ESA PSS-01-10 Issue 1

Agence Spatiale Européenne

DIVISION ASSURANCE PRODUIT DE L'ESTEC

Systèmes de gestion assurance produit et de vérification pour les véhicules spatiaux de l'ASE et équipements associés.

Mai 1981
vi + 28 pages. En anglais.

Cette spécification comporte les exigences associées ou complémentaires à toute autre discipline assurance produit. Ces exigences s'appliquent à la gestion de programmes, à la planification et vérification, à l'utilisation de pratiques standard et à la gestion de configuration.

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Product assurance management and audit systems for ESA spacecraft and associated equipment

Prepared by:
Product Assurance Division
European Space Research and Technology Centre
Noordwijk, The Netherlands

european space agency / agence spatiale européenne
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ABSTRACT

This specification contains those product assurance requirements that are associated with, and complementary to, every other PA discipline. They cover programme management, planning and auditing, the use of standard practices and configuration management.

PRODUCT ASSURANCE MANAGEMENT AND AUDIT SYSTEMS FOR ESA SPACECRAFT AND ASSOCIATED EQUIPMENT

1. SCOPE

This specification establishes the requirements for product assurance plans, organisation, planning, audits, reporting, standardisation and configuration management and control for ESA spacecraft and associated equipment.

2. GENERAL

2.1 RELATED DOCUMENTS

The system of ESA Product assurance specifications is shown in Annex A. Some or all of the content of the documents listed below is directly related to this specification. The applicability of these specifications and any of the specifications shown in Annex A is defined in the contract.

ESA PSS-01-20	Quality Assurance of ESA Spacecraft and Associated Equipment.
ESA PSS-01-30	Reliability Assurance of ESA Spacecraft and Associated Equipment.
ESA PSS-01-40	Safety Assurance of ESA Spacecraft and Associated Equipment.
ESA PSS-01-50	Maintainability and Availability Assurance of ESA Spacecraft and Associated Equipment.
ESA PSS-01-60	Component Selection, Procurement and Control for ESA Spacecraft and Associated Equipment.
ESA PSS-01-70	Material and Process Control and Procurement for ESA Spacecraft and Associated Equipment.
ESA PSS-01-80	Software Quality Assurance of ESA Spacecraft and Associated Equipment.

At the date of issue of this specification some of the related documents are only available under other numbers/series but with similar titles. They will ultimately be revised and issued in the ESA PSS-01 series.

2.2 DEFINITIONS

The definitions listed in Annex B shall apply.

3. PRODUCT ASSURANCE MANAGEMENT

3.1 GENERAL

The contractor shall organise and plan the product assurance programme to ensure sufficient implementation of all product assurance requirements throughout all phases of the contract.

3.2 PRODUCT ASSURANCE ORGANISATION

Personnel with suitable qualifications and experience in the various disciplines shall be allocated to the project in sufficient number to permit the satisfactory and timely completion of all product assurance tasks. One member of this group shall be appointed product assurance manager. He shall report directly to the project manager and be responsible for the proper conduct and conclusion of the overall product assurance programme as agreed with ESA.

The contractor shall ensure that the appointed product assurance manager has the requisite seniority and authority and that the organisational links and resources exist to permit his:

- unimpeded access to higher management through the company product assurance (or equivalent) executive as necessary to fulfil his duties;
- access to the support of other contractor organisational groups or resources either planned or required for emergency investigations;
- direct access to his counterparts at ESA and subcontractors.

3.3 PLANNING AND DOCUMENTATION

All the events, actions and tasks relating to the product assurance programme shall be fully planned and documented. Particular attention shall be paid to the planning with respect to the tasks related to each of the product assurance disciplines and the interfaces between the tasks of each discipline.

3.4 MANAGEMENT OF SUBCONTRACTORS AND SUPPLIERS

A system of product assurance management surveillance shall be established and implemented to enable the contractor to control his subcontractors and suppliers and thus ensure that contract requirements are met. The system shall ensure that the contractor has complete and continual visibility of all actions and tasks performed by the subcontractor and supplier through periodic and random visits for the purpose of the surveillance, auditing and making mandatory inspections. Supervision by resident product assurance personnel at a subcontractor's or supplier's facility shall also be considered. Interface links shall be established between the contractor and his subcontractors and suppliers to provide a communication system for the rapid and comprehensible exchange of progress data, reports, notifications, decisions, etc.

3.5 PROJECT REVIEWS

3.5.1 General

As part of his technical monitoring process, the contractor shall plan and conduct a formal programme of reviews at different stages of the work. Each review shall examine and record the compatibility of the existing hardware or software status with specified requirements.

3.5.2 Design reviews

The contractor shall establish and perform a formal programme of planned, scheduled and documented design reviews tailored to the programme of work. The reviews shall be conducted at major milestones and decision points in the programme. They shall be comprehensive objective examinations of the design, performed by qualified personnel other than the designers. The contractor shall provide a design review data package to be reviewed and give a technical presentation of the status. It shall be the product assurance manager's responsibility to certify that all the PA related information presented for review is current and valid and that it conforms to all PA requirements. The review shall include examination of the PA functions as defined in this document and in the contractor's product assurance plan.

3.5.3 Other reviews

As a minimum, the contractor shall also include in his programme, periodic reviews of the status of:

- the product assurance programme;
- all nonconformances/MRB's;

and, at the appropriate milestones, special reviews of

- reliability and safety assessments;
- test readiness and performance.

Additional requirements pertaining to such reviews will be found in the ESA reliability, safety and quality specifications.

3.6 REPORTING

3.6.1 Programme Status Reporting

The contractor shall periodically prepare and submit reports on the status of the product assurance programme to ESA. Besides describing the technical and management situation at a particular time, the report shall also identify problems that have occurred during the period and summarise intended action in the next period.

The information so provided shall cover the following:

General status

- technical progress of each major product assurance task, highlighting any significant accomplishments;
- progress of components and material procurement programmes;
- a summary of inspections, audits and visits undertaken during the period and their results;
- a summary of significant decisions or actions affecting the product assurance programme.

Problem reporting

- a list of all problems concerning hardware and/or software, whether technical or of a management character, and associated actions taken or their resolution;
- a summary of nonconformances and progress in their disposition and correction;
- a list of problems previously identified but remaining unresolved and the reasons for the lack of a solution.

Future actions

- a list of planned actions for the forthcoming period;
- a schedule of forthcoming product assurance meetings and events.

3.6.2 Qualification status list

The contractor shall establish and maintain a qualification status list showing the planned and actual qualification status of each component, material, item, equipment and satellite system. The list shall include references to the qualification data, authority and its applicability. Justification for the omission of qualification tests shall be included where applicable. The list shall show any items which have previously been identified as critical items.

This list shall be submitted to ESA in updated form with each status report.

3.6.3 Organisation

The contractor shall notify ESA prior to implementing any changes to his product assurance organisation or key personnel.

3.6.4 Nonconformance

The contractor shall notify ESA immediately when nonconformances are discovered during system, subsystem or critical equipment tests.

3.6.5 Summary report of contractor's component procurement experience

At the completion of the component procurement programme, the contractor shall prepare and submit to ESA a final report documenting the results of, and the experience gained in, the procurement of the components that are subject to the contract. The report shall be based on the following data recorded during procurement:

- information on quantities, component types, lot failures, qualification and lot acceptances;
- summaries of nonconformances and problems;
- component testing;
- adherence to time schedules (envisaged and actual dates);
- recommendations.

3.7 TRAINING

3.7.1 General

The contractor shall establish and implement training procedures necessary to ensure an effective product assurance programme. Training procedures shall be documented and shall provide for:

- proficiency in workmanship and skills;
- awareness of safety during operations;
- awareness of the need for care during operations;
- awareness of the special requirements related to operations dealing with spacecraft hardware;
- maintenance and improvement of quality and reliability.

A list shall be maintained by the contractor of all critical processes, operations and inspections for which product assurance requirements will necessitate training and certification/ recertification of personnel.

3.7.2 Certification of personnel

The demonstrated capability of personnel controlling critical processes and operations shall be certified. Certifications shall be achieved by satisfactory completion of a written examination and/or a performance demonstration. Personnel so certified by the contractor shall be given a card, badge or similar evidence of certification.

3.7.3 Recertification of personnel

Personnel shall be recertified periodically and according to a defined schedule. Additional recertification shall be implemented in the event of:

- unsatisfactory performance of a critical process;
- changes in techniques, parameters or required skills;
- interruption of work period as established for the process or operation involved.

Recertifications shall require retesting of the individual under the certification procedure to demonstrate continuing proficiency. Persons failing the retest shall not be permitted to perform those processes or operations until they have been provided with additional training and the required proficiency has been demonstrated.

3.7.4 Records

Records shall be maintained of the training, examination and certification status of personnel so that they may be recertified on a regular basis.

3.8 PROGRAMME AUDITS

3.8.1 General

The contractor shall conduct audits of his own and of his subcontractors' and suppliers' facilities, equipment, personnel, procedures, services and operations employed in the product assurance programme. Each audit shall be performed by a team of contractor personnel familiar with all written documentation applicable to the operation of the work areas being audited. It shall include examination of all operations and documentation, evaluation of actual operations as compared with established requirements, and terminate with recommendations for corrective and preventive actions and follow-up to assess results of recommendations. Audits shall also include examination of physical items to verify the effectiveness of the efforts. A product assurance audit plan shall be prepared.

3.8.2 Audit checklists and procedures.

Audit checklists and procedures for use by personnel conducting audits shall be prepared. A clear distinction shall be made between different checklists and procedures which are prepared for each of the PA disciplines.

3.8.3 Audit schedule

The contractor shall perform audits of his own resources and those of his subcontractors and suppliers when a contract is awarded and subsequently periodically on a random unscheduled basis. Provisions shall exist, however, to ensure that each product assurance area is audited at least annually.

3.8.4 Audit Reports

The results of the audits performed in each area shall be documented in reports with appropriate recommendation for corrective actions. Action shall be taken to ensure effective correction of reported deficiencies. Follow-up reviews shall be made to ensure that the required corrections have been implemented.

4. PRODUCT ASSURANCE PLANS

4.1. CONTRACTOR'S PRODUCT ASSURANCE PLAN

4.1.1 General

The product assurance plan shall provide details as to how the contractor intends to verify that the programme has been accomplished and how he intends to perform supervisory actions on subcontractors and suppliers. The contractor shall make use of his existing documentation insofar as practicable, modifying it as necessary to meet the product assurance and other requirements of the contract. The plan shall be prepared as one overall plan or as separate subplans devoted to each of the following:

- configuration management and control;
- components, quality control and procurement;
- reliability assurance;
- safety assurance;
- maintainability assurance;
- quality assurance (including cleanliness and contamination control);
- software quality assurance;
- materials and process selection and control.

The individual sections or subplans of the overall product assurance plan must be clearly segregated and compatible with each other and the overall plan. The signature of the contractor's approving authority together with the status and date of issue shall be shown on the overall plan and each subplan. The plan shall be annotated with references to the corresponding requirements of the product assurance specifications referenced in the contract. Annexed to the plan shall be a matrix delineating all the documents related to each of the tasks described correlated to the various programme phases.

4.1.2 Overall plan content

The plan shall be so prepared and dispositioned that it gives a clear description of the programme policy and method of implementation and how the contractor will ensure compliance with the product assurance requirements of the contract for each PA discipline. This shall cover all product assurance activities for the time period or phase authorised and define the management of the controls and procedures necessary for the performance of the product assurance programme.

Any intended departures from ESA requirements shall be specifically referenced in the text and separately listed with full justification in an appendix to the overall plan.

a. Organisation. The overall plan shall contain a description of the organisational structure established for the project's product assurance programme, including the interfaces with supporting groups, services and facilities. The product assurance manager and senior personnel of the product assurance group shall be named and their authority, responsibilities and position within the technical management structure established for the project clearly stated. A statement of the manpower complement needed for the performance of the product assurance programme shall be included, showing the manpower required per time period/project phase.

b. Tasks and responsibilities. The contractor shall identify the tasks he will perform to meet the requirements of the product assurance programme. The organisational group of the contractor that is responsible for performing the task shall also be identified.

c. Narrative descriptions. The overall plan and sections or subplans shall contain narrative statements which clearly describe policies, control, system flow and modifications to existing control systems to meet the contract requirements. Organigrams, charts and exhibits describing organisation elements and system flow shall be included where appropriate. Directives, methods and procedures shall be referenced for each subject or discipline and provided as an addendum to the plan when requested by ESA.

d. Milestone charts. The contractor shall identify in a chart-type format any significant product assurance events in the project life cycle which are to be used as control points for the measurement of progress and effectiveness or for planning or redirecting future effort. There may be separate milestone charts for each product assurance discipline.

e. Audit schedule. The product assurance audit planning to be used by the contractor to audit his own facilities, personnel, procedures and operations and those of his subcontractors and suppliers shall include details of the type and frequency of audits linked to programme events to be performed together with references to the appropriate checklists and procedures.

f. Planning and programme schedule. The plan shall describe the planning and time schedule for the performance of all major tasks of the overall programme. This shall include the procurement of long lead items and where necessary the design and development of any special handling and/or test equipment.

g. Documentation. Reference shall be made to procedures, instructions, practices and standards which the contractor intends to use in the implementation and execution of each PA discipline.

Details shall be provided of any lists, specifications, reports and records which are to be prepared and maintained.

h. Reporting. The contractor shall define the system he intends to implement for reporting to ESA on status, programme progress and problem areas.

4.1.3 Subplan contents

The sections or subplans of the overall PA plan prepared for each particular product assurance discipline shall conform to the requirements of Paragraph 4.1.2 herein as well as to those of the relevant paragraph(s) below.

a. Configuration management and control. The configuration management and control plan shall be arranged in such a way that a clear visibility of the configuration management and control system is given. It shall be supported by graphs and flow diagrams to demonstrate the flow of documentation and its changes through the preparation/review/approval/release cycle. Responsibilities and decision points shall be shown, and interfaces with other systems affecting configuration management and control activities shall be referenced and described.

b. Component quality control and procurement. The component quality control and procurement plan shall provide details of the approach to be adopted for the programme. Clear definition of interface links to any subcontractor or procurement agency to be used shall be given. Back-up arrangements for implementation where failures and schedule delays occur shall be stated. The plan shall take into account any established policies, standards and procedures and method of implementation and shall make reference to these insofar as they are applicable.

The contractor's plan shall include, but not be limited to, the following specific items:

- descriptions of management approach and major work packages envisaged;
- requirements on and systems for control of subcontractors, and any agency if applicable;
- description of requirements for component engineering, standardisation and procurement quality assurance together with the tasks involved.

c. Reliability programme. The reliability programme plan shall show the approach planned to achieve both the mission requirements and reliability goal. It shall include a description of the methods used to ensure that designers and associated personnel are familiar with reliability requirements and criteria. Any research and/or reliability studies shall be identified, together with any critical production techniques, assembly procedures, facilities, testing, inspection, maintenance or transport requirements which affect reliability.

d. Safety programme. The safety programme plan shall show how it is intended to ensure that the safety requirements and regulations are thoroughly understood and correctly implemented, that the technical safety requirements are known by all designers and that the applicable policy is applied through all project phases. Any safety studies or operation shall be identified, together with any critical production techniques, assembly procedures, facilities, testing, inspection, maintenance or transport requirements which affect safety.

e. Maintainability programme. The maintainability programme plan shall describe the approach which will be employed to meet the maintainability requirements. Details shall be given of any studies to be performed and the assessment criteria to be employed. Controls to be implemented to achieve the maintainability requirements shall be described.

f. Quality assurance programme (hardware). The quality assurance programme plan shall describe all the activities associated with the application of the quality assurance requirements. Particular attention shall be given to the interface and interrelation of one activity to another to ensure that each activity supports related activities to provide adequate and effective quality assurance functions.

g. Materials and Process Selection and Control. The plan for materials and process selection and control plan shall describe all the activities associated with the selection, testing, inspection, procurement and control of materials and processes. Particular attention shall be given to specific project requirements for materials and processes, their control and interfaces with subcontractor activities.

h. Quality assurance programme (software). The software quality assurance plan shall describe the management methods and software engineering practices which will be employed during the software life cycle. Particular attention shall be paid to the breakdown of the life cycle into well-identified sequential phases; to software configuration control; and to the selection of proven standards, practices and conventions in agreement with the applicable ESA software standards.

4.2 SUBCONTRACTORS' PRODUCT ASSURANCE PLANS

The contractor shall ensure that his subcontractors establish and implement product assurance plans meeting the requirements of this specification, the other ESA product assurance specifications referenced in the contract and the contractor's product assurance plan. Subcontractors' plans shall be submitted to the contractor for approval.

5. STANDARDS, SPECIFICATIONS, DRAWINGS AND DESIGN PRACTICES

5.1 GENERAL

The contractor shall use standards, specifications and drawings which meet the best practices used in spacecraft and related technologies. A standardised format shall be established for components, materials, and process specifications, project specifications, engineering drawings and related data.

When a subcontractor's facility is in another country, the contractor shall agree with him on the language of the authentic version of specifications and other documents. The language of the authentic version shall be suitably identified on any translations and in case of dispute the authentic version shall prevail.

5.2 STANDARDISATION OF DESIGN PRACTICES

The contractor shall maintain a continuous effort to standardise design practices and fabrication processes. He shall formalise the results of his efforts in manuals for use by his personnel working on design, draughting, fabrication, processing and inspection. The contractor shall use his existing standards and specifications insofar as practicable, modifying them as necessary to meet the product assurance and other requirements of the contract. Contractor's design and processing standards shall be incorporated in the subcontractors' design standards system whenever possible, to standardise the design and process approach. The contractor shall establish a reviewing group responsible for reviewing design and process standards to be used for the contract effort to ascertain their adequacy in meeting the requirements of the contract. The standardisation system shall cover as a minimum the following:

- system specifications;
- design specifications for electronic, mechanical, hydraulic and pneumatic assemblies;
- test specifications and test procedures;
- process specifications and controls;
- fabrication and assembly standards (e.g. structural, piping, electrical and electronic);
- engineering drawing practices.

The contractor shall review for adequacy and compatibility the standards and design practices of all subcontractors and suppliers.

6. CONFIGURATION MANAGEMENT AND CONTROL

6.1 GENERAL

The contractor shall establish and implement a system for configuration management and control which includes documented policies and procedures for the initiation, identification, preparation, review, approval, release, control and accounting of all documentation. The system shall also ensure that all affected organisations and parties will be cognizant of the impact of changes and will participate in the change decision-making process. The requirements established herein apply to all changes, whether directed by ESA or proposed by the contractor.

6.2 CONFIGURATION MANAGEMENT AND CONTROL PROGRAMME

6.2.1 General

A configuration management and control programme shall be planned, integrated and implemented that has clear interfaces with project control, product assurance, design-development and production functions. The programme shall include requirements and procedures relative to configuration, documentation, data and change control, drawings and specifications.

6.2.2. Organisation

A person shall be appointed as responsible for the contractor's configuration management and control programme for the project. In this function he shall act as head of the configuration management office (CMO) and provide a single point contact for all matters pertaining to configuration management and control.

6.2.3 Programme plan

The contractor's configuration management and control programme shall be described in the configuration management and control plan.

6.3 CONFIGURATION MANAGEMENT

6.3.1 Function of the Configuration Management Office (CMO)

A Configuration Management Office shall be established within the project for the purposes of:

- preparation, implementation and maintenance of the project configuration management plan;
- establishment and assignment of configuration identification numbers;
- establishment of requirements (by reference to existing policies and procedures as applicable) for the preparation and maintenance of drawings, specifications and supporting documentation and data lists for each configuration item;
- establishment and operation of the approval and release authority for engineering documents;
- establishment and operation of the configuration control board;
- establishment of subcontractor and supplier configuration management requirements;
- establishment and distribution of configuration identification and status accounting reports in conformance with configuration management and interface control requirements;
- providing documentation support for design reviews and configuration inspections and audits;
- assuring effective processing of engineering changes through the approval/disapproval cycle and the release of documents to be implemented;

- directing the preparation of engineering change proposals and establishing and maintaining files of contractual change authorisation.

6.3.2 Configuration identification

A system of configuration identification shall be established and implemented. Methods shall be established for the selection of configuration items and shall include, as a minimum, all systems, subsystems and equipment. The selection shall also include other items where they present potential control problems. A system for the identification numbering of all specifications, drawings, standards and procedures shall be established which is capable of uniquely identifying all items of hardware, software and documentation. Application of the system shall be such that a single item may have no more than one identifier and that no two versions of like items shall have the same identifier.

Hardware shall be permanently identified with the following:

- part number;
- configuration item number;
- serial number (where applicable);
- nomenclature of the item.

6.3.3 Data management.

A data management system shall be established for the management of all released engineering documentation. This shall encompass the issue of identification numbers, recording, maintenance, care, storage, retrieval and distribution of all engineering documentation and changes released for the project.

6.3.4. Interface management

Interface management shall be implemented to identify the contractual role of the contractors involved, the specific requirements for Interface Control Documents (ICD), the establishment of ICD as design constraints, the requirements for reference to ICD in appropriate specifications/drawings and interface change control.

The schedule for the release of ICD shall be compatible with project baseline schedules and design reviews; ICD shall be completed before, and available for, the design reviews.

6.3.5 Subcontractor configuration management

The contractor shall define how the requirements of this specification will be imposed on subcontractors and to what extent applicable configuration management and control requirements are to be imposed on suppliers. The contractor shall be responsible for monitoring his subcontractor configuration management and control system for compliance with these requirements.

6.4 CONFIGURATION CONTROL

6.4.1 General

A system of configuration control shall be established which provides for the control of baseline documentation and the procedures for document change control by which changes and deviation and waiver authorisations are systematically received, identified, evaluated, prepared, classified, approved/disapproved and implemented. The system shall establish the names of those individuals, organisations or suppliers who may originate a request for change which will be acknowledged and acted upon for approval/disapproval by the CMO and the procedures by which the request is submitted for consideration.

6.4.2 Baseline control

The design shall be controlled at several points in its development. At least three design baselines shall be so established, e.g.:

The Conceptual baseline, which is defined by documentation, such as the system specification, the preliminary subsystem specifications and the first definition of the interfaces etc, after their release and control.

The Design and Development baseline, which is defined by documentation, such as system, subsystem specifications, equipment and interface specifications, preliminary drawings and test procedures, after their release and control.

The Production baseline, which is defined by all the released documentation, specifications, drawings and procedures which define or otherwise establish and affect the technical and physical configuration of the complete system.

Nevertheless the contractor shall ensure that the chosen baselines are consistent with the critical milestones and phases of the project.

6.4.3 Configuration Control Board (CCB)

A Configuration Control Board shall be established to review and control the design baseline and changes thereto through waivers, deviations and engineering change notices. Waivers, deviations and engineering change notices shall be submitted to the CCB for review and approval. In addition, the class to which an engineering change notice has been designated shall be the subject of approval/disapproval by the CCB. Each CCB shall consist of members from engineering, manufacturing and/or test and product assurance with sufficient authority to determine the approval/disapproval status of the proposed waivers, deviations or engineering change notices.

The decisions of the CCB shall be documented as a CCB directive to authorise implementation of the change when approval is granted, or to notify the requester when approval is not granted. Class II changes may be implemented immediately after approval by the CCB has been granted, whilst Class I changes may only be implemented after approval by the CCB and ESA has been granted. ESA reserves the right to membership of the CCB.

6.4.4 Change evaluation

The evaluation of each proposed change shall include applicable aspects of physical and functional interfaces, performance, cost, schedule, operation effectiveness, logistics, support equipment, training and multiple use of the affected configuration. The alternative of not making the proposed change shall always be considered.

Changes shall be limited to those necessary to correct design deficiencies or offer significant benefits related to operational support, life cycle and cost savings or to prevent slippage in contractual schedules. Engineering drawings shall not be changed to avoid material review board processing of nonconforming items, except when the change is accepted for all subsequent production of the part concerned.

6.4.5 Classification of changes

All engineering change documents and subsequent documents which implement changes shall be marked with their class (Class I or II) and interchangeability status.

6.4.6 Change implementation

Changes to be implemented during manufacture, integration and test shall be the direct responsibility of the contractor's organisation which has custody of the item at the point when the change is to be implemented. Configuration changes requiring retrofit of delivered items shall be accomplished as directed by the Configuration Management Officer.

6.4.7 Components and materials substitution

A system for the substitution of components and materials that are not available in time to meet schedules shall be established. An acceptable substitute is a component or material with identical form and fit and with required characteristics equal to or better than those of the unavailable item. Substitutes shall be selected, approved and listed by the project.

6.4.8 Waivers and deviations

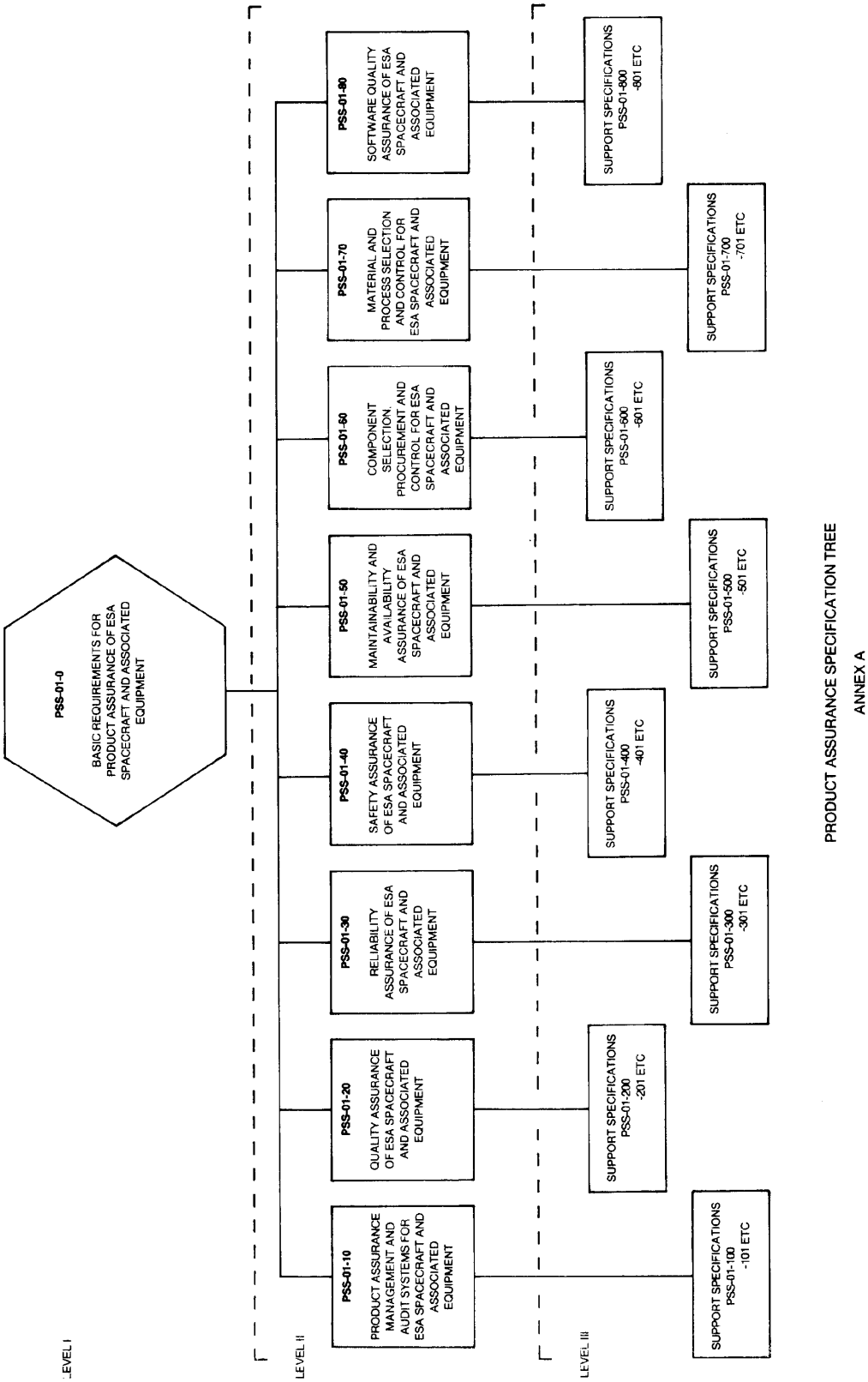
A system for the preparation and presentation of waivers and deviations to ESA shall be established together with procedures for their control and implementation and necessary formats.

6.5 CONFIGURATION STATUS ACCOUNTING

A system of configuration status accounting which encompasses the systematic release, recording, correlation and reporting of information needed to effectively manage configuration identification shall be established. This includes listing of approved configuration identification, status of proposed changes and the implementation record of approved changes.

The Configuration Management Officer shall establish and maintain appropriate reports to satisfy requirements for deliverable configuration management and control data as well as for internal control. The system established shall provide procedures for:

- the input to and maintenance of a data base to enable preparation of reports;
- the submission of configuration status reports to ESA or to a contract-designated integrating agency;
- the collation, preparation and distribution of internal reports for configuration management;
- the acceptance of inputs from associated contractors for collation into prepared reports.



PRODUCT ASSURANCE SPECIFICATION TREE

ANNEX A

ANNEX B

DEFINITIONS

Audit

A planned, purposeful and comprehensive examination and verification of management objectives, assignments of duties, delegations of responsibilities, methods of operation, facilities, hardware and software conducted periodically and systematically on any contractor, subcontractor, supplier or manufacturer.

Change

An alteration in the configuration of an end item or items delivered, to be delivered, or under development after formal establishment of its configuration identification.

Class I Change

A class I change is any change that affects:

- operational or performance factors;
- mission objectives;
- safety;
- reliability;
- cost;
- schedule;
- interfaces.

Class II Change

A class II change is by definition any change other than that which should be classified as a Class I change.

Configuration Control

The systematic evaluation , coordination , approval or disapproval and implementation of all changes in the configuration of an end item and related documentation.

Configuration Management

A discipline applying technical and administrative direction and surveillance to:

- identifying and documenting the functional, physical and environmental characteristics of an end item;
- record and report change processing and implementation status.

Deviation

A written authorisation to accept an item which, during production or after having been submitted for inspection is found to depart from specific requirements, but is nevertheless considered suitable for "use-as-is" or after rework by a approved method.

Interchangeable

An interchangeable item is one which possesses such functional and physical characteristics as to be equivalent in performance, reliability and maintainability to another item of similar or identical purpose and is capable of being exchanged for the other item:

- without selection for fit or performance and
- without alteration of the items themselves or of the adjoining items, except for adjustment.

Status Accounting

The procedures for recording and reporting all changes in items and documentation.

Waiver

A written authorisation granted before fabrication of an item to depart from a particular performance or design requirement for a specific number of units or a specific period of time.

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PRODUCT ASSURANCE DIVISION, ESTEC

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