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AAITF/17 – Workshop

WGS-84 and Data Accuracy

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ICAO Global and Regional Provisions

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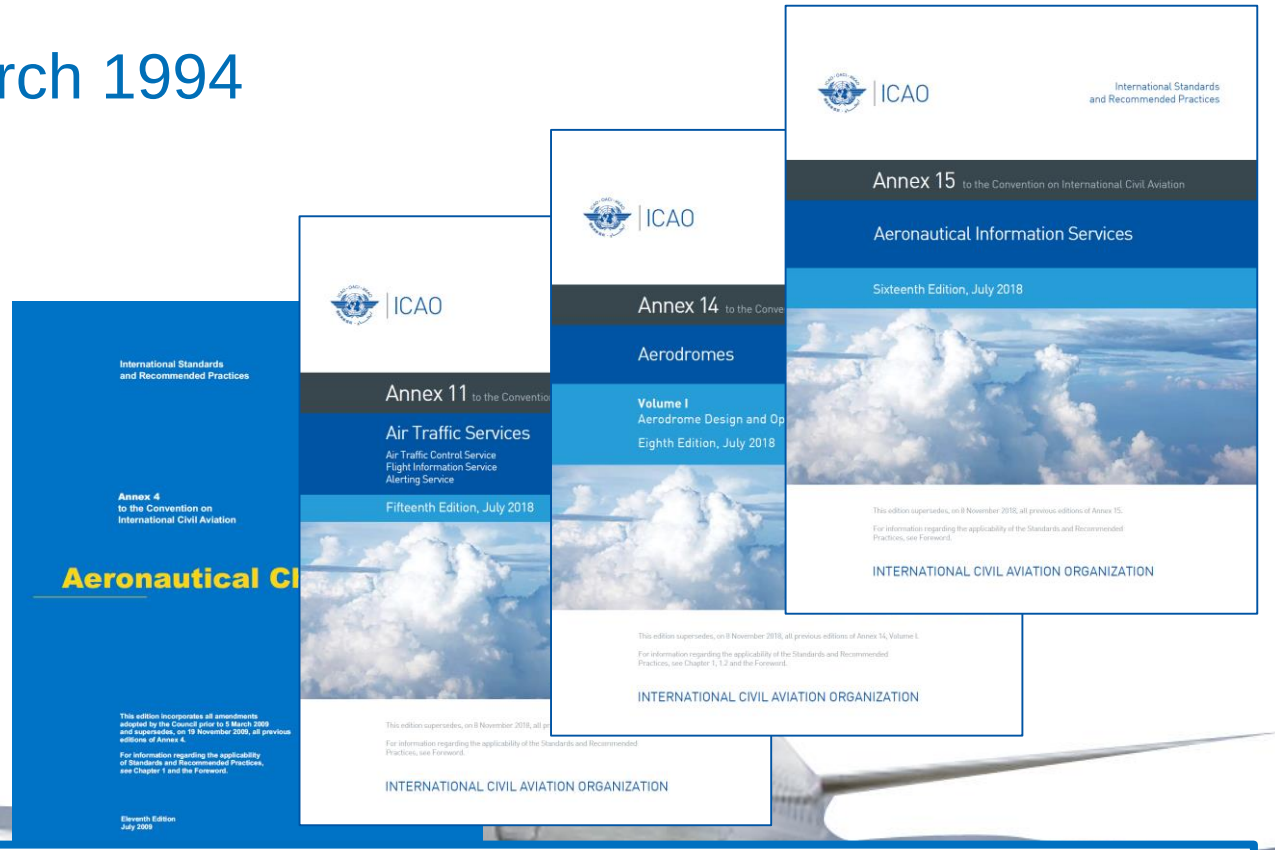
ICAO Provisions – WGS-84 and Data Accuracy

- **Annexes to the Convention on International Civil Aviation**
- **Procedures for Air Navigation Services**
- **Data Accuracy Standards and Requirements**
- **Global Guidance – the WGS-84 Manual**
- **Regional Planning**
- **APANPIRG ATM and Airspace Deficiencies**
- **Proposed Regional WGS-84 Sampling Program**

- Annexes to the Convention on International Civil Aviation
- **WGS-84** adopted by the Council 01 March 1994
- **applicable 09 November 1995**
- **Annex 4 - Aeronautical Charts**
- **Annex 11 – Air Traffic Services**
- **Annex 14 – Aerodromes**
- **Annex 15 – AIS**



WGS-84 shall be used as the horizontal (geodetic) reference system for air navigation

Procedures for Air Navigation Services

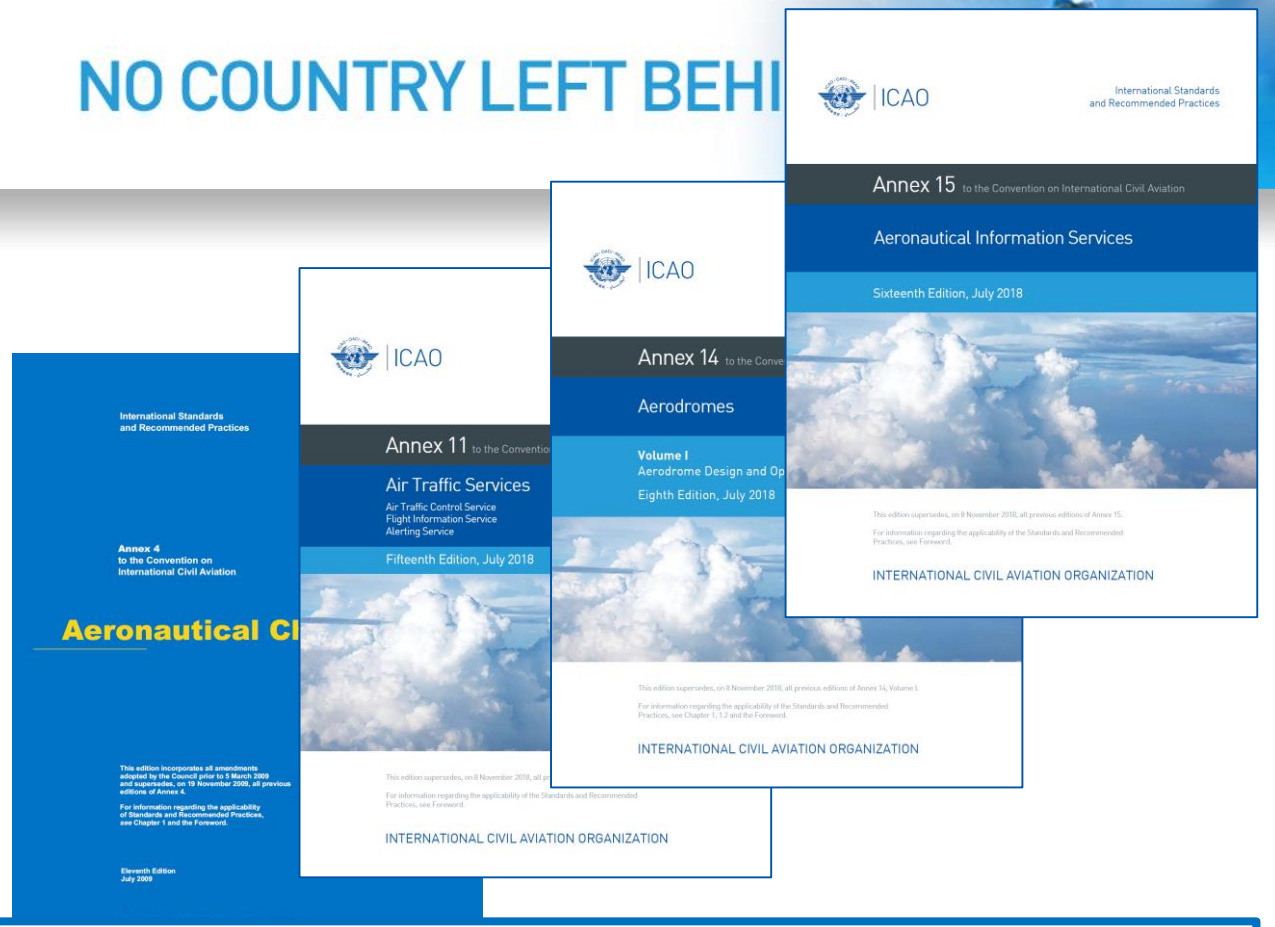
- Doc 8168 – PANS-Aircraft Operations
- Doc 9981 – PANS-Aerodromes
- Doc 10066 – PANS-AIM

PANS-AIM

Geographical coordinates indicating latitude and longitude shall be determined and reported to the AIS in terms of the WGS-84 geodetic reference datum

Data Accuracy Standards

- Annex 4 – Aeronautical Charts
- Annex 11 – Air Traffic Services
- Annex 14 – Aerodromes
- Annex 15 – AIS
- (all inc. ref to specs in PANS-AIM)



The order of accuracy for aeronautical data shall be in accordance with its intended use

Annex 11 – Air Traffic Services

The ATS responsible for provision of raw aeronautical information/data to the AIS shall do so while taking into account accuracy and integrity requirements……

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PANS-AIM

Chapter 4

AERONAUTICAL DATA REQUIREMENTS

4.1 DATA ORIGINATION REQUIREMENTS

4.1.1 Data shall be collected and transmitted to the aeronautical information service (AIS) in accordance with the accuracy requirements and integrity classification specified in Appendix 1.

4.1.2 Positional data shall be classified as: surveyed points (e.g. navigation aid positions, runway threshold); calculated points (mathematical calculations from the known surveyed points of points in space, fixes); or declared points (e.g. flight information region boundary points).

4.1.3 Geographical coordinates indicating latitude and longitude shall be determined and reported to the AIS in terms of the World Geodetic System – 1984 (WGS-84) geodetic reference datum.

4.1.4 Geographical coordinates that have been transformed into WGS-84 coordinates by mathematical means and whose accuracy of original field work does not meet the applicable requirements contained in Appendix 1 shall be identified.

4.1.5 In addition to elevation referenced to the MSL (geoid), for the specific surveyed ground positions, geoid undulation (referenced to the WGS-84 ellipsoid) for those positions specified in Appendix 2 shall also be published.

Appendix 1 – Aeronautical Data Catalogue

Data accuracy, integrity, origination type (surveyed, calculated, declared), resolution.

Aeronautical Data Catalogue (PANS-AIM Appendix 1)

Example: Final approach fixes/points

- Accuracy: 3 metres
- Integrity: essential
- Orig Type: surveyed
- Publication Resolution: 1/10 sec

Table A1-4 Instrument flight procedure data

Description	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
En-route navaids and fixes,holding, STAR/SID points	100 m	essential	surveyed / calculated	1 sec	1 sec
Final approach fixes/points and other essential fixes/points comprising the instrument	3 m	essential	surveyed /	1/10 sec	1 sec

Aeronautical Data Catalogue (PANS-AIM Appendix 1)

- Example: Runway threshold position

- Accuracy: 1 metre
- Integrity: critical
- Orig Type: surveyed
- Publication Resolution: 1/100 sec

critical data: 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.

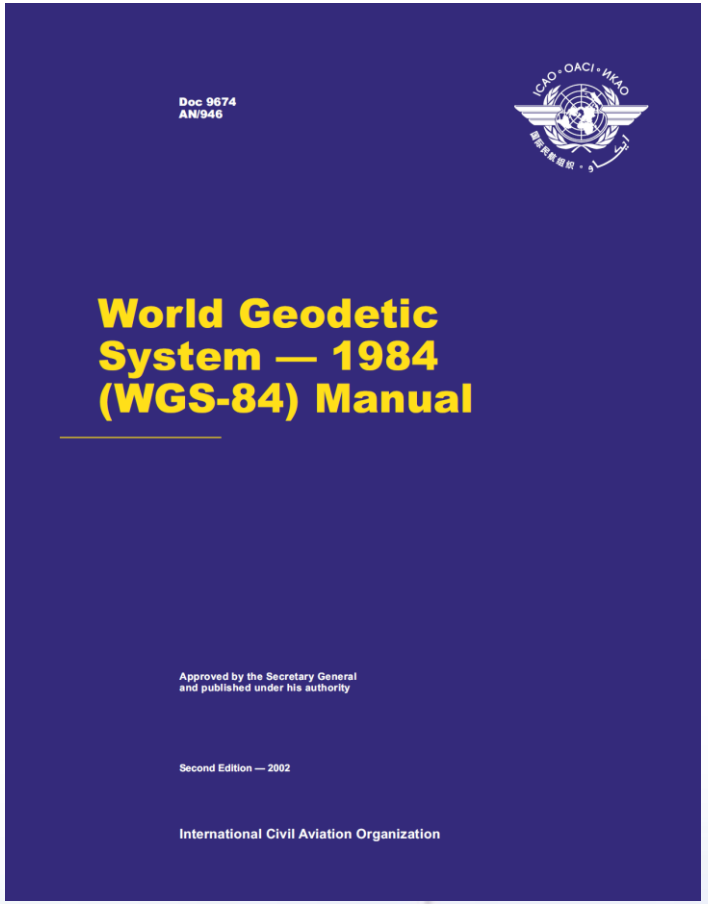
Table A 1-1 Aerodrome/Heliport data

Property	Sub-Property	Type	Note	Accuracy	Integrity	Orig Type	Pub. Res.	Chart Res.
Threshold								
	Position	Point		1 m	critical	surveyed	1/100 sec	1 sec

Global Guidance – the WGS-84 Manual

The purpose of this manual is to furnish guidance on the provision of geographic coordinates and vertical component values referenced to the WGS-84 datum in order to assist States in the uniform implementation of the SARPs on WGS-84 as contained in:

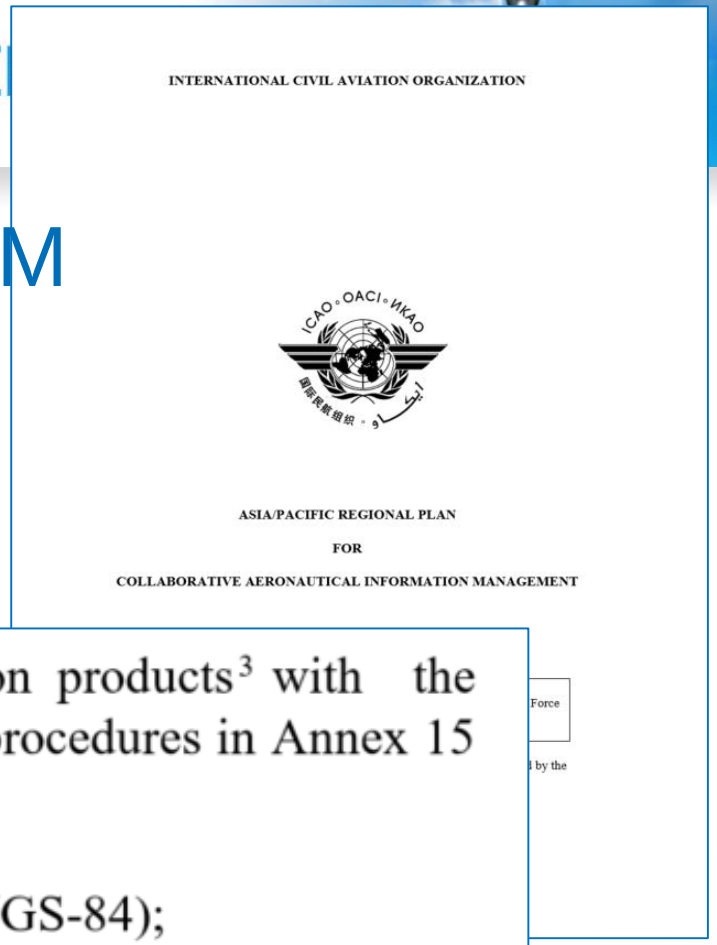
Annex 4 — *Aeronautical Charts*;
Annex 11 — *Air Traffic Services*;
Annex 14 — *Aerodromes*;
Annex 15 — *Aeronautical Information Services*.



Asia/Pacific Regional Plan for Collaborative AIM

Regional AIM Capability Phase I

Expected to be implemented immediately



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COLLABORATIVE AERONAUTICAL INFORMATION MANAGEMENT

Force

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7.13 States should ensure full compliance of all aeronautical information products[3] with the following common reference systems in accordance with the relevant SARPS and procedures in Annex 15 and PANS-AIM[4]:

i. Horizontal reference system – *World Geodetic System 1984* (WGS-84);

ii. Vertical reference system – Mean Sea Level (MSL) datum and Earth Gravitational Model – 1996 (EGM-96);

iii. Temporal reference system – UTC.

APANPIRG ATM and Airspace Deficiencies

- **WGS-84**
- Requirements of Paragraph 1.2.1 of Annex 15
- 10 APAC States

  But…….
- possibly more States do not update their WGS-84 data

1.2.1 Horizontal reference system

1.2.1.1 The World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for international air navigation. Consequently, published aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

Regional Sampling Programme (under consideration)

- ICAO to conduct periodic sampling of published aeronautical data
  - Sample international aerodrome
  - Format and Resolution
  - Accuracy
- State to be notified if any discrepancy is observed
  - Request corrective action

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THANK YOU