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JUSTIFICATORY REPORT ON THE NEED AND SUITABILITY OF TENDERING THE ENGINEERING PROJECT COMPETITION WITH JURY INVOLVEMENT TO SELECT UP TO TWO PROPOSALS FOR EARTH OBSERVATION SATELLITE PAYLOAD DEVELOPMENT PROJECTS

CPV Code: 71300000-1 Engineering Services

1. JUSTIFICATION OF THE NEED

The Institute of Space Studies of Catalonia (IEEC) was established in February 1996 as a private non-profit foundation (NPO) to promote space-related R&D in Catalonia. As a research institute, the IEEC explores all areas of knowledge and technologies relevant to the space sector and space sciences, including astrophysics, cosmology, planetary science, Earth observation, navigation, and space engineering. Its mission is to advance the frontiers of space research from both scientific and technological perspectives, delivering maximum benefits to society. It should also be noted that the foundation is affiliated with the Generalitat of Catalonia and forms part of its institutional public sector, as the Generalitat holds a majority stake in the entity.

Through its Area for the Promotion of the Space Sector in Catalonia (APEC) and within the framework of the space strategy promoted by the Generalitat of Catalonia (hereinafter referred to as the “space strategy”), the IEEC is pursuing various initiatives to increase the utilisation of Earth observation satellite data across the Catalan ecosystem. This includes data from the Copernicus program, private initiatives, and particularly missions under Catalonia’s space strategy. The goal is to create new business opportunities by developing services that enhance decision-making in the private sector across the diverse domains encompassed by Earth observation. Additionally, since September 2024, the IEEC has been coordinating the ESA Phi-Lab NET in Spain – an innovative program under the ESA’s ScaleUp commercialisation initiative, with co-financing from the Generalitat of Catalonia through the space strategy.

Phi-Lab NET in Spain focuses on climate resilience, aiming to improve understanding of climate change and bolster climate resilience in Spain via space-based technology solutions. These outcomes can then be exported to other European and Mediterranean regions for broader benefit. **Climate resilience** is defined as the capacity of societies, economies, and ecosystems to anticipate, absorb, recover from, and adapt to climate change impacts. Achieving this requires a blend of mitigation and adaptation strategies, such as enhancing responses to and recovery from natural disasters, strengthening climate monitoring and information systems, improving early warning capabilities, and incorporating long-term planning. Phi-Lab NET in Spain will provide opportunities to develop innovative technologies and bring them to market. Among these, one key area is the creation of services or applications based on Earth observation. The program also seeks to foster innovation

in onboard technology that supports these Earth observation-based services or applications. For more details on ESA Phi-Lab NET in Spain, refer to **Appendix 1** of the tender specifications or visit the program website: https://esaphilabnet-spain.ieec.cat/

As the project coordinator, the IEEC contributes to its funding by managing resources allocated under the space strategy. These funds support ongoing research and investment activities linked to ESA Phi-Lab NET Spain, including the present engineering project competition with jury involvement, which **aims to select up to two proposals for developing Earth observation satellite payloads targeted at the private sector**. Accordingly, this competition is integrated within ESA Phi-Lab Spain.

The IEEC is issuing this call for an engineering project competition to:

1. Solicit innovative proposals for developing onboard space technology for small satellite platforms (SmallSats) focused on Earth observation. These proposals must achieve a sufficient technology readiness level (TRL ≥ 6) by project end, with a commitment to deliver at least a functional engineering model (EM). Following the competition, if the model's technology readiness is adequate, the IEEC may offer guidance to qualify the payload for space flight, thereby accelerating its in-orbit demonstration (IOD) and eventual market entry.
2. From the submitted proposals for Earth observation satellite payload development, select up to two to:
    a. Boost the Catalan ecosystem in developing onboard payloads for small satellites (i.e., SmallSats[1]) that address climate resilience challenges,
    b. Enhance their competitiveness in the small satellite payload market,
    c. Facilitate their subsequent commercialisation.

2. PURPOSE OF THE PROJECT COMPETITION

This engineering project competition with jury involvement aims to select up to two (2) proposals for **developing payloads for Earth observation satellites targeted at the private sector**.

To participate in this competition, proposals for Earth observation satellite payload development projects must meet the following requirements:

A. Alignment with the theme of ESA Phi-Lab NET Spain: Space technology for climate resilience. More information on ESA Phi-Lab NET Spain can be found in Appendix 1. Participants must specify which challenge their proposal addresses.

[1] With a total mass between 11 and 200 kg.

B. A focus on commercialisation, with the project achieving a maturity level of TRL ≥ 6 upon completion and demonstrating a viable business model at the end. The bidder must commit to attaining a technology readiness level (TRL) of TRL ≥ 6 by the project's end.

C. At the time of proposal submission, the bidder must have a technical office in Catalonia to facilitate project oversight. Accordingly, when submitting the bid, documentation must be provided proving possession of a technical office within the specified maximum radius[2].

The requirement for the technical office to be located in the designated territory (Catalonia) is essential for the following reasons:

The Government of the Generalitat, via a Government Agreement dated 27 October 2020, approved a space strategy to develop a multisectoral, cross-cutting plan centred on the needs of public administration and its impact on space-related matters for individuals.

The IEEC, through its Area for the Promotion of the Space Sector in Catalonia (APEC), alongside the i2Cat Foundation and the ICGC, is among the entities tasked with promoting and implementing various activities outlined in the strategy. These include initiatives related to:

- Fostering and building a competitive ecosystem in Catalonia's space sector.

- Advancing the sustainable and economic growth of the space industry in Catalonia.

- Establishing Catalonia as a leading force in space technologies and solutions across Europe.

- Attracting, retaining, and developing specialised talent in space-related technologies within Catalonia.

- Creating workspaces, innovation centres, and collaborative environments focused on space and its services.

- Positioning Catalonia as a benchmark hub for generating and transferring space-related value and knowledge to diverse sectors of the Catalan economy and society.

- Forging collaborative bridges with other regions and prominent space management entities that share strategic interests in space.

As outlined, the space strategy, approved and driven by the Government of the Generalitat, seeks to promote the growth of the space sector in Catalonia by conducting space-related activities within this territory.

As an implementing entity for the space strategy, the IEEC is responsible for cultivating a

[2] 200 km

robust ecosystem and infrastructure in the space domain across Catalan territory. To fulfil this mandate, the IEEC deems it necessary that a technical office be established in Catalonia for the execution of the present contract. Additionally, ensuring the contract's proper implementation requires conditions that enable the IEEC to exercise its inspection, monitoring, and validation responsibilities. In this sense, throughout the development of the contract, the personnel responsible for the IEEC must be able to carry out the activities associated with this supervision of the contract in the most seamless, efficient, and effective manner possible–often through in-person activities.

D. The bidder must be a private company, though partnerships with other companies, research institutions, or public entities are permitted.

E. The objectives must be achievable within a maximum of 27 months from the contract signing (T0).

F. Inclusion of authorisation for the IEEC and the Generalitat of Catalonia to disseminate the results, with the company's involvement.

G. The proposed payload provider must commit to developing at least a functional model by project completion, in line with the Engineering Model definition in the ECSS-S-ST-00-01C standard.

The jury will exclude from the competition any companies submitting proposals that fail to meet these eligibility criteria.

Winning projects will be featured in the ESA Phi-Lab NET Spain portfolio, where they will be showcased as services, projects, or solutions, including details about the developer company to foster contact, collaboration, and potential contracts.

As part of the subsequent negotiated procedure without publicity, conducted with the competition winners, the winners will be required to submit a document detailing communication actions for the payload development results. This dissemination plan must be validated by the IEEC and the Generalitat of Catalonia. It should detail the dissemination activities to be carried out in the 3 months following the project's completion.

3. TYPE OF PROCEDURE AND SUBSEQUENT CONTRACTING

This is a project competition pursuant to Articles 183 to 187 of the LCSP (Public Sector Contracts Act).

An open award procedure is proposed, structured as a project competition in accordance with Article 183(2)(b) of the LCSP, which covers project competitions with prizes and subsequent awards to winners via a negotiated procedure for contracts involving design, validation, and implementation of the projects, as stipulated in Article 168(d) of the same legislation.

4. JUSTIFICATION FOR NOT DIVIDING INTO LOTS

Pursuant to Article 99.3 of the LCSP, dividing the contract into lots is deemed unnecessary, as executing the various services independently would complicate proper implementation from a technical perspective.

5. TERM OF THE SUBSEQUENT SERVICES CONTRACT

The timeframe for conducting the design, integration, validation, implementation, and dissemination of the contracted payload development will be detailed, as applicable, in the subsequent negotiated contracting procedure. The maximum duration cannot exceed 27 months from the contract signing (T0), allocated as follows: 24 months for project execution (encompassing design, integration, validation, and implementation of the pre-validated communication actions plan by the IEEC), plus an additional 3 months post-execution dedicated to disseminating the final results.

6. CONTRACT EXTENSION

The contract extension is not applicable.

7. TENDER BUDGET AND ESTIMATED CONTRACT VALUE

1. **Tender budget**:

   Pursuant to Article 100 of the LCSP, the base tender budget is €21,780.00 including VAT, broken down as follows: €18,000.00 net and €3,780.00 for Value Added Tax at 21%. This is based on:

   - Project 1. Prize for the first winning proposal: €9,000.00, excluding VAT.
   - Project 2. Prize for the second winning proposal: €9,000.00, excluding VAT.

2. **Estimated Contract Value**[3]. The estimated contract value is €901,000.00 excluding Value Added

[3] In accordance with Article 168(d) of the LCSP, the Procurement Body may award the services outlined in points C.1, C.2, and C.3 of the above summary to the competition winners via a Negotiated Procedure without publicity. Should this negotiated procedure be pursued, the two selected winners will be invited to negotiate. The maximum timeframe for

Tax, broken down as follows:

PROJECT COMPETITION

C.1 Project competition

Works	Bidding Amount
First prize (1): Project 1 (drafting of Technical Report)	€9,000.00, excluding VAT
Second prize (2): Project 2 (drafting of Technical Report)	€9,000.00, excluding VAT

NEGOTIATED PROCEDURE WITHOUT PUBLICITY TO BE PROCESSED SUBSEQUENTLY WITH THE 2 COMPETITION WINNERS

C.2 Project 1 (to be processed via negotiated procedure without publicity)

Design Validation Implementation	Amount to be finalised in the negotiated procedure without publicity, not exceeding €441,500.00 excluding VAT in total.

C.3 Project 2 (to be processed via negotiated procedure without publicity)

Design Validation Implementation	Amount to be finalised in the negotiated procedure without publicity, not exceeding €441,500.00 excluding VAT in total.

exercising these options is 2 years from the resolution of the current procedure. This possibility does not confer any rights to the competition winners.

The successful bidder will be eligible to receive payments for the work that has been genuinely completed, as stipulated in the relevant contract.

8. WARRANTY PERIOD

2 years to resolve any doubts and/or queries resulting from the technical report.

9. REQUIREMENTS FOR BIDDERS' CAPACITY, APTITUDE, AND SOLVENCY

1. Bidding companies, whether natural or legal persons, Spanish or foreign, must possess full legal capacity to act and cannot be subject to any incapacity or prohibition to contract as determined by current legislation, all in accordance with the provisions of articles 65 and 71 of the LCSP.

   Pursuant to the provisions of Articles 65 and 66 of the LCSP, the activity of the bidding companies that are legal persons must be related to the object of the service contract, according to their respective statutes or founding rules.

2. Bidders must maintain an organisation equipped with adequate resources (see sections 9.1 and 9.2) to ensure proper contract performance. Additionally, they must possess any necessary business or professional authorisations required for the performance of the contract's activities or services. Bidders, contractors, subcontractors, subsidiaries, or interposed companies involved in this contract are prohibited from conducting financial transactions in tax havens. This prohibition is in accordance with the list of countries compiled by European institutions or endorsed by them, or alternatively, by the Spanish State. Additionally, financial operations, whether within or outside tax havens, which are deemed criminal under legally established terms such as money laundering, tax fraud, or offences against the Public Treasury, are strictly prohibited.

3. Each bidder may submit only one proposal.

9.1. Economic and Financial Solvency Requirements

As per Article 87 of the LCSP, bidders must prove economic and financial solvency in the competition

phase through a binding commitment to secure professional indemnity insurance for at least €441,500.00. This insurance must be formalized if the bidder wins the project competition.

During the competition phase, a bidder is considered to meet this requirement by including in their proposal a binding commitment to secure the insurance upon winning.
The winner of the competition must verify compliance with this requirement within ten (10) working days as outlined in article 150.2 of the LCSP, using a certificate from the insurer that confirms the policy's issuance, the covered amounts and risks, and the insurance's expiration date, along with a binding commitment document for the subscription, extension, or renewal of the insurance where applicable.

9.2. Technical and Professional Solvency Requirements

Due to the technical complexity of the competition's subject, bidders must commit to forming–if awarded–a multidisciplinary team with broad expertise in Earth observation and instrumentation development to handle the payload's design, development, integration, and testing.

The technical team must include at least 3 members to manage execution and development across relevant fields throughout the project. Team members must hold appropriate qualifications (e.g., degrees in software engineering, telecommunications, aerospace engineering, computer science, physics, geoinformation, Earth observation, or related applications, based on the payload's specifics). These members must possess at least 3 years of experience in these areas.

Technical solvency will be evidenced by: (i) an ordered list of personnel assigned to the contract, and (ii) signed curricula vitae of team members as certification.

10. EVALUATION CRITERIA FOR PROPOSALS (TOTAL 100 POINTS)

Bidders must submit a **technical report** in envelope/electronic file B, clearly and concisely outlining their proposal for the content and execution plan of the Earth observation satellite payload development project.

The technical report must cover the following elements:

- **Project objectives and scope**
- **Innovative aspects of the proposal**
- **Current technology readiness**
- **Technical feasibility of reaching the target technology readiness**
- **Work methodology and project development approach**

- **Prior experience in similar technological developments**
- **Facilities for integration and functional testing**
- **Compatibility with small satellite-based Earth observation missions**
- **Space sustainability considerations**
- **Selection of parts and materials**
- **Social and industrial impact**
- **Future business model: target market and value proposition**

The jury will first assess whether submitted proposals satisfy the eligibility requirements in section 2 of this report. To select winners, the jury will apply the following evaluation criteria to eligible proposals, using the specified weightings (maximum 100 points):

A. Project Proposal (up to 34 points)

The jury may award 0 to 34 points based on these criteria:

Criterion	Description	Score
Project objectives and scope	The clear, coherent, and measurable definition of the objectives to be achieved within the project's timeframe will be evaluated as follows: ● The objectives are clearly defined, aligned with the requirements as well as the competition's theme, well-structured, and KPIs are defined to measure the achievement of the objectives: **up to 4 points.** ● The objectives are partially defined and aligned with the competition's theme, but present inconsistencies, lack of justification in some aspect, or no KPIs are presented to measure the achievement of the objectives: **up to 2 points**. ● The objectives are unclear, incoherent, or not aligned with the competition's requirements: **0 points.**	**Up to 4 points**
Innovative aspects of the proposal	The innovative or unique character of the proposal compared to available technological solutions on the market will be evaluated through the provided justification as follows: ● The innovative nature of the proposal is clearly justified, evidencing disruptive elements and significant advances that surpass the current state of the art. They provide a high degree of innovation and have a significant impact on technological development: **up to 12 points.** ● A reasonable analysis of the state of the art is	**Up to 12 points**

	provided with identification of some innovative elements, but with shortcomings in the depth of the analysis or in the justification of the novelty compared to existing solutions: **up to 6 points.** ● No relevant information is presented and/or no innovative elements or relevant technological impact are identified: **0 points.**	
Current technology readiness	The justification of the overall technology readiness level (TRL) achieved by the payload proposal at the time of submission to the call will be evaluated, based on the ECSS-E-HB-11A standard, as follows: - TRL = 5 and well justified: **up to 8 points.** - 3 ≤ TRL< 5, or TRL = 5 not sufficiently justified: **up to 4 points.** - TRL< 3: **0 points.**	**Up to 8 points**
Technical feasibility of reaching the target technology readiness	The justification of the plan to achieve the target technology readiness level (TRL ≥ 6) will be evaluated as follows: ● Solid justification for achieving TRL 6 or higher: **10 points.** ● Proposal to reach TRL 6 or higher with weak justification: **5 points.** ● No justification for achieving TRL 6 or higher: **0 points.**	**Up to 10 points**

B. Technical Feasibility of Project Development (up to 22 points)

The jury may award 0 to 22 points based on these criteria:

Criterion	Description	Score
Work methodology and project development approach	The level of detail and clarity in the description of the work methodology, development planning, and project management will be evaluated as follows: ● Detailed information on the work methodology, development planning, and project management is provided: **12 points.** ● Information on the work methodology, development planning, and project management is provided but not properly justified: **6 points.** ● A solid justification of the work methodology, development planning, and project management is not provided: **0 points.** This evaluation will be carried out through an analysis of the provided justification for:	**Up to 12 points**

	• Schedule and planning of milestones and phases. • Breakdown of the project into work packages and activities necessary for project achievement. • Risk management. • Cost planning. • Project management methodology. • Organisation of the work team: assignment of roles and tasks. • Capacity to achieve the proposed tasks and deadlines.	
Prior experience in similar technological developments	Properly justified previous experience in technological developments of similar payloads that provide expertise in achieving the project's objectives within the proposed timeframe will be evaluated as follows: • Complete information is provided and previous experience in at least 3 similar technological projects is justified: **6 points.** • Complete information is provided and previous experience in one or two similar technological projects is justified: **3 points.** • No previous experience is provided or the justification is insufficient: **0 points.**	**Up to 6 points**
Facilities for integration and functional testing	The prior identification and access to facilities with the necessary integration and testing equipment for the proposed payload development will be evaluated as follows: • All necessary facilities, whether own or third-party, have been identified and access is available, providing supporting documentation: **4 points.** • All necessary facilities have been identified but agreements for their use are not yet in place or supporting documentation is not provided for all facilities: **2 points.** • Not all necessary facilities have been identified or sufficient information is not provided: **0 points.**	**Up to 4 points**

C. Availability for Future Space Flight (up to 12 points)

The Jury may award between 0 and 12 points on this topic following these criteria:

Criterion	Description	Score
Compatibility with small satellite-based Earth observation	The degree of fit of the proposed payload as a secondary payload in missions based on small satellite platforms (11 to 200 kg) where the primary payload is for Earth	**Up to 8 points**

missions	observation, and the ability to achieve such fit, will be evaluated as follows: ● Detailed information on interfaces is provided and the fit is properly justified: **8 points.** ● Information on interfaces is provided but the fit is not properly justified: **4 points.** ● A solid justification of the fit is not provided: **0 points.** This evaluation will be carried out through an analysis of the justification provided for the following elements: ● Payload configuration, volume envelope. ● Mass per unit volume. ● Mechanical Interface. ● Thermal Interface. ● Electrical Interface. ● Software Interface (data/communications). ● Ground Communications Interface (Downlink/Uplink) ● Payload Operations Concept. ● Pointing and attitude required per operation mode. ● Electrical power consumption per operation mode. ● Data generation and storage strategy. ● Thermal and Electromagnetic Behaviour. ● Radioelectric Susceptibility. ● Mechanical Environment (vibrations, shocks). ● Space Environment. ● Performance stability in flight.	
Space sustainability considerations	Space sustainability Compliance with the European Space Agency's (ESA) Zero Debris Charter in the applicable parts will be evaluated. ● Complete information is provided and compliance with the Zero Debris Charter is justified[4]: **2 points.** ● Incomplete information is provided and/or partial compliance with the Zero Debris Charter is justified: **1 point.** ● No information is provided or the justification for compliance with the Zero Debris Charter is insufficient: **0 points.**	**Up to 2 points**
Selection of parts and materials	Compliance with the ECSS-Q-ST-60C standard (references Appendix II) regarding the selection of parts and components, taking into account a list of restricted materials as established by the mentioned standard, will be evaluated as follows:	**Up to 2 points**

[4] ESSB-ST-U-007

	● Complete information is provided and it is justified that there are no parts and/or materials from the restricted components list: **2 points.** ● Incomplete information is provided and/or a complete justification is not provided: **1 point.** ● No information is provided: **0 points.** The payload provider may accredit this compliance with the delivery of a declaration listing the components used (Declared Components List, DCL).	

D. Social and Industrial Impact (up to 32 points)

The Jury may award between 0 and 32 points on this topic following these criteria:

Criterion	Description	Score
Social and industrial impact	The description of the expected impact on the Catalan market, indicating the industrial areas of impact and possible business and exploitation models and their degree of relation to the territory of Catalonia, will be evaluated as follows: ● Information is provided and the social and industrial impact of the proposal is justified: **20 points** ● Information is provided, but the social and industrial impact is weakly or partially justified: **10 points** ● No information is provided or the social and industrial impact is insufficiently justified: **0 points**	**Up to 20 points**
Future business model: target market and value proposition	The clarity and solidity of the business model, the identification of the target market, potential customers, and the economic viability of the project will be evaluated as follows: ● A solid justification of commercial viability is included: **12 points.** ● A business model is proposed but with weak justification: **6 points.** ● Commercial viability is not demonstrated: **0 points.**	**Up to 12 points**

A minimum quality threshold for the award is established, as provided for in Article 146.3 of the LCSP, with the following score for each evaluation section:

Evaluation Section	Minimum Score
A. Project Proposal	17 points
B. Technical Feasibility of Project Development	11 points
C. Availability for Future Space Flight	6 points
D. Social and Industrial Impact	16 points
Global Threshold	**60 points**

Those proposals with a lower quality score in a section (A, B, C, D) or globally will be rejected and therefore excluded from the competition as they are considered technically insufficient.

The Jury will select proposals based on their ranking by score.

The Jury will provide a final opinion or decision in the form of a report, signed by all members, listing the proposals in descending order according to their scores, along with any relevant observations.

The maximum length of the technical report may not exceed 10 double-sided DIN-A4 sheets (20 pages) in Arial 10 single-spaced. This page limit does not count the index, covers, separators, or appendices. The report can be written in English, Spanish, or Catalan.

The maximum page length does not include index, covers, separators, and appendices.

Important: Exceeding the page limit mentioned will not result in the disqualification of the proposal; however, only the content within those pages will be considered for evaluation and scoring. Any additional pages will not be assessed.

Castelldefels, November 2025.

Josep Colomé Ferrer
Director of the IEEC Department for Promoting the Space Sector in Catalonia

APPENDIX NO. 1 – ESA Phi-Lab NET Spain

What is it?

In response to the ESA tender AO/1-12128/24/UK/AL/ra for the ESA Phi-Lab in Spain, the Institute of Space Studies of Catalonia (IEEC) submitted a proposal to host an ESA Phi-Lab NET Spain in Barcelona focused on climate resilience with the following main objectives:

- Improve the understanding of climate change and strengthen climate resilience in Spain through space technology-based solutions, with the goal of exporting the results to other European and Mediterranean regions that can also benefit.
- To lead in the development of sustainable and resilient technologies aimed at predicting and mitigating climate change effects.
- To serve as a hub for economic growth, providing opportunities for businesses to innovate and commercialize new technologies.

The ESA Phi-Labs belong to the ScaleUp commercialisation program to provide funding, research support, and access to laboratories and infrastructures to economic operators with the aim of carrying out research activities with commercial potential under the same roof.

ESA Phi-Lab NET Spain will provide support to presenting businesses in three critical areas through various calls: knowledge, infrastructure, and financing. This presents a unique opportunity for both companies and the Phi-Lab consortium to foster innovation.

This platform facilitates businesses in developing new solutions for potential commercial uses, leveraging the expertise of researchers and accessing available facilities. Simultaneously, it assists researchers in converting their research into commercial opportunities.

The IEEC, as project coordinator, participates in the financing of Phi-Lab NET Spain by managing the funds provided by the Generalitat of Catalonia within the framework of the space strategy, intended to develop research and investment activities that are currently in force and that will be linked to ESA Phi-Lab NET Spain, such as the present competition. Thus, this ideas competition is integrated into the ESA Phi-Lab NET in Spain.
The space strategy of the Generalitat of Catalonia aims to promote the space industry in the region.

Consortium and roles

ESA PhiLabNET Spain comprises 12 entities: IEEC (coordinator), i2CAT, ICGC, FG CSIC, KIM, Arribes, UPC, Innova IRV, UV, BSC, ICFO, UAB (Melissa pilot plant)

APPENDIX NO. 2 – Reference Documents

The following table contains the list of reference documents alluded to throughout the document.

Reference	Title	Version	Link
ECSS-S-ST-00-01C	Glossary of terms	Issue 3, Revision 1	https://ecss.nl/wp-content/uploads/2023/10/ECSS-S-ST-00-01C_Rev.1(11October2023).pdf
ECSS-E-HB-11A	Technology Readiness Level (TRL) guidelines	Issue 1	https://ecss.nl/wp-content/uploads/2017/03/ECSS-E-HB-11A(1March2017).pdf
ECSS-Q-ST-60C	Electrical, Electronic and Electromechanical (EEE) components	Issue 3, Revision 4	https://ecss.nl/wp-content/uploads/2025/05/ECSS-Q-ST-60C-Rev.4(30April2025).pdf
ESSB-ST-U-007	ESA Space Debris Mitigation Requirements	Issue 1, Revision 0	https://technology.esa.int/upload/media/ESA-Space-Debris-Mitigation-Requirements-ESSB-ST-U-007-Issue1.pdf