



# PJ.15-10 TRL6 Service Definition Documentation Aeronautical Information Service

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Founding Members



## Authoring & Approval

---

### Authors of the document

Name/Beneficiary	Position/Title	Date
Hannes Brunner / FRQ (FSP)	PJ15-10 Solution Member	06/12/2019

### Reviewers internal to the project

Name/Beneficiary	Position/Title	Date
Carlo Andreotti / ENAV	PJ.15-10 Solution Leader	06/12/2019
Maurizio ROMANO / ENAV	PJ.15-10 Solution Member	06/12/2019
Alessio FUOCO / ENAV	PJ.15-10 Solution Member	06/12/2019

### Approved for submission to the SJU By - Representatives of beneficiaries involved in the project

Name/Beneficiary	Position/Title	Date
Carlo Andreotti / ENAV	PJ.15-10 Solution Lead	09/12/2019
Maurizio ROMANO / ENAV	PJ.15-10 Solution Member	09/12/2019
Alessio FUOCO / ENAV	PJ.15-10 Solution Member	09/12/2019
Susanne Buchholzer / FRQ (FSP)	PJ.15-10 Solution Member	09/12/2019
Alberto ANGUIA JIMÉNEZ / INDRA	PJ.15 Project Coordinator	09/12/2019
Borja Martinez Fernandez / EUROCONTROL	PCIT Lead	09/12/2019
Leonardo PEINADO / ENAIRE	PJ.15-10 Solution Member	09/12/2019
Christine Driessen/ SITA	PJ.15-10 Solution Member	09/12/2019
Luigi MAZZUCHELLI / ENAV	PJ.15-10 Solution Member	09/12/2019

### Rejected By - Representatives of beneficiaries involved in the project

Name/Beneficiary	Position/Title	Date

---

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# COSER

## PJ15 COMMON SERVICES

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### **Abstract**

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This document provides the description of the Aeronautical Information Service.

## Table of Contents

<b>Abstract .....</b>	<b>4</b>
<b>Appendix A    <i>Service Description Document (SDD)</i>.....</b>	<b>8</b>
<b>A.1    Introduction .....</b>	<b>8</b>
A.1.1    Purpose of the document .....	8
A.1.2    Scope .....	8
A.1.3    Intended readership .....	8
A.1.4    Structure of the document.....	8
A.1.5    Glossary of terms .....	9
A.1.6    Acronyms and Terminology .....	10
<b>A.2    Service Identification .....</b>	<b>15</b>
<b>A.3    Operational and Business Context.....</b>	<b>15</b>
A.3.1    Operational Context .....	15
A.3.2    Information Exchange Requirements.....	23
A.3.3    Other Requirements.....	23
1.1.1.1    Security Requirements .....	23
<b>A.4    Service Overview .....</b>	<b>25</b>
A.4.1    Service Taxonomy .....	25
A.4.2    Service Levels (NFRs).....	28
A.4.3    Service Functions and Capabilities .....	29
A.4.4    Service Interfaces .....	29
<b>A.5    Service interface specifications .....</b>	<b>34</b>
A.5.1    AeronauticalInformationServiceNotification .....	34
A.5.2    AeronauticalInformationServicePublisher .....	35
A.5.3    AeronauticalInformationServiceRR .....	36
A.5.4    AeronauticalInformationServiceSubscriber .....	37
A.5.5    ProvidedAeronauticalInformationFeatureInterfaceDefinition .....	38
A.5.1.1.1    Operation DescribeFeatureType .....	39
A.5.1.1.2    Operation DescribeStoredQueries .....	40
A.5.1.1.3    Operation GetCapabilities.....	41
A.5.1.1.4    Operation GetFeature .....	42
A.5.1.1.5    Operation GetPropertyValue .....	43
A.5.1.1.6    Operation ListStoredQueries .....	44
<b>A.6    Payload Data Diagrams .....</b>	<b>44</b>
<b>A.7    Payload Data Types .....</b>	<b>44</b>
<b>A.8    Reference documents .....</b>	<b>45</b>
<b>A.9    Appendix: Gap Analysis Aeronautical Information Service / EAD.....</b>	<b>45</b>
1.1 EAD.....	45
1.1.1    Services / Functions.....	45
1.1.1.1    Interfaces.....	46
1.1.1.2    Data Model.....	47
1.1.1.3    Operational Services.....	47
1.2    Aeronautical Information Service .....	47
1.2.1    Services / Functions.....	47
1.2.2    Interfaces.....	48



1.2.3	Data Model .....	48
1.2.4	Solution 11.....	48
2	Gap Analysis.....	49
2.1	Services / Functions .....	49
2.1.1	Additional Scope of Aeronautical Information Service .....	49
2.1.2	Additional Scope of EAD .....	49
2.2	Interfaces .....	49
2.2.1	Additional Scope of Aeronautical Information Service .....	49
2.2.2	Additional Scope of EAD .....	49
2.3	Data Model .....	49
2.3.1	Additional Scope of Aeronautical Information Service .....	49
2.3.2	Additional Scope of EAD .....	50
2.4	Visualisation.....	50
2.4.1	Additional Scope of Aeronautical Information Service .....	50
2.4.2	Additional Scope of EAD .....	50
3	Tabular comparison EAD / PJ-15.10/11.....	50

## List of Tables

Table 1: Glossary of Terms .....	10
Table 2: Acronyms and Terminology.....	14
Table 3: Service identification (I).....	15
Table 4 Activities supported by PJ.15-10 .....	23
Table 5 Service Taxonomy - Supported Capabilities .....	27
Table 6: Quality of Service for Aeronautical Information Service for TRL6.....	29
Table 7: Service Interface description .....	32

## List of Figures

Figure 1: Service to Service Interface mapping.....	33
Figure 2: “AeronauticalInformationServiceNotification” Interface Exchange diagram .....	34
Figure 3: “AeronauticalInformationServicePublisher” Interface Exchange diagram .....	35
Figure 4: “AeronauticalInformationServiceRR” Interface Exchange diagram.....	36
Figure 5: “AeronauticalInformationServiceSubscriber” Interface Exchange diagram .....	37
Figure 6: “ProvidedAeronauticalFeature” Interface Exchange diagram .....	38



Figure 7: “DescribeFeatureType” Operation Exchange diagram ..... 39

Figure 8: “DescribeStoredQueries” Operation Exchange diagram ..... 40

Figure 9: “GetCapabilities” Operation Exchange diagram ..... 41

Figure 10: “GetFeature” Operation Exchange diagram ..... 42

Figure 11: “GetPropertyValue” Operation Exchange diagram..... 43

Figure 12: “ListStoredQueries” Operation Exchange diagram ..... 44

## Appendix A Service Description Document (SDD)

### A.1 Introduction

#### A.1.1 Purpose of the document

The purpose of this Service Description Document (SDD) is to provide a description of the services designed within SESAR2020.

The purpose of the SDD is to provide a complete design description of the Aeronautical Information Service identified by the Solution PJ.15-10, to describe the service to such a level that it is possible to make decisions in activities such as Service Implementation and evolution planning. The document serves as a complement to a model based description, which can be found in the EATMA Repository (MEGA).

#### A.1.2 Scope

The scope of this document is to provide the logical service definition that aims to support, the provision as defined by PJ.15-10. It includes artefacts such as service interfaces, service operations and service payload (data elements and entities), while maintaining a technology-agnostic nature, meaning that the definition of the service does not recommend or constrain any specific technology choices.

Both the Business Model and the High-Level Architecture description for TRL6 provide the necessary background information to fully understand the context of the service described in this document. The most relevant parts of these documents are referenced to enable a better understanding.

#### A.1.3 Intended readership

The intended audience for this document is the SESAR Joint Undertaking, the partners in the SESAR 2020 programme, the ATM stakeholders (e.g. Airspace Users, ANSPs, Airports and manufacturing industry) with those third parties directly affected by its findings and the contributors having dependencies with the solution.

PJ19.03, as responsible for the coordination of Systems and Service development in the programme, and other transversal projects, may also have an interest.

In addition, it is expected that those PJ.15-10 Solution partners that are involved in Technical Validation exercises planned for TRL6 used this document as guidance for their development activities.

#### A.1.4 Structure of the document

The SDD is originally an annex of the TS/IRS document. However, given the specific nature of PJ.15 and after coordination with SJU, it was agreed that PJ15 Solutions would provide the SDD(s) as independent deliverable(s), by producing one SDD per service.

An initial skeleton of the document, including its structure and most of the diagrams and tables, was produced by using the automatic document generation capability of the MEGA tool. Later, the structure was tailored by PJ.15-10 to adapt it to its needs, and some of the sections were completed with textual descriptions and non-MEGA diagrams.

The structure of the document is as follows:

- Section A.1 introduces the document, by providing an explanation of the scope and purpose.
- Section A.2 describes how the service has been identified.



- Section A.3 provides a description of the business and operational context of the service.
- Section A.4 gives an overview of the service functionality.
- Section A.5 depicts the interfaces and operations of the service.
- Sections A.6 and A.7 depict the payload exchanged through the service.
- Section A.8 provides the reference documents.

### A.1.5 Glossary of terms

Term	Definition	Source
Business model	A framework for creating economic, social, and/or other forms of value. The term 'business model' is thus used for a broad range of informal and formal descriptions to represent core aspects of a business, including purpose, offerings, strategies, infrastructure, organizational structures, trading practices, and operational processes and policies.	EUROCONTROL ATM Lexicon
Capability	The ability of one or more of the enterprise's resources to deliver a specified type of effect or a specified course of action to the enterprise stakeholders.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Centralised (service) - a particular type of Common Service	A Centralised Service is an ANS support service exercised at pan-European and central network level for harmonisation and cost-efficiency purpose avoiding multiplication of investments, leading to reduced infrastructure costs, supporting the ANSPs and the Member States of the EU to come closer or actually achieving the EU cost efficiency performance targets.	EUROCONTROL
Common Service	A service providing a capability in the same form to consumers that might otherwise have been undertaken by themselves'	SESAR B04.05 D02
Consumer	A user of a service	SESAR B04.05 D02
Customer	A consumer of a service under a specific contract.	SESAR B04.05 D02
Data Element	A formalized representation of data. Data Elements are exchanged by Technical Systems when invoking Service Operations in Service Interfaces or using System Ports.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Data Entity	A definition (type) of an item of interest. Data Entities are the building blocks used to define Data Elements.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Node	A logical entity that performs activities. Note: nodes are specified independently of any physical realisation.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Security and safety in the	Non-Functional Requirements (NFR) and Quality of service (QoS) requirements can be specified at various levels of	ISRM – Modelling guidelines

Term	Definition	Source
context of a Common Service	maturity and from different viewpoints such as from the collaborative enterprise, the logical level, technology and engineering perspectives. Conceptually, NFR and QoS are not always distinguishable. Common Services focuses at the first two viewpoints	
Service	The contractual provision of something (a non-physical object), by one, for the use of one or more others. Services involve interactions between providers and consumers, which may be performed in a digital form (data exchanges) or through voice communication or written processes and procedures.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Service contract (SLA)	A service contract represents an agreement between the stakeholders involved for how a service is to be provided and consumed. A service contract is specified through the service interface, the QoS and Service policies.	SESAR B.04.03 – Working method on service
Service Interface	The mechanism by which a service communicates. Note: a Service Interface specifies the Service Interface Definition provided and required by the Service.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Service Operation	A function or procedure which enables programmatic communication with a Service via a Service Interface.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10
Service Provider	An organisation supplying services to one or more internal or external consumers.	SESAR B.04.05 – D02
Service taxonomy	The service taxonomy describes the categorisation of services provided between ATM stakeholders. It is used to organise the responsibilities of the service design as well as to provide a means of identifying services in the run-time environment.	SESAR B.04.03 – Working method on service
Stakeholder	A stakeholder is an individual, team, or organization (or classes thereof) with interest in, or concerns relative to, an enterprise (e.g. the European ATM). Concerns are those interests, which pertain to the enterprise’s development, its operation or any other aspect that is critical or otherwise important to one or more stakeholders.	SESAR2020 PJ19.05 EATMA Guidance Material Version 10

**Table 1: Glossary of Terms**

## A.1.6 Acronyms and Terminology

Term	Definition
ACC	Area Control Centre
A-CDM	Airport Collaborative Decision Making
ADQ	Aeronautical Data Quality

Term	Definition
AIC	Aeronautical Information Circulars
AIM	Aeronautical Information Management
AIMSL	AIM Service Layer
AIP	Aeronautical Information Publication
AIRAC	Aeronautical information regulation and control
AIRM	ATM Information Reference Model
AIS	Aeronautical Information Service
AIXM	Aeronautical Information Exchange Model
AMC	Airspace Management Cell
AMDT	Amendment
ANSP	Air Navigation Service Provider
<b>AO</b>	Airport Operator
AOR	Area of Responsibility
APP	Approach
ARES	Airspace Reservation
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATCO	Air Traffic Controller
ATM	Air Traffic Management
ATS	Air Traffic Services
AU	Airspace Users
AUP	Airspace Use Plan
CADF	Centralised Airspace Data Function
CDR	Conditional Route
COSER	Common Service
CTA	Controlled Airspace or Controlled Time of Arrival
CWP	Controller Working Position

Term	Definition
<b>DCB</b>	Demand and Capacity Balancing
DMAN	Departure Manager
EAD	European AIS Database
EATMA	European ATM Architecture
eAUP	Electronic AUP
EFB	Electronic Flight Bag
EIBT	Estimated In-Block Time
E-TMA	Dynamic Extended TMA
eUUP	Electronic UUP
FAB	Functional Airspace Block
FMS	Flight Management System
GIS	Geographical Information System
GML	Geographical Markup Language
HLAPB	High Level Airspace Policy Body
<b>IER</b>	Information Exchange Requirement
IFR	Instrument Flight Rules
INO	International NOTAM Operations
<b>IRS</b>	Interface Requirements Specification
ISRM	Information Services Reference Model
iSWIM	Initial System Wide Information Management
<b>MEP</b>	Message Exchange Pattern
NAF	NATO Architecture Framework
NFR	Non-Functional Requirement
NM	Network Manager
NOP	Network Operations Plan
<b>NOTAM</b>	Notice to Airmen

Term	Definition
NOV	NAF Operational View
<b>NSOV</b>	NAF Service-Oriented View
NSV	NAF System View
OPMET	Operational aeronautical meteorological data
PAMS	Published AIP Management System
PCP	Pilot Common Project
PCP IR	Pilot Common Project Implementing Regulation
PERM	Permanent
<b>PJ</b>	Project (in SESAR2020)
<b>QoS</b>	Quality of Service
RGA	Route Generation Algorithm
SaaS	System or Software as a Service
<b>SDD</b>	Service Definition Document
SDD	Static and Dynamic Data Management
SDO	Static Data Operations
SESAR	Single European Sky ATM Research Programme
SESAR Programme	The programme which defines the Research and Development activities and Projects for the SJU.
SID	Standard Instrument Departure
SJU	SESAR Joint Undertaking (Agency of the European Commission)
SJU Work Programme	The programme which addresses all activities of the SESAR Joint Undertaking Agency.
STAR	STandard ARrival
SUP	Supplement
SWIM	System Wide Information Management
TLDT	Target Landing Time
TRAMON	Temporary Restricted Aera Monitoring



Term	Definition
TRL	Technology Readiness Level
TS	Technical Specification
TSAT	Target Start Up Approval Time
TTL	Total Estimated Elapsed Time
TTOT	Target Take-Off Time
UUP	Updated Airspace Use Plan
VPA	Vertical Path Angle
XML	Extensible Markup Language

**Table 2: Acronyms and Terminology**

## A.2 Service Identification

Name of the Service	AeronauticalInformationService
Identifier	H(st0BUGSbrg
Version	EATMA Draft
Architect(s)	BRUNNER Hannes
Last Modification Date	1/20/2019

Table 3: Service identification (I)

## A.3 Operational and Business Context

### A.3.1 Operational Context

The function of the “Aeronautical Information Service” is to provide static and dynamic aeronautical data in digital form to be used by different ATM systems. The output is an AIXM-compliant dataset whose subsets can be retrieved by individual requests demanding specific geographical areas, attributes or functional features.

The purpose of this service is very close and even overlapping the already identified “AeronauticalInformationFeature” service in the EATMA. It is also very close to the service requested in the PCP (EU IR 716/2014) for “Aeronautical information exchange” on the Initial System Wide Information Management (iSWIM) over the yellow profile and defined as:

Aeronautical information feature on request. Filtering possible by feature type, name and an advanced filter with spatial, temporal and logical operators.

Please refer to Appendix: Gap Analysis Aeronautical Information Service / EAD for a detailed description of the differences between EAD and the Aeronautical Information Service.

The main tasks of the service are to deal with static and dynamic information like the last operational status of airspace or route activation, and with permanent or long-term data. This service initially only provided static information traditionally available in the AIP. This includes the PERM NOTAMs as static data changes. PERM NOTAMs are in fact Static Data that are published by NOTAM only because they do not fit into the traditional publication cycle. Such changes are usually incorporated in the sequent AIP amendment. Using a digital service would allow to include such information as far as it is available.

The service evolved in the update for TRL6 maturity to provide also dynamic information also available in the AIXM format (Digital NOTAM).

The following table is an extract or Mega describing the activities supported by the Aeronautical Information Service, which have been mapped to the Aeronautical Information Service.

Please note that “supported activity” means that data provided by the service is required for the activities and the static aeronautical data service contributes to the execution of the activity. It does not mean that the activity is fully covered by the Aeronautical Information Service. E.g. “Determine estimated taxi time and refine EIBT” can utilize information provided by the Aeronautical Information Service on the geometry and availability of the taxiways of an aerodrome. The relationship to dynamic changes also has to be understood in this light:

- (1) Such activities that are purely related to static changes are covered with Static data and are marked below with “Static”
- (2) Such activities that are in their nature dynamic, but require only static information from PJ15 (e.g. Activate ARES) are marked with “Static / Dynamic”
- (3) Such activities that are dynamic and are also be supported with dynamic events are marked with “Dynamic”.

Supported Activity	Static / Dynamic Information	Activity Description
Activate ARES	Dynamic	Prior/with the mission entering the VPA in order to start with their training the TRAMON activates the ARES, automatically changing the airspace status in "active/used"
Aerodrome Information Origination	Static	Aerodromes originate aerodrome related information to be checked and approved by the AIM units and the Aeronautical Information Service Service provider
Aerodrome Information Retrieval	Static	Retrieval of aerodrome related information (runway, taxiway network, aprons etc.)
Allocate STAR to arrivals	Static / Dynamic	ATS unit determines the flights arriving to the aerodrome that are affected by the runway change. It automatically revises the assigned STAR in the Flight Object for the concerned flights. It has the authority to allocate the STAR as it is a route clearance starting within its AOR.
Assess taxi route change request	Static / Dynamic	In some cases, the Flight Crew may request a change of Taxi-in Route. It will be examined by the Tower Ground Controller.
Create ARES according to the VPA principle, associated route network and management rules of the ARES	Dynamic	HLAPB is responsible for analysing and possibly modifying the design of ARES according VPA principles when such modularity is considered as the best solution.  A modular design (VPA) for new airspace requirements is introduced to enable sub-divisions, new areas or revised airspace requirements closer to air bases (maximum 100 NM radius) and define different airspace scenarios to address local, sub-regional and network impact.
De-activate ARES	Dynamic	As soon as all ARES user finally left the area (with the end of the booked usage time latest) the ARES



Supported Activity	Static / Dynamic Information	Activity Description
		will be deactivated by the TRAMON via the ATC System.
Define an ARES as a combination of airspace modules in accordance with mission needs	Dynamic	the military identifies and identifies a need for a restricted or segregated airspace to protect a specific activity
Define an ARES in accordance with mission needs	Dynamic	the users / pilots refine the planning, define the ARES for each mission and start the booking process for the ARES
Define and publish new Airspace Configuration	Static / Dynamic	The activity description is not available in EATMA at the creation of this document.
Determine estimated taxi time	Static / Dynamic	The calculated planned taxi-out route is used by the ATC system to calculate an estimated taxi time. This taxi time is used by the DMAN to refine the TSAT/TTOT. [06.07.02 D76]
Determine estimated taxi time and refine EIBT	Static / Dynamic	The planned taxi-in route is used by the ATC system to calculate an accurate taxi time. This taxi time is used by the ATC system to refine the Estimated In-Block Time (EIBT). [06.07.02 D76]
Determine taxi-in route	Static / Dynamic	The Route Generation Algorithm ([RGA]) is informed by the ATC system that the assigned landing runway, stand and TLDT for the flight are available. The [RGA] calculates the planned taxi-in route in automatic mode, based on information available in the ATC system, such as taxiway rules, closed taxiways and standard taxi routes, as well as allocated stand and anticipated runway exit (possibly provided by the aircraft when it is equipped with EBS). [06.07.02 D76]
Determine taxi-out route Determine taxi-out route	Static / Dynamic	The Route Generation Algorithm ([RGA]) is informed by the ATC system that the assigned departure runway, stand and TSAT for the flight are available. The RGA calculates the planned taxi-out route in automatic mode, based on information available in the ATC system, such as taxiway rules, closed taxiways and standard taxi routes. [06.07.02 D76]

Supported Activity	Static / Dynamic Information	Activity Description
Flight briefing	Dynamic	This activity involves the flight crew being briefed for all available flight information as soon as the Extended Flight Plan is published.
Input airspace status change	Dynamic	The ATC Flight Data Operator in ATS Unit B enters the airspace status change to the ATC system.
Modify taxi route	Static / Dynamic	For different reasons, the taxi route may need to be modified. It may be re-calculated by the Route Generation Algorithm in automatic mode taking into account the new constraints or modified in semi-automatic or manual mode by the Tower Ground Controller. The ATC system re-calculates the corresponding estimated taxi time, and if necessary updates the EIBT.
Perform AIRAC cycle update of the local ASM system	Static	The activity description is not available in EATMA at the creation of this document.
Plan Arrivals	Static / Dynamic	The destination AMAN calculates and updates the arrival sequence and the advisories (e.g. TTL) using several inputs: latest flight intent, trajectory estimates and revised aircraft trajectories accessible through the Flight Object (e.g. following CTA Cancellation), Arrival flow advisories from the E-TMA Management tool, bunching in the Upstream sector, weather change (wind), overshoots, go-arounds, etc.
Plan Departures	Static / Dynamic	Each airport creates a sequence of departures. A-CDM and DMAN create the sequence at large airports, while controllers organise the sequence manually at small airports. In both cases the sequence respects information from the E-TMA Management tool.
Plan vehicle route	Static / Dynamic	The [RGA] (Route Generation Algorithm) calculates a planned route in automatic mode, based on information available in the ATC system, such as taxiway rules, closed taxiways and standard taxi routes. The Tower Ground Controller has the possibility to visualise and modify, using the A-SMGCS HMI, the planned route. [06.07.02 D76]

Supported Activity	Static / Dynamic Information	Activity Description
Pre-notify activation of the ARES	Dynamic	The TRAMON then activates the TAXI Call function via the ATC System choosing a time frame coordinated with the calling Tower controller (preset X minutes). This time frame reflects the time needed by the mission to reach the VPA. The ATC System updates the ASM Support Systems.
Prepare Draft AUP/UUP	Static / Dynamic	At x time, the AMC user prepares the Draft AUP/UUP for the D-day. The Draft AUP/UUP consists of the ARES data and the CDR segments availability as a result of the ARES expansion (note that the expansion includes all types of CDR segments and all CDR segments managed by the AMC as lead AMC). It is assumed that requests for NOTAM publications regarding closures of CDR 1 are sent to the relevant NOTAM office.  The AMC user sends the Draft AUP/UUP for validation
Provide taxi-in route	Static / Dynamic	[On request of the Flight Crew,] the planned taxi-in route is automatically uplinked. The corresponding estimated taxi time is sent at the same time. [After receiving the reply from the Flight Crew,] the ATC system displays to the ATCO that the flight crew has received the planned taxi-in route. [06.07.02 D76]
Provide taxi-out route	Static / Dynamic	When the Flight Crew requests ATC Departure Clearance and Planned Taxi-out route, the Tower Clearance Delivery Controller sends via data link the ATC Departure Clearance and the planned taxi-out route to the flight crew. The corresponding estimated taxi time is sent at the same time. [06.07.02 D76]
Publish Airport Seasonal Schedule	Static	The activity description is not available in EATMA at the creation of this document.
Publish Airspace availability	Dynamic	The activity description is not available in EATMA at the creation of this document.
Publish airspace data in the NOP	Static	The activity description is not available in EATMA at the creation of this document.

Supported Activity	Static / Dynamic Information	Activity Description
Publish and update Airspace Configuration in the NOP	Static	The Regional Network Plan is approved and promulgated by the Sub-Regional Manager. Airspace is allocated. This status is reflected in the ASM Support Systems. The NOP is updated.
Publish ARES activation in the NOP	Dynamic	The activity description is not available in EATMA at the creation of this document.
Publish ARES activation status update in the NOP	Dynamic	The activity description is not available in EATMA at the creation of this document.
Publish ARES de-activation in the NOP	Dynamic	The activity description is not available in EATMA at the creation of this document.
Publish ARES pre-activation in the NOP	Dynamic	The activity description is not available in EATMA at the creation of this document.
Release of AUP/UUP	Dynamic	When all AUPs/UUPs are in status Ready, the CADF (CADF position in the NM Ops room is responsible for the production of the eAUP) produces the eAUP/eUUP and releases it
Request taxi-in route	Static / Dynamic	The Flight Crew requests the Planned Taxi-In route. [07.07.02 D76]
Request taxi-out route	Static / Dynamic	The Flight Crew requests ATC Departure Clearance and Planned Taxi-out route via data link.
Request the change of Airspace reservation	Dynamic	The activity description is not available in EATMA at the creation of this document.
Request the change of Airspace Reservation/Mission Trajectory	Dynamic	The activity description is not available in EATMA at the creation of this document.
Revise aircraft 2D route	Static / Dynamic	The approach controller can revise the aircraft 2D route to ensure separation (possibly in coordination with the En Route Controller).
Revise planned route	Static / Dynamic	ATS Unit revises the planned route in the Flight Object.
Share airspace data with NM	Static	Static airspace data presented for NM impact assessment
Share and analyse Airspace demand data	Static / Dynamic	AMC compares civil and military needs and identifies possible imbalance between demand and capacity

Supported Activity	Static / Dynamic Information	Activity Description
Specify ARES request	Dynamic	<p>[1] Squadron Tiger Leader requests an ARES he defines:</p> <ul style="list-style-type: none"> <li>· The ARES;</li> <li>· The date;</li> <li>· The slot for the mission (start and end time);</li> <li>· The priority.</li> </ul> <p>[2] Tiger 16 is preparing his mission the day before operations. Doing that, he can confirm the request and update it. He can modify any of the information provided by Squadron Tiger Leader. He defines:</p> <ul style="list-style-type: none"> <li>· ARES (VPAX1, X2, X4 and X6) he needs to book;</li> <li>· Upper and Lower levels;</li> <li>· Penetration status - segregation or restriction.</li> </ul> <p>In addition to these information required for airspace management, he adds some useful information for the other military, the AA and/or for post ops analysis:</p> <ul style="list-style-type: none"> <li>· Call sign;</li> <li>· Number and type of aircraft;</li> <li>· Aerodrome of departure (ADEP);</li> <li>· Aerodrome of destination (ADES);</li> <li>· Mission type;</li> <li>· Link with another mission (if existing).</li> </ul> <p>[3] The booking process follows the approval chain defined at national level:</p> <ul style="list-style-type: none"> <li>· Squadron Tiger Leader confirms the booking;</li> </ul>

Supported Activity	Static / Dynamic Information	Activity Description
Submit request for ARES	Dynamic	The activity description is not available in EATMA at the creation of this document.
Submit request or modification of ARES	Dynamic	The activity description is not available in EATMA at the creation of this document.
Update CWP with ARES activation	Dynamic	The activity description is not available in EATMA at the creation of this document.
Update CWP with ARES activation status update	Dynamic	The activity description is not available in EATMA at the creation of this document.
Update CWP with ARES de-activation	Dynamic	The activity description is not available in EATMA at the creation of this document.
Update CWP with ARES pre-activation	Dynamic	The activity description is not available in EATMA at the creation of this document.
Update the CWP and share airspace status data	Dynamic	<p>Pre notification: visualization of the allocated ARES outlines in the ASM Support Systems and at the CWPs in an appropriate way so the relevant ATCOs get aware, that the airspace is booked for a military mission arriving in X minutes. ATC will now get the airspace clear of civil traffic. This visualization will maintain until the status of the ARES gets changed.</p> <p>Activation: The outlines of the ARES will now appear at the CWPs in an appropriate way signalling the usage.</p> <p>De Activation: The ATC sends a message to the ASM updating the status of the ARES. This leads to an automatic, highlighted change of the airspace status becoming "not used" in the ASM Support Systems giving an acoustical signal and also updating the predefined ATC System. The outlines of the ARES will now disappear at the CWP.</p>

Supported Activity	Static / Dynamic Information	Activity Description
		Cancellation: In case the status of the ARES is "Pending" (i.e. the cancelation had happened when the status of the ARES is "Pending"), the ATC updates the status of the ARES on the CWP to "Inactive" and the status of the ARES in the become "Inactive".

Table 4 Activities supported by PJ.15-10

### A.3.2 Information Exchange Requirements

The Aeronautical Information Service complies with the Information Exchange Requirements defined from SWIM Yellow Profile and the SWIM-TI.

Furthermore, all Information Exchange Requirements determined by the Operational Activities defined in chapter A.3.1 Operational Context are also applicable and the Aeronautical Information Service complies with them as well.

### A.3.3 Other Requirements

#### 1.1.1.1 Security Requirements

In PJ15-10, a Security Risk Assessment has been performed following the guidance provided in SecRAM [3].

Three primary assets and 9 supporting assets were identified for PJ.15-10 and PJ.15-11. The detailed outcome can be reviewed at Frequentis premises, as the results are subject to restricted access.

The following Security Requirements were identified (high level – details are available in the SecRAM):

1. Server Requirements:
  - a. The Aeronautical Information Service shall have strictly defined interfaces in accordance with ISRM and payload in accordance with AIRM
  - b. The Aeronautical Information Service shall have a strict definition of allowable ports, protocols, traffic directions and traffic initiation
  - c. The Aeronautical Information Service shall require on server side policy the latest security updates
  - d. The Aeronautical Information Service shall implement an intrusion detection and / or intrusion prevention system
  - e. The Aeronautical Information Service implementation shall be preferably stateless, where feasible



- f. The Aeronautical Information Service shall implement session handling including a unique session ID
2. Client Requirements:
    - a. Client sites (AIM Data Provider B2C, B2B, Airspace users, Data Originators and Service provider) shall apply accreditation for 3rd party software that can be installed and executed on client servers or working positions.
    - b. Client sites shall apply a security policy for all connected clients to implement minimum security controls (e.g. anti-malware software, device control, patch management, generic end-point hardening and other best practice measures).
    - c. Clients shall implement a security policy for the client environment, which allows no replay tools.
    - d. Client shall implement VLAN separation in order to segregate users.

For all identified security risks, suitable measures were identified and are documented in SecRAM [3].



## A.4 Service Overview

### A.4.1 Service Taxonomy

The following table describes the capabilities supported by PJ.15-10 and relates them to the parent activities (from MEGA) and potentially to Level 1 Capabilities.

E.g. PJ.15-10 supports Aeronautical and meteorological information management, which is a child of the Information management parent capability, which is in turn linked to EATM capabilities.

Supported Capability	Parent Capability	Level 1 Capability
Aerodrome Operations		
	[EATM Capabilities]	
Aeronautical and Meteorological Information Management		
	Information Management	
		[EATM Capabilities]
Airport Capacity Information Provision (incl. Capacity Changes)		
	Demand and Capacity Balancing (airport)	
		Demand and Capacity Balancing
Airport Operations Management		
	Aerodrome Operations	
		[EATM Capabilities]
Airspace Capacity Information Provision (incl. Capacity Changes)		
	Demand and Capacity Balancing (airspace)	
		Demand and Capacity Balancing
Airspace Classes Design		
	Airspace Design	
		Airspace Organisation and Management
Airspace Configuration Design		
	Airspace Design	
		Airspace Organisation and Management
Airspace Configuration Management		
	Airspace Management	

Supported Capability	Parent Capability	Level 1 Capability
		Airspace Organisation and Management
Airspace Design		
	Airspace Organisation and Management	
		[EATM Capabilities]
Airspace Management		
	Airspace Organisation and Management	
		[EATM Capabilities]
Airspace Organisation and Management		
	[EATM Capabilities]	
Airspace Reservation Design		
	Airspace Design	
		Airspace Organisation and Management
Airspace Reservation Management		
	Airspace Management	
		Airspace Organisation and Management
Airspace User Operations		
	[EATM Capabilities]	
Airspace User Situational Awareness		
	Execute Trajectory	
		Airspace User Operations
Arrival/Departure Route Design		
	Airspace Design	
		Airspace Organisation and Management
Arrival/Departure Routes Management		
	Airspace Management	
		Airspace Organisation and Management
Collaborative Airport Management		
	Demand and Capacity Balancing (airport)	
		Demand and Capacity Balancing
Data Centre Common Service Management		
	ATM Service Management	

Supported Capability	Parent Capability	Level 1 Capability
		Service Delivery Management
Demand and Capacity Balancing (airport)		
	Demand and Capacity Balancing	
		[EATM Capabilities]
Demand and Capacity Balancing (airspace)		
	Demand and Capacity Balancing	
		[EATM Capabilities]
Digitalised Aeronautical Information Provision		
	Aeronautical and Meteorological Information Management	
		Information Management
Information Management		
	[EATM Capabilities]	
SWIM-based Information Dissemination		
	Information Infrastructure Management	
		Information Management
Z_Aeronautical Digital Map Common Service Provision		
Z_Drone Aeronautical Information Provision		
Z_Drone Flight Planning Management		
Z_Rotorcraft Operations		
	Execute Trajectory	
		Airspace User Operations
Z_RPAS integrated in Airspace Management		
Z_RPAS Integrated in Surface Operations		
Z_RPAS Operations		

Table 5 Service Taxonomy - Supported Capabilities

## A.4.2 Service Levels (NFRs)

In order to ensure that the service is designed in such a way that is ready to support the exchange of information between the stakeholders, and thus effectively contribute to the achievement of Aeronautical Information Service, a set of indicators have been defined in PJ.15-10 to measure the Quality of Service (QoS).

For each of the indicators, a success threshold (minimum value to be achieved) has been set by expert judgement by taking into account the overall validation objectives for TRL6, as well as the context where the technical validation took place. These indicators were used as driver for the development and integration activities, and the technical validation results should capture the degree of compliance regarding these indicators and the success thresholds.

Table 6 provides the list of the indicators defined in PJ.15-10 for TRL6 phase, along with their definition and their success thresholds. The table differentiates between the threshold for validation (during which a non-redundant, simplified architecture is used – “Threshold validation”) and operation (assumed target values for a future fully operational service – “Threshold validation ex.”). The validation system is not connected to the final network infrastructure, but is executed via public internet. It does not offer the same capacity and performance as the target architecture. Not all interfaces of the validation system are implemented following the target specifications yet. Therefore, less stringent thresholds are applied for the validation exercise than for the operational service.

Indicator	Definition	Threshold operation	Threshold validation ex.
Service availability	Percentage of time that the service is up and running	>= 99.95 %	>= 95%
Message integrity	Percentage of messages transmitted by the service provider that correctly reaches the consumer system	>= 99.999 %	>= 99 %
Data integrity	For each message that correctly reaches the consumer system, the percentage of attributes that have been received with no error or corruption	>= 99.999 %	>= 99 %
Time of response	Time that it takes for the service to process a service request returning a single feature, single object and generate the required output ready to be distributed to the consumer.	<= 1 second	<= 10 seconds
Time for Transmission	Time that it takes to transmit the message from the service provider to the service consumer.	<= 1 second	<= 10 seconds

Indicator	Definition	Threshold operation	Threshold validation ex.
Compliance of Payload	Percentage of payload messages that are not compliant with the AIXM 5.1.x schema accepted by the service or distributed by the service	<= 0.001 %	<= 0.1 %
Compliance with SWIM-TI	Percentage of the interfaces of the service that are compliant with the SWIM Yellow Profile / SWIM-TI specifications in terms of AIRM/AIXM and ISRM compliance.	>= 99 %	>= 60 %

Table 6: Quality of Service for Aeronautical Information Service for TRL6

### A.4.3 Service Functions and Capabilities

### A.4.4 Service Interfaces

Service Name	Description
AeronauticalInformationService	<p>The AeronauticalInformationService is the result of the SESAR 2020 solution PJ.15-10 called Static Aeronautical Data Service. It was decided to use instead the name AeronauticalInformationService, as it actually provides information and not just data. Moreover, due to its temporality originating from the underlying AIXM information model, the information managed by the service is not purely static (i.e. changes only on a long-term basis), but also dynamic (i.e. also covers events and short-term changes like temporary runway restrictions etc.).</p> <p>The Aeronautical Information Service is an evolution of the {“AeronauticalInformationFeature”} service in the EATMA, which was developed for SESAR 1 and is an implementation of the service requested in the PCP (EU IR 716/2014 [7]) for “Aeronautical information exchange” on the Initial System Wide Information Management (iSWIM) over the yellow profile and defined as:</p> <p>Aeronautical information feature on request. Filtering possible by feature type, name and an advanced filter with spatial, temporal and logical operators.</p> <p>The Aeronautical Information Service provides:</p> <p>Aeronautical Information Service is to provide aeronautical information that was traditionally published in the AIP (Aeronautical Information Publication) and its AMDT (Amendments) every AIRAC cycle, in aeronautical Charts and with NOTAM (Notices to Airmen) or AIC (Aeronautical Information Circulars) for short term changes.</p>

Service Name	Description
	<p>The format / payload of aeronautical information follows the AIMX 5.1.1 standard (most current) and aims to always support the latest approved and operationally usable version of AIMX.</p> <p>The main covered Information Features include:</p> <ul style="list-style-type: none"> <li>* Airport / Heliport</li> <li>* Aerial Refuelling</li> <li>* Airspace</li> <li>* NAVAID and Point</li> <li>* Obstacle</li> <li>* Organisation / Unit / Authority</li> <li>* Procedure (SID, STAR, IAP, Holding)</li> <li>* Route</li> <li>* Service</li> <li>* Surveillance</li> </ul> <p>Transversal / Shared features:</p> <ul style="list-style-type: none"> <li>* Address</li> <li>* Aircraft and Flight</li> <li>* Airspace Layer</li> <li>* Circle Sector</li> <li>* Geometry</li> <li>* Light Element</li> <li>* Meteorology</li> <li>* Notes</li> <li>* Radio Frequency Limitation</li> <li>* Schedule</li> <li>* Standard Levels</li> <li>* Surface Assessment</li> </ul>



Service Name	Description
	<p>Information Retrieval:</p> <p>Information from the AeronauticalInformationService can be retrieved by:</p> <p>a) "Relational / attribute based" filtering: Information can be retrieved by filtering for individual attributes or by combinations of attributes, e.g. by name or identifier</p> <p>b) "Geographical filtering": Information can be retrieved by filtering geographically, i.e. all information within a given geographical area is retrieved</p> <p>c) Combinations of a and b.</p> <p>Communication Patterns:</p> <p>* Request / Reply: Submission of information and ad-hoc retrieval of information follows the request-reply pattern. Both synchronous requests (i.e. the caller waits for the reply) and asynchronous requests (i.e. the caller is notified when the result is available) are possible depending on the type of request and complexity of the query / amount of data.</p> <p>* Publish / Subscribe: Subscribers can register to be notified for short term events concerning a given geographical area or set of features or subscribers can register to be notified for long term changes concerning given geographical areas or sets of features</p> <p>Geographic Scope:</p> <p>Data in the Aeronautical Information Service is global, however, the most detailed information is available for such geographical areas, in which the Air Navigation Service Provider is also actively populating the Aeronautical Information Service with data. (Full data set). In other geographical regions, the data is restricted to the minimum dataset required for briefing, NOTAM processing and IFR Flight Planning.</p> <p>Deployment of the Service:</p> <p>In SESAR 2020, it was researched from a technical and commercial perspective what is the most technically and commercially beneficial deployment of the service. It was found that a regional deployment is most beneficial in comparison to sub-regional or local deployments due to the synergies gained from sharing the costs of establishing, maintaining and operating the service over as many users as possible.</p>

Service Name	Description
Service Interface Definition	Description
AeronauticalInformationServiceNotification	Notifications sent in case of changes in interested features or attributes of AeronauticalInformationService
AeronauticalInformationServicePublisher	AeronauticalInformationService Publisher Interface: Publishes topics for subscribing consumers. Consumers can e.g. subscribe to certain events that are interesting (e.g. changes to runways, airspaces etc.)
AeronauticalInformationServiceRR	Request / Reply interface for queries to the AeronauticalInformationService followed by responses to the consumers.
AeronauticalInformationServiceSubscriber	Subscribe to topics offered by AeronauticalInformationServicePublisher to be notified e.g. of interesting changes to runways, airspaces etc.
ProvidedAeronauticalInformationFeatureInterfaceDefinition	General Interface for accessing information in the AeronauticalInformationService

**Table 7: Service Interface description**



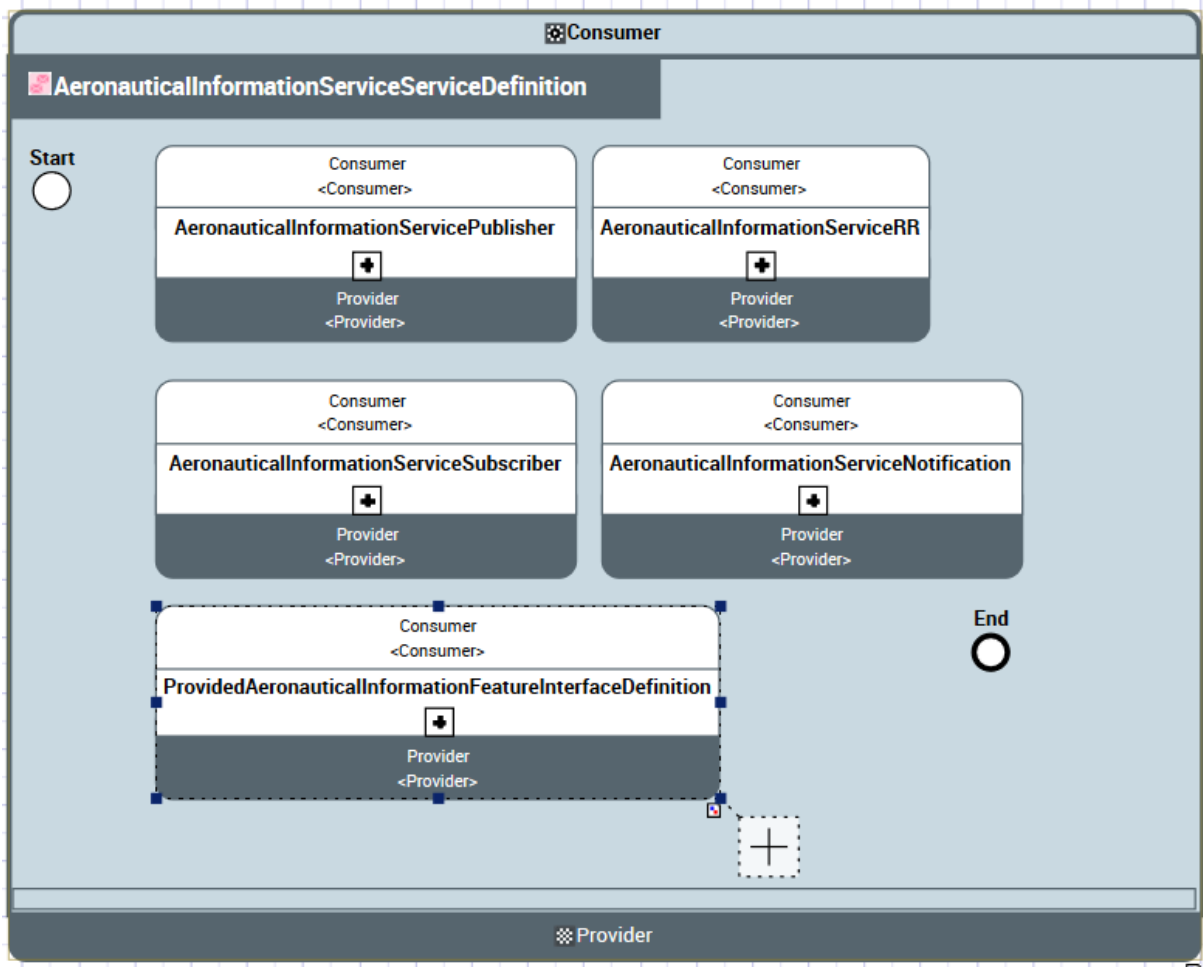


Figure 1: Service to Service Interface mapping

## A.5 Service interface specifications

### A.5.1 AeronauticalInformationServiceNotification

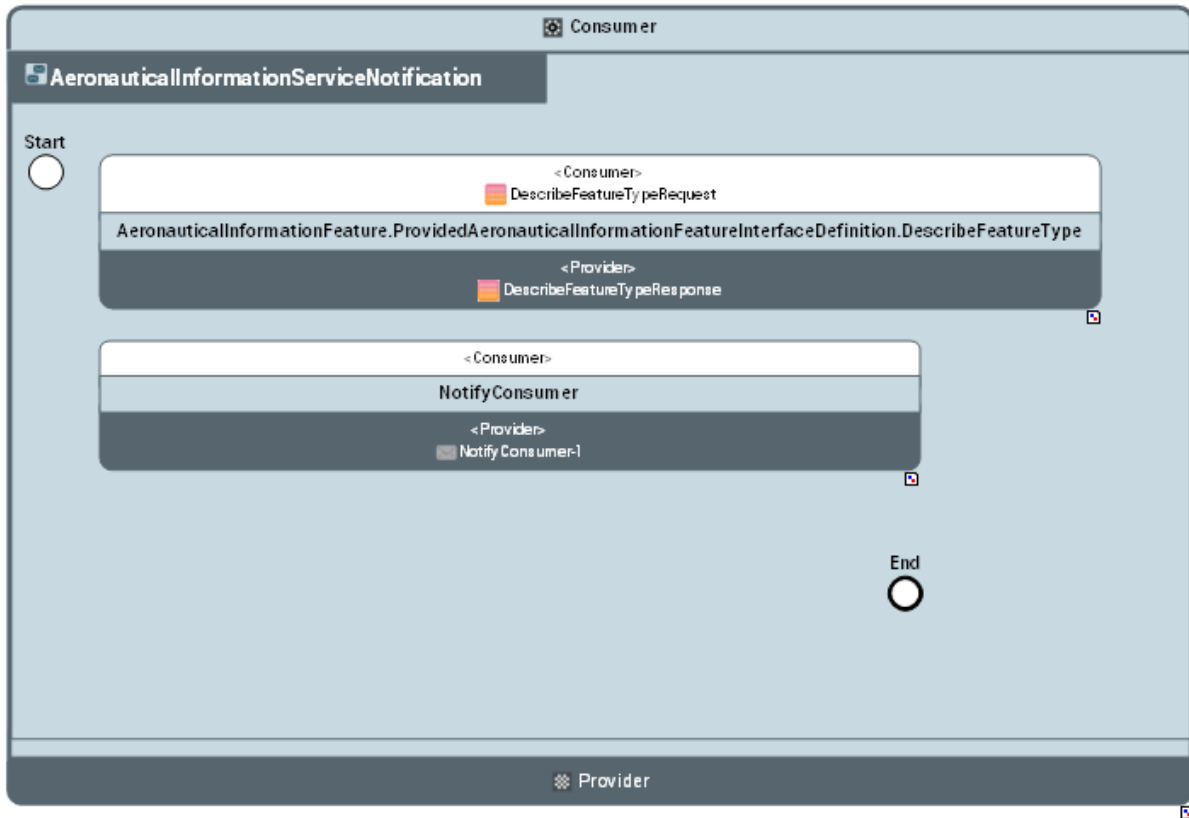


Figure 2: "AeronauticalInformationServiceNotification" Interface Exchange diagram

## A.5.2 AeronauticalInformationServicePublisher

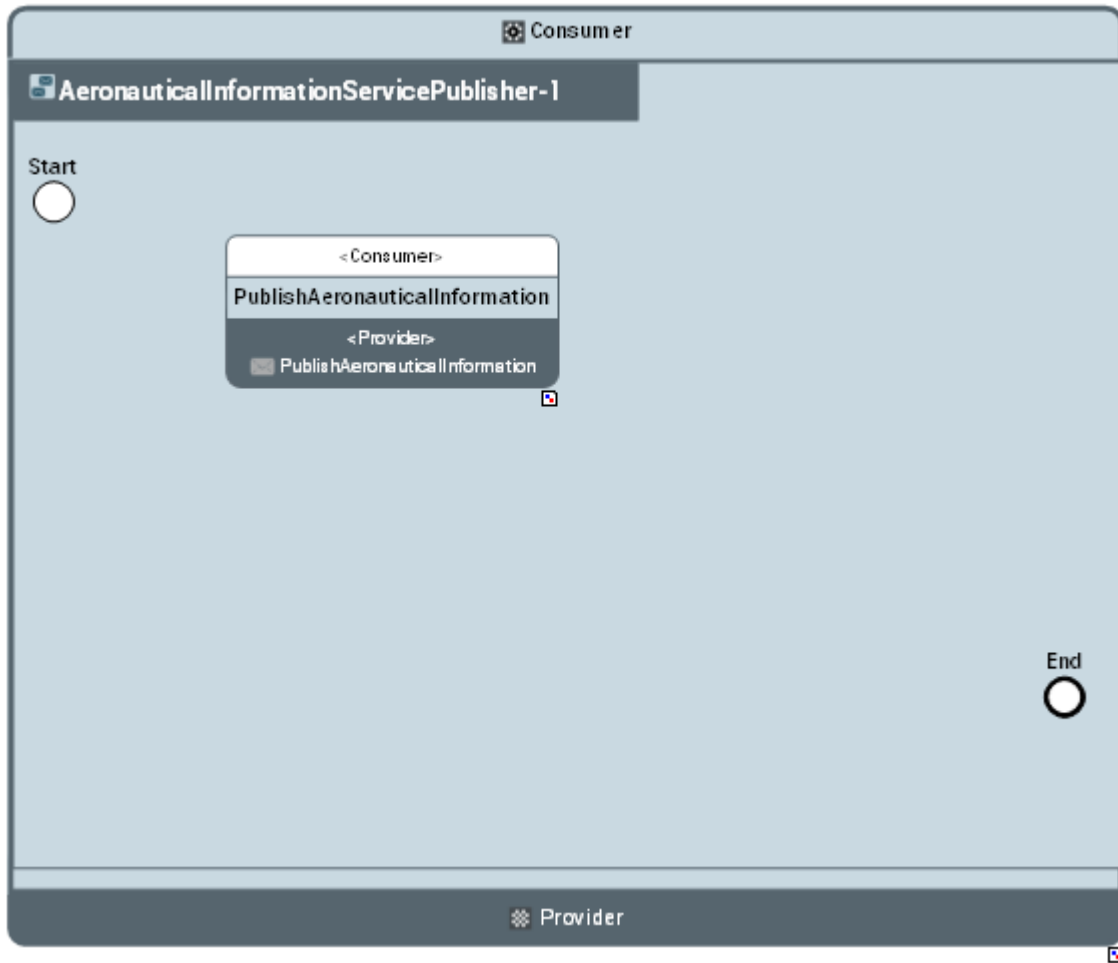


Figure 3: "AeronauticalInformationServicePublisher" Interface Exchange diagram

### A.5.3 AeronauticalInformationServiceRR



Figure 4: "AeronauticalInformationServiceRR" Interface Exchange diagram

### A.5.4 AeronauticalInformationServiceSubscriber

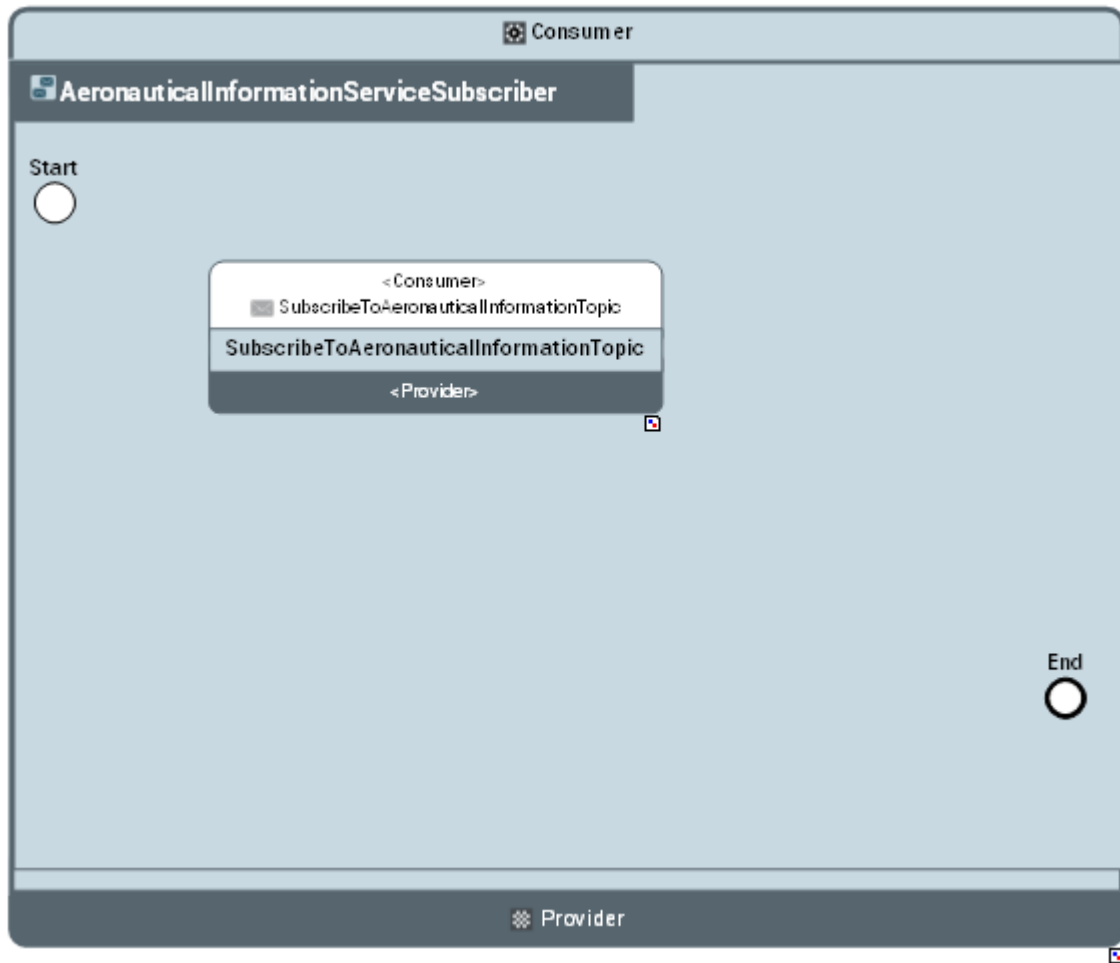


Figure 5: “AeronauticalInformationServiceSubscriber” Interface Exchange diagram

## A.5.5 ProvidedAeronauticalInformationFeatureInterfaceDefinition

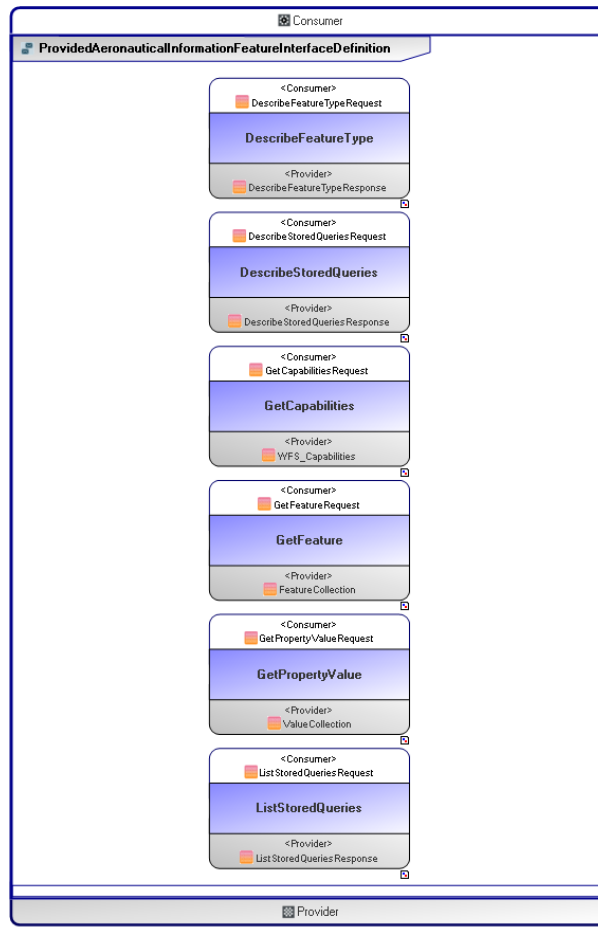


Figure 6: “ProvidedAeronauticalFeature” Interface Exchange diagram

### A.5.1.1 1. Operation DescribeFeatureType

No Comment available.

Input	Service Payload	CLDM Data Entity
	DescribeFeatureTypeRequest	
Return	Service Payload	CLDM Data Entity
	DescribeFeatureTypeResponse	

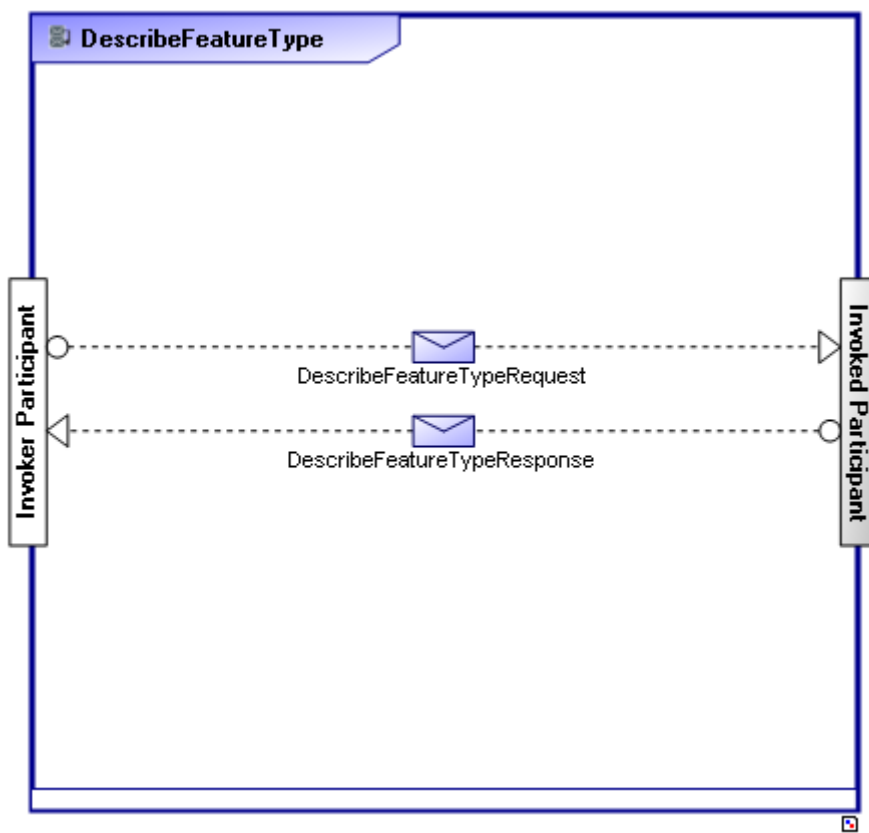


Figure 7: "DescribeFeatureType" Operation Exchange diagram

### A.5.1.2 Operation DescribeStoredQueries

No Comment available.

Input	Service Payload	CLDM Data Entity
	DescribeStoredQueriesRequest	
Return	Service Payload	CLDM Data Entity
	DescribeStoredQueriesResponse	

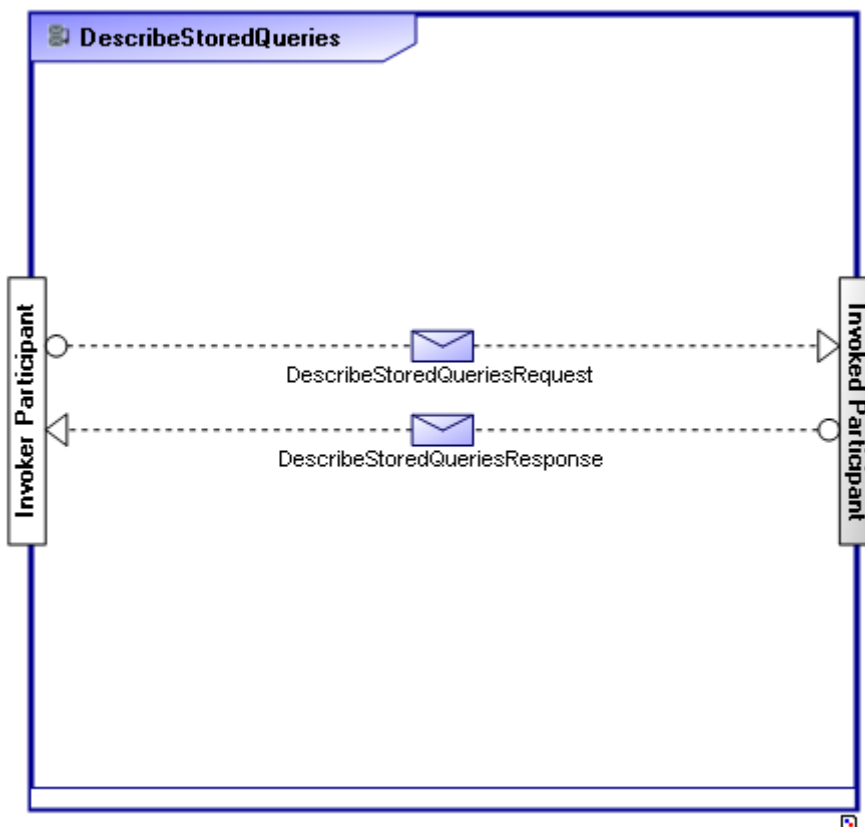


Figure 8: "DescribeStoredQueries" Operation Exchange diagram



### A.5.1.3 Operation GetCapabilities

No Comment available.

Input	Service Payload	CLDM Data Entity
	GetCapabilitiesRequest	
Return	Service Payload	CLDM Data Entity
	WFS_Capabilities	

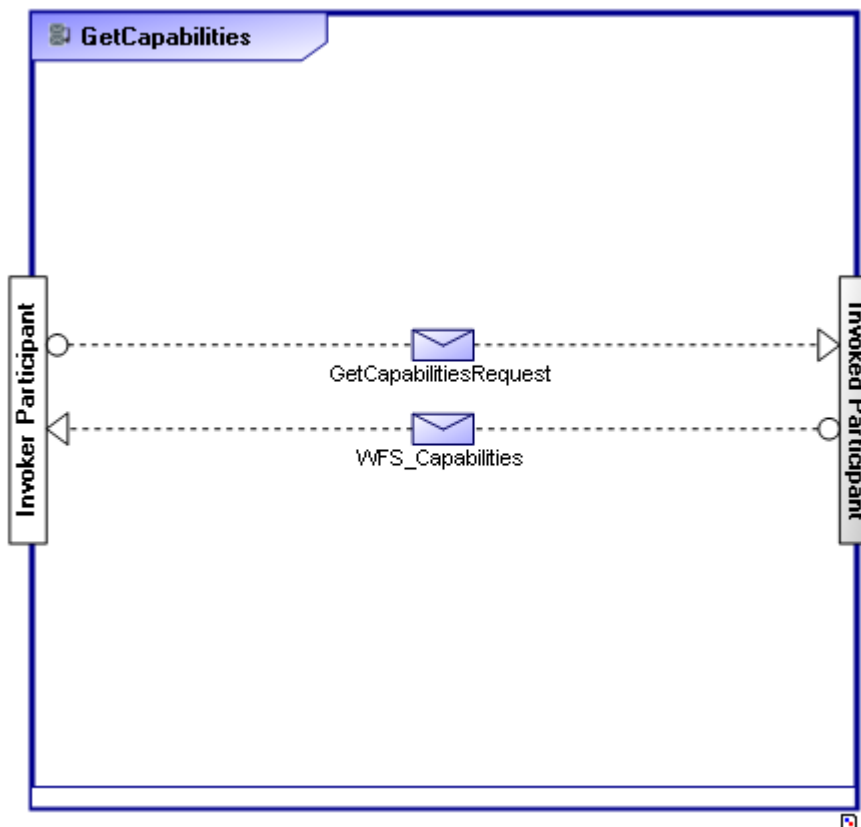


Figure 9: “GetCapabilities” Operation Exchange diagram

### A.5.1.4 Operation GetFeature

Input	Service Payload	CLDM Data Entity
	GetFeatureRequest	
Return	Service Payload	CLDM Data Entity
	FeatureCollection	

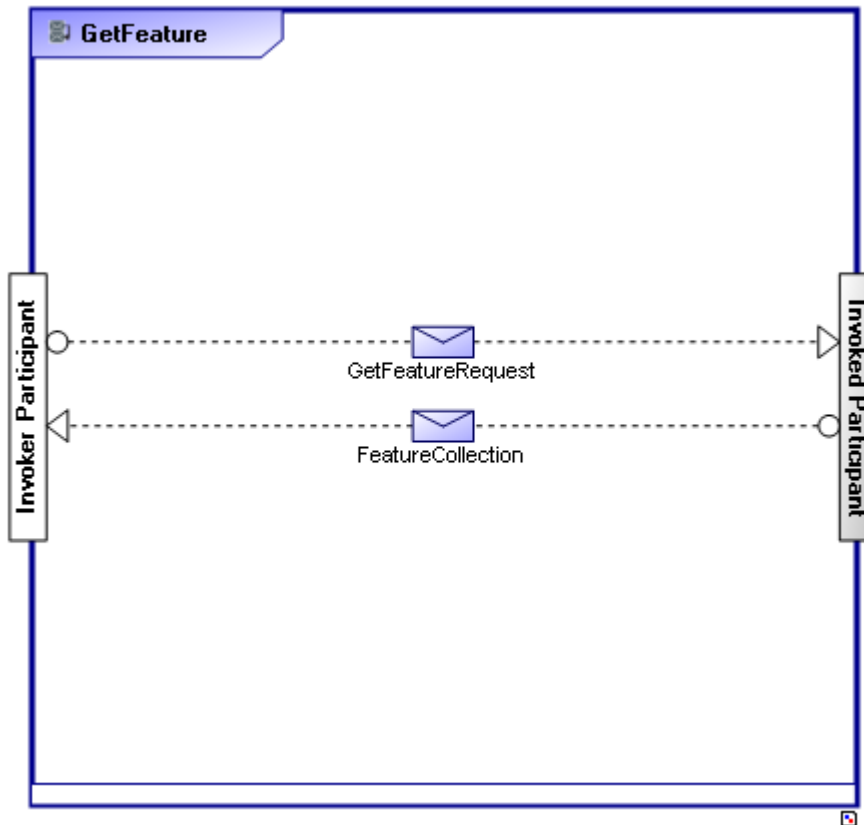


Figure 10: "GetFeature" Operation Exchange diagram

### A.5.1.5 Operation GetPropertyValue

Input	Service Payload	CLDM Data Entity
	GetPropertyValueRequest	
Return	Service Payload	CLDM Data Entity
	ValueCollection	

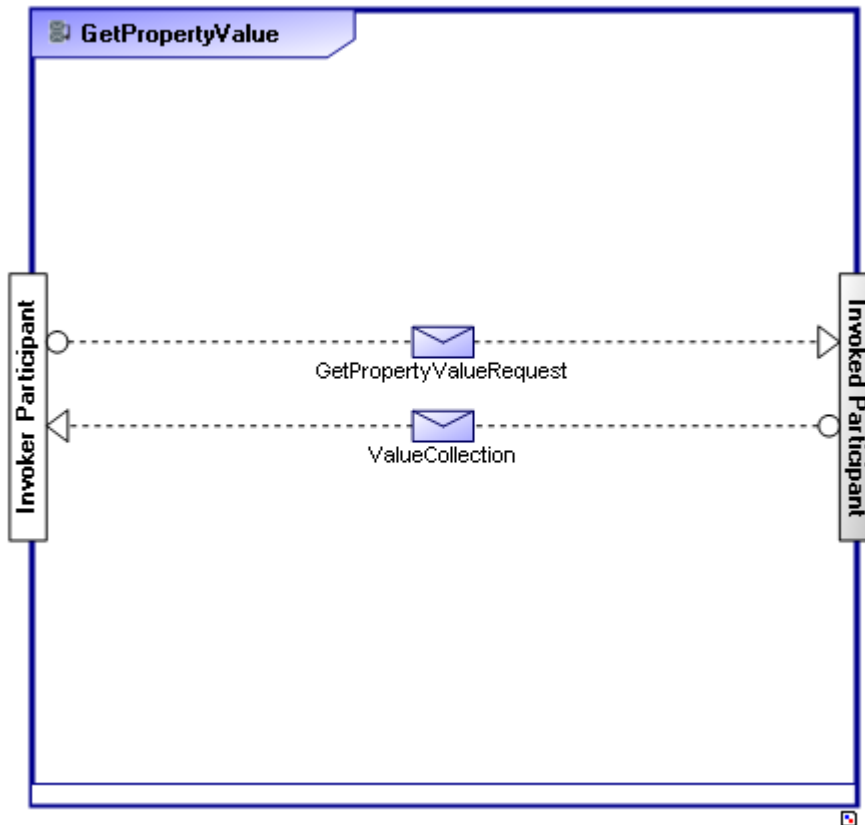


Figure 11: “GetPropertyValue” Operation Exchange diagram

### A.5.1.6 Operation ListStoredQueries

No Comment available.

Input	Service Payload	CLDM Data Entity
	ListStoredQueriesRequest	
Return	Service Payload	CLDM Data Entity
	ListStoredQueriesResponse	

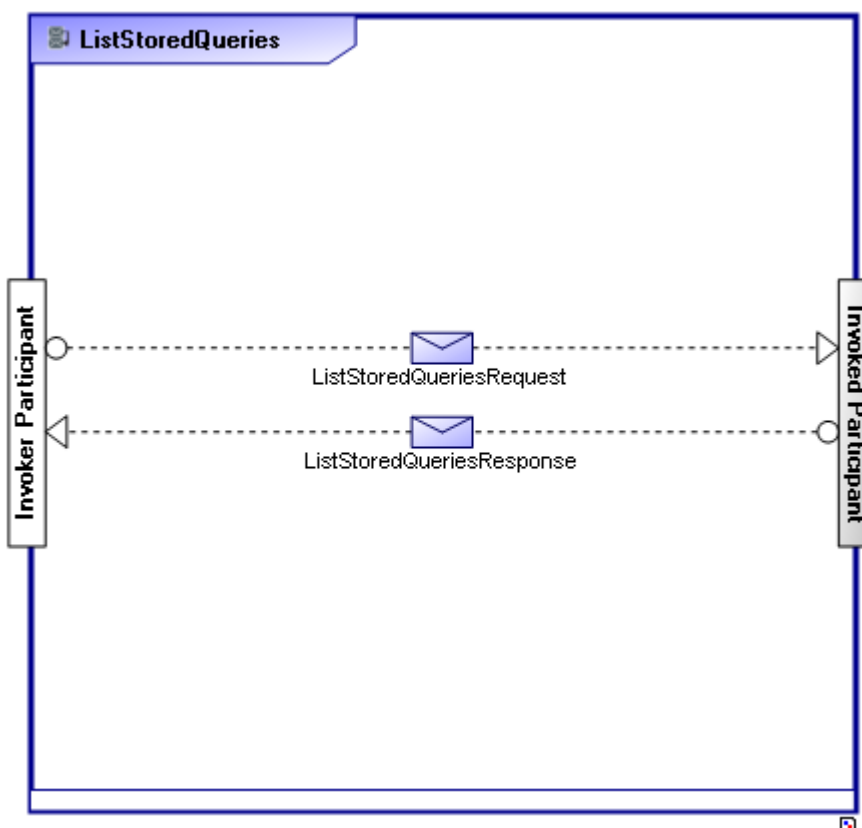


Figure 12: “ListStoredQueries” Operation Exchange diagram

### A.6 Payload Data Diagrams

The Aeronautical Information Service payload follows the AIMX standard, latest version.

### A.7 Payload Data Types

The Aeronautical Information Service payload follows the AIMX standard, latest version.

## A.8 Reference documents

- [1] SESAR2020 PJ19 D3.2 Service Portfolio 2017, Edition 00.01.00
- [2] EATMA V11 DraftSecRAM – Security and Risk Assessment MethodSESAR2020 PJ15-10 D6.2.050 Business ModelSESAR2020 PJ15-10 D6.2.070 High Level ArchitectureSESAR2020 PJ15-10 D6.2.030 TVALP

## A.9 Appendix: Gap Analysis Aeronautical Information Service / EAD

### 1. Description of PJ15 and EAD

#### 1.1 EAD

##### 1.1.1 Services / Functions

EAD is the European AIS Database. It was originally established in 2003 and provides the following key services / functionalities (additional support services are available, but not listed below as they are not relevant for this gap analysis):

- Core services for Information Management / Editing / Insertion:
  - NOTAM<sup>1</sup> Management (INO Data Provider) → traditional NOTAM not explicitly included in the Aeronautical Information Service, but implicitly via digital NOTAM in AIXM
    - produces and validates NOTAM (Notices to Airmen) and weather information (OPMET)
  - AIXM Data Management (SDO Data Provider for AIXM 4.5 and SDD for AIXM 5.1) → also covered by PJ15
    - produces and validates structured aeronautical information
    - Graphical visualisation in a GIS viewer is available as a support client application
      - in PJ15 Solution 11 a more sophisticated functionality is envisaged
  - Flight Plan submission to NM (Briefing Facilities) → not in scope for PJ15

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<sup>1</sup> Note: A NOTAM (Notice to Airmen) is a textual description of a significant event relevant to airspace users. A PERM NOTAM is NOTAM without a defined end-date.

- produces and validates flight plans / proposals
- Derived services for Information usage dependent on core services:
  - Pre-flight Information Briefing (INO Data User) → specific type of output and filtering, not explicitly included in PJ 15 in this form
    - retrieves / filters NOTAM and OPMET information
  - AIXM Data Reporting (SDO Data User) → covered in PJ15
    - retrieves / filters structured aeronautical information (AIXM)
  - Publication Management for AIP, AIC, SUP, AMDT (PAMS) → not in scope of PJ15
    - manages and publishes finished publication products
  - Publication Authoring (Charting, AIP) → AIP is not in scope of PJ15, but the visualisation of structured aeronautical information (not exactly with the same target functionality) is in scope of Solution 11
    - retrieves validated structured aeronautical information
    - produces publication products

As one of the constituents of the European ATM System, within EAD the collection, generation and processing of aeronautical data has to be performed in accordance with EU IR 73/2010.

This can be achieved by organisational, procedural and systemic measures to fulfil the regulatory requirements in order to achieve a high level of quality, integrity and reliability of the aeronautical data set. → The same applies for PJ15 as well.

### 1.1.2 Interfaces

EAD offers client applications (→ not in scope for PJ15), which can be used to manage the data, which are not relevant for this comparison, and a system-to-system interface called AIMSL (short for AIM Service Layer), which can be used to communicate with the system externally. (→ in PJ15: SWIM)

The services above are provided as a “SaaS” (System as a Service) to Eurocontrol members (AIS / AIM units of the ANSPs) and their clients (e.g. airspace users, ATC, other ATM actors).

The clients either utilize their own systems connected to EAD via AIMSL or they utilize EAD directly using the EAD client applications.

EAD currently offers the possibility to connect to the system via AIMSL as a web-service based interface, which is oriented towards the SWIM Yellow Profile. However, currently EAD does not offer full SWIM compliance, as the standard definitions for SWIM are not fully finalized and the SWIM Technical Infrastructure still needs to be established in Europe.

EAD also offers a Web Feature Service, which is also a candidate in the Yellow Profile, but as the full SWIM Infrastructure is not defined and operational yet, the interface cannot be seen in the target state yet.

### 1.1.3 Data Model

The current release of EAD (R10) is fully compliant with AIXM 5.1 in its SDD module, which is part of AIRM and also offers full access to this AIXM database via web service interfaces. → This is also in scope for PJ15

EAD additionally supports legacy data models / file formats like AIXM 4.5 and ARINC 424.

### 1.1.4 Operational Services

In addition to the purely technical service, EAD also comes with an operational service component. A service provider company called GroupEAD performs expert data clearance and consolidation for international data originating from outside the Eurocontrol area. → Operational services are currently not in scope for PJ15

A team of operational experts processes – supported by a high degree of automation in the system – incoming international data, validates and corrects it in accordance with a set of business rules and makes the world-wide dataset available for its members. The operational services also include expert data quality reviews and coordination activities between clients in case conflicting data updates are provided, which contain cross-border data conflicts.

The EAD system automatically correlates aeronautical dynamic data with published aeronautical static data and automatically detects potential inconsistencies. → Automatic validation is also in scope for PJ15

## 1.2 Aeronautical Information Service

### 1.2.1 Services / Functions

The function of the Aeronautical Information Service is to provide static aeronautical data in digital form to be used by different ATM systems (e.g. Safety Nets).

Input aeronautical data are collected from internal and external sources, conveniently validated, processed according to the regulatory requirements to ensure quality and integrity level and finally generated as dataset.

→ The collection and validation of aeronautical data is also in scope of EAD. The scope of EAD is world-wide, where a fully automated approach is not feasible due to different levels of technical maturity. The degree of automation for European data within Aeronautical Information Service can be much higher.

The accuracy and consistency of the data provided should be predictably enhanced, leading in turn to safety improvements, while the use of high-efficiency automated processes would allow cost reductions by a high margin.

→ PJ 15 will have additional business rules that increase the automation of validation for European highly structured data in accordance with AIRM / AIXM and ISRM

The output is an AIXM-compliant dataset whose subsets can be retrieved by individual requests demanding specific geographical areas, attributes or functional features.

→ The output of Aeronautical Information Service is more technically oriented than in EAD, which also offers end-user products. Aeronautical Information Service is a back-end service.

Function of the service: The service provides digital static aeronautical data as scoped by AIXM for the usage in ATM System components like SDD and Safety Nets, as well for simulation systems and other systems using digital aeronautical data.

The data can be requested in terms of geographical coverage and specific features and can be tailored in terms of display attributes and individual structures of layers.

→ This is also covered in EAD

The functionality shall include the collection, generation and processing of aeronautical data according to EU IR 73/2010 by organisational, procedural and systemic measures to fulfil the regulatory requirements in order to achieve a high level of quality, integrity and reliability of the aeronautical data set.

→ This is also applicable for EAD

### 1.2.2 Interfaces

SESAR 1 has defined AIRM and ISRM as the basis for SWIM. Moreover, SESAR 1 has defined the SWIM Technical Infrastructure and has defined a number of profiles with technical specifications regarding their quality of service capabilities and their intended use-cases and candidate technologies.

In order to leverage these designs, it is assumed that Aeronautical Information Service will be based on these SWIM standards and will run within the SWIM Technical Infrastructure. → full SWIM compliance is intended as a future development for EAD, but is currently not yet available

### 1.2.3 Data Model

In this context AIXM-compliant is to be interpreted as a fully AIRM compliant dataset, of which AIXM 5.1 is the portion related to AIM. → This also applies to EAD

In addition to AIXM, which is a part of AIRM, Aeronautical Information Service will also take into account that AIXM is embedded in AIRM and may have cross-dependencies on other AIRM components and needs to be harmonised with them. → this aspect is currently not covered by EAD

### 1.2.4 Solution 11

The Aeronautical Digital Map Service provides digital maps ready to be used by different ATM systems (e.g. Safety Nets) when performing separation functions. The output is highly customizable in order to meet the different requirements from the consumers and easily convertible among different digital formats, as AIXM, GML, XML, etc.

→ A digital MAP service as described for Solution 11 is currently not available in EAD.

The accuracy and consistency of the data provided should be predictably enhanced, leading in turn to safety improvements, while the use of high-efficiency automated processes would allow cost reductions by a high margin.



The Service collects aeronautical data from authorised sources, filters them and produces individual map graphics depending on the specific usages as geographical area or system functionality. In this sense, configuration management tools should be implemented to better satisfy the consumers requirements.

→ A service as described for central visualisation is currently not part of EAD

Given it is an offline service, no resilience measures have to be considered, but the output data should achieve high degree of quality, integrity and authenticity for safety reasons.

## 2 Gap Analysis

### 2.1 Services / Functions

#### 2.1.1 Additional Scope of Aeronautical Information Service

- Higher degree of automation for validation
- Configuration Management Tools
- Additional business rules for AIRM / ISRM

#### 2.1.2 Additional Scope of EAD

- Worldwide scope versus Europe Focus
- Specific Briefing reports
- Flight Plan Management
- Publication Management and Tools
- Front-end (client) tools

### 2.2 Interfaces

#### 2.2.1 Additional Scope of Aeronautical Information Service

- Full SWIM compliance
- Based on SWIM-TI

#### 2.2.2 Additional Scope of EAD

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### 2.3 Data Model

#### 2.3.1 Additional Scope of Aeronautical Information Service

- AIXM 5.1 and harmonisation / alignment with other AIRM components

### 2.3.2 Additional Scope of EAD

- Legacy File Formats

## 2.4 Visualisation

### 2.4.1 Additional Scope of Aeronautical Information Service

- Aeronautical Digital MAP Service (Solution 11)
  - can be a basis for aeronautical charting

### 2.4.2 Additional Scope of EAD

- Production of aeronautical paper charts

## 3 Tabular comparison EAD / PJ-15.10/11

	EAD	PJ-15.10/11
<b>Core Services</b>		
NOTAM Management ICAO (legacy)	Yes	Not in scope
Digital NOTAM	Planned in future	Yes (implicit)
AIXM Data Management (legacy AIXM 4.5)	Yes	Not in scope
AIXM Data Management (AIXM 5.x)	Partial	Yes
Flight Plan submission to NM	Yes	Not in scope
Service to ensure quality, integrity and reliability of the aeronautical data (business rules, operational service)	Yes	Yes
Provide static aeronautical data in digital form to be used by different ATM systems (e.g. Safety Nets)	Not in scope	Yes
Business rules that increase the automation of validation for European highly structured	Partial (no ISRM, no full AIRM)	Yes

	EAD	PJ-15.10/11
data in accordance with AIRM / AIXM and ISRM		
<b>Derived services for Information usage dependent on core services</b>		
Pre-Flight Information Bulletin / Briefing	Yes	Partial (more in SESAR 1)
AIXM Data Reporting	Yes	Yes
Publication Management for AIP, AIC, SUP, AMDT (PAMS)	Yes	Not in scope
Chart Authoring for print output	Yes	Not in scope
GIS output of AIM data	Basic client viewer	Aeronautical Digital Map Service usable also for systems
AIP Authoring	Yes	Not in scope
<b>Interfaces</b>		
Client / End-user applications	Yes	Not in scope (back-end service), but client applications provided for validation
System-to-system interface	AIMSL (pre-SWIM) (SWIM Payload and technology webservices, but no usage of full SWIM infrastructure)	Full SWIM
<b>SWIM Support</b>		
AIRM	Partial (AIXM 4.5, AIXM 5.1 mapped from 4.5)	Yes
ISRM	Partial	Yes

	EAD	PJ-15.10/11
SWIM-TI	Not in scope	Yes
<b>Data Model</b>		
Data Model – Compliancy with AIXM 5.1 Output	Partial, data converted from AIXM 4.5	Yes
DataModel – Compliancy with AIXM 5.1 Input	Planned	Yes
AIRM embedded AIXM	Not in scope	Yes
Minimum dataset mandatory	Yes	Yes
Full dataset mandatory	No	Yes
<b>Services</b>		
Automatic validation	Yes	Yes
Configuration management tools	Not in scope	Yes
Digital Map Service	Not in scope	Yes (PJ.15-11)
Centralised visualization	Not in scope	Yes
Operational Data Validation and Correction Service	Yes	Not in scope of pre-operational system but in final system
<b>Scope of Data</b>		
Coverage geographically	World-wide	Europe initially, worldwide planned
Data Coverage	Full AIXM 4.5 for Europe Minimum Dataset worldwide	Full AIXM 5.1

	EAD	PJ-15.10/11
Information directly usable by NM and other ATM actors	Partial	Yes
<b>Target Group</b>		
Airspace Users (physical)	Yes	Not in scope
Airspace User systems	Not in scope	Yes (SWIM)
AIM Organisations	Yes	Yes
NM	Partial	Yes (SWIM)
ATC Systems	Not in scope	Yes (SWIM)
FMS Providers	Not in scope	Yes (SWIM)
Other ATM Systems or ATM System components like SDD and Safety Nets, as well for simulation systems and other systems using digital aeronautical data	Not in scope	Yes (SWIM)
<b>Other</b>		
Degree of complexity in business rules	Medium	High
Degree of data automation	Medium	High