EEE PARTS PROCUREMENT APPROACH FOR SPACE APPLICATIONS

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High Reliability Electronic Components.

A specialized and tailored service in a very specialized and niche market.

With 25 years of experience, ALTER is the right supply channel for the EEE parts Hirel market
CORE BUSINESS

Electronic Components: Space

Certification & Testing

Electronic Components: Aerospace & Defence & Other markets

Core Business % revenues

85 %

10 %

5 %
• Definition of EEE Parts Procurement as a global strategy focused on the success of the mission.

• Description of activities associated to procurement from a global point of view.

• Strategies oriented to risk reduction and cost effectiveness.

• Different parts procurement approaches.

• Maximization of products availabilities for space applications.
• A proper **product selection** at a project early stage allows **reducing cost and delivery problems** while maintaining reliability and performance.

• EEE parts procurement must include:
  - EEE Parts definition and selection
  - Procurement
  - Quality control of procured parts
  - Non conformance management

• Risk mitigation strategies are needed, including:
  - Radiation performance
  - Reliability analysis
  - Procurement scheme
  - Additional test required for validation
THE PROCUREMENT UNDERSTOOD AS A KEY PRODUCT ASSURANCE ELEMENT

GLOBAL PROCUREMENT APPROACH

EQUIPMENT DESIGN AND MANUFACTURING

Parts Engineering

Procurement

Logistics

Testing
• Analysing the project requirements, we can tailor the product selection:
  - Mission orbit and duration
  - Radiation environment
  - Thermal equipment and satellite requirements
  - Launch requirements
  - Electronic equipment performance requirements
  - Manufacturer availability and qualification status

• These requirements also guide us on the definition of the proper product assurance requirements.

• We define the appropriate product selection and procurement strategies that minimize the risk and optimize the costs.

• The early definition of these requirements allows the product selection optimization.
Once selected the most suitable parts for our application, we must define the additional requirements that allow ensuring the minimum risk for the mission.

Risk mitigation analysis and plans must include actions for:
- Obsolescence
- Alerts monitoring
- Export control needs
- Long lead and critical schedule items
- Manufacturers and products evaluation
- Counterfeit detection

Early detection and solution of these concerns will minimize impacts on the overall project schedule and cost.
PROCUREMENT

• Cannot be considered as exclusively placing purchase orders.

• It is needed to ensure that we are using the right channel, minimizing risks.

• We must implement a plan for a global procurement approach including:
  - Purchase order placement in accordance with project needs
  - Definition of source inspect at the manufacturing site
  - Manufacturing follow-up
  - Milestone analysis
  - Proposal for corrective actions to recover required delivery date
  - Definition of alternatives capable to obtain a secure channel for the product delivery
  - Export controls handling and on time monitoring

SPECIALIZATION ON SPACE LEVEL PRODUCTS AND REQUIREMENTS ALLOWS COMPLETE UNDERSTANDING OF PROGRAMME NEEDS AND SPACE SPECIFICS
• Once parts are received, we must perform the required test and inspections that guarantee that received parts are in accordance with our project requirements.

• The level of inspection is defined during the selection phase.

• Special attention to counterfeit detection, particularly for non space level parts, must be paid.

• Testing must not add any overstress to the parts jeopardising long term performance but must be able to reach conclusive results.

• Must be performed by skilled and experienced personnel and laboratories in order to allow results are validated by the manufacturer.
• It is necessary to determine whether the non conformances are putting in risk the mission, requires some additional validation to ensure its acceptability or parts can be accepted as they are.

• This requires high expertise and solid links with the manufacturers, avoiding them questioning the results and focusing the efforts on the non conformance resolution.

• The non conformance management must be implemented during the overall project life time.

• Traceability and information tracking from the previous procurement phases are important so the overall process must be considered together.
PROVIDES A COMPLETE DATABASE FOR PROPER SELECTION AND MANAGEMENT
COORDINATED PROCUREMENT

• A specialized company like ALTER coordinates with users:
  • Parts selection and engineering support
  • Procurement
  • Quality assurance
  • Inspection and testing
COORDINATED PROCUREMENT

• This approach provides:
  - Enhanced technical support to the project
  - Single interface for management
  - Improved schedule and technical response from parts manufactured
  - Homogenous approach on testing and product evaluation
  - Cost reduction due to non recurrent cost optimization

• Contractual relationship is defined between subcontractors and ALTER.
CENTRALIZED PROCUREMENT

• The project prime contractor centralizes interfacing with the lower tier subcontractors through a specialized company like ALTER.

• Implements most of the advantages of a coordinated procurement.

• Parts selection are oriented to minimize cost by optimization of the additional testing required with prime contractor approval.

• The lessons learnt during specific procurement and testing for use subcontractor can be used throughout the project thus improving reliability, quality and overall cost.

• A contractual relationship exists between the prime contractor and ALTER.
• Sometimes, the use of COTS is required due to the lack of space level parts capable to sustain the intended design.

• COTS must be considered a high risk until proven or shown otherwise.

• A methodology for the selection and procurement of these parts is required, including:
  - Detection, recognition and elimination of potentially critical problems.
  - Performance of risk assessment and risk mitigation.
  - Definition of parts selection criteria.
At least, following steps must be covered:

- Risk assessment (functionality risks, production risks and support risks).
- Parts selection (obsolescence, environmental and design considerations and manufacturer production flow and know-how).
- Component reliability assurance (characterization, screening and validation).

All the activities must be handled by specialized channels capable to advance concerns and provide solutions reducing associated risk.
USE OF COTS AND NON SPACE PARTS

• Most important topics to be taken into account:

- EEE parts manufacturer and component selection
- Parts restriction definition
- Radiation characterization
- Derating rules applicable
- Component evaluation plans
- Specific procurement requirements
- Additional evaluation and screening requirements
- Acceptance inspections
- Complementary tests
- Non conformance management
- Counterfeit detection and recovery plans
- Lead finish and forbidden materials detection
• ALTER has a wide experience in the procurement and testing of COTS.

• This approach has been used on several project either as baseline or whenever no hi-rel product was available.

• ALTER is a recognized testing laboratory by the European Space Agency and customers worldwide.

• All tests are performed in-house, allowing control on every step and minimizing cost and product handling.
We are waiting for you
セビリアへおいでよ
THANK YOU FOR YOUR ATTENTION

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