



Agenda Item 5 Other Issues

PROVISION OF ELECTRONIC TERRAIN AND OBSTACLE DATA

(Presented by the Secretariat)

SUMMARY

This working paper focuses its attention on ICAO Annex 15 SARPs on the provision of electronic terrain and obstacle data, in Areas 1 and 3, and proposes definition of compliance with regard to Deficiencies, keeping in mind the migration plan to AIM and the other quality compliance requirements of information services.

References:

- Annex 15
- Migration Plan to the AIM services

***Strategic
Objectives***

This working paper is related to Strategic Objectives A and C.

1. Introduction

1.1 ICAO Annex 15 regulations referred to electronic terrain and obstacle data are based on the work carried out by ICAO with RTCA SC 193 and EUROCAE WG 44 industry groups, as well as in comments received from States during the process of amendment to Annex 15.

1.2 These regulations refer to the function of electronic terrain and obstacle data, coverage, obstacle numeric requirements, content and structure of terrain and obstacle data bases (defined as two independent data bases), specifications and product availability for electronic terrain and obstacle data.

2. Analysis

2.1 As of 18 November 2010, ICAO Amendment 33 to Annex 15 became effective, which requires States to ensure availability of electronic terrain and obstacle data collection (e-TOD) for Areas 1 and 3. For area 2, Amendment 36 introduced a new date.

2.2 Ground Proximity Warning Systems (GPWS) technology, with predictive capabilities, provides the flight crew with information on terrain and obstacle data and imminent hazards. This will result in earlier alerts and more time to take an appropriate corrective action. New multi-functional screens are combining electronic terrain and obstacle data bases, on-board GNSS and flight management system sensors data.

2.3 Many qualified terrain awareness warning systems use terrain digital data to be used only with advisory purposes, since these groups of data are not certified for navigation use since they do not have strict quality (integrity) requirements. Consequently, the development of an integral electronic terrain and obstacle data offers significant benefits in terms of safety.

2.4 As aviation moves towards the utilisation of RNAV, with direct point-to-point routings based on navigation systems, it is likely that more aircraft fly outside airways. Many of these routes may overfly mountainous terrain (for example the Andes), or other areas.

2.5 Occasional route changes lead commercial aircraft to routes in which a progressive descent with one non-operating engine may have performance limitations, so that the aircraft may not continue to fly over the minimum obstruction clearance altitude (MOCA). Consequently, pilots, in a fast and accurate manner, and without external assistance, must estimate their best escape route, in order to avoid elevated terrain and/or maintain the required margin with respect to terrain and obstacles.

2.6 Consequently, the utilisation of data groups on terrain and obstacle to meet numeric requirements of Area 1, to generate the topographic layer (including a possible capability to generate isohypsals) shall significantly improve visual presentation of charts, as per the type of charts specified in ICAO Annex 4: en-route charts, area maps, aeronautical charts 1:500000, small scale aeronautical navigation charts, position charts and radar minimum altitude charts.

2.7 Also, Annex 15, in support to the new ATM operational concept, in the utilisation and exchange of electronic terrain and obstacle data groups and obstacle between providers and users indicates that series ISO 19110 standards will be used for geographical information as a framework of templates in general.

2.8 For the consecution of the Transition Plan from AIS to AIM, States and ICAO have foreseen a plan in three phases:

- First phase — Consolidation
- Second phase — Going digital -
- Third phase — Information management.

2.9 Most States of the CAR/SAM Regions have not completed yet the first phase of consolidation, which covers in the roadmap *surveillance of the different areas among States with regard to Annexes 4 and 5, Surveillance of compliance of AIRAC regulations, Quality, and Execution of WGS-84 steps.*

2.10 Among these steps of the roadmap in phase 1, is the implementation of quality programmes that will ensure quality of the data to serve the final user. Therefore it is deemed as a matter of priority that - series ISO 19110 standards as regards the geographic data quality is in full application.

2.11 Within the framework of geographical – cartographic information, according to the needs of current civil aviation, the adoption of a quality system management is required, in order to lead cartographic organisations to the continuous improvement and the users' community, to the capability of understanding characteristics and potentialities of the cartographic product being uses.

2.12 Technical Committee 211 of the International Standards Association (ISO), has developed applicable regulations to geographical data. Particularly ISO standards 19113 and 19114 have been created, with the purpose of conceptualising, measuring and managing geographical data and products along the cartographic process. Also, the application of metadata ISO 19115, which enables the description of data and the description regarding their quality.

2.13 Conclusion 13/44 of GREPECAS/13, as regards the provision of electronic terrain and obstacle data in the CAR/SAM Regions, indicated:

“That, taking into consideration that the SARPs contained in Chapter 10 of ICAO Annex 15 introduce the requirement regarding the availability of electronic terrain and obstacle data between 2008 and 2010, and that the compliance of that requirement is essential to support the electronic aeronautical charts display (Annex 4, Chapter 20), States/Territories/International Organizations of the CAR and SAM Regions should take, individually or collectively, the required actions to ensure:

- a) the availability, in digital format, of all terrain and obstacle data as well as all other aeronautical, geographical and geodesic information/data, of high quality and integrity, as required by ICAO Annex 15;*
- b) the electronic aeronautical charts display, in direct support to GNSS and WGS-84 compliant, and*
- c) the availability of databases aimed at ensuring the electronic availability of all aeronautical information/data required by civil aviation.”*

2.14 Several States, through the GREPECAS working groups have noted also that most of the critical and several times complex documentation on these matters is in English language only, which in many administrations may limit its comprehension and slow down the process of adoption of procedures related with quality systems implementation.

3. Suggested action

3.1 Based on the above, the meeting is invited to analyse this working paper and, taking into consideration the information provided:

- a) to evaluate SARPs compliance on the provision of electronic terrain and obstacle data in the areas considered; and
- b) evaluate if, in the light of the action plan of Migration to AIM the non-compliance of SARPs on the provision of electronic terrain and obstacle data is or is not a deficiency, and its impact in safety and environment.

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