April 27, 1999

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Presented to the Space Parts Working Group

Space Parts Consortium

JPL Institutional Parts Program

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The Context — Faster–Better–Cheaper

- Past environment characterized by
  - Flagship missions that smaller missions could benefit from
    - Overage of long lead, high reliability parts available
    - Parts procurement contracts available for add-on buys
    - Preferred parts list developed and parts qualified
    - Large equipment items funded by flagship mission
  - Maintenance of core part support capabilities partially subsidized by flagship missions
    - Device evaluations, methodologies, qualifications
    - Part information systems, etc.
  - Substantial support to parts industry infrastructure by DOD and NASA
    - Reliability engineering
    - Radiation hardening and testing

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The Context — Faster–Better–Cheaper

- Need to adapt to new environment
  - No flagship mission
    - Many BFC missions that must work synergistically
    - Short development cycles incompatible with long lead part procurements
  - Many, smaller projects with
    - No investment in parts engineering core capabilities
    - No sustaining parts engineering support
  - Part Delivery Schedules More Constrained
    - Flight parts: 12-24 months (past); > 3-6 months (today)

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The Context — Faster–Better–Cheaper

- **Need to adapt to new environment (Continued)**
  - **Parts industry infrastructure driven by commercial needs**
    - **Decreased radiation hardening and testing**
    - **Cancellation of Mil specs**
    - **Substantial decrease in "Class S" parts**
  - **Part Process Resource Sharply Diminished**
    - **Typical parts program cost (as % of total project cost) reduced**
    - **Less parts engineering, evaluation, qualification, acquisition labor resources**
  - **Industrial partnerships**
    - **less visibility, more trust, less oversight**

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The Context—Faster–Better–Cheaper

- Need to adapt to new environment (Continued)
  - Industry Significantly Changed
    - COTS, diminishing sources (mil-spec parts), improving commercial quality, less knowledge and control of parts suppliers process changes
  - Technology Issues
    - Increased complexity, radiation susceptibility
    - Rapidly accelerating part obsolescence
    - Transition to low voltage and low power technology, and need for low temperature performance
  - Many New Initiatives
    - ISO9000 Certification
    - Single-process initiative, etc.

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The Challenge — Faster–Better–Cheaper

- **Given: Flight mission and instrument development processes are being reengineered**

  Stretch goal — Reduce the start-to-launch cycle time by 1/2 …

Example –
Reduce JPL's Mars Pathfinder cycle time from 36 months to 18 months

… and reduce development costs by 1/3 …

… while not adding risk or reducing quality

- **Challenge: Reduce total parts life cycle cost**

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Solution - Faster, Better, Cheaper Parts Program

- **Faster**
  - **Have parts inventory**
    - **Real (parts in Flight Stores or available from partners)**
    - **Virtual (open orders or other contracts in place)**
- **Better**
  - **Less risk by having many parts on hand**
  - **Use parts with known pedigree, history, characteristics, etc.**
  - **Increased access to newer technology**
- **Cheaper**
  - **Share cost of acquisition, evaluation, parts engineering, and problem resolution**
  - **Have information on problems, application issues, etc. "up front" to avoid problems**

Space Parts Consortium (SPC) Concept

- **Phase I**
  - **Provide venue to increase involvement between aerospace organizations to leverage resources**
    - **Shared Activities**
      - **Share cost of acquisition, evaluation, parts engineering, and problem resolution**
    - **Technical Information Interchange**
      - **Allow limited access to portions of each members parts information data base**
        - **Limited to Components, Quality, and Reliability information not Application information**
      - **Allow for informal communication between consortium members parts specialists or engineers**

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Space Parts Consortium Concept

- **Phase II**
  - **Increase involvement with our suppliers to emphasize inventory and supply chain management to lower costs, speed delivery, and obtain improved quality and reliability through**

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Initial Meeting Objectives

- Introduce the Space Parts Consortium Concept
- Engage participants in the further definition and implementation of the SPC
- Solicit participants EEE parts
  - Interests
  - Current Parts Evaluation Activities
  - Constraints (on SPC participation or information sharing)
- Initial implementation of selected activities
  - Initiate shared evaluation efforts
  - Initiate selected data sharing
- Devise Implementation Action Plan for follow-on activities

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Many Issues / Concerns

- Competitiveness
- Fairness
- Liability
- ITAR
- Is this just another "Initiative"?
- Why not use existing venues?
  - DSCC
  - STACK
  - GIDEP
  - G12

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What Do We Want From You?

- **Be willing to share (within constraints imposed by your organization)**
  - **Parts Information**
  - **Evaluation and Test Activities and the results**

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We Are Seeking Other SPC Opportunities

- We currently are focusing on opportunities regarding EEE parts;
  - Technical information exchange
  - Cooperative Testing
- However, we welcome expansion to any other topics of interest to you such as
  - Residual inventory
  - Supplier Agreements
  - Links to your materiel-availability databases
- We welcome your ideas on other ways to make parts programs Faster, Better, Cheaper

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• Backup Material (SPC)

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The Context — Faster–Better–Cheaper

- **Current Project customers require <u>more</u> support than past**
  - **Need to utilize more new technology to accomplish advanced missions within tight constraints**
  - **Risk management/balancing**
  - **Decrease in reliability, radiation and application margins**
  - **Industrial partners have leaner contracts than past**
  - **Smaller projects can't afford independent parts assurance activities**
  - **Advanced technology brings new issues (e.g., Radiation, failure mechanism identification, new materials reliability issues, testability, complexity, etc.)**
  - **COTS parts bring new issues (e.g., intra-lot variability, decreased traceability, unknowns, not driven by space/DOD requirements)**

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The Context — Faster–Better–Cheaper

- **Current Project customers require <u>more</u> support than past (Continued)**
  - **Unlike the past mil-parts/rad-hard parts are not readily available and need more attention**
  - **Mass constraints lead to decreased use of redundancy**
  - **Smaller, faster, leaner, independent and fragmented Projects**
    - **Increased mission competition and NASA direction drives cost ~1/10x which forces leaner Projects**
    - **Decrease in development time by a factor of 2 drives need for**
      - **pre-project or very early long lead time part procurement initiation**
      - **early and accurate parts information**
      - **getting it right the first time (no time for rework)**