



International Civil Aviation Organization

Amendment 37,38 to Annex 15 Amendment 57 to Annex 4

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Outline



1. Amendment 37 to Annex 15:

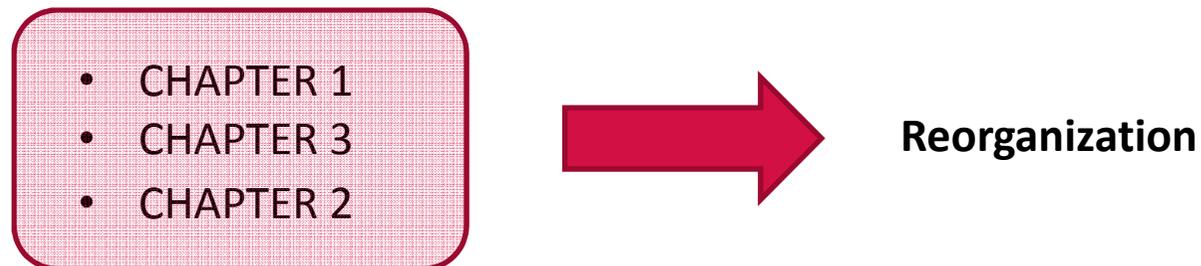
- Annex 15 document structure
- State and AIS Responsibilities and Functions
- Aeronautical Information Management
- Integrity Classifications and Levels
- Data and Information
- Prohibited, Restricted, Danger Areas
- Electronic Terrain and Obstacle Data; Aerodrome Mapping Data

2. Amendment 57 to Annex 4



Annex 15 document structure

- To accomplish the global transition from AIS provision to AIM-enabled services, it will be necessary to develop sequential and successive changes to Annex 15.
- The reorganization of the first three chapters is an evolutionary step in this process. It will facilitate a more complete incorporation of AIM-related provisions scheduled for adoption as part of Amendment 38 in 2016



Need to enhance clarity

- The present structure of Annex 15 differs from the other annexes.
- Chapter 1 does not follow the usual practice of providing the definitions in the first chapter, but contains text that introduces the Annex.



- To enhance clarity and to achieve commonality with other Annexes, the amendment proposes the use of existing Chapter 1 as the basis for an introductory note and moves the definitions from Chapter 2 to Chapter 1
- An introductory Note also allows for the addition of new text outlining the Global shift in AIS business processes from a paper product focus to a service – oriented data centric AIM focus
- Retitled “General”, and in addition to Definitions, Chapter 1 contains the specifications related to horizontal, vertical and temporal reference systems as well as certain miscellaneous specifications from the current Chapter 3



The Introductory Notes

CHAPTER 1. INTRODUCTION GENERAL

Note 1.— The object of the aeronautical information service (AIS) is to ensure the flow of aeronautical data and aeronautical information/data necessary for the global air traffic management (ATM) system safety, regularity, economy and efficiency in an environmentally sustainable manner of international air navigation. The role and importance of aeronautical data and aeronautical information/data changed significantly with the implementation of area navigation (RNAV), performance-based navigation (PBN), airborne computer-based navigation systems and data link systems. Corrupt, or erroneous, late, or missing aeronautical data and aeronautical information/data can potentially affect the safety of air navigation.

To satisfy the uniformity and consistency in the provision of aeronautical information/data that is required for the operational use by computer-based navigation systems, States shall, as far as practicable, avoid standards and procedures other than those established for international use.

Note 2.— These Standards and Recommended Practices are to be used in conjunction with the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400).

It is recognized that Supplementary Procedures may be required in certain cases in order to meet particular requirements of the ICAO Regions.

Note 3.— Guidance material on the organization and operation of aeronautical information services is contained in the Aeronautical Information Services Manual (Doc 8126).

The reference to “aeronautical information/data” is revised here and throughout the annex to “aeronautical data and aeronautical information” to point out the distinction between the management of data and the management of information. The statement outlining the object of AIS is revised to be in line with the global air traffic management (ATM) system requirements.

Annex 15 document structure

Chapter 2 is re-titled “Responsibilities and Functions”

SARPs taken from the original Chapter 3 are better organized to separate and clarify specific State responsibilities in Section 2.1 from AIS responsibilities and functions provided in section 2.2. Related responsibilities and functions concerning the exchange of aeronautical data and aeronautical information, copyright, and cost recovery are included in the chapter under separate sections.





State and AIS Responsibilities and Functions

2.1 3.1 State Responsibilities and functions

2.1.1 3.1.1 Each Contracting State shall:

- a) provide an aeronautical information service; or
- b) agree with one or more other Contracting State(s) for the provision of a joint service; or
- c) delegate the authority for the provision of the service to a non-governmental agency, provided the Standards and Recommended Practices of this Annex are adequately met.

2.1.2 Each Contracting State shall ensure that the provision of aeronautical data and aeronautical information covers its own territory and those areas over the high seas for which it is responsible for the provision of air traffic services.

2.1.3 3.1.1.1 The State concerned shall remain responsible for the aeronautical data and aeronautical information ~~provided~~ published. Aeronautical data and aeronautical information provided ~~published~~ for and on behalf of a State shall clearly indicate that it is ~~provided~~ published under the authority of that State.

2.1.4 3.1.1.2 Each Contracting State shall ~~take all necessary measures to ensure that the aeronautical data and aeronautical information/data it provides relating to its~~ is complete, timely and of the required quality in accordance with 3.3. ~~own territory, as well as areas in which the State is responsible for air traffic services outside its territory is adequate, of required quality and timely. This shall include arrangements for the timely provision of required information/data to the aeronautical information service by each of the State services associated with aircraft operations;~~

Editorial Note.— The last sentence of former 3.1.1.2, above, is incorporated into the following new 2.1.1.3.

2.1.5 Each contracting State shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information and the aeronautical information service in relation to the timely and complete provision of aeronautical data and aeronautical information.

State
Responsibilities



State and AIS Responsibilities and Functions

2.2 AIS responsibilities and functions

2.2.1 3-1.6 An aeronautical information service shall ensure that aeronautical data and aeronautical information/data necessary for the safety, regularity or efficiency of air navigation is made available in a form suitable for the operational requirements of the ATM community, including:

- a) those involved in flight operations, including flight crews, flight planning and flight simulators; and
- b) the air traffic services unit responsible for flight information service and the services responsible for pre-flight information.

2.2.2 3-1.7 An aeronautical information service shall receive and/or originate, collate or assemble, edit, format, publish/store and distribute aeronautical data and aeronautical information/data concerning the entire territory of the State as well as those areas over international waters/the high seas in which the State is responsible for the provision of air traffic services outside its territory. Aeronautical data and aeronautical information shall be published/provided as an Integrated Aeronautical Information Package.

Note.— An Aeronautical Information Service may include origination functions.

2.2.3 3-1.1.3 Where 24-hour service is not provided, service shall be available during the whole period an aircraft is in flight in the area of responsibility of an aeronautical information service, plus a period of at least two hours before and after such a period. The service shall also be available at such other time as may be requested by an appropriate ground organization.

2.2.4 3-1.2 An aeronautical information service shall, in addition, obtain aeronautical data and aeronautical information to enable it to provide pre-flight information service and to meet the need for in-flight information.

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

AIS
Responsibilities
and functions

AIM Domain Functions (Agenda Item 3.1)

On going discussion about the AIM FUNCTIONS:

- “and/or originate” in conjunction with “receive”.
- The concern is that the phrase “receive and/or originate” incorporated in paragraph 3.1.7 could infer an obligation on AIS to acquire information directly, for example by aerodrome survey, if it was not in “receipt” of such information.
- There was concern that removal of the term could also generate undesirable consequences. Specifically, it was expressed that if “originate” was not included in the list of AIS functions, it could be interpreted in some States that functions assigned to an AIS could not include origination and that this could be problematic in some States.

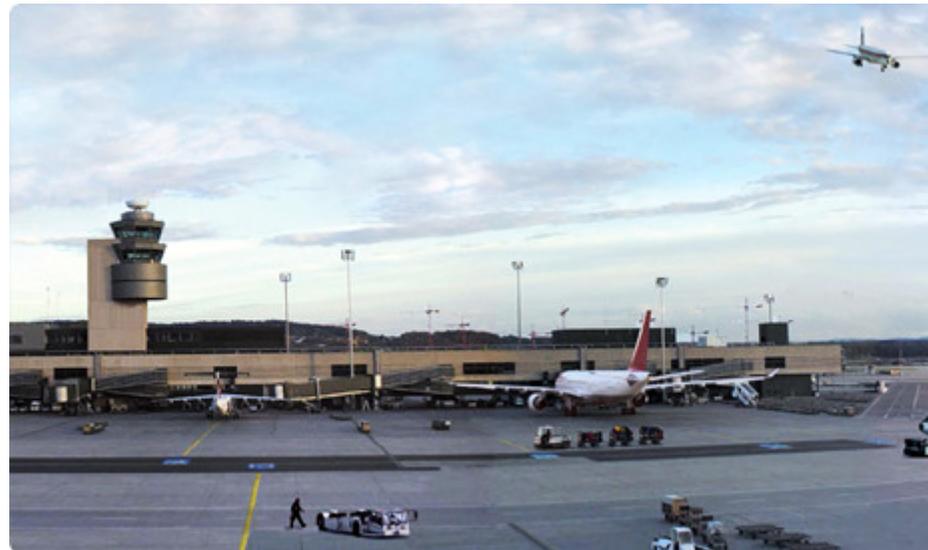


ANNEX 17 – AMD 37: “**and/or originate**” taken out

Note. — *An Aeronautical Information Service may include origination functions.*

Annex 15 document structure

Chapter 3 is re-titled “Aeronautical Information Management” to reflect the shift of focus and process from traditional AIS to AIM. This chapter outlines the processes that are applicable to AIM and will in the future provide an appropriate location for AIM – RELATED provisions



Aeronautical Information Management

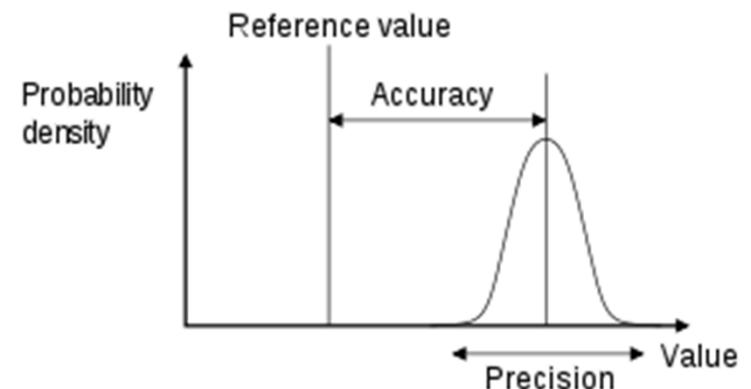


- Chapter 3 contains the original provisions relating to information management and adds new ones
- The original Chapter 3 is re-organized as a new chapter on aeronautical information management. The applicable elements from the original Chapter 3 pertaining to responsibilities and functions have been moved to Chapter 2 while the remaining elements are moved and revised to correctly align and specify aeronautical information management performance requirements along with the quality management system and human factors specifications.
- Chapter 3 provides performance requirements for the verification and validation of the aeronautical information and aeronautical data received.
- The data quality requirements (accuracy, resolution, integrity) along with traceability and protection requirements are further supported with reference to the necessary guidance materials drawn from the original note under paragraph 3.2.14.

Aeronautical Information Management



- Resolution is revised by the addition of a note to clarify that the database resolution should be commensurate with the data accuracy requirements (which may require an appropriate resolution to fulfill the requirements for all applications in the system) and may differ from the publication resolution (which may differ depending on the publication resolution for a specific use.)



- A significant number of aeronautical data is being published in excess of ICAO requirements for publication resolution. This in itself does not cause any safety issue; however, when this data is processed by the various automated systems requiring lower resolution, different methods for rounding aeronautical data may cause the data to be altered in different segments of the aeronautical data process chain. With the increasing number of automated aeronautical data processing systems, reference to a common rounding convention is needed to avoid any possibility for aeronautical data alteration.

Aeronautical Information Management



- **Use of automation** section is revised from a recommendation to a standard. New paragraphs are added to address consistency in the formats for delivery and provide performance requirements to enable digital data exchange and the use of aeronautical information and data exchange models to be globally interoperable. Recommendations are provided concerning the performance requirements for the aeronautical information model used and the aeronautical data exchange model that should be used.



3.6 3.6.5 Use of automation

3.6.1 Recommendation. Automation ~~enabling digital data exchange should~~ **shall** be introduced with the objective of improving the ~~timeliness~~ **speed**, quality, efficiency and cost-effectiveness of aeronautical information services.

3.6.2 Where aeronautical data and aeronautical information are provided in multiple formats, processes shall be implemented to ensure data and information consistency between formats.

3.6.3 In order to meet the data quality requirements, automation shall:

- a) ~~enable~~ digital aeronautical data exchange between the parties involved in the data processing chain; and
- b) ~~use~~ aeronautical information exchange models and data exchange models designed to be globally interoperable.

Note. Guidance on the aeronautical information and data exchange models may be found in the Aeronautical Information Services Manual (Doc 8126).

3.6.4 Recommendation. ~~The aeronautical information model used should encompass the aeronautical data and aeronautical information to be exchanged.~~

Integrity Classifications and Levels

The Integrity Classifications and levels listed in Aeronautical data requirements are associated specific numeric values. The numeric values are associated with target levels of a reduced probability of a transmitted error in information



- The values themselves have proven to be problematic
- For States implementing quality management systems (QMS) the expression of a numeric value of integrity has proven to complicate the effort to develop compliance mechanisms.



- The secretariat has concluded that the intent of providing integrity classification can be met providing by providing qualitative descriptions on three levels and developing provisions



Data and Information

- There has been considerable discussion with respect to the meaning of the terms “data” and “information”. Annex 15 makes frequent use of the combined term information/data.
- Though in their combined use, information and data provide reference to the domain under discussion, **the terms are not strictly interchangeable.**



The proposal changes the usage of the term information/data to “aeronautical information” and “aeronautical data”

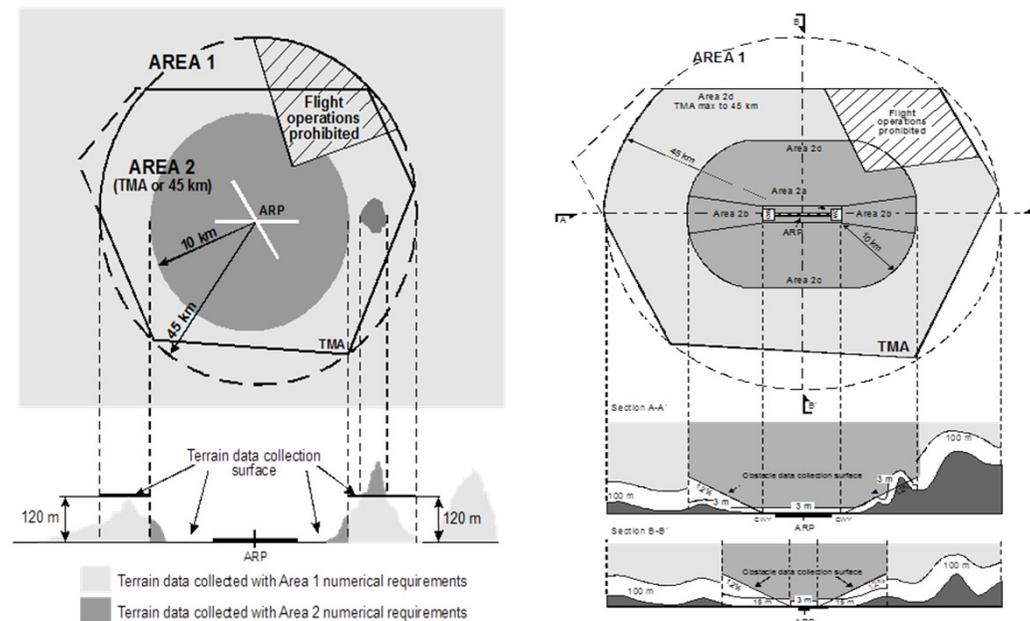
Prohibited, Restricted, Danger Areas

- Since 1957 Annex 15 has contained provisions relating to prohibited, restricted and danger areas.
- While the need to provide information on those areas is properly specified in Appendix 1, the section dealing with identification and establishment of those areas is outside the scope of Annex 15 and would be more appropriately contained in Annex 11.



Electronic Terrain and Obstacle Data

- Revisions to the electronic terrain and obstacle data provisions promulgated with Amendment 36 produced a small number of inconsistencies between Chapter 10 and Appendix 8 of Annex 15
- Minor changes to these provisions have been made to improve clarity and accuracy
- The collection requirement applicable for 12 November 2015 has been separated into two: one paragraph for obstacles, one paragraph for terrain





Aerodrome Mapping Database

- New provisions for aerodrome mapping data (AMD) are proposed as an outcome from ongoing work from the joint EUROCAE WG44/RTCA SC217.
- The proposals for AMD result from the desire to provide a standardized data set meeting quality and integrity requirements
- The primary envisioned use of the data is to support electronic charting used by both by both ATM and aircraft systems (e.g. cockpit aerodrome map display)
- The proposal would have data made available through AIS, once the responsible authority has provided it .
- The need to collect and provide data will set by individual States, in accordance with an identified need to support on-board aircraft systems where a cockpit aerodrome display will provide a significant benefit, particularly in the application of low visibility procedures

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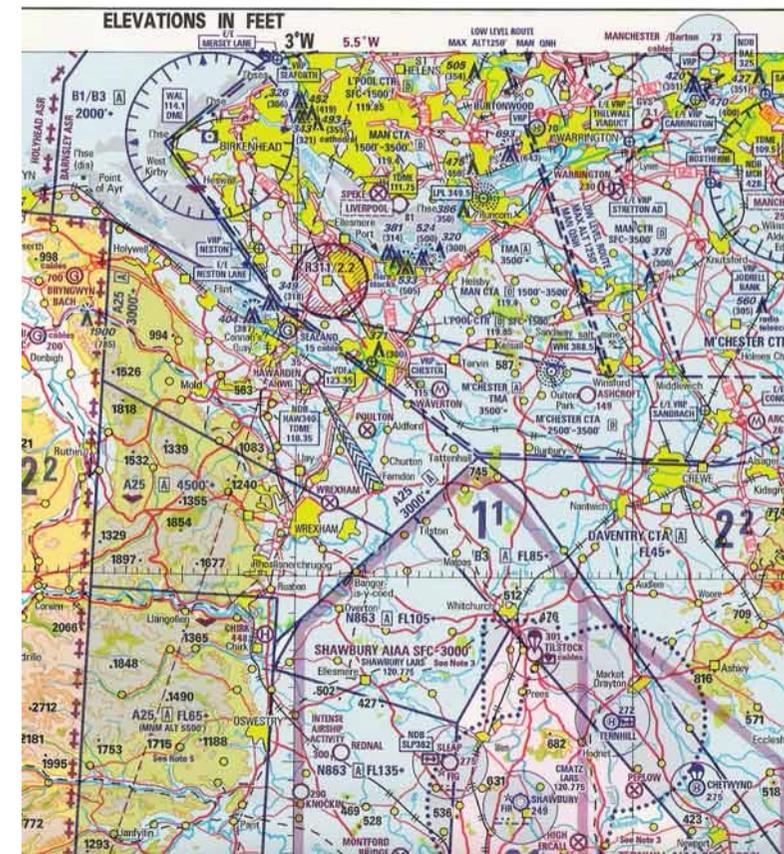
Annex 15 Consequential Amendments:

- The proposed deletion of Integrity Classification of Numerical Values requires their deletion in Annex 4, Appendix 6

Main Topics:

- Inclusion of RNAV/RNP procedure charts (fix wing and helicopters from ICAO Instrument Flight Procedure Panel)
- Intent to incorporate Aeronautical Chart 1:500.000 Guidance Material(Annex 4, Chapter 17).

AERONAUTICAL CH

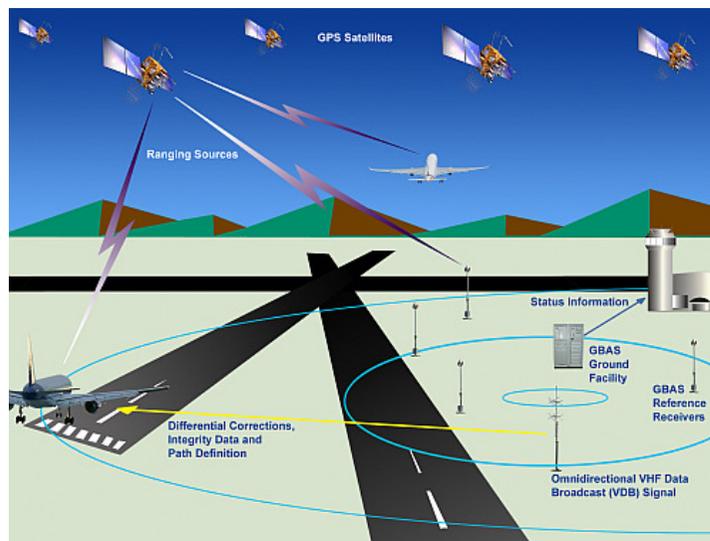


The Instrument Flight Procedure Panel (IFPP) Inputs for Annex 4



The Instrument Flight Procedure Panel (IFPP) is the ICAO ANC Panel whose main mandate consists of the development of PANS-OPS Volume I & II. Within this context, their main tasks encompass:

- Promoting Performance Based Navigation (PBN) criteria;
- Supporting new technologies (precision GBAS and SBAS landing systems);
- Providing charting and navigation data requirements;
- Providing procedure design and related charting criteria for PinS operations for helicopters.



IFPP- Integration Working Group (IFPP/IWG) and the Helicopter Working Group (IFPP/HWG), several inputs in relation to amendment material for Annex 4 and Annex 15.

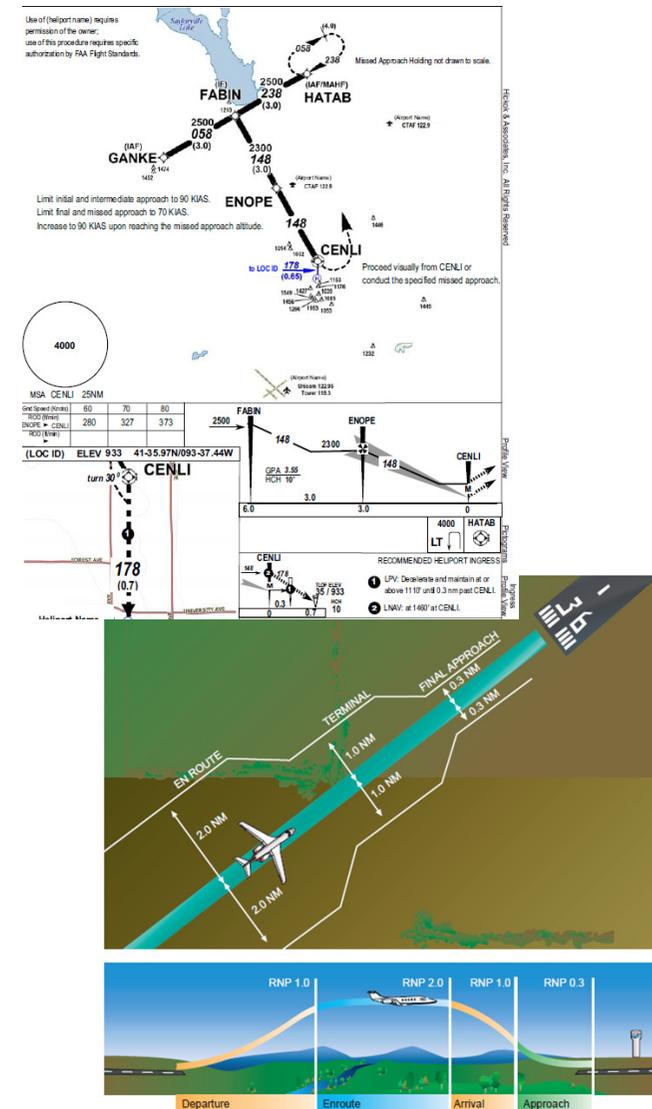
The Instrument Flight Procedure Panel (IFPP) Inputs for Annex 4



SBAS Charting and Publication and GLS Procedure Publication: IFPP has identified a minimum amount of information required for publication by the States (Channel Number, Reference Path Indicator) and has progressed a standardization process for how the various lines of minima are charted and as well the chart titling.

Charting concepts of Point-in-Space (PinS) approach and departure manoeuvring visual segments (VS). Proposals for Annex 4 charting requirements for helicopter PinS approach and departure procedures that contain a manoeuvring visual segment have been developed. Material which includes requirements for Plain View, Profile View, Direct VS or a Manoeuvring VS insets or Continuation Chart(reverse side).

Depiction of RNP Navigation Accuracies on RNP Route Segments: to standardize the depiction of route segment RNP Navigation Specification accuracy requirements



ICAO Chart Harmonization Focus Group



Outcome of the ICAO Aeronautical Chart 1: 500 000 harmonisation activity in ECAC:

- The Focus Group concentrated its work on the depiction of airspace structure and aeronautical information on Aeronautical Charts ICAO 1:500 000. The main objective was to produce guidance material in order to harmonise the Aeronautical Chart ICAO 1:500 000 within Europe, taking into account the existing ICAO requirements specified in ICAO Annex 4, Doc 8697, and the findings of the Airspace Infringement Safety Improvement Initiative. **As a consequence of the findings of the Focus Group and the elaborated guidance material for the ICAO Aeronautical Chart 1:500 000, a subsequent change proposal for Annex 4 has been developed.**
- *The group stepped into each single detail of the various ICAO Charts in order to find a “common ground” for a European wide standardised and harmonised publication in the future. This harmonisation process had to be in line with the standards and recommendations defined in ICAO Annex 4. Although Annex 4 is explicit in some areas, it is open for various interpretations in some others.*
- Annex and Manual do not cover problems emerging when depicting a complex airspace structure with an overlap of several airspace elements on a chart. In addition, ICAO Annex 4, Appendix 2 does not present adequate distinction between airspace requiring ATC clearance and airspace not requiring any clearance.

Summary



- **Annex 15 – Amendment 37:** Reorganization of the first three chapters as an evolutionary process.
- **CORRIGENDUM** → it deals with NOTAM selection codes (combination of “B” and “O” qualifiers) and editorial corrections to integrity values.
- **Annex 4 – Amendment 57:** mostly driven by the Instrument Flight Procedure Panel.



THANK YOU!