



Agenda Item 1: Implementation of electronic terrain and obstacle data (e-TOD) provision

PROJECT G1 “DEVELOPMENTS FOR THE PROVISION OF ELECTRONIC TERRAIN AND OBSTACLE DATA (ETOD) (SAM)” – SERVICE LEVEL AGREEMENT

(Presented by the Coordinator of Project G1, Mr. Juan José González)

SUMMARY	
This working paper presents a guide to define service level agreements (SLAs) between the AIS and the offices that provide aeronautical data and information in each SAM State.	
References: <ul style="list-style-type: none">• AIS-AIM Transition Roadmap• Project G1 “Developments for the provision of electronic terrain and obstacle data (eTOD) (SAM)”.	
ICAO strategic objectives	<i>A and C</i>

1. Introduction

1.1 The SAM/AIM/2 meeting analysed Draft Conclusion 13/3 Provision of electronic terrain and obstacle data (eTOD), which reads as follows:

That CAR/SAM States and Territories take urgent action in order to:

- a) electronically portray the geodetic data of WGS-84 aeronautical charts in support of performance-based navigation (PBN), and*
- b) have electronic terrain and obstacle data of high quality and integrity available, as required in ICAO Annex 15.*

1.2 After working on the definition of the work project, which was called G1 “Developments for the provision of electronic terrain and obstacle data (eTOD) (SAM)”, task 17 “*Sign service agreement - SLA between providers and AIS service*” was defined.

1.3 Service level agreements will permit the reception of aeronautical data and information based on predefined criteria that ensure their inclusion in aeronautical information management systems for the delivery of information based on quality criteria to attain the ATM systems foreseen in the global air traffic management operational concept.

2. Analysis

2.1 The proposed objective is for the AIS to have a tool for receiving aeronautical data and information with the required accuracy, resolution, and integrity, in accordance with ICAO Annexes 4, 15, 11, and 14 (Vol. I and II).

2.2 Although several States have AIS offices with quality certification, the problem of the quality of the aeronautical data and information regularly received by providers thereof persists. Likewise, the need for new information, in this case terrain and obstacle information, raises again the issue of quality criteria.

2.3 With this in mind, an attempt was made to raise awareness amongst all providing offices as to the need to have a quality certification that would ensure that they applied the quality criteria required in manuals and Annexes to the products they delivered.

2.4 In general terms, providers say that they find it difficult to implement quality management systems at their offices and thus, compliance with aeronautical data and information quality requirements cannot be guaranteed.

2.5 Accordingly, it has been suggested that it is necessary to sign service level agreements with those providers. As a first step, it is advisable to define an agreement on the model to be signed between the AIS and the aeronautical data and information providing office, containing mainly the rights and obligations of each office involved. **Appendix A** to this paper shows a tentative model of such agreement.

2.6 The second step is related to the detailed description of all the data involved in these agreements, divided by office involved. **Appendix B** to this paper shows a model listing.

2.7 After completing the two documents, all the corresponding aeronautical information and data will be entered to an office specified in the model agreement to be signed. Consequently, the resulting SLA will indicate the rights, obligations, the information involved (its accuracy, resolution, and integrity), responsible parties, and anything deemed relevant for that agreement, which shall be signed by the responsible parties of each office.

2.8 Finally, when provider offices do not have a certified quality management system for their data, a set of audits shall be arranged with the internal audit office of the organisation so that the corresponding reviews are carried out to ensure that the data sent by the providers meet that states in the previously signed SLA until such time that the corresponding quality certificate is obtained.

2.9 Finally, it should be noted that **Appendices A** and **B** to this working paper are just examples, and the States must study and analyse the convenience of adopting or modifying them to reflect the reality of their organisations.

3. **Suggested action**

3.1 The Meeting is invited to review the information contained in this working paper and make the comments it may deem appropriate.

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APPENDIX A

**SERVICE LEVEL
AGREEMENT**

**Aeronautical Information Service
(Other Office)**

	SERVICE LEVEL AGREEMENT	<i>Code No.:</i> SLA – 01 <i>Version:</i> 00 <i>Date:</i> 00/00/2011 <i>Issue No.:</i> 01
	Aeronautical Information Service (AIS) (Other Office)	<i>Page 1 of 18</i>

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SERVICE LEVEL AGREEMENT

Aeronautical Information Service (Other Office)

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	<i>Prepared by:</i>	<i>Reviewed by:</i>	<i>Approved by:</i>
<i>Position</i>			
<i>Signature</i>			
<i>Date</i>			

	<p style="text-align: center;">SERVICE LEVEL AGREEMENT</p>	<p>Code No.: SLA – 01 Version: 00 Date: 00/00/2011 Issue No.: 01</p>
	<p style="text-align: center;">Aeronautical Information Service (AIS) (Other Office)</p>	<p style="text-align: right;"><i>Page 2 of 18</i></p>

Scope and Field of Application

The scope of this Agreement covers the provision of data by (other Office) and the Aeronautical Information Service (AIS) and subsequent management thereof, which involves:

- entering;
- editing;
- formatting;
- publication/storage, and
- distribution/provision

aeronautical information/data through:

- the AIP, with the corresponding amendments;
- the AIP supplements;
- NOTAMs and PIBs;
- AIC and AIRAC; and
- checklists and lists of valid NOTAMs.

This agreement applies to both the Aeronautical Information Service (AIS) and the office (other Office).

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Control of changes

Document

Coding:	AC
Title:	Service Level Agreement
Owner:	AIS – (other Office)
Location of the master copy:	AIS (country)
Date of last update:	00/00/2012

Control of modifications

Date	Version	Reason for the modification	Responsible party
00/00/2012	01	Document definition	(name)

This Agreement will be updated whenever a new versión thereof is produced.



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Reference Documentation

Regarding the regulatory technical documents applicable to the AIS:

- ICAO Annex 4 – Aeronautical Charts
- ICAO Annex 5 – Units of Measurement to be used in Air and Ground Operations
- ICAO Annex 11 – Air Traffic Services
- ICAO Annex 14 – Aerodromes
- ICAO Annex 15 – Aeronautical Information Services
- ICAO Doc 8126 – Aeronautical Information Services Manual
- ICAO Doc 8400 – ICAO Abbreviations and Codes
- ICAO Doc 8697 – Aeronautical Chart Manual
- ICAO Doc 9674 – WGS-84 Manual
- (National regulations)

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Terms and definitions

The abbreviations contained in the Uruguay AIP are adopted.

Other Definitions

- Service Level Agreement (SLA): is a written contract between a service provider and its customer to define the agreed level of quality of that service. For this Agreement, the “service provider” will be considered to be the data originator, and the “customer” will be considered to be the Aeronautical Information Service.
- Accuracy: A degree of conformance between the estimated or measures value and the true value.
- Integrity (aeronautical data): The classification is based on the potential risk resulting from the use of altered data. Aeronautical data are classified as:
 - a) Ordinary data: very low probability that the use of altered ordinary data will seriously jeopardise the safe continuation of the flight and landing of an aircraft to such an extent as to cause a catastrophe;
 - b) Essential data: low probability that the use of altered essential data will seriously jeopardise the safe continuation of the flight and landing of an aircraft to such an extent as to cause a catastrophe; and
 - c) Critical data: high probability that the use of altered critical data will seriously jeopardise the safe continuation of the flight and landing of an aircraft to such an extent as to cause a catastrophe.
- Metadata: Information about data, or the set of features associated to any data. Therefore, metadata describe the content, quality, format, and other characteristics of a resource. In general, they respond to the following questions:
 - What: Title and description of a data set or service
 - When: When the data set or service, and the various updates, if any, were created. It may also indicate until when this data set is reliable.
 - How: How data was obtained and processed and how can it be accessed. In the case of service metadata, it must indicate how to access or use the service.
 - Where: The geographical area or extension covered by the data, based on latitude/longitude, x and y coordinates, or an administrative area described by its name.

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- Data originator: (Other Office)
- Precision: The smallest different that can be reliably distinguished by a measurement process.
- Resolution: Number of units or digits with which a measured or estimated value is expressed or used.

Abbreviations

- SLA: Service level agreement

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1. Introduction

The **Service Level Agreement (SLA)** is a formal agreement between:

The Aeronautical Information Service (AIS) and
(other Office);

that defines the services provided, the indicators associated to said services, acceptable and non acceptable levels, the responsibility of the data originator and the Aeronautical Information Service, and the measures to be adopted under specific circumstances.


Likewise, the Director of Civil Aviation is also included in this Agreement as regulator in those cases in which conflicts cannot be resolved between the parties to the SLA

The basic objectives of this SLA are as follows:


- Improve communication. It facilitates two-way communication between the parties. This communication starts at the beginning of the SLA process and continues throughout the life of the agreement. Both parties must get together in order to understand the needs, priorities, and concerns of their counterpart, and thus understand the consequences of not meeting their obligations.
- Protect against excessive expectations. The process facilitates the identification and discussion of expectations and the resources needed to meet them. Consequently, it helps to identify the service levels that are acceptable to both parties and that are attainable and achievable.
- Define mutually agreed standards. A standard is set against which performance can be measured. Customer expectations are identified, the boundaries of service provision are defined, and responsibilities are clarified. An SLA and the communication process involved in its establishment help to minimise conflicts between the parties and provide a means for conflict resolution should a problem arise.
- Measure service effectiveness. As the SLA defines the standards against which the service can be measured and assessed, it provides the basis for assessing the efficacy of the service.

The Agreement must ensure that both parties have a clear understanding of the bases on which data shall be provided, received and used.

This is especially important since most of such data will be part of the Integrated Aeronautical Information Package and will be disseminated to all the aeronautical community, both national and international.

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An agreement of these characteristics is based on the fact that Annex 15 “Aeronautical Information Services”, 3.2, states the need to implement a Quality Management System in AIS which, in turn, means that data entering the system must have a level of quality that meets the requirements contained in that Annex.

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2. Service Description

A description follows of a set of rights and obligations of both the originator and the AIS, which they shall comply with in relation to the provision and handling, respectively, of the data involved.

2.1. Regulations applicable to the data originator

2.1.1. Data originator rights

- a) Request the information generated by the AIS, both in relation to the data specified in 3. and to any other contained in the Integrated Aeronautical Information Package, which may be delivered in printed or digital format.
- b) Make all the changes to data specified in 3. as and when so required, provided the established deadlines are met.

2.1.2. Data originator obligations

- a) Provide the data established in 3. with the requirements and/or formats defined in this agreement in both Spanish and English (see “AIS obligations concerning data”).
- b) Introduce any changes to such data as promptly as possible, meeting the requirements and/or formats established in this agreement.
- c) For those cases in which data is directly related to operational changes (Annex 15, Appendix 4), its delivery shall be based on the AIRAC cycles. In order to know the dates and operation of the AIRAC system, refer to the current Aeronautical Information Circular (AIC) “Use of the AIRAC system”. The reported information will not be modified again at least up to 28 days after the effective date, unless the reported circumstance is of a temporary basis and does not prevail throughout the period (Annex 15, Ch. 6, 6.1 General specifications, 6.1.1).

2.2. Regulations applicable to the AIS

2.2.1. AIS concerning data

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- a) The data received may be converted to other formats (example: digital)
- b) All the information generated by the AIS may be placed at the disposal of users through printed, digital, and other media, included the AIS website.
- c) All the information generated by the AIS may be exchanged with other AIS that so request, in accordance with the conventions listed in Annex 15 15, 3.3.4 and 3.3.5.
- d) All data that, upon being sent to the AIS, does not meet the requirements and/or formats established in this agreement will be sent back to the originator and will not be used to generate any product of the Integrated Aeronautical Information Package until the established requirements have been met.


2.2.2. AIS obligations in relation to data

- a) Data received will be kept in its original format
- b) All information generated by the AIS may be requested by the data originator, and may be delivered in printed or digital format
- c) In the case of any changes or report of changes that affect the data indicated in 3. and that do not come from the originator, the AIS will primarily contact the originator and until such time that the latter does not send the new data with the requirements and/or formats established in this agreement, they will not be used to generate any products of the Integrated Aeronautical Information Package.
- d) When new data or modifications to existing data made by the originator are received, the AIS will conduct the corresponding verifications and will prepare a draft for its publication, which will be sent to the originator for approval, without which no changes to the data involved will be published.
- e) In case the information is not received in English, the AIS may proceed to its translation, and the originator may not ask for the modification of the terms or phrases used, unless the meaning of the information is the opposite to what it was intended.


2.3. Validity

This Agreement will be valid during the following period (2 years at the most):

<i>Start</i>	<i>End</i>
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3. Level of the services to be provided

3.1. Quality requirements

The data and the quality requirements to be met by such data are listed below.

<i>Data</i>	<i>Accuracy</i>	<i>Resolution</i>	<i>Integrity</i>	<i>Remarks</i>

3.2. Metadata

<i>Data</i>	<i>What</i>	<i>When</i>	<i>How</i>	<i>Where</i>

3.3. Dates

All data will be provided in accordance with the following criteria:

- Data will include the effective date (“as of” date) in the following format:
 - Day/month/year time:minute in UTC (e.g.: 05/10/2011 08:27 UTC)
- Data will include the effectiveness period (“until” date), which may be of a permanent nature:
 - Day/month/year hour:minute in UTC (e.g.: 05/10/2011 08:27 UTC, or permanent)
 The “Estimated” concept may also be included when specifying a given date/time for the end of the effectiveness period.


3.4. List of persons authorised to deliver data

<i>Name</i>	<i>Position</i>	<i>Telephone</i>

3.5. Means for delivering data

Data indicated in 3.1 and 3.2 may be delivered through the following means:

3.5.1. Digital

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This will be the preferred format. Data shall be delivered with its corresponding value, with the indicated precision, and with the 32-bit cyclic redundancy check (CRC) resulting from the application of that algorithm to the new data.

In turn, such data shall be accompanied by the signature of the authorised person (which shall appear in 3.6).

To this end, the CDs, DVDs, or emails containing the data together with the 32-bit cyclic redundancy check (CRC) will be valid.

3.5.2. Printed

This will be the alternative format. Data shall be delivered with its corresponding value, with the indicated precision, and with the 32-bit cyclic redundancy check (CRC) that results from applying such algorithm to the new data.

In turn, such data shall be accompanied by the signature of the authorised person (which shall appear 3.6).


To this end, the printed material, fax or email will be valid.

If so requested by the originator, the AIS may deliver an application so that the originator may calculate the 32-bit CRC.


3.6. Service level indicators

In order to assess service performance, the following measurements will be used:

<i>Measurement</i>	<i>Description</i>	<i>Objective</i>
Quality of the data	Data are delivered by the originator with the required quality levels	100 %
Terms	Data will be delivered by the originator to the AIS within the stipulated terms	<ul style="list-style-type: none"> – 100%: 56 days before the date of publication for data affecting safety, in accordance with Annex 15, Appendix 4. (See current AIC “Use of the AIRAC system”). – 95%: during the seven days prior to the effective date, for data not affecting safety. – 100%: during the three

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		days prior the effective date for data not affecting safety. After the three days prior to the effective date, the AIS shall be consulted. The publication of this last information will be subject to negotiation.
Format	Data will be delivered by the originator to the AIS without errors in accordance with the format established in this SLA	95 %
Draft for publication	The AIS will deliver to the originator the draft publication for validation within the established timetable	<ul style="list-style-type: none"> – 100%: 20 days after the date of publication for data affecting safety – 95%: on the two days prior to the effective date, for data not affecting safety. – 100%: one day before the effective date, for data not affecting safety.
Publication	The AIS will publish the information on the stipulated deadlines, preferably using the AIRAC cycle	95 %
Quality of the publication	The Integrated Aeronautical Information Package will be provided in accordance with the applicable standards	95 %

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4. Management of the Agreement

4.1. Conflict settlement

In case of differences with respect to that established in this SLA, the following procedure will be followed:

- a) the person responsible for the Aeronautical Information Service will consult with the persons authorised to send data, stating the difference and striving to jointly abide by the agreement;
- b) in case no solution is found, the problem will be referred to the Director of Civil Aviation so that he/she may establish an *ad-hoc* group to study the problem and find a solution to it.

Until such time that the problem is resolved, the data involved will be kept in abeyance.

4.2. Revision of the Agreement

This Agreement will be in force for the following period (2 years at the most), after which it will be reviewed.

During the effective period of this Agreement, the parties may not unilaterally modify it totally or partially.

In the event any of the parties deems it advisable to review it before that period, a meeting will be held between the parties to analyse the changes and then, if agreed, to include them in a new SLA that shall supersede the existing one.

After the validity period, the Agreement must be reviewed by both parties, modified (if necessary), or I período de validez, el Acuerdo deberá ser revisado obligatoriamente por ambas partes, modificado (si fuese necesario) or endorsed by signing a new Agreement, which will be valid for no more than 2 years.

APPENDIX B
AERONAUTICAL INFORMATION SERVICE OF (country)

LETTERS OF AGREEMENT

<i>Location in the AIP</i>	<i>Responsible office</i>	<i>Data</i>	<i>Accuracy</i>	<i>Resolution</i>	<i>Integrity</i>	<i>Remarks</i>
<i>GEN</i>						
National regulations and requirements – Authorities – Address, Phone, mail (GEN 1.1)	– (Directorate of Civil Aviation): airport charges, commercial air transport inspectors, – MET – CUSTOMS – HEALTH – MIGRATION – SERVICE to third parties – ANIMAL HEALTH – PLANT HEALTH – Air Force (country)	Postal address	real value	real value	ordinary	
		Phone	real value	real value	ordinary	
		Fax	real value	real value	ordinary	
		Telex	real value	real value	ordinary	
		e-mail	real value	real value	ordinary	
Entry, transit, and exit of aircraft (GEN 1.2)	(Directorate of Civil Aviation): Legal, Air traffic	Aeronautical code	real value	real value	ordinary	
		Digest	real value	real value	ordinary	
		Decrees	real value	real value	ordinary	
Entry, transit, and exit of passengers and crew (GEN 1.3)	CUSTOMS	Customs requirements	real value	real value	ordinary	
	(Directorate of Migration)	Migration requirements	real value	real value	ordinary	
	HEALTH (MSP)	Public health requirements	real value	real value	ordinary	
Entry, transit, and exit of goods (GEN 1.4)	CUSTOMS	Customs requirements related to cargo	real value	real value	ordinary	
	ANIMAL HEALTH PLANT HEALTH	Plant health requirements	real value	real value	ordinary	
Measurement systems, aircraft marks, holidays (GEN 2.1)	(Directorate of Civil Aviation): AIS	Units of measurements	real value	real value	ordinary	
		Time system	real value	real value	ordinary	
		Geodetic reference	real value	real value	ordinary	
		Nationality marks and registration of aircraft	real value	real value	ordinary	
		Holidays	real value	real value	ordinary	
Abbreviations used in AIS publications (GEN 2.2)	(Directorate of Civil Aviation): AIS	Abbreviation and meaning	real value	real value	ordinary	
Mapping symbols (GEN 2.3)	(Directorate of Civil Aviation):	Symbol and meaning	real value	real value	ordinary	

	AIS					
Location indicators (GEN 2.4)	(Directorate of Civil Aviation): Air traffic, telecommunications	Indicator and location	real value	real value	ordinary	
		Addressee indicators and designators of official entities and aeronautical services	real value	real value	ordinary	
List of navigation aids (GEN 2.5)	(Directorate of Civil Aviation): Electronics – Radio aids	Name of station	real value	real value	ordinary	
		Identification	real value	real value	ordinary	
		Type of radio aid	real value	real value	ordinary	
		Purpose (aerodrome/route)	real value	real value	ordinary	
		Magnetic variation (for VOR)	1 degree	1 degree	essential	Preferred accuracy: 1 minute
Aeronautical Information Services (GEN 3.1)	(Directorate of Civil Aviation): AIS	AIS information	real value	real value	ordinary	
Aeronautical charts (GEN 3.2)	(Directorate of Civil Aviation): AIS	Chart information	real value	real value	ordinary	
Air traffic services (GEN 3.3)	(Directorate of Civil Aviation): Air traffic	Postal address	real value	real value	ordinary	
		Phone	real value	real value	ordinary	
		Fax	real value	real value	ordinary	
		Telex	real value	real value	ordinary	
		e-mail	real value	real value	ordinary	
		Documents on which the service provided is based	real value	real value	ordinary	
		Area of responsibility	real value	real value	ordinary	
		Type of service provided	real value	real value	ordinary	
		Operator/ATS coordination	real value	real value	ordinary	
		Aerodrome circling separation	real value	real value	ordinary	
		Minimum flight altitude	real value	real value	ordinary	
		Addresses of ATS units	real value	real value	ordinary	
Aeronautical Communication Services (GEN 3.4)	(Directorate of Civil Aviation): Telecommunications	Postal address	real value	real value	ordinary	
		Phone	real value	real value	ordinary	
		Fax	real value	real value	ordinary	
		Telex	real value	real value	ordinary	
		e-mail	real value	real value	ordinary	
		Area of responsibility	real value	real value	ordinary	
		Types of services provided	real value	real value	ordinary	
		Requirements and conditions on which the service is based	real value	real value	ordinary	
Aerodrome/Heliport rates (GEN 3.5)	(Directorate of Civil Aviation):	Applicable decrees	real value	real value	ordinary	Must be

4.1)	Administration and finance	Tables applied, with the corresponding amounts	real value	real value	ordinary	reviewed annually or when modified
<i>ENR</i>						
General rules (ENR 1.1)	(Directorate of Civil Aviation): Air traffic	Applicable documents	real value	real value	ordinary	
		Launching of objects	real value	real value	ordinary	
		Acrobatic flights	real value	real value	ordinary	
		Tow and advertisement flights	real value	real value	ordinary	
		Hours and units of measurements	real value	real value	ordinary	
		Airspace structure	real value	real value	ordinary	
		Prohibited areas and flight restrictions	real value	real value	ordinary	
		Glider flights between clouds	real value	real value	ordinary	
		Aircraft take-offs and landings outside of aerodromes in which they are admitted	real value	real value	ordinary	
		Climb of balloons, kites, etc.	real value	real value	ordinary	
		Uruguay State flights	real value	real value	ordinary	
Holding, approach, and departure procedures (ENR 1.5)	(Directorate of Civil Aviation): Air traffic,	General	real value	real value	ordinary	
		Incoming flights	real value	real value	ordinary	
		Outgoing flights	real value	real value	ordinary	
		Holding speeds	real value	real value	ordinary	
Radar services and procedures (ENR 1.6)	(Directorate of Civil Aviation): Air traffic, Electronics	Radar service	real value	real value	ordinary	
		Application of the radar control service	real value	real value	ordinary	
		Emergency procedures	real value	real value	ordinary	
		Radar and communication failure procedure [ordinary] Code assignment system	real value	real value	ordinary	
		Criteria for checking the accuracy of flight level information derived from Mode C	real value	real value	ordinary	
		Radar coverage representation	real value	real value	ordinary	
		Location of the radar antenna	1 tenth of a second (lat/long)	1 tenth of a second (lat/long)	ordinary	Preferred accuracy: 1 hundredth of a second
Altimeter setting procedures (ENR 1.7)	(Directorate of Civil Aviation): Air traffic	Methods used	real value	real value	ordinary	
		Basic procedures: general, take-	real value	real value	ordinary	

		off and climb, en-route vertical separation, approach and landing, missed approach				
		Procedures applicable to operators (including pilots)	real value	real value	ordinary	
		Cruise level tables	real value	real value	ordinary	
Air traffic service airspace (ENR 2.1)	(Directorate of Civil Aviation): Air traffic, Inspections	FIR, UIR, TMA, CTR, ATZ, FIZ, CTA: Lateral boundaries – Precisions - Latitude/Longitude: 1 second; altitude: rounded to 10 metres.	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Vertical boundaries	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Class of airspace	real value	real value	ordinary	
		Unit providing the service	real value	real value	ordinary	
		Call sign	real value	real value	ordinary	
		Languages	real value	real value	ordinary	
		Area and conditions of use	real value	real value	ordinary	
		Duty hours	real value	real value	ordinary	
		Frequency/purpose	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Lower international ATS routes (ENR 3.1)	(Directorate of Civil Aviation): Air traffic, Inspections	Route designator	real value	real value	ordinary	
		RNP	real value	real value	ordinary	
		Name of significant points	real value	real value	ordinary	
		Coordinates	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Magnetic heading	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Radial of the VOR	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Distance	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre

		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Airspace classification	real value	real value	ordinary	
		Lateral limit	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Direction of cruising levels	real value	real value	ordinary	
		Control unit	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Lower domestic ATS Routes (ENR 3.1)	(Directorate of Civil Aviation): Air traffic, Inspections	Route designator	real value	real value	ordinary	
		RNP	real value	real value	ordinary	
		Name of significant points	real value	real value	ordinary	
		Coordinates	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Magnetic heading	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		VOR radial	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Distance	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Airspace classification	real value	real value	ordinary	
		Lateral limit	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre

		Direction of cruising levels	real value	real value	ordinary	
		Control unit	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Upper international ATS routes (ENR 3.2)	(Directorate of Civil Aviation): Air traffic, Inspections	Route designator	real value	real value	ordinary	
		RNP	real value	real value	ordinary	
		Name of significant points	real value	real value	ordinary	
		Coordinates	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Magnetic heading	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		VOR radial	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Distance	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Airspace classification	real value	real value	ordinary	
		Lateral limit	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Direction of cruising levels	real value	real value	ordinary	
		Control unit	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Area navigation routes (RNAV) (ENR 3.3)	(Directorate of Civil Aviation): Air traffic, Inspections	Route designator	real value	real value	ordinary	
		RNP	real value	real value	ordinary	
		Name of significant points	real value	real value	ordinary	
		Coordinates	1 second	1 second (lat/long)	ordinary	Preferred

			(lat/long)			accuracy: 1 tenth of a second
		Magnetic heading	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		VOR radial	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Distance	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Airspace classification	real value	real value	ordinary	
		Lateral limit	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Direction of cruising levels	real value	real value	ordinary	
		Control unit	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Helicopter routes (ENR 3.4)	(Directorate of Civil Aviation): Air traffic, Inspections	Route designator	real value	real value	ordinary	
		RNP	real value	real value	ordinary	
		Name of significant points	real value	real value	ordinary	
		Coordinates	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Magnetic heading	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		VOR radial	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a

						degree
		Distance	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Airspace classification	real value	real value	ordinary	
		Lateral limit	1 tenth of a NM	1 tenth of a NM	ordinary	Preferred accuracy: 1 metre
		Direction of cruising levels	real value	real value	ordinary	
		Control unit	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Radio navigation aids - En Route (ENR 4.1)	(Directorate of Civil Aviation): Electronics – Radio aids, Inspections	Name of station Precisions - Latitude/Longitude: 1 tenth of a second; magnetic variation: 1 minute; elevation: 30 metres.	real value	real value	ordinary	
		Magnetic variation	1 tenth of a second	1 tenth of a second	ordinary	Preferred accuracy: 1 hundredth of a second
		Identification	real value	real value	ordinary	
		Frequency	real value	real value	ordinary	
		Hours of operation	real value	real value	ordinary	
		Coordinates	1 tenth of a second (lat/long)	1 tenth of a second (lat/long)	ordinary	Preferred accuracy: 1 hundredth of a second
		DME antenna elevation	30 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Observations	real value	real value	ordinary	
Significant point designator or code name (ENR 4.3)	(Directorate of Civil Aviation): Air traffic	Designator	real value	real value	ordinary	
		Coordinate	1 second for en-route points;	1 second for en-route points;	ordinary	Preferred accuracy:

			1 hundredth of a second for standard approach, departure or arrival points	1 hundredth of a second for standard approach, departure or arrival points		1 tenth of a second for en-route points; 1 thousandth of a second for standard approach, departure or arrival points
		Affected route	real value	real value	ordinary	
Aeronautical ground lights - En Route (ENR 4.4)	(Directorate of Civil Aviation): Electronics, Inspections	Identification	real value	real value	ordinary	
		Coordinates	1 second	1 second	ordinary	Preferred accuracy: 1 tenth of a second
		Type and intensity	100 candles	100 candles	ordinary	Preferred accuracy: 10 candles
		Characteristics	real value	real value	ordinary	
		Hours of operation	real value	real value	ordinary	
		Observations	real value	real value	ordinary	
Prohibited, restricted, and danger areas (ENR 5.1)	(Directorate of Civil Aviation): Air traffic, legal	Identification, name Precisions – Lateral limits (Latitude/Longitude): 1 second; Upper/lower limit: 10 metres	real value	real value	ordinary	
		Lateral limits	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Upper limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	1 metre	ordinary	Preferred accuracy: 1 metre
		Observations	real value	real value	ordinary	
		Working hour	real value	real value	ordinary	
		Type of restriction	real value	real value	ordinary	
		Nature of risk	real value	real value	ordinary	
		Interception risk	real value	real value	ordinary	
		Resolution or decree	real value	real value	ordinary	

Volcanic ash	(Directorate of Civil Aviation): Air traffic, MET	Duration of effect (from, to)	Day/month/year hour:minute	Day/month/year hour:minute	ordinary	
		Volcano name and number	real value	real value	ordinary	
		Colour code level	real value	real value	ordinary	
		Horizontal/vertical extent of the cloud	1 second (lat/long) 10 metres (alt)	1 second (lat/long) 10 metres (alt)	ordinary	Preferred accuracy: 1 tenth of a second 1 metre
		Routes affected	real value	real value	ordinary	
		Closed areas or routes and alternate routes	real value	real value	ordinary	
Military manoeuvre and training area (ENR 5.2)	(Directorate of Civil Aviation): Air traffic, Air Force	Identification	real value	real value	ordinary	
		Lateral limits	1 second (lat/long)	1 second (lat/long)	ordinary	Preferred accuracy: 1 tenth of a second
		Upper limit	10 metres	10 metres	ordinary	Preferred accuracy: 1 metre
		Lower limit	10 metres	10 metres	ordinary	Preferred accuracy: 1 metre
		Announcement activation systems/media, civil flight information	real value	real value	ordinary	
		Observations, time of operation	real value	real value	ordinary	
Location indicator and name of aerodrome (AD 2.1)	(Directorate of Civil Aviation):	Location indicator (4-letter code)	real value	real value	ordinary	
		Complete name of the aerodrome	real value	real value	ordinary	
Aerodrome geographical and administrative data (AD 2.2)	(Directorate of Civil Aviation):	ARP coordinate	1 second (lat/long)	1 second (lat/long)	ordinary	Coordinate: 1 second
		Location	real value	real value	ordinary	Location: 1 metre
		Direction and distance from (city)	real value	real value	ordinary	Precisions – Direction: N, S, E, W, up to 2 directions; Distance: 1 kilometre
		Elevation	1 metre	1 metre	essential	Preferred

						accuracy: 1 tenth of a M
		Reference temperature	1 degree	1 degree	ordinary	Preferred accuracy: 1 tenth of a degree
		Geoid undulation at AD measuring position	1 metre	1 metre	essential	Preferred accuracy: 1 tenth of a M
		Magnetic variation/annual change	1 minute	1 minute	ordinary	Preferred accuracy: 1 second
		AD management, address, phone, telefax, telex, AFS	real value	real value	ordinary	
		Types of traffic allowed (IFR or VFR)	real value	real value	ordinary	
		Observations	real value	real value	ordinary	