'AMC and GM to Part-ATM/ANS.OR — Issue 1, Amendment 2'

Annex III to Decision 2017/001/R is amended as follows:

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

(a) deleted text is ~~struck through~~;

(b) new or amended text is highlighted in blue;

(c) an ellipsis [...] indicates that the rest of the text is unchanged.

GM1 ATM/ANS.OR.A.001 Scope

DEFINITIONS AND SCOPE IN RELATION TO SERVICE PROVIDERS

[...]

(d) In this Regulation, 'services' ~~means~~ refers to those specified in Annex ~~Vb~~ VIII(2) to Regulation ~~(EC) No 216/2008~~ (EU) 2018/1139. ~~This Annex includes an additional service (airspace design) that is neither directly included in the definition of ATM/ANS nor in the definition of 'Air Traffic Management' or 'Air Navigation Service'~~.

[...]

(g) Figure 1 indicates both a further breakdown of ATS into air traffic control services (ATC), alerting services, air traffic advisory services, and flight information services and groupings of:

(1) air traffic management (ATM): comprising ATS, ASM, and ATFM;

(2) air navigation services (ANS): comprising ATS, CNS, MET, and AIS; and

(3) ~~airspace~~ flight procedure design services (~~ASD~~FPD) and data ~~provision~~ services (DAT) and ATM network functions.

[...]

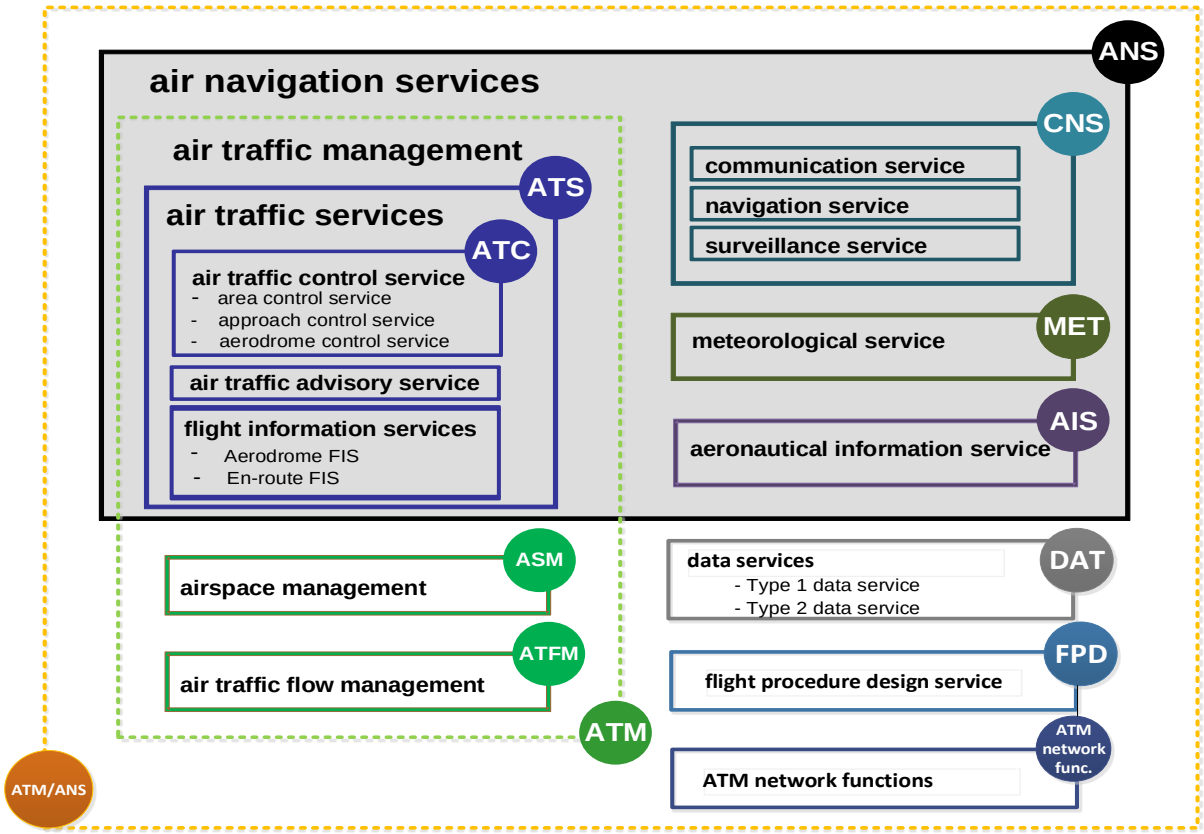

Figure 1: The scope of the services, subject to certification, as specified in ~~Annex Vb to~~ Regulation ~~(EC) No 216/2008~~ (EU) 2018/1139 ~~and, additionally, the other ATM network functions~~.

[...]

	Annex III (Part-ATM/ANS.OR)				Annex IV (Part-ATS)	Annex V (Part-MET)	Annex VI (Part-AIS)	Annex VII (Part-DAT)	Annex VIII (Part-CNS)	Annex IX (Part-ATFM)	Annex X (Part-ASM)	Annex XI (Part-FPD~~ASD~~)	Annex XII (Part-NM)	Annex XIII (Part-PERS)
	Subpart A	Subpart B	Subpart C	Subpart D										
Air traffic services providers (see Note 1)	**X**	**X**		**X**	**X**									
Meteorological services providers	**X**	**X**	**X**	**X**		**X**								
Aeronautical information services providers	**X**	**X**	**X**	**X**			**X**							
Data services providers	**X**	**X**	**X**					**X**						
Communication, navigation and surveillance service providers	**X**	**X**	**X**	**X**					**X**					
Air traffic flow management service providers	**X**	**X**	**X**	**X**						**X**				
Airspace management service providers	**X**	**X**	**X**								**X**			
~~Airspace design~~	**X**	**X**	**X**									~~**tbd***~~		

Flight procedure design services providers												X		
Network Manager	X	X	X	X									X	
service providers (see Note 2)														X

Table 1: Applicability of annexes to service providers

X = Applicable annexes for each service provider.

Note 1: Section 3 of Annex IV (Part-ATS) only applies to providers of air traffic control services and not to providers of alerting, air traffic advisory, and flight information services.

Note 2: The applicability of Annex XIII is dependent upon the scope as specified within each of the subparts of Annex XIII.

~~* to be introduced under RMT.0445, as necessary.~~

GM3 ATM/ANS.OR.A.005 Application for a service provider certificate

GENERAL — AIS PROVIDER

Terrain data sets are part of the digital data sets, but are typically originated and maintained by organisations different than AIS providers. The provision of terrain data sets by an AIS provider for the purpose of air navigation is consequently limited to the mere distribution of a finished product or even only the provision of information on how the product can be obtained, in accordance with the applicable requirements of Regulation (EU) 2017/373.

GM2 ATM/ANS.OR.A.035 Demonstration of compliance

RELEVANT EVIDENCE

ATM/ANS.OR.B.005(e) requires 'The management system shall be proportionate to the size of the service provider and the complexity of its activities, taking into account the hazards and associated risks inherent in those activities.' Consequently, the relevant evidence to demonstrate compliance with the applicable requirements of this Regulation should be also proportionate to the size of the service provider and the complexity of its activities.

GM1 ATM/ANS.OR.A.045(a) Changes to a functional system

NOTIFICATION

[…]

(b) Early and accurate notification facilitates the interactions between the provider and the competent authority and, thus, maximises the likelihood of introducing a change into service in due time and according to the service provider's initial schedule when the competent authority has decided to review an assurance case. Therefore, it is advisable that the change description identified in AMC1 ATM/ANS.OR.A.045(a) is completed as soon as possible and contains the following data:

[…]

(6) Consequence of the change, i.e. the harmful effects of the hazards associated with the change — see (f) below and also the definition of 'risk' in Annex I (8~~0~~5).

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

URGENT DISTRIBUTION OF AERONAUTICAL INFORMATION

The obligation to comply with the relevant provisions of ATM/ANS.OR.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.

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

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 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 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.)

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 meeting point 2.4.5 Aeronautical Data Tool Qualification of EUROCAE ED-76A/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 geo-referencing 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, Volume 2: Guidance material (EUROCONTROL-SPEC-154, Edition 1.0 of 04/02/2013).

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 middle-wave 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 ± 0.05 m (oceans) and ± 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, Volume 2 (EUROCONTROL-SPEC-154, Edition 1.0 of 04/02/2013).

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.

GM1 ATM/ANS.OR.B.005 Management system

DEFINITIONS AND CONCEPT OF MANAGEMENT SYSTEM

(a) ISO 9000~~:2005~~ series of standards define~~s~~ a management system as a 'set of interrelated or interacting elements to establish policy and objectives and to achieve those objectives'.

[...]