Comment-Response Document (CRD) to CPTS-0000414 Issue 01 on "Bird Strike and Ingestion - Bird orientation"

Table of contents

1. Summary of the outcome of the consultation

During the public consultation of the above referenced proposed Deviation from 16 September 2024 to 08 October August 2024, EASA has received:

- 5 comments
- From 4 different commenters.

2. Individual comments (and responses)

In responding to comments, EASA states its position as follows:

(a) **Accepted** — EASA agrees with the comment and any proposed change is incorporated into the text.

(b) **Partially accepted** — EASA either partially agrees with the comment or agrees with it but the proposed change is partially incorporated into the text.

(c) **Noted** — EASA acknowledges the comment, but no change to the text is considered necessary.

(d) **Not accepted** — EASA does not agree with the comment or proposed change.

(General Comments)	-

comment	*1* comment by: *Luftfahrt-Bundesamt* The LBA has no comments.
response	Noted

comment	*3* comment by: *FOCA (Switzerland)* Thank you for the opportunity to comment. We have no remarks on this document.
response	Noted

1.1 AFFECTED CS	p. 4

comment	*2* comment by: *Federal Aviation Administration* Paragraphs 1.1(a) and 1.1(b) require an assessment that an impact of an appropriately sized bird of any orientation will not lead to an IFSD or hazardous engine effects. CS-E 800(c) and CS-E 800(d) do not specify a particular bird orientation, as far as I can tell. AMC E 800 does not offer guidance on specific bird impact orientation either. As such, it seems that alternate bird impact orientations are already addressed by the existing CS-E 800 regulations, as part of assessing the most critical impact condition for a particular bird ingestion test. The CS-E 800 requirements were based on many real world bird ingestion tests (which could conceivably involve bird impacts of many different orientations) and there is no specific requirement to bind the birds (to ensure or favor a particular impact orientation) before the tests. In summary, perhaps this requested deviation is superfluous and unnecessary?
response	Not accepted. Bird orientation is neither excluded nor included as a parameter to be considered by Applicants for the identification of the critical ingestion parameters. However, it is EASA understanding that the rule does not require consideration of the bird orientation for the purpose of determining the test conditions. It was reasonably assumed that bird

orientation would affect impact energy and thrust lost, however the effects would be normally minor. As it is not practical to control the bird orientation during the test and still meet other critical ingestion parameters (e.g. critical target location), the testing has always been based on axial bird orientation with no additional requirement for assessment of the impact of the bird orientation.

The events caused an immediate IFSD, including the fracture of the fan blade near the root, therefore there is a need to assess the bird orientation specifically for this design to achieve the objectives of CS-E 800(a).
Much of the real-world data used for supporting the definition of the rule does not include conclusive information on the bird species or bird masses. Consequently, the bird mass introduced in the definition of the rule was, to some extent, inferred from the damage to the engine for each particular event. The fidelity of the data is not sufficient to allow understanding of the incremental effect of the presentation of the bird.

comment *4* comment by: *DGAC France*

DSAC France would like to thank you for this consultation.

The special condition concludes that “the Applicant must also demonstrate that an impact of any bird, with a mass as specified by CS-E 800(c) and/or CS-E 800(d) but in any orientation, will not lead to an immediate IFSD or Hazardous Engine Effect”.

We would like to draw the attention of EASA on the fact that this wording could be ambiguous regarding the applicable test conditions and then application acceptance test criteria.

Indeed, the SC does not state explicitly that test conditions specified by CS-E 800(c) still apply but with any bird orientation (only the masses specified by CS-E 800 are explicitly applicable). Moreover, one of the acceptance test criteria in CS-E 800(c) is that “the test of CS-E 800(c)(1)(v) must not cause a Hazardous Engine Effect. Again, it is not clear whether all the other acceptance test criteria remain applicable under the proposed SC. We believe that they should remain applicable (the test of CS-E 800(c)(1)(v) mut not cause the Engine to be unable to complete the required test schedule, the Engine to be shut down before end of step 6, a sustained reduction in thrust to less than 50% Rated Take-off Thrust during step 1; the absence of immediate IFSD does not cover all these test acceptance criteria).
The same comment applies to CS-E 800(d), the test conditions and acceptance criteria should also remain applicable (the ingestion must not cause more than a sustained 25% power or thrust loss, the Engine to be shut down during the test).

response Partially accepted.

The acceptance criteria for the SC is included in the SC, that is, “will not lead to an immediate IFSD or Hazardous Engine Effect”. Therefore, the acceptance criteria as per CS-E 800(c)(2) and CS-E 800(d)(2) would not be applicable when the bird orientation is considered. The wording in the SC has been accordingly changed:

> From: “the demonstration of compliance shall also require that an impact of any bird, with mass corresponding to the previous

	requirements but in any orientation, will not lead to an immediate IFSD or Hazardous Engine Effect." To: "the demonstration of compliance must also require to re-evaluate compliance with CS-E 800(c) and/or CS-E 800(d), as applicable depending on the evidence above, but including the impact of any bird with any bird orientation to the centre line, and with a modified acceptance criteria that the ingestion will not lead to an immediate IFSD or an Hazardous Engine Effect."

4. MITIGATING FACTORS p. 6

comment	*5* comment by: *DGAC France* A clarification of the affected CS (refer to our comment on the special condition) would be necessary to be able to assess the proposed mitigation factors.
response	Partially accepted. Wording in section 1.1 "Affected CS" has been modified considering the changes to the wording of the SC.