



OPINION No 07/2011

OF THE EUROPEAN AVIATION SAFETY AGENCY

of 13th December 2011

for a Commission Regulation amending Regulation (EC) No 1702/2003 of 24 September 2003 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations

AND

for a Commission Regulation amending Regulation (EC) No 2042/2003 of 20 November 2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks

AND

for a Commission Regulation amending Regulation (EU) No xxxx/2012 laying down technical requirements and administrative procedures related to Air Operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council

AND

for a Commission Regulation amending Regulation (EU) No 1178/2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council

'Operational Suitability Data'

Executive Summary

This Opinion proposes changes to several implementing rules to introduce the concept of Operational Suitability Data (OSD). The OSD concept has been introduced in the Regulation (EC) No 216/2008 as part of the 1st extension package.

The new rules will ensure that certain data, necessary for safe operation, is available to, and used by the operators. This data is considered specific to an aircraft type and must therefore be produced by the designer of that type. It consists of:

- the minimum syllabus of pilot type rating training;
- the aircraft reference data to support the qualification of simulators;
- the minimum syllabus of maintenance certifying staff type rating training;
- type specific data for cabin crew training; and
- the master minimum equipment list (MMEL).

The OSD proposed by the designer will be approved by the EASA along with the airworthiness certification.

Once approved, the OSD must be used by operators and training organisations when establishing their customised training courses and MEL.

The OSD is expected to contribute to closing the gap between airworthiness and operations.

Explanatory Note

I. General

1. The purpose of this Opinion is to suggest to the Commission the amendment of Regulation (EC) No 1702/2003¹, Regulation (EC) No 2042/2003², Regulation (EU) xxxx/2012³ and Regulation (EU) 1178/2011⁴. The scope of this rulemaking activity is outlined in Terms of Reference (ToR) 21.039 and is described in more detail below.
2. The Opinion has been adopted following the procedure specified by the European Aviation Safety Agency's (hereafter referred to as the 'Agency') Management Board⁵, in accordance with the provisions of Article 19 of Regulation (EC) No 216/2008⁶ (hereafter referred to as the 'Basic Regulation').
3. The proposed rule has taken into account the development of European Union and International law (ICAO), and the harmonisation with the rules of other authorities of the European Union's main partners as set out in the objectives of Article 2 of the Basic Regulation. The proposed rule:
 - a. is above International Civil Aviation Organisation (ICAO) Standards and Recommended Practices (SARPs). The products of the operational suitability data (OSD) process, the training syllabi and Master Minimum Equipment List (MMEL) are required for establishing training courses and MEL which are also required under ICAO Annexes 1 and 6. However, the requirement for establishing OSD by the aircraft manufacturer as part of the type certification process is not included in ICAO Annex 8.
 - b. deviates on the following points from the rules of US FAA and Transport Canada (TCCA) rules. Both FAA and TCCA have processes for evaluating the operational suitability of new and derivative aircraft types. The results of these evaluations are used for publishing an authority-established MMEL or for approving training courses for flight and cabin crew. However, the operational evaluation does not require mandatory input from the aircraft manufacturers.
4. Currently the approval of data that is necessary for the safe operation of a given type of aircraft, such as the minimum syllabus for pilot type rating training, cabin crew type training and the MMEL, is the responsibility of the National Aviation Authorities (NAA). To

¹ Commission Regulation (EC) No 1702/2003 of 24 September 2003 laying down implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organisations (OJ L 243, 27.9.2003, p. 6). Regulation as last amended by Regulation (EC) No 1194/2009 of 30 November 2009 (OJ L 321, 8.12.2009, p. 5).

² Commission Regulation (EC) No 2042/2003 of 20 November 2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks (OJ L 315, 28.11.2003, p. 1). Regulation as last amended by Regulation (EU) No 1149/2011 of 21 October 2011 (OJ L 298, 16.11.2011, p. 1).

³ The 'OPS Regulation', to be published.

⁴ Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 311, 25.11.2011, p. 1).

⁵ Decision of the Management Board concerning the procedure to be applied by the Agency for the issuing of Opinions, Certifications Specifications and Guidance Material (Rulemaking Procedure). EASA MB 08-2007, 13.06.2007.

⁶ Regulation (EC) No 216/2008 of the European Parliament and of 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, 19.03.2008, p. 1). Regulation as last amended by Regulation 1108/2009 of 21 October 2009 (OJ L 309, 24.11.2009, p. 51).

promote uniformity, Joint Aviation Authorities (JAA) members decided to follow a single approval process acceptable to all – the Joint Operations Evaluation Board (JOEB). Each JOEB was established on a case-by-case basis and composed of relevant stakeholders, including non-JAA authorities, if appropriate, to examine the operational conditions for the use of an aircraft type resulting in recommendations for type training and MMEL. The JOEB process under the JAA umbrella was a voluntary process. Despite such a joint activity, each authority involved had to transpose the recommendations into its national legislative and administrative system. Consequently, the final result may have differed from the one arising from the JOEB process. After the dismantling of the JAA in 2008, the OEB process was continued under the auspices of the Agency with the agreement of the former JAA member authorities. It remained a voluntary process.

5. The (J)OEB process did not include an evaluation of the minimum syllabus of maintenance certifying staff type rating training. Therefore, the training courses for such staff were developed and approved under the responsibility of the national authorities following the general requirements of Part-66. These courses could vary not only in length but also in the subjects included.
6. One of the main objectives for establishing the EASA system was to provide for uniformity. Therefore, the Agency recommended in its Opinion No 3/2004⁷ amending the Basic Regulation that the type related operational information such as the information developed under the (J)OEB process should be mandatory for all aircraft operated by EU operators. This could be achieved by the adoption of an Agency Decision based on an amendment to the Basic Regulation. The European Commission, however, considered that such a Decision can only be adopted by the Agency if it is directly linked to the product it is related to (individual Decision with a clear addressee). According to its interpretation of the EC Treaty and European Court of Justice jurisprudence, agencies cannot set generally applicable binding standards. The proposal for amending the Basic Regulation was therefore changed so that these additional operational elements could be approved by the Agency by linking them to the TC of the aircraft.
7. The European Commission adjusted the Agency's Opinion No 3/2004 to take into account the above-mentioned legal constraints and proposed that the additional specifications for the operation of a given aircraft type shall be determined as part of the certification of the product. Consequently, the following elements were added to Article 5(5)(e) of the Basic Regulation:
 - (iv) *'the minimum syllabus of maintenance certifying staff type rating training to ensure compliance with paragraph (2)(f);*
 - (v) *the minimum syllabus of pilot type rating and the qualification of associated simulators to ensure compliance with Article 7;*
 - (vi) *the master minimum equipment list as appropriate and additional airworthiness specifications for a given type of operations to ensure compliance with Article 8'.*
8. These provisions were adopted as such by the Legislator. The subject of the present Opinion is to define the conditions under which these provisions will be implemented.

⁷ Opinion No 3/2004 of the European Aviation Safety Agency for amending Regulation (EC) No 1592/2002 of the European Parliament and of the Council on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, to extend its scope to the regulation of pilot licensing, air operations and third country aircraft, 16 December 2004. (<http://www.easa.europa.eu/agency-measures/opinions.php#2004>).

II. Consultation

9. Notice of Proposed Amendment (NPA) 2009-01⁸ that contained the draft Opinion for a Commission Regulation amending Commission Regulations (EC) No 1702/2003 and (EC) 2042/2003 was published on the web site (<http://www.easa.europa.eu>) on 16 January 2009.
10. By the closing date of 30 June 2009, the Agency had received 1011 comments from 80 National Aviation Authorities, professional organisations and private companies.
11. In order to handle these comments, the Agency established a comment review group. This group was composed of members of the drafting group including two additional experts. The full composition of the drafting group was published together with an update of ToR 21.039. It contained experts from manufacturing industry, operators associations, aviation personnel associations, EASA and national aviation authorities. The review group met three times in 2009 and 2010. All main issues were extensively discussed in the group and even though full consensus on all issues could not be achieved, the Agency drafted the CRD and the resulting text taking into account all the views of the individual experts. The opportunity of this proposal was taken to introduce changes in the text of Regulation No 1702/2003 to align with the latest amendment of Regulation No 216/2008 as reflected in Regulation No 1108/2009. In the new Articles 18 and 19 the term 'Airworthiness Code' is deleted and therefore in Regulation 1702/2003 this term was replaced systematically by 'Certification Specifications'.
12. The CRD did not follow the traditional format. Due to the high number of comments received and changes made in the structure of the text resulting from incorporating the comments, the Agency considered it inefficient to draft a response to each individual comment. Therefore, the Agency adopted an alternative method for processing all comments. This alternative method was the comment response summary. This approach was supported by the Commission and Management Board in September 2009. All comments received were acknowledged and summarised in this comment-response summary with the general responses of the Agency. The resulting text, which was published in Appendix 1 to this CRD, highlighted the changes as compared to the current rule. The CRD was published 13 May 2011. The main changes as compared to the NPA were the following:
 - a. The NPA proposal envisaged a separate certificate for approving the operational suitability elements. With the CRD the concept of a separate certificate was abandoned. The proposal is changed in such a way that the operational suitability elements are approved as OSD included in the aircraft type certificate (TC) or supplemental type certificate (STC).
 - b. In the NPA proposal the approved operational suitability elements were mandatory for operators and training organisations in their entirety when establishing their training courses and MEL. This approach has been considerably changed. With the CRD the proposal envisages a core of the OSD which will remain mandatory for operators and training organisations but also a large part of OSD that will get the status of Acceptable Means of Compliance (AMC). Operators and training organisations will not be able to deviate from the mandatory part of the OSD except through an Agency approved change. However, they can deviate from the non-mandatory parts of the OSD under the control of their competent (national⁹) authority using an alternative AMC.
 - c. The applicability of the OSC/OSD concept to aircraft other than complex motor-powered aircraft was not very clear in the NPA. It has been further clarified in the CRD. The main conclusion is that most of the OSD elements are not applicable to the aircraft in the category other than complex motor-powered. In more detail:

⁸ See Rulemaking Archives at http://www.easa.europa.eu/ws_prod/r/r_archives.php.

⁹ In case of non-EU applicants the Agency is the competent authority.

- The requirement to produce minimum syllabi for type training of pilots and maintenance staff is only applicable when the aircraft has a type rating. By default, small aircraft will be in a class or group rating. However, the Agency can decide on an ad-hoc basis that a type rating is necessary due to performance, design or other features that require specific training. For most small aircraft this is not the case and they will be in a class or group rating. Whether a new aircraft type should have a type rating or can be in a class rating will be part of the OSD approval process and finally will be decided by the Agency. The assessment is based on objective criteria that will be included in Guidance Material. When no individual type rating is required for the aircraft, it means that the relevant OSD elements are not required¹⁰.
 - Simulator data is only required when the syllabus for pilot type rating includes the use of full flight simulators. This is typically not the case for small aircraft.
 - The type specific data for cabin crew training is only required when the operational rules require cabin crew for the maximum approved passenger seating capacity¹¹. Small aircraft do not have this number of passenger seats.
 - The requirement to establish an MMEL is applicable to all aircraft that can be used for commercial operations since the relevant operators must have MELs for those aircraft. So this means that for most small aircraft an MMEL will be required. However, in order to minimise the burden for the TC applicants, the Agency will establish generic MMELs for most categories of non-complex aircraft by means of a dedicated CS. The TC applicant for an aircraft within those categories can suffice with confirming that this generic MMEL is appropriate for its design. The CS with generic MMELs is currently being developed.
13. By the closing date of the reaction period 13 July 2011, the Agency had received 69 reactions from 23 National Aviation Authorities, professional organisations and private companies.
14. As a result of the reactions, the following changes were made to the proposals:
- a. The transition provision for ongoing approval processes for STCs and changes to TCs was added to the cover Regulation. This provision was missing.
 - b. References to operational suitability data in points 21A.3 and 21A.3B related to occurrence reporting and Airworthiness Directives were removed. The Agency agrees with the comments that these references are unnecessary because as soon as the OSD will be part of the TC, the existing wording of points 21A.3 and 21A.3B can already be interpreted to include occurrences and unsafe conditions related to OSD.
 - c. The concept of Safety Enhancement Directives (SEDs) has been abandoned. Therefore, the points 21A.3C and 21A.3D were deleted from the proposal. The Agency acknowledged that the concept of SEDs was complex and not easy to implement, while other regulatory tools were available to reach the same objective. The objective of the SED concept was twofold: to allow the Agency to impose new airworthiness requirements on existing designs, i.e. newly produced or in-service aircraft, and to allow the Agency to impose corrections to the operational suitability elements. The latter objective will be achieved through using the existing tool of airworthiness directives (ADs). As the OSD will be part of the TC, the scope of 21A.3B dealing with the issuance of ADs will also include OSD. So if there is a need

¹⁰ The applicant can always voluntarily provide a minimum syllabus for type rating training to be approved under OSD.

¹¹ Currently for a maximum approved passenger seating configuration of more than 19.

to urgently a correction to an already approved OSD, this can be done through the issuance of an AD.

Imposing new airworthiness requirements on existing designs will be done through dedicated implementing rules supported by Certification Specifications. This means that an initial version of a new Annex to Regulation 1702/2003 called Part-26 will be created to transpose the existing JAR-26¹² provisions. The high level requirement, applicability and entry into force will be covered by that Part-26. The technical details on how to comply with this high level requirement will be in a new Certification Specification CS-26. The Part-26 requirements can be applicable to operators but, depending on the technical content, also to design approval holders. Each time a new airworthiness requirement needs to be imposed, an amendment to Part-26 will be proposed. The initial version of Part-26, CS-26 and all subsequent amendments will follow the normal EASA rulemaking process.

- d. The possibility for the TC applicant to request validation of additional operational suitability elements on a voluntary basis has been made clearer in the proposal for amending Part-21. The possibility already existed but was hidden under the general term 'type of operations'. It is now more prominently present in the rule text.
- e. The obligation for engine TC holders to provide data to the aircraft TC applicant allowing the completion of the OSD with engine related data is deleted. The Agency acknowledged that existing arrangements between the engine and aircraft TC holders/applicants can be extended to address OSD without a need for a dedicated requirement in Part-21.
- f. The requirements related to classification of changes have been simplified. Where the wording was 'changes to type design', this is amended to 'changes to type certificates'. As the OSD is included in the TC but not in the type design, this amendment allows the further text to be simplified. The fact that the rule for classification of changes to type design and OSD is the same does not mean that they will administratively in the same process. To emphasise this, a requirement for the Agency is established in Section B that explains that the classification of changes to type design and OSD is done separately. AMC and Guidance Material (GM) will be developed to further explain this (see also paragraph (g) below). The above Amendment in the requirement for classification of changes also allows for a simplification of the possible privileges for Design Organisation Approval (DOA) holders. The existing privilege to approve minor changes will cover both changes to type design as well as changes to OSD.
- g. The implementation of the requirement to assess all type design changes for their impact on OSD is postponed for another three years after entry into force of the amending Regulation. Industry had expressed severe concerns regarding this requirement due to the expected additional administrative burden for managing the change classification and approval process even for the majority of changes that would not impact the OSD. The Agency has acknowledged these concerns and agrees that further Guidance Material is needed for the classification of changes to OSD as well as for assessing the impact of design changes on OSD. This guidance can be developed during the three years transition period and can also be based on the experience acquired with the approval of initial OSDs. During the transition period it will be possible to apply for approval of changes to OSD on a voluntary basis.

¹² Joint Aviation Requirements JAR-26 was used in the Joint Aviation Authorities (JAA) for making certain additional airworthiness requirements for operations mandatory for operators that had to comply with JAR-OPS 1.

III. Content of the Opinion of the Agency

A. OSD establishment by design approval applicants

15. As explained above, the initial concept of a separate approval to cover the operational suitability in addition to the TC was abandoned. It was replaced by the concept of OSD included in the TC. In summary the concept is as follows:
16. For new types¹³, the application for TC must be supplemented by adding the OSD elements to be approved. The TC applicant will have to show compliance with the applicable technical standards. These standards are included in Certification Specifications (CSs) which are issued by the Agency in accordance with the Rulemaking Procedure. There shall be a CS for each element: CS-MMEL, CS-FC (pilot type rating training), CS-SIM (Flight Simulator Training Devices), CS-CC (cabin crew type training) and CS-MCS (maintenance certifying staff type rating training). All of these CSs are currently under development and are or will be open for consultation through publication of dedicated NPAs.
17. The TC applicant is obliged to show compliance with the applicable standard for all the OSD elements before the TC can be issued. However, it will be possible to delay the showing of compliance for one or more OSD elements to a date after the issuance of the TC but ultimately before operation by an EU operator.
18. When approved, the OSD will be referenced in the Type Certificate Data Sheet (TCDS) but the data itself will be held by the TC holder (similar to Instructions for Continuing Airworthiness). Elements of the OSD will have to be made available to the operators and, on request, to any entity required to comply with its content.
19. The applicant for the initial OSD is the TC holder. Changes to the initial OSD may be proposed by the OSD holder or any other legal entity under the conditions as imposed by Part-21 Subparts D or E. This means that the existing provisions for changes to type design will also apply to changes to OSD. When a change is developed, the applicant must verify whether the change impacts one or more of the approved OSD elements. If the OSD elements are affected (for example if the flight deck instruments and avionics are upgraded requiring additional or revised pilot training), the applicant must also supplement its application with the required changes to the OSD. As explained above in the discussion of the changes in the proposal resulting from the CRD reactions, the requirement to assess all design changes for their impact on OSD is postponed for three years.

B. OSD use by operators and training organisations

20. The approved OSD will have to be used by the operators and training organisations as the basis for establishing customised type training courses and MEL. The approved simulator data will be used for evaluating simulators and is therefore necessary for simulator operators. As explained above, there will be a part of the OSD that is mandatory for operators and training organisations and another part that will not be mandatory and have the status of AMC. Therefore, the rules and AMCs regarding type training and MEL addressing the operators and training organisations need links with OSD. In the final text of the draft Flight Crew Licensing Regulation¹⁴ most of the links with OSD had already been included. However, some links were missing and, in addition, the transition provision was not included. In the draft Operations Regulation¹⁵ most of the links were only provisionally included and were not made specific. Therefore, further refinement of these provisions is needed. In addition, the transition provisions have not

¹³ New type means an aircraft type for which the application for TC is done after the entry into force of the amendment to Regulation 1702/2003 resulting from this Opinion.

¹⁴ New Regulation in the process of being adopted by the EC.

¹⁵ New Regulation in the process of being adopted by the EC.

yet been included. In the recent Part-66 Amendment¹⁶ no links with OSD were included. This Opinion therefore includes the proposed amendments to these Regulations to establish, improve or elaborate the necessary links with OSD and to include the necessary transition provisions. Obviously, these amendments only deal with the mandatory part of the OSD, because the link with the non-mandatory part of the OSD will be established in AMCs issued by the Agency.

C. Grandfathering and transition measures

21. Grandfathering and transition measures are necessary for a smooth implementation of the new rules. The intent is to limit the administrative burden for the industry as well as authorities and to aim for not disrupting ongoing operations.
22. *Grandfathering for TC holders:* All JOEB and EASA OEB reports are grandfathered automatically for the content that corresponds to the OSD as required and/or allowed by Part-21.
23. *Grandfathering for operators/training organisations:* Existing nationally approved or accepted type rating training courses, simulator qualifications and MEL are grandfathered.

When an OSD (new, grandfathered or caught up) for the type is established, operators/training organisations would have a minimum of 2 years after the approval of the OSD to adapt their training courses to the mandatory part of the OSD elements. In case of the development of a new¹⁷ training course, it would be mandatory to use OSD, when available. If not available, the training course should be established using the rules in Part-FCL, Part-OPS or Part-66 respectively.

For adapting the MEL to more stringent MMEL provisions the maximum period is 90 days; this is the standard time already applicable in the existing rules. In case an EASA approved MMEL does not exist, the MEL (new or changed) can continue to be based on the MMEL as accepted by the competent authority of the operator.

The existing qualifications of simulators are not affected by the establishment of OSD.

24. *Catch-up for TC holders:* Catch-up is a process to establish approved OSD for an aircraft type that has already been certified. The catch-up process is a light touch process compared to the initial approval of OSD for a new type.

Application for catch-up is mandatory for aircraft models still in production and being delivered to EU operators¹⁸. The deadline is to obtain approval within 2 years after the amendment to Part-21. Catch-up is not required for the minimum syllabus of maintenance certifying staff type rating training and the aircraft validation source data to support the objective qualification of simulators but can be done on a voluntary basis. When a model re-enters in production after a period of being dormant, the OSD shall be approved before the new aircraft starts operation by an EU operator.

Catch-up is voluntary for other models that are no longer in production and for the non-required elements.

25. *Ongoing certifications:* Aircraft types, variants or STCs, for which the certification is ongoing on the date of the amendment to Part-21, cannot benefit from grandfathering due to the lack of a formal document/certificate to be grandfathered. Therefore, the relevant applicants will have to extend their TC application to EASA to include OSD. However, if that applicant had already applied for an OEB evaluation, the work already done under that OEB process when transitioning to the OSD process will be accepted without further verification. The applicant of an ongoing type certification can decide to

¹⁶ Included in Regulation (EU) 1149/2011 amending Regulation (EC) No 2042/2003.

¹⁷ New for the operator/training organisation.

¹⁸ This means that when production has stopped but then restarted at a later date, an OSD is required.

extend its application to include the OSD immediately after the entry into force of the amended Regulation. In any case the OSD approval should be obtained within 2 years of the new rule being in place or before the aircraft is operated by an EU operator if that is after that 2 years time frame.

26. *Design Organisation Approvals (DOA)*: When a type certificate includes operational suitability data either through grandfathering or catch-up, the TC holder shall obtain approval of an extension of the scope of its DOA or alternative procedures to DOA as applicable to include operational suitability aspects within two years after the applicability of the rule.

New TC applicants that have to include OSD in their application shall obtain extension of the scope of their DOA or alternative procedures to DOA before the OSD is approved.

27. *Transition for changes and STCs*. As indicated above, the implementation of the requirement to assess all type design changes for their impact on OSD is postponed for another three years after entry into force of the amending Regulation. During the transition period it will be possible to apply for approval of changes to OSD on a voluntary basis.

IV. Regulatory Impact Assessment

28. The purpose of this Regulatory Impact Assessment is to analyse the most important impacts expected as a result of the rule as proposed in this Opinion and summarised in section III. above.

Sectors Affected

29. The sectors of the civil aviation community within the Agency's scope, which will be affected:
- a. EU Qualified personnel: pilots, cabin crew and maintenance certifying staff;
 - b. Aircraft TC holders and applicants (EU and non-EU);
 - c. STC applicants (EU and non-EU);
 - d. EU Operators and aircraft owners;
 - e. Training organisations (EU and non-EU);
 - f. Simulator manufacturers and operators (EU and non-EU);
 - g. Approved maintenance organisations (EU and non-EU);
 - h. Competent Authorities (EASA and NAAs).

Impacts

Safety impact

30. There have been a number of incidents and accidents in the recent decade where a deficiency in the training of crew or in the MMEL was identified as a causal or contributing factor. As a result, the respective national accident investigation boards have made recommendations to the Agency for improving the rules relative to training and MMEL. By closing the gap between certification, operations and maintenance processes, the OSD concept is expected to contribute to addressing these safety recommendations.
31. The most significant and recent safety recommendations are mentioned below.
- a. *1 June 2009, Air France flight 447, A330, Atlantic Ocean*

Recommendation: 'The BEA recommends that EASA review the content of check and training programmes and make mandatory, in particular, the setting up of specific and regular exercises dedicated to manual aircraft handling of approach to stall and stall recovery, including at high altitude.'

- b. *25 February 2009, Turkish Airlines flight 1951, B737, Amsterdam Schiphol Airport*
 Recommendation: 'DGCA, ICAO, FAA and EASA should change their regulations in such a way that airlines and flying training organisations see to it that their recurrent training programmes include practicing recovery from stall situations on approach.'
- c. *27 November 2008, XL Airways, A320, Perpignan*
 Recommendation: 'The BEA recommends that EASA, in cooperation with manufacturers, improves training exercises and techniques relating to approach-to-stall to ensure control of the aeroplane in the pitch axis.'
- d. *20 August 2008, Spanair flight 5022, MD-82, Madrid-Barajas Airport*
 Recommendation: 'It is recommended that the European Aviation Safety Agency (EASA) modify item 30.8 of the Master Minimum Equipment List (MMEL) for the Boeing DC-9, MD-80, MD-90 and B-717 series of airplanes to consider the possibility of not dispatching an airplane with a fault involving RAT probe heating on the ground, and if it is dispatched, that a clear reference be included to the maintenance (M) and operating (O) instructions, as well as to other items in the Master Minimum Equipment List (MMEL) that may be related to said fault.'
- Recommendation: 'It is recommended that the European Aviation Safety Agency (EASA) establish requirements for flight simulators so as to allow simulator training to cover sustained take-off stalls that reproduce situations that could exceed the flight envelope limits.'
- e. *9 July 2006, S7 Airlines flight 778, A310, Irkutsk Airport*
 Recommendation: 'It is recommended to EASA and other Certifying authorities together with the manufacturers of large transport aircraft: to review the human factors issues associated with the dispatch conditions and the operational procedures in case of one thrust reverser being inoperative, in order to avoid inadvertent forward thrust application.'
- f. *21 September 2005, Robinson R22 F-GRIB*
 Recommendation: 'EASA make it mandatory for pilots to undertake training in the specific characteristics of the R22 Mariner when equipped with float-type landing gear.'
32. The need to close the gap between certification, operations and maintenance processes has also been demonstrated by the following studies in Europe and in the USA:
- a. 'Commercial Airplane Certification Process Study, An Evaluation of Selected Aircraft Certification, Operations, and Maintenance Process, FAA, March 2002.' Findings and observations of the CPS conducted by the FAA in 2001 concern interface issues involving certification, maintenance and operation processes.
- b. 'Federal Aviation Administration Human Factors Team Report on the Interfaces Between Flightcrews and Modern Flight Deck Systems, June 18, 1996¹⁹'. The FAA Human Factor Team report of 1996 also identified issues with the STC process (e.g. not necessarily cognisant with the flight deck design philosophy, or of the operating assumptions used).
- c. The 'Commercial Aviation Safety Team (CAST) on Loss of Control Joint Safety Implementation Team Report, 15 February 2003'²⁰ includes a safety recommendation relative to 'reliable processes should be developed to ensure flight

¹⁹ https://www.faa.gov/aircraft/air_cert/design_approvals/csta/publications/media/fltcrews_fldeck.pdf.

²⁰ http://www.cast-safety.org/pdf/jsit_loss%20-control.pdf.

operation and maintenance personnel are made aware of and incorporate essential operating information in a timely manner’.

33. With the introduction of rules regarding type training for personnel and MMEL in the form of OSD being the mandatory minimum for all operators and training organisations, supported by standardisation activities, it is expected that all training courses and MEL are approved using the same standard.
34. Responsibilities will be more clearly defined thus leaving no gap in the responsibilities related to minimum syllabi for type rating training and MMEL:
 - a. The responsibility for establishing the initial OSD with all the necessary elements will be with the TC holder of the aircraft. The Agency considers that the TC holder is best placed to develop these elements because it has all the necessary background information that is available from the design and airworthiness exercise. For example, for developing a safe MMEL it is necessary to have insight in the systems safety analysis of the aircraft. Therefore, confirming the responsibility of the TC holder for the OSD elements is also expected to have a positive impact on safety.
 - b. At the same time, making the Agency responsible for the approval of the minimum syllabi and the MMEL will allow the involvement of the expertise that was also used to do the airworthiness approval of the design.
 - c. There will be a proactive approach to safety aspects of type training and MMEL by introducing the concept of ‘continued operational suitability’: The originator of the OSD will be responsible for the continued validity of the approved OSD element(s). It will be clear that this responsible entity shall monitor the experience by using the approved elements and will have to react in case of safety occurrences. In the worst case, when there are immediate safety concerns, the Agency can issue Airworthiness Directives to correct deficiencies in OSD that need to be implemented at operator level. Finally, the rule will also impose on third parties making design changes (Supplemental Type Certificate — STC) the need to consider the effects of that design change on OSD, and, if necessary, to propose amendments to the OSD elements.
35. Overall the OSD will ensure a uniform high standard for crew training and MMEL as well as clarify the responsibilities for these processes. This is expected to have a significant safety benefit and contribute to a uniform high level of safety.

Economic impact on industry

The introduction of the OSD is expected to create additional costs for TC and STC holders and applicants. These costs may be transferred partly or wholly to their customers in the price of their product or data.

However, that will not affect the overall costs for the industry. The costs for TC and STC applicants/holders can be divided in three parts:

- the costs for OSD development plus certification;
- the costs for maintaining the OSD up to date; and
- the costs for extending their design organisation approvals (DOA).

The costs for OSD development and certification can again be split in the costs for new applications and the costs for the mandatory catch-up. For all of the cost items it needs to be taken into account that the existing voluntary OEB process is currently already implemented by most affected TC and STC holders. The analysis of cost impacts will thus need to look at the *additional* costs created by the OSD proposal in this Opinion as compared to the existing OEB process.

36. Limited cost effects are expected for the users of the OSD (i.e. operators and training organisations). Instead of using data from the OEB reports, other sources or self-generated data, they will use the OSD. In fact, the availability of the OSD may have a

positive economic impact for them. For developing new training courses and MEL they can use the OSD as a basis thereby reducing development costs. There will be some additional costs in amending the existing training courses and MEL to be in compliance with the OSD. However, the transition period for that is 4 years, so the expectation is that such an update will coincide with the natural updating cycle of the data.

In order to provide an indication of the magnitude of the expected cost impacts, the following sections look in more detail at the major items as identified above.

OSD development and certification costs for new TC applications

37. *Large aeroplanes and complex rotorcraft.* Today's practice is that all applicants for an EASA TC for a large aeroplane or a complex rotorcraft also apply on a voluntary basis for an OEB evaluation. These OEB evaluations generally²¹ include the syllabus for pilot type rating training, for cabin crew training, the simulator data and the MMEL. Therefore, the additional costs when introducing the mandatory OSD concept will be limited to the costs for the syllabus for maintenance certifying staff type rating training and for type specific data for cabin crew training, in a number of cases of large aeroplanes where cabin crew training was not part of the OEB evaluation. Most complex rotorcrafts have a maximum passenger configuration of less than 20 and therefore cabin crew is not required and there is no need to develop the training data.
38. *Non-complex rotorcraft.* Currently most applicants for an EASA TC for a non-complex rotorcraft also apply on a voluntary basis for an OEB evaluation of the syllabus for pilot type rating training. When OSD is implemented, they will in addition have to apply for MMEL approval. Due to the complexity of most new non-complex rotorcraft it will not be practical to establish a generic MMEL that can be used by all. However, non-complex helicopters are in a group rating with regard to maintenance certifying staff and therefore there is no need to develop a type rating training syllabus. Non-complex rotorcrafts have maximum 9 passengers and need no cabin crew. The additional cost for new applications will therefore be limited to the costs for development and certification of an MMEL.
39. *Other non-complex (small aeroplanes, Very Light Aeroplanes, Light Sport Aeroplanes, sailplanes and balloons).* With the exception of high performance (HP) small aeroplanes, none of the aircraft in this category undergo OEB evaluation today. For the HP small aeroplanes the OEB is limited to the pilot type rating training. When OSD is implemented, the only element that needs to be established in addition to what is done today is the MMEL. For this category of aircraft the MMEL can be based on a generic MMEL that is developed by the Agency. There is therefore only very limited effort needed from the TC applicant.
40. As there are no examples of the development and certification of the OSD elements, the estimates for the expected costs will be based on experience with the OEB implementation. Certain manufacturers have provided rough data related to OEB implementation, which has been used to estimate the OSD development costs.
41. The costs of approving the OSD by the Agency are equal to the fees and charges for the activity. In line with the fees and charges Regulation²² the Agency will charge an hourly rate for OSD approval.
42. In order to develop a cost estimation, the number of working hours necessary for development and certification of the main OSD elements Flight Crew Type Rating Training (OSD-FC), Maintenance Certifying Staff Type Rating Training (OSD-M), Type

²¹ Few non-western designed aircraft did not undergo a full OEB evaluation but in those cases the national aviation authorities perform evaluations. The effect on the total costs for industry is marginal.

²² Commission Regulation (EC) No 593/2007 of 31 May 2007 on the fees and charges levied by the European Aviation Safety Agency (OJ L 140, 1.6.2007, p. 3). Regulation as last amended by Regulation (EC) No 1356/2008 of 23 December 2008 (OJ L 350, 30.12.2008, p. 46).

Specific Data for Cabin Crew (OSD-CC) and Master Minimum Equipment List (MMEL) were estimated (See Table 1).

Table 1: OSD development and certification - working hours estimates by aircraft category per new TC application

Aircraft Category	Flight Crew Type Rating Training (hrs)	Maintainance Certifying Staff Type Rating Training		Type Specific Data for Cabin Crew		Master Minimum Equipment List	
		Development (hrs)	Certification (hrs)	Development (hrs)	Certification (hrs)	Development (hrs)	Certification (hrs)
Large Aeroplanes ¹	—	3 200	1 050	2 000	750	—	—
Small aeroplanes complex ²	—	1 200	600	n/a	n/a	1 600	900
Complex rotorcraft	—	1 600	800	n/a	n/a	—	—
Non-complex rotorcraft	—	n/a	n/a	n/a	n/a	800	400
Other non-complex	—	n/a	n/a	n/a	n/a	8	4

Notes:

¹ MTOW more than 5.7t

² MTOW less than 5.7t two engines or one turbine or high performance

—: this OSD element is already part of current OEB evaluations

n/a: Not applicable because the OSD element is typically not required for these categories of aircraft

43. Based on this data and assumptions on the hourly rate for the industry and the Agency, the development and certification costs per type are estimated and included in Table 2 below.
44. The total annual costs for OSD development and certification for new TC applicants are derived by adding the assumptions on the number of new TCs that can be expected every year. These assumptions are based on average figures from the past. The costs for elements in the OSD approval that are added at the request of the TC applicant are not included. The total annual costs including development and approval for the industry are therefore estimated to be around EUR 2.6 million.

Table 2: Cost estimate for OSD development and certification for new TC applications

Aircraft Category	No. of Type Certificates per Year	Costs per Type Certificate (€)	Annual Costs (€)
Large Aeroplanes	1.5	952 000	1 428 000
Small aeroplanes complex	1	640 000	640 000
Complex rotorcraft	1	352 000	352 000
Non-complex rotorcraft	1	176 000	176 000
Other non-complex	14	1 760	24 640
Total			2 620 640

OSD development and certification costs for catch-up

45. *Complex motor-powered aeroplanes and rotorcraft.* The catch-up effort is required for aircraft models that are still being produced and will be limited to Flight Crew Type Rating Training, Type Specific Data for Cabin Crew and MMEL. The costs for development are

minimal as the basis for catch-up can be a training course approved for a particular operator and an MMEL approved by one NAA. The TC holder only needs to refer the Agency to one of these approved elements. The Agency effort is estimated at 28 man-hours per type for each element. 8 hours are assumed for the industry side. On the whole, this is estimated to result in costs of EUR 7 500 for each catch-up certification. It is assumed that the catch-up process will be completed within two years.

46. Based on the Agency's assumptions for the number of catch-up certifications, Table 3 below provides an overall cost estimate of roughly EUR 700.000.
47. *Aeroplanes other than complex motor-powered and balloons.* The catch-up effort is required for aircraft models that are still being produced. However, the only element that is applicable is MMEL. For these categories of aircraft there will be a generic MMEL issued by the Agency which can be used as is with possible additional items on a voluntary basis. Therefore, the costs for development as well as approval are negligible.

Table 3: Cost estimate for OSD catch-up certifications (non-recurring costs)²³

Aircraft Category	Unit cost of catch-up certification (€)	Flight Crew Type Rating Training		Type Specific Data for Cabin Crew		Master Minimum Equipment List		Total cost (€)
		No. of catch-up certifications	Total cost of FCTRT catch-up (€)	No. of catch-up certifications	Total cost of TSD CC catch-up (€)	No. of catch-up certifications	Total cost of MMEL catch-up (€)	
Large aeroplanes and small aeroplanes complx	7 520	38	285 760	11	82 720	29	218 080	586 560
Rotorcraft	7 520	10	75 200	n/a	n/a	10	75 200	150 400
Total			360 960		82 720		293 280	736 960

OSD development and certification costs for STC holders/applicants

48. There is no mandatory catch-up for existing STCs so holders of STCs are not affected. Those that are designing new STCs may be affected after the additional transition period of three years if the STC has an impact on existing OSD.
49. All new STC applicants have to assess possible effects of the STC on OSD elements. Only if there is an effect, then they have to develop necessary supplements to the approved elements of the OSD as part of the STC. Costs will be the cost of developing the supplements to OSD, continued validity of those elements and fees and charges for the Agency approval. All these costs will be a proportionate fraction of the costs associated with the initial OSD and will be commensurate to the extent of the STC and its effect on training and MMEL. As indicated above, the requirement to assess all changes and STC for their impact on OSD is postponed for three years to allow for the further development of AMC and GM. This time will also be used to assess the exact impact of this requirement. However, based on calculations of one manufacturer, only 5% of all changes may have an impact on OSD so the additional costs will be relatively limited.

²³ This table does not include non-complex aeroplanes because the catch-up process for these aircraft will consist only of confirming the applicability of the generic MMEL that is developed by the Agency.

Costs for maintaining validity of the OSD elements

50. The TC holder will be required to investigate and follow up on occurrences if they are caused by possible deficiencies in the OSD elements. Today the TC holders already have the same responsibility regarding occurrences caused by design deficiencies. Before analysing an occurrence, it is difficult to identify the root cause so the existing system of dealing with occurrence reporting can also be used to filter out those occurrences that have a link with OSD. When the first analysis shows that the root cause is related to OSD, then the costs for further analysis and development of improvements can be attributed to the costs of continued validity of OSD. Based on experience with OEB, the Agency expects that the number of cases where occurrences relate to OSD will be relatively limited. The additional costs are therefore estimated as follows:

Table 4: Cost estimate for OSD continued validity²⁴

Aircraft category	Hours per TC holder (A)	Hourly wage rate (€) (B)	Number of TC holders (C)	Total cost (€) (A × B × C)
Large aeroplanes	800	100	15	1 200 000
Small aeroplanes complex	400	100	9	360 000
Complex rotorcraft	600	100	6	360 000
Non-complex rotorcraft	200	100	6	120 000
Other non-complex	0	100	0	0
Total			36	2 040 000

Costs of extending the DOA to include OSD

51. The TC holder with new or caught-up OSD will be required to extend the scope of its DOA to include OSD. This applies to organisations holding a DOA that have a grandfathered OSD or are required to catch-up and those applying for a new TC. This means that it applies to roughly 40 organisations. The additional costs for obtaining the approval of DOA extension are difficult to estimate as it depends heavily on the level of previous involvement in OEB activities. Most organisations designing large aircraft will have already procedures in place for dealing with most OSD elements. For them it is a matter of including those activities in the DOA structure. The designers of non-complex aircraft may have no experience with OEB but their DOA extension only needs to address MMEL, knowing that the Agency will establish generic MMELs that can be used by those organisations. So for these organisations the effort will be minimal.

Finally, the fees and charges for the DOA extensions will be covered by the existing DOA surveillance fee and no additional fees and charges will be imposed.

Total costs for the industry

52. The total costs for the industry can be split in a one-off cost for the catch-up and an average annual cost for the grandfathered, caught up and new OSDs. The non-recurring catch-up costs are estimated to be in the order of 740 000 euros (See Table 3).

The recurring average annual costs are in the order of magnitude of 4.6 million euros (Table 5). Both cost elements are additional costs created by the OSD proposal beyond what is done today.

²⁴ The estimates for the annual hours related to OSD are based on the conservative assumption of 1 500 occurrences per year per TC holder for large aeroplanes of which 5 % are OSD-related. For each occurrence with a potential unsafe condition on average 10-11 working hours are assumed.

Table 5: Summary of estimated annual costs for OSD implementation

Aircraft category	New TC applications (€)	Continued validity (€)	Total (€)
Large aeroplanes	1 428 000	1 200 000	2 628 000
Small aeroplanes complex	640 000	360 000	1 000 000
Complex rotorcraft	352 000	360 000	712 000
Non-complex rotorcraft	176 000	120 000	296 000
Other non-complex	24 640	0	24 640
Total (€)	2 620 640	2 040 000	4 660 640

Costs for the Agency and NAAs

53. The Agency needs additional resources for the approval of the OSD elements during the type certification process. However, all the time spent by the people dedicated to approval of OSD will be charged to the applicant on an hourly rate. The costs for the oversight of the continued validity of OSD will be covered by the annual fee for TCs. Therefore, the costs for the Agency will be equal to the additional income through fees and charges on a budget-neutral way.
54. NAAs will continue to approve customised training courses and MEL. Instead of using the OEB reports as a reference, the OSD will provide the basis for the approval. The amount of approvals and the content of the work will not be affected by the OSD system. Therefore, no additional costs for NAA are expected.

Other impacts: Harmonisation with non-EU aviation regulations

55. In all known regulatory systems an operational evaluation of new types is performed. For example, in the US this is carried out in the Flight Standardization Board (FSB) under the supervision of the FAA. Such FSB evaluation is not directly mandated in the rules but implemented through policy. The results of the FSB are implemented by the FAA when approving training courses and MEL. The OSD is therefore a different tool to achieve the same objective and will be implemented in close co-operation with the FAA.
56. Non-EU TC and STC applicants must also comply with the OSD requirements. Today the OEB evaluation of new types is carried out jointly with the FSB evaluation of the FAA. In the end each of the authorities makes its own findings. The Agency intends to continue with joint evaluations after the implementation of OSD. The existing practice will therefore not be affected. The difference will be the different regulatory basis for the evaluation. The existing bilateral arrangements with third countries do not address OSD. As a result, the Agency cannot accept without further review the findings made by the third country authority on OSD elements. However, this is already the case today for the OEB evaluations of non-EU products. Whether there is a need to include OSD in future amendments of bilateral arrangements is currently being investigated.
57. EU applicants who have obtained an OSD approval are expected to have certain benefits when exporting their products or STCs. Some countries require already some form of operational suitability data when importing new aircraft. It is expected that local approvals needed for any of the OSD elements will be facilitated by the EASA approval.

Summary

58. Overall, the Agency considers that the significant safety benefit of the OSD proposal which addresses a number of safety recommendations outweighs the costs created for the aviation industry. The costs for OSD implementation are estimated to be roughly 4.6 million euros per year as well as the non-recurring costs for catch-up of 740 000 euros.

Cologne, 13th December 2011

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