



Guidance

ANSP Interoperability Compliance

the Interoperability Regulation EC No 552/2004
as amended by Regulation EC No 1070/2009

1. Introduction

- 1.1 The purpose of this document is to assist Air Navigation Service Providers (ANSPs) with the process of compliance with the Single European Sky Interoperability (IOP) Regulation (Regulation (EC) No 552/2004 as amended by Regulation (EC) No 1070/2009).
- 1.2 The guidance addresses compliance with the IOP Essential Requirements (ERs) and the necessary content of the EC Declaration of Verification (DoV) and Technical File (TF) for systems where there are no relevant Implementing Rules (IRs) or Community Specifications (CSs). This guidance should be read in conjunction with the IOP Regulation. In parallel with IOP compliance, the UK Air Navigation Order and CAP 670 continue to apply.
- 1.3 The guidance draws together information from published material, information available to those participating in the development of conformity assessment processes at Eurocontrol², and the European Commission's interpretation of elements of the IOP Regulation³. It is intended to give an informed insight to ANSPs to assist their compliance with the IOP Regulation in the UK. This guidance will be updated as further information appears and may be found on the CAA website www.caa.co.uk/sesinteroperability with additional information about IOP.

2. IRs and CSs

- 2.1 IRs are EU regulations (European Law) intended to determine any specific requirements such as safety, seamless operation, performance or assessment procedures that may further refine ERs. IRs determine the implementation dates for European Air Traffic Managements Network (EATMN) systems. IRs may also identify specific constituents that form a system, and provide conformity assessment procedures where Notified Bodies (see IOP annex V) may be involved. The ANSP compliance with an IR is to be detailed in the TF. See section 12.
- 2.2 Notified Bodies may be involved with ANSPs in the certification process as defined in the IRs, however only a limited number of areas will be covered by IRs. *Currently there are no organisations recognised as Notified Bodies for IOP in the UK⁴.*

- 2.3 CSs are listed in the Official Journal of the European Union. CSs contain detail on how ERs are complied with by constituents and systems and may define constituents. Compliance with a CS by a manufacturer or ANSP provides a presumption of conformity to the ERs and IRs and thereby recognition by the National Supervisory Authority (NSA), but remain voluntary as 'a' means of compliance. In the UK, the CAA is recognised as the NSA.
- 2.4 ANSPs must verify whether any IRs or CSs are applicable to the system being brought into service. Evidence of compliance must be provided as part of the process described below. ANSPs may check the status of IRs and CSs at the European Commission websites:

[Implementing rules](#)

and:

[Community Specifications](#)

or the Eurocontrol website:

[Implementing Rules](#)

or the CAA website:

[SES Legislation](#)

3. CE Marking

- 3.1 It is not a requirement to CE mark constituents or systems to show compliance with the IOP Regulation. However ER 3 does require evidence of the installed system being free from harmful interference (see 6.5.5 below) and therefore a manufacturer's EC Declaration of Conformity (DoC) showing compliance with the EMC or R&TTE directive is useful supporting evidence when meeting this requirement. CE marking may be also necessary to show compliance with other New Approach Directives. For this reason the CAA will require evidence in the form of a relevant DoC that the EMC or R&TTE directive, as appropriate, has been complied with.

4. Systems and Constituents

- 4.1 'System' means "the aggregation of airborne and ground based constituents that provide support for air navigation services for all phases of flight¹". *Constituents become a system or an interoperability relevant part of a system when installed/integrated and/or used for air navigation services. Also, the design, build, operation and maintenance of the installation are included within the meaning of system compliance⁴.*
- 4.2 'Constituents' means "tangible objects such as hardware and intangible objects such as software upon which the interoperability of the EATMN depends¹". - *A constituent is principally a device*

that provides the interface to or from an aircraft, controller or other ANSP unit and has a direct influence on the interoperability, hence transmitter, receiver, aerial, comms control, display, data processor etc for the purpose of air traffic management. A radar 'system' as sold by a manufacturer is a constituent until installed and operated by the ANSP.

Equipment that provides the intervening connection of signals and data between the above equipment without intentionally changing the signal or data between input and output, and not the subject of an IR or CS, is not considered to be a constituent⁴.

5. IOP Compliance

- 5.1 An ANSP demonstrates compliance by the presentation of a suitable EC Declaration of Verification (DoV) (section 11 of this document) supported by a Technical File (TF) (section 12 of this document), and in most cases a manufacturer's Declaration of Suitability for Use (DSU) for a constituent. The ANSP should ensure that the DSU meets the IOP requirements before sending it to the CAA. A declaration of IOP compliance is required for systems listed in IOP Regulation Annex I, prior to being brought into service, irrespective of whether the particular systems are newly manufactured or previously used. This requirement relates to systems and procedures for ATS, CNS, ATM, AIS, Met and Airspace Management. Article 2 of the IOP Regulation states that systems and constituents shall meet the ERs.
- 5.2 IOP compliance has been a requirement to be met before systems are put into operation since 20 October 2005. See ATSIN 167. It should be noted that from 20 April 2011 all systems in operation prior to 20 October 2005 (legacy systems) required IOP compliance declarations based on existing ANO compliance.

6. Essential Requirements Parts A & B

- 6.1 Essential Requirements (ERs) are detailed in Annex II of the IOP Regulation, which in general address technical performance, safety of systems, constituents and procedures. Procedures encompass, design, build, maintenance and operation. Operation encompasses technical operation and air traffic operational procedures. The ERs are divided into General (Part A) which addresses all systems and constituents and Specific Requirements (Part B) which address the systems defined in IOP Annex I with more specific detail.
- 6.2 The combination of these measures is aimed at achieving seamless operation for aircraft operating in the European ATM Network and communication between airports and control centres.

- 6.3 Seamless operation means “the operation of the EATMN in such a manner that from the user’s perspective it functions as if it were a single entity¹”, it can be expressed, in terms of information sharing, including the relevant operational status information, common understanding of information, comparable processing performances and the associated procedures enabling common operational performance². *“Common operational performance” may be interpreted to mean the expected performance from a system such that it would meet International Civil Aviation Organisation (ICAO) requirements or CAP 670 and be compatible with the expected performance from an aircraft or an Air Traffic Control (ATC) unit. Such information would be contained in the safety assurance documentation [a specific safety case and paragraph reference in the TF will suffice]*⁴
- 6.4 Support for New Concepts of Operation requires that relevant systems will be required to accommodate new operational concepts that advance the quality, effectiveness, safety and capacity of air navigation services. *New Concepts of Operation are those that are defined in adequate detail to be implemented, and therefore systems and constituents can be designed to accommodate such concepts for future implementation. Such changes would be introduced on defined dates on a coordinated basis, possibly by an Implementing Rule*⁴.

6.5 Safety

- 6.5.1 There are a number of high-level safety requirements in the ERs. Most of these may be addressed by listing the relevant paragraph references from the safety assurance documentation. It is required that ANSPs maintain safety management and reporting procedures to achieve this.
- 6.5.2 Safety nets are mentioned specifically in the ERs. *These relate to separate systems or functions such as MSAW and STCA designed for the purpose of being a safety net. As such, there are likely to be few systems that have identified safety nets. A duplicate ‘standby’ system is not considered to be a safety net*⁴.
- 6.5.3 The safety documentation referenced and the operational procedures shall cover normal and any defined degraded modes of operation.
- 6.5.4 Design and assessment of Human Machine Interface (HMI) for control staff shall be documented for all EATMN systems in normal and any defined degraded modes of operation.
- 6.5.5 ‘Free from harmful interference’ may be understood as referring to electromagnetic interference. *Whilst any electronic constituent will have either EMC or R&TTE Directive compliance, indicated by the DoC to those directives, this addresses EMC compliance in isolation. Therefore, IOP compliance needs to include the broader objective of measures taken to determine interference free operation when installed. As this IOP ER says, this needs to be addressed during the design, build, maintenance and operation of the system*⁴. The requirements of EMC Directive 2004/108/EC particularly with regard to the fixed installation requirements should be taken into account. The CAA requires sight of the manufacturer’s R&TTE or EMC DoC at the time of the IOP submission.

- 6.6 Civil-military coordination requires that relevant systems and constituents i.e. those that may be designed to have a civil-military interface will progressively accommodate the requirements for the sharing of information, as they are defined, to enable the flexible use of airspace.
- 6.7 Environmental constraints requires that any relevant community legislation such as EC Directive 2003/30 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports, EC Directive 2008/50 on ambient air quality, the Waste Electrical and Electronic Equipment (the WEEE Directive 2002/96/EC) and the restriction of certain hazardous substances, (the RoHS directive 2002/95/EC), is complied with where relevant.
- 6.8 Principles governing the logical architecture of systems are to ensure that as systems are introduced, there is a focus on improved integration to the EATMN.
- 6.9 Principles governing the construction of systems relate to the use of good engineering practices being employed for the design, build and maintenance of systems, the modularity design of constituents enabling interchangeability and the high availability redundancy and fault tolerance of critical constituents. These points may be covered by reference in the TF to the appropriate areas in the safety assurance documentation.
- 6.10 The DoV declares that the ERs as described in 6 above have, where relevant, been addressed and documented. Details relating to each relevant ER are to be documented in the TF.

7. Specific Requirements – Part B

- 7.1 Part B of the ERs addresses additional requirements for the specified list of EATMN systems. The specific requirements further refine the general requirements seamless operation, and support for new concepts of operation, in the context of the eight EATMN systems. Details of compliance to these requirements are to be given in the TF. In some cases, more than one specific ER may be applicable to a system.

8 Verification Procedure for systems

- 8.1 Verification is the procedure whereby an ANSP checks and declares that a system complies with the ERs and may be put into operation. *The ANSP is responsible for determining that constituents and their DSUs meet the IOP requirements⁵.*
- 8.2 The system [the design, build, operation and maintenance of the installation] is checked by the ANSP for each of the following aspects:
 - overall design;
 - development and integration of the system, including in particular constituent operation and overall adjustments - *factory testing⁴*;
 - operational system integration – *site testing⁴*;
 - specific system maintenance provisions if applicable – *maintenance exposition⁴*.
- 8.3 The verification process, as detailed above, is to be recorded in the TF.

9 Upgrades and Modifications

- 9.1 The upgrading of systems is included in the definition of putting into service³, therefore certain upgrades must have a updated TF. TF changes may also affect the detail on the DoV so that may also need to be updated.
- 9.2 An upgrade of a system is “any modification that changes the operational characteristics of a system¹”. In practice, it is considered “that an upgrade is a significant increase of the performance or the capabilities of a system due to important modifications or new features³”. *Where a system or constituent is replaced with a system or constituent having a similar performance but with a different design, it is considered to be a new installation⁴.*
- 9.3 “A periodic update of a system without significant performance changes (such as when dealing with component obsolescence) should not be considered as an upgrade of a system³ and therefore would not need a DoV. *Such updates will be those, which are part changes where the original system and constituent(s) remains in place, otherwise it is considered that a new system is being brought into service, requiring an IOP DoV and TF⁴.*

10 EC Declaration – Manufacturers Conformity

(a more detailed explanation of this is available on the CAA website: www.caa.co.uk/sesinteroperability) - Guidance, Manufacturers Interoperability Compliance.

- 10.1 The IOP Regulation requires that any constituent supplied to an ANSP must be accompanied by either an Interoperability Regulation EC Declaration of Conformity (DoC) or a DSU. ***The ANSP is responsible for ensuring that the constituent(s) and the manufacturer’s DSU(s) are satisfactory for the IOP requirements⁴.***
- 10.2 In accordance with IOP Annex III (2) an Interoperability Regulation DoC may be employed **only** in association with a relevant Community Specification.
- 10.3 Where relevant Community Specifications have not been produced, the manufacturer or the authorised representative can only provide a DSU to an ANSP. This requires an assessment/judgement that the equipment is suitable for use within its ATM environment. *In the absence of further definition, the assumption is made that this may be generic, so evidence of compliance with any relevant ICAO requirements and any additional recognised documentation such as Eurocontrol specifications is to be provided or referenced⁴.* The DSU (or DoC) is to accompany the TF.
- 10.4 Where a constituent is no longer in production or was not designed specifically for ATM applications, the ANSP may produce the equivalent DSU from their assessment of the constituent’s suitability for the intended application⁴.

11 EC Declaration of Verification (ANSP)

11.1 An EC DoV, along with a TF, is required from the ANSP as a declaration that the system meets the requirements of the IOP Regulation and any required IRs. The DoV must be dated and signed and a copy submitted to the NSA AAA Regional Office at:

ats.southern.regional.office@caa.co.uk or
ats.northern.regional.office@caa.co.uk as appropriate

or the relevant SARG regional AAA Engineering Inspector, where known, at **least 30 days** before the system is to be brought into operation.

The date planned for operation is to be stated.

IOP Regulation Article 7 requires that the NSA is to restrict or prohibit the use of a system or constituent that is not IOP compliant. The absence of the DoV or TF is considered to be non-compliance. The manufacturer or agent supplying a constituent is also required to provide a DSU/DoC. This and the ANSPs responsibility to provide a DoV and TF is confirmed Statutory Instrument 2009 No. 1735.

11.2 The DoV and TF must be separate documents, written in English. The DoV must contain the following:

- the Regulation references, - *the IOP Regulation title and number⁴*,
- the name and full address of the ANSP - *registered address, and the location address of the system if different⁴*,
- the planned operational date
- a brief description of the system or update being introduced, including identification of any pre-existing system parts that will be connected to the new installation such as antenna or display. The principle purpose of a system already described in ICAO Annex 10 or CAP 670 does not need to be stated. The description should focus on the particular configuration of the system being installed.
- description of the procedure followed in order to declare conformity of the system - *describe the process followed, from design requirement, constituent testing, installation design, testing and verification confirming that the system and the constituent meets the ERs⁴ and relevant IRs;*
- Reference to the TF and the references of the documents contained in the TF;
- where appropriate, reference to relevant Community Specifications, - *where none exist, reference to any relevant ICAO specific requirements and any additional recognised compliance documentation employed such a Eurocontrol specifications may support the declaration⁴*
- all the relevant temporary or definitive provisions to be complied with by the systems and in particular, where appropriate, any operating restrictions or conditions;

- if temporary, the duration of validity of the EC declaration; or if unlimited this is also to be stated - *to be determined by the ANSP. Currently there are no time restrictions defined by the CAA*⁴.
- Signature and date
- identification of the signatory. – *position/title*⁴
- The ANSP should provide a response, in the DoV, to each of the bullet points above.

A template, that may be used to complete a DoV, can be obtained from the SARG regional AAA Engineering Inspector or directly from the CAA at ats.enquiries@caa.co.uk.

12 Technical File

12.1 The TF will:

- Reference the DoV
- Accompany the EC DoV, be retained and maintained by the ANSP throughout the service life of the system;
- Contain
 - A list of constituents and copies of their DSUs;
 - List the operational, maintenance and other procedures relevant to the system.
- Contain (*or reference*⁴) all the necessary documents relating to the characteristics of the system, including;
 - Conditions and limits of use of the system;
 - A record of the tests and installation configurations made to ensure compliance with ERs and relevant IRs (such as factory/site acceptance tests)
 - Evidence of compliance with each of the relevant ERs (see para 6.8) and relevant IRs. *References should be made to the sections of documents, such as safety cases, that relate to specific ERs*⁴.
 - Details and results of the verification process (see para 8.3)

12.2 A copy of the TF must be sent by the ANSP to any other Member State that requests it. *Issues of IPR, and confidentiality may then need to be considered by the ANSP. The TF will be sent by the CAA with the agreement of the ANSP*⁴.

Flow diagrams are provided in Annex 1 to illustrate the compliance process.

12.3 A template that may be used to complete a TF can be obtained from the regional SARG AAA Engineering Inspector or directly from the CAA at ats.enquiries@caa.co.uk.

13 Relationship to provider certification under SES

- 13.1 The IOP Regulation states at Article 6(4) that “the EC DoV shall be without prejudice to any assessments that the NSA may need to carry out on grounds other than interoperability”. Although safety is one of the ERs, it is important that IOP is seen within the overall context of a provider’s safety management system. Thus, it is closely linked to the safety elements of provider certification under the SES Common Requirements Regulation (Regulation (EC) 2096/2005). This includes requirements both for SMS and for risk assessment and mitigation with regard to changes.
- 13.2 EC Regulation No.1315/2007 requirements for safety oversight by NSAs require NSAs to audit compliance with all safety regulatory requirements including the various IOP declarations. The oversight of safety changes to functional systems is a key element of EC Regulation No.1315/2007.

14 Relationship to Air Navigation Order approvals

- 14.1 Providers will continue to be approved by the CAA under ANO Article 169 as part of the overall certification and designation process. The CAA will also continue to issue equipment approvals under ANO Article 205. There may in due course be amendments to UK legislation to reflect the interaction of the IOP Regulation and Article 205. However, the CAA’s present intention is to address both interoperability and wider safety issues within the framework of the Article 205 approval because of their close alignment.

Abbreviations:

| | | |
|-------|---|---|
| AIS | - | Aeronautical Information Service |
| ANO | - | Air Navigation Order |
| ANSPs | - | Air Navigation Service Providers |
| ATC | - | Air Traffic Control |
| ATM | - | Air Traffic Management |
| ATS | - | Air Traffic Services |
| AAA | - | Air Traffic Standards Department |
| CAA | - | Civil Aviation Authority |
| CAP | - | Civil Aviation Publication |
| CE | - | Communauté Européenne |
| CNS | - | Communications, Navigation, Surveillance |
| CSs | - | Community Specifications |
| DoC | - | EC Declaration of Conformity |
| DoV | - | EC Declaration of Verification |
| DSU | - | EC Declaration of Suitability for Use |
| EATMN | - | European Air Traffic Management Network |
| EC | - | European Community |
| EMC | - | Electromagnetic Compatibility (Directive 2004/108/EC) |
| ERs | - | Essential Requirements |
| HMI | - | Human Machine Interface |
| ICAO | - | International Civil Aviation Organisation |
| IOP | - | Interoperability (Regulation 552/2004) |
| IPR | - | Intellectual Property Rights |
| IRs | - | Implementing Rules |
| LVD | - | Low Voltage Directive (73/23/EEC) |
| MSAW | - | Minimum Safe Altitude Warning |
| NSA | - | National Supervisory Authority |
| R&TTE | - | Radio & Telecommunication Terminal Equipment (Directive 1999/5) |
| RoHS | - | Restrictions on the use of Hazardous Substances in electronic equipment |
| SES | - | Single European Sky |
| SARG | - | Safety Regulation Group |
| STCA | - | Short Term Conflict Alert |
| TF | - | Technical File |
| WEEE | - | Waste Electrical and Electronic Equipment (2002/96/EC) |

References:

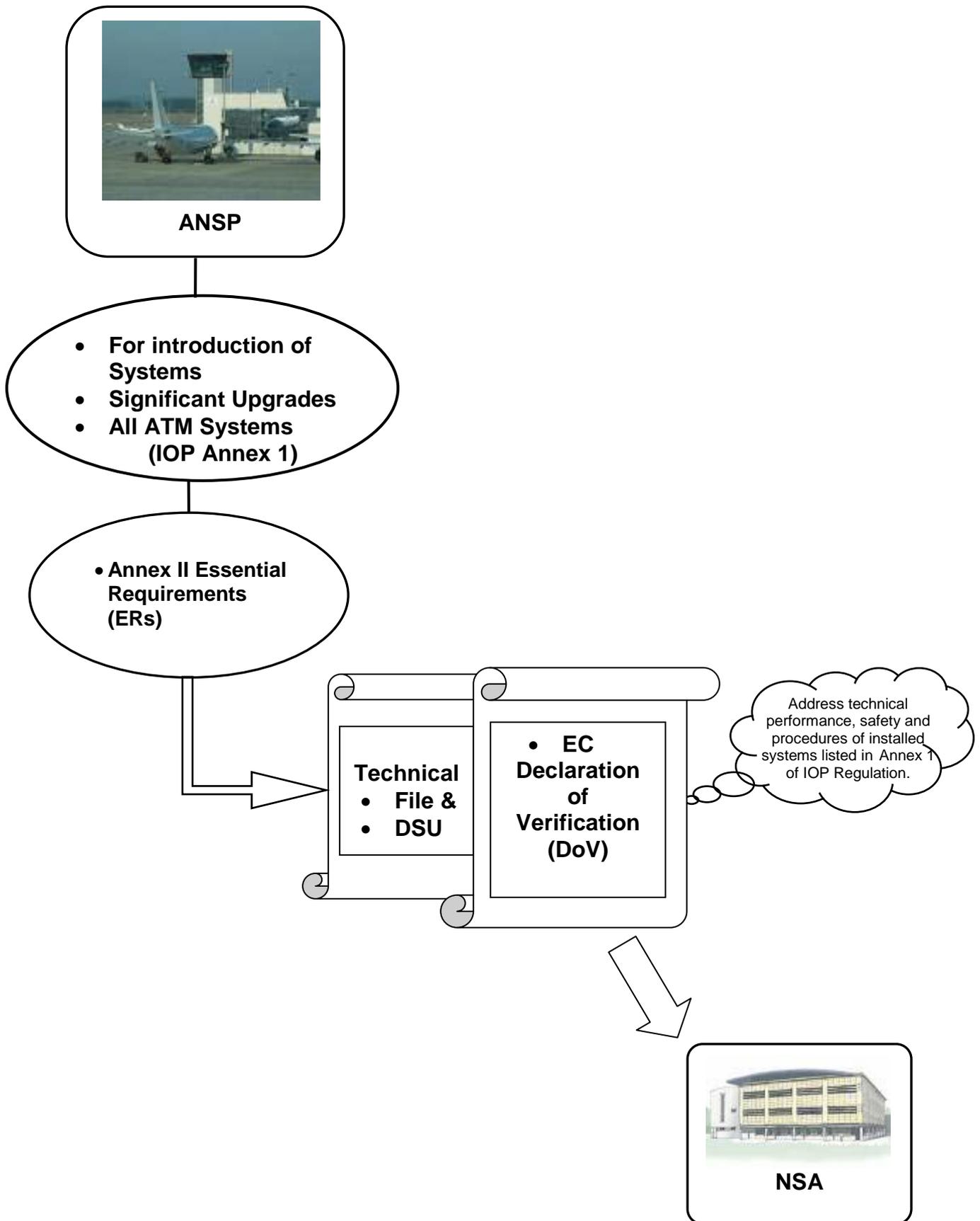
- 1 **REGULATION (EC) No 549/2004 the Framework Regulation**
- 2 **Eurocontrol - Initial Guidelines for The Conformity Assessment Of EATMN Systems**
- 3 **EC - Conformity assessment of the EATMN. TREN.F2/EMM D(2005)**
- 4 **CAA derived guidance**

CAA Contact:

ats.enquiries@caa.co.uk

Annex 1

SES Interoperability Regulation - ANSP Route with no relevant IRs or CSs



SES Interoperability Regulation – ANSP Route with applicable IRs and/or CSs

