Aerospace Qualified Electronic Components

As part of an Integrated Avionics Strategy

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## JCAA Obsolescence National Strategy

### “Seven Deadly Sins”

<table>
<thead>
<tr>
<th>Obsolescence Issue</th>
<th>Status</th>
<th>OPR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate Parts Control &amp; Mgmt</td>
<td>FY 05</td>
<td>JCAA-GEIA</td>
</tr>
<tr>
<td>Obsolescence Tools NOT Integrated</td>
<td>FY 05-07</td>
<td>JCOMMSS</td>
</tr>
<tr>
<td>Limited/Incorrect Vendor Data</td>
<td>FY 05-07</td>
<td>DASN-L</td>
</tr>
<tr>
<td>Lack of Robust Obsolescence Management in our SE Process - Component Qualification</td>
<td>FY 05-06</td>
<td>DASN-L</td>
</tr>
<tr>
<td>Lack of Training</td>
<td>FY-04</td>
<td>COE</td>
</tr>
<tr>
<td>Poor Understanding of the Parts Environment</td>
<td>FY-03</td>
<td>JCAA - AVSI</td>
</tr>
<tr>
<td>Little or No Utilization of Advanced Obsolescence Mitigation (VCA/MOSA)</td>
<td>FY-03</td>
<td>JCAA-AEB</td>
</tr>
</tbody>
</table>

Must Partner with Industry to Fix the Obsolescence Issue(s)
Aerospace Part Trends

Early 1990s: Transition to COTS Parts
Mil-spec mfrs. exit market

Mid 1990s: DMS
60% of parts are obsolete within 5 years

Today: Nanometer scale
3-7 yr. life, targeted products

We “survived” because COTS parts were more reliable than we had thought, and because of improvements in quality and reliability.

We are “coping” through aggressive responses, and beneficial, but temporary circumstances.

We cannot “survive” or “cope” with tactics that have worked in the past.

We cannot “survive” or “cope” with tactics that have worked in the past.

Strategic, long-term solution based on cooperation between semiconductor device and avionics industries.

• Tactical, short-term, and ad hoc solutions.
• Each “solution” introduces a future DMS problem.
Parts Control Management
- Future Vision

Need to move from Management of Parts to Management of the Parts Process

• Historical Parts control was inflexible, costly and ineffective
• Required approval of parts by government agency
• MIL-STD-965 was on the “top 10” list of specs targeted for acquisition reform

Solution: Work with OEMs to PLAN for:

• Configuration Management (plans for die shrinkage)
• Transfer of manufacturing to aftermarket manufactures
• Selection of common design tools
• Provisions for data escrow, die banks…

How can we Develop a Pre Milestone C Philosophy?
Aerospace Qualified Electronic Components allows

- Better information flow between customer and supplier
- Response to global **electronics** industry trends
- Response to **aerospace industry** trends
- Response to technology trends
- Couple obsolescence upgrades with mission growth
- Strategic solutions for a small, fragmented industry
- Response to political, legal, and standards trends

*Provides a third party certified process*
Aerospace Qualified Electronic Components (AQEC)

Start with the device manufacturer's “COTS” component

- Assure qualification, quality, reliability, design stability, etc.
- Assess the component’s capability to satisfy essential aerospace requirements
- Evaluate part availability and business issues

If necessary, issue a new part number and data sheet
Technology Trends

Component Challenges:
- Radiation susceptibility
- Short design and service life
- Uncontrolled configuration changes
- Narrow temperature ranges

System Challenges:
- DMS - Obsolescence
- Continuous upgrades
- System-on-a-Chip
- Open Systems
Global Industry Trends

The Past
“Design it and forget it”

The Near Future
Pro-active incremental upgrades

The Present
Reactive incremental upgrades

The Target
Pro-active continuous upgrades

Why is aerospace the only major industry that still designs repairable cards?
Parts Process Management – Planning for Tech Refresh

II) Need to work across all levels of industry

III) Incorporate User Defined Upgrades/Spirals

<table>
<thead>
<tr>
<th>Component /ICs</th>
<th>Cards</th>
<th>Box</th>
<th>System</th>
<th>OEM Integrator</th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Moderate</td>
<td>Increasing</td>
<td>Leverage</td>
<td>Leverage</td>
<td></td>
</tr>
</tbody>
</table>

- S&T Projects
- Demonstration Projects
- Acquisition Program

- Concept Refinement
- Technology Development
- System Development & Demonstration
- Production & Deployment
- Operations & Support

Spiral 1
Spiral 2

32 Bit Computing
- 80386
- 80486
- Pentium
- Pentium II

64 Bit Computing

Manage tech refresh & obsolescence with Warfighter requirements
We cannot expect industry to develop technology without government sharing the risk.

PM Dilemma – Successful Tech Insertion

Development | Transition | Acquisition | Sustainment

The Frogger Affect

- Identify the top concerns
  - National Strategy
  - Work With Industry
    - Defense Sustainment Consortium
      - AADI/DSTO
  - Fund the Gaps
  - Work the Transition
  - Work as a Team

Government Oversight and Regulation
Performance Based Logistics (without data)

Too costly

Too risky

Misguided micro-management

Irresponsible ignorance
Path Forward

1. Continue adoption of AQEC standards
   • Reference EIA documents in acquisition
2. Revise Navy and DoD DMSMS policy to
   Encourage AQEC as a “preferred” process
   – Develop BCA
   – Select Pilot Programs
   – Draft AQEC language (Navy Complete)
3. Brief Senior Leaders on AQEC Strategy
4. Modify Source Selection and Acquisition
   Handbooks to account for AQEC

Recognize the Global Nature of Avionics
Bob’s followers demand a jihad against the un-herded avionics cats
“We must have an integrated avionics strategy!”
Questions?
Full Spectrum Obsolescence Support

Standardized approach
- Multiple tools for each phase
- Waterfall charts
- Tracking of Metrics
- Certified Costs

Component Solution ——— System Replacement

Procurement:
- SOW preparation
- Re-engineering
- Supplier obsolescence plans
- Component Selection
- Architecture Refresh options

Process:
- Tools Re-engineering
- Metrics
- Training

Sustainment:
- “Hot Line Support
- Re-engineering options
- System Analysis and Support
Our Response – The Integrated Aerospace Parts Acquisition Strategy

• Part I (in place): Electronic Component Management Program (ECMP)
  – Industry documents in place: IEC 62239 and EIA 4899
  – Avionics suppliers document their processes for managing electronic components, in accordance with industry documents
  – Plans are approved by a third party, e.g., IECQ
  – Avionics suppliers use approved plans as baseline RFP processes

• Part II (in development): Aerospace Qualified Electronic Component (AQEC)
  – Streamline implementation of ECMP
  – AQEC parts are automatically approved per IEC62239 and EIA 4899
  – Use AQEC parts “as-is”
First Sin - Parts Control Management

Develop a “Best Practices” for Guide Obsolescence Management & Evaluation of Proposals

What Constitutes “Best Practices”

Parameters for Evaluation Contract Proposals

- Selection of a Set of Common Design Tools
- Procedures for Design Review
  - Component selection → Transition to Aftermarket
die shrinkage
- Configuration Management
die shrinkage
- BOM Monitoring
- Data packages
  - Data Escrow
  - Die Banks

Consensus with Industry
Global Industry Trends

We must design, produce, and support cost-effective aerospace products with electronics designed for other industries.

We won the Cold War, but we lost our supply chain.