



## Notice of Proposed Amendment 2013-17

### Certification Specifications and Guidance Material for the development of the definition of scope of the aircraft validation source data to support the objective qualification of simulator(s) associated to the pilot type rating training (simulator data) — CS-SIMD

RMT.0108 (21.039(g)) — 27/08/2013

#### EXECUTIVE SUMMARY

This NPA introduces CS-SIMD following the introduction of the Operational Suitability Data (OSD) concept in Part-21. The OSD will be part of the airworthiness certification and simulator data will be required from the applicant for a type certificate when the syllabus for type rating training of pilots is based on the use of simulators. The new CS will provide the standard for the development of the definition of scope of the aircraft validation source data to support the objective qualification of simulator(s) associated to the pilot type rating training.

Applicability		Process map	
Affected regulations and decisions:	CS-SIMD (new)	Concept Paper:	No
Affected stakeholders:	Aircraft designers	Terms of Reference:	09/07/2007
Driver/origin:	Legal obligation	Rulemaking group:	No
Reference:	Article 5.5(e) of Regulation (EC) No 216/2008	RIA type:	Light
		Technical consultation during NPA drafting:	Yes
		Duration of NPA consultation:	3 months
		Review group:	TBD
		Focussed consultation:	No
		Publication date of the Opinion:	N/A
		Publication date of the Decision:	2014/Q2

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## 1. Procedural information

### 1.1. The rule development procedure

The European Aviation Safety Agency (hereinafter referred to as the 'Agency') developed this Notice of Proposed Amendment (NPA) in line with Regulation (EC) No 216/2008<sup>1</sup> (hereinafter referred to as the 'Basic Regulation') and the Rulemaking Procedure<sup>2</sup>.

This rulemaking activity is included in the Agency's Rulemaking Programme for 2013–2016 under task number RMT.0108 (21.039(g)).

The text of this NPA has been developed by the Agency with input from industry. It is hereby submitted for consultation of all interested parties<sup>3</sup>.

The process map on the title page contains the major milestones of this rulemaking activity to date and provides an outlook of the timescale of the next steps.

### 1.2. The structure of this NPA and related documents

Chapter 1 of this NPA contains the procedural information related to this task. Chapter 2 (Explanatory Note) explains the core technical content and contains a Regulatory Impact Assessment. Chapter 3 contains the proposed text for the new requirements.

### 1.3. How to comment on this NPA

Please submit your comments using the automated **Comment-Response Tool (CRT)** available at <http://hub.easa.europa.eu/crt/><sup>4</sup>.

The deadline for submission of comments is **27 November 2013**.

### 1.4. The next steps in the procedure

Following the closing of the NPA public consultation period, the Agency will review all the comments.

The outcome of the NPA public consultation will be reflected in the respective Comment-Response Document (CRD).

The Agency will publish the CRD with the Decision.

The Decision containing Certification Specification (CS) and Guidance Material (GM) will not be published by the Agency before the draft Commission Regulation .../... amending Regulation (EU) No 748/2012 on Operational Suitability Data is adopted by the Commission and published in the *Official Journal of the European Union*.

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<sup>1</sup> Regulation (EC) No 216/2008 of the European Parliament and the Council of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC (OJ L 79, 19.3.2008, p. 1), as last amended by Commission Regulation (EU) No 6/2013 of 8 January 2013 (OJ L 4, 9.1.2013, p. 34).

<sup>2</sup> The Agency is bound to follow a structured rulemaking process as required by Article 52(1) of the Basic Regulation. Such process has been adopted by the Agency's Management Board and is referred to as the 'Rulemaking Procedure'. See Management Board Decision concerning the procedure to be applied by the Agency for the issuing of Opinions, Certification Specifications and Guidance Material (Rulemaking Procedure), EASA MB Decision No 01-2012 of 13 March 2012.

<sup>3</sup> In accordance with Article 52 of the Basic Regulation and Articles 5(3) and 6 of the Rulemaking Procedure.

<sup>4</sup> In case of technical problems, please contact the CRT webmaster ([crt@easa.europa.eu](mailto:crt@easa.europa.eu)).

## 2. Explanatory Note

This NPA includes a proposal for Certification Specifications for the definition of scope of the aircraft validation source data to support the objective qualification of simulator(s) associated to the pilot type rating training, or provisional data to support their interim qualification.

With the issuance of Regulation (EC) No 216/2008, which replaced Regulation (EC) No 1592/2002, the scope of Article 5 'Airworthiness' of that Regulation was extended. In addition to providing the legal basis for Implementing Rules to regulate the 'classical' airworthiness certification, a new basis was created to include operational suitability into the type certification activity.

Until then, the approval of operational suitability elements was the responsibility of the national aviation authorities (NAAs). To promote a uniform approach for such approvals, the Joint Aviation Authorities (JAA) members decided to follow a single approval process called the Joint Operational Evaluation Board (JOEB). Each JOEB was established on a case-by-case basis and composed of relevant stakeholders, including non-JAA authorities as appropriate, to examine the operational conditions for the use of an aircraft type and to make the appropriate recommendations.

JAA ended its activities in 2009. Taking into account the amended Basic Regulation, the Agency established a process called Operational Evaluation Board (OEB) to replace JOEB. This process is maintained by the Agency until the new Implementing Rules related to Operational Suitability Data (OSD) enter into force.

The amended Basic Regulation establishes the Agency's responsibility to approve relevant data necessary for the safe operation of a specific aircraft type. This data relates to type-specific elements for training of pilots, cabin crew, and maintenance certifying staff and includes the Master Minimum Equipment List (MMEL) and flight simulator data. The data is to be approved as OSD that will be included in the type certificate (TC). Once issued, the approved elements in the OSD will be used by the operators of the particular aircraft type or training organisations to develop the appropriate training programmes or Minimum Equipment List (MEL).

The development of the OSD concept was done under rulemaking task 21.039 'Amending Part-21 to include the OSD concept', and the Opinion No 07/2011 on Operational Suitability Data (concluding this rulemaking process) was issued on 13 December 2011. The European Commission is progressing with the development of the said Opinion to an EU Regulation. It will be issued as a Regulation amending Regulation (EU) No 748/2012.

For most of the above-mentioned OSD elements draft Certification Specifications in the form of an NPA have already been issued and progressed further:

- CS-MMEL (complex): NPA 2011-11 issued on 28-06-2011; CRD issued on 10-07-2012; reaction period closed.
- CS-Generic MMEL (non-complex): NPA issued on 16-08-2012; commenting period closed.
- CS-CCD (Cabin Crew Data): NPA 2011-10 issued on 06-06-2011; CRD issued on 10-07-2012; reaction period closed.
- CS-FCD (Flight Crew Data): NPA 2012-05 issued on 06-07-2012; commenting period closed.
- CS-MCSD (Maintenance Certifying Staff Data): development put on hold.

This NPA focusses on the Certification Specifications for simulator data (CS-SIMD) containing the information related to the definition of scope of the aircraft validation source data to support the objective qualification of simulator(s) associated to the pilot type rating training, or provisional data to support their interim qualification, as required under the OSD concept.

The working method selected by the Agency was the use of Agency resources with input from an informal group with industry representatives.

The approved OSD element on simulator data will become the mandatory basis for identifying the validation source data that has to be used for the objective qualification of simulators.

## **2.1. Objectives**

The overall objectives of the EASA system are defined in Article 2 of the Basic Regulation. This proposal will contribute to the achievement of the overall objectives by addressing the issues outlined in Chapter 2 of this NPA.

The specific objective of this proposal is to require aircraft manufacturers to identify the aircraft validation source data that is necessary to allow the objective qualification of simulators associated to pilot type rating training. This is necessary to make sure that the simulator correctly reflects the simulated aircraft type, which will allow the use of those simulators in the pilot type training syllabus.

## **2.2. Regulatory Impact Assessment (RIA)**

### **2.2.1. Issues to be addressed**

The OSD concept will be introduced in Part-21 and included in the type certification activity. The necessary specifications for developing the OSD will then be included in the type certification basis. It is therefore necessary that for each of the elements of the OSD the necessary certification specifications be issued by the Agency. This NPA proposes the certification specifications for simulator data.

Affected are manufacturers of large aeroplanes and large rotorcraft that intend to include the use of flight simulators in their proposed syllabus for pilot type rating training. Only the manufacturers who apply for a type certificate for a new aircraft type after the entry into force of the OSD rules in Part-21 will be required to include simulator data in the OSD package. There is no mandatory catch up for already issued type certificates.

Affected are also operators of flight simulators. They will be responsible for ensuring that the objective qualification of a simulator is done in accordance with the data provided as part of the OSD, when available.

### **2.2.2. Policy options**

The option of doing nothing is not viable because the implementation of the OSD concept in Part-21 requires the establishment of Certification Specifications for all OSD elements.

Within the option of developing Certification Specifications for simulator data the Agency did not identify any possible suboptions.

### **2.2.3. Analysis of impacts**

CS-SIMD is not a stand-alone document. It is part of the bigger OSD concept which was introduced by NPA 2009-01<sup>5</sup> and further developed in CRD 2009-01<sup>6</sup> and Opinion No 07/2011<sup>7</sup>. Please refer to these documents for the analysis of the impacts.

### **2.2.4. Comparison and conclusion**

As already explained above, the option of proposing this CS-SIMD is the only one that fits with the ongoing adoption of the OSD concept in Part-21.

## **2.3. Overview of the proposed CS-SIMD**

Like most other CSs, the draft CS-SIMD is divided in a Book 1 containing the Certification Specifications and a Book 2 containing the Guidance Material.

Book 1 has currently two subparts and a third subpart is reserved. Subpart A contains general information about the scope, applicability, status of data and terminology. Subpart B contains the core of the document related to the determination of scope of validation source data, the source of validation source data and the validation data road map. Finally, Subpart C is reserved for specifications related to changes to the validation source data. This Subpart will be elaborated after a further discussion on the general aspects of changes to OSD in the framework of the new rulemaking task RMT.0607 (21.39(b)) 'Changes to operational suitability data'.

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<sup>5</sup> <http://easa.europa.eu/rulemaking/docs/npa/2009/NPA%202009-01.pdf>

<sup>6</sup> [http://easa.europa.eu/rulemaking/docs/crd/2009/CRD%202009-01%20\(EN,%20comment%20response%20summary%20and%20resulting%20text\).pdf](http://easa.europa.eu/rulemaking/docs/crd/2009/CRD%202009-01%20(EN,%20comment%20response%20summary%20and%20resulting%20text).pdf)

<sup>7</sup> <http://easa.europa.eu/agency-measures/docs/opinions/2011/07/Opinion%2007-2011%20-%20OSD.pdf>

### **3. Proposed amendments**

CS-SIMD is a new document, therefore there is no indication, marking or highlighting of amendments.

#### **3.1. Draft Certification Specifications and Guidance Material (Draft EASA Decision)**

***European Aviation Safety Agency***

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**Certification Specifications  
and  
Guidance Material  
for  
Simulator Data  
CS-SIMD**

Initial Issue



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### CS-SIMD — Simulator Data

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# **CS-SIMD**

## **Book 1**

### **Certification Specifications**

### **Simulator Data**

## Subpart A – General

### **CS SIMD.100 Scope**

(see GM1 SIMD.100)

These Certification Specifications contain the specifications for the definition of scope of:

- (a) validation source data to support the objective qualification of aeroplane full flight simulators associated to the pilot type rating training, or provisional validation source data to support their interim qualification, including additional features as requested by the applicant;
- (b) validation source data to support the objective qualification of helicopter full flight simulators and flight training devices associated to the pilot type rating training, or provisional validation source data to support their interim qualification, including additional features as requested by the applicant.

### **CS SIMD.110 Scope of applicability**

- (a) These Certification Specifications apply to all aircraft type certificate applicants for which the pilot type rating training makes use of approved:
  - (1) Level B, C or D full flight simulators for aeroplanes; or
  - (2) Level B, C or D full flight simulators and Level 2 or 3 flight training devices for helicopters.
- (b) These Certification Specifications apply also to applicants for the approval of changes to the elements listed in CS SIMD.100.

### **CS SIMD.120 Status of provided data**

(see GM1 SIMD.120)

CS-SIMD specifies data provision which is required from the applicant and data provided at the request of the applicant. Data provided by the applicant is presented as mandatory or non-mandatory (recommendations) for the end user.

### **CS SIMD.130 Terminology**

(see GM1 SIMD.130)

For the purpose of these Certification Specifications the following definition applies:

Validation source data: the aircraft reference data related to aircraft systems and avionics which are used to objectively confirm that the flight simulation model reflects the static as well as the dynamic performance characteristics of the aircraft and its relevant systems.

**Subpart B — Determination of scope of validation source data****CS SIMD.200 Determination of scope of validation source data**

(see GM1 and GM2 SIMD.200)

- (a) This paragraph contains the specification applicable to the scope of aircraft validation source data which is used to objectively confirm that the flight simulation model reflects the static as well as the dynamic performance characteristics of the aircraft and its relevant systems.

The determination of the scope of the validation source data is based on:

- (1) Certification Specifications extracted from CS FSTD(A)&(H) as applicable;
  - (2) any additional specification resulting from the additional features selected by the applicant.
- (b) The scope comprises the list of validation source data used as validation data in the qualification test guide, its related source and relevant justifications or rationales. It is provided through a validation data road map.

**CS SIMD.210 Source of validation source data**

(see GM1 SIMD.100 and GM1 SIMD.210)

- (a) For initial qualification of full flight simulators, aeroplane manufacturer's validation flight test data is used. Data from other sources may be used, when properly justified.
- (b) For initial qualification of full flight simulators and flight training devices, helicopter manufacturer's validation flight test data is used. Data from other sources may be used, when properly justified.
- (c) The data other than flight tests includes an explanation of validity with respect to available flight test information.
- (d) In the case of a new aircraft type, the aircraft manufacturer's engineering simulation/simulator data, partially validated by flight test data, may be used to support the interim qualification of the full flight simulator or flight training device.

**CS SIMD.220 Validation data road map**

- (a) A validation data road map document contains the definition of the scope of validation source data to be used as validation data in the qualification test guide.
- (b) The validation data road map clearly identifies in a matrix format the sources of data for all required tests. It also provides information regarding the validity of these data for a specific engine type and thrust/power rating configuration and the revision levels of all avionics affecting aircraft handling qualities and performance. The document includes rationale or explanation in cases where data or parameters are missing, engineering simulation data are to be used, flight test methods require explanation, or other comparable cases, together with a brief narrative describing the cause/effect of any deviation from data requirements. It identifies the applicable aircraft configuration impacting the simulator definition.

**Subpart C — Determination of changes to validation source data**

Reserved

# **CS-SIMD**

## **Book 2**

### **Guidance Material**

## GM Subpart A – General

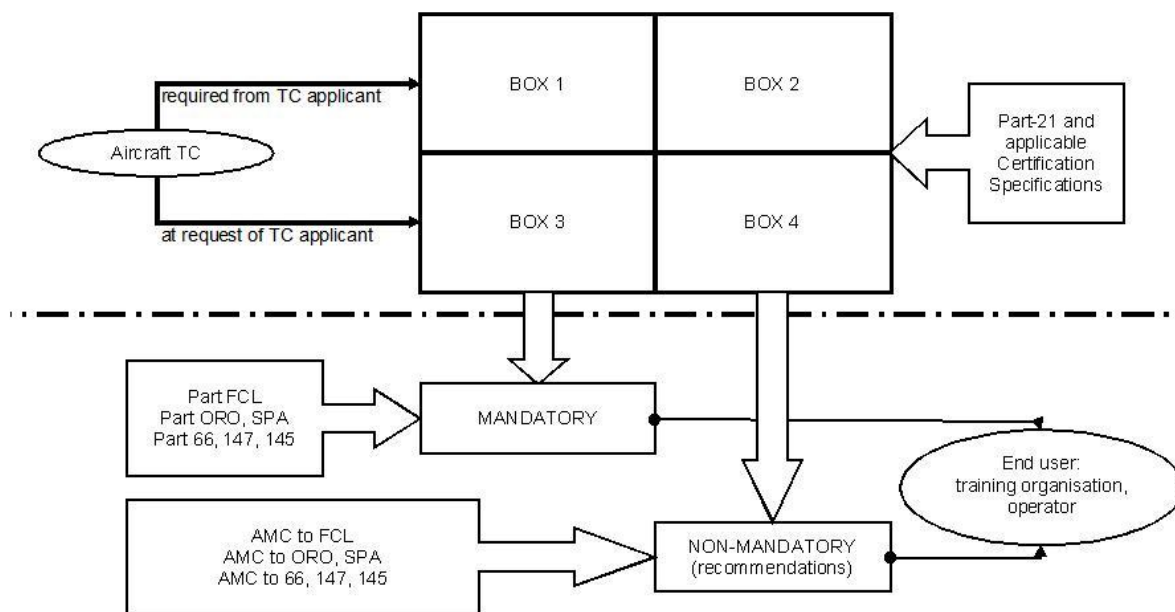
### GM1 SIMD.100 Scope

'Additional features' as mentioned in CS SIM.100 may be composed of the OSD applicant's additional requirements to be added to the CS-FSTD requirements as Box 3 contents (see GM1 SIMD.120), such as additional tests to the required FSTD objective validation tests, to cope with, for instance:

- specific aircraft operations profiles (e.g. steep approaches), or
- validation source data from CS-FCD requirements related to TASE, impacting the simulator definition, or
- reference of actual pieces of equipment.

### GM1 SIMD.120 Status of provided data

OSD provided by the OSD applicant is presented as mandatory data or non-mandatory data (e.g. recommendation/having the AMC status) for the end user, according to the 4-box concept below:



Box 1: required from the applicant; mandatory for end users.

Box 2: required from the applicant; non-mandatory (recommendations) for end users.

Box 3: at the request of the applicant; mandatory for end users.

Box 4: at the request of the applicant; non-mandatory (recommendations) for end users.

### GM1 SIMD.130 Terminology

Additional terminology and abbreviations of terms may be found in AMC1 to FSTD(A/H).200.

## GM Subpart B — Determination of scope of validation source data

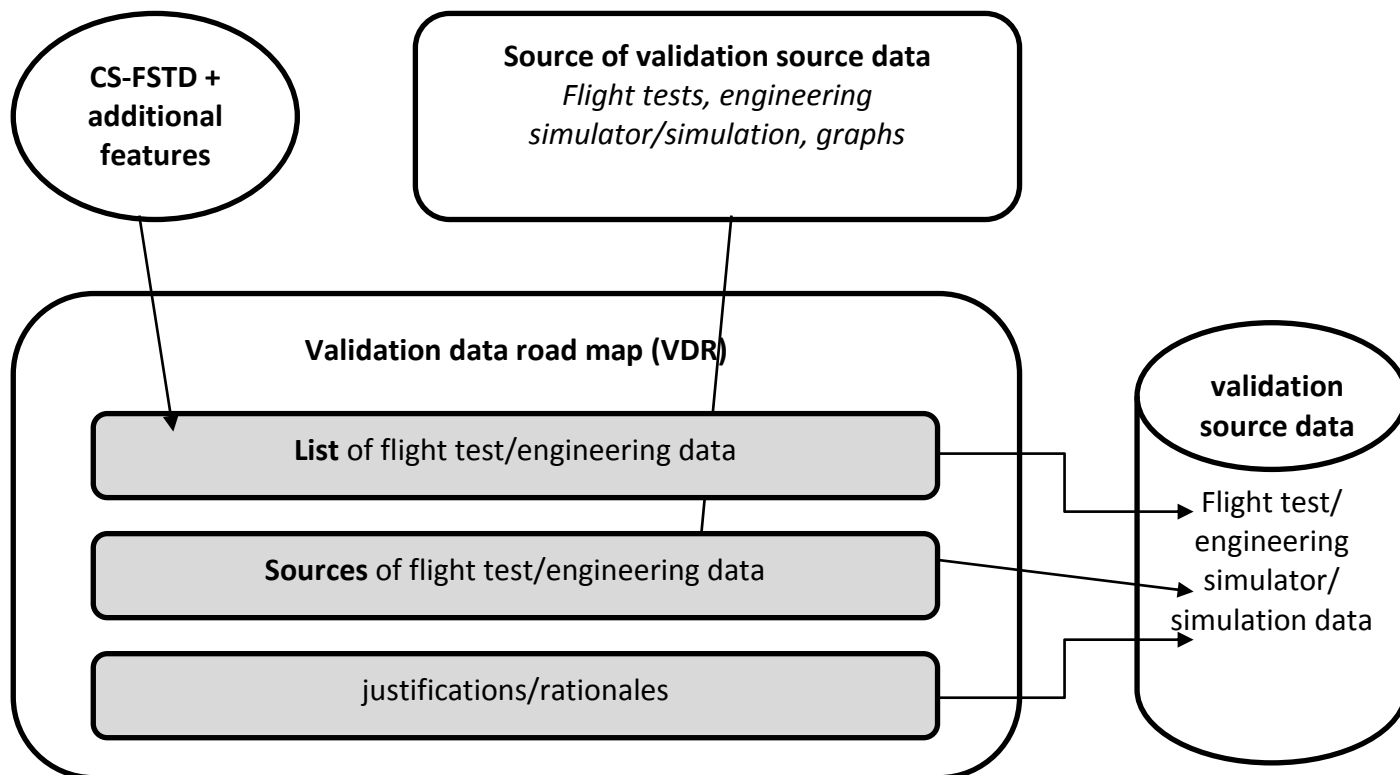
### GM1 SIMD.200 Determination of scope of validation source data

The scope of the validation source data should be substantiated. The substantiation may be performed using different means, such as:

- (a) through the use of an MQTG and associated FFS/FTD (the means would be useful should they already be available from the ATO);
- (b) through the demonstration that the applicant has correctly and thoroughly run a process, acceptable to the Agency, aiming to develop the scope of the validation source data;
- (c) any other way that may be proposed by the applicant and agreed by Agency.

### GM2 SIMD.200 Determination of scope of validation source data

The diagram below shows in grey the scope of validation source data:



### GM1 SIMD.210 Engineering simulator/simulation validation data

- (a) With the prior agreement of the Agency, an OSD applicant may choose to supply validation source data from an 'audited' engineering simulator/simulation to selectively supplement flight test data.
- (b) To be qualified to supply engineering simulator/simulation validation data, an aircraft manufacturer should:
  - (1) have a proven track record of developing successful data packages;



- (2) have demonstrated high quality prediction methods through comparisons of predicted and flight test validated data;
  - (3) provide a demonstration of the engineering simulator/simulation fidelity to the aircraft. The use of the engineering simulator/simulation to support aircraft development and certification is an acceptable means of demonstration; and
  - (4) have an acceptable configuration control system in place covering the engineering simulator/simulation.
- (c) Aircraft manufacturers seeking to take advantage of this alternative arrangement should contact the Agency at their earliest convenience.

## **4. References**

### **4.1. Affected regulations**

None

### **4.2. Affected CS, AMC and GM**

CS-SIMD

### **4.3. Reference documents**

Opinion No 07/2011 'Operational Suitability Data'