European Aviation Safety Agency

Deviations request #72 for an ETSO approval for CS-ETSO applicable to Complex Electronic Hardware (CS-ETSO Subpart A 2.3)
Consultation Paper

1. Introductory note

The hereby presented deviation request shall be subject to public consultation, in accordance with EASA Management Board Decision No 7-2004 as amended by EASA Management Board Decision No 12-2007[1] products certification procedure dated 11. September 2007, Article 3 (2.) of which states:

"Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

2. ETSO-A.2.3#1 – Electronic Hardware

Deviate from CS-ETSO Subpart A 2.3 and use an ASIC being designed before EUROCAE ED-80/RTCA DO-254 had been published without having the necessary documentation of the design process available but having positive in service experience.

Requirement:
CS-ETSO Subpart A 2.3:
If the article contains a complex Application-Specific Integrated Circuit (ASIC) or complex programmable logic (e.g. Programmable Array Logic components (PAL), Field-Programmable Gate Array components (FPGA), General Array Logic components (GAL), or Erasable Programmable Logic Devices) summarised as Complex Hardware to accomplish the function, develop the component according to EUROCAE/RTCA document ED-80/DO-254 "Design Assurance Guidance for Airborne Electronic Hardware", dated April 2000. **All Complex Hardware included in the article definition must be developed in accordance with EUROCAE/RTCA document ED-80/DO-254**.

Additional Note:
Further interpretative guidance to this requirement is given in the EASA Certification Memorandum, EASA CM-SWCEH-001[2], Development Assurance of Airborne Electronic Hardware.

Industry:
We like to continue using an ASIC being developed before the existence of ED-80/ DO-254, which is already in use in various equipment certified for installation on aircraft and for which we do have positive service experience but no documentation exists for the design process, as required for the ED-80/DO-254 design process compliance demonstration.

[1]) http://easa.europa.eu/management-board/meetings/2007/04/MB%20Decision%2012-2007%20amending%20the%20certification%20procedure.pdf
[2]) http://easa.europa.eu/certification/docs/certification-memorandum/EASA%20CM-SWCEH-001%20Development%20Assurance%20of%20Airborne%20Electronic%20Hardware.pdf

EASA:
Already ED-80/DO-254 in section 11.1 addresses a way how to deal with previously developed hardware. As no modification is done to the design of the ASIC, the guidance related to the upgrade of the design base line is not applicable but the guidance as given for Commercial of the Shelf (COTS) complex hardware is fully applicable, even if the original design had not been done by an external party and is commercially not available. Detailed guidance for the aspects to be considered is given in ED-80/DO-254 section 11.2 and 11.3.

In section 9 of the EASA CM-SWCEH-001, Guidelines for Commercial Off-The-Shelf Digital Airborne Electronic Hardware Components, we provide further guidelines on the expected activities and our acceptance criteria.

As we see no need to handle an external bought part differently from an internal available one, were the development had been finalised in the past, the COTS guidelines are applicable to those existing devices as well.
To avoid misinterpretation, it should be clearly understood that this approach can not be used for a new developed device as the required service experience, applicable to the current design, can not be demonstrated.

The deviation is rejected as the issue can be handled within the given frame of the complex hardware review activities and sufficient guidance is available how to deal with the issue. The issue need to be addressed properly in the PHAC and the HAS and compliance demonstration against section 9 of the EASA CM-SWCEH-001 is expected as well within the provided data package.