



International
Civil Aviation
Organization

Organisation
de l'aviation civile
internationale

Organización
de Aviación Civil
Internacional

Международная
организация
гражданской
авиации

منظمة الطيران
المدني الدولي

国际民用
航空组织

Tel.: +1 (514) 954-8194

Ref.: AN 2/2.2-09/13

23 April 2009

Subject: Proposals for amendments to Annex 15 and consequential amendments to Annexes 4, 11 and 14, Volumes I and II, and the PANS-ABC relating to aeronautical information services

Action required: Comments on the proposal to reach Montréal by 6 August 2009

Sir/Madam,

1. I have the honour to inform you that, the Air Navigation Commission, at the eleventh meeting of its 180th Session held on 12 March 2009, carried out a preliminary review of amendments to Annex 15 — *Aeronautical Information Services*, and consequential amendments to Annex 4 — *Aeronautical Charts*, Annex 11 — *Air Traffic Services*, Annex 14 — *Aerodromes*, Volume I — *Aerodrome Design and Operations* and Volume II — *Heliports*, and the *Procedures for Air Navigation Services — ICAO Abbreviations and Codes* (PANS-ABC, Doc 8400), and authorized their transmittal to Contracting States and interested international organizations for comment. The proposed amendment to Annex 15 is in Attachment A. The consequential amendments to Annexes 4, 11 and 14, Volumes I and II, and the PANS-ABC are in Attachments B to F, respectively.

2. The amendment proposal to Annex 15 involves provisions related to the following issues:

- a) quality management systems (QMS);
- b) use of automation enabling digital data exchange;
- c) electronic aeronautical information publications (eAIP);
- d) the NOTAM Format; and
- e) electronic terrain and obstacle data.

3. The proposal related to QMS stems from Decision 49/1 of the forty-ninth meeting of the European Air Navigation Planning Group (EANPG/49) and was further developed by the Secretariat with

the assistance of the Aeronautical Information Services-Aeronautical Information Management Study Group (AIS-AIMSG). The proposal:

- a) clarifies the scope of QMS to encompass all organizations involved in the data processing chain, from the point of origin/survey, through to the AIS and distribution of the data to the intended user;
- b) introduces a requirement for only one cyclic redundancy check (CRC) algorithm (instead of three) for all integrity classifications in the interests of harmonization;
- c) upgrades the provision of automated pre-flight information systems to a Standard;
- d) requires that States give due consideration to human factors issues associated with the integrity of information and take steps to mitigate any risks identified;
- e) requires the use of metadata to support the existing traceability requirements;
- f) clarifies the applicability of “major changes” with regard to information to be notified by AIRAC; and
- g) introduces editorial amendments aimed at improving consistency.

4. As a consequence, amendments are proposed to Annexes 4, 11, and 14, Volumes I and II, and the PANS-ABC. In order to foster the implementation of QMS, a manual on QMS is under development by the Secretariat with the assistance of the AIS-AIMSG.

5. Furthermore, during its preliminary review, the Air Navigation Commission requested that States be consulted regarding the status of implementation of QMS. In order to facilitate your response, a form, to be duly completed and returned to ICAO, has been provided in Attachment G. The form includes questions related to the implementation of Section 3.2 of Annex 15.

6. The proposal related to the use of automation enabling digital data exchange may be regarded as a first step towards the necessary evolution required for the future digital data exchange services. It amends Annex 15, paragraph 3.6.5, to recommend that States introduce automation enabling digital data exchange, with the objective of improving the speed, quality, efficiency and cost-effectiveness of AIS. The proposal will be supported by guidance material on aeronautical conceptual and data exchange models for the development of databases and establishment of data exchange services.

7. The proposal to amend Annex 15 includes a recommendation for the provision of an electronic aeronautical information publication (eAIP) which is based on a format that allows for digital data exchange. It is considered that clear provisions and guidance are necessary to prevent proliferation of eAIP formats and that a standard layout would simplify access by users. Accordingly, the proposal specifies that when the eAIP is provided, the information contained in the eAIP product shall follow the content and structure of the paper AIP product which is specified by Annex 15, Appendix 1. Also, concerning Appendix 1, the contact information in the AIP for designated authorities and responsible services has been updated to include e-mail and website addresses and discontinue the inclusion of telex numbers.

8. With regard to the NOTAM Format, the current Standard allows for a future date to be inserted in Item B) (date/time) in NOTAMR (replacing). This has created a situation in which the recipient is unable to discern whether the NOTAM is to be replaced immediately or remain valid until the

date/time appearing in Item B). This issue was highlighted by the eighteenth meeting of the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG/18) (Conclusion 18/4 refers). Furthermore, when a future effective date is indicated in a NOTAMR or a NOTAMC (cancelling), the current Standard does not allow for promulgation of a further change which may occur after the NOTAMR or NOTAMC is issued but before the future effective date of that NOTAMR or NOTAMC is reached. The proposed revision of Item B) clarifies that in the cases of NOTAMR and NOTAMC, the date-time group is the actual date and time of the NOTAM origination.

9. The proposal also introduces provisions to clarify NOTAM numbering, qualifiers (Item Q), designation of the start/end of a day and designation of upper/lower limits. A corresponding consequential amendment is proposed to amend the NOTAM Code in the PANS-ABC.

10. With regard to the amendment proposal related to electronic terrain and obstacle data (eTOD), it may be recalled that Amendment 33 to Annex 15 introduced requirements for States to provide eTOD over four areas. These requirements became applicable in 2008 as far as the “entire territory of a State” and “Category II and III operations area” are concerned (i.e. Area 1 and Area 4, respectively) and would become applicable in 2010 as far as the “terminal control area” and “aerodrome/heliport area” are concerned (i.e. Area 2 and Area 3, respectively). States have since indicated that the requirements related to Area 2 will be difficult and costly to implement. This may possibly lead to widespread non-compliance. This issue was addressed at the forty-ninth meeting of the European Air Navigation Planning Group (EANPG) which requested the Secretariat review of Standards and Recommended Practices (SARPs) and guidance material related to eTOD Area 2 to determine whether a refinement of SARPs or additional guidance material would be necessary.

11. During the preliminary review of the eTOD proposal, the Air Navigation Commission noted that the Secretariat is working towards further refinement of Area 2 requirements with the assistance of the AIS-AIMSG. The Commission considered that since the proposal is expected to significantly reduce implementation difficulties and costs, mainly through the amendment of requirements for proposed Area 2, it should not be postponed until the next scheduled amendment in 2013. Accordingly, the eTOD proposal, which is based on the international consensus reached so far, is included in this amendment. States may expect some further refinement of Area 2 through this consultative process.

12. In addition, to arrive at a better understanding of where States are in the eTOD implementation process, the Air Navigation Commission, requested that States be consulted. In order to facilitate your response, a form to be duly completed and returned to ICAO has been provided in Attachment G. The form includes questions related to the implementation of Section 10.6 of Annex 15.

13. Due to expected implementation issues, it is proposed that the applicability date for Areas 2 and 3 be extended to 15 November 2012 (proposed Annex 15, paragraph 10.6.1.2 refers). As the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic) is based on Annex 15 specifications for Area 2 and Area 3 electronic terrain and obstacle data, a consequential amendment is proposed to Annex 4, paragraph 5.2.1.

14. In examining the proposed amendments, you should not feel obliged to comment on editorial aspects as such matters will be addressed by the Air Navigation Commission during its final review of the draft amendment.

15. May I request that any comments you may wish to make on the proposed amendments to Annex 15, and consequential amendments to Annexes 4, 11 and 14, Volumes I and II, and the

PANS-ABC, be dispatched to reach me not later than 6 August 2009. The Air Navigation Commission has asked me to specifically indicate that comments received after the due date may not be considered by the Commission and the Council. In this connection, should you anticipate a delay in the receipt of your reply, please let me know in advance of the due date.

16. For your information, the proposed amendments to Annex 15, and consequential amendments to Annexes 4 and the PANS-ABC, are envisaged for applicability on 18 November 2010, except for those parts of the amendments to Annex 15 related to terrain and obstacle data according to Area 2 and Area 3 specifications, and Annex 4 related to the Aerodrome Terrain and Obstacle Chart — ICAO (Electronic), for which applicability should be 15 November 2012. The consequential amendments to Annexes 11 and 14, Volumes I and II, are also envisaged for applicability on 15 November 2012. Any comments you may have thereon would be appreciated.

17. The subsequent work of the Air Navigation Commission and the Council would be greatly facilitated by specific statements on the acceptability or otherwise of the amendment proposal. Please note that, for the review of your comments by the Air Navigation Commission and the Council, replies are normally classified as “agreement with or without comments”, “disagreement with or without comments”, or “no indication of position”. If in your reply the expressions “no objections” or “no comments” are used, they will be taken to mean “agreement without comment” and “no indication of position”, respectively. In order to facilitate proper classification of your response, a form has been included in Attachment H which may be completed and returned together with your comments, if any, on the proposal in Attachments A, B, C, D, E and F.

18. I wish to inform you that, in addition to these amendment proposals, a global roadmap for the transition from AIS to AIM has been developed to address the future direction of aeronautical information management. It is intended as a high-level document to provide a framework for States in their evolution towards AIM, and to clarify the purpose and scope of the transition. The roadmap identifies the major milestones towards a uniform global evolution to AIM and indicates specific steps and timelines for implementation. The roadmap for the transition from AIS to AIM has been noted by the Air Navigation Commission and is presented at <http://www.icao.int/anb/AIM/>. Language versions will be posted as soon as possible.

Accept, Sir/Madam, the assurances of my highest consideration.

Taïeb Chérif
Secretary General

Enclosures:

- A — Proposed amendment to Annex 15
- B — Proposed amendment to Annex 4
- C — Proposed amendment to Annex 11
- D — Proposed amendment to Annex 14, Volume I
- E — Proposed amendment to Annex 14, Volume II
- F — Proposed amendment to PANS-ABC
- G — Response form to individual questions
- H — Response form to the proposed amendments

ATTACHMENT A to State letter AN 2/2.2-09/13

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERONAUTICAL INFORMATION SERVICES

**ANNEX 15
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF A PROPOSED AMENDMENT TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES
AERONAUTICAL INFORMATION SERVICES
ANNEX 15
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

...

CHAPTER 3. GENERAL

...

3.2 Quality management system

3.2.1 Each Contracting State shall ~~take all necessary measures to introduce a properly organized quality system containing procedures, processes and resources necessary to implement quality management at each function stage~~ ensure that quality management systems are implemented and maintained encompassing all functions of an aeronautical information service, as outlined in 3.1.7 above. The execution of such quality management systems shall be made demonstrable for each function stage, when required.

3.2.2 Recommendation.— *The quality management system should evolve to be applicable to the whole data supply chain from data origination to distribution to the next intended user, taking into consideration the intended use of data.*

~~3.2.2~~ **3.2.3 Recommendation.**— *The quality management system established in accordance with 3.2.1 should ~~be in conformity with~~ follow the International Organization for Standardization (ISO) 9000 series of quality assurance standards, and be certified by an approved organization.*

Note 1.— *An ISO 9000 certificate, issued by an accredited certification body would be considered an acceptable means of compliance.*

Note 2.— *International Organization for Standardization (ISO) 9000 series of quality assurance standards provide a basic framework for the development of a quality assurance programme and define the term “accredited certification body”. The details of a successful programme are to be formulated by each State and in most cases are unique to the State organization.*

Note 3.— *Supporting material in respect to the processing of aeronautical data is contained in RTCA Document DO-200A and European Organization for Civil Aviation Equipment (EUROCAE) Document ED-76 — Standards for Processing Aeronautical Data. These standards support the development and application of aeronautical databases.*

~~3.2.3~~ **3.2.4** Within the context of a ~~the established~~ quality management system, the skills and knowledge required for each function shall be identified and personnel assigned to perform those functions shall be appropriately trained. States shall ensure that personnel possess the skills and competencies required to perform specific assigned functions, and appropriate records shall be maintained so that the qualifications of personnel can be confirmed. Initial and periodic assessments shall be established that require personnel to demonstrate the required skills and competencies. Periodic assessments of personnel shall be used as a means to detect and correct shortfalls.

~~3.2.4~~ 3.2.5 States shall ensure that established procedures exist in order that aeronautical data at any moment is traceable to its origin so as to allow any data anomalies or errors, detected during the production/maintenance phases or in operational use, to be corrected. The quality management system includes the necessary policies, processes and procedures to assure and verify that aeronautical data is traceable to its origin so as to allow any data anomalies or errors detected in use to be identified by root cause, corrected and communicated to affected users.

~~3.2.5~~ 3.2.6 The established quality management system shall provide users with the necessary assurance and confidence that distributed aeronautical information/data satisfy stated requirements for data quality is adequate for its intended use and of required quality (accuracy, resolution and integrity) and for data traceability by the use of appropriate procedures in every stage of data production or data modification process. The system shall also provide assurance of the applicability period of intended use of aeronautical data as well as that the agreed distribution dates will be met.

3.2.7 States shall take all necessary measures to monitor compliance with the quality management system in place.

~~3.2.6~~ 3.2.8 The order of accuracy for aeronautical data, based upon a 95 per cent confidence level, shall be as specified in Annex 11, Chapter 2, and Annex 14, Volumes I and II, Chapter 2. In that respect, three types of positional data shall be identified: surveyed points (runway thresholds, navigation aid positions, etc.), calculated points (mathematical calculations from the known surveyed points of points in space/fixes) and declared points (e.g. flight information region boundary points).

~~3.2.7~~ 3.2.9 States shall ensure that the order of publication resolution of aeronautical data shall be that as specified in Appendices 1 and 7.

~~3.2.8~~ 3.2.10 Contracting States shall ensure that the integrity of aeronautical data is maintained throughout the data process from survey/origin to distribution to the next intended user (the entity that receives the aeronautical information from the aeronautical information service provider). Aeronautical data integrity requirements shall be based upon the potential risk resulting from the corruption of data and upon the use to which the data item is put. Consequently, the following classifications and data integrity levels shall apply:

- a) critical data, integrity level 1×10^{-8} : there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) essential data, integrity level 1×10^{-5} : there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) routine data, integrity level 1×10^{-3} : there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

Note 1.— Distribution to the next intended user will differ in the delivery method applied which may either be:

Physical distribution. The means by which aeronautical information/data distribution is achieved through the delivery of a physical package, such as postal services.

or

Direct electronic distribution. The means by which aeronautical information/data distribution is achieved automatically through the use of a direct electronic connection between the AIS and the next intended user.

Note 2.— Different delivery methods and data media may require different procedures to ensure the required data quality.

~~3.2.9~~ **3.2.11** Aeronautical data quality requirements related to classification and data integrity shall be as provided in Tables A7-1 to A7-5 of Appendix 7.

~~3.2.10~~ **3.2.12** ~~Protection of electronic~~ Electronic aeronautical data sets, while stored ~~or in transit~~ shall be ~~totally monitored~~ protected by the a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. ~~To achieve protection of the integrity level of critical and essential aeronautical data as classified in 3.2.8, a 32- or 24-bit CRC algorithm shall apply respectively.~~

Note 1.— The requirement in 3.2.12 does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

~~3.2.11~~ **Recommendation.** ~~To achieve protection of the integrity level of routine aeronautical data as classified in 3.2.8, a 16-bit CRC algorithm should apply.~~

~~3.2.12~~ **3.2.13** Material to be issued as part of the Integrated Aeronautical Information Package shall be thoroughly checked and coordinated with the services responsible ~~services~~ before it is submitted to the aeronautical information service, in order to make certain that all necessary information has been included and that it is correct in detail prior to distribution. Validation and verification procedures shall be established which ensure that quality requirements (accuracy, resolution, integrity) and traceability of aeronautical data are met.

Note.— Guidance material on the liaison with other related services is contained in ~~the Aeronautical Information Services Manual (Doc 8126).~~

~~3.2.13~~ **3.2.14** Demonstration of compliance of the quality management system applied shall be by audit. If nonconformity is identified, initiating action to correct its cause shall be determined and taken. All audit observations and remedial actions shall be evidenced and properly documented.

...

3.6 General specifications

...

3.6.5 Use of automation

Recommendation. ~~Automation in AIS~~ enabling digital data exchange should be introduced with the objective of improving the speed, ~~accuracy,~~ quality, efficiency and cost-effectiveness of aeronautical information services.

Note.— Guidance material on an aeronautical conceptual and data exchange model for the development of databases and the establishment of data exchange services is contained in Doc 8126.

...

3.6.7 Human Factors considerations

3.6.7.1 The organization of the aeronautical information services as well as the design, contents, processing and distribution of aeronautical information/data shall take into consideration Human Factors principles which facilitate their optimum utilization.

3.6.7.2 Due consideration shall be given to the integrity of information where human interaction is required and mitigating steps taken where risks are identified.

Note.— This may be accomplished through the design of systems, through operating procedures or through improvements in the operating environment.

...

3.8 Metadata

3.8.1 Each Contracting State shall collect metadata for aeronautical information/data processes and/or exchange points. This metadata collection shall be applied throughout the data supply chain, from survey/origin to distribution to the next intended user by the aeronautical information service.

Note.— ISO Standard 19115 specifies requirements for geographic information metadata.

3.8.2 The metadata to be collected shall include, as a minimum:

- a) the name of the organization or entity performing the function;
- b) the function performed; and
- c) the date and time of operation.

...

CHAPTER 4. AERONAUTICAL INFORMATION PUBLICATIONS (AIP)

...

4.3 Specifications for AIP Amendments

...

4.3.4 Each AIRAC AIP Amendment page, including the cover sheet, shall display an effective date. When an effective time other than 0000 UTC is used, the effective time shall also be displayed on the cover sheet.

...

4.4 Specifications for AIP Supplements

...

4.4.4 When an error occurs in an AIP Supplement or when the period of validity of an AIP Supplement is changed, a new AIP Supplement shall be published as a replacement.

Editorial Note.— *Renumber subsequent paragraphs accordingly.*

...

4.6 Electronic AIP (eAIP)

4.6.1 **Recommendation.**— *The AIP, AIP Amendment, AIP Supplement and AIC should also be published in a format that allows for displaying on a computer screen and printing on paper.*

Note 1.— *This composite electronic document is named “Electronic AIP” (eAIP) and is based on a format that allows for digital data exchange.*

Note 2.— *Guidance material for the production and provision of the eAIP is contained in Doc 8126.*

4.6.2 When provided, the information content of the eAIP and the structure of chapters, sections and sub-sections shall follow the content and structure of the paper AIP. The eAIP shall include files that allow for printing a paper AIP.

4.6.3 **Recommendation.**— *When provided, the eAIP should be available on a physical distribution media (CD, DVD, etc.) and online on the Internet.*

Note.— *Guidance material on the use of the Internet is contained in Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).*

...

CHAPTER 5. NOTAM

...

5.2 General specifications

...

5.2.2 Text of NOTAM shall be composed of the significations/uniform abbreviated phraseology assigned to the ICAO NOTAM Code complemented by ICAO abbreviations, indicators, identifiers, designators, call signs, frequencies, figures and plain language.

Note.— *Detailed guidance material covering NOTAM, SNOWTAM, ASHTAM and PIB production is contained in Doc 8126.*

...

5.2.6 When errors occur in a NOTAM, a NOTAM with a new number to replace the erroneous NOTAM shall be issued or the erroneous NOTAM shall be cancelled and a new NOTAM issued.

...

5.2.13 A checklist of valid NOTAM shall be issued as a NOTAM over the Aeronautical Fixed Service (AFS) at intervals of not more than one month using the NOTAM Format specified in Appendix 6. One NOTAM shall be issued for each series.

Note.— Omitting a NOTAM from the checklist does not serve to cancel a NOTAM.

...

CHAPTER 6. AERONAUTICAL INFORMATION REGULATION AND CONTROL (AIRAC)

6.1 General specifications

6.1.1 Information concerning the circumstances listed in Appendix 4, Part 1, shall be distributed under the regulated system (AIRAC), i.e. basing establishment, withdrawal or significant changes upon a series of common effective dates at intervals of 28 days, including ~~29 January 1998~~ 14 January 2010. The information notified therein shall not be changed further for at least another 28 days after the effective date, unless the circumstance notified is of a temporary nature and would not persist for the full period.

...

6.2 Provision of information in paper copy form

6.2.1 In all instances, information provided under the AIRAC system shall be published in paper copy form and shall be distributed by the AIS unit at least 42 days in advance of the effective date with the objective of reaching recipients at least 28 days in advance of the effective date.

6.2.2 **Recommendation.**— *Whenever major changes are planned and where advance notice is desirable and practicable, information published in paper copy form should be distributed by the AIS unit at least 56 days in advance of the effective date. This should be applied to the establishment of, and premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.*

Note.— Guidance on what constitutes a major change is included in Doc 8126.

6.3 Provision of information in electronic form

6.3.1 States that have established an aeronautical database shall, when updating its contents concerning the circumstances listed in Appendix 4, Part 1, ensure that the effective dates of data coincide with the established AIRAC effective dates used for the provision of information in paper copy form.

6.3.2 Information provided in electronic form, concerning the circumstances listed in Appendix 4, Part 1, shall be distributed/made available by the AIS unit so as to reach recipients at least 28 days in advance of the AIRAC effective date.

6.3.3 **Recommendation.**— *Whenever major changes are planned and where advance notice is desirable and practicable, information provided in electronic form should be distributed/made available at least 56 days in advance of the effective date. This should be applied to the establishment of, and*

premeditated major changes in, the circumstances listed in Appendix 4, Part 3, and other major changes if deemed necessary.

Note.— Guidance on what constitutes a major change is included in Doc 8126.

...

CHAPTER 8. PRE-FLIGHT AND POST-FLIGHT INFORMATION/DATA

...

8.2 Automated aeronautical information systems

...

8.2.1 ~~Where the~~ **The** civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) ~~uses~~ **shall use** automated pre-flight information systems to make aeronautical information/data available to operations personnel including flight crew members for self-briefing, flight planning and flight information service purposes. ~~the~~ **The** information/data made available shall comply with the provisions of 8.1.2 and 8.1.3.

~~8.2.4~~ **8.2.2** Self-briefing facilities of an automated pre-flight information system shall provide ~~for access by~~ to operations personnel, including flight crew members and other aeronautical personnel concerned, ~~to~~ **for** consultation as necessary with the aeronautical information service by telephone or other suitable telecommunications means. The human/machine interface of such facilities shall ensure easy access in a guided manner to all relevant information/data.

~~8.2.5~~ **8.2.3 Recommendation.**— Automated pre-flight information systems for the supply of aeronautical information/data for self-briefing, flight planning and flight information service ~~should~~ **shall**:

- a) provide for continuous and timely updating of the system database and monitoring of the validity and quality of the aeronautical ~~information~~ **data** stored;
- b) permit access to the system by operations personnel including flight crew members, aeronautical personnel concerned and other aeronautical users through suitable telecommunications means;
- c) ensure provision, in paper copy form, of the aeronautical information/data accessed, as required;
- d) use access and interrogation procedures based on abbreviated plain language and ICAO location indicators, as appropriate, or based on a menu-driven user interface or other appropriate mechanism as agreed between the civil aviation authority and operator concerned; and
- e) provide for rapid response to a user request for information.

Note.— ICAO abbreviations and codes and location indicators are given respectively in the Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400) and Location Indicators (Doc 7910).

~~8.2.2~~ **8.2.4 Recommendation.**— *Automated pre-flight information systems providing a harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information in accordance with 8.2.1 and meteorological information in accordance with 9.5.1 of Annex 3 — Meteorological Service for International Air Navigation, should be established by an agreement between the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) and the relevant meteorological authority.*

~~8.2.3~~ **8.2.5** Where automated pre-flight information systems are used to provide the harmonized, common point of access by operations personnel, including flight crew members and other aeronautical personnel concerned, to aeronautical information/ data and meteorological information, the civil aviation authority or the agency to which the authority to provide service has been delegated in accordance with 3.1.1 c) shall remain responsible for the quality and timeliness of the aeronautical information/ data provided by means of such a system.

Note.— *The meteorological authority concerned remains responsible for the quality of the meteorological information provided by means of such a system in accordance with 9.5.1 of Annex 3.*

...

CHAPTER 10. ELECTRONIC TERRAIN AND OBSTACLE DATA

10.1 Function

Sets of electronic terrain and obstacle data used in combination with aeronautical data, as appropriate, shall ~~satisfy user requirements necessary to~~ support the following air navigation applications:

...

10.2 Coverage and terrain and obstacle data numerical requirements

10.2.1 ~~To satisfy requirements necessary to accommodate air navigation systems or functions specified in 10.1, sets of electronic~~ **Electronic** terrain and obstacle data shall be collected and recorded in ~~databases~~ **data sets** in accordance with the following coverage areas:

- Area 1: entire territory of a State;
- Area 2: terminal control area;
- Area 3: aerodrome/heliport area; and
- Area 4: Category II or III operations area.

Note.— *See Appendix 8 for graphical illustrations of the defined coverage areas.*

...

10.2.3 Area 2 data shall be provided for all aerodromes regularly used by international civil aviation.

10.2.4 Recommendation.— *Area 3 data should be provided at those aerodromes/heliports where it is considered to be beneficial, e.g. where it is supported by the availability of aerodrome mapping data.*

~~10.2.3~~ **10.2.5** ~~At IFR aerodromes/heliports,~~ **When provided,** Area 3 shall cover the area that extends from the edge(s) of the runway(s) to 90 m from the runway centre line(s) and for all other parts of aerodrome/heliport movement area(s), 50 m from the edge(s) of the defined area(s).

~~10.2.4~~ **10.2.6** Area 4 shall be restricted to those runways where precision approach Category II or III operations have been established and where detailed terrain and appropriate obstacle information is required by operators to enable them to assess, by use of radio altimeters, the effect of terrain and obstacles on decision height determination. The width of the area shall be 60 m on either side of the extended runway centre line while the length shall be 900 m from the runway threshold measured along the extended runway centre line.

Note.— Area 4 terrain data and Area 2 obstacle data are normally sufficient to support the production of the Precision Approach Terrain Chart — ICAO. When more detailed obstacle data is required for Area 4, this may be provided in accordance with the Area 4 obstacle data requirements specified in Appendix 8, Table A8-2. Guidance on appropriate obstacles for this chart is given in the Aeronautical Chart Manual (Doc 8697).

10.2.7 Recommendation.— *Where the terrain at a distance greater than 900 m (3 000 ft) from the runway threshold is mountainous or otherwise significant, Area 4 should be extended to a distance not exceeding 2 000 m from the runway threshold.*

~~10.2.5~~ **10.2.8** ~~According to the air navigation applications listed in 10.1 and areas of coverage, sets~~ **Sets** of electronic terrain data shall satisfy the numerical requirements specified in Appendix 8, Table A8-1 while obstacle data shall satisfy the numerical requirements specified in ~~Appendix 8,~~ Table A8-2.

Note 1.— Numerical terrain and obstacle data requirements for Area 2 provided in ~~Appendix 8,~~ Table A8-1 and Table A8-2, respectively, are defined on the basis of the most stringent application requirement (application listed under 10.1 b)).

Note 2.— It is recognized that some applications listed in 10.1 could be adequately accommodated with terrain and obstacle data sets that are of lower requirements than those specified in ~~Appendix 8,~~ Table A8-1 and Table A8-2, respectively. Consequently, careful evaluation of available data sets by data users is necessary in order to determine if the products are fit for their intended use.

10.3 Terrain database data set — content and structure

10.3.1 A terrain ~~database~~ **data set** shall contain digital sets of data representing terrain surface in the form of continuous elevation values at all intersections (points) of a defined grid, referenced to common datum. A terrain grid shall be angular or linear and shall be of regular or irregular shape.

...

10.3.3 Terrain data shall be collected according to the areas specified in 10.2, terrain data collection surfaces and criteria specified in ~~Appendix 8, Figure~~ **Figures** A8-1, A8-3 and A8-4, and in accordance with the terrain data numerical requirements provided in Table A8-1 ~~of Appendix 8.~~ In terrain ~~databases~~ **data sets**, only one feature type, i.e. terrain, shall be recorded. Feature attributes describing terrain shall be those listed in ~~Appendix 8, Table~~ **Table** A8-3. The terrain feature attributes listed in Table A8-3 represent the minimum set of terrain attributes, and those annotated as mandatory shall be recorded in the terrain ~~database~~ **data set**.

10.4 Obstacle ~~database~~ data set — content and structure

10.4.1 ~~One obstacle database~~ Obstacle data sets shall contain a digital set of obstacle data and shall include all obstacles that penetrate the collection surfaces defined in Figure A8-2 ~~those features having vertical significance in relation to adjacent and surrounding features that are considered hazardous to air navigation~~. Obstacle data shall comprise the digital representation of the vertical and horizontal extent of man-made objects. Obstacles shall not be included in terrain ~~databases~~ data sets. Obstacle data elements are features that shall be represented in the ~~database~~ data sets by points, lines or polygons.

10.4.2 Obstacles, which in accordance with the definition, can be fixed (permanent or temporary) or mobile shall be identified within the areas defined in 10.2, on the basis of the obstacle data collection surfaces and criteria specified in ~~Appendix 8, Figure~~ Figures A8-2, A8-3 and A8-4, and collected in accordance with obstacle data numerical requirements provided in Table A8-2 ~~of Appendix 8~~. In an obstacle ~~database~~ data set, all defined obstacle feature types shall be recorded and each of them shall be described according to the list of mandatory attributes provided in Table A8-4 ~~of Appendix 8~~.

Note.— Specific attributes associated with mobile (feature operations) and temporary types of obstacles are annotated in ~~Appendix 8, Table A8-4~~, as optional attributes. If these types of obstacles are to be recorded in the ~~database~~ data set, appropriate attributes describing such obstacles are also required.

...

10.6 Availability

...

10.6.1.1 States shall ensure that ~~as of 20 November 2008~~, electronic terrain and obstacle data are made available in accordance with Area 1 specifications and terrain data in accordance with Area 4 specifications.

10.6.1.2 States shall ensure that as of ~~18 November 2010~~ 15 November 2012, electronic terrain and obstacle data are made available in accordance with Area 2 and Area 3 specifications.

10.6.1.3 **Recommendation.**— *States should ensure that electronic terrain and obstacle data are made available in accordance with Area 1, Area 2, and Area 3 specifications ~~and terrain data in accordance with Area 4 specifications~~.*

...

**APPENDIX 1. CONTENTS OF AERONAUTICAL
INFORMATION PUBLICATION (AIP)**

(see Chapter 4)

PART 1 — GENERAL (GEN)

...

GEN 1. NATIONAL REGULATIONS AND REQUIREMENTS

GEN 1.1 Designated authorities

...

- 6) ~~telex number; and~~ e-mail address;
- 7) aeronautical fixed service (AFS) address; ~~and;~~
- 8) website address, if available.

...

GEN 3. SERVICES

GEN 3.1 Aeronautical information services

GEN 3.1.1 Responsible service

...

- 5) ~~telex number~~ e-mail address;
- 6) AFS address;
- 7) website address, if available;

Editorial Note.— Renumber subsequent subparagraphs accordingly.

...

GEN 3.2 Aeronautical charts

GEN 3.2.1 Responsible service(s)

...

- 5) ~~telex number~~ e-mail address;
- 6) AFS address;
- 7) website address, if available;

Editorial Note.— Renumber subsequent subparagraphs accordingly.

...

GEN 3.2.3 Purchase arrangements

...

5) ~~telex number~~ e-mail address;

6) AFS address;

7) website address, if available;

...

GEN 3.2.7 Topographical charts

...

5) ~~telex number~~ e-mail address;

6) AFS address;

7) website address, if available;

...

GEN 3.3 Air traffic services

GEN 3.3.1 Responsible service

...

5) ~~telex number~~ e-mail address;

6) AFS address;

7) website address, if available;

Editorial Note.— Renumber subsequent subparagraphs accordingly.

...

GEN 3.3.6 ATS units address list

...

5) ~~telex number~~ e-mail address;

6) AFS address;

7) website address, if available;

...

GEN 3.4 Communication services

GEN 3.4.1 Responsible service

...

- 5) ~~telex number~~ e-mail address;
- 6) AFS address;
- 7) website address, if available;

Editorial Note.— Renumber subsequent subparagraphs accordingly.

...

GEN 3.5 Meteorological services

GEN 3.5.1 Responsible service

...

- 5) ~~telex number~~ e-mail address;
- 6) AFS address;
- 7) website address, if available;

Editorial Note.— Renumber subsequent subparagraphs accordingly.

...

GEN 3.5.9 Other automated meteorological services

...

- 4) telephone, ~~telex~~ and telefax number(s), e-mail address, and, if available, website address.

GEN 3.6 Search and rescue

GEN 3.6.1 Responsible service(s)

...

- 5) ~~telex number~~ e-mail address;
- 6) AFS address; ~~and~~
- 7) website address, if available; ~~and~~

- 7) 8) a statement concerning the ICAO documents on which the service is based and a reference to the AIP location where differences, if any, are listed.

...

PART 3 — AERODROMES (AD)

...

AD 2. AERODROMES

Note.— **** is to be replaced by the relevant ICAO location indicator.

...

****** AD 2.2 Aerodrome geographical and administrative data**

...

- 6) name of aerodrome administration, address, telephone, telefax, e-mail address, and telex numbers and AFS address and, if available, website address;

...

****** AD 2.10 Aerodrome obstacles**

Detailed description of obstacles, including:

...

- 2) indication that information on obstacles in Area 3 is not provided, or if provided:

...

- d) obstacle elevation and height to the nearest tenth of a metre or tenth of a foot;

...

Note 1.— Chapter 10, ~~10.2.3~~ 10.2.5, provides a description of Area 3 while Appendix 8, Figure A8-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

...

****** AD 2.12 Runway physical characteristics**

...

- 5) geographical coordinates in degrees, minutes, seconds and hundredths of seconds for each threshold and runway end, and geoid undulation to the nearest one-half metre or foot for each threshold; of:

— thresholds of a non-precision approach runway to the nearest metre or foot; and

— thresholds of a precision approach runway to the nearest tenth of a metre or tenth of a foot;

6) elevations of:

- thresholds of a non-precision approach runway to the nearest metre or foot; and
- thresholds and the highest elevation of the touchdown zone of a precision approach runway to the nearest ~~one-half~~ tenth of a metre or tenth of a foot;

...

****** AD 2.16 Helicopter landing area**

1) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation ~~to the nearest one-half metre or foot~~ of the geometric centre of touch-down and lift-off (TLOF) or of each threshold of final approach and take-off (FATO) area (where appropriate); :

- for non-precision approaches, to the nearest metre or foot; and
- for precision approaches, to the nearest tenth of a metre or tenth of a foot;

2) TLOF and/or FATO area elevation:

- for non-precision approaches, to the nearest metre or foot; and
- for precision approaches, to the nearest ~~one-half~~ tenth of a metre or tenth of a foot;

...

AD 3. HELIPORTS

...

****** AD 3.2 Heliport geographical and administrative data**

...

6) name of heliport administration, address, telephone, telefax, ~~e-mail address, and telex numbers~~ and AFS address ~~and, if available, website address~~;

...

****** AD 3.10 Heliport obstacles**

Detailed description of obstacles, including:

...

2) ~~indication that information on obstacles in Area 3 is not provided, or if provided:~~

...

d) obstacle elevation and height to the nearest tenth of a metre or tenth of a foot;

...

Note 1.— Chapter 10, ~~10.2.3~~ 10.2.5, provides a description of Area 3 while Appendix 8, Figure A8-3, contains graphical illustrations of obstacle data collection surfaces and criteria used to identify obstacles in Area 3.

...

****** AD 3.12 Heliport data**

...

6) geographical coordinates in degrees, minutes, seconds and hundredths of seconds and geoid undulation to the nearest ~~one-half metre or foot~~ of the geometric centre of TLOF or of each threshold of FATO (where appropriate);

— for non-precision approaches, to the nearest metre or foot; and

— for precision approaches, to the nearest tenth of a metre or tenth of a foot;

7) TLOF and/or FATO slope and elevation:

— for non-precision approaches, to the nearest metre or foot; and

— for precision approaches, to the nearest ~~one-half~~ tenth of a metre or tenth of a foot;

...

APPENDIX 4. INFORMATION TO BE NOTIFIED BY AIRAC

PART 1

1. The establishment, ~~and~~ withdrawal of, and premeditated significant changes (including operational trials) to:

...

1.2 Positions, frequencies, call signs, ~~identifiers~~, known irregularities and maintenance periods of radio navigation aids, ~~and~~ communication ~~and surveillance~~ facilities.

1.3 Holding and approach procedures, arrival and departure procedures, noise abatement procedures and any other pertinent ATS procedures.

1.4 Transition levels, transition altitudes and minimum sector altitudes.

~~1.4~~ 1.5 Meteorological facilities (including broadcasts) and procedures.

~~1.5~~ 1.6 Runways and stopways.

1.7 Taxiways and aprons.

1.8 Aerodrome ground operating procedures (including low visibility procedures).

1.9 Approach and runway lighting.

1.10 Aerodrome operating minima if published by a State.

PART 2

2. The establishment and withdrawal of, and premeditated significant changes to:
- 2.1 Position, height and lighting of navigational obstacles.
 - ~~2.2 Taxiways and aprons.~~
 - ~~2.3~~ 2.2 Hours of service of aerodromes, facilities and services.
 - ~~2.4~~ 2.3 Customs, immigration and health services.
 - 2.5 2.4 Temporary danger, prohibited and restricted areas and navigational hazards, military exercises and mass movements of aircraft.
 - 2.6 2.5 Temporary areas or routes or portions thereof where the possibility of interception exists.

PART 3

3. The establishment of, and premeditated major changes to:
- 3.1 New aerodromes for international IFR operations.
 - 3.2 New runways for IFR operations at international aerodromes.
 - 3.3 Design and structure of the air traffic services route network.
 - 3.4 Design and structure of a set of terminal procedures (including change of procedure bearings due to magnetic variation change).
 - 3.5 Circumstances listed in Part 1 if the entire State or any significant portion thereof is affected or if cross-border coordination is required.

...

APPENDIX 6. NOTAM FORMAT

(see Chapter 5, 5.2.1)

...

INSTRUCTIONS FOR THE COMPLETION OF THE NOTAM FORMAT

...

2. NOTAM numbering

Each NOTAM shall be allocated a series identified by a letter and a four-digit number followed by a stroke and a two-digit number for the year (e.g. A0023/03). Each series shall start on 1 January with number 0001.

3. Qualifiers (Item Q)

Item Q) is divided in eight fields, each separated by a stroke. An entry shall be made in each field. If no entry is to be made in a field, it is not necessary to transmit blanks between the strokes. Examples of how

fields are to be filled are shown in the *Aeronautical Information Services Manual* (Doc 8126). The definition of the field is as follows:

1) FIR

- a) If the subject of the information is located geographically within one FIR, the ICAO location indicator of the affected FIR concerned. When an aerodrome is situated within the overlying FIR of another State, the first field of Item Q) shall contain the code for that overlying FIR (e.g. Q) LFRR/ ...A) EGJJ)

or, if applicable to

If the subject of the information is located geographically within more than one FIR within a State, the first two letters of the ICAO location indicator nationality letters of a the State plus followed by "XX". (The location indicator of the overlying UIR shall not be used). The ICAO location indicators of the FIRs concerned shall then be listed in Item A) or indicator of State or non-governmental agency which is responsible for provision of a navigation service in more than one State.

...

2) NOTAM CODE

All NOTAM Code groups contain a total of five letters and the first letter is always the letter Q. The second and third letters identify the subject, and the fourth and fifth letters denote the status or condition of the subject reported upon. The two-letter codes for subjects and conditions are those contained in the PANS-ABC (Doc 8400). For combinations of second and third, and fourth and fifth letters, insert the ICAO NOTAM codes listed in the PANS-ABC (Doc 8400) or in refer to the NOTAM Selection Criteria contained in the *Aeronautical Information Services Manual* (Doc 8126) or insert one of the following combinations, as appropriate:

...

- e) The following fourth and fifth letters of the NOTAM Code shall be used in NOTAM cancellations:

AK : RESUMED NORMAL OPERATION
 AL : OPERATIVE (OR RE-OPERATIVE) SUBJECT TO PREVIOUSLY PUBLISHED LIMITATIONS/CONDITIONS
 AO : OPERATIONAL
 AX : PREVIOUSLY PROMULGATED SHUTDOWN HAS BEEN CANCELLED
 CC : COMPLETED
 CN : CANCELLED
 HV : WORK COMPLETED
 XX : PLAIN LANGUAGE

3) TRAFFIC

I = IFR
 V = VFR
 K = NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field TRAFFIC may contain combined qualifiers. ~~For possible combinations refer to~~ Guidance concerning the combination of TRAFFIC qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in the Aeronautical Information Services Manual (Doc 8126).

4) PURPOSE

N	=	NOTAM selected for the immediate attention of aircraft operators
B	=	NOTAM selected for PIB entry
O	=	NOTAM concerning flight operations
M	=	Miscellaneous NOTAM; not subject for a briefing, but it is available on request
K	=	NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field PURPOSE may contain the combined qualifiers BO or NBO. ~~For possible combinations refer to~~ Guidance concerning the combination of PURPOSE qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in the Aeronautical Information Services Manual (Doc 8126).

5) SCOPE

A	=	Aerodrome
E	=	En-route
W	=	Nav Warning
K	=	NOTAM is a checklist

Note.— Depending on the NOTAM subject and content, the qualifier field SCOPE may contain combined qualifiers. ~~For possible combinations refer to~~ Guidance concerning the combination of SCOPE qualifiers with subject and conditions in accordance with the NOTAM Selection Criteria is contained in the Aeronautical Information Services Manual (Doc 8126). If the subject is qualified AE, the aerodrome location indicator must be reported in Item A).

6) and 7) LOWER/UPPER

LOWER and UPPER limits ~~shall always be filled and~~ shall only be expressed in flight levels (FL) and shall express the actual vertical limits of the area of influence without the addition of buffers. In the case of navigation warnings and airspace restrictions, values entered shall be consistent with those provided under Items F) and G).

...

4. Item A)

Insert the location indicator as contained in ICAO Doc 7910 of the aerodrome or FIR in which the facility, airspace, or condition being reported on is located. More than one FIR/UIR may be indicated when appropriate. If there is no available ICAO location indicator, use the ICAO nationality letter as given in ICAO Doc 7910, Part 2, plus "XX" and followed up in Item E) by the name, in plain language. If multiple FIR belonging to several States are concerned, the ICAO nationality letter of the NOTAM originator, plus "XX" shall be used.

...

5. Item B)

For date-time group use a ten-figure group, giving year, month, day, hours and minutes in UTC. This entry is the date-time at which the NOTAMN, ~~NOTAMR OR NOTAMC~~ comes into force. In the cases of NOTAMR and NOTAMC, the date-time group is the actual date and time of the NOTAM origination. The start of a day shall be indicated by “0000”.

6. Item C)

With the exception of NOTAMC, a date-time group (a ten-figure group giving year, month, day, hours and minutes in UTC) indicating duration of information shall be used unless the information is of a permanent nature in which case the abbreviation “PERM” is inserted instead. The end of a day shall be indicated by “2359” (i.e. do not use “2400”). If the information on timing is uncertain, the approximate duration shall be indicated using a date-time group followed by the abbreviation “EST”. Any NOTAM which includes an “EST” shall be cancelled or replaced before the date-time specified in Item C).

...

9. Items F) and G)

These items are normally applicable to navigation warnings or airspace restrictions and are usually part of the PIB entry. Insert both lower and upper height limits of activities or restrictions, clearly indicating only one reference datum and ~~units~~ unit of measurement. The abbreviations GND or SFC shall be used in Item F) to designate ground and surface respectively. The abbreviation UNL shall be used in Item G) to designate unlimited.

Note.— For NOTAM examples see Doc 8126 and the PANS-ABC (Doc 8400).

APPENDIX 7. AERONAUTICAL DATA QUALITY REQUIREMENTS
Table A7-1. Latitude and longitude

Latitude and longitude	Publication resolution	Integrity Classification
Flight information region boundary points.....	1 min	1×10^{-3} routine
P, R, D area boundary points (outside CTA/ CTZ CTR boundaries)	1 min	1×10^{-3} routine
P, R, D area boundary points (inside CTA/ CTZ CTR boundaries)	1 sec	1×10^{-5} essential
CTA/ CTZ CTR boundary points.....	1 sec	1×10^{-5} essential
...		
Runway end (flight path alignment point).....	1/100 sec	1×10^{-8} critical
...		

...

APPENDIX 8. TERRAIN AND OBSTACLE DATA REQUIREMENTS
(see Chapter 10)

...

Editorial Note.— Replace Figure A8-2 with the following figure.

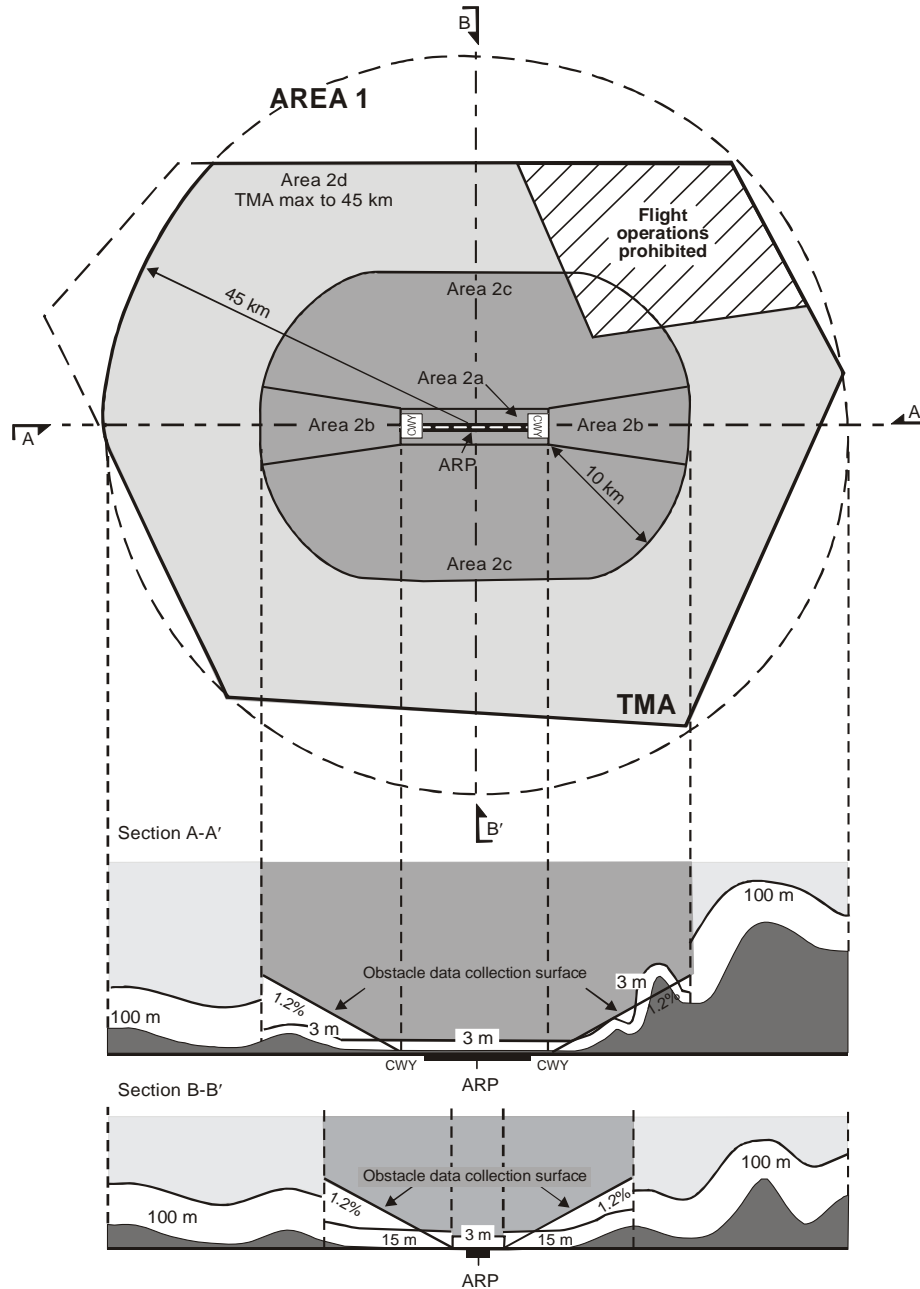


Figure A8-2. Obstacle data collection surfaces — Area 1 and Area 2

1. Obstacle data shall be collected and recorded in accordance with the Area 2 numerical requirements specified in Table A8-2:

Editorial Note.— Delete the following existing text.

- a) any obstacle that penetrates the conical surface whose origin is at the edges of the 180-m wide rectangular area and at the nearest runway elevation measured along the runway centre line, extending at 1.2 per cent slope until it reaches 120 m above the lowest runway elevation of all operational runways at the aerodrome (1.2 per cent slope reaches 120 m at 10 km); in the remainder of Area 2 (between 10 km and the TMA boundary or 45-km radius, whichever is smaller), the horizontal surface 120 m above the lowest runway elevation; and

Editorial Note.— Insert the following new text.

- a) Area 2 shall be divided into four sub-areas as follows:
 - Area 2a is described as a rectangular area around the runway extending to 255 m each side of the runway centre line with the length of the runway strip plus any clearway(s) that exist;
 - Area 2b is described as a surface with a 1.2% slope extending from the ends of Area 2a with a length of 10 km and a splay of 15% to each side;
 - Area 2c is described as an Area with a 1.2% slope extending outside Area 2a and Area 2b at a distance of not more than 10 km to the boundary of Area 2a; and
 - Area 2d is described as the remainder of Area 2 outside the Areas 2a, 2b and 2c up to a distance of 45 km from the ARP, or the TMA boundary, whichever is smaller;
- b) obstacles shall be collected if they:
 - are located within Area 2a and their height exceeds 3 m above ground level;
 - penetrate the surface in Area 2b and their height exceeds 3 m above ground level; and
 - penetrate the surface in Area 2c and their height exceeds 15 m above ground level;
- c) in Area 2d, obstacles whose height exceeds 100 m above ground level shall be collected and recorded in the dataset.

End of new text.

- ~~b)~~ 2. In those portions of Area 2 where flight operations are prohibited due to very high terrain or other local restrictions and/or regulations, terrain data shall only be collected and recorded in accordance with the Area 1 numerical requirements.
- ~~2.~~ 3. Data on every obstacle within Area 1 whose height above the ground is 100 m or higher shall be collected and recorded in the data set in accordance with the Area 1 numerical requirements specified in Table A8-2.

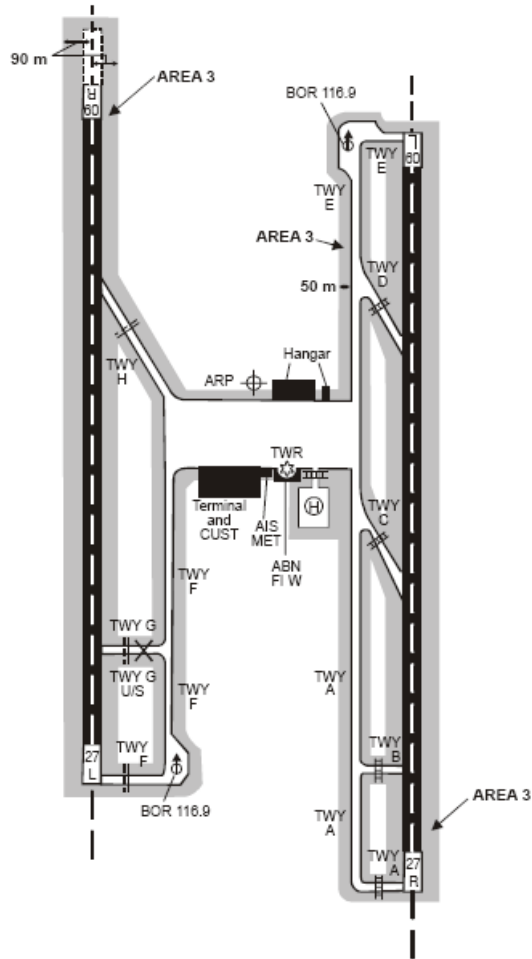


Figure A8-3. Terrain and obstacle data collection surface — Area 3

1. Data on terrain and obstacles, except frangible objects as defined by Annex 14, that extend more than a half-metre (0.5 m) above the horizontal plane passing through the nearest point on the aerodrome/heliport movement area shall be collected and recorded.
2. Terrain and obstacle data in Area 3 shall be collected and recorded in accordance with numerical requirements specified in Table A8-1 and Table A8-2, respectively.

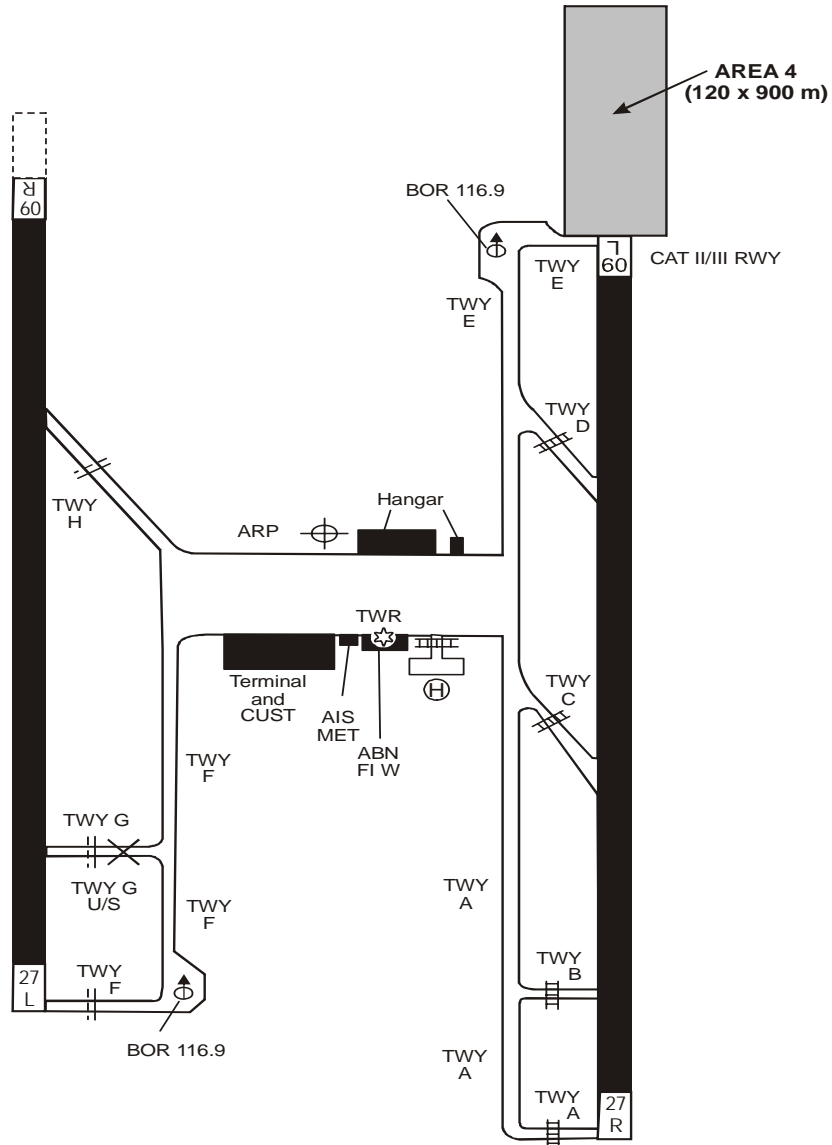


Figure A8-4. Terrain and obstacle data collection surface — Area 4

~~Only terrain~~ Terrain data shall be collected and recorded in Area 4 in accordance with the numerical requirements specified in Table A8-1.

Note 1.— The horizontal extent of Area 2 covers Area 4. More detailed obstacle data may be collected in Area 4 in accordance with Area 4 numerical requirements for obstacle data specified in Table A8-2. (See 10.2.6.)

Note 2.— Area 4 may be extended in accordance with 10.2.7.

Table A8-1. Terrain data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Post spacing	3 arc seconds (approx. 90 m)	1 arc second (approx. 30 m)	0.6 arc seconds (approx. 20 m)	0.3 arc seconds (approx. 9 m)
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01 m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level (1σ)	90%	90%	90%	90%
Data classification	routine	essential	essential	essential
Integrity level	1×10^{-3}	1×10^{-5}	1×10^{-5}	1×10^{-5}
Maintenance period	as required	as required	as required	as required

Table A8-2. Obstacle data numerical requirements

	Area 1	Area 2	Area 3	Area 4
Vertical accuracy	30 m	3 m	0.5 m	1 m
Vertical resolution	1 m	0.1 m	0.01m	0.1 m
Horizontal accuracy	50 m	5 m	0.5 m	2.5 m
Confidence level (1σ)	90%	90%	90%	90%
Data classification	routine	essential	essential	essential
Integrity level	1×10^{-3}	1×10^{-5}	1×10^{-5}	1×10^{-5}
Maintenance period	as required	as required	as required	as required

Table A8-3. Terrain attributes

Terrain attribute	Mandatory/Optional
...	
Vertical confidence level	Mandatory
Surface type	Mandatory Optional
Recorded surface	Mandatory
...	

Table A8-4. Obstacle attributes

Obstacle attribute	Mandatory/Optional
...	
Elevation	Mandatory
Height	Optional
Vertical accuracy	Mandatory
...	

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERONAUTICAL CHARTS

**ANNEX 4
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF A PROPOSED AMENDMENT TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERONAUTICAL CHARTS

**ANNEX 4
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

...

CHAPTER 2. GENERAL SPECIFICATIONS

...

2.17 Aeronautical data

2.17.5 ~~Protection of electronic~~ Electronic aeronautical data sets, while stored ~~or in transit~~ shall be ~~totally monitored~~ protected by the a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. ~~To achieve protection of the integrity level of critical and essential aeronautical data as classified in 2.17.3, a 32- or 24-bit CRC algorithm shall apply respectively.~~

Note 1.— The requirement in 2.17.5 does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

~~2.17.6—Recommendation.—To achieve protection of the integrity level of routine aeronautical data as classified in 2.17.3, a 16-bit CRC algorithm should apply.~~

...

**CHAPTER 5. AERODROME TERRAIN
AND OBSTACLE CHART — ICAO (ELECTRONIC)**

...

5.2 Availability

5.2.1 From ~~18 November 2010~~ 15 November 2012, Aerodrome terrain and Obstacle Charts — ICAO (Electronic) shall be made available in the manner prescribed in 1.3.2 for all aerodromes regularly used by international civil aviation.

...

APPENDIX 6. AERONAUTICAL DATA QUALITY REQUIREMENTS

Table 1. Latitude and longitude

Latitude and longitude	Chart resolution	Integrity Classification
Flight information region boundary points	as plotted	1×10^{-3} routine
P, R, D area boundary points (outside CTA/ CTZ CTR boundaries)	as plotted	1×10^{-3} routine
P, R, D area boundary points (inside CTA/ CTZ CTR boundaries)	as plotted	1×10^{-5} essential
CTA/ CTZ CTR boundary points	as plotted	1×10^{-5} essential
...		

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AIR TRAFFIC SERVICES

**ANNEX 11
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF A PROPOSED AMENDMENT TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES
AIR TRAFFIC SERVICES
ANNEX 11
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

...

CHAPTER 2. GENERAL

...

2.19 Aeronautical data

2.19.3 ~~Protection of electronic~~ Electronic aeronautical data sets, while stored or in transit shall be ~~totally monitored~~ protected by the a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. ~~To achieve protection of the integrity level of critical and essential aeronautical data as classified in 2.19.2, a 32- or 24 bit CRC algorithm shall apply respectively.~~

Note 1.— The requirement in 2.19.3 does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

~~2.17.6 **Recommendation.**— To achieve protection of the integrity level of routine aeronautical data as classified in 2.19.2, a 16-bit CRC algorithm should apply.~~

...

APPENDIX 5. AERONAUTICAL DATA QUALITY REQUIREMENTS

Table 1. Latitude and longitude

Latitude and longitude	Chart resolution	Integrity Classification
Flight information region boundary points	2 km declared	1×10^{-3} routine
P, R, D area boundary points (outside CTA/ CTZ CTR boundaries)	2 km declared	1×10^{-3} routine
P, R, D area boundary points (inside CTA/ CTZ CTR boundaries)	100 m calculated	1×10^{-5} essential
CTA/ CTZ CTR boundary points	100 m calculated	1×10^{-5} essential

...

ATTACHMENT D to State letter AN 2/2.2-09/13

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

**ANNEX 14
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME I
(AERODROME DESIGN AND OPERATIONS)**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

TEXT OF A PROPOSED AMENDMENT TO THE

**INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

**ANNEX 14
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME I
(AERODROME DESIGN AND OPERATIONS)**

...

CHAPTER 2. AERODROME DATA

2.1 Aeronautical data

...

2.1.3 ~~Protection of electronic~~ Electronic aeronautical data sets, while stored or in transit shall be ~~totally monitored~~ protected by the a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. ~~To achieve protection of the integrity level of critical and essential aeronautical data as classified in 2.1.2, a 32- or 24-bit CRC algorithm shall apply respectively.~~

Note 1.— The requirement in 2.1.3 does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

~~2.1.4 **Recommendation.**— To achieve protection of the integrity level of routine aeronautical data as classified in 2.1.2, a 16-bit CRC algorithm should apply.~~

...

**PROPOSED AMENDMENT TO
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

**ANNEX 14
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME II
(HELIPORTS)**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF A PROPOSED AMENDMENT TO THE
INTERNATIONAL STANDARDS
AND RECOMMENDED PRACTICES**

AERODROMES

**ANNEX 14
TO THE CONVENTION ON INTERNATIONAL CIVIL AVIATION**

**VOLUME II
(HELIPORTS)**

...

CHAPTER 2. AERODROME DATA

2.1 Aeronautical data

...

~~2.1.3 Protection of electronic~~ **Electronic** aeronautical data sets, while stored or in transit shall be ~~totally monitored~~ protected by the a 32-bit cyclic redundancy check (CRC) implemented by the application dealing with the data sets. ~~To achieve protection of the integrity level of critical and essential aeronautical data as classified in 2.1.2, a 32- or 24-bit CRC algorithm shall apply respectively.~~

Note 1.— The requirement in 2.1.3 does not apply to the communications systems used for the transfer of data sets.

Note 2.— Guidance material on the use of a 32-bit CRC algorithm to implement a protection of electronic aeronautical data sets is contained in the Aeronautical Information Services Manual (Doc 8126).

~~2.1.4 **Recommendation.**— To achieve protection of the integrity level of routine aeronautical data as classified in 2.1.2, a 16-bit CRC algorithm should apply.~~

...

ATTACHMENT F to State letter AN 2/2.2-09/13

**PROPOSED AMENDMENT TO
PROCEDURES FOR AIR NAVIGATION SERVICES
ICAO ABBREVIATIONS AND CODES
(PANS-ABC, DOC 8400)**

NOTES ON THE PRESENTATION OF THE PROPOSED AMENDMENT

The text of the amendment is arranged to show deleted text with a line through it and new text highlighted with grey shading, as shown below:

1. ~~Text to be deleted is shown with a line through it.~~ text to be deleted
2. **New text to be inserted is highlighted with grey shading.** new text to be inserted
3. ~~Text to be deleted is shown with a line through it~~ followed by the replacement text which is highlighted with grey shading. new text to replace existing text

**TEXT OF A PROPOSED AMENDMENT TO THE
PROCEDURES FOR AIR NAVIGATION SERVICES
ICAO ABBREVIATIONS AND CODES**

(PANS-ABC, DOC 8400)

...

ABBREVIATIONS

DECODE

...

U

...

UA Unmanned aircraft

...

Editorial Note.— Amend Encode Section accordingly.

...

THE NOTAM CODE — DECODE

SECOND AND THIRD LETTERS

<i>Code</i>	<i>Signification</i>	<i>Uniform abbreviated phraseology</i>
AGA Lighting facilities (L)		
...		
LG	Pilot-controlled lighting	pci
...		
AGA Movement and landing area (M)		
...		
MO	Stopbar (<i>specify taxiway</i>)	stopbar
...		
MW	Strip/ shoulder (<i>specify runway</i>)	strip/ shoulder
...		

<i>Code</i>	<i>Signification</i>	<i>Uniform abbreviated phraseology</i>
MY	Rapid exit taxiway (<i>specify</i>)	rapid exit twy
...		
AGA	Facilities and services (F)	
...		
FI	Aircraft de-icing (<i>specify</i>)	acft de-ice
...		
FZ	Customs/immigration	cust/immigration
ATM	Airspace organization (A)	
...		
AX	Intersection Significant point	int sigp
...		
ATM	Air traffic procedures (P)	
...		
PL	Flight plan processing, filing and related contingency	fpl
...		
PN	Noise operating restrictions	noise opr restrictions
PO	Obstacle clearance altitude and height (<i>specify procedure</i>)	oca och
PP	Obstacle clearance height (<i>specify procedure</i>)	oeh
...		
PT	Transition altitude or transition level (<i>specify</i>)	ta/trl
...		
Navigation Warnings		
Airspace restrictions (R)		
...		
RD	Danger area (<i>specify national prefix and number</i>)	. . d . .
...		
RP	Prohibited area (<i>specify national prefix and number</i>)	. . p . .
RR	Restricted area (<i>specify national prefix and number</i>)	. . r . .

<i>Code</i>	<i>Signification</i>	<i>Uniform abbreviated phraseology</i>
...		
Navigation Warnings Warnings (W)		
...		
WP	Parachute jumping exercise, paragliding or hang gliding	pje/paragliding/hang gliding
...		
WU	Unmanned aircraft	ua
...		
WY	Aerial survey	Aerial survey
...		

Editorial Note.— Amend Encode Section accordingly.

Reference: Section 10.6 — Availability [of electronic terrain and obstacle data] (paragraph 12 of the State letter refers)

Please encircle

1. Have you developed an implementation plan to make electronic terrain and obstacle data available in your State? Y N

If not, please evaluate the time required to make electronic terrain and obstacle data available.

Remarks:

2. Do you foresee significant costs and effort to implement Section 10.6 in your State? Y N
(Only consider costs related to aeronautical information services.)

Remarks

3. Do you envisage changes to the level of charging for your aeronautical information services to international air navigation as a result of the implementation of Section 10.6? Y N

Remarks:

Signature _____ **Date** _____

ATTACHMENT H to State letter AN 2/2.2-09/13

**RESPONSE FORM
TO BE COMPLETED AND RETURNED TO ICAO
TOGETHER WITH ANY COMMENTS YOU MAY
HAVE ON THE PROPOSED AMENDMENTS**

To: The Secretary General
International Civil Aviation Organization
999 University Street
Montreal, Quebec
Canada, H3C 5H7

(State) _____

Please make a checkmark (✓) against one option for each amendment. If you choose options “agreement with comments” or “disagreement with comments”, **please provide your comments on separate sheets.**

	<i>Agreement without comments</i>	<i>Agreement with comments*</i>	<i>Disagreement without comments</i>	<i>Disagreement with comments</i>	<i>No position</i>
Amendment to Annex 15 (Attachment A refers)					
Amendment to Annex 4 (Attachment B refers)					
Amendment to Annex 11 (Attachment C refers)					
Amendment to Annex 14 , Volume I (Attachment D refers)					
Amendment to Annex 14 , Volume II (Attachment E refers)					
Amendment to the <i>Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC, Doc 8400)</i> (Attachment F refers)					

* “Agreement with comments” indicates that your State or organization agrees with the intent and overall thrust of the amendment proposal; the comments themselves may include, as necessary, your reservations concerning certain parts of the proposal and/or offer an alternative proposal in this regard.

Signature _____ Date _____