COMMENT				Comment summary	Suggested resolution	Comment is an observation or is a suggestion*	Comment is substantive or is an objection**	EASA comment disposition	EASA response
NR	Author	Section, table, figure	Page						
1	*Transport Canada*	Background on the creation of CS 25.143(l)	2	In the section "Background on the creation of CS 25.143(l)", there is a statement referring to the recommendations of the FTHWG… *This working group issued recommendations for load factor capability in the Phase 2 Report Rev. A Topic 1 dated April 2017, particularly to create a new specification 25.144 Envelope Protection Functions—General, to replace CS 25.143(l) in the future for aeroplanes equipped with EFCS.* While it may be inferred from this report that CS25.143(l) is to be replaced by 25.144, the report does not appear to explicitly state that in the recommendations.	Report should include clear statement on 25.144 in the recommendation.	yes	no	Noted.	EASA believe the FTHWG report does not explicitly mention the replacement of 25.143(l), because current CFR 25 does not have a subparagraph 25.143 (l) to be replaced. This sub-paragraph is only part of current CS-25.
2	*Transport Canada*	Appendix A		The material contained in Appendix A, Equivalent Safety Finding to CS 25.143(l) Amdt 22, appears to be derived from the recommendations made by the FTHWG Phase 2 Report Rev A Topic 1 dated April 2017 for proposed change to guidance material for FAA AC 25.7x, Flight Test Guide for Certification of Transport Category Airplanes. Although the FTHWG proposed this material as guidance for FAR 25.144(a), its origin was clearly from the EASA CS 25.143(l). Consequently it is understandable to use this material as an equivalent safety finding to CS 25.143(l). TCCA had representation during the FTHWG discussions for Topic 1, and concurred with the recommendation to replace the requirement for a trajectory change of 5 deg/s by a qualitative assessment for the negative maneuver capability.	n/a	n/a	n/a	Noted.	The agreement is noted.
3	*The Boeing Company*	Paragraph: Appendix A	4	**THE PROPOSED TEXT STATES:** "The following compensating factors must be demonstrated to provide an equivalent level of safety: 1) Positive Load Factors… 2) Negative Load Factors…" **JUSTIFICATION**: The complete applicable FTHWG proposal is not used for this ESF as stated on Page 2, 4th paragraph after "Background on the creation of CS 25.143(l)": "Furthermore, the complete FTHWG proposal shall be used instead of adapting only the 25.143(l)(4)(ii) to apply a consistent and complete set of specification and AMC." Also, the current ESF text in Appendix A	**REQUESTED CHANGE:** *Add the complete applicable FTHWG proposal to Appendix A, including applicable FTHWG Phase 2 Final Recommendation Report Attachment B Proposed Regulatory Material [§25.144 Envelope Protection Functions—General, subsections (a) through (f)] and applicable paraphrasing of Attachment C Proposed Guidance Material [Chapter 2, Section 3, 20.g.(2)(a)(b)(3)(4)(5)(6)(7)], as follows:* "The following compensating factors must be demonstrated to provide an equivalent level of safety: For airplanes that employ envelope protection functions:	no	yes	Partially accepted.	It is correct that the FTHWG report for Topic 1 included a much wider proposal than the replacement of CS 25.143 (l). EASA acknowledge that the statement in the consultation paper "*Furthermore, the complete FTHWG proposal shall be used instead of adapting only the 25.143 (l)(4)(ii) to apply a consistent and complete set of specification and AMC*" was not well reflecting the intended way how to use FTHWG proposal. In fact, the complete CS 25.143 (l) was subjected to the ESF, not just CS 25.143 (l)(4)(ii). Only that part of the guidance from the FTHWG topic 1 report was selected that is relevant to replace CS 25.143 (l). The ESF was mainly targeting the subparagraph CS 25.143 (l) (4) (ii) where the quantified value of a trajectory change of 5°/s was introduced. As explained in the consultation paper, such quantitative requirement of 5°/s of trajectory change is replaced by a qualitative

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				comes from the FTHWG proposal guidance material, is not complete, and does not include the FTHWG proposed regulation changes. It is recommended that Appendix A should list the regulation changes that would be equivalently safe, followed by the guidance material needed to support the ESF. Complying with the complete applicable FTHWG proposal ensures that characteristics required by the current CS 25.143(l) at Amdt. 22, in particular "The quantitative requirement of 5°/s of trajectory change", are sufficiently met to an equivalent level.	(a) Envelope protection functions must not unduly limit the maneuvering capability of the airplane nor interfere with its ability to perform maneuvers required for normal and emergency operations. (b) Onset characteristics of each envelope protection function must be appropriate to the phase of flight and type of maneuver, and must not conflict with the ability of the pilot to satisfactorily control the airplane flight path, speed, or attitude. (c) Excursions of a limited flight parameter beyond its nominal design limit value due to dynamic maneuvering, airframe and system tolerances, and non-steady atmospheric conditions must not result in unsafe flight characteristics or conditions. (d) Operation of envelope protection functions must not adversely affect aircraft control during expected levels of atmospheric disturbances, nor impede the application of recovery procedures in case of wind-shear. (e) Simultaneous action of envelope protection functions must not result in adverse coupling or adverse priority. (f) In case of abnormal attitude or excursion of any flight parameters outside the protected boundaries, operation of envelope protection functions must not hinder airplane recovery." "The applicant should: (2) Positive Load Factors. [Insert text as currently listed in ESF]. Negative Load Factors. [Insert text as currently listed in ESF]. (3) … ensure that when envelope protection functions become active they do not create undesirable or unexpected handling qualities that interfere with the pilot's ability to perform tasks that involve controlling the aircraft in proximity to the onset point or the limit…. conditions should be demonstrated that involve approaching each limit in a fashion that allows the pilot to assess the handling and control characteristics associated with onset of the function. (4) … show that the performance of the function is sufficient to prevent excursion to a potentially unsafe regime as a result of foreseeable aircraft dynamics, non-steady atmospheric conditions, and system tolerances, in any appropriate combination. (5) … when the airplane is operated in turbulence, the EPFs do not introduce unexpected behaviors or create undue difficulty in controlling the flight path. (6) … show that the EPFs are prioritized or coordinated so simultaneous action of EPFs results in the proper priority of functions and does not cause hazardous or confusing behaviors. (7) … ensure that the design of an EFCS and any envelope protection functions consider the possibility that the airplane could experience excursions well beyond the intended operating regime due to				requirement of satisfactory trajectory change. Moreover, the alternative standard describes more precisely the manoeuver to be performed for the assessment. CS-25 Book 2 does currently not provide an AMC for 25.143(l). The text of the consultation paper has been updated accordingly for clarification. The complete proposal of the FTHWG Topic 1 report will be taken as an input for a future rulemaking activity to update CS-25.

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					unforeseen events. The full range of potential pilot inputs or strategies for recovery should be considered. It should be shown that for aircraft states well beyond the protection boundaries, the aircraft will either respond in a conventional manner to large pilot inputs, or will recover automatically to within the protected envelope regardless of pilot input."				

* Please complete this column using the word "yes" or "no"
** Please complete this column using the word "yes" or "no"