สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

Guidance Material for Establishment of Formal Arrangements between AIS Provider and Data Originators

CAAT-GM-ANS-AISFA

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Approved by

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Abbreviations

Abbreviations	Meaning
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Services
ATM	Air Traffic Management
ATS	Air Traffic Services

0. Introduction

0.1 Background

The Guidance Material for Establishment of Formal Arrangements between AIS Provider and Data Originators is developed based on ICAO Doc 8126 – Aeronautical Information Services Manual.

In accordance with ICAO Annex 15 paragraph 2.1.5, which states that: "Each Contracting State shall ensure that formal arrangements are established between originators of aeronautical data and aeronautical information service in relation to the timely and complete provision of aeronautical data and aeronautical information." And Air Navigation Act B.E. 2497 (Amendment No. 14) B.E.2562, The Civil Aviation Authority of Thailand (hereinafter 'CAAT') has been promulgated "CAAT Regulation on Air Navigation Services for Aeronautical Information Services" and "CAAT Rules on Manual of Standards of Aeronautical Information Services" paragraph 13.3.1, which states that: "An Aeronautical Information Services Provider shall ensure that formal arrangements are established with all parties transmitting data to them and between themselves when exchanging aeronautical information and data."

Therefore, this Guidance Material has been developed to assist Aeronautical Information Service Provider to establish formal arrangement with their data originators. It is not legal advice, is not a substitute for individual advice, and may not be applicable to every data originator.

0.2 Purpose

This Guidance Material has been developed to assist the Aeronautical Information Service Provider in drafting their formal arrangement to maintain their own safety of operations.

Although the Guidance Material are intended to be as encompassing as possible, it should be noted that very specific requirements, remain the subject to negotiation and agreement of the units concerned.

It should be clearly understood that this document has no legal status. It is intended to provide recommendations and guidance to illustrate a means of drafting formal arrangement.

0.3 Applicability

This Guidance Material is applicable to Aeronautical Information Service Provider and Data Originators.

Readers should forward advice of errors, inconsistencies or suggestions for improvement to this guidance material to the Manager of Air Navigation Services Standards Department of CAAT by email to ans@caat.or.th. This document is published on the CAAT website and will be an uncontrolled document when printed out, or when opened as an electronic file from other sources than CAAT website.

0.4 Reference

a) Air Navigation Act B.E. 2497 (Amendment No. 14) B.E.2562;
b) The Requirement of the Civil Aviation Authority of Thailand No. 25 (R2CAAT No. 25) on the Application for and Issuance of Air Navigation Services Certificate;
c) The Notification of the Civil Aviation Authority of Thailand on the Specification of the Juristic Person, Validity and Other Duties of the Air Navigation Service Certification Holder;
d) The Regulation of the Civil Aviation Authority of Thailand No. 20 on Aeronautical Information Services Standards; and
e) Rule of Civil Aviation Authority of Thailand on Manual of Standard of Aeronautical Information Services with Manual of Standard of Aeronautical Information Services (CAAT-ANS-MOSAIS).
f) ICAO Annex 15 – Aeronautical Information Services
g) ICAO Doc 8126 – Aeronautical Information Services Manual

h) ICAO Doc 10066 – Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM)

0.5 Definitions

Term	Definition
Aeronautical information product	Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation on 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. *Note.— Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.*
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 (assurance level)	A degree of assurance that an aeronautical data and its value have not been lost or altered since the origination or authorized amendment.
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.
Metadata	Data about data.
Origination (aeronautical data or aeronautical information).	The creation of the value associated with new data or information or the modification of the value of existing data or information.
Originator (aeronautical data or aeronautical information)	An entity that is accountable for data or information origination and/or from which the AIS organization receives aeronautical data and aeronautical information.
Validation	Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled.
Verification	Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled.

1. Introduction to Formal Arrangement

1.1 General

1.1.1 Formal arrangements are agreements between two parties. In the context of data collection, the two parties are the data originator and the AIS (see Figure 1).

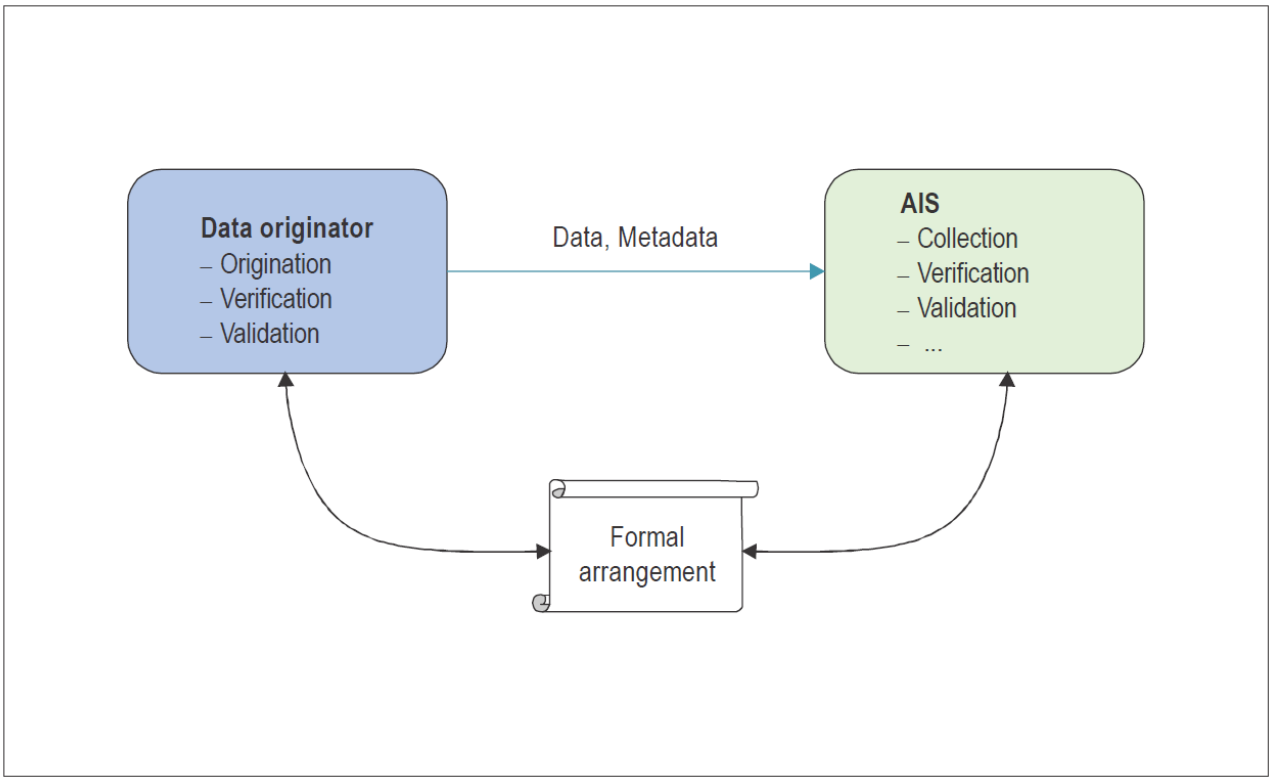

Figure 1. Data origination and provision of data and metadata to the AIS

1.1.2 Data originators may be both internal and external to the AIS organization. Formal arrangements with external originators should be formalized through written agreements. Formal arrangements between different units within the same organization (e.g. between procedure design and AIS of an air navigation service provider) can be established as part of the management system of the organization.

1.1.3 Information regarding infrastructure operational status often comes from a different originator than the information about its physical characteristics. Therefore, originators of operational status information of aeronautical features should be identified and added to the list of authorized originators. Formal arrangements with these originators assure the expeditious publication of a NOTAM in case of disruption of the service.

1.1.4 Organizations responsible for aeronautical data often contract a third party to originate the data. A typical example is an airport authority contracting a professional surveyor to undertake an airport survey (see Figure 2).

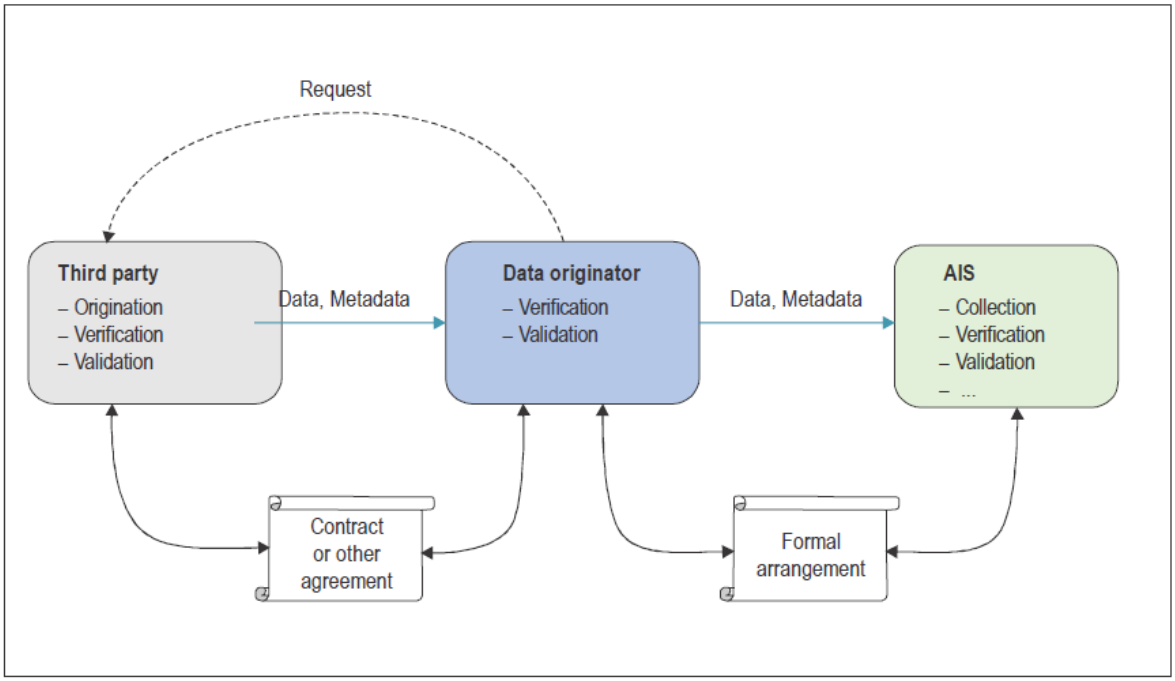

Figure 2. Data origination subcontracted to a third party

1.2 Content of Formal Arrangement

Formal arrangements should include the following minimum content:

a) the aeronautical data to be provided;

b) the data quality requirements for each data item supplied according to the data catalogue;

c) the method(s) for demonstrating that the data provided conforms with the specified requirements;

d) the action to be taken in the event of discovery of a data error or inconsistency in any data provided;

e) the following minimum criteria for notification of data changes:

   i. criteria for determining the timeliness of data provision based on the operational or safety significance of the change;

   ii. any prior notice of expected changes; and

   iii. the means to be adopted for notification;

f) the party responsible for documenting data changes;

g) data exchange details such as format or format change processes;

h) any limitations on the use of data;

i) requirements for the production of data origination quality reports;

j) metadata requirements; and

k) contingency requirements concerning the continuity of data provision.

2. Aeronautical Information Management

2.1 Data Quality Specification

2.1.1 Data Accuracy

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

Note. — Specifications concerning the order of accuracy (including confidence level) for aeronautical data are contained in the PANS-AIM, Appendix 1.

2.1.2 Data Resolution

The order of resolution of aeronautical data shall be commensurate with the actual data accuracy.

Note.1 — Specifications concerning the resolution of aeronautical data are contained in the PANS-AIM, Appendix 1.

Note.2 —The resolution of the data contained in the database may be the same or finer than the publication resolution.

2.1.3 Data Integrity

a) The integrity of aeronautical data shall be maintained throughout the data process from origination to distribution to the next intended user.

Note. — Specifications concerning the integrity classification related to aeronautical data are contained in the PANS-AIM, Appendix 1.

b) Based on the applicable integrity classification, procedures shall be put in place in order to:

i. for routine data: avoid corruption throughout the processing of the data;

ii. for essential data: assure corruption does not occur at any stage of the entire process and include additional processes as needed to address potential risks in the overall system architecture to further assure data integrity at this level; and

iii. for critical data: assure corruption does not occur at any stage of the entire process and include additional integrity assurance processes to fully mitigate the effects of faults identified by thorough analysis of the overall system architecture as potential data integrity risks.

2.1.4 Data Traceability

Traceability of aeronautical data shall be ensured and retained as long as the data is in use.

2.1.5 Data Timeliness

Timeliness shall be ensured by including limits on the effective period of the data elements.

Note. 1 — These limits may be associated with individual data elements or data sets.

Note. 2 — If the effective period is defined for a data set, it will account for the effective dates of all of the individual data elements.

2.1.6 Data Completeness

Completeness of the aeronautical data shall be ensured in order to support the intended use.

2.1.7 Data Format

The format of delivered data shall be adequate to ensure that the data is interpreted in a manner that is consistent with its intended use.

2.2 Aeronautical Data and Aeronautical Information Verification and Validation

2.2.1 Material to be issued as part of an aeronautical information product shall be thoroughly checked before it is submitted to the AIS in order to ensure that all necessary information has been included and that it is correct in detail.

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

3. Aeronautical Data and Aeronautical Information

3.1 Scope of Aeronautical Data and Aeronautical Information

3.1.1 The aeronautical data and aeronautical information to be received and managed by the AIS providers shall include at least the following sub-domains:

a) National regulations, rules and procedures;
b) Aerodromes and heliports;
c) Airspace;
d) ATS and other routes;
e) Instrument flight procedures;
f) Radio navigation aids/systems;
g) Obstacles; and
h) Geographic information.

Note. 1 — Detailed specifications concerning the content of each sub-domain are contained in the PANS-AIM, Appendix 1.

Note. 2 — Aeronautical data and aeronautical information in each sub- domain may be originated by more than one organisation or authority.

3.1.2 Determination and reporting of aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end- user of aeronautical data.

Note. — Specifications concerning the accuracy and integrity classification related to aeronautical data are contained in the PANS-AIM, Appendix 1.

3.2 Aeronautical Data Requirement

3.2.1 AIS provider shall ensure that aeronautical data received from data originators shall be complied with aeronautical data requirement mentioned in PANS-AIM.

3.2.2 Data Origination Requirements

Data shall be collected and transmitted to the AIS in accordance with the accuracy requirements and integrity classification specified in Appendix 1 PANS-AIM.

3.2.3 Metadata

a) Metadata shall be collected for aeronautical data processes and exchange points

b) Metadata collection shall be applied throughout the aeronautical information data chain, from origination to distribution to the next intended user.

3.2.4 Metadata requirement

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

a) the name of the organisations or entities performing any action of originating, transmitting or manipulating the data;

b) the action performed; and

c) the date and time the action was performed.

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

4. Formal Arrangement Template

SERVICE LEVEL AGREEMENT

Between

[name of entity receiving the aeronautical data and aeronautical information]
(hereinafter the "AIS")

And

[name of entity providing the aeronautical data and aeronautical information]
(hereinafter the "The Data Originator")

CONTENTS

1. INTRODUCTION

1.1 Scope

This service level agreement sets out the terms and conditions for the supply of aeronautical data and aeronautical information (hereinafter collectively the "Data") by *[organization name]* (hereinafter the "Data Originator") to the aeronautical information service *[organization name]* (hereinafter the "AIS").

1.2 Parties to the agreement

The parties to this agreement, and their responsibilities, are as follows:

Party	Official address	Legal representative	Responsibilities
The Data Originator: *[name of entity providing the aeronautical data and aeronautical information]*			The Data Originator shall provide the Data to the AIS in accordance with this agreement.
The AIS: *[name of entity receiving the aeronautical data and aeronautical information]*			The AIS shall receive the Data in accordance with this agreement.

1.3 Regulatory requirements

The following ICAO and national documents specify the regulatory requirements for the origination, collection, handling, storage, processing, transfer and distribution of the Data:

- The Regulation of the Civil Aviation Authority of Thailand No. 20 on Aeronautical Information Services Standards
- Rule of the Civil Aviation Authority of Thailand on Manual of Standards of Aeronautical Information Services Standards
- The Notification of the Civil Aviation Authority of Thailand on Notice to Airmen
- Annex 4 — Aeronautical Charts
- Annex 5 — Units of Measurement to be Used in Air and Ground Operations
- Annex 11 — Air Traffic Services
- Annex 14 — Aerodromes
- Annex 15 — Aeronautical Information Services
- Doc 8126 — Aeronautical Information Services Manual
- Doc 8400 — Procedures for Air Navigation Services — ICAO Abbreviations and Codes (PANS-ABC)
- Doc 10066 — Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM)
- EUROCONTROL Guidelines for Operating Procedures for AIS Dynamic Data (OPADD)
- *[update list to reflect all applicable ICAO and national regulations]*

1.4 Entry into force and termination

1.4.1 This Agreement is valid from ***[enter start date]*** to ***[enter end date].***

Alternatively:

This Agreement shall enter into force on the date of the later signature of the Parties and shall remain in force until terminated. This Agreement may be terminated by written agreement between the Parties, or by written advance notice of ***[add time period, e.g. x months]*** prior to termination by either Party.

1.5 Definitions and conventions

For the purpose of this agreement, the definitions in Annex 15 — Aeronautical Information Services and Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066) shall apply, including the following definitions:

a) 'Agreement' refers to this service level Agreement;
b) 'Data' collectively refers to the aeronautical data and aeronautical information that the Data Originator is responsible to provide to the AIS under the terms of this Agreement;
c) 'Data Originator' refers to the legal entity responsible for the provision of aeronautical data and aeronautical information, as set out in the terms of this Agreement;
d) 'AIS' refers to the legal entity responsible for receiving the aeronautical data and aeronautical information, as set out in the terms of this Agreement; and
e) 'Parties' refer to the Data Originator and the AIS.

2. DATA PROVISION SERVICE

2.1 Service description

2.1.1 The Data Originator shall provide the Data to the AIS, incorporating all data items listed in Attachment A to this Agreement.

2.1.2 In case the Data Originator provides complete aeronautical features (e.g. runway threshold) to the AIS, Attachment A shall describe all individual data elements that compose the aeronautical feature (e.g. latitude and longitude shall be listed separately).

2.1.3 The Data shall be provided in accordance with the data quality requirements described in Attachment A to this Agreement.

2.1.4 The Data shall be provided within the date and time limits described in Attachment B to this Agreement.

2.1.5 The Data shall be provided together with the metadata items described in Attachment C to this Agreement.

2.1.6 The Data shall be transferred between the Parties by the means described in Attachment D to this Agreement.

2.1.7 The Data shall be provided in accordance with the data exchange format described in Attachment E to this Agreement.

2.2 Data management

2.2.1 The Data Originator shall follow the recommendations of Annex 15 — Aeronautical Information Services, Chapter 6.2 concerning the advance notice of changes to the Data **(for ATS providers refer to Annex 11 — Air Traffic Services, Chapter 2, section 2.22.4 and for aerodrome operators refer to Annex 14 — Aerodromes, Volume I, Chapter 2, section 2.13.4)**.

2.2.2 The Data Originator shall be responsible for the timely provision of the Data. The Data Originator accepts that the Data shall be subject to validation and verification by the AIS and that, if queries arise, this may delay final acceptance and hence publication in the aeronautical information products.

2.2.3 The Data Originator shall be responsible to submit the Data in sufficient time to meet the AIRAC publication cycle. The Data Originator acknowledges that if the Data is not provided on time, the Data shall not be released for publication. In exceptional circumstances, a NOTAM may need to be issued, if deemed necessary.

2.2.4 The Data Originator shall be responsible to maintain the validity of the Data. The Data Originator shall provide updates to the Data whenever required by *[organisation name]*, national regulations or whenever a change is made that requires an update of the Data.

2.2.5 The Data Originator shall be responsible for documenting any changes made to the Data.

2.2.6 If any third party is involved in the origination of the Data, or parts of the Data, the Data Originator shall remain responsible to ensure that the third party documents any changes made to the Data.

2.3 Demonstrating compliance

2.3.1 The Data Originator shall ensure that the Data is originated and processed in accordance with international best practices and guidelines.

- ***[update list to reflect all applicable standards, specifications, guidance material …]***

2.4 Data errors or inconsistencies

2.4.1 In the event of the AIS discovering a data error or inconsistency in the Data, and provided that the Data is still subject to validation and verification by the AIS prior to publication or distribution, the AIS shall ***[describe the actions to be taken by the AIS when discovering a data error or inconsistency during validation and verification prior to publication or distribution]***.

2.4.2 In the event of the Data Originator receiving a notification from the AIS that the Data, which is still subject to validation and verification by the AIS prior to publication or distribution, contained a data error or inconsistency, the Data Originator shall ***[describe the actions to be taken by the Data Originator when notified that the Data contains a data error or inconsistency detected during validation and verification prior to publication or distribution]***.

2.4.3 In the event of the AIS discovering a data error or inconsistency in the Data, and provided that the Data has already been published or distributed, the AIS shall ***[describe the actions to be taken by the AIS when discovering a data error or inconsistency after publication or distribution]***.

2.4.4 In the event of the Data Originator receiving a notification from the AIS that the Data, which has already been published or distributed, contained a data error or inconsistency, the Data Originator shall ***[describe the actions to be taken by the Data Originator when notified that the Data contains a data error or inconsistency detected after publication or distribution]***.

2.5 Contingency

2.5.1 In the event that the Data Originator cannot guarantee the continuity of the provision of the Data, the Data Originator shall ***[describe the actions to be taken by the Data Originator when the Data Originator cannot guarantee the continuity of the provision of the Data]***.

2.5.2 In the event that the Data Originator cannot guarantee the continuity of the provision of the Data, the AIS shall ***[describe the actions to be taken by the AIS when the Data Originator cannot guarantee the continuity of the provision of the Data]***.

2.5.3 In the event that the AIS cannot guarantee the continuity of receipt and processing of the Data, the AIS shall ***[describe the actions to be taken by the AIS when the AIS cannot guarantee the continuity of receipt and processing of the Data]***.

2.5.4 In the event that the AIS cannot guarantee the continuity of receipt and processing of the Data, the Data Originator shall ***[describe the actions to be taken by the Data Originator when the AIS cannot guarantee the continuity of the receipt and processing of the Data]***.

3. PROCEDURAL PROVISIONS

3.1 Entire agreement

3.1.1 This Agreement forms the entire agreement and understanding of the Parties and supersedes all previous agreements whether written or oral between the Parties, including any previous agreement or understanding varying or extending the same. There are no further or other agreements or understandings, written or oral, in effect between the Parties with respect to the scope of this Agreement.

3.1.2 Any amendments and modifications to this Agreement may be made at any time by written agreement by both Parties.

3.2 Liaison

3.2.1 The Data Originator and the AIS shall each appoint an Accountable Manager for the implementation and operation of this Agreement. These nominated managers will act as points of contact for all issues regarding the implementation and operation of this Agreement.

3.2.2 The Data Originator Accountable Manager and the AIS Accountable Manager shall have the authority to take decisions regarding the operation and distribution of the Data on behalf of their respective organisations. All communications between the parties regarding the implementation and operation of this Agreement shall be coordinated by these managers.

3.2.3 The Accountable Managers and their respective administrative contacts are:

Party	Accountable Manager	Administrative Contact
[Insert Data Originator details here]	***[Insert Primary Contact details here, including name, job title, address, telephone and email]***	***[Insert Administrative Contact details here, including name, job title, address, telephone and email]***
[Insert AIS details here]	***[Insert Primary Contact details here, including name, job title, address, telephone and email]***	***[Insert Administrative Contact details here, including name, job title, address, telephone and email]***

Data Originator Accountable Manager: ***Name*** ***Title*** ***Date*** ***Signature***	AIS Accountable Manager: ***Name*** ***Title*** ***Date*** ***Signature***

Attachment A

AERONAUTICAL DATA AND AERONAUTICAL INFORMATION TO BE PROVIDED

Example :

Refer to Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM*, Doc 10066), Appendix 1:*

- *Table A1-1 Aerodrome data;*
- *Table A1-2 Airspace data;*
- *Table A1-3 ATS and other routes data;*
- *Table A1-4 Instrument flight procedure data;*
- *Table A1-5 Radio navigation aids/systems data;*
- *Table A1-6 Obstacle data;*
- *Table A1-7 Geographic data;*
- *Table A1-8 Terrain data;*
- *Table A1-9 Data types; and*
- *Table A1-10 Information about national and local regulation, services and procedures.*

Attachment B

TIMELINESS REQUIREMENTS

Example #1:
The timely submission of the Data shall be made in accordance with the requirements indicated in Annex 15 — Aeronautical Information Services*, Chapter 6.*

Example #2:
On initial provision of the Data, or where the Data is subject to a planned update, the following minimum Data submission periods apply:

Aeronautical information products

a) *AIP Amendments – xxx days in advance;*
b) *AIP Supplements – xxx days in advance;*
c) *Aeronautical Information Circulars (AICs) – xxx days in advance;*
d) *NOTAM – as required.*

Aeronautical charting products

a) *en-route chart – xxx days in advance;*
b) *instrument approach chart – xxx days in advance;*
c) *World Aeronautical Chart – xxx days in advance;*
d) *The Aeronautical Chart – xxx days in advance;*
e) *Standard Departure Chart – xxx days in advance;*
f) *Standard Arrival Chart – xxx days in advance;*
g) *etc.*

Digital data sets

a) *Aerodrome/heliport data – xxx days in advance;*
b) *Airspace data – xxx days in advance;*
c) *ATS and other routes data – xxx days in advance;*
d) *instrument flight procedures data – xxx days in advance;*
e) *etc.*

Example #3:
The Data shall be provided in accordance with the timelines given in the production and publication calendar of the aeronautical information product.

Attachment C

METADATA REQUIREMENTS

Example:

The Data shall include, as a minimum, the following metadata items:

a) the names of the organization or entities providing the data set;
b) the date and time when the data set was provided;
c) the period of validity of the data set; and
d) any limitations with regard to the use of the data set.

Attachment D

DATA DISTRIBUTION

Example #1:
All Data shall be transferred between the Parties through distribution in digital format via electronic transfer or direct input into the AIM system.

Example #2:
All Data shall be transferred between the Parties via email, with special attention to the following:

a) use of designated email addresses;
b) the Data is provided in an attached file;
c) copy and paste actions or the retyping of the Data is avoided;
d) receipt of the Data is confirmed to the Data Originator; and
e) the Data is encrypted with a digital data error detection technique, such as hash functions or CRC.

Attachment E

DATA EXCHANGE FORMAT

Example #1:
The Data shall be transferred in accordance with the AIXM x.x Extensible Markup Language (XML) schema.

Example #2:
*The Data shall be transferred in CSV format, in accordance with the data catalogue **[insert the name and version of the data set specification]**.*

Example #3:
1. Aeronautical Information Publication
- *1.1 Responsible Person*
- *1.2 Documentation*
- *1.3 Method (s)*
- *1.4 Data Exchange Format*

2. Notice to Airmen (NOTAM)
- *2.1 Responsible Person*
- *2.2 Documentation*
- *2.3 Method (s)*