

**CAA Decision to adopt AMC and GM for UK Reg (EU) 2017/373  
pursuant to Article 76(3) UK Reg (EU) 2018/1139**

**DECISION No. 13**

**Publication date: 2 September 2022**

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**Decision amending Acceptable Means of Compliance (AMC) and Guidance Material (GM)  
for UK Reg (EU) 2017/373 regarding data quality requirements**

**Background**

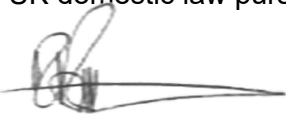
CAA UK-EU Transition Decision No. 1 adopted a form of Acceptable Means of Compliance (“**AMC**”) as means by which the requirements in Regulation (EU) **2017/373** as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018 (“**UK Reg (EU) 2017/373**”) could be met. That decision also adopted Guidance Material (“**GM**”) as non-binding explanatory and interpretation material on how to achieve the requirements in **UK Reg (EU) 2017/373**. The CAA has decided to adopt revised AMC and GM in respect of **UK Reg (EU) 2017/373**.

**Decision**

1. The CAA, under Article 76(3) of Regulation (EU) No 2018/1139 as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018, has decided to adopt the AMC and GM attached at Schedule 1.
2. This AMC and GM supplements and/or replaces that which was adopted for **UK Reg (EU) 2017/373** by CAA UK-EU Transition Decision No. 1 dated 22 December 2020.
3. This Decision will remain in force unless revoked or amended by the CAA.
4. The AMC and GM attached at Schedule 1 to this Decision comes into force on 2 September 2022.

**Definitions**

All references to UK Reg (EU) 2017/373 are to those Regulations as retained and amended in UK domestic law pursuant to the European Union (Withdrawal) Act 2018.



Rob Bishton  
For the Civil Aviation Authority and the United Kingdom

Date of Decision: 2 September 2022

Date of Decision Coming into force: 2 September 2022

## Schedule 1

### Includes the Acceptable Means of Compliance (AMC) and Guidance Material (GM) documents referenced below.

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

- (a) ~~Text to be deleted is shown struck through~~;
- (b) New text is highlighted in grey;
- (c) ~~Text to be deleted is shown struck through~~ followed by the replacement text which is highlighted in grey.

### AMC and GM for UK Reg (EU) 2017/373 regarding data quality requirements

#### GM1 Article 2 'Definitions'

##### GENERAL

(a) Point (5) of Article 3~~(q)~~ of Regulation (EC) No 216/2008 UK Regulation (EU) 2018/1139 defines ATM/ANS as 'the air traffic management functions and services as defined in point (10) of Article 2~~(10)~~ of Regulation (EC) No 549/2004; the air navigation services defined in point (4) of Article 2~~(4)~~ of that Regulation, including the network management functions and services referred to in Article 6 of Regulation (EC) No 551/2004, as well as services which augment signals emitted by satellites of core constellations of GNSS for the purpose of air navigation; flight procedures design; and services consisting in the origination and processing of data and formatting and delivering data to general air traffic for the purpose of safety-critical air navigation'.

(b) References to EU/EC regulations above are to those regulations as retained and amended in UK domestic law under the European Union (Withdrawal) Act 2018.

(c) It should, therefore, be noted that 'ATM/ANS' includes more services and functions than 'air traffic management' and 'air navigation services' together.

(d) It is important to note that ATS is included in ATM and ANS.

(e) As already defined, 'ATM network functions' refers to functions performed by the Network Manager in accordance with UK Regulation (EU) 2019/123 No 677/2011.

#### GM1 Article 3(5) Provision of ATM/ANS and design of airspace structures

##### AERONAUTICAL INFORMATION — DATA ORIGINATION

(a) Parties originating, processing and providing aeronautical data and aeronautical information in the scope of the aeronautical data quality requirements that are neither subject to the applicable requirements in UK Regulation (EU) 2017/373 nor to the data quality requirements in UK Regulation (EU) No 139/2014, need to comply with the aeronautical data quality management requirements laid

down in point ATM/ANS.OR.A.085 of Annex III, except those in points (c), (d), (f)(1) and (i) thereof, and their working methods and operating procedures need to comply with the requirements laid down in ATM/ANS.OR.A.090.

(b) The CAA Publication CAP 1054 Aeronautical Information Management provides national policy and guidance on the requirements applicable to all parties in the scope of the aeronautical information and data quality requirements. CAP 1054 should be used in conjunction with the AMC and GM provided for data quality requirements (DQRs).

## GM1 29A. Assemble

### AERONAUTICAL DATA

The assemble phase includes checking the data and ensuring that detected errors and omissions are rectified.

## GM1 30A. ATS route

### TYPES OF ATS ROUTES

(a) The term 'ATS route' is used to mean variously 'airway', 'advisory route', 'controlled' or 'uncontrolled route', 'arrival' or 'departure route', etc.

(b) An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and as determined by the competent authority, the lowest safe altitude.

## GM1 38B. Confidence level

### AERONAUTICAL DATA

The interval is usually referred to as the accuracy of the estimate.

## GM1 39B. Controlled airspace

### GENERAL

Controlled airspace is a generic term which covers ATS airspace classes A, B, C, D and E as described in the Annex to UK Regulation (EU) No 923/2012 SERA.6001.

## GM1 40I. Data product specification

### AERONAUTICAL DATA

A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end use or other purpose. Data product specification provides a means by which the content of a data set is precisely specified. A data product specification supports the party generating a data set by providing information as to what exactly should be included within the data set. The content of the data product specification is closely related to the metadata. The users of the data may determine, by comparing their data product specification with the metadata, how the data may be used in their application and what mitigations, if any, are needed as result of, for example, the quality/completeness of the data.

## GM1 62C. Integrity classification

### AERONAUTICAL DATA

Aeronautical data is classified as:

- (a) routine data: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for a catastrophe;
- (b) essential data: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for a catastrophe; and
- (c) critical data: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for a catastrophe.

## GM1 65A. Metadata

### GENERAL

A structured description of the content, quality, condition or other characteristics of data.

## GM1 ATM/ANS.OR.A.085 Aeronautical data quality management

### URGENT DISTRIBUTION OF AERONAUTICAL INFORMATION

The obligation to comply with the relevant provisions of ATM/ANS.OR.A.085 should not inhibit the urgent distribution of aeronautical information necessary to ensure the safety of flight. It is recognised that in this case it is not always possible to comply with all the relevant provisions. However, it is also not possible to determine a priori all cases where this exception may apply; hence, this shall be dependent on a case-by-case individual assessment made by competent staff.

## GM2 ATM/ANS.OR.A.085 Aeronautical data quality management

The CAA Publication CAP 1054 Aeronautical Information Management provides national policy and guidance on the requirements applicable to all parties in the scope of the aeronautical information and data quality requirements. CAP 1054 should be used in conjunction with the AMC and GM provided for data quality requirements (DQRs).

## GM1 ATM/ANS.OR.A.085(a) Aeronautical data quality management

### ICAO AERONAUTICAL DATA CATALOGUE

The ICAO aeronautical data catalogue presents the scope of data that can be collected and maintained by the AIS providers and provides a common terminology that can be used by data originators and service providers. CAA Publication CAP 1054, describes how the ICAO Data Catalogue is implemented in the UK. When originating, processing, or providing data for publication in UK aeronautical information

products, reference to CAP1054, Annex A identifies all data items which are in scope of the ICAO aeronautical data catalogue.

## GM1 ATM/ANS.OR.A.085(b) Aeronautical data quality management

### GENERAL

Minimum requirements for the processing of aeronautical data may be found in EUROCAE ED-76A, 'Standards for Processing Aeronautical Data', June 2015, which aims to assist aeronautical data chain actors.

## GM1 ATM/ANS.OR.A.085(b)(4) Aeronautical data quality management

### RESOLUTION

(a) Stating that resolution needs to be commensurate with the actual accuracy means that digital data needs to have sufficient resolution to maintain accuracy. Typically, if an accuracy of .1 unit is needed, then a resolution of 0.01 or .001 units would enable a data chain to preserve the accuracy without issue. A finer resolution could be misleading as one could assume that it supports a finer accuracy. This factor range of 10 to 100 between accuracy and resolution is applicable regardless of the units of measurements used.

(b) The resolution should be enough to capture the accuracy of the data.

## GM1 ATM/ANS.OR.A.085(b)(5) Aeronautical data quality management

### TRACEABILITY

Traceability is supported by maintaining the metadata.

## AMC1 ATM/ANS.OR.A.085(b)(8) Aeronautical data quality management

### FORMAT

The format requirements should be specified in the formal arrangements.

## AMC1 ATM/ANS.OR.A.085(d) Aeronautical data quality management

### VALIDATION AND VERIFICATION

(a) The processes implemented to carry out validation and verification should define the means used to:

(a) verify received data and confirm that the data has been received without corruption;

(b) preserve data quality and ensure that stored data is protected from corruption; and

(c) confirm that originated data has not been corrupted prior to being stored.

(b) Those processes should define the:

(1) actions to be taken when data fails a verification or validation check; and

(2) tools required for the verification and validation process.

## GM1 ATM/ANS.OR.A.085(d) Aeronautical data quality management

### VALIDATION AND VERIFICATION — GENERAL

(a) Validation

(1) Validation is the activity where a data element is checked as having a value that is fully applicable to the identity ascribed to the data element, or where a set of data elements are checked as being acceptable for their intended use.

(2) The application of validation techniques considers the entire aeronautical data chain. This includes the validation performed by prior data chain participants and any requirements levied on the data supplier.

(3) Examples of validation techniques

(i) Validation by application

One method of validation is to apply data under test conditions. In certain cases, this may not be practical. Validation by application is considered to be the most effective form of validation. For example, flight inspection of final approach segment data prior to publication can be used to ensure that the published data is acceptable.

(ii) Logical consistency

Logical consistency validates by comparing two different data sets or elements and identifying inconsistencies between values based on operative rules (e.g. business rules).

(iii) Semantic consistency

Semantic consistency validates by comparing data to an expected value or range of values for the data characteristics.

(iv) Validation by sampling

Validation by sampling evaluates a representative sample of data and applies statistical analysis to determine the confidence in the data quality.

#### (b) Verification

(1) Verification is a process for checking the integrity of a data element whereby the data element is compared to another source, either from a different process or from a different point in the same process. While verification cannot ensure that the data is correct, it can be effective to ensure that the data has not been corrupted by the data process.

(2) The application of verification techniques considers only the portion of the aeronautical data chain controlled by the organisation. Yet, verification techniques may be applied at multiple phases of the data processing chain.

#### (3) Examples of verification techniques

##### (i) Feedback

Feedback testing is the comparison between the output and input state of a data set.

##### (ii) Independent redundancy

Independent redundancy testing involves processing the same data through two or more independent processes and comparing the data output of each process.

##### (iii) Update comparison

Updated data can be compared to its previous version. This comparison can identify all data elements that have changed. The list of changed elements can then be compared to a similar list generated by the supplier. A problem can be detected if an element is identified as changed on one list and not on the other.

## GM2 ATM/ANS.OR.A.085(d) Aeronautical data quality management

### VALIDATION AND VERIFICATION TECHNIQUES

Validation and verification techniques are employed throughout the data processing chain to ensure that the data meets the associated data quality requirements (DQRs). More explanatory material may be found in Appendix C (Guidance on compliance with data processing requirements) to EUROCAE ED-76A 'Standards for Processing Aeronautical Data'.

## GM1 ATM/ANS.OR.A.085(e) Aeronautical data quality management

### ELECTRONIC MEANS

The transmission of aeronautical data and aeronautical information may be done by various electronic means.

## AMC1 ATM/ANS.OR.A.085(f) Aeronautical data quality management

### FORMAL ARRANGEMENTS

Formal arrangements should include the following minimum content:

- (a) the aeronautical data to be provided;
- (b) the data quality requirements (DQRs) for each data item supplied according to the aeronautical data catalogue;
- (c) the method(s) for demonstrating that the data provided conforms with the specified requirements;
- (d) the action to be taken in the event of discovery of a data error or inconsistency in any data provided;
- (e) the following minimum criteria for notification of data changes:
  - (1) criteria for determining the timeliness of data provision based on the operational or safety significance of the change;
  - (2) any prior notice of expected changes; and
  - (3) the means to be adopted for notification;
- (f) the party responsible for documenting data changes;
- (g) data exchange details such as format or format change processes;
- (h) any limitations on the use of data;
- (i) requirements for the production of data origination quality reports;
- (j) metadata to be provided; and
- (k) contingency requirements concerning the continuity of data provision.

## GM1 ATM/ANS.OR.A.085(f) Aeronautical data quality management

### FORMAL ARRANGEMENTS

ATM/ANS providers may use the predetermined template 'Data Provision Agreement' developed by EUROCONTROL (ADQ Formal Arrangement Template, version 1.1. issued on 22 February 2016), if all elements listed in AMC1 ATM/ANS.OR.A.085(f) Aeronautical data quality management are included in the document.

## GM1 ATM/ANS.OR.A.085(i) Aeronautical data quality management

### SOFTWARE

- (a) A means by which the requirement in ATM/ANS.OR.A.085(i) can be met, is through the verification of software applied to a known executable version of the software in its target operating environment.



(b) The verification of software is a process of ensuring that the software meets the requirements for the specified application or intended use of the aeronautical data and aeronautical information.

(c) The verification of software is an evaluation of the output of an aeronautical data and/or aeronautical information software development process to ensure correctness and consistency with respect to the inputs and applicable software standards, rules and conventions used in that process.

## GM2 ATM/ANS.OR.A.085(i) Aeronautical data quality management

### TOOLS

Tools can be qualified by meeting point 2.4.5 Aeronautical Data Tool Qualification of EUROCAE ED76A/RTCA DO-200B 'Standards for Processing Aeronautical Data', dated June 2015.

## GM1 ATM/ANS.OR.A.085(j) Aeronautical data quality management

### DATA ERROR DETECTION TECHNIQUES

(a) Digital error detection techniques can be used to detect errors during the transmission or storage of data. An example of a digital error detection technique is the use of cyclic redundancy checks (CRCs). Coding techniques can be effective regardless of the transmission media (e.g. computer disks, modem communication, or internet).

(b) Transmission of data via electronic/digital means (e.g. file transfer protocol (FTP) sites, web downloads, or email) may be subject to malicious attack that can corrupt the integrity of data for its intended use. Provision of means to mitigate the intentional corruption of digitally transmitted data may already exist within the organisational construct and operating procedures of participating entities.

(c) The objective of data security is to ensure that data is received from a known source and that there is no intentional corruption during processing and exchange of data.

(d) Records should be maintained to show what data security provisions have been implemented.

(e) Provisions supporting this objective may include:

(1) implementation of technical data security measures to provide authentication and prevent intentional corruption during exchange of data (e.g. secure hashes, secure transmissions, digital signatures); and

(2) implementation of organisational data security measures to protect processing resources and prevent intentional corruption during processing of data.

## GM2 ATM/ANS.OR.A.085(j) Aeronautical data quality management

### DATA ERROR PROCESSING

More explanation and guidance may be found in Appendix C (Guidance on compliance with data processing requirements) to EUROCAE ED-76A.

## GM1 ATM/ANS.OR.A.085(l) Aeronautical data quality management

### ERROR HANDLING

(a) The term 'error' is understood as being defective, degraded, lost, misplaced or corrupted data elements, or data elements not meeting stated DQRs.

(b) Guidance on how to detect, identify, report and address/resolve aeronautical data errors may be found in Appendix C (Guidance on compliance with data processing requirements) to EUROCAE ED-76A 'Standards for Processing Aeronautical Data'.

## GM1 ATM/ANS.OR.A.090(a) Common reference systems for air navigation

### HORIZONTAL REFERENCE SYSTEM — WGS-84

(a) A reference system provides a definition of a coordinate system in terms of the position of an origin in space, the orientation of an orthogonal set of Cartesian axes, and a scale. A terrestrial reference system defines a spatial reference system in which positions of points anchored on the Earth's solid surface have coordinates. Examples are WGS-84, ITRS/European Terrestrial Reference System (ETRS) and national reference systems.

(b) WGS-84 defines, inter alia, a conventional terrestrial reference system, a reference frame and a reference ellipsoid. WGS-84 is currently the reference system ICAO requires for georeferencing aeronautical information.

(c) Further explanation and guidance may be found in Annex B (Horizontal reference systems) to EUROCONTROL Specification for the Origination of Aeronautical Data, (EUROCONTROL-SPEC-154, Edition 2.0 of 16/12/2021).

## GM2 ATM/ANS.OR.A.090(a) Common reference systems for air navigation

### TEMPORARY NON-COMPLIANCE OF GEOGRAPHICAL COORDINATES

In those particular cases where geographical coordinates have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the applicable requirements contained in the aeronautical data catalogue, they should be identified until the time when they can be compliant.

## AMC1 ATM/ANS.OR.A.090(b) Common reference systems for air navigation

### VERTICAL REFERENCE SYSTEM

(a) A service provider should use the Earth Gravitational Model — 1996 (EGM-96), as the global gravity model.

(b) When a geoid model other than the EGM-96 model is used, a description of the model used, including the parameters required for height transformation between the model and EGM-96, should be provided in the aeronautical information publication (AIP).

## GM1 ATM/ANS.OR.A.090(b) Common reference systems for air navigation

### MEAN SEA LEVEL

(a) The geoid globally most closely approximates mean sea level (MSL). It is defined as the equipotential surface in the gravity field of the Earth which coincides with the undisturbed MSL extended continuously through the continents.

(b) Gravity-related heights (elevations) are also referred to as 'orthometric heights', while distances of points above the ellipsoid are referred to as 'ellipsoidal heights'.

(c) Global and local geoids differ in their origin: global geoids consider only the long- and middlewave part of the Earth's gravity field, whilst local geoids also consider the short-wave part of the gravity field. Global geoids are used when consistent orthometric heights, over long distances (continent or earth surveying), are required. Currently, the world's best global geoid model is EGM 200846. It was determined using satellite tracking, gravity anomalies and satellite altimetry. Its accuracy is in the range of  $\pm 0.05$  m (oceans) and  $\pm 0.5$  m (on land). This accuracy is higher in flat regions than in topographically mountainous terrain, such as the Alps.

(d) For local engineering applications and cadastre-surveying, global geoids are not as accurate as needed. For such applications, local geoid models are calculated. These can only be developed using local field measurements. They offer centimetre accuracy over several hundred kilometres, with a high resolution. Local geoids are not suitable for height comparison over large distances since they are based on different origins and reference heights (different equipotential levels).

## GM2 ATM/ANS.OR.A.090(b) Common reference systems for air navigation

### VERTICAL REFERENCE SYSTEM

Further explanation and guidance may be found in Annex C (Vertical reference systems) to EUROCONTROL Specification for the Origination of Aeronautical Data, (EUROCONTROLSPEC-154, Edition 2.0 of 16/12/2021).

## GM1 ATM/ANS.OR.A.090(c) Common reference systems for air navigation

**TEMPORAL REFERENCE SYSTEM**

- (a) A value in the time domain is a temporal position measured relative to a temporal reference system.
- (b) ISO Standard 8601 specifies the use of the Gregorian calendar and 24-hour local or UTC for information interchange, while ISO Standard 19108 prescribes the Gregorian calendar and UTC as the primary temporal reference system for use with geographic information.

**AMC1 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers****ESTABLISHMENT AND IDENTIFICATION OF STANDARD TAXI ROUTES**

- (a) The air traffic services provider, in coordination with the aerodrome operator, should assess the necessity for establishing standard routes for taxiing aircraft on an aerodrome between runways, aprons and maintenance areas.
- (b) When established, such routes should be direct, simple and, where practicable, designed to avoid traffic conflicts.
- (c) Standard routes for taxiing aircraft should be identified by designators distinctively different from those of the runways and ATS routes.

**AMC2 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers****INFORMATION EXCHANGE ON THE AERODROME CONDITIONS AND OPERATIONAL STATUS OF AERODROME FACILITIES**

The air traffic services provider should establish arrangements with the aerodrome operator for the exchange of information regarding the aerodrome conditions, in particular the operational conditions of the movement area, including the existence of temporary hazards, and the operational status of any associated facilities at the aerodrome(s) with which they are concerned.

**AMC3 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers****APRON MANAGEMENT SERVICES**

The air traffic services provider should establish arrangements, including a coordination procedure, with the aerodrome operator and, when applicable, with the other organisation(s) providing apron management services. The coordination procedure between the provider(s) of apron management services and the air traffic services provider should contain at least the following:

- (a) the boundaries of the respective areas of responsibilities on the movement area;
- (b) the handover points between apron and manoeuvring area;
- (c) the holding areas;
- (d) the means of guidance for the aircraft taxiing;
- (e) the operational information to be exchanged between both parties; and

(f) the push back operations, when interfering with the manoeuvring area.

## AMC4 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers

### COORDINATION FOR LOW-VISIBILITY OPERATIONS

The air traffic services provider should establish arrangements with the aerodrome operator and, where established, with the apron management services provider(s) for the relevant aspects and the definition of the respective responsibilities in conducting low-visibility operations (LVOs). ~~in addition to those established in ATS.TR.265(b).~~

## AMC5 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers

### COORDINATION FOR RUNWAYS INSPECTIONS

The air traffic services provider should coordinate with the aerodrome operator the conduct of routine and non-routine runway inspections.

## AMC6 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers

### INFORMATION ON THE SAFE USE OF THE MANOEUVRING AREA

When a not previously notified condition pertaining to the safe use by aircraft of the manoeuvring area is reported to or observed by the aerodrome air traffic controllers or by aerodrome flight information services (AFIS) officers, the air traffic services provider should inform the aerodrome operator, and should ensure that operations on that part of the manoeuvring area are terminated until otherwise advised by the aerodrome operator.

## GM1 ATS.OR.110 Coordination between aerodrome operators and air traffic services providers

### COORDINATION FOR THE AERODROME MANUAL

The air traffic services provider should establish close coordination with the aerodrome operator to participate in the development of the elements of the aerodrome manual pertaining to the services it provides.

## GM1 ATS.OR.125(a) Coordination between aeronautical information services and air traffic services providers

### PROMULGATION OF INFORMATION ON AFIS

The air traffic services provider should arrange to report information regarding the availability of AFIS and related procedures for its inclusion in the relevant parts of the AIP in the same manner as in the case of aerodromes provided with air traffic control service. Information should be provided in accordance with CAA Publication CAP1054 .and should include, but is not limited to, the following:

(a) identification of the aerodrome;

(b) location and identification of the AFIS unit;

(c) hours of operation of the AFIS unit. For aerodromes where there is an alternation of the air traffic control service and AFIS provision, hours of operation of both services;

(d) lateral and vertical limits of the associated airspace;

(e) language(s) used;

(f) detailed description of the services provided, including alerting service and, if applicable, use of direction-finding;

(g) special procedures for application by pilots; and

(h) any other pertinent information.

## GM1 ATS.OR.125(c) Coordination between aeronautical information services and air traffic services providers

### ORIGIN OF AERONAUTICAL INFORMATION

Information to be reported by the air traffic services provider to the AIS provider for the purpose of air traffic services may originate also from other entities, such as the aerodrome operator, the apron management services provider, CNS service providers, etc.

## GM1 ATS.OR.125(d) Coordination between aeronautical information services and air traffic services providers

Of particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system, as stipulated in AIS.OR.505 and AIS.TR.505.

## GM1 AIS.OR.100 Aeronautical information management

### AERONAUTICAL INFORMATION

(a) The object of aeronautical information services is 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.

(b) The role and importance of aeronautical data and aeronautical information changed significantly with the implementation of area navigation (RNAV), performance-based navigation (PBN), airborne computer-based navigation systems, performance-based communication (PBC), performance-based surveillance (PBS), data link systems and satellite voice communications (SATVOICE). Corrupt, erroneous, late, or missing aeronautical data and aeronautical information can potentially affect the safety of air navigation.

(c) Guidance material on the organisation and operation of aeronautical information services is contained in ICAO Doc 8126 'Aeronautical Information Services Manual'.

## GM1 AIS.OR.105(1) Responsibilities of aeronautical information services (AIS) providers

**PERSONNEL INVOLVED IN FLIGHT OPERATIONS, INCLUDING FLIGHT CREWS, FLIGHT PLANNING, AND FLIGHT SIMULATORS**

The data services (DAT) providers are considered as one of the entities or parties listed in AIS.OR.105(1). They also receive, assemble, translate, select, format, distribute and/or integrate aeronautical data and information that are released by an authoritative source for use in aeronautical databases on certified aircraft application/equipment.

**GM1 AIS.OR.105(3) Responsibilities of aeronautical information services providers****SERVICES RESPONSIBLE FOR PRE-FLIGHT INFORMATION**

An AIS provider obtains aeronautical data and aeronautical information to provide pre-flight information service and to meet the need for in-flight information from:

- (a) the aeronautical information services of other States;
- (b) other sources that may be available.

**GM1 AIS.OR.105 Responsibilities of aeronautical information services providers****AVAILABILITY OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION**

An AIS provider is not required to provide data or information requested by other AIS providers if such data or information is not available to the AIS provider.

**GM1 AIS.OR.200(a) General****AERONAUTICAL DATA CATALOGUE**

The aeronautical data catalogue presents the scope of data that can be collected and maintained by the AIS providers and provides a common terminology that can be used by data originators and service providers.

**GM1 AIS.OR.200(b) General****DATA QUALITY**

The quality of data is a degree or level of confidence that the data provided meets the requirements of the user. Minimum requirements for the processing of aeronautical data may be found in the EUROCAE Document ED-76A 'Standards for Processing Aeronautical Data' which aims to assist aeronautical data chain actors and authorities in meeting their responsibilities. It is intended to be used by organisations seeking approval of the method(s) they use to process or manipulate data.

**AMC1 AIS.OR.200(c) General****AUTOMATED DATA PROCESSING**

Where processes or parts of processes used in the origination, production, storage, handling, processing, transfer and distribution of aeronautical data and aeronautical information are subject to automation, they should be:

- (a) automated to a level commensurate with the context of the data process;
- (b) automated to optimise the allocation and interaction of human and machine to achieve a high degree of safety and quality benefits of the process;
- (c) automated to ensure traceability of the performed actions;
- (d) designed to avoid the introduction of data errors; and
- (e) designed to detect errors in received/input data.

## AMC1 AIS.OR.205 Formal arrangements

### MINIMUM CONTENT

Formal arrangements should include the following minimum content:

- (a) the aeronautical data to be provided;
- (b) the data quality requirements (DQRs) for each data item supplied according to the aeronautical data catalogue;
- (c) the method(s) for demonstrating that the data provided conforms with the specified requirements;
- (d) the action to be taken in the event of discovery of a data error or inconsistency in any data provided;
- (e) the following minimum criteria for notification of data changes:
  - (1) criteria for determining the timeliness of data provision based on the operational or safety significance of the change;
  - (2) any prior notice of expected changes; and
  - (3) the means to be adopted for notification;
- (f) the party responsible for documenting data changes;
- (g) data exchange details such as format or format change processes;
- (h) any limitations on the use of data;
- (i) requirements for the production of data origination quality reports;
- (j) metadata requirements; and
- (k) contingency requirements concerning the continuity of data provision.

## AMC1 AIS.OR.210(a) Exchange of aeronautical data and aeronautical information

### EXCHANGE MODEL

An AIS provider should use the aeronautical information exchange model (AIXM) to enable the management and distribution of aeronautical information services data in digital format.

## GM1 AIS.OR.210(a) Exchange of aeronautical data and aeronautical information

### EXCHANGE MODEL



(a) AIXM 5.1 is considered as being the current baseline for the exchange of aeronautical data and aeronautical information.

(b) More information on the AIXM may be found under <http://www.aixm.aero>.

## GM2 AIS.OR.210(a) Exchange of aeronautical data and aeronautical information

### DIGITAL TERRAIN DATA

(a) The existing formats for the exchange of electronic terrain datasets do not fully meet the requirements of the ISO 19100 series on geographic information, therefore the GeoTIFF format and Shape file with metadata is preferred.

(b) The list of most used terrain formats can be found in Appendix D to the EUROCONTROL 'Terrain and Obstacle Data (TOD) Manual' (edition 3.0, dated 04 May 2021).

## GM1 AIS.OR.210(b) Exchange of aeronautical data and information

### ELECTRONIC MEANS

The exchange of aeronautical data and aeronautical information may be done by a number of electronic exchanges avoiding the need of manual interaction with the data itself.

## GM1 AIS.OR.215 Tools and software

### SOFTWARE

(a) AIS.OR.215 may be met through the verification of software applied to a known executable version of the software in its target operating environment.

(b) The verification of software is a process for ensuring that the software meets the requirements for the specified application or intended use of the aeronautical data and aeronautical information.

(c) The verification of software evaluates the output of an aeronautical data and/or aeronautical information software development process to ensure correctness and consistency with respect to the inputs and applicable software standards, rules and conventions used in that process.

## GM2 AIS.OR.215 Tools and software

### TOOLS

Tools can be qualified by meeting point 2.4.5 Aeronautical Data Tool Qualification of EUROCAE ED76A/RTCA DO-200B 'Standards for Processing Aeronautical Data', dated June 2015.

## GM1 AIS.OR.220 Validation and verification

### GENERAL

(a) Validation

Validation is the activity where a data element is checked as having a value that is fully applicable to the identity ascribed to the data element, or a set of data elements is checked as being acceptable for their intended use.

The application of validation techniques considers the entire aeronautical data chain. This includes the validation performed by prior data chain participants and any requirements levied on the data supplier. Providing data integrity has been assured, there is no need to repeat earlier validations as a matter of course. Examples of validation techniques include the following:

(1) Validation by application validates by applying data under test conditions. In certain cases, this may not be practical. Validation by application is considered to be the most effective form of validation. For example, flight inspection of final approach segment data prior to publication can be used to ensure that the published data is acceptable.

(2) Logical consistency validates by comparing two different data sets or elements and identifying inconsistencies between values based on operative rules (e.g. business rules).

(3) Semantic consistency validates by comparing data to an expected value or range of values for the data characteristics.

(4) Validation by sampling evaluates a representative sample of data and applies statistical analysis to determine the confidence in the data quality.

#### (b) Verification

Verification is a process for checking the integrity of a data element whereby the data element is compared to another source, either from a different process or from a different point in the same process. While verification cannot ensure that the data is correct, it can be effective to ensure that the data has not been corrupted by the data process.

The application of verification techniques considers only the portion of the aeronautical data chain controlled by the organisation. Yet, verification techniques may be applied at multiple phases of the data processing chain.

Examples of verification techniques include the following:

(1) Feedback testing is the comparison of a data set between its output and input state.

(2) Independent redundancy testing involves processing the same data through two or more independent processes and comparing the data output of each process.

(3) Update comparison involves comparison of updated data with its previous version. This comparison can identify all data elements that have changed. The list of changed elements can then be compared to a similar list generated by the supplier. A problem can be detected if an element is identified as changed on one list and not on the other.

## AMC1 AIS.OR.220 Validation and verification

### DATA PROTECTION

(a) The processes implemented to carry out validation and verification should define the means used to:

(1) verify received data and confirm that the data has been received without corruption; (2) preserve data quality and ensure that stored data is protected from corruption; and (3) confirm that originated data has not been corrupted prior to being stored.

(b) Those processes should define the:

(1) actions to be taken when data fails a verification or validation check; and

(2) tools required for the verification and validation process.

## GM1 AIS.OR.225 Metadata

### PERSONAL DATA

Metadata is subject to applicable data protection law and when collecting metadata, the protection of individuals with regard to the processing of personal data and with regard to the free movement of such data applies. The relevant law within the UK is the Data Protection Act 2018 and the UK General Data Protection Regulation. If operating or providing services outside the UK, the AIS provider may need to comply with additional or alternative requirements.

## GM1 AIS.OR.230 Data error detection and authentication

### GENERAL

More explanation and guidance on data security, including data error detection and authentication, may be found in Section 2 of EUROCAE ED-76A. DATA ERROR DETECTION An example of a digital error detection technique is the use of cyclic redundancy checks (CRCs). Coding techniques can be effective regardless of the transmission media (e.g. computer disks, modem communication, or internet).

## GM1 AIS.OR.230(a) Data error detection and authentication

### ERROR

The term 'error' is understood as being defective, degraded, lost, misplaced or corrupted data elements, or data elements not meeting stated quality requirements.

## GM1 AIS.OR.235 Error reporting, error measurement and corrective actions

### ERROR MANAGEMENT

(a) An AIS provider should have a system for handling errors and anomalies identified both during data processing and after delivery of the data to the users.

(b) All problems reported with the data should be analysed and any errors or anomalies documented and resolved or addressed.

(c) All errors or anomalies detected in the data should be resolved or addressed prior to delivery.

(d) Information concerning any errors in the data that have been delivered should be made available to all affected users.

## AMC1 AIS.OR.250 Consistency requirement

### DUPLICATED INFORMATION

The AIS provider should ensure that:

(a) coordination and explicit agreement are established with the AIS providers responsible for the aeronautical information publications (AIPs) of the States concerned before introducing changes in published border or cross-border data and information; and

(b) periodic reviews are performed to detect inconsistencies between the AIPs of the States concerned.

## GM1 AIS.OR.250 Consistency requirement

### DUPLICATED INFORMATION

- (a) Coordination and alignment processes between AIS providers should whenever possible be expanded beyond the AIP content and include all duplicated aeronautical data and information.
- (b) The AIS provider may identify and maintain a list of the data items and information which should be subject to coordination, for reference and use by its operational staff.
- (c) When establishing periodic reviews, the AIS provider may reflect those in formal arrangements established with other AIS providers.

## GM1 AIS.OR.300 Aeronautical information products

### AERONAUTICAL DATA AND INFORMATION PROVIDED IN MULTIPLE FORMATS

'Aeronautical data and information provided in multiple formats' refers to aeronautical data and aeronautical information provided using different products, such as data sets, electronic or paper products.

## AMC1 AIS.OR.325 Aeronautical charts

### PRODUCTION

Aeronautical charts should be produced in accordance with the specifications contained in ICAO Annex 4, Amendment No 61.

## GM1 AIS.OR.330(a) NOTAM

### SHORT DURATION / SHORT NOTICE

- (a) The term 'short duration' should, in general, be understood as being less than 3 months.
- (b) The term 'short notice' should be understood as insufficient time for the AIS provider to distribute an AIP supplement or amendment.

## GM1 AIS.OR.330(b) NOTAM

### TIMELY KNOWLEDGE

It may be considered that the knowledge of the information is 'timely' if it reaches the personnel involved with flight operations in time to ensure the safety, regularity and efficiency of flight operations.

## GM2 AIS.OR.330(b) NOTAM

### EXCEPTIONAL SITUATIONS

- (a) It is recognised that, in the cases of NOTAM or digital NOTAM that are crucial to ensure the safety of flight, it is not always possible to comply with all the relevant provisions of the Regulation. However, it is also not possible to determine a priori all cases where this consideration may apply; this is dependent on a case-by-case individual assessment made by competent AIS staff.

(b) If it is determined that it is not possible to comply with all the relevant provisions of the Regulation, the NOTAM office ensures, at the minimum, that:

(1) the party originating the aeronautical data is authorised and/or an eligible/reasonable source;

(2) the content is plausible; and

(3) the data quality requirements (DQRs) are validated post publication, as soon as practicable.

## GM1 AIS.OR.335 General — Digital data sets

### DATA SETS

Data items may appear in multiple data sets.

## GM1 AIS.OR.345 AIP data set

### GENERAL

The purpose of the AIP data set is to support the initial transition of the ATM domain towards the use of digital data sets instead of paper products. Therefore, its scope is defined considering the likelihood that the data contained in this set is actually being used in digital format by service providers, air traffic control and instrument flight rules/visual flight rules airspace users.

## GM1 AIS.OR.350 Terrain and obstacle data – General requirements

### GENERAL

(a) Useful information for those organisations involved in the origination, processing and provision of digital 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, can be found in the EUROCONTROL 'Terrain and Obstacle Data (TOD) Manual' (edition 3.0, dated 04 May 2021).

(b) In addition, EUROCAE ED-98C 'User Requirements For Terrain And Obstacle Data' (October 2015) provides guidance for data gathering by data originators, for data processing by data integrators, for implementation by application integrators, and for end use by the aviation community (e.g. air carriers, air traffic services, procedure designers).

## GM2 AIS.OR.350 Terrain and obstacle data – General requirements

### NAVIGATION APPLICATIONS

(a) Terrain and obstacle data are intended to be used in air navigation applications such as:

(1) ground proximity warning system with forward-looking terrain avoidance function and minimum safe altitude warning (MSAW) system;

(2) determination of contingency procedures for use in the event of an emergency during a missed approach or take-off;

(3) aircraft operating limitations analysis;

(4) instrument procedure design (including circling procedure);

(5) determination of en-route 'drift-down' procedure and en-route emergency landing location;

(6) advanced surface movement guidance and control system (A-SMGCS); and

(7) aeronautical chart production and on-board databases. Additional information on the use of terrain and obstacle data can be found in Appendix C to EUROCAE ED-98C.

(b) The data may also be used in other applications such as flight simulator and synthetic vision systems and may assist in determining the height restriction or removal of obstacles that pose a hazard to air navigation.

## GM1 AIS.OR.355 Terrain data sets

### ADDITIONAL TERRAIN DATA

Where additional terrain data is collected to meet other aeronautical requirements, the terrain data sets may be expanded to include this additional data.

## GM1 AIS.OR.355(b)(3) Terrain data sets

### TAKE-OFF FLIGHT PATH AREA

'Take-off flight path area' is defined in 3.8.2 of ICAO Annex 4.

## GM1 AIS.OR.355(b)(4) Terrain data sets

### AERODROME OBSTACLE LIMITATION SURFACES

'Aerodrome obstacle limitation surfaces' are defined in the UK Certification Specification (CS) for Aerodrome Design (Chapter H – Obstacle Limitation Surfaces) for UK (EU) Reg No 139/2014

## GM1 AIS.OR.360 Obstacle data sets

### ADDITIONAL OBSTACLE DATA

Where additional obstacle data is collected to meet other aeronautical requirements, the obstacle data sets may be expanded to include this additional data.

## GM1 AIS.OR.400(a) Distribution services

### DELIVERY METHOD

(a) The distribution of available aeronautical information products to the intended users differs in the delivery method applied which may either be:

(1) physical distribution — the means by which aeronautical data and aeronautical information distribution is achieved through the delivery of a physical package, such as postal services; or

(2) direct electronic distribution — the means by which aeronautical data and aeronautical information distribution is achieved automatically through the use of a direct electronic connection between the AIS provider and the intended user.

(b) Different delivery methods and data media may require different procedures to ensure the required data quality.

(c) Further guidance on digital dataset distribution can be found in ICAO Doc 10039 'Manual on System Wide Information Management (SWIM) Concept'.

(d) Global communication networks and web services may be employed for the provision of aeronautical information products.

(e) Guidance to assist the AIS providers in developing and adapting their systems for the distribution of the State AIP on the internet as an official and authoritative source of information may be found in the EUROCONTROL 'Guidelines for Aeronautical Information Publication (AIP) distribution on the Internet' (edition 1.0, dated October 2017).

## GM1 AIS.OR.405(a) Pre-flight information services

### COMMUNICATION

Pre-flight information may be provided as a verbal briefing or a self-briefing.

## GM1 AIS.OR.405(b) Pre-flight information services

### OPERATIONAL SIGNIFICANCE

(a) Geographic coverage for pre-flight information services should be determined and periodically reviewed. In general, the coverage zone should be limited to the flight information region (FIR) within which the aerodrome/heliport is located, the FIR(s) adjacent thereto, and all air route or portion of route flown without an intermediate landing, originating at the aerodrome/heliport and extending beyond the FIR(s) mentioned.

(b) The elements of the aeronautical information products may be limited to national publications and when practicable, those of immediately adjacent States, provided that a complete library of aeronautical information is available at a central location and means of direct communications with that library are available.

(c) A recapitulation of valid NOTAM of operational significance and other information of urgent character can be made available to flight crews in the form of plain-language pre-flight information bulletins (PIBs).

(d) Guidance on the preparation of pre-flight information services and PIBs may be found in Chapter 8 of ICAO Doc 8126 'Aeronautical Information Services Manual' and in Chapter 7 of the EUROCONTROL 'Guidelines — Operating Procedures for AIS Dynamic Data (OPADD)' (edition:4.0, dated 17 April 2015).

## AMC1 AIS.OR.505(2) Aeronautical information regulation and control (AIRAC)

### DISTRIBUTION

AIRAC information, distributed as a physical medium, should be sent at least 42 days in advance of the AIRAC effective dates with the objective of reaching recipients at least 28 days in advance of the effective date.

## GM1 AIS.OR.505 Aeronautical information regulation and control (AIRAC)

### AIRAC SYSTEM

Further explanations with regard to the application of the AIRAC system can be found in the EUROCONTROL 'Procedure for the Assessment of Information for Notification by AIRAC' (SDP/8),

(edition 2.0, dated 17 July 2009). Additional details can be found in SDP/9, 10 and 13 for specific products.

## AMC1 AIS.OR.515 Data set updates

### GENERAL

(a) When made available as a completely re-issued data set, the differences from the previously issued complete data set should be indicated.

(b) When temporary changes of short duration are made available as digital data, they should use the same information model as the complete data set.

## GM1 AIS.OR.600(b) General requirements

### COMPETENCE

'Competence' is understood as a situation where the personnel responsible for originating aeronautical data and aeronautical information possess the required level of knowledge, technical and behavioural skills and experience, and language proficiency when required, in order to be authorised to perform their duties.

### AUTHORISATION

The authorisation of personnel is usually granted by the AIS provider, but it might be granted by another entity depending on the national arrangements for managing the competence and performance of AIS personnel.

## GM1 AIS.TR.200(b) General

### ACCURACY — RESOLUTION

(a) The resolution of the data contained in the database may be the same or finer than the publication resolution.

(b) Stating that resolution needs to be commensurate with the accuracy means that digital data needs to have sufficient resolution to maintain accuracy. Typically, if an accuracy of .1 units is needed, then a resolution of 0.01 or .001 units would enable a data chain to preserve the accuracy without problems. A finer resolution could be misleading as one could assume that it supports a finer accuracy. This factor range of 10 to 100 between accuracy and resolution is applicable regardless of the units of measurements used.

## AMC1 AIS.TR.200(d) General

### TRACEABILITY

Aeronautical data and associated metadata should be kept for a minimum period of 5 years beyond the validity period of the associated aeronautical information.

## AMC1 AIS.TR.210 Exchange of aeronautical data and aeronautical information

### EXCHANGE MODELS



(a) The exchange model used should encompass the aeronautical data and aeronautical information to be exchanged.

(b) The exchange model used should:

- (1) use the unified modelling language (UML) to describe the aeronautical information features and their properties, associations and data types;
- (2) include data value constraints and data verification rules;
- (3) include provisions for metadata;
- (4) include a temporality model to enable capturing the evolution of the properties of an aeronautical information feature during its life cycle;
- (5) apply a commonly used data encoding format;
- (6) cover all the features, attributes, data types and associations of the aeronautical information model; and
- (7) provide an extension mechanism by which groups of users can extend the properties of existing features and add new features which do not adversely affect global standardisation.

## GM1 to AMC1 AIS.TR.210 Exchange of aeronautical data and aeronautical information

### ENABLING EXCHANGE

(a) The intent of using a commonly used data encoding format is to ensure interoperability of aeronautical data exchange between agencies and organisations involved in the data processing chain.

(b) Examples of commonly used data encoding formats include extensible markup language (XML), geography markup language (GML), and JavaScript object notation (JSON).

## AMC1 AIS.TR.225(a) Metadata

### IDENTIFICATION

The metadata collected should clearly identify the organisation or entity originating the data, as well as any organisation or entity introducing amendments to the data.

## AMC1 AIS.TR.225(b) Metadata

### ACTION PERFORMED

The metadata reflecting each action performed involving origination or manipulation of the data should reflect any potential impact on the compliance with the applicable DQRs.

## GM1 AIS.TR.225 Metadata

### GENERAL

Further explanation on the schema required for describing geographic information and services by means of metadata may be found in the:

(a) International Organization for Standardization, ISO 19115 — Geographic information — Metadata, Part I; and

(b) EUROCONTROL 'Guidelines for the provision of Metadata to support the Exchange of Aeronautical Data' (edition 1.0, dated 28 November 2019)

## GM1 AIS.TR.240 Data limitations

### ANNOTATION

(a) The objective of such an annotation is to notify the users of the AIS products including their aeronautical data that specific quality requirements are not met and may, therefore, compel limitations in the operational use of the relevant aeronautical data.

(b) The following principles apply:

(1) the solution applies for both the eAIP and paper AIP, if relevant;

(2) the use of the 'asterisk' is undesirable;

(3) the non-compliance covers all parts of the AIP, i.e. textual aeronautical data and charts; and

(4) non-compliant aeronautical data items shall be individually and explicitly identified and the use of any general statement with the intention of covering a range of data items shall be avoided.

(c) The AIP section GEN 1.7 is used to identify non-compliant aeronautical data items. A sub-header should be included, named 'Data not fully compliant with aeronautical data quality requirements included in UK Reg (EU) 2017/373 and UK Reg (EU) No. 139/2014'.

(d) Within AIP GEN 1.7, the following two alternatives are proposed. The choice of which depends on national practicalities being based either on the amount of annotations to be published or on individual existing operational or technical constraints.

(1) Annotation alternative 1

Alternative 1 is recommended if the number of identified non-compliances covers no more than two AIP pages. The relevant non-compliant data items shall be listed in a table, including as a minimum: — specific data item; — AIP section(s) concerned; — reason for non-compliance; — Notes/remarks.

Proposed table format:

Data Item	AIP section	Reason for noncompliance	Notes/remarks

(2) Annotation alternative 2

Alternative 2 is recommended if the number of non-compliances extends more than two AIP pages. It should then contain a general (global) statement to indicate 'Several data items are not compliant with the given regulation – details can be found online via '. The link shall direct the user to a list on the website which must support compliance with minimum requirements: the list must be accessible online.

Note: The indication of 'available on request', or similar, is clearly insufficient. The list must be kept up to date and fully synchronised (consistent) with the AIP update cycles, as relevant. This list should be

in the form of a table as indicated under alternative 1 noting that it will be made available to users as an extra element outside the AIP.

## GM1 AIS.TR.300(b) General — Aeronautical information products

### PLACE NAMES

The phrase ‘when necessary’ means ‘for interoperability purposes’ e.g. in aeronautical information products that are intended to be processed by automated systems (NOTAM, data sets, etc.).

## AMC1 AIS.TR.305(a) Aeronautical information publication (AIP)

### ELECTRONIC FORM

The eAIP, eAIP amendments and eAIP supplements should be provided according to the EUROCONTROL ‘Specification for the Electronic Aeronautical Information Publication (eAIP)’ (edition 2.1, dated 6 October 2015).

## AMC2 AIS.TR.305(a) Aeronautical information publication (AIP)

### ELECTRONIC AIP

When provided, the eAIP should be available on a physical distribution medium (CD, DVD, etc.) and/or online on the internet.

## GM1 AIS.TR.305(a) Aeronautical information publication (AIP)

### PRINTING FORMAT

(a) A system of page numbering adaptable to the addition or deletion of sheets should be adopted. The page number should include:

- (1) an identification of the part of the AIP;
- (2) the section; and
- (3) subsection, as applicable,

thus creating a separate set of numbers for each subject (e.g. GEN 2.1-3, ENR 4.1-1 or AD 2.2- 3).

(b) If it is necessary by reason of bulk or for convenience, to publish an AIP in two or more parts or volumes, each of them will indicate that the remainder of the information is to be found in the other part(s) or volume(s).

(c) When the AIP is provided in more than one volume, each volume should include:

- (1) a preface;
- (2) a record of AIP amendments;
- (3) a record of AIP supplements;
- (4) a checklist of AIP pages; and
- (5) a list of current hand amendments.

(d) When the AIP is published as one volume, the above-mentioned subsections should appear only in Part 1 — GEN and the annotation ‘not applicable’ should be entered against each of these subsections in Parts 2 and 3.

(e) The AIP should be published in loose-leaf form unless the complete publication is reissued at frequent intervals.

(f) Further guidelines for a harmonised AIP publication may be found in the EUROCONTROL 'Guidelines for harmonised AIP publication and data set provision' (edition 2.0, dated 23 May 2019).

## GM1 AIS.TR.305(c) Aeronautical information publication (AIP)

### INFORMATION RELATED TO LOCATIONS

When listing locations, the city or town should be given in capital letters followed, where the facility is an aerodrome/heliport or is located at an aerodrome/heliport, by an oblique stroke and the name of the aerodrome/heliport in smaller capital letters or lower-case letters. Unless otherwise indicated, the list should be in alphabetical order.

## GM2 AIS.TR.305(c) Aeronautical information publication (AIP)

### INFORMATION RELATED TO CHARTS, MAPS OR DIAGRAMS

(a) Charts, maps or diagrams should be used, when appropriate, to complement the AIP or serve as a substitute for the tabulations or text of the AIP.

(b) Where appropriate, charts produced in conformity with AIS.OR.325 may be used to fulfil this requirement.

## GM3 AIS.TR.305(c) Aeronautical information publication (AIP)

### INFORMATION RELATED TO THE AIP DATA SET

When the AIP data set is provided, the following sections of the AIP may be left blank and a reference to the data set availability should be provided:

- (a) ENR 2.1 FIR, UIR, TMA;
- (b) ENR 3.1 Lower ATS routes;
- (c) ENR 3.2 Upper ATS routes;
- (d) ENR 3.3 Area navigation (RNAV) routes;
- (e) ENR 3.4 Helicopter routes;
- (f) ENR 3.5 Other routes;
- (g) ENR 3.6 En route holding;
- (h) ENR 4.1 Radio navigation aids — en route;
- (i) ENR 4.4 Name-code designators for significant points;
- (j) ENR 4.5 Aeronautical ground lights — en route;
- (k) ENR 5.1 Prohibited, restricted and danger areas;
- (l) ENR 5.2 Military exercise and training areas and air defence identification zone (ADIZ);
- (m) ENR 5.3.1 Other activities of a dangerous nature;
- (n) ENR 5.5 Aerial sporting and recreational activities;

- (o) AD 2.17 Air traffic services airspace;
- (p) AD 2.19 Radio navigation and landing aids;
- (q) AD 3.16 Air traffic services airspace; and
- (r) AD 3.18 Radio navigation and landing aids.

## GM4 AIS.TR.305(c) Aeronautical information publication (AIP)

### INFORMATION RELATED TO THE OBSTACLE DATA SET

When the obstacle data set is provided, the following sections of the AIP may be left blank and a reference to the data set availability should be provided:

- (a) ENR 5.4 Air navigation obstacles;
- (b) AD 2.10 Aerodrome obstacles; and
- (c) AD 3.10 Heliport obstacles.

## AMC1 AIS.TR.310(g) AIP amendments

### ANNOTATION

- (a) The annotation in the margin should be done by a thick black vertical line or, where the change incorporated covers one line only or a part of a line, a thick black horizontal arrow.
- (b) For aeronautical charts, the annotation should be made as a marginal note.

## GM1 AIS.TR.310(h) AIP amendments

### EFFECTIVE TIME

When an effective time other than 00.00 UTC is used, the effective time should also be indicated.

## GM1 AIS.TR.315 AIP supplements

### ISSUE OF NOTAM

When there is not sufficient time for the distribution of an AIP supplement, a NOTAM may be issued.

## AMC1 AIS.TR.320(a) Aeronautical information circular (AIC)

### ELECTRONIC FORM

When AICs are provided as part of the 'electronic AIP', they should comply with the EUROCONTROL 'Specification for the Electronic Aeronautical Information Publication (eAIP)' (edition 3.0, edition date 30 November 2021, Reference nr: EUROCONTROL-SPEC-146)

## GM1 AIS.TR.320(a) Aeronautical information circular (AIC)

### PRINTED FORM

Differentiation and identification of AIC topics according to subjects using colour coding should be practised where the numbers of AICs in force are sufficient to make identification in this form necessary. For example:

- (a) white — administrative;
- (b) yellow — ATC;
- (c) pink — safety;
- (d) mauve — danger area map; and
- (e) green — maps/charts.

## GM1 AIS.TR.320(c) Aeronautical information circular (AIC)

### GENERAL

(a) AICs are not used to promulgate aeronautical data and aeronautical information that qualify for inclusion in AIP (including amendments and supplements) or in NOTAM. Nevertheless, AICs can be used to provide detailed information and/or interpretation about data contained in those aeronautical information products.

(b) Consequently:

- (1) an AIC is not used to promulgate aeronautical data that is part of the data catalogue; and
- (2) the content of an AIC is not subject to the application of the DQRs.

(c) AICs can be made available with the electronic AIP for distribution purpose, as long as it is understood that they remain separate aeronautical information products.

## GM1 AIS.TR.320(d) Aeronautical information circular (AIC)

### SNOW PLAN INFORMATION

The seasonal AIC on the snow plan may contain information such as that listed below:

(a) a list of aerodromes/heliports where during the coming winter the following are expected to be performed:

- (1) snow clearance in accordance with the runway and taxiway systems; or
- (2) planned snow clearing, deviating from the runway system (length, width and number of runways, affected taxiways and aprons or portions thereof);

(b) information concerning any centre designated to coordinate information on the current state of progress of clearance and on the current state of runways, taxiways and aprons;

(c) a division of the aerodromes/heliports into SNOWTAM distribution lists in order to avoid excessive NOTAM distribution;

(d) an indication, as necessary, of minor changes to the standing snow plan;

(e) a descriptive list of clearance equipment; and

(f) a listing of what will be considered as the minimum critical snow bank to be reported at each aerodrome/heliport at which reporting will commence.

## AMC1 AIS.TR.330 NOTAM

### USE OF OPADD

The origination and issuing of NOTAM should be in accordance with the EUROCONTROL 'Guidelines — Operating Procedures for AIS Dynamic Data (OPADD)' (edition 4.1, edition date 07 December 2020 ), Document reference: EUROCONTROL-GUID-121.

## GM1 AIS.TR.330(d) NOTAM

### NOTAM CODE

The ICAO NOTAM Code together with significations/uniform abbreviated phraseology, and ICAO Abbreviations are those contained in ICAO Doc 8400 'Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC)'.

## GM1 AIS.TR.330(u) NOTAM

### CHECKLIST

The checklist NOTAM may include the checklist of AIP Supplement (SUP).

## GM1 AIS.TR.335(a) General — Digital data sets

### STANDARD FOR GEOGRAPHIC INFORMATION

The ISO 19100 series of standards for geographic information may be used as a reference framework.

## GM1 AIS.TR.335(b) General — Digital data sets

### DATA PRODUCT SPECIFICATION

(a) ISO Standard 19131 specifies the requirements and outline of data product specifications for geographic information. This is intended to facilitate and support the use and exchange of digital data sets between data providers and data users.

(b) The data product specification enables air navigation users to evaluate the products and determine whether they fulfil the requirements for their intended use (application).

(c) This may include an overview, specification scope, data product identification, data content and structure, reference system, data quality, data capture, data maintenance, data portrayal, data product delivery, additional information, and metadata.

## GM1 AIS.TR.345(b) AIP data set

### PROPERTY

There may also be other reasons why a property is not provided, e.g. missing, unknown, withheld, etc.

## GM1 AIS.TR.350(d) Terrain and obstacle data — General requirements

### AREA 4

Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant, the length of Area 4 should be extended to a distance not exceeding 2 000 m (6 500 ft) from the runway threshold.

## GM1 AIS.TR.355(e) Terrain data sets

### ATTRIBUTES

The following additional terrain feature attributes may be recorded in the terrain data set:

- (a) surface type;
- (b) penetration level; and
- (c) known variations.

## GM1 AIS.TR.360(b) Obstacle data sets

### ATTRIBUTES

The following additional obstacle feature attributes may be recorded in the obstacle data set:

- (a) height;
- (b) operations; and
- (c) effectiveness.

## GM1 AIS.TR.365 Aerodrome mapping data sets

### ADDITIONAL GUIDANCE

Further information concerning minimum requirements and reference material applicable to the content, origination, publication, and updating of aerodrome mapping information may be found in EUROCAE ED-99D 'User Requirement for Aerodrome Mapping Information', October 2015, and EUROCAE ED-119C 'Interchange Standards for Terrain, Obstacle and Aerodrome Mapping Data', October 2015.

## GM1 AIS.TR.365(a) Aerodrome mapping data sets

### AERODROME FEATURES

Aerodrome features consist of attributes and geometries, which are characterised as points, lines or polygons. Examples include runway thresholds, taxiway guidance lines and parking stand areas.

## GM2 AIS.TR.365(a) Aerodrome mapping data sets

### ADDITIONAL DATA

Aerodrome mapping data may be supported by electronic terrain and obstacle data for Area 3 in order to ensure consistency and quality of all geographical data related to the aerodrome.

## GM3 AIS.TR.365(a) Aerodrome mapping data sets

### COMMON ACQUISITION TECHNIQUES

Electronic terrain and obstacle data pertaining to Area 3 as well as aerodrome mapping data may be originated using common acquisition techniques and managed within a single geographic information system (GIS).



## GM1 AIS.TR.365(b) Aerodrome mapping data sets

### GENERAL

ISO Standard 19100 series on geographic information can be used as a reference framework.

## GM1 AIS.TR.365(c) Aerodrome mapping data sets

### GENERAL

ISO Standard 19131 contains standards for data product specification.

## GM1 AIS.TR.365(d) Aerodrome mapping data sets

### GENERAL

ISO Standard 19109 contains standards for application schemas, while ISO Standard 19110 describes the feature cataloguing methodology for geographic information.

## GM1 AIS.TR.370 Instrument flight procedure data sets

### GENERAL

Guidance on the instrument flight procedure data sets can be found in PANS-OPS, ICAO Doc 8168, Volume II – Part III, Section 2, Chapter 5.

## GM1 AIS.TR.400(a) Distribution services

### NOTAM

(a) The predetermined distribution system provides for incoming NOTAM (including SNOWTAM and ASHTAM) to be channelled through the aeronautical fixed service (AFS) directly to designated addressees predetermined by the receiving country concerned while concurrently being routed to the international NOTAM office for checking and control purposes.

(b) The addressee indicators for those designated addressees are constituted as follows:

(1) First and second letters

The first two letters of the location indicator for the AFS communication centre associated with the relevant international NOTAM office of the receiving country.

(2) Third and fourth letters

The letters 'ZZ' indicating a requirement for special distribution.

(3) Fifth letter

The fifth letter differentiating between NOTAM (letter 'N'), SNOWTAM (letter 'S'), and ASHTAM (letter 'V').

(4) Sixth and seventh letters

The sixth and seventh letters, each taken from the series A to Z, denoting the national and/or international distribution list(s) to be used by the receiving AFS centre. The fifth, sixth and seventh letters replace the three-letter designator YNY which, in the normal distribution system, denotes an international NOTAM office.

**(5) Eighth letter**

The eighth position letter shall be the filler letter 'X' to complete the eight-letter addressee indicator.

(c) Information about the sixth and seventh letters to be used under different circumstances should be made available to ensure proper routing.

**GM1 AIS.TR.405(a) Pre-flight information services****AUTOMATION**

(a) Automated pre-flight information systems that provide a harmonised, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information and meteorological information should be established by an agreement between the AIS provider and the meteorological services provider.

(b) Where automated pre-flight information systems are used to provide the harmonised, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical data, aeronautical information and meteorological information, the AIS provider remains responsible for the quality and timeliness of the aeronautical data and aeronautical information provided by means of such a system.

(c) The meteorological services provider concerned remains responsible for the quality of the meteorological information provided by means of such a system in accordance with Annex V to UK Regulation (EU) 2017/373.

**GM1 AIS.TR.405(e) Pre-flight information services****NOTAM**

Although NOTAM with purpose 'M' are regarded not subject for a briefing but available on request, all NOTAM are to be provided for briefing by default, and content reduction should be at user's discretion.

**GM1 AIS.TR.505(a) AIRAC OTHER CIRCUMSTANCES WHERE USE OF THE AIRAC SYSTEM MAY BE CONSIDERED**

The AIRAC system may also be considered for the provision of information relating to the establishment and withdrawal of, and planned significant changes in, the circumstances listed below:

(a) position, height and lighting of air navigation obstacles;

(b) hours of service of aerodromes, facilities and services;

(c) customs, immigration and health services;

(d) temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft; and

(e) temporary areas or routes or portions thereof where the possibility of interception exists.

**AMC1 AIS.TR.505(b) AIRAC****MAJOR CHANGES**

Whenever major changes are planned and where advance notice is desirable and possible, information should be distributed and/or made available by the AIS provider, whenever practicable, so as to reach recipients at least 56 days in advance of the AIRAC effective date. This should apply to the establishment of, and premeditated major changes in the circumstances listed below, as well as to other major changes if deemed necessary:

- (a) new aerodromes for international instrument flight rules operations;
- (b) new runways for instrument flight rules (IFR) operations at international aerodromes;
- (c) design and structure of the ATS route network;
- (d) design and structure of a set of terminal procedures (including change of procedure bearings due to magnetic variation change); and
- (e) circumstances listed in AIS.TR.505(a) if the entire State or any significant portion thereof is affected or if cross-border coordination is required.

## GM1 AIS.TR.510(a) NOTAM

### ADVANCE NOTICE

- (a) Whenever possible, an at least 24 hours' advance notice is desirable, to permit timely completion of the notification process and to facilitate airspace utilisation planning.
- (b) Notice of any subsequent cancellation of the activities or any reduction of the hours of activity or the dimensions of the airspace should be given as soon as possible.