Department of Transportation
Federal Aviation Administration
Aircraft Certification Service
Washington, DC

TSO-C214

Effective
Date: 07/29/2021

Technical Standard Order

Subject: ***FUNCTIONAL TSO EQUIPMENT USING A TSO-C153a-AUTHORIZED IMA PLATFORM(S) AND/ OR MODULE(S)***

1. PURPOSE. This technical standard order (TSO) is for manufacturers applying for a TSO authorization (TSOA) or letter of TSO design approval (LODA). In it, we (the Federal Aviation Administration, (FAA)) tell you what minimum performance standards (MPS) your *Functional TSO(F-TSO) Equipment* must meet for approval and identification with the applicable TSO marking.

2. APPLICABILITY. This TSO affects new applications submitted after its effective date.

This TSO standard is applicable to any equipment presented for a TSO authorization to an existing TSO standard for an aircraft function (F-TSO), where the equipment is implemented on one (or several) TSO-C153a-authorized Integrated Modular Avionics (IMA) platform(s) and/or module(s). Compliance credit from TSO-C153a can be taken to demonstrate compliance with a F-TSO. This TSO standard is also applicable to any equipment for which an applicant is seeking TSO authorization of a F-TSO standard, where the applicant performs additional development on a previously authorized TSO-C214 'open' class article, and intends to take compliance credit from this authorization to demonstrate compliance with further F-TSO standards. This TSO standard provides the requirements which F-TSO equipment using a TSO-C153a-authorized IMA platform(s) and or module(s) or integrating further a TSO-C214-authorized article that is designed and manufactured on or after the date of this TSO, must meet in order to be identified with the applicable TSO marking.

RTCA DO-297 and EUROCE ED-124 recognize the concept of incremental IMA system approval by introducing intermediate acceptance steps. TSO-C153a authorization is the first step in the TSO IMA authorization process. This TSO C-214 standard is an intermediate step to authorize F-TSO equipment implemented on a TSO-C153a-authorized IMA platform(s) and/or module(s), when the applicant is seeking compliance credit from these preceding authorizations to demonstrate compliance with an F-TSO standard. This TSO standard defines the requirements and delta activities that shall be performed for the authorization of the F-TSO equipment.

> **Note:** This TSO standard does not define the minimum operational performance specifications of a defined function; these are defined by the individual F-TSO standards. F-TSO equipment is the integrated equipment for which the applicant is seeking a TSO standard approval, using TSO-C153a platform(s) and/or module(s).

3. REQUIREMENTS. New models of *F-TSO Equipment Using TSO-C153a authorized IMA Platform(s) and/or Module(s)* identified and manufactured on or after the effective date of this TSO must meet the requirements of this TSO, when applicable.

a. Functionality. This TSO's standards apply to equipment intended to *meet the minimum performance standards outlined in appendix 1 or 2.*

b. Failure Condition Classifications. There is no standard minimum failure condition classification for this TSO. The failure condition classification appropriate for the equipment will depend on the intended use of the equipment in a specific aircraft. Document the loss of function and malfunction failure condition classification for which the equipment is designed. Development to a lower Design Assurance Level (DAL) may be justified for certain cases and accepted, but will lead to installation restrictions and must be documented in the installation and limitations manual defined in paragraph **5.a** of this TSO.

c. Functional Qualification. Demonstrate the required performance under the test conditions in appendix 1 or 2 of this TSO.

d. Environmental Qualification. Environmental Qualification of this TSO using standard environmental conditions and test procedures appropriate for airborne equipment.

> **Note:** The use of RTCA/DO-160D (with Changes 1 and 2 only, without change 3 incorporated) or earlier versions is generally not considered appropriate and will require substantiation via the deviation process as discussed in paragraph **3.g** of this TSO.

e. Software Qualification. If the article includes software, develop the software according to RTCA, Inc., document RTCA/DO-178C, *Software Considerations in Airborne Systems and Equipment Certification*, -, including referenced supplements as appropriate, and the applicable guidance in AC20-115D (or later version) to at least the software level consistent with the failure condition classification defined in paragraph **3.b** of this TSO. You may also develop the software according to RTCA, Inc., document RTCA/DO-178B if you follow the guidance in AC 20-115D(or later version).

1. The applicant shall clearly define the software that will be developed and integrated with the TSO-C153a platform(s) and/or module(s) that are used and with any possible additional hardware.

f. Electronic Hardware Qualification. If the article includes complex custom airborne electronic hardware, then develop the component according to RTCA Inc., Document RTCA/DO-254*, Design Assurance Guidance for Airborne Electronic Hardware*, and the applicable guidance in AC 20-115A (or later version) to at least the design assurance level consistent with the failure condition classification defined in paragraph 3.b of this TSO.

1. The applicant shall clearly define the additional hardware part that will be developed and integrated with the TSO-C153a platform() and/or module(s) that are used.

g. Deviations. There are provisions for using alternate or equivalent means of compliance with the criteria in the MPS of this TSO. If you invoke these provisions, you must show that your equipment maintains an equivalent level of safety. Apply for a deviation pursuant to Title 14 of the Code of Federal Regulations (14 CFR) 21.618.

h. Problem Reports. Follow the guidance of AC 20-189, *Management of Open Problem Reports, or later revision.* Note that the AC applies to electronic systems, software, and AEH, so it is not appropriate to attach it to the software qualification or hardware qualification section.

4. MARKING.

a. Mark at least one major component permanently and legibly with all of the information in 14 CFR 45.15(b).

b. If the article includes software and/or airborne electronic hardware components, then the article part numbering scheme must identify the software and airborne electronic hardware components configuration. The part numbering scheme can use separate, unique part numbers for hardware, software, and airborne electronic hardware.

c. You may use electronic part marking to identify software or airborne electronic hardware components by embedding the identification within the hardware component itself (using software), rather than marking it on the equipment nameplate. If electronic marking is used, it must be readily accessible without the use of special tools or equipment.

5. APPLICATION DATA REQUIREMENTS.

You must give the FAA Aircraft Certification Office (ACO) branch manager responsible for your facility a statement of conformance, as specified in 14 CFR 21.603(a) (1), and one copy each of the following technical data to support your design and production approval. LODA applicants must submit the same data (excluding paragraph **5.g**) through their civil aviation authority.

a. Manuals containing the following:

(1) Operating instructions and article limitations sufficient to describe the equipment's operational capability.

(2) Detailed description of any deviations.

(3) Installation procedures and limitations sufficient to ensure that the IMA platform, or module with F-TSO when installed according to the installation or operational procedures, still meets this TSO's requirements. Limitations must identify all unique aspects of the installation. The limitations must also include a note with the following statement:

"This article meets the minimum requirements of TSO-C214. In addition to the required TSO –C214 application data, you must give the FAA ACO branch manager responsible for your facility a statement of conformance as specified in 14 CFR 21.603(a)(1), and one copy each of the Application Data specified in each implemented F-TSO to support your design and production approval. Letter of Design Approval (LODA) applicants must submit the same data through their civil aviation authority. Installation of this article requires separate approval."

(4) For each unique configuration of software and airborne electronic hardware, reference the following:

(a) Software part number, including revision and design assurance level,

(b) Airborne electronic hardware part number including revision and design assurance level, and

(c) Functional description.

(5) A summary of the test conditions used for environmental qualifications for each component of the article. For example, a form as described in RTCA/DO-160G, *Environmental Conditions and Test Procedures for Airborne Equipment,* appendix A.

(6) Schematic drawings, wiring diagrams, and any other documentation necessary for installation of the IMA platform(s) and/or module(s).

(7) By-part-number list of replaceable components that make up the TSO-C214 equipment. Include vendor part number cross-references, when applicable. The By-part-number list should also refer to the used TSO-C153a IMA platform(s) and/or module(s).

b. Instructions covering periodic maintenance, calibration, and repair, to ensure that the IMA platform(s) and/or module(s) continue to meet the TSO approved design. Include recommended inspection intervals and service life, as appropriate.

c. If the article includes software: a plan for software aspects of certification (PSAC), software configuration index, and a software accomplishment summary.

d. If the article includes airborne electronic hardware, the appropriate hardware life cycle data as defined in RTCA/DO-254, Appendix A, Table A-1 and AC 20-152A (or later version).

e. A drawing depicting how the article will be marked with the information required by paragraph **4** of this TSO.

f. Identify functionality contained in the article not evaluated under paragraph **3** of this TSO (defined as non-TSO functions). Non-TSO functions can be accepted in parallel with the TSOA. For those non-TSO functions to be accepted, you must declare these functions and include the following information with your TSO application:

(1) Description of the non-TSO function(s), such as performance specifications, failure condition classifications, software, hardware, and environmental qualification levels. Include a statement confirming that the non-TSO function(s) do not interfere with the article's compliance with the requirements of paragraph **3**.

(2) Installation procedures and limitations sufficient to ensure that the non-TSO function(s) meets the declared functions and performance specification(s) described in paragraph **5.f.(1)**.

(3) Instructions for continued performance applicable to the non-TSO function(s) described in paragraph **5.f.(1).**

(4) Interface requirements and applicable installation test procedures to ensure compliance with the non-TSO function(s) performance data defined in paragraph **5.f.(1).**

(5) Test plans and analysis, as appropriate, to verify that the performance of the hosting TSO article is not affected by the non-TSO function(s).

(6) Test plans and analysis as appropriate, to verify that the function and performance of the non-TSO function(s) as described in paragraph **5.f.(1).**

g. The quality manual required by 14 CFR 21.608, including functional test specifications. The quality system must ensure that you will detect any change to the approved design that could adversely affect compliance with the TSO MPS, and reject the article accordingly. Applicants who currently hold TSOAs must submit revisions to the existing quality manual as necessary (not required for LODA applicants).

h. A description of your organization as required by 14 CFR 21.605.

i. Material and process specifications list.

j. A list of all drawings and processes (including revision level) that define the article's design.

k. Manufacturer's TSO qualification report showing results of testing accomplished according to paragraph **3.c** of this TSO.

6. MANUFACTURER DATA REQUIREMENTS. Besides the data given directly to the responsible ACO, have the following technical data available for review by the responsible ACO:

> **Note:** The following data for a LODA applicant may be made available for review through its CAA. Refer to the applicable bilateral agreement for specific details regarding access to this data.

a. Functional qualification specifications for qualifying each production article to ensure compliance with this TSO.

b. Article calibration procedures.

c. Schematic drawings.

d. Wiring diagrams.

e. Material and process specifications.

f. The results of the environmental qualification tests conducted according to paragraph **3.d** of this TSO.

g. If the article includes software, the appropriate documentation defined in RTCA/DO-178B or RTCA/DO-178C specified in paragraph **3.e** of this TSO, including all data supporting the applicable objectives in Annex A, *Process Objectives and Outputs by Software Level,* of RTCA/DO-178B or RTCA/DO-178C.

h. If the article includes complex custom airborne electronic hardware, the appropriate hardware life-cycle data in combination with design assurance level, as defined in RTCA/DO-254, appendix A, Table A-1. For simple custom airborne electronic hardware, the following data are required: test cases or procedures, test results, test coverage analysis, tool assessment and qualification data, and configuration management records, including problem reports.

i. If the article contains non-TSO function(s), you must also make items **6.a** through **6.h** available as they pertain to the non-TSO function(s).

7. FURNISHED DATA REQUIREMENTS.

a. When furnishing one or more articles manufactured under this TSO to one entity (such as an operator or repair station), provide one copy or online access to the data in paragraphs **5.a** and **5.b** of this TSO. Add any other data needed for the proper installation, certification, use, or continued compliance with the TSO, of the *{insert type of equipment}*.

b. If the article contains declared non-TSO function(s), include one copy of the data in paragraphs **5.f.(1)** through **5.f.(4).**

c. In accordance with AC 20-189, include one copy of the Open Problem Report (OPR) summary to type certification, supplemental type certification, or amended type certification design approval holders.

8. HOW TO GET REFERENCED DOCUMENTS.

a. Order RTCA documents from RTCA, Inc., 1150 18th Street NW., Suite 910, Washington, DC 20036. Telephone: (202) 833-9339; fax: (202) 833-9434. You can also order copies online at www.rtca.org.

b. Order SAE documents from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001. Telephone: (724) 776-4970, fax: (724) 776-0790. You can also order copies online at www.sae.org.

c. Order copies of parts 21 and 45 from the Superintendent of Documents, Government Printing Office, PO Box 979050, St. Louis, MO 63197-9000. Telephone: (202) 512-1800, fax: (202) 512-2104. You can also order copies online at www.gpo.gov.

d. You can find a current list of TSOs and advisory circulars at http://rgl.faa.gov/. You will also find the TSO Index of Articles at the same site.

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Appendix 1

1. MINIMUM PERFORMANCE STANDARD. This section provides the minimum performance standard requirements for the process of further development of equipment using a TSO-C153a-authorized platform(s) and/or module(s) for which a F-TSO authorization (defined as the F-TSO equipment) is sought.

a. The process requirements will cover the environmental qualification, the hardware development assurance, software development assurance and finally the integration of these developed items into the F-TSO equipment to demonstrate compliance for the intended function, using the credit of the authorized TSO-C153a platform(s)/module(s).

b. The applicant is responsible for establishing the necessary communication channels with the company that holds the authorization for TSO-C153a. The applicant shall have access to all necessary design data as a 'user' of the TSO-C153 platform(s) and/or module(s) (for instance, the declaration of design performance, user guide/manual per TSO-C153a Appendix 3, installation manual, environmental qualification plans/reports, etc.). The applicant's organization shall establish a communication means to obtain timely notifications of design changes, open problem reports (at least the ones affecting the usage of the platform(s) and/or module(s), occurrence reports and airworthiness directives (ADs) that affect or relate to the TSO-C153 platforms/modules.

c. The applicant shall perform a change impact analysis on TSO-C153a platform(s) and/or module(s) design evolutions on the functional TSO equipment, and shall perform the necessary development life cycle activities that are impacted by the TSO-C153a changes. The functional TSO holder is responsible for assessing the classification of the changes to the F-TSO equipment as minor or major as per CFR Part 21.611 and for providing the necessary associated justification. Change management processes shall be compliant with AC 20-170 Section 5.4.

d. The management, analysis and classification of OPRs shall be performed by the applicant following the objectives of AC 20-170 Section 5.5, for which objective a) of that section is adapted to the F-TSO context as follows:

    1) The reporting of open problem reports (OPRs) between the different TSO-C153a platform(s) and/or /module(s) and the F-TSO equipment shall be established and assessed by the F-TSO applicant.

2. DEFINITION OF CLASSES. This TSO is an incremental step between TSO-C153a and complete IMA systems certified during an aircraft type certification. Depending on the future evolution of the F-TSO equipment, two classes are defined:

a. 'Open' class refers to a TSO article that has been integrated taking into account the provisions for future evolution (*) of the TSO article but restricted to an IMA context. That means that there are still shared resources available after the integration of all the

functions of the F-TSO article, and that the performance and usage constraints of the remaining resources are characterized.

b. 'Closed' class refers to TSO articles that have been integrated and where no evolution (*) has been anticipated, with all IMA-related activities considered closed. The performance of the remaining resources are not characterized. An F-TSO 'closed' class article no longer offers the capability for IMA development. Design changes may still be performed in accordance with the part-21 provisions, as for other TSO articles.

Class	Minimum performance standard
"Open"	Appendices 1 and 2 of this document
"Closed"	Appendix 1 of this document

(*) *The term 'evolution' in these sentences refers to further development of functions using the remaining resources of the IMA, and without affecting the performance of the already authorized F-TSO equipment.*

3. IDENTIFICATION OF TSO-C153a PLATFORM(S) AND/OR MODULE(S).

The applicant shall clearly define the TSO-C153a platform(s) and/or module(s) used in the design and the associated TSO-C153a authorization credit intended to be used for the F-TSO equipment compliance demonstration.

a. The TSO approval and the part number of the TSO-C153a platform(s) and/or module(s)used shall clearly be referenced in the TSO certification program.

b. The TSO approval and the part number, including the issue/minor revisions of the TSO-C153a platform(s) and/or module(s) used, shall clearly be referenced in the installation instruction manual.

c. Any resources/functions included in the TSO-C153a platform(s) and/or module(s) but unused in the current F-TSO equipment shall clearly be identified and documented in the TSO authorization program..

d. The applicant shall identify and quantify the usage (used and partially used) of the TSO-C153a platform resources, including the usage of its health monitoring and fault management resources.

e. The applicant shall demonstrate the proper use of the TSO-C153a platform resources, , and demonstrate compliance with the TSO-C153a platform integration requirements or user requirements, and with consideration of the safety features. In particular, the applicant shall demonstrate that the use, partitioning, configuration of resources, and the integration of the F-TSO software and hardware items are performed on the TSO-C153a platform(s) and/or module(s) in compliance with the TSO-C153a user manual integration requirements, or equivalent data (as documented per TSO-C153a). This also includes the deactivation or disabling of unused TSO-C153a platform(s) and/or module(s), or the

means to ensure that the intended function is performed without any interference from TSO-C153a platform(s) and/or module(s).

4. TSO AUTHORIZATION PROGRAM.

a. The TSO authorization program shall describe the F-TSO equipment and its structural breakdown. This shall include the use and integration of the TSO-C153a-authorized platform(s)/module(s) within the F-TSO equipment. The F-TSO equipment authorization program shall introduce the planning, organization, division of tasks, and the development, validation, integration, and verification activities conducted on the F-TSO article, including the tool environment used for those activities.

b. Considerations regarding the content of this TSO certification program and guidance can be found in DO-297 chapter 4.4.3, referring to 'IMA system certification plans'. In particular, the TSO authorization program shall indicate the structure of the life cycle data that will support the compliance demonstration with the TSO requirements.

c. Any non-TSO function embedded in the equipment shall be developed and integrated in conformance to the requirements of this TSO, in order to be able to demonstrate that it does not interfere with the TSO functions. It shall be clearly identified as non-TSO functions in the TSO authorization program.

5. SOFTWARE/ APPLICATION DEVELOPMENT.

a. The applicant shall clearly define the software/applications that will be developed and integrated with the TSO-C153a platform(s) and/or module(s) that are used and with any possible additional hardware. This should include embedded software necessary as a complement to the operating system to provide general services such as contributing to the intended function of resources sharing, handling hardware, drivers, software loading, health monitoring, boot strap, etc.

b. The development of software/applications shall be compliant with section **3.e.** of this TSO with respect to the resources allocated (available) to the application or directly controlled by the application.

6. HARDWARE DEFINITION.

a. The applicant shall clearly define the additional hardware part that will be developed and integrated with the TSO-C153a platform(s) and/or module(s) that are used.

b. The development of the hardware shall be compliant with section **3.f.** of this TSO.

7. HOSTED APPLICATIONS.

a. The development of the hosted applications executing on an TSO-C153a platform shall comply with the Task 2 objectives defined in DO-297 Table A-2, and chapter 4.3.1,

except objective 4.3.1.d, and with the following adaptation for objective 4.3.1.a, where the DO-297 text is replaced by:

> *Demonstrate that each application performs its intended function and satisfies this TSO standard requirement, and the F-TSO (i.g. C-2c Airspeed) article requirements while properly utilizing the appropriate platform resources, and interface with other modules/or applications.*

b. It shall be demonstrated that the hosted application on the TSO-C153a platform(s) and/or module(s) complies with the user requirements provided by the TSO-C153a provider (see the TSO-C153a standard-Appendix 3).

c. Any non-TSO application embedded in the TSO article shall be developed in conformance to the above requirements (a) and (b) in order to be able to demonstrate that it does not interfere with the TSO functions.

d. The associated life cycle data to demonstrate the above requirements shall be produced and organized to support the F-TSO system integration objectives, and show that the applications are executing correctly within the platform(s) and/or module(s) requirements and limitations. Even though the objectives for the development of hosted applications remain applicable, when relevant, some activities/life cycle data might be combined with F-TSO equipment activities/data (next section).

8. EQUIPMENT INTEGRATION PROCESS. There are several levels of integration that are possible for F-TSO equipment using TSO-C153a-authorized platform(s) and/or module(s), of which some examples are listed below:

- Integration of software/applications on an TSO-C153a platform;
- Integration of several TSO-C153a modules to build an integrated equipment and its software applications; and
- Integration of additional hardware simultaneously with software/applications, together with a TSO-C153a platform(s) and/or module(s) or additional hardware, into a TSO-C153a rack platform (class RH).

General Requirement-The applicant shall perform the integration of the TSO-C153a platform(s) and/or module(s)s used with any additional hardware and the software/ applications. These integration activities must be compliant with the DO-297 Task 3 objectives defined in DO-297 Table A-3, and chapter 4.4.1, except Objective 4.4.1.a, and with the following adaptation for Objective 4.4.1.d where the DO-297 text is replaced by:

> *Demonstrate compliance with the applicable F-TSO standards and related MOPS.*

> **Note**: Even though the integration activities have their own objectives, when relevant, some activities/data might be combined

with some activities/life cycle data of the development of the hosted applications (see section 4 of this Appendix)

9. HEALTH MONITORING AND FAULT MANAGEMENT

a. The applicant shall describe how the TSO-C153a health monitoring and fault management resources are used and integrated with the other platform(s) and/or module(s)/application features, resulting in the health monitoring and fault management of the F-TSO equipment.

b. Principles and mechanisms shall be defined in order to allow the consistent sharing of fault management data between TSO-C153a platform(s) and/or module(s) resources and the functions of the TSO article.

c. Recovery mechanisms shall be defined to ensure the continuity of the functions of the TSO article when needed.

Guidance on health monitoring and fault management can be found in DO-297 chapters 3.6.1 to 3.6.4. Guidance about health monitoring and fault management at the platform and application levels respectively can also be found in DO-297, chapters 3.1.1.b.5 and 3.1.2.d.

10. INTEGRATION AND CONFIGURATION DATA/PARAMETER DATA ITEMS. AC 20-170A section 5.2 shall be followed.

11. INTEGRATION AND USE OF TOOLS AND TOOL QUALIFICATION. AC 20-170A section 5.3 shall be followed.

12. SAFETY ASSESSMENT. The safety assessment of the F-TSO equipment shall consider possible failures in the TSO-C153a platform(s) and/or module(s) used in the F-TSO equipment that are described by the platform provider in their failure modes and effect analysis.. If any assumptions have been made at the TSO-C153a platform(s) and/or module(s) level, they shall be validated by the F-TSO safety assessment .

The failure condition classification that is appropriate for the TSO article will not be driven by this TSO standard, but driven by the intended aircraft function and the minimum classification indicated in the F-TSO standard with which the TSO article is intended to comply.

Note: If additional hardware and/or software/applications is added to a TSO-C153a platform(s) and/or module(s), it shall also be considered in the F-TSO safety assessment.

13. ENVIRONMENTAL STANDARD. The applicant shall demonstrate the compliance of the integrated F-TSO equipment with the environmental requirements identified in **3.d.** of this TSO.

If the applicant intends to reuse evidence from an earlier demonstration of compliance achieved by the TSO-C153a platform(s) and/or module(s), an assessment of the achieved performance shall be performed. The applicant shall identify all gaps between the earlier qualification of the TSO-C153a platform(s) and/or module(s) and the environmental qualification requirements of th eF-TSO, in compliance with the requirements of **3.d.** of this TSO. The qualification test plan of the F-TSO shall clearly identify any additional qualification activities and any tests that need to be (re)performed. The plan shall considering the impact of the integration of several hardware platform(s) and/or module(s), as well as the possible differences between the environmental qualification requirements for the F-TSO equipment and the environment for which the TSO-C153a platform(s) and/or module(s) were qualified.

14. MARKING. In addition to the requirements of section 4 of this TSO the applicant shall mark the TSO article with selected class of equipment:

- TSO-C214 “Open”, or
- TSO-C214 “Closed”.

The applicant shall maintain the original TSO marking of the TSO-C153a platform(s) and/or module(s) used in the F-TSO equipment. When the technique of electronic marking was used, this electronic marking shall remain available, even after having developed additional software.

15. INSTALLATAION MANUAL. In addition to the requirements of section 5. a. of this TSO the applicant shall include in the installation manual:

a. All the data necessary for the proper installation and use of the F-TSO equipment.

b. Documented means to ensure the compatibility between the authorized TSO-C153a platform(s) and/or module(s) and the authorized F-TSO article.

c. Compatibility and mixability information between the IMA TSO-C153a platform(s) and/or module(s) and the F-TSO software/application(s) and additional hardware.

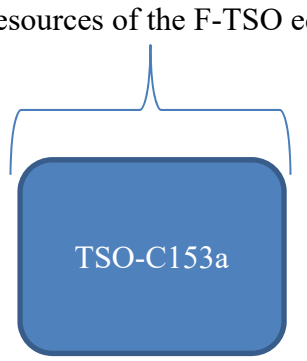
Appendix 2

1. MINIMUM PERFORMANCE STANDARD. In addition to Appendix 1, this appendix is applicable to 'open' class IMA equipment.

When the TSO-C214 article is of 'open' class, the F-TSO applicant shall properly characterize and document the resulting platform resources and partitioning features for the next user.

Three main cases of 'open' equipment are distinguished in order to adapt the requirements to the development specificities of the F-TSO article as follows:

a. When the applicant uses only one TSO-C153a platform and does not augment its resources, as illustrated below:

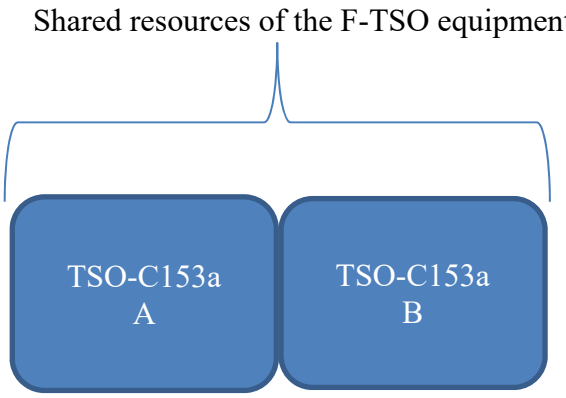


(1) The applicant shall describe the use of the original TSO-C153a platform with regard to the TSO-C153a appendix 3 data (such as the user guide).

(2) The applicant shall describe the remaining resources with respect to appendix 3 data so it is clear which shared resources remain available for future incremental development by an independent user or aircraft manufacturer.

(3) The applicant shall describe and quantify the resources that are used and allocated.

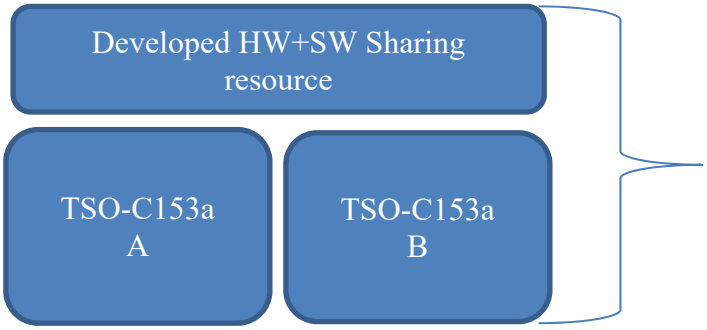
b. When the F-TSO equipment integrates multiple TSO-C153a-authorized resources without augmenting the IMA sharing capability, as illustrated below:



(1) The F-TSO applicant shall characterize the resulting platform using the individual characterization of the TSO-C153a platform

(2) The F-TSO applicant shall document the resulting TSO-C214 'open' platform in compliance with TSO-C153a appendix 3.

c. When the F-TSO equipment augments the IMA sharing resources with additional development (hardware and/or software), as illustrated below:



(1) The F-TSO applicant shall comply with TSO-C153a appendix 2 and the related classes.

(2) The F-TSO applicant shall document the augmented 'open' platform TSO-C214 in compliance with TSO-C153a appendix 3. The applicant can use the appendix 3 data of the TSO-C153a platform(s) and/or module(s) that are used and augment or amend them to document the TSO-C214 'open' platform user data, in compliance with TSO-C153a appendix 3.

Within the characterization effort of resources, the applicant should document the instructions for configuration of the TSO-C214 article so that the next user can ensure the integrity and continuity of the system configuration, and ensure that the

resource allocation, partitioning, and health monitoring will not be impaired when integrating the TSOA article.

2. CONTINUOUS HEALTH MONITORING CAPABILITY. As a user of a TSO-C153a platform(s) and/or module(s), the F-TSO applicant should pay particular attention to ensuring that there is a continuous health monitoring capability.

a. Health monitoring features provided in an ‘open’ class platform shall be continuously maintained and characterized throughout the integration process.

b. Health monitoring capability shall be made available for any potential further incremental development.