



# SESAR Solution Regulatory Overview

## *Validation of LPV; ATC procedures and ATC Training*

### Document information

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### **Abstract**

This document contains an overview of the SESAR Solutions documented recommendations from regulatory, standardisation, oversight and certification perspectives resulting from the cooperation with EASA and National Authorities.

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# Table of Contents

<b>1</b>	<b>INTRODUCTION</b> .....	<b>4</b>
<b>2</b>	<b>GENERAL RECOMMENDATIONS</b> .....	<b>5</b>
<b>3</b>	<b>SPECIFIC RECOMMENDATIONS</b> .....	<b>6</b>
3.1	ON THE REGULATORY FRAMEWORK .....	6
3.2	ON THE STANDARDISATION FRAMEWORK.....	6
3.3	ON THE REGULATORY OVERSIGHT AND CERTIFICATION ACTIVITIES .....	6
3.3.1	<i>On Safety (Reg. 1035/11, Annex II, Art. 3.2)</i> .....	6
3.3.2	<i>On other regulatory domains:</i> .....	8

# 1 Introduction

The purpose of this document is to provide an overview of the SESAR Solutions documented recommendations from regulatory, standardisation, oversight and certification perspectives resulting from the cooperation with EASA and National Authorities.

The document presents the recommendations issued by the National Authorities and EASA, for an acceptable deployment of the concepts contained in the SESAR Solution. These recommendations must be taken into consideration by the entities in charge of deployment of the correspondent SESAR Solution.

## 2 General recommendations

In general terms, it must be underlined that:

- 1) When deploying a SESAR Solution, the compliance with all applicable regulatory requirements must be ensured by the different concerned entities;
- 2) In particular, it must be ensured that the appropriate safety argument for the concerned change to the ATM functional system is performed in accordance with EC regulation 1035/2011 considering local specific risks and mitigation to those risks.
- 3) The present SESAR Solution does not constitute in itself an acceptable Means of Compliance with the previously mentioned regulatory requirements. Means of Compliance are subject to their acceptance by the Authorities involved in each concrete local implementation.
- 4) A verification of the existing standardisation and regulatory frameworks has to be done at the date of local deployment to identify possible major changes to the one in use at the moment of publication of this SESAR Solution.

## 3 Specific recommendations

### 3.1 On the Regulatory Framework

- There is no specific topic on the regulatory framework field to be specially considered in deployment, beyond the currently existing applicable regulations. On the airborne side the regulatory approval processes are largely harmonized due to the fact that EASA has clear responsibility in this area.
- Each State has its own national process for issuing the approval for operators to perform RNP APCH procedures to LPV minima. It would be advisable to promote the harmonization of these processes for the entire operational approvals process for all types of operations, thus including LPV operations. In particular, harmonization under the EASA umbrella could be considered on specific safety requirements for navigation database provider, aircraft operator, aircraft navigation systems and flight crew.

### 3.2 On the Standardisation Framework

- There is no specific topic on the standardisation framework field to be specially considered in deployment, beyond the currently existing applicable standards.
- Nevertheless, a checking of the existing standardisation framework in the date of local deployment has to be done to identify possible major changes to the one in use at the moment of publication of this solution.
- Modifications may need to be made to ICAO PBN manual (Doc 9613).

### 3.3 On the Regulatory Oversight and Certification Activities

When proceeding with the local implementation of this solution, Modifications will need to be made to ANSP training programmes, procedures and documentation, to accommodate the local specificities of the LPV operation. The following topics must be taken into consideration:

- Prevalence of safety (above flexibility) should be taken into consideration in the elaboration of the safety argument for the local deployment.

#### 3.3.1 On Safety (Reg.1035/11, Annex II, Art. 3.2)

- Following Regulation EC 1305/2011, changes in the ATM functional system derived from the deployment of this solution are subject to the elaboration of a safety argument:
  - Verifying the validity of the R&D Safety Objectives with the local conditions of the specific operational environments at the local ATM/CNS system, based on local figures. In particular, it should be taken into account the contribution to safety at local level of elements such as:
    - The proportion of commercial flights and GA, and the figures of accidents and incidents for each type,
    - Pilot situational awareness,
    - ATCO warning,
    - Radar environment,
    - ATC capability to have information on GNSS signal status,
    - Existence of approach procedures of the same family, such as LP approaches, steep glide path approaches, offset final approach track alignment, simultaneous approaches to parallel/near parallel runways.
  - Identify local hazards derived from those local conditions.
  - Considering local risks derived from those local conditions, such as the potential non-compliance of the airborne part with the applicable EASA specific dispositions.
  - Introducing additional local safety requirements (of functional, operational, integrity or architectural nature) derived from the local hazards and local conditions. An example of this situation could be the failing to achieve locally APV 1 ICAO performance requirements by the SBAS service provider. Additional risk assessment activities should be performed by the ANSP in that case.
  - Introducing mitigation measures to those risks, regarding the local physical architecture design, in particular on total loss or failure in the GPS signal in space and the concurrent eventuality of a missed approach when navigation aid is out of service.
- In particular, achieving a 50-fold increase in safety at the R&D level does not automatically entail achieving it in the local scenario, for each particular given baseline in deployment. A demonstration that the implementation of this solution would not decrease safety should suffice when elaborating the local safety argument.
- For local implementation of this solution in airports with pre-existing ILS procedures, ILS safety figures should be taken into account as a reference for the APV operations.
- Some of the requirements for a safe local implementation of this solution might be outside of the managerial control of the ANSP. However it is necessary that the affected ANSP ensures that all these requirements have been correctly addressed before promulgating an LPV approach. An example of this situation could be the AIS; the organization and relations between the ANSPs the responsible organization for the Procedure Design function varies widely from State to another in Europe.

- The aspects of the interaction of the SESAR Solution and SBAS existing solutions such as EGNOS, has to be assessed, considering in particular:
  - The actual discussion concerning the information to be provided in the FPL regarding the APV-SBAS procedure followed by the pilot is not pointed out,
  - The demonstration of reduced DA/H to 300 feet and 250 feet is safe enough,
  - Mitigation measures for loss or bias of the satellite signal,
  - Mitigation measures in case of SBAS augmentation information failure.
- Any new approach procedure has to be assessed, prior to its publication, by the certified AIS provider.

### 3.3.2 On other regulatory domains:

- There could be commonalities in the content of training for different GNSS based procedures. Those commonalities should be considered for each local implementation case.
- As far as practicable, consideration could be given to the level of information to be provided in the Flight Plan regarding the APV-SBAS procedure.
- As far as practicable, a mutual recognition mechanism for certification of constituent elements of this solution (such as database providers) should be ensured with the US.



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