and document:

- roles responsible for data and data activities (roles and responsibilities MUST be clearly defined);
- roles within the organisation responsible for development and maintenance of Management System objectives related to data and data activities.

5.5 Parties should establish and maintain:

- evidence of the functioning of the management system by means of manuals and monitoring documents referring to ‘ADQ’ requirements covering all data activities (with associated roles and responsibilities);
- work instructions for all data activities together with their assigned personnel responsibilities;
- Job descriptions including roles and responsibilities regarding data activities;
- regular reviews (internal and external) of the management system in place and take remedial actions, as appropriate;
- periodic and ongoing reviews of data and data-related documentation.

5.6 Parties should avoid assigning too many responsibilities to one person.

Safety and Security Management

Applicability: Specific requirements on Safety and Security Management apply only to ATM/ANS providers and Aerodrome Operators, however it must be noted that necessary processes and procedures should be established by all parties in the scope of the ‘ADQ’ requirements to ensure their compliance with the minimum set of requirements as per paragraphs 2.19 and 2.20.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.B.005, ATM/ANS.OR.D.010; ATS.OR.200; ADR.OR.D.005; ADR.OR.D.007; ADR.OR.E.005

Relevant objectives from the AIR Guide: Implement and Maintain Management System

5.7 Parties shall ensure that their Management System defines procedures to meet the safety and security management objectives as laid down in the legislation.

5.8 Parties should identify and document:

- role(s) within the organisation responsible for the development and maintenance of the safety management objectives related to data and data activities;
- role(s) within the organisation responsible for the development and maintenance of the security management objectives related to data and data activities;
- safety and security risks related to data and data activities.

5.9 Parties should establish and maintain:

- safety and security processes, measures, and standards so that data is protected from interference and restricted only to those authorized while in storage and transit and therefore the risk of any aviation incident arising from data errors (intentional or accidental) is minimised;
- procedures relating to data security risk assessment and mitigation, security monitoring and improvement, security reviews and lesson dissemination;
- means designed to detect security breaches and controlling the effects of security breaches, identifying recovery action and mitigation procedures to prevent reoccurrence;
- measures to protect its aeronautical data against cyber security threats;
- mandatory criminal record check for all personnel involved in data activities.

5.10 The CAA holds responsibility for cyber security oversight for aviation and all cyber security regulatory activity within any of the CAA regulatory domains. CAP 1753 outlines the CAA's approach to cyber security oversight.

5.11 If appropriate, a Disclosure & Barring Service (DBS) Check should be considered as the acceptable level of security clearance for personnel involved in processing of aeronautical data on behalf of ATM/ANS providers and Aerodrome Operators in the scope of the 'ADQ' requirements. Further information regarding these checks can be found on the Disclosure & Barring Service web page of the GOV.UK website.

Formal Arrangements

Applicability: ATM/ANS Providers and Aerodrome Operators in the scope of the 'ADQ' requirements need to have compliant Formal Arrangements with all parties with which they exchange aeronautical data and/or which exchange this data on their behalf. All other parties in the scope of the 'ADQ' requirements are only required to establish Formal Arrangements with ATM/ANS providers and Aerodrome Operators when exchanging aeronautical data with them or exchanging data on behalf of those ATM/ANS Providers and/or Aerodrome Operators.

ATM/ANS IR and ADR IR requirements: ATM/ANS IR Article 3 paragraph 5(a); ATM/ANS.OR.A.085; AIS.OR.205; ADR.OPS.A.010

Relevant objectives from the AIR Guide: Establish and Manage Formal Arrangements

5.12 Parties shall establish arrangements with parties with which they exchange aeronautical data and/or which exchange or process aeronautical data on their behalf.

5.13 The formal arrangements shall include the minimum content required by the legislation and can also include any other elements relevant to the provision and exchange of data between parties, if agreed between those parties.

5.14 Parties should identify and document:

- All aeronautical data items provided by the party, together with associated ‘ADQ’ requirements;
- specific data activities (origination, processing, storage, provision, publication, distribution etc.);
- organisations or individuals exchanging any aeronautical data items with the party or on behalf of the party (including contracted activities).

5.15 Parties should establish and maintain:

- Formal Arrangement Template, if not already established (e.g. all Authorised Sources wanting to submit data to AIS will be provided by AISP with a Formal Arrangement Template);
- Formal Arrangements with all organisations or individuals exchanging data with the party or on behalf of the party.

5.16 When a party contracts any part of its data activities to another organisation, the contracted organisation works under the oversight of the Authorised Source. The Authorised Source remains the party ultimately accountable for the information delivered to AISP and published in the Aeronautical Information Products.

5.17 Every data activity conducted by a contracted organisation needs to be described in a Formal Arrangement between the party (e.g., Aerodrome Operator or ANSP) and the contracted organisation (e.g., survey company or Approved Procedure Design Organisation).

5.18 A Formal Arrangement may form part of a contract, Letter of Agreement (LoA), Service Level Agreement (SLA), Memorandum of Understanding (MoU). Or, as a stand-alone Formal Arrangement covering all aspects of the service and product to be delivered.

5.19 The UK AISP uses a standard template to establish Formal Arrangements with all parties submitting aeronautical data and aeronautical information for publication in the Aeronautical Information Products.

5.20 Additional guidance on the content of Formal Arrangements between the Aerodrome Operator and the external organisation providing a survey of aeronautical data for the aerodrome is provided in CAP 1732 Appendix 1.

Competent Personnel

Applicability: Requirements on training and competency are applicable to all parties in the scope of the 'ADQ' requirements.

ATM/ANS IR and ADR IR requirements: ATM/ANS IR Article 3 paragraph 5(b); ATM/ANS.OR.B.005; ATM/ANS.OR.B.015; ATS.OR.200; ATSEP.OR; ADR.OR.D.017; ADR.OPS.A.057

Relevant objectives from the AIR Guide: Define and Implement Training Programme

5.21 Each party must nominate an individual (role) to be directly responsible for all aeronautical data activities and aeronautical information provision activities in the organisation, as per Chapter 3. Additionally, personnel (roles) should be appointed for all tasks associated with the provision of aeronautical data or aeronautical information. All roles and responsibilities associated with the provision of aeronautical data or aeronautical information should be clearly defined, as described in the Quality Management System section above.

5.22 All parties should identify, establish and document the following requirements for personnel involved in any data activities:

- minimum competency levels (requirements);
- an adequate training programme (including contractors if relevant);
- an adequate training programme for the whole organisation (including as a minimum) promoting organizational awareness of safety risks and issues related to aeronautical data and aeronautical information e.g., by sharing lessons arising from safety activities and by encouraging all staff to propose solutions to identified safety issues, and improvements to assist the effectiveness and efficiency of the processes.

Note: Specific guidance for all ATM/ANS providers on compliance with requirements included in Part-PERS (ATSEP.OR) is provided in CAP 1649 Air Traffic Safety Electronics Personnel Training & Competence Requirements.

Error prevention, detection, and handling

Applicability: Requirements on error detection, authentication, reporting, measurement, and corrective actions are applicable to all parties in the scope of the 'ADQ' requirements. Requirements on Verification and Validation are only applicable to ATM/ANS providers and Aerodrome Operators in the scope of the 'ADQ' requirements.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.085; AIS.OR.220; AIS.OR.230; AIS.OR.235; AIS.TR.235; ADR.OPS.A.025; ADR.OPS.A.035; ADR.OPS.A.040

Relevant objectives from the AIR Guide: Establish Verification and Validation Procedures; Error Reporting, Measurement and Corrective Actions

5.23 All parties shall ensure that error detection and authentication, reporting, measurement, and corrective actions mechanisms are established, maintained, and included in the Management System.

5.24 Parties should identify and document:

- all aeronautical data transfers conducted by the organisation;
- all aeronautical data items being entered manually by the organisation;
- tools required for the verification and validation processes;
- parties that should be notified about any identified data errors alongside with AIS (e.g., data originator, next user);

5.25 Parties should establish and maintain:

- validation and verification processes to ensure that data is acceptable for its intended use and has not been corrupted by the data process;
- digital data error detection techniques and authentication process for any data transfer;
- independent verification of manually inputted aeronautical data (if any) to detect any errors that may have been introduced;
- mechanism to ensure the currency of the aeronautical data within their responsibility (maintenance of data);
- process of monitoring relevant aeronautical data promulgated by AISP;
- mechanisms to report to AIS, with minimum delay changes to data items within the responsibility of the Authorised Source (standard updates or identified errors);
- mechanisms to notify all other relevant parties with minimum delay changes to data items within the responsibility of the Authorised Source (identified errors);
- data error detection and handling process;

- records of identified data errors and the consequential corrective measures taken for errors identified after data delivery to AIS.

5.26 Different data validation techniques can be used for different data items and/or parties in the scope of 'ADQ' requirements. Every time validation technique should be fit for purpose and sufficient to give the party the level of assurance that the data is checked as having a value that is fully applicable to the identity ascribed to the data element, or a set of data is checked as being acceptable for their intended use.

5.27 All parties should deliver data to UK AISP via the Aurora Data Originators Portal as a .zip file with all required files. Other data error detection techniques can also be used and described in the Formal Arrangements between parties exchanging data.

Note: Examples of data protection solutions are "checksum" or "hash functions" such as MD5, SHA1 or XML Signature. XML Signature is used in AIXM files but is currently not covered by the AIXM 5.1 coding guidelines. There is a draft document dealing with this topic: "EUROCONTROL Guidelines for the use of CRC in AIXM 5.1" (6.12.2013) including a chapter about XML Signature. This GM has never been finalised due to the changing focus on CRC but also due to other priorities applied at this stage considering that existing industry solutions were sufficiently addressing these aspects.

5.28 AIXM files can also be exchanged with the AISP but due to the fact that harmonised AIXM coding guidance haven't been finalised yet, parties willing to exchange data using AIXM format should engage with the UK AISP to test those files and receive feedback ahead of the required date of submission.

5.29 All errors, inconsistencies and anomalies detected in any aeronautical data published by AIS should be reported to AISP.

5.30 Problems identified by users and reported to the AISP, should also be referred by AISP to the Authorised Source identified at Annex A.

5.31 All errors, inconsistencies and anomalies detected in published critical and essential aeronautical data and aeronautical information are to be notified immediately by the Authorised Source to all users via the promulgation of a NOTAM and resolved permanently as soon as possible thereafter.

Data origination, processing, and provision

Applicability: All parties in the scope of the 'ADQ' requirements shall ensure that data quality requirements in terms of accuracy, integrity, resolution, traceability, timeliness, completeness, and format are met when originating, processing, or providing data; aeronautical data in the scope of the 'ADQ' requirements conform to the specifications included in Annex A; data is transmitted by electronic means and provided in due to AISP.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.085; ATM/ANS.OR.A.090; AIS.OR.200; ADR.OR.D.007; ADR.OPS.A.020; ADR.OPS.A.050

Relevant objectives from the AIR Guide: Define and Implement Processes and Procedures, Request Data Origination/Provision, Originate Data, Define Catalogue of AIS Products and Services; Assemble AIS products; Collect Data; Annotate AIS Data/Products for Limitations

5.32 Any activity conducted as part of origination, processing, and provision of aeronautical data, whether manual or automated is considered as part of the data process.

5.33 Parties should identify and document:

- Data product specifications – e.g., data set specifications requirements including the minimum metadata requirements (survey, IFP design, airspace design etc.);
- Data provision and maintenance requirements (e.g. annual reviews of surveyed data);
- All data transfers conducted by the organisation;
- Relationships between data items, if relevant (e.g. change to one data item can trigger an update/recalculation of another data item based on it);
- Non-compliant data items.

5.34 Parties should establish and maintain:

- Data product specifications, if necessary (when specifications are not already established) – e.g., Data set specifications used by and/or required by organisation including the minimum metadata requirements;
- Electronic means for all data exchange processes;
- Mechanisms to ensure consistency of data items that are duplicated or cross- dependent;
- Data provision and maintenance plan (with timescales and evidence);
- Transition plan for achieving full compliance with ‘ADQ’ requirements (if not already achieved), including date of the full compliant survey and date when all Aeronautical Information Products, including aerodrome data, will be compliant;

5.35 Aeronautical data should not be subject to re-origination unless the Authorised Source identifies the need to re-originate data (e.g., as part of the data maintenance throughout the lifetime of each data item), such as:

- Physical changes to the surveyed features (including new/removed features);
- Limited lifetime of the data;
- New user's needs;
- Changes to the requirements applicable to the data;
- Inability to demonstrate compliance of the data with any applicable requirements;
- Detection of an error, inconsistency, or anomaly in existing data e.g., when processing data or originating new data.

5.36 Aeronautical data and aeronautical information to be provided by surveyors, procedure designers, and airspace designers shall include all attributes (complete data set), or part (if amending existing full data set) described in relevant CAA publications:

- CAP 1732 Aerodrome Survey Guidance, Appendix 5;
- CAP 785B Approval of instrument flight procedures;
- Policy Statement - AERONAUTICAL DATA ASSOCIATED WITH AIRSPACE DESIGN (CAP 1616) - Annex A including the Aeronautical Data Template Spreadsheet.

5.37 To meet the data set specification requirements, the aeronautical information exchange model AIXM developed by EUROCONTROL and the Federal Aviation Authority (FAA) should be used, therefore AIXM files can also be exchanged with the AISP. Due to the fact that the UK is in the process of implementing AIXM data sets in the upstream data chain, parties willing to exchange AIXM files with AISP, should engage with AISP first to test those files and receive feedback ahead of the required date of submission.

Note: AIXM can become the primary format used for providing data to AIS, even if the relevant CAA publications (such as CAP 1616 or CAP 1732) specify a different format to be used for a specific process involving aeronautical data exchange, but only if it has been agreed with the CAA and AIS and is reflected in the formal arrangements.

5.38 Guidance on AIXM can be found on the EUROCONTROL website[6]. Please note that the use of AIXM is mandatory only for the UK AISP (more information can be found in Chapter 6 below).

5.39 The data set and exchange specification requirement is designed to ensure that, not only can a whole and complete data set be exchanged, but also that a particular feature can be exchanged individually. This is particularly important for providers of limited subsets of the whole data set or even just the value of one property, such as a position, elevation, frequency, identifier, etc.

5.40 In order to ensure a common implementation of the exchange specification EUROCONTROL is in the process of establishing harmonized coding rules for AIXM.

5.41 All parties providing data to AIS, are required to declare which data items do not meet data quality requirements. This can be done during the submission of data to AIS or via the Aurora Data Originators Portal for all data items already stored in AIS AIXM database.

5.42 All parties in the data chain are required to exchange data using electronic means.

5.43 In the case where no direct electronic network connection is available between parties in the data chain, other than with the AISP, it is acceptable to use e-mail if the following conditions can be met:

- Aeronautical data and aeronautical information are provided in an attached file that can be automatically ingested into the recipient's system without the need for manual input.
- Receipt of the data can be confirmed to the sender.

5.44 Use of DVDs and portable memory drives to transfer aeronautical data (whether encrypted or not) should be eliminated from the upstream data-chain.

5.45 Final submission of data to the AISP shall be performed via the Aurora Data Originators Portal:

- individual data items can be submitted manually using the Change Request (double blind entry is required for data items with an ICAO integrity level of critical or essential to ensure a proportionate degree of data quality assurance to meet ICAO Annex 15 integrity requirements);

[6] https://ext.eurocontrol.int/aixm_confluence/

- multiple data items can be attached to the Change Request (files containing data in the scope of the 'ADQ' requirements should be compressed and attached as .crc files);
- changes to the data that are already published in the AIP (especially textural data) can also be applied using the AIP editor (available via the Change Request).

Metadata

Applicability: Requirements on metadata are applicable to all parties in the scope of the 'ADQ' requirements.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.085; AIS.OR.225; AIS.OR.240; AIS.OR.340; AIS.TR.225; AIS.TR.240; AIS.TR.340; ADR.OPS.A.010; ADR.OPS.A.045

Relevant objectives from the AIR Guide: Originate data; Collect data; Store data; Annotate AIS Data/Product for Limitations; Transmit data.

5.46 The term 'data' is intended to cover both the data and its associated metadata. This section covers some specific requirements and policies applicable to metadata only.

5.47 Aeronautical data and aeronautical information that is required to meet the 'ADQ' requirements shall include metadata. The table below specify the required metadata for each category of data required to meet the 'ADQ' requirements.

5.48 Some metadata may originate from another Authorised Source further back in the aeronautical data chain, such as survey data provided to an aerodrome operator prior to submission of the survey data by the aerodrome operator to the AISP. The original metadata shall be retained at all stages of data management and final submission to the AISP.

5.49 To ensure consistent metadata from the data origination stages of aeronautical information through to publication in the AIP, or when made available to the next intended user, the EUROCONTROL Metadata profile shall be used. The EUROCONTROL Metadata profile can be obtained from the media and info area of the EUROCONTROL website. www.eurocontrol.int

5.50 Failure to include the required metadata will result in the aeronautical data being non-complaint. If the required metadata cannot be provided, the sponsor must mark the aeronautical data as non-compliant in Aurora Data Originators Portal.

5.51 The following tables specify the required metadata.

- Common Metadata Attributes

Metadata items	Mandatory or Optional
Metadata elements about the originator of data*	Mandatory
Metadata elements about amendments*	Mandatory
Metadata elements about persons or organisations that have interacted with data*	Mandatory
Metadata elements about any validation and verification performed*	Mandatory
Metadata elements about effective start date and time of data	Mandatory
Metadata elements, for geospatial data, about the Earth reference model used***	Mandatory
Metadata elements, for geospatial data, about the coordinate system used***	Mandatory
Metadata elements, for numerical data, about the statistical accuracy or calculation technique used	Mandatory
Metadata elements about the data resolution	Mandatory
Metadata elements about the confidence level	Optional**
Metadata elements about any functions applied during conversion/transformation	Mandatory
Metadata elements about any limitations on the use of data.	Mandatory

"*" In every case the organization or entity performing any action of originating, transmitting, or manipulating the aeronautical data should be identified together with the action performed and the date and time the action was performed.

"**" Required if it is requested in the required format (e.g., required to be provided in survey package as per CAP 1732 survey format but taken as a condition (rather than an attribute to be provided) within the CAP 1616 Aero Data Spreadsheet accuracy requirements.

"***" The geographical co-ordinates indicating Latitude and Longitude are expressed in terms of the World Geodetic System 1984 (WGS84) geodetic reference datum. The CAA recognises the fact that geographical positions in the

UK have been supplied in ETRF2014, therefore, it is acceptable to use ETRF2014 reference frame and Newlyn Datum for vertical reference in the UK. This position statement may be revised when the difference between ETRF and ITRF becomes intolerable.

- Metadata to be provided for data sets (applicable to all data sets)

Metadata items	**Mandatory or Optional**
Metadata elements about the organisations or entities providing the data set	Mandatory
Metadata elements about effective start date and time of the data set.	Mandatory
Metadata elements about any limitations on the use of the data set.	Mandatory

Note: ISO 19115 – Geographic Information – Metadata is used as the basis the metadata information facilitates interoperability. Metadata elements should be drawn from the 19115 — Geographic information — Metadata Standard. Further information on the schema for describing geographic information and services by means of metadata can be found in the ISO 19115 — Geographic information — Metadata, Part I.

6 Additional requirements for certified/licensed parties

Data exchange format

Applicability: Requirements on format specified in the formal arrangements apply to all signatories of the formal arrangements. Specific requirements on the aeronautical information exchange model apply to AIS providers only.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.085; AIS.OR.210; ADR.OPS.A.010

Relevant objectives from the AIR Guide: Assemble AIS products; Establish and Manage Formal Arrangements

6.1 AIXM 5.1 fully complies with the ‘ADQ’ requirements for aeronautical information exchange model.

6.2 The AIXM model has two main components. One component describes the concepts of the aeronautical information domain as a collection of features, properties, and relationships. This component is referred to as the AIXM logical information model and it is defined using the Unified Modelling Language (UML) and shall be used as the basis of the UK common data set specification.

6.3 A common data set specification does not mean that existing or future systems have to use it for their internal data management. It only means that the data input/output by the system needs to be organised according to the common data set specification, which is achievable through mapping and data conversions.

6.4 The AIXM logical information model enforces the use of Universally Unique Identifiers (UUID). For the provision of data to the AISP, UUID’s shall persist for the entire lifecycle of the feature and shall not be re-used upon deprecation of the feature.

Note 1: UUID for obstacle areas and aerodrome features can be obtained from the SDO Explorer tool in the Aurora Data Originators Portal.

Note 2: The provision of Obstacle UUIDs by surveyors is welcomed and UUIDs can be submitted by appending an extra (last) field to the existing fields in the survey data delivery format as specified in CAP 1732, Appendix 5 (Digital Data Specification).

Note 3: UUID generation algorithms guarantee that the risk for the same UUID value to be generated by another system, for another feature, is extremely low.

Information about such algorithms is provided in EUROCONTROL Document, AIXM 5, Feature Identification and Reference, Appendix 1 (UUID algorithms)[7]

6.5 The second component is derived from the AIXM logical information model and describes how to encode aeronautical data in a format that can be transmitted electronically between computer systems. The second component uses XML (Extensible Mark-up Language) as a language for system-to-system exchange. This component is also referred to as the XML Schema of AIXM and should be used as the basis of the UK common data exchange specification.

6.6 UK NOTAM exchange format does not comply with the AIXM data exchange requirements (no Digital NOTAM service provided).

Delivery of Aeronautical Information Products

Applicability: Specific requirements on the provision of Aeronautical Information Products are only applicable to AIS providers.

ATM/ANS IR and ADR IR requirements: AIS.OR.305 – AIS.OR.515; AIS.TR.305 - AIS.TR.515

Relevant objectives from the AIR Guide: Assemble AIS products; Distribute AIS Products

6.7 UK Aeronautical Information Products are provided in accordance with the relevant ATM/ANS IR and ICAO Annex 4 and Annex 15 requirements (unless a difference has been filed to ICAO – as per UK AIP GEN 1.7).

6.8 There are cases when there is more than one Authorised Source of the information. It is the AISP responsibility to establish mechanisms to ensure consistency across different data sources. An element of the UK-specific mechanisms is described in paragraph 4.13.

6.9 There are cases when the aeronautical information is published in the AIP of more than one Member State, and it is the AISP's responsibility to establish mechanisms to ensure consistency across the duplicated information.

6.10 There are cases when the AISP is provided with aeronautical data and aeronautical information which does not meet the data quality requirements (where there is no evidence available to give a degree of assurance that the requirements are met). It is the AISP's responsibility to inform users which data items do not fully comply with the data quality requirements. As described in paragraphs 2.16, 3.4 and 5.41, data sponsors are required to declare compliance status for each data item in the scope of the 'ADQ' requirements at the point of data submission to the AISP. The UK AISP publishes a list of non-compliant data items in AIP GEN 1.7.

[7] http://www.aixm.aero/sites/aixm.aero/files/imce/AIXM51/aixm_feature_identification_and_reference-1.0.pdf

Tools and Software

Applicability: Requirements on tools and software are only applicable to ATM/ANS providers and Aerodrome Operators in the scope of the 'ADQ' requirements.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.085; AIS.OR.215; ADR.OPS.A.055

Relevant objectives from the AIR Guide: Assure Tools and Software

6.11 Parties shall ensure that tools (including software) used to support or automate aeronautical data processes perform their functions without adversely impacting the quality of the aeronautical data.

6.12 In order to prove that tools used in data processes do not adversely impact on the quality of data, the potential contribution to failure conditions should be assessed and documented.

6.13 All parties should identify and document:

- Tools used in data processes.

Note: Tools and software (systems) include those used to support or automate aeronautical data processes, such as those used to: propose NOTAM, support safeguarding, generate datasets, or used for operational decision-making, if they may be used to originate, process or transmit data in the scope of 'ADQ' (see Chapter 2).

6.14 Parties should establish and maintain:

- Tool (and software/systems) assessment processes to determine requirements for:
  - validation and verification processes;
  - qualification processes.

Note 1: Tools and software can be qualified meeting paragraph 2.4.5 Aeronautical Data Tool Qualification of EUROCAE ED76A Standards for Processing Aeronautical Data, dated June 2015.

Note 2: ATM/ANS Interoperability – Where ATM systems and constituents that require approval under Article 205 of the Air Navigation Order (ANO) include tools and/or software (and systems) that are in scope of the ADQ requirements these will need to comply with the ATM "systems and constituents" elements of the essential requirements in UK Regulation (EU) 2018/1139 (the UK Basic Regulation). The means of demonstrating compliance with the essential requirements include the submission of a Record of Verification, Technical File(s) and (manufacturer's) Summary of Compliance. Where applicable, these documents may be used to support the ANSPs assurance that tools and

software perform their functions without adversely impacting the quality of aeronautical data. Refer to Paragraph 6.18 for further details.

Record keeping and Contingency

Applicability: Requirements on record keeping, contingency plan and back-up arrangements apply only to ATM/ANS providers and Aerodrome Operators in the scope of the 'ADQ' requirements.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.070; ATM/ANS.OR.A.085; ATM/ANS.OR.B.030; ADR.OPS.A.010; ADR.OR.D.035

Relevant objectives from the AIR Guide: Establish Contingency Plans; Assure Tools and Software; Store Data

6.15 Parties shall establish an adequate system of record keeping and back-up arrangements.

6.16 Parties should identify and document:

- Record keeping requirements for aeronautical data including records format, storage and reference to safety and security measures established for stored data;

6.17 Parties should establish and maintain:

- Record-keeping system including format, storage and retention arrangements and referring to safety and security measures established for stored data;
- processes and facilities for archiving and the back-up of stored data;
- contingency plan in place that addresses the arrangements in case of loss or temporary loss of the ability to access or publish data.

ATM/ANS interoperability requirements

Applicability: Interoperability requirements are only applicable to ATM/ANS providers.

ATM/ANS IR and ADR IR requirements: Based on a process established in accordance with ATM/ANS.AR.C.005, ATM/ANS systems and constituents approved under Article 205 of the Air Navigation Order (and systems used by the UK Aeronautical Information Service Provider) fall under the ATM/ANS interoperability requirements - See the ATM/ANS interoperability requirements section of the CAA website for further details.

Relevant objectives from the AIR Guide: Assure Tools and Software

6.18 Where ATM systems and constituents that require approval under Article 205 of the Air Navigation Order (ANO) include tools and/or software (and systems) that are in scope of the ADQ requirements (for example flight data and surveillance

data systems, human-machine interface systems, communication/navigation/surveillance services), these will need to comply with the ATM “systems and constituents” elements of the essential requirements in UK Regulation (EU) 2018/1139 (the UK Basic Regulation). The means of demonstrating compliance with the essential requirements include the submission of a Record of Verification, Technical File(s) and (manufacturer’s) Summary of Compliance. For further details regarding the arrangements for demonstrating interoperability compliance under Article 205 of the ANO and the completion and submission of Records of Verification, Technical File(s) and (manufacturer’s) Summary of Compliance see the ATM/ANS interoperability requirements section of the CAA website.

Change Management and Change Notification

Applicability: Requirements on Change Management are only applicable to ATM/ANS providers and Aerodrome Operators.

ATM/ANS IR and ADR IR requirements: ATM/ANS.OR.A.045; ATM/ANS.OR.B.005; ATM/ANS.OR.B.010; ATM/ANS.OR.C.005; ATS.OR.205; ADR.OR.B.040; ADR.OR.D.005.

Relevant objectives from the AIR Guide: Manage Changes to the Functional System

6.19 Guidance for ANSPs regarding Change Management and Change Notification process can be found in the Air Navigation Services[8] part of the CAA website.

6.20 Guidance for Aerodrome Operators regarding Change Management and Change Notification process can be found in the Certificated Aerodromes[9] and Licenced Aerodromes[10] part of the CAA website.

[8] https://www.caa.co.uk/commercial-industry/airspace/air-traffic-management-and-air-navigational-services/air-navigation-services/ansp-certification-and-designation/change-management-and-change-notification-process/
[9] https://www.caa.co.uk/Commercial-industry/Airports/Changes/Changes-to-EASA-certificated-aerodromes/
[10] https://www.caa.co.uk/Commercial-industry/Airports/Changes/Changes-to-national-licenced-aerodromes/

7 Types of data

General

7.1 Aeronautical data and aeronautical information include:

- numerical aeronautical data and aeronautical information;
- non-numerical aeronautical data and aeronautical information.

7.2 Types of data describing the nature of the property are used in the ICAO Data Catalogue, as follows:

- Point
- Line
- Polygon
- Height
- Altitude
- Elevation
- Distance
- Angle / Bearing
- Value
- Date
- Schedule
- Code list
- Text

7.3 Positional data is also classified by its origination type:

- surveyed;
- calculated; or
- declared.

Note 1: It is common to use the term “derived” for manually selected data that is still based on processed data defined in WGS-84.

Note 2: The methods(s) employed to calculate or derive data shall be recorded as metadata. In Data Catalogue derived data is be visible as declared data.

7.4 Every party originating, processing, and transmitting aeronautical data or information should have identified and documented types of every data item that they are responsible for to ensure that the most appropriate processes for the data type are implemented to provide and maintain specific data items.

Surveyed data

7.5 Full details regarding CAA survey requirements and periodicity are specified in CAP 1732 Aerodrome Survey Guidance.

7.6 Surveyed data categorised as critical or essential shall be monitored for changes on a yearly basis (as a minimum). Where changes are detected, re-survey of the relevant data shall be undertaken. It is the Authorised Source's responsibility to ensure the currency of the data.

7.7 If the Authorised Source cannot confirm that the data still meets the data quality requirements, the data can no longer be assured beyond the annual review date and therefore the Authorised Source must change their declaration in the Aurora Portal so the data can be referenced in the AIP at GEN 1.7 as not meeting the data quality requirements.

7.8 Consideration will be given to future system enhancements to allow reminders to be sent via Aurora Data Originators Portal to the Authorised Sources to support timely review of critical and essential data.

Note: CAP 1732 Aerodrome Survey Guidance, Chapter 4, includes guidance material on continuous monitoring of the obstacle environment and annual review of the aerodrome survey data.

8 Data Quality Attributes

General

8.1 The ICAO Data Catalogue specifies only three data quality attributes for each data item - accuracy, resolution, and integrity level. These attributes were implemented as the original data quality attributes in ICAO Annexes and they are considered as ‘numerical data quality requirements’.

8.2 Currently, ATM/ANS IR, ADR IR and EUROCAE ED-76A Standards for processing aeronautical data require seven characteristics (attributes) of data quality (accuracy, resolution, integrity, timeliness, completeness, traceability, and format). Amendment 40 to ICAO Annex 15 also included four new data quality attributes and the new attributes should be considered equally important and need to be considered in a wider data- exchange context – not only for individual data items but also data sets and other AIS products.

8.3 Aeronautical data quality attributes for specific data items in scope of the ‘ADQ’ requirements are based upon the ICAO Data Catalogue and UK national policies as specified at Annex A. As explained in Chapter 2, the Table included in Annex A includes all data items published in the AIP which should meet data quality requirements.

8.4 The aeronautical data quality attributes for data items referred to in Annex A have been developed in accordance with a standardised process describing the methodology for the derivation and validation of these requirements prior to publication, taking due account of the potential impact on relevant ICAO provisions.

8.5 All applicable data quality requirements and methods of demonstrating that the data provided conforms with the specified requirements should always be included in the formal arrangements covering data exchange activities between parties involved in the data chain from the point of data origination to the point of publication by the AISP. More details about Formal Arrangements can be found in Chapter 5.

8.6 EUROCAE ED-77 User Requirements for Navigational Data provides a comprehensive overview of the data quality characteristics and requirements.

Accuracy

8.7 For positional data, accuracy is expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling. Accuracy requirements are specified at Annex A.

Resolution

8.8 Publication Resolution is the smallest separation that can be employed to make the positional statement. Publication Resolution is always a rounded value.

8.9 Resolution supports the accuracy requirements. Resolution values are specified at Annex A.

Integrity

8.10 The integrity of aeronautical data shall be maintained throughout the data process. Based on the applicable integrity classification, the validation and verification procedures shall:

- For critical data: assure that corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.
- For essential data: assure corruption does not occur at any stage of the entire process and may include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level.
- For routine data: avoid corruption throughout the processing of the data.

8.11 As a minimum, measures should be applied for processing numerical data with associated data integrity classification (as per Annex A).

Traceability

8.12 The data traceability requirements are met through the provision of appropriate metadata.

8.13 All parties in the scope of the ‘ADQ’ requirements, processing data in the scope of the ‘ADQ’ requirements, shall record and maintain evidence and change history for each item identified in this chapter in order to ensure that traceability is maintained on each data item during its period of validity and for at least 5 years following the end of that period.

Timeliness

8.14 The timely submission and publication of new or amended aeronautical data and aeronautical information in accordance with published AIS publication schedules (including cut-off and publication dates) to ensure that up to date data are

available to users without undue delay are considered essential to support the achievement of data quality.

Completeness

8.15 All parties in the scope of the ‘ADQ’ requirements, processing data in the scope of the ‘ADQ’ requirements, shall ensure the data and information is complete and as agreed in the Formal Arrangements between the parties concerned. Any missing data items shall be declared by the party providing the data.

Format

8.16 All parties in the scope of the ‘ADQ’ requirements, processing data in the scope of the ‘ADQ’ requirements, should deliver and receive data in formats agreed in the formal arrangements covering data exchange activities between parties involved in the data chain from the point of data origination to the point of publication by AIS.

8.17 Some data sets in the upstream data chain have a defined exchange format, e.g.:

- ICAO data sets provided by AIS (AIXM & GeoTIFF);
- Data sets to be delivered to AIS via the Aurora Data Originators Portal are described in paragraph 5.36.

A UK AIP Authorised Sources and data quality requirements

Annex A and B are provided in a separate .xls file.

B Contact Details of Parties referred to in Annex A Column I

Annex A and B are provided in a separate .xls file.

C Application of Magnetic Variation in the UK Aeronautical Information Publication

Policy Details

Published magnetic values in UK Aeronautical Information Products are updated following the release of a new World Magnetic Model (WMM) by the United States' National Geospatial-Intelligence Agency (NGA) and the United Kingdom's Defence Geographic Centre (DGC), which is usually every five years and valid for next five-year epoch.

Post release of a new model, NATS AIM department schedule an update of the magnetic variation value for all aeronautical features which have a magnetic value attribute, using the date at the mid-point of the EPOCH cycle to derive the value from the WMM.

These updated features are often the reference source of magnetic variation for other aeronautical features with a calculated magnetic value and therefore NATS AIM additionally undertake an evaluation of impacted features and systematically update these where necessary.

The following features are sources of Magnetic Variation:

- Airport/Heliport
- Navaid
- Significant/Designated Point

The table below indicates features which have calculated magnetic values and the source of variation that should be used for the calculation:

Feature	**Source of Variation**
IFP Segment Leg/Final Leg	Magnetic variation of the associated Airport Heliport will be used or VOR declination of the associated VOR component (PlgRadialCourse)
Holding Pattern	Magnetic variation of the associated Designated Point will be used or Declination of the first associated VOR component of the Navaid will be used or (for conventional hold only) Magnetic variation the associated navaid component of the Navaid will be used

Feature	Source of Variation
Angle Indication	Magnetic variation of the associated Designated Point will be used or Declination of the first associated VOR component of the Navaid will be used or Magnetic variation the associated navaid component of the Navaid will be used
Azimuth/Localizer/SDF	Magnetic variation of the Entity itself
Runway Direction	Magnetic variation of the associated Airport Heliport will be used
Route Segment (RNAV)	Magnetic variation of the associated starting Designated Point will be used.

For magnetic variation management post the NATS AIM Quinquennial update, the following applies:

1. Features which are sources of magnetic variation and are established prior to the mid-point of the current epoch shall use the epoch mid-point date to derive the value.
2. Features which are sources of magnetic variation and are established after the mid-point of the current epoch shall use the epoch end date to derive the value.
3. Each new or amended track shall have a true track/bearing value defined, the source of magnetic variation will be as per the table above. Magnetic tracks/bearings shall be calculated by NATS AIM using the sources published/stored magnetic variation value.
4. Airport/Heliport and Navaid magnetic variation values and dates are published in the AIP and can be viewed in the Aurora Data Originators Portal. Significant/Designated Point magnetic variation values and dates are only viewable in Aurora Data Originators Portal.
    a) Additionally, to allow a user to make forward or backward calculations from the true north heading, magnetic variation annual rates of change are viewable in Aurora Data Originators Portal.
5. Calculation of aerodrome runway designators shall follow this policy and any update as a consequence, shall not be updated without co-ordination with the aerodrome operator and CAA.

En-Route - ATS routes

1. ENR ATS routes shall include magnetic tracks for each segment of a route.
2. The magnetic track of each segment shall be calculated as absolute values for forward and reverse ‘True-North’ headings, using the respective magnetic variation values for the starting designated point and end designated point, and may result in non-reciprocal headings.

D Flight Restriction Zone (FRZ)/Runway Protection Zone (RPZ) Data

Full details of the CAA's policy and guidance regarding the establishment and dimensions of FRZ/RPZs can be found in CAP 722C Unmanned Aircraft Systems – UK Airspace Restrictions, but the following details should be noted:

1. To maintain FRZ/RPZ data on an ongoing basis, changes to the shape or dimensions of an aerodrome's FRZ/RPZ will require the AIP to be updated by the aerodrome operator by submitting a Change Request through the Aurora Data Originators Portal. An Airspace Change Proposal may also be required for some changes.

2. Changes to aerodrome data arising from the re-surveying of the aerodrome, changes to the boundary which affect the FRZ, changes to the ARP, changes to runway thresholds or any other such change, may also result in a change to the notified shape and/or dimensions of the FRZ/RPZ (in accordance with Annex A). Therefore, in such cases, the aerodrome operator must re-calculate their FRZ/RPZ dimensions, and an ACP must be submitted.

3. FRZ/RPZ data must comply with the data quality requirements and CAA policies for the provision of aeronautical information as detailed in this CAP (and with reference as applicable to CAA Policy Statement – Aeronautical Data associated with Airspace Design).