Study on the legal aspects of ATM services and the possible impact on SWIM
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Abstract

This document identifies legal aspects of the implementation of SWIM, intellectual property rights (IPRs), cost charging/recovery, liability, governance, the applicable legal instruments, and the compliance mechanisms are described in the context of information sharing in ATM.

The study also looks at what is currently in place for existing ATM services such as EAD, PENS, etc., and also INSPIRE as an example of what might be done for SWIM in terms of public-private partnership, IPRs, licensing, funding and pricing policy, etc.

The document provides conclusions and an orientation for the future SWIM legal framework.

Keywords

SWIM Governance Cost recovery
INSPIRE Compliance Charging
Intellectual property Licensing
Liability

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EXECUTIVE SUMMARY

Based on a review of legal ATM aspects as implemented by some European organisations and services, this document aims at identifying the relevant legal aspects regarding the implementation of SWIM. The focus is on intellectual property rights, cost charging/recovery, liability, governance, the applicable legal instruments, and the compliance mechanisms. For this purpose, the organisation of services and domains related to air traffic management will be described, in order to facilitate an understanding of how information sharing works within ATM.

The study looks at what is currently in place for existing ATM services such as meteorology, EAD, PENS and SURNET, and AIS domains.

The Directive of Infrastructure for Spatial Information in Europe (INSPIRE) is also explained. INSPIRE is an example of what might be done for SWIM in terms of public-private partnership, legislation on access to public sector information, IPRs, licensing, funding and pricing policy, quality of the data, and the interoperability and harmonisation of data. As the INSPIRE Directive is already in force in the Member States, a representative sample of countries is described in order to bring out the best practices.

The objective of this work is to provide an analysis of the current situation of each domain related to ATM by highlighting the red lines and similarities. This will help the stakeholders involved to identify the possible impacts on SWIM, and build SWIM's own legal framework.

The findings of this study show that:

- SWIM will not change the nature of the information (public or confidential). Therefore, it will not modify the basis of the contractual relationships between the air navigation stakeholders;

- the liability regime is likely to remain the same, unless an operational risk is conferred with SWIM;

- the existing governance systems of ATM services are a good example with regard to building the governance of SWIM;

- the mechanisms used for the charging and recovery of costs follow the common requirements issued by ICAO, and the European Union; and

- the standards for SWIM will be a combination of ATM-specific and general IT standards.
1. Introduction

1.1 Purpose and scope of the document

The Single European Sky (SES) was launched in 2004 by the European Commission to reform the architecture of European air traffic management (ATM). The SES aims at providing a management system for a more efficient, safer, and cleaner ATM.

To reach these objectives, the information system is a primary tool. System Wide Information Management (SWIM) has been defined as the backbone, and “consists of standards, infrastructure and governance enabling the management of the ATM information and its exchange between qualified parties via interoperable services.”

The ATM Master Plan provides a description of SWIM in its Chapter 3.2.1.1: “SWIM has been recognised as an essential enabler of ATM applications, the principles of which are also applied in, and supplied by, other industries. Technologies enabling SWIM capabilities required by ATM are available. SWIM as a methodology of sharing information can apply to all ATM capability and service levels [...]”.

SWIM is an enabler of end-user applications needed in ATM. It is not in itself an ATM end-user application. The concept of SWIM will make information more commonly available and consequently allow its usage by end-user applications. This will further allow an unconstrained implementation of end-user applications, by the full deployment of the relevant air and ground capabilities, and to provide benefits at an earlier stage;

- SWIM creates the conditions for advanced end-user applications based on extensive information sharing and the capability of finding the most appropriate source of information.”

Therefore, SWIM needs a legal framework to operate smoothly and safely. For this purpose, an institutional study is necessary.

The solutions already implemented in some ATM services and domains will enable this document to provide an initial answer to the questions regarding its legal aspects raised by SWIM in its definition phase. Each ATM stakeholder will be involved in the sharing of information: aircraft operators, airports, air navigation service providers (ANSPs), airspace users, meteorological information services, etc. All areas linked to ATM will be involved, as well as the European countries which are part of the Single European Sky.

In this document, four ATM services (Chapter 1), and two ATM domains (Chapter 2) have been studied as examples of what is currently being used in European ATM:

ATM Stakeholders
- Météo-France – The French bureau of meteorology
- European Aeronautical Database (EAD)
- Pan-European Network Services (PENS)
- Surveillance Data (SURNET)

ATM Domains
- Terrain and Obstacles Data (TOD)
- AIS-AIM – the UK current position

Their policies will be described to provide a better understanding of the current legal environment

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1 SWIM ConOps
2 “In this context "SWIM Capability Level" relates in some cases to an extension of geographical/spatial availability, although different ATM Service Levels may equally need more advanced and/or widespread implementation of SWIM.” ATM Master Plan, Edition 1, 30 March 2009, SESAR Master Plan – Deliverable 5, Chapter 3.2.1.1, p.38
3 ATM Master Plan, Edition 1, 30 March 2009, SESAR Master Plan – Deliverable 5, Chapter 3.2.1.1, p.38
in the sharing of information.

SWIM will need to:

- build a governance structure to supervise the whole system from a high level;
- consider the relevant applicable legal instruments;
- find out how to charge and recover costs;
- know who is liable in the event of wrong or erroneous information being provided;
- protect the information and the IPRs; and
- establish a compliance system to identify means of compliance, and check the compliance against SWIM standards.

Another objective is to provide an analysis of the current situation of each ATM-related domain. We will highlight the red lines and similarities in order to identify the possible impacts on SWIM, and to help it build its own legal framework.

1.2 Intended readership

Stakeholders interested in ATM, and in particular SWIM.

1.3 Document structure

The legal areas examined in this document are:

1. Governance structure
   - Structure
   - Obligations of the data users
   - Obligations of the data providers
   - Management of the agreement

2. Legal Instruments
   - Licence
   - Letter of Agreement
   - Common Procurement Agreement (CPA)
   - Applicable law

3. Charging
   - Charging criteria
   - Cost recovery

4. Liability
   - Insurance
   - Commercial provider issues

5. IPR
   - Principles
   - Confidentiality
   - Re-use of information
   - Commercial exploitation of data
   - Cross-border access to information
   - Requests for data

6. Compliance
2. The current running of four ATM Services

2.1 Meteorology: Météo-France policy

2.1.1 Introduction

The ICAO document 9161 on Air Navigation Services Economics states that meteorological services are part of a State’s responsibility. The MET services must meet the meteorological requirements under ICAO Annex 3 on Meteorological Service for International Air Navigation, and adequate procedures for determining the costs of this service. The cost allocation of MET services is subject to a State’s decision (financed partially or completely by its public budget). However, air traffic has to bear its own costs, and consequently a transparent and sound cost allocation is required. Since the aviation industry contributes to meteorological data as well as often financing parts of the meteorological costs, States should ensure accountability and consultation.4

The French bureau of Meteorology, Météo-France, is attached to the French Ministries of Transport, Infrastructure, and the Environment, and is the unique supplier for aeronautical MET information in France. It is an EPA (Établissement Public à caractère Administratif [public administrative body with legal personality]), and is financially autonomous.5

The organisation provides general meteorological information to private users (individuals or companies) as well as to public entities (government agencies), using two types of meteorological information; some is public and free of charge, some is charged, and subject to a licence. Two types of licences are used, depending on the nature of the information requested: the standard licence, and the special licence.

For MET aeronautical information, Météo-France uses AEROWEB. The service provides aeronautical information to airspace users.

ICAO Annex 3, Article 2.1.2 Chapter 2 defines the users of meteorological services: “The objective of meteorological service for international air navigation “shall be achieved by supplying the following users: operators, flight crew members, air traffic services units, search and rescue services units, airport managements and others concerned with the conduct or development of international air navigation, with the meteorological information necessary for the performance of their respective functions.”6

The definition is completed by France: “Users preparing the flight, or participating in its execution, on one or more aircraft capable of flying and moving in the air, registered, in French airspace, in the general air navigation and/or users flying under the French Leisure Aviation Federation, referenced by the DGAC in its annual report on light aviation.”7

2.1.2 Governance structure

The data users: Licensees are responsible for the execution of their obligations entrusted to a third party as they would execute them themselves. Licensees cannot use the information for a different aim than that allowed in the licence, without explicit agreement from Météo-France.8

The data providers: Météo-France is an EPA and is financially autonomous.9 The organisation is

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5 Article 1, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
6 Article 2.1.2 Chapter 2, ICAO Annex 3 on Meteorological Service for International Air Navigation
7 Conditions générale du service AEROWEB, Météo-France 2011
8 Licence de réutilisation d’informations météorologiques – Licence Standard, Article 6, p.2
9 Article 1, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
managed by a Chief Executive Officer, and administered by an administrative council.\textsuperscript{10}
The Council comprises eight State representatives nominated by the Minister of Transport for three years, and four experts, including one from the Administrative Supreme Court. They are chosen for their experience and skills. There are also six representatives elected among, and by, the Météo-France personnel for three years.\textsuperscript{11} The Council meets three times a year, and decisions are taken by the majority of the members attending.\textsuperscript{12} General matters such as policy, contracts, and budget are under the competence of the Council.\textsuperscript{13}

\subsection*{2.1.3 Legal instrument}

\textbf{Licence}: For general MET information, there are two different types of licence:

- \textbf{The Standard Licence} which covers the majority of meteorological information. Licensees can use the information for their own needs, and to add value to their services, offering them to a third party, free of charge or for a fee, including online services.\textsuperscript{14}

- \textbf{The Special Licence} allows licensees to use the information for their own needs and to add value to their own products/services, offering them to third parties, free of charge or for a fee, including online services. In addition, the use of imaging radar information to provide graphic products or services online is permitted.\textsuperscript{15}

Regarding MET aeronautical information, AEROWEB users agree to a licence which defines an airspace user, the IPRs, and the liability regime applicable to the provision of such information in FRANCE.

\textbf{Applicable law}: Agreements are passed under French Law (the French Government Procurement Code).\textsuperscript{16}

\subsection*{2.1.4 Charging}

\textbf{Charging criteria for general meteorological information}: There are four different types of information, classified by Météo-France as follows:

- Observation data
- Satellite imaging and radar
- Climatology
- Forecasting models

In each of these categories, the data can be made available either free of charge, or charged to the users and subject to a licence agreement.

\textbf{Criteria for the cost charging for MET aeronautical information}: Institutional products provided by the AEROWEB service are not free of charge, but accessible without additional costs for users satisfying the previous “airspace user” definition.\textsuperscript{17}

\textbf{Cost recovery}

A royalty fee is due by the user for each order. The amount is indicated in a quote that the user has

\begin{flushright}
\textsuperscript{10} Article 5, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
\textsuperscript{11} Article 7, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
\textsuperscript{12} Article 9, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
\textsuperscript{13} Article 10, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
\textsuperscript{14} Licence de réutilisation d’informations météorologiques – Licence Standard, Article 7, p.2
\textsuperscript{15} Supra note 13 - Licence de réutilisation d’informations météorologiques – Licence Standard, Article 7, p.2
\textsuperscript{16} Article 18, Décret numéro 93-861 du 18 juin 1993 portant création de l’établissement public Météo-France
\textsuperscript{17} Conditions générale du service AEROWEB, Météo-France 2011
\end{flushright}
to accept. The re-use of information by the licensee is subject to the payment of a royalty fee.\textsuperscript{18}

\subsection*{2.1.5 Liability}

\textit{Météo-France} has limited its liability for events arising or resulting from the interpretation or use of the information provided.

\textbf{Penalty:} In the event of a breach by the licensee, a claim may be brought to the competent jurisdiction. Licensees may face a penalty of up to EUR 300,000. They can also be prohibited from using public information produced or received by \textit{Météo-France} and the State, local authorities, other public persons, or private persons exercising a public-service mission, during a period of up to two years.\textsuperscript{19}

The liability regime for MET aeronautical information: \textit{Météo-France} has limited its liability for damages resulting from the inability to use or access the data, and from the loss or loss of benefit from the information provided on the website, regardless of the origin of the damages.\textsuperscript{20}

\textit{Météo-France} is not held responsible in the event of any damage resulting from the interpretation and/or use of information available on its website. Users must verify that the information is relevant for their own needs.\textsuperscript{21}

\subsection*{2.1.6 IPRs}

\textbf{Principles}

IPRs and the authorised use of the information and data are governed by licence agreements with each user. The information and data is the property of \textit{Météo-France} or its related organisations. They are the sole owners of the intellectual property rights relating to the information and data. These rights are not transferred to the licensee.\textsuperscript{22}

Regarding the information provided by AEROWEB, \textit{Météo-France} is the sole owner of the information and data, and it might be subject to a licence agreement.\textsuperscript{23}

\textbf{Re-use of Information:}

Where the information is not MET radar information, licensees can use it for their own needs, and to add value to their services, offering it to third party, free of charge or not, including online services.

Regarding the imaging radar information, licensees may use the information for their own needs, and create their own services to include added value, offering it to third parties, free of charge or for a fee, by any means except by online services. However, the publication of online products or services with added value, which do not permit the reproduction of original information, is authorised.\textsuperscript{24}

When using the AEROWEB website, the representation and/or the reproduction, even in part, of the content of the website and/or of one of its elements is prohibited, as is its commercial exploitation. The representation of a page of this website within a non-institutional framework not owned by \textit{Météo-France} and the insertion of a picture owned by \textit{Météo-France} in a page that is not owned by the licensee is prohibited, unless dispensation has been given by \textit{Météo-France}.\textsuperscript{25}

\textsuperscript{18} Supra note 13 - Licence de réutilisation d'informations météorologiques – Licence Standard, Article 7, p.2
\textsuperscript{19} Licence de réutilisation d'informations météorologiques – Licence Standard, Article 8, 8.1, p.2
\textsuperscript{20} Conditions générale du service AEROWEB, Météo-France 2011
\textsuperscript{21} Conditions générale du service AEROWEB, Météo-France 2011
\textsuperscript{22} Licence de réutilisation d'informations météorologiques – Licence Standard, Article 5, p.2
\textsuperscript{23} Conditions générale du service AEROWEB, Météo-France 2011
\textsuperscript{24} Licence de réutilisation d'informations météorologiques – Licence Standard, Article 3, p.1
\textsuperscript{25} Conditions générale du service AEROWEB, Météo-France 2011
Request for data

Users interested in accessing the meteorological information services may make a direct request to Météo-France on its website.

Some information is provided free of charge, and some information is not. For information to be provided free of charge, it must be used under certain conditions:

- The information must not be altered.
- The information must not be re-used for a different purpose than the mission of public service for which the information was produced and received by Météo-France.  

When a fee is charged for the use of the information, a specific licence agreement is negotiated with each user.

2.1.7 Compliance

Consumers

For general MET information, there are no compliance requirements regarding the users as they can be professionals or the general public.

Providers

For aeronautical meteorological information, Annex 3 of the ICAO Convention states in Chapter 2 – 2.2 that the contracting States should ensure that the meteorological organisation establishes and implements “a properly organized quality system”. This quality system should be in accordance with the ISO 9000 standards and certified by an approved organisation. Demonstration of compliance with the quality system applied should be accomplished through an audit.

Météo-France is certified ISO 9000 by Veritas.

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26 Article Météo-France: “La réutilisation des informations publiques de Météo-France”
27 Supra note 20 - Article Météo-France: “La réutilisation des informations publiques de Météo-France”
2.2 The European AIS Database

2.2.1 Introduction

The EAD service is a service provided by the EAD Group, and owned by EUROCONTROL on behalf of its Member States. The States are responsible for providing their respective national data (AIP) in EAD. The EAD service is provided by GroupEAD, a consortium of industry and service providers.29

EAD data providers are: civil aviation authorities (CAA), ANSPs, EUROCONTROL, and military organisations.

EAD data users are: aircraft operators, private pilots, commercial entities, and the general public.

Data providers send data directly into a European Aeronautical Information Repository, and EAD operational staff maintain data for States that have not yet migrated (i.e. which are not formally participating in the EAD), and world-wide States (outside ECAC and that are not formally participating in the EAD).

Data users retrieve data from a single point.

2.2.2 Governance structure

Structure: The EAD Service Steering Group (ESSG) provides guidance for the management of the EAD. It ensures the provision of the EAD service, maintains the commitment from EAD stakeholders and encourages a “standardised approach for the exchange of aeronautical information and related data.”30

The ESSG must:

- “provide guidance to EAD and ensure that the evolution is in line with EUROCONTROL objectives and customers’ requirements;
- provide advice, guidance and support to the Head of EAB related to the management of the EAD Systems and Services;
- advise on operational, policy or financial decisions to ensure that the EAD service remains viable and meets its business objectives;
- agree on actions having a major impact on the EAD functionality and/or on the budget,
- perform an annual review of the EAD service and copyright charging scheme.”31

The ESSG meets every six months to focus on “general management, system management, client migration, system performance and operational issues.”32

The ESSG comprises senior representatives from civil and military governmental organisations, and corporate or privatised ANSPs that have an interest in aeronautical information (AI) and/or responsibility for the provision of AI for or on behalf of:

- a ECAC Member State;
- any other State that has migrated to EAD as a data provider.33

Obligations of the data users: The users of the EAD service should coordinate with their national competent authorities to ensure that the operations with the EAD are approved. EUROCONTROL

29 DFS, Aena, Frequentis
30 EAD General Website: http://www.cfmu.eurocontrol.int/cfmu/public/standard_page/ead_ssg.html
31 Supra note 23 - EAD General Website: http://www.cfmu.eurocontrol.int/cfmu/public/standard_page/ead_ssg.html
32 Supra note 23 - EAD General Website: http://www.cfmu.eurocontrol.int/cfmu/public/standard_page/ead_ssg.html
33 Supra note 23 - EAD General Website: http://www.cfmu.eurocontrol.int/cfmu/public/standard_page/ead_ssg.html
must then be made aware of any national rules and regulation from a State, which may affect the EAD service. The users are responsible for the software operability.  

Management of the agreement: Each stakeholder must have a manager dedicated to EAD as a point of contact.

2.2.3 Legal instrument

Licence: There are agreements between the data provider/user, States ANSP/AIS, and EUROCONTROL: The Data Provider Agreement and the Data User Agreement. EUROCONTROL grants the client a non-exclusive, non-transferable licence to use the ESI-Software provided by EUROCONTROL for the sole purpose of using the EAD Service. Sub licences are prohibited.

The applicable law: The agreements are governed by the laws of Belgium: “The court of Brussels shall have the exclusive jurisdiction over any dispute relating to this agreement.”

2.2.4 Charging criteria

Cost charging
The charges applicable to EAD clients are a combination of EAD service charges, to cover the cost of the service provision, and royalty fees (for the use of the data) returned to the data provider.

EAD classifies three types of clients, those who do not pay a fee (type 1), those who pay a fee (type 2), and those who pay a fee plus an additional royalty (type 3).

Type 1 comprises clients acting on the behalf of a EUROCONTROL Member State and those who are recognised as airspace users.

Type 2 comprises clients who are using the data for their own business, without any commercial purpose, but which do not contribute to the EUROCONTROL budget or are not recognised as airspace users. They might also be clients who are software development companies, and provide airspace users with a mechanism to access EAD data.

Type 3 comprises clients who commercialise the data, with or without adding value to the products.

Cost Recovery
EUROCONTROL collect charges from the users for the use of EAD. It is based on different EAD services, with charges and royalty fees collected on behalf of the data providers.

2.2.5 Liability

The Data Provider Agreement states that EUROCONTROL is “responsible for the accurate transmission of Data received by the EAD to those recipients defined by the Client, ensuring the Data either remains unchanged or is changed correctly by the EAD.” Paragraph 3 of Article 8

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34 Client agreement document, version 1.0, Article 3.1 and 3.2, p.5
35 Client agreement document, version 1.0, Article 18, p.10
36 Client agreement document, version 1.0, Article 8, p.6
37 Client agreement document, version 1.0, Article 20, p.10
38 EAG Charging discussion document, EUROCONTROL, July 2011, 3. Charges, p.1
39 Client agreement document, version 1.0, Article 9, p.7
40 Supra note 32 - Client agreement document, version 1.0, Article 9, p.7
41 Supra note 32 - Client agreement document, version 1.0, Article 9, p.7
42 Supra note 32 - Client agreement document, version 1.0, Article 9, p.7
43 Data provider agreement document, version 1.4, Article 13, p.8
44 Data provider agreement document, version 1.4, Article 8, 8.2, p.7
states that “this responsibility refers only to adverse system impact on the Data, and to incorrect processing by the EAD staff, and explicitly does not include networks.” EUROCONTROL must also ensure that EAD complies with all appropriate and relevant international rules and regulations as well as the national ones.

However, according to Article 7 of the Data Provider Agreement, “EUROCONTROL does not warrant the completeness, correctness, adequacy, reliability, accuracy, safety or conformance of the Data with national or international standards.”

The Data User Agreement states that the parties are liable for direct damage resulting from a breach of their obligations to the Data User Agreement in the event of negligence, gross negligence or wilful misconduct. If there are damages due to corrupted data, EUROCONTROL is liable if the data has been corrupted by the EAD system. EUROCONTROL is not liable for damage caused by data corrupted because incorrectly introduced into the EAD system by a data provider (limited to EUR 1,000,000).

The parties are not liable for indirect damages such as those caused by business interruptions or economic loss.

Access to the EAD data and its system is provided on a “as-is” basis without guarantee of accuracy of its content, format, or fitness for a particular purpose. EUROCONTROL is not liable for any direct or indirect damages arising from the use of EAD data or services, such as those caused by business interruptions, except in the case of wilful misconduct.

Assurance: Regarding the EAD software, EAD accurately depicts the data as provided by data providers, and accurately inserts into the EAD information obtained from other sources. EUROCONTROL does not guarantee the completeness, correctness, adequacy, reliability, accuracy, safety or conformance of the data with national or international standards.

### 2.2.6 IPRs

**Confidentiality:** The receiving party of the information/data, as a general rule, does not disclose confidential information received.

Data providers are responsible for the “creation, maintenance and storage of aeronautical information. They retain full control of – and the IPRs of – the data they input into EAD.”

### 2.2.7 Compliance

**For the data providers:** The data is reviewed on a quarterly basis, is subject to validation rules, and there is a coordination of cross-border conflict resolution. There is also a system of data completeness monitoring.

**Services:** The EAD service has been certified with ISO 9001. The service is in line with ICAO standards, and EUROCONTROL Recommendations.

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45 Data provider agreement document, version 1.4, Article 8, 8.3, p.7
46 Data provider agreement document, version 1.4, Article 8, 8.2, p.7
47 Data provider agreement document, version 1.4, Article 7, 7.2, p.6
48 Data provider agreement document, version 1.4, Article 16, 5.2, p.9
49 Data provider agreement document, version 1.4, Article 16, 16.3, p.10
50 Client agreement document, version 1.0, Article 4, 4.1, p.6
51 Data provider agreement document, version 1.4, Article 7, 7.2, p.6
52 Client agreement document, version 1.0, Article 14, p.9
53 EAD General Website: http://www.cfmu.eurocontrol.int/cfmu/public/standard_page/ead_dp_area.html
54 Client agreement document, version 1.0, Article 5, 5.5, p.6
2.3 Pan-European Network Services

2.3.1 Introduction

PENS is an international ground-to-ground communications infrastructure jointly implemented by EUROCONTROL and the EUROCONTROL ANSPs. PENS provide a common IP-based network service across the European region, operated by a Network Service Provider (i.e. SITA). In accordance with the "Charging for the PENS" document\(^{55}\), each PENS user has to pay a charge for the service required.

PENS users are EUROCONTROL for the CFMU (now Directorate Network Management) and EAD service, ANSPs (ENAV, NATS, DFS, DSNA, Skyguide, LPS, NAV Portugal, HUNGAROCONTROL, AVINOR, SLOVENIA CONTROL, CROATIA CONTROL, FINAVIA, AUSTROCONTROL, AENA, LFV, and NAVAIR. IAA has signed a Letter of Intent, and BULATSA, ROMATSA, and PANS have signed the Common Procurement Agreement, which is the first step in the application process.

PENS is one of the stakeholders of the Collaborative Decision Making (CDM) concept being developed in the context of SESAR, and the backbone of SWIM.

2.3.2 Governance structure

The PENS governance document describes the parties involved: PENS Contractor (the Network Service Providers), PENS Steering Group (PSSG), PENS User Group (PUG), and PENS Management Unit (PMU). Governance comprises the actions required to set objectives and standards for PENS and to impose the appropriate level of oversight to ensure that the objectives and standards are being met. There are two PENS governance bodies; the PSSG and the PUG. In addition, there are committees within the regular EUROCONTROL working arrangements, which have an interest in the provision of communications services and may need to be consulted on matters related to PENS operations.\(^{56}\)

PENS is operated by the NSP acting under a contract let by EUROCONTROL on its own behalf and on behalf of the PENS users organisations (PENS contract). The user organisation authorises EUROCONTROL to act on their behalf in the negotiation and management of the PENS Contract with the Network Service Provider by means of a Common Procurement Agreement (CPA).\(^{57}\)

Structure:

i. **PENS Steering Group (PSSG)**

The PENS Users have representatives in the PSSG. It sets policies with standards and performance review. It also provides direction and guidance to the PMU (service and business planning, financial, security, contractual and procurement matters). The group steers and oversees the activities of the PENS User Group including requests for specific deliverables, monitors progress, and validates the agenda.\(^{58}\)

Only PENS Users, those who have signed the PENS contract, may have a representative with right to vote at the PSSG. The candidate to be PENS Users, those who have signed the CPA but not the PENS contract, may be observers. The other ANSPs in neither situation are not in the PSSG.

ii. **PENS Users Group (PUG)**

\(^{55}\) Charging for the PENS, Ed 01.01, 2009, Yvan Fisher

\(^{56}\) PENS Governance Structure document, Ed 2.0, 2011

\(^{57}\) PENS Governance Structure document, Ed 2.0, 2011

\(^{58}\) PENS Governance Structure document, Ed 2.0, 2011, 3.2 (4) p.5
Under the oversight of the PSSG, the PUG is a committee with members from the user community who carry out reviews of performance, user needs, policy and standards. The PUG advises the PSSG of its findings and draws the attention of the PSSG to deficiencies or emerging opportunities. It reports its activities to the PSSG.59

iii. PENS Management Unit (PMU)

The performance of the NSP is monitored and supervised on behalf of the user organisations by the PMU, within the EUROCONTROL Agency. It implements policy and standards set by the PSSG, and therefore manages PENS, on behalf of the users. It assists and advises the PSSG in the development of policy and standards for the management of the service and the PENS business plan.60

The different tasks of the PMU are:

Service level management: to supervise the Network Service Providers on incidents, problems, configurations, changes, and management availability.61

Change management: to accurately define the changes to be performed by the NSP and to assure their correct planning and implementation by the Network Service Provider.62

Financial management: to advise and make recommendations to the appropriate EUROCONTROL units on contractual and financial matters: pricing and process for the financial management.63

59 PENS Governance Structure document, Ed 2.0, 2011, p.5-6
60 PENS Governance Structure document, Ed 2.0, 2011, p.6
61 Financial management process document for PENS, version 1.4
62 Supra note 50 - Financial management process document for PENS, version 1.4
63 Supra note 50 - Financial management process document for PENS, version 1.4
64 EUROCONTROL website: http://www.eurocontrol.int/communications/public/standard_page/pens.html
Relationships within the PENS governance structure: the PSSG steers the PUG and the PMU. The PUG reports to the PSSG and the PMU manages the NSP, which delivers service to PENS users (ANSPs and EUROCONTROL).

2.3.3 Legal instrument

There are two legal instruments:

i) Common Procurement Agreement (CPA)

The CPA is signed bilaterally between EUROCONTROL and the organisations that want to become a PENS User. It is the first step for a user who wishes to be part of the PENS. It authorises EUROCONTROL to act on behalf of each signatory in the selection of the NSP, the negotiation and signature of the PENS contract and the subsequent management of the contractual relationship with the NSP.65

ii) PENS Contract

PENS is provided by the Network Service Providers acting under a contract let by EUROCONTROL on its own behalf and on behalf of the PENS user organisations. The PENS Contract may also be signed by the PENS User concerned (in such case EUROCONTROL will need in any case to sign as well so as to commit to its obligations relating to the management of the PENS Contract).

The PENS Contract is a single legal instrument binding several parties (NSP, ANSPs which are a party to the contract and EUROCONTROL). The PENS contract defines the right and obligations of each party and does not establish a joint or several liability of the PENS User vis-à-vis the Network Service Provider.

2.3.4 Costs

PENS costs are:66

- Costs made by the NSP: network, provision and management of equipment at the PENS service delivery points. Each PENS User is charged individually, depending on its respective use (size of the bandwidth). The PENS Users will pay the price of their use depending on the site and the location.

- PMU costs: staff, equipment, operational and administrative costs. The costs of the PMU are fixed by EUROCONTROL in accordance with its own internal rules and as agreed by its governing bodies. They have been financed for the first 3 years of the PENS Contract. They should be charged to the PENS ANSPs Users from there onwards.67

- Costs of the governance bodies: PENS ANSPs Users and EUROCONTROL are responsible for their own participation costs to the PSSG and the PUG. EUROCONTROL provides the secretarial function for the PSSG and the PUG.68

Setting and Invoicing of costs:

The particularity of PENS is the cost sharing of common costs. The NSP submits the invoices with the amounts agreed by the PENS Management Unit (PMU) directly to each of the PENS users and these pay the Network Service Provider directly. Thus, EUROCONTROL is invoiced directly the costs of its own PENS Users (CFMU and EAD as per PENS Contract).69

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65 PENS Governance Structure document, Ed 2.0, 2011, p.6
66 Charging for the PENS document, 2009, p.4
67 This might change as the User Pay Principle has recently been adopted within EUROCONTROL.
68 Charging for the PENS document, 2009, p.5
69 Charging for the PENS document, 2009, p.10
2.3.5 Liability

Liability in the context of the CPA:

SITA is responsible for the provision of PENS services to EUROCONTROL and the PENS ANSPs Users. EUROCONTROL is not liable in the event of damage due to the provision of the services, as it only takes care of the management of the PENS Contract.

The liabilities of each party to the PENS Contract are established in the PENS Contract and it is important to note that EUROCONTROL and each ANSP which becomes a party to the PENS Contract, is not jointly and severally liable towards the Network Service Provider.

2.3.6 Copyright

In the relationships between the PENS Users (i.e. EUROCONTROL and ANSPs PENS Users) and SITA, the foreground Information will be owned by the PENS Users having paid for its development under the PENS Contract. The PENS users may grant a licence to SITA. The licence provides a legal framework for the use of the information.

The permission to use the information for a commercial purpose shall be subject to a licence agreement and eventually, may be subject to the payment of a royalty fee.

Conversely, the PENS users may be granted a licence to use SITA’s background information.

2.3.7 Compliance

There is no compliance to standards for PENS. The service is considered to be a telecommunications service and not a pure aeronautical service. The ANSPs do not certify telecommunications services. However, potential safety issues have been raised, and are currently being discussed.
2.4 SURNET: Surveillance Data Network

2.4.1 Introduction

Surveillance data distribution uses a network called SURNET, formerly called RADNET. This network is a means to exchange surveillance data in the area of the Four States (Germany, Belgium, the Netherlands and Luxemburg), MUAC, and with neighbouring countries. The principle is that everyone who signs the surveillance data-sharing agreement can use the data. The networks are connected with each other, and the hardware (RMCDE: SuRveillance Message Conversion and Distribution Equipment) is owned by the national ANSPs. The various users and providers include the DFS, the Ministry of Defence in Germany, Belgocontrol, the Ministry of Defence of Belgium, the EUROCONTROL Maastricht Upper Area Control Centre. External users include NAVIAIR in Denmark, Austro Control in Austria, the DSNA, and Deutscher Wetterdienst (German meteorological information service provider). The sharing of information and data is free of charge between the parties of the surveillance data-sharing agreement. Access to the data by third parties is subject to approval by the SURNET Board. Currently the exchange of data with third parties is also free of charge, with the exception of UK NATS, which charges for the provision of surveillance data to the SURNET users.

2.4.2 Governance structure

Structure: The SURNET board is composed of representatives of the parties who signed the surveillance data-sharing agreement. The board supervises the operations of the SURNET network, adopts modifications to the equipment for the provision of surveillance data, adopts amendments to the surveillance data-sharing agreement, and informs the SURNET users of decisions.74

Management of the agreement: The SURNET board is entrusted with various functions including supervision of operations and adoption of modifications to the equipment for the provision of surveillance data and for private circuits, adoption of amendments, etc. A decision must be unanimous. Each party has one vote.75

2.4.3 Legal instrument

The provision of data is subject to a written surveillance data-sharing agreement between the provider and the user, containing legal and funding provisions.76

Licence: The RMCDE Implementation Team (RIT) at MUAC is responsible for the administration, documentation and maintenance of the software running on the SURNET Service Access Point, as agreed in the respective SLA, and is subject to a licence agreement.

Common Procurement Agreement (CPA)77: EUROCONTROL is the facilitator and developer. A CPA is used for the equipment for RMCDEs, in order to make it easier for the ANSPs. The CPA is signed by EUROCONTROL, but payment is made by the ANSPs directly.

Applicable law: Any dispute relating to the agreement itself which may arise between the parties and which has not been possible to settle by negotiation must be referred to arbitration, pursuant to the provisions of Article 31 of the amended Convention.78

74 SURNET – Surveillance data sharing agreement, article 13, p.7
75 Supra note 58 - SURNET – Surveillance data sharing agreement, article 13, p.7
77 This CPA is not the same as the PENS CPA.
78 SURNET – Surveillance data sharing agreement, article 15, p.8
2.4.4 Charging

Cost charging: “Initial and periodic cost in respect of equipment and private circuits and the cost of maintenance and any modification arising from the surveillance data sharing agreement is borne by SURNET Users, each paying its share, unless otherwise specified.” This applies to the infrastructure in general, maintenance of the equipment and the rental of the telecommunication lines.

This is not related to the data that is exchanged. In principle, the use of surveillance data is free of charge for SURNET users. Nobody pays if the exchange remains between the parties who signed the surveillance data-sharing agreement. The exchange of data with third parties is also free of charge, with the exception of UK NATS, which charges for the provision of data to SURNET users.

2.4.5 Liability

The SURNET surveillance data-sharing agreement states that data providers are not be considered liable for any break in the provision of surveillance data which is due to a failure or defect in a private circuit. Data providers are not liable for any direct or consequential costs, loss or damage from any break in the continuity of the data provided.

SURNET users indemnify the data provider against any costs, charges, losses, expenses, demands, claims, etc.

According to the agreement, it is the responsibility of the ANSPs that data comply with the requirements defined at local level. The data providers must make sure that the data is as good as possible, but the ANSPs may have different requirements as regards quality. Therefore, the latter must check the data before using it.

2.4.6 IPRs

Principles: Users employ the surveillance data provided only to ensure the safe, proper and continuous operation of their ATS or activities in support of ATS, and for technical demonstration, evaluation and test purposes related to the operational tasks of SURNET users.

Confidentiality: All data derived from SURNET are confidential. SURNET users must not communicate to any party not specified in the surveillance data-sharing agreement the information supplied, before obtaining permission.

The information must not be used for the assessment of ATC working procedures.

In each organisation, a local manager is responsible for authorisation to access and use data. It must be ensured that no unauthorised staff can access data.

Re-use of information: In principle, it is not allowed for the users of the data to redistribute data without getting permission according to the procedures specified in the Guidelines and Procedures for the Provision of Live Data from the Four States RADNET. The knowledge derived from the received data must not be revealed to a third party.

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79 SURNET – Surveillance data sharing agreement, article 12, p.6
80 Supra note 62 - SURNET – Surveillance data sharing agreement, article 12, p.6
81 SURNET – Surveillance data sharing agreement, article 14 (1. and 2.), p.8
82 Supra note 64 - Surveillance data sharing agreement, article 14 (1. and 2.), p.8
84 Supra note 55
No other use of data other than as specified in the agreement is permitted. If data is used outside the agreement, delivery can be stopped immediately without prior notice.

**Cross-border access to information:** Trans-border data exchange allows synergies to be built between the parties concerned and contributes in an efficient way to achieving the required separation minima, while at the same time limiting the effects on the environment.  

**Request for data:** For operational users, a request for the provision of data must be submitted to the Secretary of the SURNET Board. An evaluation is performed in close coordination with the Common Network Group/Office.  

For non-operational users, the provision of such data must be beneficial to network and/or common developments and should not jeopardise in any way the proper functioning of the network. A request must be addressed to the Secretary of the SURNET Board, providing an explanation for the need for live data, the purpose, required period, intended use, and expected benefit from using live data.

### 2.4.7 Compliance

**Users**
The users must put in place all procedures required to ensure that the service levels related to the use of SURNET comply with the requirements imposed by the respective NSA.  

**Providers**
Data providers must put in place all means to ensure the quality of the surveillance data in accordance with the requirements imposed by their NSAs. They must take all possible steps, in accordance with the standards commonly adopted by them, to maintain the quality and continuity of the provision of surveillance data by the facilities.

### 2.4.8 Further relevant information related to SURNET

“The most important objective is to make sure that the network does not get overloaded and that confidentiality is guaranteed.” For this purpose, SURNET distinguishes between operational users and non-operational users.

Operational users are those providing operational services, and the ATC units. There is usually no restriction applied to the provision of data to this category of users. Some restrictions may apply to users supporting operational users. As a matter of principle, the other users shouldn’t be allowed to get data from RADNET, but permission may be granted, to include a time frame for the provision of data, and only after close examination by the RADNET Board.

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86 SURNET – Surveillance data sharing agreement COST, Annex III  
88 Live data is a standardised, categorised and reliable surveillance data that has a high update rate. All users are provided with the data at the same time, and according to their needs.  
90 SURNET – Surveillance data sharing agreement, article 10, p.5  
91 Supra note 60 - Surveillance data sharing agreement, article 10, p.5  
93 Supra note 70 – Guidelines and Procedures for the Provisions of Live Data from the 4 States/ EUROCONTROL Surveillance Data Network RADNET, Version 1.3, 2009, p.3  
The exchange of surveillance data between those who have signed the surveillance data-sharing agreement must be done in the ASTERIX data format.95

2.5 ATM services analysis

2.5.1 Météo-France

Météo-France is attached to the Ministry of Transport, Infrastructure, and the Environment. The organisation is the main supplier for meteorological information services in France, and provides information to professionals and to the general public.

To protect their work, the provision of meteorological information is subject to a licence agreement that sets the rights and obligations of the user and the provider. There are two different types of Licence: the Standard Licence and the Special Licence. Depending on the type of information requested, customers may have to pay a royalty fee. This is usually the case for professionals, when the requests for information are specific to an activity.

The liability regime is of a particular type, due to the nature of the MET information, which cannot be certain. The provider must provide the information on time, and may be subject to a civil liability claim under the Napoleonic Code in the event of voluntary late provision of meteorological information, for example.

As for aeronautical meteorological information, Météo-France, like many other Meteorological information services in the world, follows Annex 3 of the ICAO Convention regarding the quality system required, and is ISO 9001 certified.

2.5.2 EAD

EAD is a service provided and owned by the GroupEAD on behalf of EUROCONTROL. The data provider/user agreements are therefore concluded with EUROCONTROL. The licence mechanism is also granted to the client for use of the software provided by EUROCONTROL.

The use of EAD services is charged directly to the users. For this purpose, there are three different types of clients: the client acting on behalf of EUROCONTROL; the client using the data without commercial purpose; the client who can commercialise the data, with or without added value. The charges or/and royalty fees are collected directly from the users by EUROCONTROL, depending on the services used.

EUROCONTROL is not responsible for the data stored in EAD, unless the latter is altered, or modified within the system. This means that in the event of damage, the liability regime runs between the parties (the users and the provider), but does not include EUROCONTROL.

EAD is certified with ISO 9001.

2.5.3 PENS

PENS was implemented jointly by EUROCONTROL and the ANSPs to provide a network service in Europe, operated by an NSP: SITA.

The governance structure is divided in three groups:

- one group, the PMU, is dedicated to the management of PENS. This group has three tasks to perform: service-level management, change management, and financial management. The PMU therefore supervises the performance of the NSP, and assists the PSSG in the development of policies and standards, and implements the latter.

- The two other groups are governance bodies, the PSSG and the PENS User Group:

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95 SURNET – Surveillance data sharing agreement, article 7, p.5
- The PSSG set standards and policies, and provides direction and guidance to the PMU in its tasks. The group steers and oversees the activities of the PUG.
- The PUG represents the users of PENS, and advises the PSSG of its findings. The Chairman of the PUG is a member of the PSSG.

Given the nature of PENS, there is no need to use a licence agreement. The Common Procurement Agreement is the first legal step for PENS. This agreement authorises EUROCONTROL to act on behalf of the parties in the selection of the NSP, and negotiation and signature of the PENS contract. This legal instrument makes it possible to avoid a call for tender every time a new stakeholder wishes to be part of PENS.

The cost charging/recovery mechanism is based on the sources of the costs of PENS: PMU and PSSG. SITA bills the users directly.

EUROCONTROL is not responsible in the event of damage due to erroneous data, unless the data has been changed within PENS.

IPRs do not apply here, given the nature of the PENS service, which is an IP-based managed network service across the European region.

2.5.4 SURNET

Surveillance data is running through the SURNET network within the Four States (Belgium, the Netherlands, Luxemburg, and Germany). The governance of SURNET is composed of a board in which the parties who signed the surveillance data-sharing agreement supervise the operations of the network, and adopt modifications.

Depending on the agreement, various legal instruments are used to provide a legal framework to the providers and the users. A licence agreement is signed between the users of the software running on the SURNET Access Point and EUROCONTROL. A CPA is signed for the hardware, with EUROCONTROL as a facilitator. ANSPs pay directly. The document which sets the legal basis for this network is the SURNET – Surveillance Data-Sharing Agreement.

There is no cost charging and recovery issue for the SURNET network. The data is provided free of charge among the signatory parties to the agreement. If a third party wishes to obtain the data, the request is submitted to the SURNET Board which decides on a case-by-case basis whether or not to grant the authorisation. In principle, the exchange of data with third parties is also free of charge, with the exception of NATS in the UK, which is currently charging for the provision of surveillance data.

In principle, data providers are not liable for any break in the provision or the continuity of the provision of surveillance data due to a problem in a private circuit. ANSPs are responsible for providing good data quality, even though the requirements may differ among States.

Surveillance data is only provided for the benefit of the ATS, or the operational tasks of the SURNET users. The data is confidential and must strictly remain between the parties who signed the surveillance data-sharing agreement. Non-operational users must submit a request to the SURNET Board to get access to the data. This request must be duly justified and is closely examined before a possible grant.

The SURNET services must comply with the requirements set by the various NSAs involved.
3. **An overview of two ATM domains**

3.1 Terrain and Obstacle Data

3.1.1 **Introduction**

This chapter concerns the bodies involved in the origination, processing, and provision of electronic Terrain and Obstacle Data (TOD), from origination to the public availability. The regulator in each State is usually responsible for the implementation of TOD or the aeronautical information service provider (AISP). Stakeholders include military authorities, ANSPs, geodetic institutes, power/energy supply companies, wind farm operators, and mapping agencies. This section also deals with the ICAO requirements and European documents regarding cost charging for ANS.

3.1.2 **Governance structure**

As TOD is a domain of ATM, and not a service, no governance structure applies.

3.1.3 **Legal instrument**

**Licence:** Contracts and licences are also a possible solution to limiting the use of the TOD. They do not totally prevent misuse but provide the owner of the data with a legal basis to address any unauthorised use of the data. This licence agreement is used for many commercial types of software. The licence agreement could include the grant, ownership, IPR, restrictions, liability, governing laws, etc.

**Letter of Agreement:** A cross-border letter of agreement might be used for the sharing of data such as TOD, with reference models specified. This type of agreement is an instrument to promote harmonisation in the TOD which needs to be published for an aerodrome in one State, where the area of coverage extends into the territory of another State. State regulators may be involved as well as the AIS people and aerodromes directly.

3.1.4 **Charging**

**Cost charging**

A chart has been designed to determine the appropriate funding and cost recovery for a State. This allows the State to determine the beneficiaries of the data, the owner of the data and the allocation of costs to recovery mechanisms. The various criteria of the chart are as follows:

- **Responsibility:** Who is responsible for the initial payment for the collection of the TOD?
- **Beneficiary:** What functions are likely to benefit from the data? It is likely that in a lot of cases the data will be used in many different functions, in order to help with the allocation of costs?
- **Allocation:** What percentage of the cost will be allocated to specific cost-recovery mechanisms? Can this include State funding, aerodrome terminal charges, en-route charges, etc.?
- **Reference:** What materials have been used to describe or establish the cost-recovery mechanisms referred to?

96 Terrain and Obstacle Data Manual, Ed 2.0, 4.1.1, p.74
97 Terrain and Obstacle Data Manual, Ed 2.0, 4.1.10, p.81
98 Terrain and Obstacle Data Manual, Ed 2.0, 5.5.2, p.97
99 Terrain and Obstacle Data Manual, Ed 2.0, 5.6.6, p.102
100 Terrain and Obstacle Data Manual, Ed 2.0, 6.1, p.104
ICAO Document 7300 states that uniform conditions apply to the use of airports and air navigation services in a contracting State by aircraft of all other contracting States. The charges imposed by a contracting State for the use of such airports or air navigation services must not be higher for aircraft of other contracting States than those paid by its national aircraft engaged in international operations. It is also stated that no charges are to be imposed by any contracting State solely for the right to transit over, enter into or exit from its territory for any aircraft of a contracting State or persons or property thereon.\textsuperscript{101}

**Charging mechanisms**

EC Regulation 1794/2006 imposes the following principles regarding a common charging scheme for ANS:

a. Reflect the costs incurred
b. The costs for en-route services must be financed by en-route charges
c. The costs for terminal services must be financed by means of terminal charges or other revenues

This includes: costs incurred in the provision of ANS, administrative overheads, training, studies, test and trials, research and development, and costs incurred by the relevant national authorities/organisations.

The common charging scheme must include: aerodrome control services, flight information services (alert and advisory), services related to approach and departure, appropriate ANS component (attribution between en-route and terminal services).\textsuperscript{102}

**Airports and ANS:** ICAO Document 9082 stipulates that States should permit the imposition of charges only for services and functions which are provided for, directly related to, or ultimately beneficial to, civil aviation operations. They should also refrain from imposing charges which discriminate against international civil aviation in relation to other modes of international transport.\textsuperscript{103}

The **cost basis for airport charges** is an important part of the costs of providing TOD. The Terrain and Obstacle Data manual states that “where an airport is provided for international use […] the users must bear their full and fair share of the cost. It is therefore important that airports maintain accounts that provide information adequate for the needs of both airports and users and that the facilities and services related to airport charges be identified as precisely as possible.”\textsuperscript{104}

The **cost basis for air navigation services** states that where air navigation services are provided for international use, ANSPs may require the users to pay their share of the related costs. In the meantime, international civil aviation should not be asked to meet costs which cannot properly be allocated to it. “The Council (ICAO) considers that an equitable cost recovery system could proceed from an accounting of total air navigation services costs incurred on behalf of aeronautical users, to an allocation of these costs among categories of users, and finally to the development of charging or pricing policy system.” Facilities that should be taken into account when establishing the cost of providing the ANS are: ATM, communication, navigation and surveillance systems, meteorological services, and other ancillary services.\textsuperscript{105}

**ANS economics:** ICAO Document 9161 states that some services are provided purely to aviation services, such as air traffic services (ATS), while some others serve other communities, such as meteorology. Some aviation services are shared between en-route and airports, and costs should be met by a combination of en-route and airport charges. The document recommends that the costs should be shared between the different beneficiaries of these shared services, on an

\textsuperscript{101} Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.2.2, p.107
\textsuperscript{102} Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.2.5, p.114
\textsuperscript{103} Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.2.3, p.108
\textsuperscript{104} Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.2.3.1, p.108
\textsuperscript{105} Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.2.3.2, p.110
equitable basis. Costs should be attributable to route utilisation and airport utilisation, and allocated among the different categories of users. State traffic and military traffic may often be exempt from charges.106

En-routes charging and calculation: EUROCONTROL Document 10.60.01 establishes the basis for the calculation of unit rates. Some services are shared between terminal and en-routes services, so the costs allocated should be based on one or more criteria, such as: number of dedicated controllers, dedicated sectors, number of flights, estimated time of use of the equipment, personnel, square footage of accommodation, average distance flown, and organisational structure of the ATS provision.107

3.1.5 Liability

The State’s ANSP, aerodrome, regulators, etc. all fall under the State’s liability framework. The responsibility still needs to be allocated by the State, because it is the State itself which is primarily responsible for the data published. The State, thereafter, may delegate to other parties.

The Terrain and Obstacle Data Manual states that “In order to determine the liability, the data needs to be captured and traced adequately from its point of origination to its publication. The cause of the error can then be detected and liability can be placed accordingly.”108

The body responsible for the data may vary between States: aerodrome operator, ANSP, or the State itself. It also might be a combination of two bodies. Each State must determine which body is responsible for this. The data of one State is provided to the AIS/AIM of the neighbouring States.109

3.1.6 IPRs

Re-use of information

Re-use of existing data raises the issue that the data is provided by the aviation sector, sometimes free of charge, and this is considered as potentially detrimental to the business of the previous provider. A solution proposed would be to contact the organisation originating the data directly to make arrangements regarding the re-use of information.110

Commercial exploitation of data

Concerns have been raised regarding the data exploited outside the aviation domain, for the purposes of organisations. It is difficult to monitor if we cannot define clearly what is meant by “aviation use”. One solution would be to simply restrict access to the data, but this would go against the spirit of ICAO SARPs.111

Cross-border access to information:

A cross-border letter of agreement might be used for the sharing of data like TOD, with reference models specified.112 Arrangements between States should be made for the reception, exchange and provision of Terrain and Obstacle Data “which lies in the territory of one State but which is required for a data set which needs to be provided by another State.”113

3.1.7 Compliance

Consumers

106 Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.24, p.112
107 Terrain and Obstacle Data Manual, Ed 2.0, 6.3.1.3, p.115
108 Terrain and Obstacle Data Manual, Ed 2.0, 2011, 5.3, p.95
109 Requirements of Annex 15 of the ICAO Convention on Aeronautical Information Services
110 Terrain and Obstacle Data Manual, Ed 2.0, 5.4.1, p.96
111 Terrain and Obstacle Data Manual, Ed 2.0, 5.4.2, p.96
112 Terrain and Obstacle Data Manual, Ed 2.0, 5.6, p.98
113 Terrain and Obstacle Data Manual, Ed 2.0, 4.1.11.1, p.62
If the data users choose to use the data, they assume responsibility for its use. If a State is provided with data that does not meet the ICAO requirements, it is recommended that it does not publish the data or that it informs those concerned that the data does not comply with the ICAO requirements.\textsuperscript{114}

**Providers**

The State can grant permission for the neighbouring State to collect the data of the area in question. The validation of the data and the verification process should be applied to data from neighbouring States, as with any other data. As it sometimes might be difficult to verify, the publishing State may not wish to assume liability for this data. So if the data users choose to use the data, they assume liability for its use.

**Services**

Arrangements are made between the provider of the service and the recipient. If the provision of data is likely to take place regularly, over a period of time, a service-level agreement (SLA) is appropriate to formalise the data provision.\textsuperscript{115} Information regarding the quality requirements for the data should be documented with criteria such as timeliness, means of provision, and data formats. The standards, to which the data sources should adhere, must be captured in the arrangements. This could include the EUROCONTROL Specification for the Origination of Aeronautical Data, a means of compliance for many of the data origination provisions of Commission Regulation EU 73/2010.\textsuperscript{116}

### 3.1.8 Outlines

The TOD domain contains digital terrain models, and obstacles data. TOD are relevant as the information is shared among ATM stakeholders.

In this case, various legal instruments can be used to provide a legal basis for the use of TOD. But, again the licence is the most common one as it can include all legal points in one document: IPR, ownership, liability, governance structure, etc. The cross-border letter of agreement is important because TOD is exchanged among States. This is a way of harmonising the TOD when its coverage extends into the territory of another State.

The cost-charging and cost-recovery mechanisms are dealt on general guidelines set by the TOD Manual and ICAO. As TOD is a domain of ATM, the criteria are less specific. The general idea is to allocate cost equitably among users, taking into account the different categories of users and types of use.\textsuperscript{117} When we look at the mechanisms in place in ATM services, we can see that these principles are well applied, but also that we are moving towards the user-pays principle.

The liability regime is clear as the State will have to allocate the responsibility itself, as it is primarily liable for the data published. This means that responsibility will need to be attributed accordingly among stakeholders.

Regarding the IPR issues, the dilemma remains in the fact that a balance has to be found between the legitimate protection of data against plagiarism, and the move towards the harmonisation of the sharing of information. Depending on a State's policy, data is sometimes distributed free of charge, or is classified into different categories to determine whether or not it will be charged. As in other ATM domains, there is no clear view for TOD on this subject, and it is still dealt with within each service.

The compliance system is based on ICAO requirements, the EUROCONTROL Specification for the Origination of Aeronautical Data, and means of compliance for many of the data origination

\textsuperscript{114} Terrain and Obstacle Data Manual, Ed 2.0, 5.6.5, p.101

\textsuperscript{115} Terrain and Obstacle Data Manual, Ed 2.0, 4.1.10 Data Sources, p.82

\textsuperscript{116} Terrain and Obstacle Data Manual, Ed 2.0, 4.1.10 Data Sources, p.82

\textsuperscript{117} “The Council (ICAO) considers that an equitable cost recovery system could proceed from an accounting of total air navigation services costs incurred on behalf of aeronautical users, to an allocation of these costs among categories of users, and finally to the development of charging or pricing policy system.” TOD Manual, Ed 2.0, p. 110
provisions of Commission Regulation EU 73/2010. For regular services, a service-level agreement might be used to formalise the data provision.

3.2 AIS-AIM: The current UK position

3.2.1 Introduction
According to ICAO Document 9161, aeronautical information services must ensure “the flow of information necessary for the safety, regularity and efficiency of air navigation”. This includes “the staff, facilities and equipment employed to collect, collate, edit, publish and distribute aeronautical information concerning the entire territory of a State as well as any other areas for which it has undertaken to provide air navigation services”, and the preparation and dissemination of Aeronautical Information Publications (AIPs), Notices to Airmen (NOTAMs), Aeronautical Information Circulars (AICs) and the pre-flight information service.118

This chapter deals with the current position of the UK CAA on IPRs and copyrights issues, and liability associated with State-published aeronautical information. The ICAO Member States are required to provide AIS. They do so, free of charge, for other ICAO Member States. States’ aeronautical information is made available in paper copy, usually in the form of an Integrated Aeronautical Information Package (IAIP).

3.2.2 Governance structure
Not applicable

3.2.3 Legal instrument
Not applicable

3.2.4 Charging criteria
Cost charging: The UK follows EUROCONTROL Document 10.60.01 which states that “AIS costs should either be charged to en route services or apportioned between en route services and other services, the latter according to national practice.”119

3.2.5 Liability
Insurance
The document called Preface to the UK AIP states that the CAA is not responsible for the accuracy of the contents of the UK AIP and other AIS publications. The UK AIS provider limits its liability, also regarding the information available online, saying that they do not guarantee that any content available online is accurate, current, or error free. The UK CAA therefore has insurance in several areas, such as:

i. professional indemnity, and
ii. third party liability

Any claim for loss, injury, or damage would need to establish the adequacy of the legislative or guidance material published, identify whether or not errors occurred during information handling prior to publication, and identify whether or not the source material was at fault. In the event of the latter being proved to be the case, the CAA would seek to claim a contribution from the data providers towards meeting any third-party claim.120

119 EUROCONTROL Document 10.60.01, Central route charges office, “Principles for establishing the cost-base for en route charges and the calculation of the unit rates”, March 2010, 3.9 AIS costs, p.11
120 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 6.4, p.4
In 2009, the UK paper explains that when States start to deliver quality-assured aeronautical information to industry via standard electronic means, the re-use of information by commercial suppliers will need to be addressed. They will therefore be able to consider the possible implementation of royalty fees payable by companies making a profit out of State information, in particular in the case of using formatted electronic data sets.  

**Commercial provider issues**

i. **IAIP to digital**: in paper or PDF. The format is not very practical for day-to-day use. According to the UK, there is no wish to impede the flow of data to industry by imposing unnecessary obstructions.

ii. **Quality of published aeronautical information**: current data management practices cannot give any assurance that the international standards for this type of information is being met.

### 3.2.6 IPRs

**Principles**

As previously described, State aeronautical information in the form of the IAIP is made available on paper copy, compact disc or via the Internet. It is distributed free of charge to other ICAO Member States. It may be delivered to other stakeholders who are willing to pay an annual subscription fee. There is usually no charge for access. States may wish to apply copyright to that information, in accordance with their national laws. If the information is made available by a State to another State, it will only be made available to a third party who is aware of the copyright protection of this product, and subject to copyright by the originating State. Moreover, as a licensee, NATS would be entitled to pursue copyright and database infringements in its own name and on behalf of the UK CAA.

**Re-use of information**

There is no uniform approach to the question of the re-use of information payable in royalty fees by commercial suppliers. Any such royalty fees would be passed directly on to the end user. Currently, the UK CAA does not want to charge for the re-use of information through royalty fees.

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121 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 6.3, p.4
122 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 5.2, p.3
123 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 5.2, p.3
124 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 4.3, p.2
125 Intellectual Property Rights, Copyright and Liability – Current UK Position, Article 5.1, p.3
Best practices and conclusion

3.3 Common practices identified

3.3.1 Governance structure

The governance structure defines how the roles, responsibilities, and relations of providers and users are organised. What comes out from this study is that the governance must permit SWIM to supervise operations, adopt amendments and modifications, set policies and standards, provide direction, advise, assist, etc., from a high level in the organisation. PENS and SURNET are good examples. Their governance is well structured, with a management group, a user group, and a steering group. The tasks and responsibilities are shared among the members and they work in coordination to provide governance to the network.

3.3.2 Legal instrument

We can highlight three main legal instruments used in the sharing of information:

- The first is the licence. Each domain uses the licence as a legal basis for the owner of the information: software, data, information, etc. This agreement can include various legal aspects to be protected, such as ownership, IPRs, limited liability, restrictions, governing law, etc.

- The second is the Common Procurement Agreement, commonly used by EUROCONTROL to facilitate negotiation and the management of the agreement between the user and the provider. This might be considered as an useful tool to avoid administrative steps that take time in the negotiation, delaying the deployment process.

- The third is the cross-border letter of agreement. This is used for TOD. The letter makes it possible to harmonise the sharing of information between neighbouring States, making the relationships easier between the relevant authorities in each country. In this case, the nationals and the local entities are involved.

We must underline that the contractual relationships will not change because of SWIM. If within the relationship between two or more stakeholders, the licence agreement is used, this will not change.

However, given SWIM's objective of enabling “the management of the ATM information and its exchange between qualified parties via interoperable services"\(^\text{126}\), the system might impact the legal instruments cited above. For example, the compliance clause may change if the user or the provider wants to be certified as SWIM compliant.

3.3.3 Charging criteria

Depending on the type of information and services provided, service providers will continue to charge accordingly on an equitable basis following EC regulations, and ICAO requirements. As the nature of each domain is different, the charging policies also differ.

However, some general principles can be highlighted. Users are usually classified depending on the type of their use (which information, which service, what bandwidth is used, etc.), and their nature (public body, private or commercial body, third party to a contract, etc.). From there, different rules apply to the users regarding charging and cost recovery. The basic information is usually made available free of charge. More specific data are generally subject to a fee. For services, users have to pay the costs of administration, management, functioning, and

\(^{126}\) Definition of SWIM – SWIM Conops
maintenance.

**ICAO requirements**

According to the recommendation of the ICAO Annex 15 on aeronautical information services, “The overhead cost of collecting and compiling aeronautical information/data should be included in the cost basis for airport and air navigation services charges; as appropriate, in accordance with the principle contained in ICAO’s Policies on Charges for Airports and Air Navigation Services (9082).” It is noted also that the charge to an individual customer for the supply of a particular AIS product may be based on the costs of printing paper copies or producing electronic media, and the distribution costs.  

Cost basis for air navigation services charges

The facilities and services taken into account in determining the costs of air navigation services are the ATM, the aerodrome control service, the approach control service, the area control service, the ground and/or satellite-based aeronautical communications, the navigation, surveillance, MET services, AIS, and other ancillary aviation services.

Section III of the ICAO document on Charges for Airports and Air Navigation Services states that when air navigation services are provided for international use, the State may require the users of such services to pay the portion of costs applicable to them. Air navigation services costs can include maintenance, operation, management and administration.

The costs of providing such services “during en-route, approach and aerodrome phases of aircraft should be identified separately where possible, as well as the cost of supporting services such as aeronautical meteorological services (MET), aeronautical information services (AIS) and other ancillary services.” The costs related to oversight functions (safety and economic oversight) for air navigation services may be included in the ANSPs’ cost basis, at the State’s discretion, and it may choose to recover less than full costs in recognition of local, regional or national benefits.

**Allocation of costs of air navigation services among aeronautical users**

The allocation of the costs of air navigation services among aeronautical users should be carried out in an equitable manner among international civil aviation stakeholders and others (including domestic civil aviation, State or other exempted aircraft, and non-aeronautical users), and should be determined in a way as to ensure that no users are burdened with costs not properly allocable to them. Regarding the utilisation of data, States should ensure that when information is relevant to the allocation and recovery of costs, “data could include the number of flights by user category, whether domestic or international, as well as distances flown and information on aircraft type or weight.”

Air navigation services charging systems

The main principle is still that the charging systems must be equitable, simple, transparent, and must not discriminate against the users or providers of air navigation services. The charges should also be determined in conformity with ICAO Annex 15.

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127 ICAO Annex 15 on Aeronautical Information Services, 13th ed, July 2010, Chapter 3, 3.5 Cost recovery
128 ATM is defined as “The dynamic, integrated management of air traffic and airspace including air traffic services (ATS), airspace management and air traffic flow management (ATFM) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.” ICAO document 9082, Appendix 2
129 Navigation is defined as “The conventional ground-based radio and visual aids to navigation, global navigation satellite system (GNSS) and its associated augmentation systems in support of all phases of flight.” ICAO document 9082, Appendix 2
130 Surveillance is defined as “The primary/secondary surveillance radars and other ground/satellite-based facilities supporting the automatic dependent surveillance (ADS) and/or ADS-Broadcast (ADS-B).” ICAO document 9082, Appendix 2
131 ICAO document 9082, Section III ICAO’s policies on charges for air navigation services
132 ICAO document 9082, Section III ICAO’s policies on charges for air navigation services
133 ICAO document 9082, Section III ICAO’s policies on charges for air navigation services
134 ICAO document 9082, Section III ICAO’s policies on charges for air navigation services
European Union level


The Regulation lays down a common charging scheme for air navigation services. The charging scheme must be in accordance with ICAO Annex 15, and consistent with the EUROCONTROL Route Charges System, taking into account functional airspace blocks (FABs). It stipulates that “Member States should be able to apply the same unit rate for terminal service charges at all airports served by the same air traffic service provider or in several groups of such airports…” 135

Regarding the costs of air navigation service provision, the providers of the service “shall establish the costs incurred in the provision of air navigation services in relation to the facilities and services provided for, and implemented under ICAO Regional Air Navigation Plan, European Region, in the charging zones under their responsibility.”136 Included in the costs are: the costs for administration, training, studies, test and trials.

Allocation of costs

A transparency principle must be applied. The services concerned are:

- a) “Aerodrome control services, aerodrome flight information services including air traffic advisory services, and alerting services;
- b) Air traffic services related to the approach and departure of aircraft within a certain distance of an airport on the basis of operational requirements;
- c) An appropriate allocation of all other air navigation services components, reflecting a proportionate attribution between en route and terminal services.”137

Collection of charges

A transparency principle must also be applied. “Member States may collect charges through a single charge per flight. Users of air navigation services must pay air navigation charges.”138

Annex of the Regulation

Annex II to the Regulation includes tables that the Member States should follow139:

- Annex II describes the transparency of the cost base, detailed by nature (staff, operating costs, depreciation, cost of capital, exceptional items), and by services (air traffic management, communication, navigation, surveillance, search and rescue, aeronautical information, meteorological information, etc.)
- Annex VI describes the charging mechanism.

3.3.4 Liability

In most cases, providers are liable for the data they provide, and for direct damages that may result from a breach of their obligations in the event of negligence, gross negligence, or wilful misconduct. However, providers are not liable for indirect damages and economic loss.

The providers are not responsible for the accuracy of the contents of information; unless the provider itself decides to alter the information and this modification causes damage. For this purpose, providers usually get insurance for professional indemnity and third-party liability.

Again, the liability framework differs with the domain studied and the nature of the provider (public

135 Commission Regulation (EC) No 1794/2006 lays down a common charging scheme for air navigation services
136 Commission Regulation (EC) No 1794/2006 lays down a common charging scheme for air navigation services, article 5
137 Commission Regulation (EC) No 1794/2006 lays down a common charging scheme for air navigation services, article 7
138 Commission Regulation (EC) No 1794/2006 lays down a common charging scheme for air navigation services, article 14
139 Commission Regulation (EC) No 1794/2006 lays down a common charging scheme for air navigation services, Annex II and VI
or private). The body responsible for the data provision is liable for the quality of the data, and this data must comply with the relevant requirements.

Regarding the insurance policy, the **MASUAC air risk insurance** for activities in the Maastricht Upper Area Control Centre is used. If an accident occurs (i.e. a mid-air collision), they are covered up to a certain amount. This insurance also covers some other activities at CFMU and EAD, and some of the software tools widely available (namely ARTAS and SASS-C). This insurance is required by the Member States themselves, and the risk must be disclosed. **It applies only when there is a direct operational risk, which might not be relevant in the context of SWIM.**

### 3.3.5 IPRs

When it comes to the sharing of information within European ATM (between ATM stakeholders and States), intellectual property rights are at stake. In ATM, IPRs are generally protected through a licence agreement. Different types of licence are used, depending on the type of information and the type of use. As mentioned previously, some information is available free of charge, while other information is confidential or subject to the payment of a royalty fee. In most cases, **the originating provider of the data/information is the sole owner. The general spirit of ICAO Standards and Recommended Practices (SARPs) is to move towards more openly available aeronautical data. However, owing to the sovereignty of the Member States, this is only a recommendation.** States are making more and more effort to make the data more openly available, and at a low cost, but charges and copyrights still apply in each national legal system.

As several States are sharing their data and information, a letter of agreement for cross-border information might be signed. The sharing of information with a third party is restricted and an agreement must be used to protect the rights of the owner of the information.

### 3.3.6 Compliance

Lastly, the compliance systems are quite similar among ATM stakeholders, and remain at a global level. **The standards commonly adopted refer to ICAO requirements, ISO, OGC, EASA, RTCA, EUROCAE, and ARINC standards.** For example, the bureaux of meteorology in Europe comply with Annex 3 of the ICAO Convention on Meteorology Services for International Air Navigation. For the TOD, we also refer to the EUROCONTROL Specification for Origination of Aeronautical Data (Commission Regulation 73/2010).

For **the certification of products such as networks and services, International Organization for Standardisation (ISO) is the more common certification.** Here again, the meteorology services are certified ISO 9001.

In addition, the service-level agreement is also used at local level, usually for regular services, over a given period of time.
**Table 1: Summary table**

<table>
<thead>
<tr>
<th></th>
<th>Météo France</th>
<th>EAD</th>
<th>PENS</th>
<th>Surveillance data</th>
<th>TOD</th>
<th>AIS-AIM, the UK position</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Governance</strong></td>
<td>NA</td>
<td>NA</td>
<td>PSSG – PUG - PMU</td>
<td>SURNET Board</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Legal instrument</strong></td>
<td>Standard Licence</td>
<td>Licence for the software</td>
<td>CPA</td>
<td>Licence for the software CPA</td>
<td>Licence Letter of agreement</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Charging and cost recovery</strong></td>
<td>Depends on the information provided, a royalty fee may be paid</td>
<td>3 different types of client. Costs are recovered by EUROCONTROL on the behalf of the data provider</td>
<td>Information is provided free of charge, except NATS, which charges for the provision of surveillance data</td>
<td>General policy based on ICAO SARPS</td>
<td>ECTL document on charging policy</td>
<td></td>
</tr>
<tr>
<td><strong>Liability</strong></td>
<td>Météo France is not responsible, as the information provided is volatile</td>
<td>EUROCONTROL is responsible only if the information is modified (errors added)</td>
<td>No liability for EUROCONTROL, only the originator of the information is liable</td>
<td>There is no liability, unless the information is changed</td>
<td>The State is primarily responsible, and needs to allocate responsibility itself</td>
<td>There is no guarantee from the UK CAA. Two types of insurance coverage taken: professional insurance, and for third-party liability</td>
</tr>
<tr>
<td><strong>IPRs</strong></td>
<td>Distinction made between radar information and the other information</td>
<td>NA</td>
<td>NA</td>
<td>Confidential Information: need the agreement of the SURNET Board to be provided to a third party</td>
<td>No clear Statement. Depends on the States. Cross-border letter of information is commonly used</td>
<td>Info is distributed to ICAO Member States. The other States have to pay for it</td>
</tr>
<tr>
<td><strong>Compliance</strong></td>
<td>ISO 9000 + ICAO</td>
<td>ISO 9001 + ICAO</td>
<td>NA</td>
<td>Established at local level</td>
<td>ICAO SARPS and</td>
<td>NA</td>
</tr>
<tr>
<td>by the NSA</td>
<td>a SLA</td>
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</tr>
</tbody>
</table>
3.4 Recommendations for SWIM

The purpose of SWIM is to provide standards, infrastructure, and governance to make the sharing of information between ATM stakeholders easier and smoother, via interoperable services.

The various ATM services and users currently in place come both from the private sector (air carriers, pilots, etc.), and the public sector (MET office, ANSPs, ATC, etc.), or they can be both public and private (e.g. airports).

They already share information everyday, and their relationships are governed by current legislation in force (ICAO, EU Regulation, national law, etc.), and contracts (licences, CPA, s letters of agreement, SLAs, etc.).

This study shows that different legal instruments are applicable for the provision of ATM services. The licence usually covers most of the legal aspects at stake: legal basis, liability, IPRs, nature and organisation of the relationships between the parties, governance, etc. More specific agreements may be signed, such as a CPA or letter of agreement. These legal instruments will gather the legal aspects of SWIM regarding standardisation and governance.

The charging and recovery of costs

In the context of SWIM, it is likely that the costs for the maintenance, operation, administration and management of SWIM will be recovered. A reasonable return on investment is possible according to ICAO recommendations and EU legislation. The entity which will manage SWIM should be able to recover the cost from the ATM stakeholders directly, but only for the costs that the functioning of SWIM will generate. In this case, the UPP might be applicable.

The INSPIRE example shows that European governments are clearly moving towards more open access to public-sector information, at a minimum cost. In this case, SWIM should follow the same path, for information of a similar nature.

The contractual relationships

The nature of the information; confidential or public, protected by copyrights or free to use, will not change because of SWIM. The contractual relationships between the ATM stakeholders sharing information will therefore remain the same. Standards and the governance enabling a smoother flow of ATM information will be put in place, but the information itself will keep its specific nature, and the relationships between the ATM stakeholders will not change.

For example, military information is currently confidential. SWIM will not make this information public, but will provide new ways of sharing it.

In this way, the legal instruments will remain the same, because the relationships between ATM stakeholders will not change. SWIM should not get involved in the negotiation of licence agreements between air navigation stakeholders. This will remain the responsibility of the parties wishing to provide, use, or share information. The clauses usually included in a licence will not therefore be dealt with by SWIM.

Liability and IPRs

As liability and IPRs are legal aspects dealt with in the contractual relationships, it is still difficult to determine the risk that SWIM could generate through its standards, infrastructure, or governance. Regarding the sharing of information itself, these areas of law will continue to be negotiated by the parties themselves.

Liability: SWIM consists of standards, infrastructure and governance for the sharing of ATM information. Given the nature of SWIM, it is unlikely that a direct operational risk for air navigation would occur. For example, Member States request air risk insurance to EUROCONTROL only if a high risk of direct aviation accident or incident is identified. There is no operational risk disclosed for SWIM at the moment.
Risks related to the new standards and governance in force might be at stake later in the development of SWIM. Therefore, a contractual liability would be placed in the contract between SWIM and the stakeholders. **SWIM would not be liable for the sharing of information, but only regarding possible mistakes in the elaboration and malfunctioning of the standards.**

**IPRs:** As mentioned previously, the nature of the data or information will not change. If data/information are protected, then the use of SWIM standards will not change its nature. **Therefore, copyright protection will remain the same.**

**Governance:** Well developed governance structures already exist in the ATM services. **It would be interesting to take example from the PENS governance structure or EAD governance to build an appropriate one for SWIM.** This has already been done in the SWIM Conops.140

**Compliance:** The common standards used in the ATM are ISO, EASA, OGC, RTCA, EUROCAE, and ARINC standards. SWIM could establish its own standards, but always in accordance with the ones that are already in force. **The idea would be to established standards based on a combination of a large number of general IT standards (ISO, OGC, etc.), and some standards specific to ATM.**

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140 SWIM Conops
3.5 The INSPIRE example relevant for SWIM

INSPIRE was launched in 2001 and aims at creating an EU spatial data infrastructure. The INSPIRE Directive came into force in 2007. With this Directive, “The European Union intends to establish an infrastructure for spatial information in Europe that will allow the public sector users at the European national, regional, and local levels to share spatial data from a wide range of sources in an interoperable way for the execution of a variety of public tasks at conditions which do not restrain its use”\(^{141}\).

One of the key elements behind the INSPIRE concept was the necessity for a legislative framework. Therefore, Geographical Information (GI) stakeholders were involved in different working groups to prepare the INSPIRE Directive. Five major subjects were developed: metadata, interoperability of spatial data sets and services, network services, data and service sharing, and monitoring and reporting.\(^ {142}\)

INSPIRE can be seen as an example for SWIM as it is steps ahead already. The legal aspects of the sharing of information between European countries constitute the core subject of INSPIRE, and now SWIM.

Seven issues raised in the context of INSPIRE have been gathered from a representative sample of the countries involved (Norway, the Netherlands, Denmark, France, and the United Kingdom):

- Public-private-partnership (PPP)
- Policy and legislation on access to public sector information (PSI)
- Legal protection of GI by IPRs
- Licensing framework
- Funding of spatial data infrastructure (SDI) and pricing policy
- Quality of the data
- Interoperability and harmonisation of data

3.5.1 Norway

The Norway Spatial Data Infrastructure (SDI) is called “Norway Digital” and aims at enhancing the availability, access and use of high-quality geographic information among a broad range of users. The Norwegian Mapping and Cadastral Authority manage and lead the NSDI. It takes care of the work relating to regulations, standardisation, technological development, administration and guidance necessary to make the infrastructure function properly with the implementation of spatial data at a sub-national level.\(^ {143}\)

Geovekst is an important component of Norway Digital. The concept is to pool money for jointly executed projects to establish, improve and maintain large-scale digital geographic data. It has several participants, such as the Norwegian Mapping Authority, the Road Department, the electricity companies, the local authorities, etc.\(^ {144}\) This program is based on a shared responsibility regarding the cost of the mapping.\(^ {145}\)

Many private entities participate in Geovekst, forming the Association of Enterprises in Geomatics (GBL) to work in the public sector, parliament, ministries and for other stakeholders.\(^ {146}\)


\(^{142}\) INSPIRE & NSDI State of Play – D4.2 – Summary Report (Spring 2011), K.U Leuven, p.18

\(^{143}\) Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 10

\(^{144}\) Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 12


\(^{146}\) Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 13
For the Norwegian Parliament, “Geographic data must be easily accessed and used efficiently across sectors and management level.”

“The NSDI has been described as a collection and co-ordination of key elements built around a core of geographic information and services.” (See Figure 2: The Norway Digital model – data providers and users, p.16.)

PPP: The collaboration between public and private companies has been in place since the development of Geovekst. One example is the Norway Mapping Group, which is an alliance of seven mapping companies offering systems and services related to GI technology.  

Policy and legislation on access to public-sector information: Norway has a Freedom of Information Act which grants the right to access to public files.

Legal protection of GI by IPRs: Norway is a member of the Bern Convention. The Copyright Act in Norway was amended by an EU Directive in 2005. The country protected non-original and comprehensive databases before the EU Directive on databases came into force.

Licensing framework: Norway Digital’s partners can use all the data. There is a mechanism of two contracts including annual costs, delivery and specific conditions or limitations.

Funding of SDI and pricing policy: the financing part comes from the Government, user payments, and joint ventures with public authorities and public-owned organisations. Regarding the pricing, the public sector provides information free of charge (the cost of gathering the information and a reasonable return on investment is permitted). In Geovekst: each partner contributes to the projects with funding and personnel. Under Norway Digital, partners pay an annual fee for the use of the data based on a system of partnership fee called the “Digital Norway calculator” depending on the type of datasets needed. There is still a charge for the commercial use of data.

Quality of the data: The data is continuously updated, and there are standard contracts, technical manuals and guidelines for this purpose. These documents are available on Internet.

Interoperability and harmonisation of data: The SOSI standard is used for the exchange of data.

3.5.2 The Netherlands

The Ministry of Infrastructure and Environment is the formal body responsible for GI-related matters in the Netherlands. The NSDI uses the “authentic registers”. A law on 2 July 2009 transposed the INSPIRE Directive into national law, and requires metadata to be created, granting everyone the right to use the network services.

147 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 16
148 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 16
149 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 20
150 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 21
151 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 22
152 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 23
153 Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven, p. 25
154 SOSI is a Norwegian standard.
155 Spatial Data Infrastructure in the Netherlands: State of Play 2011, K.U Leuven, p. 18
In 2009, the Ministry of Public Health, Spatial Planning and Environmental Affairs stated that “Spatial Information is key for the proper execution of environmental policies. Harmonisation through INSPIRE including the requirement to share data, enables more effective future European environmental policy making. INSPIRE implementation will result in accessible, viewable, downloadable, and interoperable digital information. The impact of INSPIRE will be broader than just environmental policy making. It will result in a general spatial data infrastructure at the European level.”

PPP: The LSV-GBKN (Landelijk Samenwerkingverband – National Cooperation GBKN) was a national joint venture with 11 regional joint ventures. It is a PPP of the municipalities, utility companies, water boards, Dutch cadastre and Dutch administration.

Policy and legislation on access to and re-use of PSI: The legal basis is the Government Information Public Access Act of 1991. Documents created by public agencies should be available to everyone. The price is based on the dissemination cost. Government agencies can still claim copyright on their data.

The Government Information Public Access Act has been revised to include the implementation of Directive 2003/98 on the re-use of PSI. This new legislation is based on the adaptation of the pricing principle towards the charging of only marginal costs, the banning of public-sector bodies using their intellectual property rights to impose conditions on re-use, and the creation of transitory rules for a number of data collections.

Legal protection of GI by IPRs: Copyright is based on the Copyright Act 1912 and the 2001 EU Directive on copyright in the information society. The copyright must be claimed by the government explicitly to be effective and a copyright symbol © must be placed on the work.

Geo information protected for personal viewing can be copyrighted in some cases. The Copyright Act amended in 1999 protects the producer of the database in some cases showing that the producer provided investments obtaining or verifying the content.

In general, the PSI policy aims at banning the government from using the copyright protection.

Licensing framework: Geonovum, in cooperation with Delft University of Technology, developed a licensing framework based on creative commons, proposing seven possible licensing conditions.

Funding model for SDI and pricing policy:

Funding: The funding for INSPIRE implementation is directed to: coordination body, service development, setting-up registers, and other components of the infrastructure. The cadastre is required by law to recover its operational costs through data sales, but it is forbidden to make profit from the core activity.

Pricing: metadata from the national georegister is provided free of charge. However, a general lack of guidelines can be observed in the pricing framework.
3.5.3 Denmark

The quality is based on ISO standards in the production of data for the NSDI. The Danish SDI approach is national, with PPP cooperation.

KMS (Kort & Matrikelstyrelsen), the National Survey and cadastre belongs to the Ministry of the Environment. They fulfill the responsibilities of the central government in the area of mapping and spatial data in Denmark. KMS is assigned to manage the infrastructure for spatial information in Denmark. The public bodies specify the data requirements, conduct data quality assurance and distribute the data. The private companies collect the data and contribute to technical solutions for accessibility.\textsuperscript{165}

Public-private-partnership: In terms of PPP, there is good cooperation in place as it is considered very important for the development of the Danish NSDI. “The public bodies specify the data requirements, conduct data quality assurance and distribute the data. The private companies collect the data and contribute to technical solutions for accessibility.”\textsuperscript{166}

Legislation on access to public-sector information: An agreement of 1 January 2009 grants all ministries full access to geodata, national survey, and cadastre for a fixed annual contribution based on its used and needs.\textsuperscript{167}

An agreement of 2002 makes it possible public and private users to access public data.

Legal protection of GI by IPRs: Section 9 of the Copyright Act provides that laws, administrative orders, legal decisions, and similar official documents are not subject to copyright. This does not extend to independent contribution to those documents, and photos are also protected.\textsuperscript{168}

Restricted access to GI further to the legal protection of privacy: The Danish Data Protection Agency exercises surveillance over the processing of data to which the Act applies.\textsuperscript{169}

Licensing framework: Data from KMS is accessible to the public with a distinction made between production users and other users. Under the National Geodata Agreement (2009-2010), all ministries, agencies, universities and elementary and secondary schools get access to KMS data (topographic, network data, etc.). This is also the case for the local authorities, Armed Forces, and the regions. This agreement was supported by an increasing interest in the application of spatial data.\textsuperscript{170}

The funding model for SDI and the pricing policy: We can observe a combined mode, with government funding and cost recovery. KMS is a state enterprise carrying out tasks on market terms. By law, KMS is required to finance these activities by user payments if at all possible. Nevertheless, a considerable part is financed by the Government. Under the National Geodata Agreement, each ministry pays a fixed annual contribution based on its use and needs.\textsuperscript{171}

Quality of the data: Different authorities active in spatial information have quality-assurance procedures which are applied in the implementation of the INSPIRE Directive. KMS use this quality assurance based on ISO standards for geographical data, as well as for metadata.\textsuperscript{172}

Interoperability: To support interoperability, the spatial data service community, in cooperation with the Geoforum, has recently published various books and models with the possibility discussed for

\textsuperscript{165} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 6
\textsuperscript{166} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 14
\textsuperscript{167} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 15
\textsuperscript{168} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 16-17
\textsuperscript{169} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 17
\textsuperscript{170} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 18
\textsuperscript{171} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 18
\textsuperscript{172} Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 23
3.5.4 France

The main challenge for the NSDI in FRANCE is the relationship between national level and local authorities.

Public-private-partnership: There is no true PPP in France. The private sector does not play an important role in the NSDI.\(^{174}\)

On policy and legislation on access to and re-use of public sector information:
- Requests may be refused on a limited number of grounds (state security, privacy, commercial secrets)
- Documents received may not be reproduced or redistributed for commercial purposes
- Jurisprudence of this law (17 Juillet 1978) allows charging for data access

In France, the 1998 Directive was transposed in 2005.\(^{175}\)

On protection of geographical information by IPRs: Maps belong to the same category as books, music, and other artistic creations. They therefore benefit from IPR protection under French law.

A system of licences is used to regulate the copyrights. A licence for internal use exists and several tariffs are in force depending on the amount of use to which the information is put. Government bodies also grant licences to private companies for the commercialisation of their data.\(^{176}\)

Licensing framework: “The Ordonnance of 6 June 2005 on re-use of PSI states that if charges are made for the re-use, a licence has to be available, which holds the conditions for the re-use.” The restrictions made on the re-use of information can only be motivated by the general interest, and must be proportionate.\(^{177}\)

IGN provide users with the general conditions for the use of its products and services, and with a set of licences: standard, server, electronic representation, commercial exploitation, integration, etc.

The Geoportal makes it possible to buy IGN data online, and pay by credit card or bank transfer.

The North Sea Hydrographic Commission has established a principle of custodianship, by which country A portraying on its charts the data owned by country B can authorise the re-use of the data of country B (provided that the corresponding fees are yearly paid to country B).\(^{178}\)

Funding model and pricing policy\(^{179}\): The French model encompasses grants and cost recovery, cadastral maps, electronic nautical charts, and geodesy aerial surveys. Referential geographic at a large scale are 100% funded by the Government.

Partial public funding for activities of IGN in 2009. The annual budget amounted to EUR 136.5 million, of which 43.6% was provided by IGN itself.

BRGM (geological survey) must provide for its own funding, by allowing free-of-charge access to the data, but charging for added-value services, advice and consultancy. Services are offered to

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173 Spatial Data Infrastructure in the Denmark: State of Play 2011, K.U Leuven, p. 23
175 Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 19
176 Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 20
177 Spatial Data Infrastructure in France: State of Play 2011, K.U Leuven, p. 21
178 Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 21
179 Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 21-22
the public (national and local) and the private sector.

Pricing: Official French policy says that each public authority must recover its marginal costs. The IGN is moving towards free access to data or lower prices (for research or education purposes).

Conclusion: There is no clear PPP or specific funding for INSPIRE in France, only a pricing framework for individual organisation (IGN). Copyright is regulated by licence mechanisms.

Quality of data: In 2008, the Ministries of agriculture and ecology created COVADIS (Commission de Validation des Données Informatiques Spatialisées). BRGM and IGN are certified ISO 9001 to ensure quality. A quality assurance plan was created to guarantee the quality and functioning of the service.\(^\text{180}\)

Interoperability and harmonisation of data: the French forum for OGC is committed to promoting interoperability among French data providers. It is used as an intermediary to settle issues between the various members, data and service providers on the one hand, and OGC international on the other hand.\(^\text{181}\)

3.5.5 United Kingdom

The UK SDI is truly national and a number of the SDI components have reached a significant level of operability. It goes beyond one single organisation. It is mainly public-sector producers participating in the SDI, while there is a very small involvement of non-public sector actors.\(^\text{182}\)

Legal framework: Prior to the UK location strategy, there was no framework for the NSDI. The INSPIRE Directive was transposed in 2009.

PPP: There is a small number of PPP. The National Land Information Service leads a “flagship” project with PPP in the GI sector. Beside this, no general statement was found.\(^\text{183}\)

Policy and legislation on access to public sector information: Freedom of Information Act 2000 (in force in 2005) is the reference. The 2005 re-use of public information regulation has been transposed. The regulations do not impose a general obligation on the pubic-sector bodies to make their document available for re-use.\(^\text{184}\)

Many studies have been done in the UK to show the value of the availability of public-sector data under non-restrictive conditions and at a marginal cost or lower. So in January 2010, data.gov.uk launched a website with 3,000 datasets available for re-use, free of charge and without use restriction.\(^\text{185}\)

Legal protection of GI by IPRs

The 1996 EU Directive on the legal protection of databases and Copyright Regulation 1992 amend the 1988 Copyright, Designs, and Patents Act.\(^\text{186}\)

Government geo-information is strongly protected by far-reaching Crown Copyright. No other country has a system quite like it (copyright is defined in the above work as a work made by Her Majesty or by an officer or servant of the Crown. It covers a wide range of materials, legislation, government codes of practice, ordonnance survey mapping, government reports, official press

\(^{180}\) Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 26

\(^{181}\) Spatial Data Infrastructure in the France: State of Play 2011, K.U Leuven, p. 27

\(^{182}\) Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 6


\(^{185}\) Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 14

releases, government forms, and public reports).  

GI can be protected by Crown Copyright, but initiatives are being taken to make data more freely available (e.g.: data.gov.uk portal).

**Restricted access to GI further to the legal protection of privacy:** The 1998 Data Protection Act (in force in 2000) provides for limitation of the use of personal information, access to, and correction of records and requires that entities which maintain records register with the Information Commissioner.

**Licensing framework:** Public-sector information is regulated by Crown Copyright and is licensed by the Controller of Her Majesty's Stationery Office (HMSO) at The National Archives (TNA), but for many geographic datasets the data providers have their own licensing policy. TNA works with these agencies to harmonise licensing policies.

In June 2009, Gordon Brown wanted to open up data access, but the licence is the basis for licensing the use of datasets that are part of UK location.

In March 2010, the Ordonnance Survey decided to make some of its datasets available, using the same licence model. In November 2010, a new licensing and pricing model was launched for the Ordonnance Survey data that was not under the Ordonnance Survey Data Licence, as previously. They are also trying to make it more affordable.

**Funding model and pricing policy**

**Funding:** The UK has no mechanism for the central funding of pan-government initiatives. Funding has to be obtained collectively, across public sector bodies. A budget has been foreseen for implementation of the UK L 11 which represents £10 million over 5 years, with £1 million for coordination.

Many of the large providers of geographical data in the UK have the status of a trading fund, requiring them to gain a return on investment. That way, they can recover costs. Example: the users pay the funding model for Ordonnance Survey but are responsible for financing it.

In 2009/2010, the total turnover was £114.3 million, and the trading surplus was £16.6 million.

**Pricing:** In 2005, in the re-use of PSI, a public-sector body may charge for allowing re-use, but it cannot exceed the cost of collection, production, reproduction, dissemination and reasonable return on investment. So it must establish standard charges or explain the factors taken into account in calculating the charges. In the GI sector, funding falls to the users, which ensures that the products are customer-driven and data is maintained. The UK Government directs its agencies to recover costs through charges and other income (depending on various factors). The general idea is to keep data charges to a minimum.

**Quality of the data:** PRINCE2 standard is used for quality assurance. Stakeholders work together on procedure, requirements, harmonisation, etc.

**Interoperability of the data:** The UK Location Program will create a common infrastructure for the adoption of common standards and protocols. ISOs are not widely used. Many UK data custodians are involved in data interoperability and harmonisation efforts, in different thematic.

UK Location is working actively on lined-data issues and has organised a number of workshops on

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187 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 15
188 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 15
189 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 15
190 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 15
191 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 16,17,18
192 Spatial Data Infrastructure in the United-Kingdom: State of Play 2011, K.U Leuven, p. 21
the importance of linked data and semantic web. No documented data-quality control procedure at
the level of the SDI has been found.

3.5.6 Conclusion

INSPIRE is clearly a relevant example as it deals with all the legal and technical aspects that
SWIM might need for its launch. The highlights of the seven issues raised for INSPIRE can be
summarised as follows:

3.5.6.1 Public-private-partnership (PPP)
The countries studied are involved in a PPP for the sharing of geographical information in their
countries. This includes the public-sector (government, municipalities, national cadastre, etc.) and
the private sector (private companies).

3.5.6.2 Policy and legislation on access to public sector information (PSI)
The common practice observed is free access to public sector information. Most of the countries
have a Freedom of Information Act (or similar name) in their national legislation, which permits
users to access public information (cadastre, geodata, national survey, etc.), at a low price.

3.5.6.3 Legal protection of GI by IPRs
Based on the Copyright Act of each country, the GI are protected for personal viewing, or if the
producer shows an investment in obtaining some information. Public documents such as laws,
legal decisions, or similar documents are public. But documents that show an independent
contribution are protected by copyrights.

In France, maps belong to the category of artistic works, and for this reason a licence is used. This
is also the case in the United Kingdom, which has a strong policy, and where GI are protected
under the Crown Copyright.

3.5.6.4 Licensing framework
Where there is a strong protection of GI, the licensing mechanism is well developed. This is the
case in France and in the United Kingdom. In other countries, a distinction is made between the
type of users and the nature of the use of the GI required. An annual fee might be included, as well
as a different basis and methods regarding charging and the cost recovery, and various possible
licensing solutions.

3.5.6.5 Funding of Spatial Data Infrastructure (SDI) and pricing policy
The financing part usually comes from the government, or at least the main part of it. The marginal
costs are recovered by the public authorities. Norway uses the annual fee to recover the use of the
data. Again, it all depends on the type of use. The commercial-use data is always charged for. In
the UK, funding falls to the users. The UK Government directs its agencies to recover costs
through charges and other income.

3.5.6.6 Quality of the data
All countries have quality-assurance procedures. Denmark bases this assurance on ISO
standards, as does France. The UK uses PRINCE2 standards.

3.5.6.7 Interoperability and harmonisation of data
Fora are organised in the countries to improve the interoperability and harmonisation of data. For
example:

- the OGC for France promotes interoperability among French data providers;
- the UK has a location program which creates a common infrastructure for the adoption of
  common standards and protocols;
- the Data Service Community and the GeoForum in Denmark has started to discuss a joint
  mapping activity.
4. **Annexes**

4.1 **International regulatory framework**

4.1.1 **ICAO level**

The main document is the Convention on International Civil Aviation signed in Chicago on 7 December 1944. This is the reference text, which governs international civil aviation at global level. In addition, Annexes to the Convention are technical specifications called Standards and Recommended Practices (SARPS).

The articles of the Convention are binding, but not the Annexes. However, if a State wishes not to apply a specification in the Annexes, the Contracting States will have to notify this difference to the Council.

Provisions that are relevant for SWIM are:

- Annex 3: Meteorological Service for International Air Navigation
- Annex 4: Aeronautical Charts
- Annex 10: Aeronautical Telecommunication
- Annex 14: Aerodromes
- Annex 15: Aeronautical Information Services

In civil aviation, these texts are the main reference for all States that have signed the Chicago Convention (190 States). The fact that some ICAO provisions are non-binding derives from the lack of effective harmonisation. Besides, the ICAO Regulatory Framework is increasingly complex. However, it provides the starting points for States wishing to improve air transport by means of new regulations and specifications.

4.1.2 **European Union level**

4.1.2.1 **SES I Regulatory Package**

In 2004, the SES I Regulatory Package adopted the first four regulations (one outline regulation, and three specific regulations) which give the first legal basis for future European ATM:

- The Framework regulation (EC No 549/2004) laying down the framework for the creation of the single European sky;
- The Service provision regulation (EC No 550/2004) on the provision of air navigation services in the Single European sky;
- The Airspace regulation (EC No 551/2004) on the organisation and use of airspace in the Single European Sky;
- The Interoperability regulation (EC No 552/2004) on the interoperability of the European air traffic management network.

The objectives sought are taking place in two phases: the first (SES I) is to reinforce safety, regularity and efficiency in air transport, the second (SES II) is to modernise and harmonise air traffic management.

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194 Article 38 of the Chicago Convention

195 SESAR JU, Legal Review, Burkhart Von Erlach, Edition 00.01.01, 2011, p.13
Additionally, further regulations have been adopted to specify the requirements for the SES:

- Regulation (EC) No 2096/2005 of 20 December 2005 laying down common requirements for the provision of air navigation services
- Regulation (EC) No 1794/2006 of 6 December 2006 laying down a common charging scheme for air navigation services
- Regulation (EC) No 482/2008 of 30 May 2008 establishing a software safety assurance system to be implemented by air navigation service providers and amending Annex II to Regulation (EC) No 2096/2005

4.1.2.2 SES II Regulatory Package

In 2009, the Vice President of the European Commission, Antonio Tajani, stated “the objective is to get a well developed system for the management of the air traffic harmonised, making it possible to reorganise the flow of traffic in European airspace by means of rules and operational common procedures aimed at shortening flight routes and duration; a better service, at a better price, and with a better environmental impact.”

The main regulations for the SES II Regulatory Package are:


This second phase aims at updating the current legislation, providing performance targets in the fields of safety, capacity, flight and cost efficiency and the environment. It also determines a commitment date for the Member States to improve performance by using Functional Airspace Blocks by 2012.196

For this purpose, the European Commission sets the following objectives:

- create a single safety framework to enable harmonised development of safety regulations and their effective implementation;
- improve the performance of the ATM system through setting of targets;
- open the door to new technologies enabling the implementation of new operational concept and increasing safety levels by a factor of ten;
- improve management of airport capacity.

The SES is not yet fully completed. The process is very complex; it takes time for the various States to reach agreement. They all have different legal systems and cultures.

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196 SESAR JU, Legal Review, Burkhart Von Erlach, Edition 00.01.01, 2011, p.12
### 4.2 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACC</td>
<td>Area Control Centres</td>
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<tr>
<td>AENA</td>
<td>Aeropuertos Españoles y Navegación Aérea (Spain)</td>
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<tr>
<td>AIM</td>
<td>Aeronautical Information Management</td>
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<td>AI</td>
<td>Aeronautical Information</td>
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<td>AIS</td>
<td>Aeronautical Information Services</td>
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<td>AISP</td>
<td>Aeronautical Information Service Provider</td>
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<tr>
<td>AIP</td>
<td>Aeronautical Information Publication</td>
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<tr>
<td>ASTERIX</td>
<td>All Purpose Structured EUROCONTROL SuRveillance Information Exchange (standard format used for the exchange of surveillance data)</td>
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<tr>
<td>ANS</td>
<td>Air Navigation Services</td>
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<td>ATC</td>
<td>Air Traffic Control</td>
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<td>ATM</td>
<td>Air Traffic Management</td>
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<td>ATS</td>
<td>Air Traffic Services</td>
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<tr>
<td>CAA</td>
<td>Civil Aviation Authority</td>
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<tr>
<td>CDM</td>
<td>Collaborative Decision Making</td>
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<tr>
<td>CFMU</td>
<td>Central Flow Management Unit, now Network Management Directorate</td>
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<tr>
<td>ConOps</td>
<td>Concept of Operations</td>
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<tr>
<td>CPA</td>
<td>Common Procurement Agreement</td>
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**DFS**
Deutsche Flugsicherung GmbH (German air navigation service provider)

**DSNA**
Direction des Services de la Navigation Aérienne (French air navigation service provider)

**EAD**
European AIS Database

**EC**
European Community

**ECAC**
European Civil Aviation Conference

**ENAV**
Ente Nazionale di Assistenza al Volo (Italian air navigation service provider)

**EU**
European Union

**EPA**
Établissement Public à caractère Administratif (government agency)

**ESSG**
EAD Service Steering Group

**FAA**
Federal Aviation Administration (air navigation service provider of the United States)

**FAB**
Functional Airspace Block

**GI**
Geographical Information

**IAIP**
Integrated Aeronautical Information Package

**ICAO**
International Civil Aviation Organisation established by the 1944 Chicago Convention on International Civil Aviation

**IM**
Information Management

**INSPIRE**
Infrastructure for Spatial Information in Europe

**IR**
Implementing Rules
ISO            International Standards Organization
IPR            Intellectual Property Rights
MUAC           Maastricht Upper Area Centre (EUROCONTROL)
MET            Meteorological Services
NATS           National Air Traffic Services (air navigation service provider of the United Kingdom)
NAVIAIR        Navigation Via Air (Denmark air navigation service provider)
NSA            National Supervisory Authority as defined in Article 4 of Regulation (EC) No 549/2004
NSDI           National Spatial Data Infrastructure
NSP            Navigation Service Providers
PENS           Pan European Network Services
PMU            PENS Management Unit
PPP            Public-Private-Partnership
PSSG           PENS Steering Group
PUG            PENS User Group
RADNET         Radar Data Network
RIT            SuRnet Implementation Team, established as support organisation to the SURNET Data Providers and SURNET Users.
RMCDE          suRveillance Message Conversion and Distribution Equipment
SARPs  Standards And Recommended Practices (ICAO)
SDDS  Surveillance Data Distribution System replaces RMCDE
SES  Single European Sky
SESAR  Single European Sky ATM Research
SITA  Société Internationale de Télécommunications Aéronautiques
SJU  SESAR Joint Undertaking
SLA  Service-level agreement
SURNET  Surveillance Network – The data communications infrastructure put in place for the exchange of surveillance data as defined in the EUROCONTROL 4-States (MUAC) area
SWIM  System Wide Information Management
TOD  Terrain and Obstacles Data
UPP  User Pay Principle
4.3 Definitions

4.3.1 Aeronautical data
According to Article 3.1 of Regulation (EC) No 73/2010, and ICAO Annex 15 on Aeronautical Information Services, “Aeronautical data means a representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing”\textsuperscript{197}

4.3.2 Aeronautical information (AI)
According to Article 3.1 of Regulation (EC) No 73/2010, and to ICAO Annex 15 on Aeronautical Information Services, “Aeronautical information” means information resulting from the assembly, analysis and formatting of aeronautical data;\textsuperscript{198}

4.3.3 Aeronautical information service (AIS)
According to Article 2.3 of EC Regulation No 549/2004, and to ICAO Annex 15 on Aeronautical Information Services, “AIS means a service established within the defined area of coverage responsible for the provision of aeronautical information and data necessary for the safety, regularity, and efficiency of air navigation.”\textsuperscript{199}

4.3.4 Air navigation services (ANS)
According to Article 2.4 of EC Regulation No 549/2004, ANS are “air traffic services; communication, navigation and surveillance services; meteorological services for air navigation; and aeronautical information services.”\textsuperscript{200}

According to The ICAO Manual on Air Navigation Services Economics, “this term includes air traffic management (ATM), communications, navigation and surveillance systems (CNS), meteorological services for air navigation (MET), search and rescue (SAR) and aeronautical information services (AIS). These services are provided to air traffic during all phases of operations (approach, aerodrome and en route).”\textsuperscript{201}

4.3.5 Air navigation service providers (ANSPs)
According to Article 2.5 of EC Regulation No 549/2004, ANSPs are “any public or private entity providing air navigation services for general air traffic.”\textsuperscript{202}

According to Article 2.3 of EC Regulation No 2096/2005, ANSPs “shall be understood to include an organisation having applied for a certificate to provide such services.”\textsuperscript{203}

\textsuperscript{197} Article 3, Regulation (EC) No 73/2010 of the European Parliament and of the Council laying down the requirements on the quality of the aeronautical data and aeronautical information for the Single European Sky, and ICAO Annex 15 on Aeronautical Information Services, Chapter 2 - Definitions Chapter 2 – Definitions 5

\textsuperscript{198} Article 3, Regulation (EC) No 73/2010 of the European Parliament and of the Council laying down the requirements on the quality of the aeronautical data and aeronautical information for the Single European Sky, and ICAO Annex 15 on Aeronautical Information Services, Chapter 2 - Definitions

\textsuperscript{199} Article 2, Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky (the framework Regulation), and ICAO Annex 15 on Aeronautical Information Services, Chapter 2 - Definitions

\textsuperscript{200} Article 2, Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky (the framework Regulation)


\textsuperscript{202} Article 2, Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky (the framework Regulation)

\textsuperscript{203} Article 2, Regulation (EC) No 2096/2005 of the European Parliament and of the Council laying down the common requirements for the provision of air navigation services
The ICAO Manual on Air Navigation Services defines an ANSP as follows: “An independent entity established for the purpose of operating and managing air navigation services, and empowered to manage and use the revenues it generates to cover its costs. In this manual, the terms provider, entity and organization are used interchangeably.”

4.3.6 Air traffic control (ATC) services

ATC makes sure that aircrafts are safely separated in the sky as they fly, and at the airports where they land and take off again. In Europe, air traffic control is performed by the area control centres (ACCs) located in each country, which guide aircrafts to and from airports.

According to Article 2.1 of EC Regulation 549/2004, and to ICAO Annex 11 on Air Traffic Services “ATC services means a service provided for the purpose of:

(a) Preventing collisions:
   — Between aircraft, and
   — In the manoeuvring area between aircraft and obstructions; and

(b) Expediting and maintaining an orderly flow of air traffic;”

4.3.7 Air traffic flow management

According to ICAO Annex 11 on Air Traffic Services, air traffic flow management is “a service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.”

4.3.8 Air traffic management (ATM)

ATM is about the process, procedures and resources which come into play to make sure that aircraft are safely guided in the skies and on the ground. It is composed of a number of complementary systems: airspace management, air traffic flow and capacity management (ATFCM), and air traffic control (ATC). These systems, in combination, make sure that your flight is safe and punctual.

According to Article 1.2 of EC Regulation No 1070/2009, “ATM means the aggregation of the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations.”

4.3.9 Air traffic services (ATS)

According to Article 2.11 of EC Regulation No 549/2004, and to ICAO Annex 11 on Air Traffic Services, “ATS means the various flight informations services, alerting services, air traffic advisory services and ATC services (area, approach and aerodrome control services);”
4.3.10 Charging vs. recovery

Recovery: Absorption of a cost through its allocation to an appropriate account. “Recoupment of the purchase price of a capital [or cost of a service] or qualified asset through depreciation over a prescribed period”211

Charging: To require a payment from somebody

4.3.11 Common procurement agreement

The CPA is an instrument used in the context of PENS. It is a declaration of intention and interest signed by an organisation that wishes to use a service. In the context of PENS, the CPA allows EUROCONTROL to act on behalf of each signatory in the selection of the network service provider (NSP), the negotiation and the signature of the PENS contract and the subsequent management of the contractual relationship with the NSP. The CPA does not commit an organisation to the PENS contract with the NSP.

4.3.12 Cross-border services

According to Article 2.41 of (EC) Regulation No 549/2004 “'cross-border services' means any situation where air navigation services are provided in one Member State by a service provider certified in another Member State.”212

4.3.13 Domain

In this document, a Domain will be understood to be a field, scope of knowledge, or activity related to ATM.

4.3.14 Governance

In the context of SWIM, “the main task of the governance is to identify the roles and reporting structures within the system. These are the different roles that can be found in the governance structure: executive management, committees, working groups, and subject-matter experts. Using these roles, a generic governance structure can be built, and will illustrate the relationships among the various roles, and this relationship model will show the basic governance of responsibilities within a system or organisation.”213

4.3.15 Integrated aeronautical information package (IAIP)

According to Article 3.7 of (EC) Regulation No 73/2010, laying down the requirements on the quality of the aeronautical data and aeronautical information for the Single European Sky, and to ICAO Annex 15 on Aeronautical Information Services, “IAIP means a package which consists of the following elements:

(a) Aeronautical information publications (hereinafter AIP), including amendments;
(b) Supplements to the AIP;
(c) The NOTAM, as defined in point 17 and pre-flight information bulletins;
(d) Aeronautical information circulars; and
(e) Checklists and lists of valid NOTAMs.”214

211 http://www.businessdictionary.com/definition/cost-recovery.html#ixzz1uFvJsTp5
212 Article 2, Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky (the framework Regulation)
213 “Governance Structure: Defining Relationships and Roles”, Steve Schlarman, 2009
4.3.16 Intellectual property rights

Intellectual property rights are the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time. IPRs include copyrights, trademarks, trade names, patents, design rights, etc. in the general domain of law, which includes copyright, trademark, licensing, and patent law.

4.3.17 Liability vs. responsibility

Liability is the “legal responsibility for one's acts or omissions. Failure of a person or entity to meet that responsibility leaves him/her/it open to a lawsuit for any resulting damages or a court order to perform (as in a breach of contract or violation of statute).”

We can distinguish contractual liability from extra-contractual liability. Contractual liability arises from the contract between two parties where there is a potential liability issue. Extra-contractual liability is a consequence of torts where the parties concerned have no contractual relationship.

In the SWIM context, we usually encounter the following types of liability:

- liability of the data provider, the second provider (for erroneous data provided), or the data user (illicit use or access to data, breach of the contractual obligations);
- liability of the network provider (for error in the data transmission or availability of the network);
- liability of the SWIM management entity (for granting wrong access/access to information not intended for a particular data consumer);

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215 see also: http://www.wto.org/english/tratop_e/trips_e/intel1_e.htm:

Intellectual property rights are customarily divided into two main areas:

“Copyright and rights related to copyright: The rights of authors of literary and artistic works (such as books and other writings, musical compositions, paintings, sculpture, computer programs and films) are protected by copyright, for a minimum period of 50 years after the death of the author.

Also protected through copyright and related (sometimes referred to as “neighbouring”) rights are the rights of performers (e.g. actors, singers and musicians), producers of phonograms (sound recordings) and broadcasting organizations. The main social purpose of protection of copyright and related rights is to encourage and reward creative work.”

(ii) Industrial property. Industrial property can usefully be divided into two main areas:

One area can be characterised as the protection of distinctive signs, in particular trademarks (which distinguish the goods or services of one undertaking from those of other undertakings) and geographical indications (which identify a good as originating in a place where a given characteristic of the good is essentially attributable to its geographical origin).

The protection of such distinctive signs aims to stimulate and ensure fair competition and to protect consumers, by enabling them to make informed choices between various goods and services. The protection may last indefinitely, provided the sign in question continues to be distinctive.

Other types of industrial property are protected primarily to stimulate innovation, design and the creation of technology. In this category fall inventions (protected by patents), industrial designs and trade secrets.

The social purpose is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities.

A functioning intellectual property regime should also facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing.

The protection is usually given for a finite term (typically 20 years in the case of patents).

While the basic social objectives of intellectual property protection are as outlined above, it should also be noted that the exclusive rights given are generally subject to a number of limitations and exceptions, aimed at fine-tuning the balance that has to be found between the legitimate interests of right holders and of users.

216 Copyright ©, 1981-2005 by Gerald N. Hill and Kathleen T. Hill

217 SESAR JU, Legal Review, Burkhart Von Erlach, Edition 00.01.01, 2011, p.13

218 SESAR JU, Legal Review, Burkhart Von Erlach, Edition 00.01.01, 2011, p.13
- liability of oversight agent/NSA, and **responsibility** is “the duty or the obligation to satisfactorily perform or complete a task (assigned by someone, or created by one's own promise or circumstances) that one must fulfil, and which has a consequent penalty for failure.”\(^{219}\) Responsibility is the obligation to answer for an act done, and to repair any injury it may have caused.\(^{220}\)

**4.3.18 Licence**

A licence is granted by the holder of a patent or a copyright on literary or artistic work, and gives the holder of the licence a limited right to reproduce, sell, or distribute the work. The licensee will usually pay a fee to the licensor in exchange for use of the property. For example, in the case of computer software, companies sell licenses to their products. In the licensing agreement users are informed that although they possess a disk containing the software, they have actually only purchased a license to operate it. The license typically forbids giving the software to someone else, making copies of it, or running it on more than one computer at a time.\(^{221}\)

**4.3.19 Meteorological services**

According to Article 2.29 of (EC) Regulation No 549/2004, MET services “means those facilities and services that provide aircraft with meteorological forecasts, briefs and observations as well as any other meteorological information and data provided by States for aeronautical use.”\(^{222}\)

**4.3.20 Radar information**

RADAR is the acronym for RAdio Detection And Ranging. In this document, Radar represents the system used to acquire surveillance information, MET information, and other data related to ATM in this context.

**4.3.21 Service**

From a public point of view, service is an organised system of labour and material aids used to supply the needs of the public. From a business point of view, service is the supply, installation, or maintenance of goods carried out by a dealer.

Within the Single European Sky (SES) context, service can be seen as an organised system which provides the supply, installation, or maintenance of data and information, conducted by a provider to a user.

**4.3.22 Service level agreement**

A service-level agreement (SLA) is usually a part of a service contract where different and detailed aspects of the quality of a service are formally defined. Examples: intervention times or the standards applying to the relationship between the parties.\(^{223}\)

**4.3.23 Surveillance data**

According to Article 3.1 of (EC) Regulation No 1207/2011, “Surveillance Data means any data item, time stamped or not, within the surveillance system that pertains to:

(a) aircraft 2D position;

\(^{219}\) http://www.businessdictionary.com/definition/responsibility.html  
\(^{220}\) “A Law Dictionary, Adapted to the Constitution and Laws of the United States”, John Bouvier, 1856  
\(^{222}\) Article 2, Regulation (EC) No 549/2004 of the European Parliament and of the Council laying down the framework for the creation of the Single European Sky (the framework Regulation)  
\(^{223}\) http://www.sla-zone.co.uk/
(b) aircraft vertical position;
(c) aircraft altitude;
(d) aircraft identity;
(e) 24-bit ICAO aircraft address;
(f) aircraft intent;
(g) aircraft velocity;
(h) aircraft acceleration

4.3.24 Surveillance services
According to Article 2.38 of (EC) Regulation No 549/2004, “surveillance services’ means those facilities and services used to determine the respective positions of aircraft to allow safe separation.”

4.3.25 Terrain and Obstacle Data
Articles 3.8 and 9 of (EC) Regulation No 73/2010 defines obstacle data and terrain data as follows: “Obstacle data means data concerning all fixed (whether temporary or permanent) and mobile objects, or parts thereof, that are located on an area intended for the surface movement of aircraft or that extend above a defined surface intended to protect aircraft in flight.”
“Terrain data means data about the surface of the earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.”

4.3.26 User-pays principle
The User Pay Principle (UPP) is a pricing approach based on the idea that the consumers pay the full cost of the good that they consume.

224 Article 3, Regulation (EC) No 1207/2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky
4.4 Reference material

**ICAO:**

Annex 3 to the Convention on International Civil Aviation on Meteorological Services for International Air Navigation

Annex 15 to the Convention on International Civil Aviation on Aeronautical Information Services

ICAO Document 9377, Manual on Coordination between Air Traffic Services, Aeronautical Information Services and Aeronautical Meteorological Services, 5th edition, 2010


ICAO Document 9082, ICAO's Policies on Charges for Airports and Air Navigation Services

**European Union:**


Commission Regulation (EC) No 2096/2005 of 20 December 2005 laying down common requirements for the provision of air navigation services

Commission Regulation (EC) No 1794/2006 of 6 December 2006 laying down a common charging scheme for air navigation services


Commission Regulation (EU) No 73/2010 of 26 January 2010 laying down requirements on the quality of aeronautical data and aeronautical information for the single European sky

Commission Implementing Regulation (EU) No 1207/2011 of 22 November 2011 laying down requirements for the performance and the interoperability of surveillance for the single European sky

**EAD:**

EAD - Data Provider Agreement Document (version 1.4)

EAD - Client Agreement Document (version 1.0)

EAD Charging discussion document, EUROCONTROL, July 2011

**Meteorological Services:**

Météo France - Licence de réutilisation d'informations météorologiques – Licence Standard et Licence Spéciale

**PENS:**

PENS - Charging for the PENS document

PENS - Governance Structure document

PENS - Financial management process document for PENS

**SURNET:**
RADNET – Surveillance data sharing agreement
SURNET – Surveillance data sharing agreement


INSPIRE:
Spatial Data Infrastructure in Norway: State of Play 2011, K.U Leuven
Spatial Data Infrastructure in the Netherlands: State of Play 2011, K.U Leuven
Spatial Data Infrastructure in France: State of Play 2011, K.U Leuven
Spatial Data Infrastructure in Denmark: State of Play 2011, K.U Leuven
Spatial Data Infrastructure in the United Kingdom: State of Play 2011, K.U Leuven

Terrain and Obstacle Data:
Terrain and Obstacle Data Manual, Ed 2.0

Others:
SWIM ConOps, 2012
EUROCONTROL Document 10.60.01, Central Route Charges Office, “Principles for establishing the cost-base for en route charges and the calculation of the unit rates”, March 2010, 3.9 AIS costs
European Air Traffic Management Master Plan, Edition 1, 30 March 2009
Legal Review for SWIM, SESAR Joint Undertaking, Edition 00.01.01, 2011
SWIM-SUIT, SWIM Regulatory Framework, Deliverable No. D5.3.1, 2006