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ATTACHMENTS:

Annex A: "Deliverables"

DOCUMENT DISTRIBUTION:

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1. SCOPE

This document establishes the Product Assurance requirements applicable to **"Qualifica processo GaAs"** project.

The PA program shall ensure that for **"Qualifica processo GaAs"** project the required objectives will be successfully achieved in a cost-effective way and assuring the required quality level by managing the available resources and personnel within the allocated budget and by co-ordinating, in an integrated effort, the PA and QA activities with Program Management and Engineering.

This document takes into account all the policy and principles of **ECSS-S-ST-00C**.

The Product Assurance requirements specified by this document are applicable to the Prime Contractor during the whole life cycle of the project. The latter shall be responsible to tailor the requirements to his sub-Contractors and Suppliers, according to their contribution, through the process explained in **ECSS** and ASI document [AD 3]. It is under the responsibility of the Prime Contractor to ensure the PA requirements implementation throughout the whole contractual supply chain.
The Product Assurance requirements set forth by this document are applicable to the phases of the Program as specified in **[AD2].**

2. DEFINITIONS

All the definitions of the contractual documents will be applicable; in addition the definitions from the applicable ECSS standards shall be taken in charge.

3. DOCUMENTS

The PA requirements are based on **ECSS** series "Q" documents after that the required tailoring process, that takes into account the specific objectives, needs and constraints for **"Qualifica processo GaAs"** project, has taken place and document **[RD01]** has been issued by the Contractor and agreed with ASI.
The ECSS documents shall be applicable documents to the extent they have been made applicable to **"Qualifica processo GaAs"** by the process of tailoring of first level performed by ASI (this tailoring is defined in **[AD3]** and **[AD5]**) and to the extent that their applicability has been negotiated, through the process of tailoring of second level performed by the Prime Contractor with ASI agreement (therefore when **[RD01]** is issued).

3.1 Applicable Documents

The following documents are applicable to the Product Assurance requirements document (this document) and are hierarchically above :

[AD1] The Contract (or the ASI letter "Request for Proposal")

[AD2] "Capitolato Tecnico" - Progetto: Qualifica processo GaAs PHEMT 0.25 µm, ASI document n° DC-STE-2011-028

[AD3] Istruzione Operativa "Linee guida per il Tailoring delle norme ECSS" ASI document n° OP-IPC-2005-007

[AD4] Norma per la redazione del Piano Assicurazione del Prodotto ASI document n° OP-IPC-2005-008

[AD5] Progetto **"Qualifica processo GaAs"** - "Tailoring of ECSS Standards" ASI Document n° DC-QTA-2011-010

[AD6] "Sistemi di Gestione per la Qualità" Document UNI EN ISO 9001:2008

[AD7] Istruzione Operativa "ECSS Applicability Guidelines for ASI Programmes" ASI document n° OP-IPC-2006-002

3.2 Reference Documents

Reference documents are those documents used to provide clarification and integration in support of the applicable documents. Although the following reference documents do not form part of the Contract and are not identified in the Contract they do integrate Product Assurance requirements for **"Qualifica processo GaAs"**.

[RD01] ECSS tailoring document – second level. Document shall be produced and delivered by the Contractor, according to **[AD3]** and **[AD5]**.

4. PA REQUIREMENTS

To fulfil the **"Qualifica processo GaAs"** PA requirements the Contractor shall establish and maintain a PA program in accordance with the requirements specified by the **ECSS** series "Q" standards, as made applicable to the **"Qualifica processo GaAs"** Program by documents **[AD3], [AD5]** and **[AD7]** and tailored, to the specific Program's needs and constraints, by document **[RD01].**

Contractor's PA, responsibilities, tasks and deliverables to ASI are specified in the following sections.

4.1 Product Assurance Plan

The PA program shall be based upon a **"Qualifica processo GaAs"** Program's specific **PA Plan** to be prepared, implemented and maintained by the Contractor throughout the whole Program life cycle and to be submitted to ASI for approval. The Contractor's PA Plan shall describe the resources, tasks, responsibilities, methods and procedures adopted by the Contractor for the implementation of the PA and QA requirements and for the achievement of the PA objectives. Document **[AD4]** describes the objectives and the general required contents for the **PA Plan**.

The **PA Plan** shall be used as a master planning and control document for the Product Assurance program. The **PA Plan** shall include a section addressing the compliance with the requirements of **ECSS** "Q" (as tailored to the Program) identifying any relevant discrepancy.

The **PA Plan** shall describe how the Contractor intends to verify that the PA program for **"Qualifica processo GaAs"** will be accomplished and how the Contractor intends to perform supervisory and monitoring actions on sub-Contractors (suppliers). Contractor's internal Company procedures may be referenced in the PA Plan, in this case they shall be provided to ASI on request.

Contractors should be aware that referencing internal Company's procedures in the PA Plan will limit the Company's ability to unilaterally change those procedures. Any change to those procedures shall be considered as modifications to the PA Plan.

The PA Plan, an integrated document including separate sections corresponding to the various PA activities, shall be prepared according to the instruction provided in the applicable document **[AD4]** and in the applicable ECSS standard defined in **[AD 5]**.

Required output:

Delivery schedule	
First issue at KOM Update as required	**Product Assurance Plan** (PA Plan) prepared according to the required DRD-PA00 and the related applicable documents.

ASI reserves the right to :

a. access all documents and records made for the **"Qualifica processo GaAs"** project, including the physical access to all Contractor's or sub-Contractor (suppliers) facilities where activities are carried-out or documents, equipments, materials are stored;
b. perform or participate in any audit, survey, inspection, review, test, etc. relevant to the **"Qualifica processo GaAs"** project activities at Contractor's premises or one of his sub-Contractors (suppliers). ASI participation in the above activities, or ASI performed audits towards Contractors, shall not replace or relieve the Contractor of his contractual responsibilities.

The **PA Plan** shall specifically mention the above retained rights of ASI, as specified at point 4, Annex "A" of **[AD4].**
Intellectual property issues, associated with documentation and access rights, are managed by the Contract **[AD1]** and the Statement of Work **[AD2].**

4.2 PA Progress reporting

PA Progress reporting shall be part of the overall Program's progress reporting as defined in the Program Management section of **[AD2].** For the PA activities the Contractor shall produce a dedicated and detailed specific PA report/section to ASI.

Required output:

Delivery schedule	
as required by SoW	**PA Progress Report** to be prepared as required by Annex "A" , point 18, of **[AD4]**.

4.3 Quality Assurance

The Contractor shall prepare, implement, maintain and control a Plan for all QA activities. The plan shall be part of the overall PA Plan. QA requirements are made applicable to the **"Qualifica processo GaAs"** Program by documents

[AD3] and **[AD5]** and tailored by document **[RD01]** to the specific Program's needs and constraints.

Required output:

Delivery schedule	
as for PA Plan	**Quality Assurance Plan** (QA Plan), could be part of PA Plan as specified in **[AD4].**

4.4 Audits Plan

The Contractor shall identify the external and internal PA/QA audits planned to:

a. verify the implementation and effectiveness of the PA/QA Program for **"Qualifica processo GaAs"**
b. assess the capability of the Contractor and sub-Contractors (suppliers) to perform the required tasks or the suitability of their internal procedures to the requirements of the **"Qualifica processo GaAs"** project.

The audits shall be planned according to the level of risks of the **"Qualifica processo GaAs"** project therefore higher priority shall be given to new sub-Contractors (suppliers) or when new or not yet qualified technologies are foreseen. Detailed organization and plan for each audit will be prepared and given in advance to all the parties involved in the process.

The Contractor shall prepare dedicated checklist(s) to be used when performing audits. The checklist(s) shall cover all the PA requirements, applicable to the **"Qualifica processo GaAs"** project, that are supposed to be audited. Checklist(s) shall be made available to ASI upon request.

ASI reserves the right to be represented in sub-Contractor (supplier) audits. For this reason a minimum ten working days notice shall be given to ASI.

Required output:

Delivery schedule	
First issue at KOM and update as required	**PA Audit Plan** , prepared according to DRD-PA01
as required/generated	**Audit Report** , prepared according to DRD-PA02

4.5 Non Conformance Control

The Contractor shall define and implement a non-conformance management process and related control system in accordance with the requirements specified

by the **ECSS** series "Q" standards, as made applicable to the **"Qualifica processo GaAs"** project by documents **[AD3]** and **[AD5]** and tailored, to the specific Program's needs and constraints, by document **[RD01].**
To this end the Contractor shall define a procedure covering all the steps, from initial notification until final close-out, for each class of non-conformance.
In particular the procedure shall clearly define the relationship between the Risk Management, the Configuration Management and the PA Management processes when handling non-conformances.

Based on the non-conformance system specific procedures shall also be defined for the processing of Waivers/Deviations (RFW/D) that require ASI approval.

Required output:

Delivery schedule	Required output (no specific DRDs are required)
As PA Plan, updated as necessary	**Non-conformance control procedure (normative reference is ECSS-Q-ST-10-09C)**
As required/generated	**Non-conformance Reports**
As PA Plan, updated as necessary	**Waiver/Deviation requests/ justifications process procedure.**

4.6 Qualification processing and Acceptance

The Contractor shall identify, substantiate and foresee an implementation of an incremental qualification and acceptance philosophy and process for all items that compose the **"Qualifica processo GaAs"** process, in order to fulfil all requirements and constraints (Programmatically and Management, Technical, PA/QA).

The Contractor's PA Organisation shall be responsible for the incremental qualification and acceptance definition process from his sub-Contractors (suppliers). During this process the Contractor shall implement a qualification status reporting system in accordance with **"Qualifica processo GaAs"** project PA requirements. (ECSS-Q-ST-10C Annex B).

Appropriate Qualification and Testing Plan(s) (DRD-PA07) shall be foreseen, developed and agreed with ASI Program Manager, in particular for any modified or not previously qualified/tested item.

Final ASI acceptance or delivery Review(s) shall be pre-planned and prepared by the Contractor, in coordination with ASI, according to a specific procedure to be produced by the Contractor and to be approved by ASI. Foreseen **"Qualifica processo GaAs"** project reviews are specified in **[AD2].**
The delivery should include the **Final Report,** at acceptance events.

Required output:

Delivery schedule	
Could be part of the PA Plan	**Qualification Plan** prepared according to DRD-PA-07
At qualification event First at PRR (as a minimum, at major Design Reviews)	**Qualification status List** prepared according to
At acceptance events Update as required	**Final Report**

4.7 Dependability

The objective of Dependability program (Reliability, Availability and Maintainability - RAM) is to ensure a successful **"Qualifica processo GaAs"** project by using the available technical, managerial and financial resources.

The Contractor shall identify, substantiate, prepare, maintain and implement at various levels an appropriate Dependability program - as integral part of the overall PA tasks - to fulfil Requirements and constraints (Programmatic and Management, Technical, PA). This program shall be based upon a **Dependability Plan** showing how the Contractor plans perform the Dependability tasks in conjunction with other PA and Engineering tasks during all **"Qualifica processo GaAs"** project phases.
Dependability discipline requirements are made applicable to the **"Qualifica processo GaAs"** Project by documents **[AD3]** and **[AD5]** and are tailored, to the specific Program's needs and constraints, by document **[RD01].**

Required output:

Delivery schedule	
as part of the PA plan	**Dependability Plan** prepared according to Annex "A" of **[AD4]**

4.8 Critical Items Control

The Contractor shall establish and maintain a list of **Critical Items,** if any, that provides the rationale for their identified criticality and the specific actions taken to reduce the criticality levels. Periodic Risk analysis and assessment will contribute to the identification of Critical Items.

A close-out reference shall be recorded when the corresponding actions have been implemented.

Required output:

Delivery schedule	
As generated/as required	**Critical Items List** prepared according to DRD-PA06.

4.9 EEE Components Control.

The objectives associated with EEE Components control program is to ensure that the Equipments (S/s, units, components) to be developed will satisfy the performance/reliability requirements during the intended life-time of the **"Qualifica processo GaAs"** Project, by an appropriate evaluation, selection, procurement and control process.

The Contractor shall prepare an **EEE Components Control Plan** to ensure that the selection, approval, procurement, and use of EEE components in all flight hardware meet the **"Qualifica processo GaAs"** Program Dependability requirements. The corresponding required activities are defined by documents **[AD3]** and **[AD5]** and are tailored, to the specific Program's needs and constraints, by doc **[RD01]** limited to the section dealing with **ECSS-Q-ST-60C**.

Required output:

Delivery schedule	(no specific DRDs are required)
As required by the contract	**Component Control Plan (CCP)**
As required by the contract	**Declared Component List (DCL)**

4.10 Materials , Parts & Processes

The objectives associated to Materials, Mechanical Parts and Processes (MMPP) selection is to ensure that they will satisfy the performance requirements during the intended life-time of the **"Qualifica processo GaAs"** Program, by an appropriate approach for evaluation, selection, procurement and control process of MMPPs .

The Contractor shall define in the PA Plan the Materials, Parts and Processes Assurance organisation and associated tasks. With this plan it shall be ensured

that the selection, approval, procurement, and usage of Materials, Mechanical parts and Processes for all flight hardware meet the **"Qualifica processo GaAs"** System Dependability requirements. The corresponding required activities are defined by documents **[AD4]** and **[AD6]** and are tailored, to the specific Program's needs and constraints, by document **[RD01]** limited to the section dealing with **ECSS-Q-ST-70 C**.

The Contractor shall identify any specification to be used to ensure the Dependability requirements of the **"Qualifica processo GaAs"** Program are met.

Any process that involves hazards above "marginal" shall be identified as "Critical Item".
Critical processes shall be identified by the Contractor and reported to ASI through the **Critical Items List**.

A breakdown of MMPP lists and suitable examples are given in **ECSS-Q-ST-70C**, DRD in Annex "A", "B", "C". These lists shall be consolidated up to subsystem level (as a minimum).

Annex "A"- Deliverables.

For those deliverables where no specific DRD has been required (*) the Contractor shall propose one for ASI approval, according to ECSS applicability, at offer evaluation time. The "first issue" of a document shall be a document that has obtained internal Contractor's approval as its contents is suitable for the intended use.

DRD no.	Deliverable title	ASI action	First issue required by (event or milestone)
PA DOCUMENTATION			
DRD-PA-00	**Product Assurance Plan**	A	KOM
DRD-PA-xx	**PA Progress Report**	R	as required
DRD-PA-00	**Quality Assurance Plan - could be part of PA Plan**	A	as PA Plan
DRD-PA-01	**PA Audit Plan**	R	KOM
DRD-PA-02	**Audits Report**	I	As generated/as required
DRD-PA-xx	**Non-conformance control procedure (*)**	I	as PA Plan
DRD-PA-xx	**Non-conformance reports (*)**	I	as required/generated
DRD-PA-xx	**Waiver/Deviation requests/ justifications process procedure (*).**	I	As PA Plan
DRD-PA-xx	**Qualification Status List**	R	As generated /required
DRD-PA-xx	**Final Report**	R/A	at final event
DRD-PA-06	**Critical Items List**	R	As generated
DRD-PA-00	**Dependability Plan - could be part of PA Plan**	A	as PA Plan
DRD-PA-xx	**Component Control Plan (*)**	R	as PA Plan

DRD no.	Deliverable title	ASI action	First issue required by (event or milestone)
DRD-PA-xx	**Declared Component List**	R	As generated /required
DRD-PA-07	**Qualification Plan**	R/A	as PA Plan

A = approval ; I = information ; R = review

TITLE: **PRODUCT ASSURANCE PLAN**

DRD NO.: **PA00**

REMARKS: this plan shall be approved by ASI

INTENDED USE OR APPLICATION: .

The PA Plan of the Prime Contractor shall describe how the Contractor intends to implement and verify that the PA program will be accomplished and how the Contractor intends to perform supervisory and monitoring actions on sub-Contractors and suppliers. Contractor's internal company procedures may be referenced in the PA Plan, in this case they shall be provided to ASI on request.

REFERENCES, INPUTS AND RELATED DOCUMENTS:

Program Management Plan , Program Development Plan, Program Verification Plan.

The PA Plan, including separate sections corresponding to the various PA activities, shall be prepared according to the instruction provided in the applicable document **[AD4].**

Note.

Contractors should be aware that referencing internal Company's procedures in the PA Plan will limit the Company's ability to unilaterally change these Company's procedures. Any change to procedures shall be considered as modifications to the PA Plan (requiring ASI's approval).

TITLE: **AUDIT PLAN**

DRD NO.: **PA01**

REMARKS: For ASI information

INTENDED USE OR APPLICATION:

To identify the external and internal PA audits planned to verify the implementation and effectiveness of the PA Program and to assess the capability of the Contractor and sub-Contractors / suppliers to perform the required tasks or the suitability of their internal Procedures to the requirements of the Program.

REFERENCES, INPUTS AND RELATED DOCUMENTS:

Program Risk assessment. Audit procedures and check-lists

DOCUMENT DESCRIPTION:

The Audit Plan shall contain at least the following basic elements :

- Identification of Company (department) / sub-Contractor / supplier to be audited
- Date (or reference to a program milestone) of audit(s)
- Description of audit objectives and field
- Audit baseline identification
- Audit check-list identification
- Audit team composition
- Audit schedule and agenda
- Audit report format and distribution
- Audit actions control

TITLE: **AUDIT REPORT**

DRD NO.: **PA02**

REMARKS: For ASI information

INTENDED USE OR APPLICATION: .

To report status on performed audits

REFERENCES, INPUTS AND RELATED DOCUMENTS:

Audit Plan

DOCUMENT DESCRIPTION:

The Audit Report shall contain at least the following basic elements :

- Audit reference
- Place / Company (unit) audited
- Area being audited
- Audit baseline (used documentation)
- Audit checklist (reference)
- Audit team and observers (names, functions)
- Recall of audit objectives
- Audit results, actions plan and observations
- Conclusions and recommendations of the audit team
- Closure visit(s) reference

TITLE: **CRITICAL ITEMS LIST**

DRD NO.: **PA06**

REMARKS: For ASI review

INTENDED USE OR APPLICATION: The Dependability and Safety technical risk identification , reduction and control as part of the Program Risk Management Process.

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REFERENCES, INPUTS AND RELATED DOCUMENTS:

ECSS-Q- series , Program Risk assessment

DOCUMENT DESCRIPTION:

To identify and track the critical items as a result from risk assessment. The dependability critical items list shall contain the list of all items identified by dependability analyses performed to support the risk reduction and control process.

- classification of functions and items
- identified risk
- actions and recommendations for risk reduction
- risk decisions
- verification of risk reductions

The safety critical items list shall list all safety-related items.

TITLE: **QUALIFICATION PLAN**

DRD NO.: **PA07**

REMARKS: For ASI Review

INTENDED USE OR APPLICATION: The Qualification Plan identifies methods and parameters that will be used for the Item qualification.
Qualification results will confirm that the specified design qualification has been met.
Qualification reports summarize the results of the qualification and are used to justify the use of the Items that are built to the same configuration baseline.

REFERENCES, INPUTS AND RELATED DOCUMENTS: Statement of Work.

Process Design, Development Plan. PA Plan and Requirements

DOCUMENT DESCRIPTION:

- The Qualification Plan format shall be proposed by Contractor and may be combined with the Design & Development Plan.
- The content of the Qualification Plan shall follow the items identified in the table of contents of the contractual document.

Qualification results shall be discussed, summarized and appropriate conclusions stated in a Qualification Report.