

Certification Authorities for Propulsion Products (CAPP)

CAPP Worklist Item CWI-5 Icing Novelty of ICI Rule

Date Raised:	1/19/23	Status:	Closed
Initial Release:	2/10/23	Updated:	9/5/23
Raised By:	FAA, EASA, TCCA, ANAC		
SME Team (* denotes lead authority):	ANAC Antonio Parente	EASA Julien Delanoy	FAA Philip Haberlen * TCCA Éric Fleurent-Wilson
Subject:	Icing CWI-5 – 14 CFR 33.68/CS-E 780, Novelty of the Icing rule and guidance		
Reference Requirements/ Guidance:	FAA AC 20-147A and AMC E-780		
Related Issue(s): (Identify Discussion Paper number, if any)	None		

Description of Issue(s):

(Give a brief description of issue(s))

The current FAA SEI list includes SEI #5 – Induction System Icing. The FAA SEI #5 refers to a “new standard amendment”. 14 CFR 33.68, amendment 34, became effective on 5 January 2015. EASA CS-E 780, Amendment 4, became effective on 12 March 2015. Both agencies introduced, at the aforementioned dates, requirements for turbine engine applicants to consider specific Ice Crystal Icing (ICI) and mixed-phase conditions. EASA also introduced ICI and mixed phase guidance material in AMC E 780, and the FAA issued AC 20-147A.

This FAA SEI requires involvement of the FAA when acting as a Validating Authority.

Background:

(Give a brief background of issue(s))

CS-E 780 amendment 4 and 14 CFR 33.68, amendment 34 have introduced the need for Turbine Engines Applicants to consider specific ICI and mixed-phase conditions. AMC E 780 and FAA AC 20-147A also introduced associated guidance.

Because of the novelty of ICI rules and corresponding guidance, the FAA declared SEI #5 per paragraph 3.5.10.4(b)(i) of the Technical Implementation Procedures (TIP) revision 6 of the Bilateral Agreement between EASA and the FAA. This requires the FAA to be involved directly when it is the validating authority for EU engines. Once sufficient experience has been demonstrated by EASA for the new requirements, then ICI no longer remains a novel requirement, and the FAA SEI #5 can be eliminated.

Proposed Prioritization:

(Per CAPP Worklist Items Prioritization schema)

Question	Answer
1. Is there an active working group related to this issue?	AIA provided recommendations that the FAA considered in drafting the AC' on air data probe icing, and issued two reports addressing Ice Crystal Icing means of compliance for probes in October 2017 and for engines in May 2019.
2. In which documents are there deviations amongst the authorities?	None
3. Was this issue raised by or at the CMT?	Yes, Engine icing is a CMT Top-3 task.
4. What is the level of impact on projects in the future (i.e. minor, major, critical)?	Major: ICI is not a well understood phenomenon and is expected to affect many turbine engines.
5. How many authorities does the issue impact?	All authorities via validation.
6. What is the approximate complexity of the issue	High

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(i.e. low, medium, high)?

Recommendation, Objectives and Expected Outcome:

(The authority or industry member that proposes a CWI provides an initial recommendation to the CAPP. The CAPP may refine the objectives.)

A group of Subject Matter Experts should be formed to:

- Discuss certification/validation projects that had ICI requirements as part of their certification bases and any challenges that those projects faced regarding ICI compliance.
- Determine if any challenges encountered during past certification/validation efforts would preserve the novelty of ICI such that FAA SEI #5 should remain in effect until sufficient certification or validation experience has been acquired.

CAPP Decision (Phase 1)

Phase 1. CAPP agreement to proposition and identification of SME team.

CAPP agreed with SMEs recommendation on 1/21/22 and commits resources to complete the recommendation and objectives stated above.

This CWI is accepted into the CAPP system and the tracking number is CWI-5.

Notes:

- The CMTS approved the overall Icing Task Request Form (TRF) during their 1/19/21 meeting
- The CAPP transitioned to CATA CWI report-out format for consistency
- The overall task was separated into individual subtasks/CWIs in response to CMTS feedback
- Novelty of the Icing rule subtask identified as CWI-5
- Presented all CWIs, including CWI-5, to the CMTS during their 9/28/22 meeting

SME Team Project Plan:

Milestones and Work Packages (WP)	Deadline	Status
Novelty of ICI rule (FAA SEI #5)		
Develop criteria for determining when the ICI rule is no longer novel	N/A	Completed
Complete discussions regarding any remaining challenges or controversies regarding ICI certification.	N/A	Completed

SME Discussions:

(Indicate Source (Meeting, Telecon or E-mail) and Date, Include Significant Issues/Developments, and Actions if applicable)

Update	Action Owner	Status
Various SME discussions and certification meetings	Various	Completed

SME Recommendation (Phase 4 Completion)

(Recommendations from SME Working Group; may contain links and/or embedded documents)

It was agreed that when the FAA has validated or has agreed to the compliance plan for ICI for at least 2 engines to §33.68, amendment 34 or later, that ICI would be no longer novel, and the FAA SEI #5 can be eliminated at that point.

The FAA has successfully certified one U.S. engine and validated two non-U.S. engine to §33.68, amendment 34. In addition, EASA has certified two engines to CS-E 780, amendment 4 or later.

No specific controversies regarding ICI validation were discovered by the FAA.

The SMEs recommend removal of FAA SEI #5, associated with the novelty of 33.68 amendment 34, once the criteria discussed above have been met.

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Final CAPP Position (Phase 5 Completion Target: <Phase 4 + 2 Months>)

(Explain agreement, dissent or conclusion on the SME recommendation)

All tasks have been successfully completed. While the original intent was for EASA to find compliance (and the US validate) two engines from two different manufacturers, we have gained sufficient experience from the two engines (same manufacturer) to know that EASA is interpreting the regulation as we would. This CWI represents an agreement that FAA SEI #5 associated with novelty of ICI rule will be removed. This CWI is closed.

Release of CWI:

CAPP Representative	Name	Signature	Date
ANAC	Marcelo Saito	Marcelo Batista Saito 	Assinado de forma digital por Marcelo Batista Saito Dados: 2023.09.13 07:56:53 -03'00'
EASA	Javier Castillo	CASTILLO O Javier 	Digitally signed by CASTILLO Javier Date: 2023.09.13 18:45:57 +02'00'
FAA	Robert Ganley	ROBERT J GANLEY 	Digitally signed by ROBERT J GANLEY Date: 2023.09.13 06:21:49 -04'00'
TCCA	Roop Dhaliwal	Dhaliwal, Roop 	Digitally signed by Dhaliwal, Roop DN: c=CA, o=GC, ou=TC-TC, ou=NCR-RCN, cn=Dhaliwal, Roop Reason: I have reviewed this document Location: Date: 2023.09.13 09:13:54 -04'00' Foxit PDF Editor Version: 12.1.3