TECHNICAL GUIDANCE MATERIAL
for
Origination of Aeronautical data and Aeronautical Information

SUBJECT: ORIGINATION OF AERONAUTICAL DATA AND AERONAUTICAL INFORMATION

EFFECTIVE DATE: 10 JUNE 2025

1. APPLICABILITY

The objective of this Guidance material is to provide guidance for the supply, collection, processing and quality assurance of Aeronautical data and Aeronautical information by Data originators, and AIS providers, in the data processing value chain for the publication of the Aeronautical Information Products outlined throughout this document.

2. PURPOSE

The material contained in this TGM has been developed to provide Data originators and AIS providers, with an understanding of the requirements of a Quality System and provide a foundation for the processing and timely delivery of accurate Aeronautical data and Aeronautical information in compliance with the requirement of ICAO Annex 15, Doc 10066 and Doc 8126.

ICAO Annex 15 - stipulates that AIS is to ensure the flow of Aeronautical data and Aeronautical information necessary for global ATM system safety, regularity, economy and efficiency in an environmentally sustainable manner. AIS shall ensure that the aeronautical data and aeronautical information provided are of the required quality in accordance with data quality requirements.

3. REFERENCES:

3.1. Supporting Regulations and Documentation

The operation and maintenance of AIS in South Africa is subject to a number of ICAO Standards and Recommended practices and South African Civil Aviation Regulations, including:

- **i.** ICAO Annex 4 "Aeronautical Charts";
- **ii.** ICAO Annex 5 "Units of Measurement to be used in Air and Ground Operations";
- **iii.** ICAO Annex 10 “Aeronautical Telecommunications”
- **iv.** ICAO Annex 11 "Air Traffic Services";
- **v.** ICAO Annex 14 "Aerodromes";
- **vi.** ICAO Annex 15 "Aeronautical Information Services";

3.2. These documents are further supported by:

- **i.** ICAO Doc 8126 "AIS Manual";
- **ii.** ICAO Doc 8697 "Aeronautical Charts Manual";

iii. ICAO Doc 9674 "WGS-84 Manual".
iv. ICAO Doc 9881 "Guidance for Electronic Terrain, Obstacle and Aerodrome Mapping Information".
v. ICAO Doc 9839 "Manual on the Quality Management System for Aeronautical Information Services"
vi. ICAO Doc 10066 "Aeronautical Information Management"
vii. South African Civil Aviation Regulations and associated Technical Standards.

4. TERMS AND ABBREVIATIONS:

4.1. Terms

TERM	DEFINITION
Aeronautical data	A presentation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing
Aeronautical information	Information resulting from the assembly, analysis and formatting of aeronautical data.
Aeronautical Information Product	Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include: — Aeronautical Information Publication (AIP), including Amendments and Supplements; Aeronautical Information Circulars (AIC); aeronautical charts; NOTAM; and — digital data sets.
Aeronautical Information Services Provider	An AIS certificate holder, authorised to provide aeronautical information service.
AIRAC	(Aeronautical information regulation and control - AIRAC) signifying a system aimed at advance notification based on common effective dates at intervals of 28 or 56 days of circumstances that necessitate significant changes in operating practices.
AIRAC System	A system aimed at advance notification based on common effective dates, of circumstances that necessitate significant changes in operating practices.
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.
Data Accuracy	A degree of conformance between the estimated or measured value and the true value.
Data Completeness	The degree of confidence that all of the data needed to support the intended use is provided.
Data Format	A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.
Data Integrity	A degree of assurance that aeronautical data and its value has not been lost or altered since the data origination or authorised amendment.
Data originator	An entity that is accountable for data or information origination and/or from which the AIS Provider receives aeronautical data and aeronautical information.
Data quality	A degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution and integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

Data Resolution	A number of units or digits to which a measured or calculated value is expressed and used.
Data Timeliness	The degree of confidence that the data is applicable to the period of its intended use.
Data Traceability	The degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator.
Datum	Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities. (ISO 19104*).
Digital data sets	AIP data set; b) terrain data sets; c) obstacle data sets; d) aerodrome mapping data sets; and e) instrument flight procedure data sets. Note. — Detailed specifications concerning the content of the digital data sets are contained in PANS-AIM (Doc 10066).
Essential data	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.
Metadata	Data about data: A structured description of the content, quality, condition or other characteristics of data.
NOTAM System:	A system of distributing notices by means of telecommunication, that contains information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.
Originator	An originator in relation to aeronautical data or aeronautical information is an entity that is accountable for data or information origination from which an AIS Provider receives aeronautical data and aeronautical information;
Quality Management	Coordinated activities to direct and control an organization with regard to quality (ISO 9000*).
Routine data	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.
Validation	Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000*)
Verification	Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (ISO 9000*)

4.2. Abbreviations

ABBREVIATION	DESCRIPTION
AD	Aerodrome
AI	Aeronautical Information
AIC	Aeronautical Information Circular
AIM	Aeronautical Information Management
AIXM	Aeronautical Information Exchange Model
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation and Control - AIRAC
AIS	Aeronautical Information Service
ANSP	Air Navigation Service Provider
ATM	Air Traffic Management

CAA	Civil Aviation Authority
DALRRD	Department of Agriculture Reform and Rural Development
ENR	Enroute
GEN	General
ICAO	International Civil Aviation Organization
ISO	International Organization for Standardization
KPI's	Key performance indicators
MSL	Mean Sea Level
NOTAM	Notice to Airmen
PANS-AIM	Procedure for Air Navigation Services: Aeronautical Information Management
QMS	Quality Management System
SACAA	South African Civil Aviation Authority
SA-CAR	South African Civil Aviation Regulations
SANSA	South African National Space Agency
SARPs	Standards and Recommended practices.
SAWS	South African Weather Services
UTC	Coordinated universal time
WGS-84	World Geodetic System – 1984

5. GENERAL

5.1. Quality Management System (QMS)

5.1.1 International standards specify the requirements for QMS for aeronautical information services to:

- **a.** Demonstrates its ability to consistently provide products that meet customer and applicable regulatory requirements.
- **b.** Ensure QMS include necessary policies, processes and procedures, including the use of metadata, to ensure and verify that aeronautical data are traceable throughout the data chain, from origin to publication.
- **c.** Meet data quality requirements.
- **d.** Address customer satisfaction through the effective application of the system, including processes for continual improvement and the prevention of non-conformity; and
- **e.** Ensure that integrity of aeronautical data is maintained throughout the data provision process from survey/origin to the next intended user, based on the applicable integrity classification, the validation, verification procedures for routine, essential and critical data provided.

5.2. Collection of Information

5.2.1 The AIS Provider shall receive aeronautical data and aeronautical information for publication from, but not limited to the following organisations that provide services in support of the air navigation system:

- **a.** Surveyors.
- **b.** Aerodrome/Airport authorities.
- **c.** Civil Aviation Authority (CAA).
- **d.** Air Navigation Service Provider (ANSP).
- **e.** Airspace planners.
- **f.** South African Weather Services (SAWS)
- **g.** South African National Space Agency (SANSA)
- **h.** Department of Agriculture Land Reform and Rural Development (DALRRD)

i. Procedure designers.
j. Obstacle Evaluators
k. Sport recreation Organisations.
l. Suppliers/installers of equipment requiring survey.
m. Other data originators (e.g. national mapping agencies, terrain/obstacles);
n. Database providers, telecommunication companies, etc).
o. South African Air Force.
p. South African Government Departments (Transport, Environmental Affairs, Health Customs and Immigration, South African Police Service etc).
q. Ad-hoc data providers (e.g., applicants for Flexible Use of airspace, pilots, operators, flying schools etc).

5.2.2 Information and data for inclusion in the AI Product is sent directly to the AIS Provider by the data originator.

5.3. Data Originator responsibilities:

5.3.1 Data originators are responsible to ensure the data quality requirement of aeronautical data and aeronautical information are met upon submission to the AIS Provider.

5.3.2 Data originators need to nominate a responsible person who will liaise with the AIS Provider. The responsible person can be an individual or a nominated office holder/s.

5.3.3 Compliance with the data quality requirement is the responsibility of the Data Originator.

5.3.4 The Aeronautical Data Catalogue as contained in ICAO PANS-AIM Doc 10066, symbolises the shift from product-centric to data-centric environments, and is considered the point of reference for all provisions related to Aeronautical data and Aeronautical information origination and publication. It represents the common language for Originators and the AIS Provider.

5.3.5 The Data Catalogue is available upon request from the AIS Provider.

5.3.6 It is important that data originators review the information published in the AI Product on an annual basis and/or when updates are required.

5.3.7 The Data Originator must notify the SACAA when the responsible person changes; and

5.3.8 Any change, in responsible person, requires proper coordination between affected parties.

5.3.9 The Data Originator must ensure that the aeronautical data and aeronautical information originated, processed and transmitted is done by a competent and authorised person/persons.

5.3.10 The Data originator must have verification and validation processes in place to ensure the required data quality is achieved before transmission to the AIS Provider.

5.3.11 The responsibility for the accuracy, completeness and timeliness of the original data and information rests with the originator.

5.3.12 The Data originator must ensure that all additions, deletions or modifications are made to all documents and related paragraphs and/or indexes that may be affected by the changes.

5.3.13 The Data originator shall be responsible to ensure that submission of data meets the AIRAC publication cycle as specified in the Data Provision Agreement.

5.4. Data Quality Requirements

5.4.1 The aeronautical data and aeronautical information submitted to the AIS Provider by the Data originator must conform to the specifications of the Aeronautical Data Catalogue and the following data quality requirements are to be met:

5.4.1.1 The accuracy of aeronautical data is as specified in the aeronautical data catalogue;

5.4.1.2 The integrity of aeronautical data is maintained;

5.4.1.3 Based on the integrity classification specified in the aeronautical data catalogue, procedures are put in place so that:

- **a.** for routine data, corruption is avoided throughout the processing of the data,
- **b.** for essential data, corruption does not occur at any stage of the data processing life cycle (e.g. collection, processing, storing, integration, exchange and delivery) and include additional measures or steps as needed to address potential risks in the overall processing of aeronautical data to further ensure data integrity level; and
- **c.** for critical data, that data corruption does not occur at any stage of the data processing life cycle (e.g. collection, processing, storing, integration, exchange and delivery) and include additional data integrity assurance procedures to mitigate the risk of errors.

5.4.1.4 the resolution of aeronautical data is commensurate with the actual data accuracy;

the traceability of aeronautical data is ensured;

5.4.1.5 the timeliness of the aeronautical data is ensured, including any limits on the effective period of the data;

5.4.1.6 the completeness of the aeronautical data is ensured;

5.4.1.7 the delivered data meets the specified format requirements;

5.4.1.8 data is transmitted by electronic means.

Note: The Aeronautical Information Exchange Model (AIXM) is the ICAO supported exchange model for data sets contained in Annex 15.

5.4.2 collect and transmit metadata which include a minimum:

5.4.2.1 the identification of the organisation or entities performing any action of originating, transmitting or manipulating the aeronautical data.

5.4.2.2 the action performed, with date and time.

5.4.3 ensure that digital data error detection techniques are performed when digital data exchange models are used in the transmission or storage of aeronautical data, or both, in order to support the applicable data integrity levels.

5.4.4 ensure that the transfer of aeronautical data is subject to a suitable authentication process such that recipients are able to confirm that the data has been transmitted by an authorised source.

5.4.5 ensure that errors identified during data origination and after data delivery are addressed, corrected, or resolved and that priority is given to manage errors in critical and essential aeronautical data.

5.5. Nomination of a responsible person/s.

5.5.1 The data originator may nominate a person/s who is responsible for providing AIS with aeronautical data and aeronautical information.

5.5.2 The responsible person/s shall provide aeronautical data and aeronautical information to the AIS Provider for publication:

- **a.** in the AIP,
- **b.** as an AIP Amendment,
- **c.** as an AIP Supplement,
- **d.** as an AIC,
- **e.** in a NOTAM,
- **f.** aeronautical charts;
- **g.** digital datasets (if provided).

5.5.3 The responsible person/s will ensure that, aeronautical data and aeronautical information for which they are responsible:

5.5.4 Is provided to the AIS Provider with any changes to aeronautical data and aeronautical information in a timeframe which is appropriate to the operational significance of the information.

- **a.** The aeronautical data and aeronautical information are provided in accordance with the data attributes and quality requirements specified in Annexes 4, Annex 11, Annex 14, Annex 15 and associated PANS documents, as amended.
- **b.** The aeronautical data and aeronautical information are provided in the required format specified in Doc 8126, Doc 10066 and Doc 8697.
- **c.** Any aeronautical data and aeronautical information changes have been coordinated with all affected parties.
- **d.** The aeronautical data and aeronautical information that has been published in the Aeronautical Information Product is reviewed at least annually; and
- **e.** After the review mentioned above, the AIS Provider is provided with a report of all aeronautical data and aeronautical information changes.
- **f.** Aeronautical data and information shall be thoroughly checked before it is submitted for publication.
- **g.** Digital data sets, when provided, shall conform to the Specifications concerning the content requirements as contained in the ICAO DOC 10066.

5.6. AIS CAA Responsibilities.

5.6.1 AIS CAA has the following audit/oversight responsibilities:

5.6.1.1 Ensure that data and information collected is published in the appropriate format, in accordance with the applicable standards and distributed according to the operational significance of the information.

5.6.1.2 Ensure that the information received is accurately promulgated.

5.6.1.3 Ensuring the timely provision of aeronautical data and aeronautical information in accordance with AIRAC and/or AIP timelines to the aeronautical information services of other states. This should typically be done through the provision of the AIP, AIP Supplement and NOTAM.

5.6.1.4 The AIS CAA shall ensure that Data provision agreements are established between originators of aeronautical data and aeronautical information and the AIS Provider in relation to the timely and complete provision of aeronautical data and aeronautical information.

5.7. Processing of Aeronautical Information by AIS Provider

5.7.1 The AIS Provider shall keep a record of all received aeronautical data and aeronautical information. The following shall be indicated in the record:

5.7.1.1 The date and time for the receipt of aeronautical data/information.

5.7.1.2 The name of the aeronautical data/originator given name and surname of the contact person in accordance with the signed Data Provision agreement.

5.7.1.3 The part of the aeronautical information compilation, to which the submitted aeronautical data/information pertains to i.e. the action performed.

5.7.1.4 In the process of preparing Aeronautical Information Product after the receipt thereof, all changes shall be recorded.

5.7.2 The AIS Provider shall examine the received aeronautical data and aeronautical information; update it, if necessary.

5.7.3 An AIS Provider shall establish verification and validation procedures which ensure that upon receipt of aeronautical data and aeronautical information, quality requirements are met.

5.7.4 Whenever errors are detected during the verification procedure, these errors must be recorded and corrected before proceeding to the next phase.

5.7.5 The AIS Provider shall format aeronautical data and aeronautical information in conformance with the requirements for the distribution of aeronautical information of Annex 15 to the convention, as amended.

5.7.6 The AIS Provider shall keep aeronautical data and aeronautical information submitted in accordance with their document control QMS.

5.7.7 The AIS Provider shall ensure that Data Provision Agreements are signed with Data Originators.

5.8. AIRAC

5.8.1 AIRAC dates shall be published and updated annually on the SACAA website~~.~~ at www.caa.co.za and AIS Provider website at www.atns.co.za

5.9. Correction of Errors in Published Information

5.9.1 If an error is determined to be hazardous or have the potential to be hazardous, remedial action appropriate to the operational significance of the error will be initiated by the AIS Provider in accordance with their QMS procedures.

5.9.2 The operational significance of the error should be determined in consultation with the originator. Appropriate action may include:

- **a.** Issue a NOTAM:
- **b.** Issue AIP Supplement, to be incorporated in the next scheduled amendment.
- **c.** If a NOTAM is issued, the error should be scheduled for correction in the next scheduled amendment.
- **d.** Publish in AIP Amendment.

5.10. Origination of a NOTAM:

5.10.1 A NOTAM shall be originated and issued promptly as prescribed in SA-CAR Part 175.

5.11. Origination of an AIC

5.11.1 An AIC shall be originated whenever it is necessary to promulgate aeronautical information which does not qualify:

- **a.** Under the specifications for inclusion in an AIP; or

b. Under specifications for origination of a NOTAM.

5.11.2 An AIC shall be originated as prescribed in SA-CAR Part 175.

6. CONVENTIONS

Within this guidance material the following conventions are used:

6.1. Date and Time

6.1.1 Presentation of Date and Time shall be in accordance with ISO standard 8601, as amendment, which is an international standard covering the worldwide exchange and communication of date and time-related data.

6.1.2 Where applicable, the Gregorian calendar and coordinated universal time (UTC) shall be used as the temporal reference system.

6.1.3 Times expressed as a number of "Office hours" include the hours from 8:00 to 16:00 South African local time (Monday to Friday).

6.1.4 Times expressed as a number of "Office hours" include business hours, Monday through Friday, excluding designated holidays.

6.1.5 Unless specifically mentioned otherwise, all durations specified are in working days.

6.2. Data Categories

6.2.1 The following data classifications are used within this document and described under definitions:

a. Routine
b. Essential; and
c. Critical.

6.3. *Referencing systems*

6.3.1 For the purpose of air navigation, the World Geodetic System – 1984 (WGS-84) horizontal reference system shall be used.

6.3.2 Mean sea level (MSL) datum shall be used as the vertical reference system.

7. SERVICES AND SERVICE LEVELS

7.1. Service Description

7.1.1 Data originator will provide the data for which it is responsible in respect of AIP Content: GEN, ENR, AD Sections and AIP Supplement and AIC.

7.2. Data Originator

7.2.1 The aeronautical data and aeronautical information shall be provided no later than the indicated delivery date as published in the SACAA AIRAC and AIP amendment schedule and in accordance with the service level indicators.

7.2.2 Extensions of target dates will not be negotiated.

7.2.3 The Data shall be provided electronically or in written format. The Approval for release of Aeronautical Information form CA 175-01 and promulgation request form CA175-03 shall be used, available from SACAA AIS or CAA website: www.caa.co.za, under Aeronautical Information.

Note: Telephonic request will not be accepted.

7.3. AIS Provider

7.3.1 The AIS Provider shall process the data upon receipt.

7.3.2 The AIS Provider shall present a draft publication including the data for approval to data originator at least 7 days prior to submitting to the Regulator. Data originator will have 2 working days to approve the draft publication.

7.3.3 The AIS Provider shall publish the data within the required publication unless otherwise agreed, in writing, with the data originator/s.

7.4. Aeronautical Information Safety Key Performance Indicators of AIS Provider

7.4.1 Safety Key performance measurement system provides the ATM Community with quality assured information to enable decision making for the purposes of safety improvement.

7.4.2 The AIS Provider has implemented the Aeronautical Information Safety KPI's for the sole objective of data quality improvement within the ATM Systems.

7.4.3 The main category performance indicator considered in the development of these KPI's is the leading indicators which:

- **a.** identifies essentially through ample evaluation of data and information received from data originators.
- **b.** designed to assist in identifying whether data originators are taking action or have processes that are effective in lowering the risk that errors potentially may have.
- **c.** drives better performance, improved rules, regulations, oversight and procedures, etc.
- **d.** leads to fewer errors within various ATM systems.

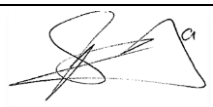
7.4.4 The quality of Aeronautical data and Aeronautical Information shall be verified in terms of accuracy, completeness, format, integrity, traceability, resolution and timeliness.

AERONAUTICAL INFORMATION KPI'S	***DESCRIPTION***	***TARGET***
NOTAM Accuracy	*Aeronautical Information Product prepared will be prepared in accordance with the applicable standard*	*98% of NOTAM to be processed and distributed error free*
Measurement 1	*Total amount of NOTAM Requests received per month divided by number of NOTAM Requests identified with errors before processing and distribution.*	
Measurement 2	*Total amount of NOTAM requests received per month divided by number of NOTAM identified with errors after processing and dissemination.*	
Promulgation Information Published	*The Published Aeronautical Information Products is without errors in presentation or content, in the required format.*	*95% of total AI Products published error free*
Measurement 1	*Total amount of promulgation requests received before verification and validation before*	

AERONAUTICAL INFORMATION KPI'S	*DESCRIPTION*	*TARGET*
	divided by number of discrepancies identified on the promulgation submission before processing.	
Measurement 2	*Total amount of promulgation requests processed divided by number of discrepancies identified after publication.*	
AIXM Database Accuracy	*The Data and Information contained in the AIXM Central Aeronautical Information Database*	*95% of data stored in the CAD and distributed to other systems to be error free.*
AIRAC Adherence	*Data will be published in accordance with the AIRAC*	*99% adherence to AIRAC submission and publication timelines*

7.4.5 Users should advise SACAA AIS of any errors, inconsistencies, requests for further information or suggestions for improvement to this guidance material.

8. Document Authorisation

DEVELOPED BY:		
	**L VENTER**	**27 August 2025**
SIGNATURE OF M: AIS	**NAME IN BLOCK LETTERS**	**DATE**
REVIEWED & VALIDATED BY:		
	**S MAPHANGA**	**27 August 2025**
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APPROVED BY:		
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