The Safety Regulatory Requirements for the Aeronautical Data Originators

1. Purpose

1.1. This notice provides guidance and comprehensive requirements, stemming from different recognised sources, which should be met when originating aeronautical data to comply with requirements concerning the quality of aeronautical data and aeronautical information ensuring that all Aeronautical Survey Providers intending to carry out survey work meet applicable requirements.

1.2. Airports need current and accurate aeronautical surveys showing the ground surface and air space objects. Therefore, the need to develop highly accurate airport surveying and mapping data is more important than ever.

1.3. This notice therefore pursuant to the provisions of Regulation (EU) 2017/373 is to notify persons or entities intending to supply Aeronautical Data.

1.4. Data Originators of aeronautical data for the State include:

- Air Navigation providers.
- Aeronautical Information Service (AIS) e.g., State AIP
- Aerodrome Operators.
- Procedure Design Services.
- National Mapping Agencies
- Geodesic Agencies
- Satellite Data Providers
- SRD

1.5. Readers should forward advice of errors, inconsistencies, requests for further information or suggestions for improvement to this regulatory requirement to airspace@iaa.ie

2. REFERENCES

2.1. This Manual is based mainly on compliance with the following documents:

- ICAO Annex 4 Aeronautical Charts.
- ICAO Annex 5 Units of Measurement.
- ICAO Annex 14 Vol I Aerodromes.
- ICAO Annex 15 Aeronautical Information Services.
- ICAO Doc 9674 World Geodetic System 1984 (WGS 84) Manual.
- ICAO Doc 8168 Procedures for Air Navigation Services – Aircraft Operations.
- ICAO Doc 9137 Airport Services Manual.
- ICAO Doc 8697 Aeronautical Chart Manual.
- Regulation (EU) 2017/373
- Eurocontrol Surveying of Navigational Facilities.
- Eurocontrol Specification for the Origination of Aeronautical Data Vol.1.

- AIC- Data Validation Prior to Promulgation.
- Aeronautical Information Exchange Model (AIXM) - Obstacle Model Proposal.
- Eurocae: User Requirements for Terrain and Obstacle Data, ED-98A.
- Eurocae Standards for Processing Aeronautical Data ED-76.

3. DEFINITIONS:

3.1. Data origination means 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; (Reg (EU) 2017/373)

3.2. 'Data integrity' means a degree of assurance that aeronautical data and its value has not been lost or altered since the data origination or authorised amendment.

4. GENERAL

4.1. In the interest of safety, the data originator shall implement the aeronautical data provision in a consistent manner, using processes that will minimise the possibility of errors, identify errors that do occur before they impact safety, and provide for continuous improvement of the surveying process to eliminate or reduce future errors.

4.2. All aeronautical data coming within the scope of this notice and bearing the aeronautical information date of 16/06/22 or later shall conform to the Standards relevant to aeronautical data.

4.3. All aeronautical data shall be submitted to the Aeronautical Services Department for validation. No aeronautical data will be published prior to validation.

4.4. Any processing of aeronautical data/information shall be conducted in a manner that ensures that the accuracy and resolution are maintained and that the data quality requirements are achieved.

4.5. The Aeronautical Data Process Guidelines covers data origination activities through to the AIS Provider making aeronautical information products/services available, in accordance with ICAO Annex 15, ICAO Annex 4 and PANS-AIM, whilst recognising that States also offer bespoke products/services.

4.6. When a data originator is not able to comply with any standards specified or referenced in this regulatory requirement, the data originator shall apply to ANSD for exemption or deviation from the relevant standards. Applications shall be supported in writing with the reasons for such exemption or deviation including any safety assessment or other studies undertaken and where appropriate, an indication of when compliance with the current standards can be expected.

4.7. When a data originator is not able to comply with any recommended practices specified or referenced in this regulatory requirement, the data originator shall notify ANSD of the non-compliance or deviation with the supporting reason including any safety assessment or other studies undertaken, and where appropriate, an indication of when compliance with the current recommended practices can be expected.

4.8. Any exemption or deviation granted to a data originator shall also be recorded in their operations manual. The operations manual shall also contain the details of the exemption

or deviation, such as the reason that the exemption or deviation was requested, and any resultant limitations or conditions imposed.

5. Aeronautical Data Process Guidelines

5.1. The objective of the Data Origination process is to ensure that data is originated, as needed, in accordance with applicable standards and that it meets its quality requirements.

5.2. Regulation (EU) 2017/373 - ATM/ANS.OR.A.085 Aeronautical data quality management ensures that aeronautical data conforms to the specifications of the aeronautical data catalogue, ensure data quality requirements are met and establish specific formal arrangements with the party originating data that contain instructions for data creation, modification, or deletion.

5.3. The Aeronautical Data Catalogue is a general description of the AIM data scope and consolidates all data that can be collected and maintained by the AIS as specified in ICAO Doc 10066, Appendix 1.

6. Relationship of Data Originators and AIS

6.1. The data originator shall either create the data item with its associated value, modify the value of an existing data item or delete an existing data item or ensure the value associated with a given data item is created or modified by a third-party qualified entity on the behalf of the data originator.

6.2. The data originator shall ensure an existing value associated to a data item is updated whenever necessary. The data originator is responsible for the verification and validation of aeronautical data and information. When the data originator has subcontracted the creation of data to a third party, it can have this third party verify the data.

6.3. The data originator shall ensure that aeronautical data and information are transmitted to the AIS organisation. The data originator should transmit the aeronautical data and information to the AIS organisation. Otherwise, the data originator might delegate the task to a third party.

6.4. The data originator shall establish a formal arrangement with the AIS organisation.

6.5. The data originator should establish a system for handling errors or anomalies which either it identifies itself or that are identified after the delivery of the data to the AIS organisation.

7. Aeronautical Data Requirements

7.1. Scope of aeronautical data and aeronautical information is specified in Annex 15, 4.1 - 4.2

7.2. Data origination and metadata requirements are specified in ICAO Doc 10066, 4.1 - 4.2.

7.3. Data origination requirements are laid down in Regulation (EU) 2017/373.

8. Data Quality Specifications

8.1. Data quality specifications are listed in Annex 15, 3.2.

8.2. It is the responsibility of relevant technical services, within the appropriate authority of a Contracting State, to ensure the determination of raw aeronautical data required for promulgation by the AIS as specified in ICAO Doc 9674, 2.3.

8.3. Accuracy, Resolution & Integrity Requirements as listed in Annex 15 are described in ICAO Doc 9674, 2.4 - 2.6 and ICAO Doc 10066, Appendix 1.

8.4. Regulation (EU) 2017/373 specifies data quality requirements.

9. Data Error Detection

9.1. Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets, and to maintain the integrity levels as specified in Annex 15, 3.2.3.

9.2. Data Integrity, Monitoring & Assurance is specified in Doc 10066, 2.2. Guidance material is contained in RTCA DO-200B/EUROCAE ED-76A — Standards for Processing Aeronautical Data.

9.3. The parties referred to in Regulation (EU) 2017/373 shall ensure that error reporting, feedback and rectification mechanisms are established and operated in accordance with the requirements as laid down.

10. Use Of Automation

10.1. Automation is specified in Annex 15, 3.5 and guidance material on the development of databases and the establishment of data exchange services is contained in ICAO Doc 8126.

10.2. Data process requirements for automation are laid down in Regulation (EU) 2017/373.

11. Formal Arrangements

11.1. 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.

11.2. Data originators shall establish arrangements with parties with which they exchange aeronautical data and/or which exchange this data on their behalf.

11.3. 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.

12. Aeronautical data Quality (ADQ)

12.1. 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 Irish AISP:

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

12.2. 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 12.1 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.

13. Aeronautical Information Exchange Model (AIXM)

13.1. 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. 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.

14. Quality Management System

14.1. A QMS shall be implemented and maintained encompassing all functions of an AIS as specified in Annex 15, 3.6 and ICAO Doc 10066, 3.1.

14.2. Guidance material can be found in ICAO Doc 9839 and ASAM 006. QMS requirements are laid down in Regulation (EU) 2017/373.

15. Approval of Data Originators

15.1. A data originator approval will be issued for an unlimited period.

15.2. The approval authorises the provider to:

15.2.1. Create, edit, or delete aeronautical data and its associated metadata.

15.2.2. Submit for validation aeronautical data intended for publication in the Irish AIP.

15.2.3. An approval will specify the work that the provider is authorised to carry out.

15.3. A Data Originator approval remains in force until it expires or withdrawn or suspended or revoked.

15.4. The holder of a data originator approval that is revoked shall forthwith surrender the approval to SRD; and

15.5. The holder of a data originator approval that is suspended shall forthwith produce the approval to the SRD for appropriate endorsement.

15.6. Register of Aeronautical Survey Provider Approval

15.6.1. The IAA will maintain a register of all aeronautical data provider approvals issued under this notice.

16. Ongoing Oversight and audit of data originators

16.1. Ongoing oversight and audit of the service provider/data originator shall be undertaken against:

16.1.1. The requirements of this notice.

16.2. The purpose of the audit is to ensure:

16.2.1. That the data originator is providing aeronautical data in line with applicable requirements; and

16.2.2. That the data originator's quality management system is functioning appropriately.

16.3. Non-conformities

16.3.1. If the audit reveals non-conformities in service provision, non-conformities should be drawn to the attention of the data originator in accordance with normal audit practice and the standard corrective action process followed. See also ASAM No.004-Guidance on the NSA Audit Finding Corrective Action Process.

16.3.2. If the non-conformities are such that safety is or may be affected, authority measures may include:

16.3.2.1. variation or cancellation of the DO approval; or

16.3.2.2. revocation of the approval

16.3.3. If a safety-critical non-conformity is identified, unless it can be rectified immediately, notification of the deficiency should be distributed to users by the most appropriate means available. It may be necessary to call for withdrawal and replacement of the affected aeronautical data.

17. Data Validation & Verification

17.1. Data validation and verification processes shall be adequate for the assigned integrity level of the data item.

17.2. Prior to use in deriving or calculating other data, aeronautical data/information shall be validated and verified.

17.3. Careful consideration must be given to the means by which the transfer from printed to electronic form is to be performed and verified, if end to end integrity is to be achieved.

17.4. Validation checks provide some assurance that data have been correctly entered, maintained, or transferred and they can assist the checking of the integrity of the data to a limited degree. However, validation checks cannot be used to improve the reported data quality. Their primary use is to filter out gross errors.

17.5. Verification is a process for checking the integrity of a data item. It can take place when data are input into a database, e.g., a visual check of the input data against the original source document by an independent checker, or an automatic check of the same data which is entered two or more times by one or more data entry operators (double, triple entry methods).

17.6. Any procedures established to validate and verify must also include a procedure to ensure that where errors are identified these are dealt with by corrective action.

17.7. Material to be issued as part of an aeronautical information product shall be thoroughly checked before it is submitted to the AIS to ensure that all necessary information has been included and that it is correct in detail.

17.8. An AIS shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements are met.

17.9. Management of aeronautical data and aeronautical information shall include Collection, Processing, Quality Control and Distribution as detailed in ICAO Doc 10066, 2.1.1 - 2.1.4.

17.10. When originating, processing, or transmitting data to the AIS provider, the service provider shall ensure that data validation and verification techniques are employed to ensure that the aeronautical data meets the associated data quality requirements and in addition:

17.10.1. the verification shall ensure that aeronautical data is received without corruption and that corruption does not occur at any stage of the entire aeronautical data process.

17.10.2. aeronautical data and aeronautical information entered manually shall be subject to independent verification to detect any errors that may have been introduced.

17.10.3. when using aeronautical data to derive or calculate new aeronautical data, the initial data shall be verified and validated, except when provided by an authoritative source.

18. DOCUMENTATION:

18.1. The following outlines the required documentation to be developed and maintained by those entities wishing to supply aeronautical data:

18.2. Quality Management Manual

18.2.1. A documented quality management system, conforming to the standards of Eurocae shall be developed and implemented by the data originator.

18.2.2. The data originator shall comply with the order of accuracy for aeronautical information/data as specified in ICAO Annex 11, Chapter 2, paragraph 2.19, and Annex 14, Volumes I and II, Chapter 2. The order of publication resolution and data integrity of aeronautical information/data shall comply with Annex 15, paragraph 3.2.9, and Appendices 1 and 7.

18.2.3. The data originator shall ensure that electronic data sets, while stored shall be protected by a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets.

18.3. Safety Management Manual

18.3.1. The data originator shall document how it manages the safety of its services. ICAO Doc 9859 – Safety Management Manual outlines the principles of safety management and provides guidance for the conduct of effective safety management system.

18.4. Operations Manual

18.4.1. The data originator shall submit an operation manual to the Air Navigation Services Division (ANSD). The information presented in the operations manual shall serve to demonstrate how the data originator will comply with the requirements of ANSD. It also serves as a reference document agreed between the data originator and the ANSD with respect to the standards, conditions, and level of service to be maintained for the provision of aeronautical data.

18.4.2. **Qualifications, Training and Personnel Requirement**

18.4.2.1. The data originator shall ensure that a person surveying or dealing with aeronautical data demonstrates required competency level for aeronautical survey data.

18.4.2.2. The data originator shall employ enough competent personnel to perform the operation of the service. The data originator shall provide in the operations manual an analysis of the number of personnel required to perform the survey service considering the duties, training, annual leave, and workload required.

18.4.2.3. The competency of the data originator shall be subject to periodic verification by the Authority.

18.4.2.4. The data originator shall establish procedures to ensure that all its personnel, including technical staff, possess the skills and competencies required in the provision of aeronautical DO. The data originator shall develop an overall training policy, training programme and detailed job descriptions for its staff. The training policy and programme should lay down the training

courses that different levels of staff must undergo to perform their duties, including initial, recurrent, on the job and specialised training.

18.4.2.5. The data originator shall ensure that their staff undergo a suitable period of supervised on-the-job training before being deployed for duties.

18.4.2.6. The data originator shall document training plans for each staff member.

18.5. Errors in aeronautical surveying data

18.5.1. An approved data originator shall establish a procedure for recording, investigating, correcting, and reporting any identified error and any identified non-conformance or suspected non-conformance with the standards and requirements for aeronautical data that is approved or maintained.

18.6. Promulgation

18.6.1. Recognising the criticality of data to the safety of air navigation, all aeronautical data to be promulgated in the AIP must be submitted to the Air Navigation Services Division (ANSD) of the Irish Aviation Authority in accordance with ASAM 09 Guidance Material on Aeronautical Information Regulation and Control (AIRAC)'s. ANSD will then independently assess and validate all such aeronautical data against relevant quality standards and specifications. Aeronautical data must be traceable to the data originator and must be submitted to ANSD in electronic format.

18.6.2. If an amendment is required to a promulgated page within AIP Ireland, the Aerodrome Licensee, or ATM Service Provider as appropriate, must ensure that all data on that page continues to remain valid and complies with ICAO, EUROCAE (Requirements for Aerodrome Mapping Information (ED-99A) October 2005) and Irish Aviation Authority requirements for data, those relating to accuracy and integrity, whether or not such data relates to the proposed amendment.

19. Further Information

Any queries or requests should be addressed to the following Airspace email address: airspace@iaa.ie.

Irish Aviation Authority.