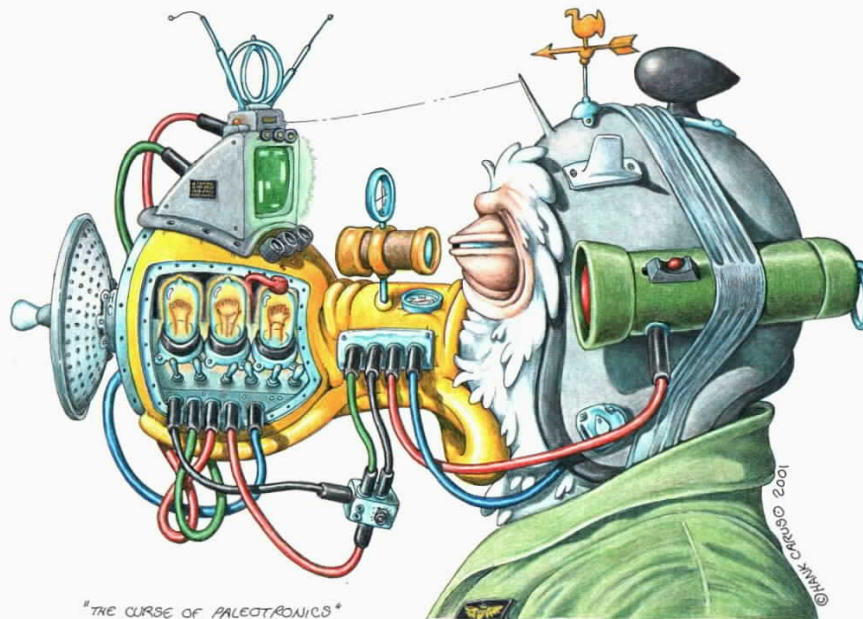


Aerospace Qualified Electronic Components

As part of an

Integrated Avionics Strategy



Robert Ernst

Head, Aging Aircraft IPT

**Chairman, Joint Council On
Aging Aircraft**

July 2006

JCAA Obsolescence National Strategy

“Seven Deadly Sins”

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

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

Aerospace Part Trends

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

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

- Tactical, short-term, and ad hoc solutions.
- Each “solution” introduces a future DMS problem.

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

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

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

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.

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...

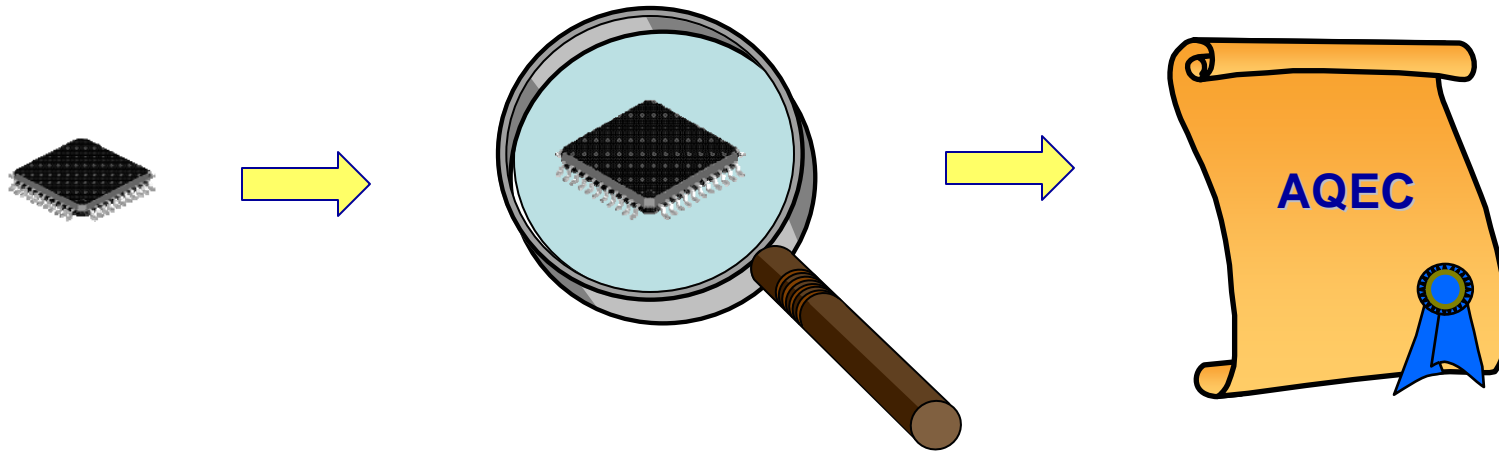
How can we Develop a Pre Milestone C Philosophy?

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)

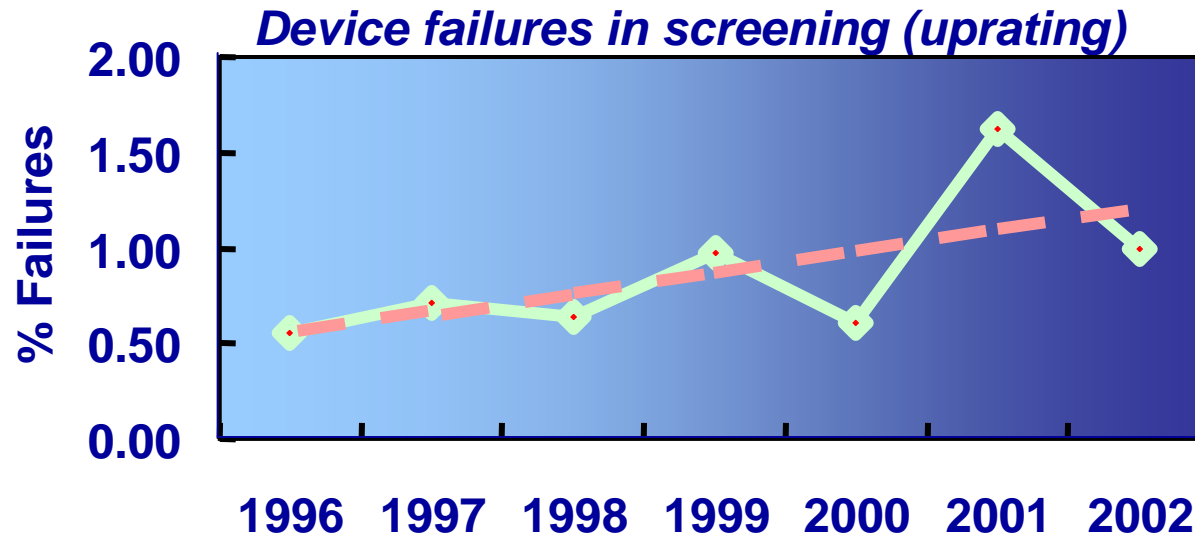


Start with the device manufacturer's "COTS" component

- ***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

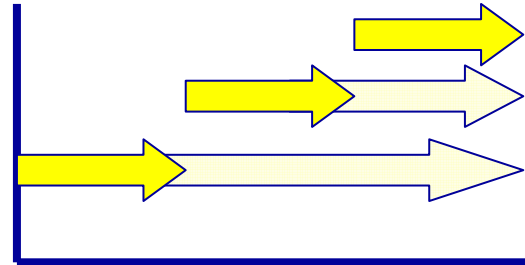
The Past

“Design it and forget it”



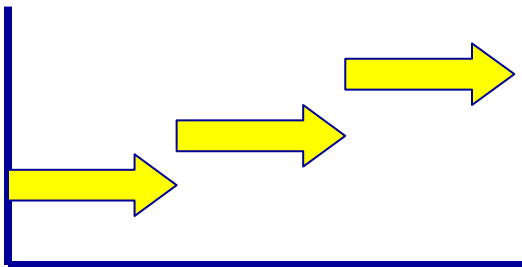
The Present

Reactive incremental upgrades



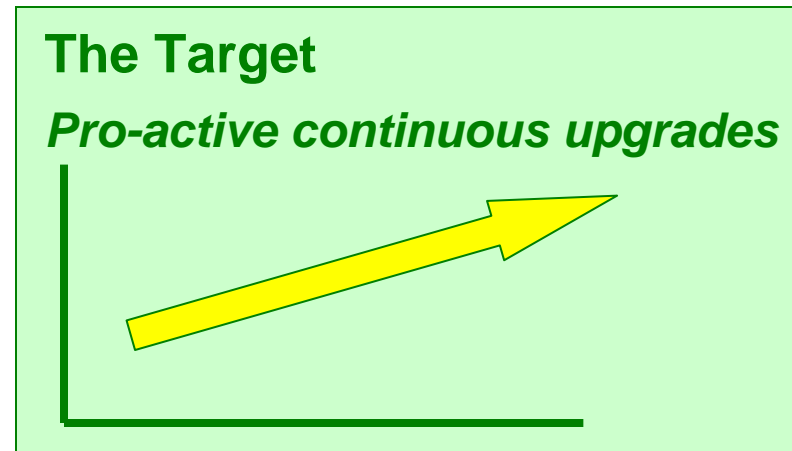
The Near Future

Pro-active incremental upgrades



The Target

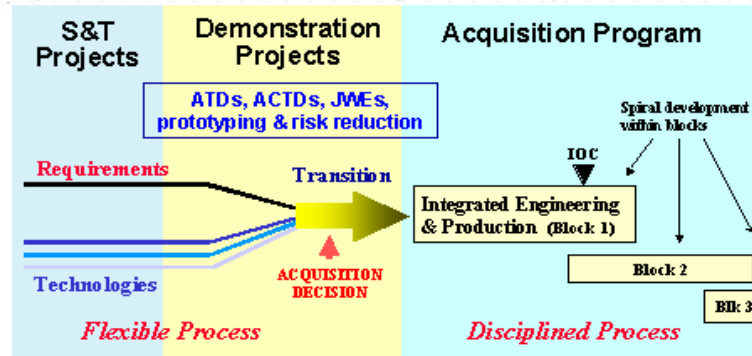
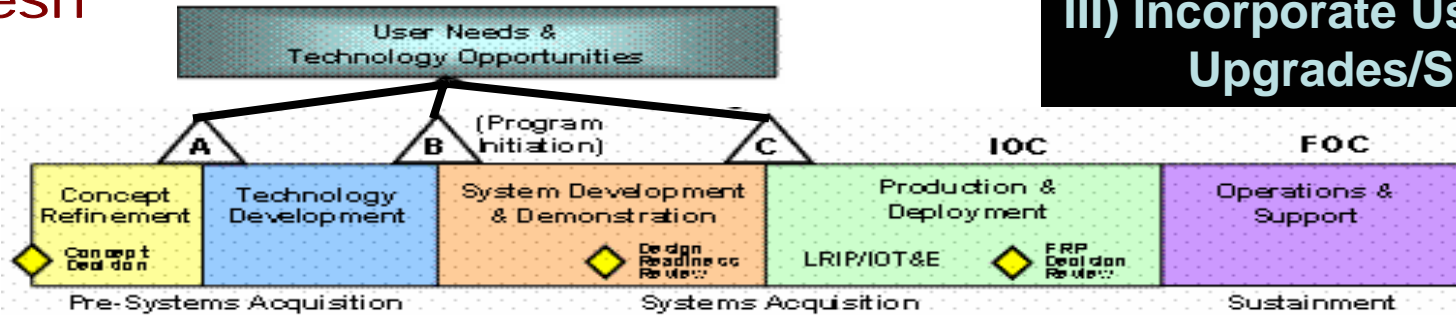
Pro-active continuous upgrades



Why is aerospace the only major industry that still designs repairable cards?

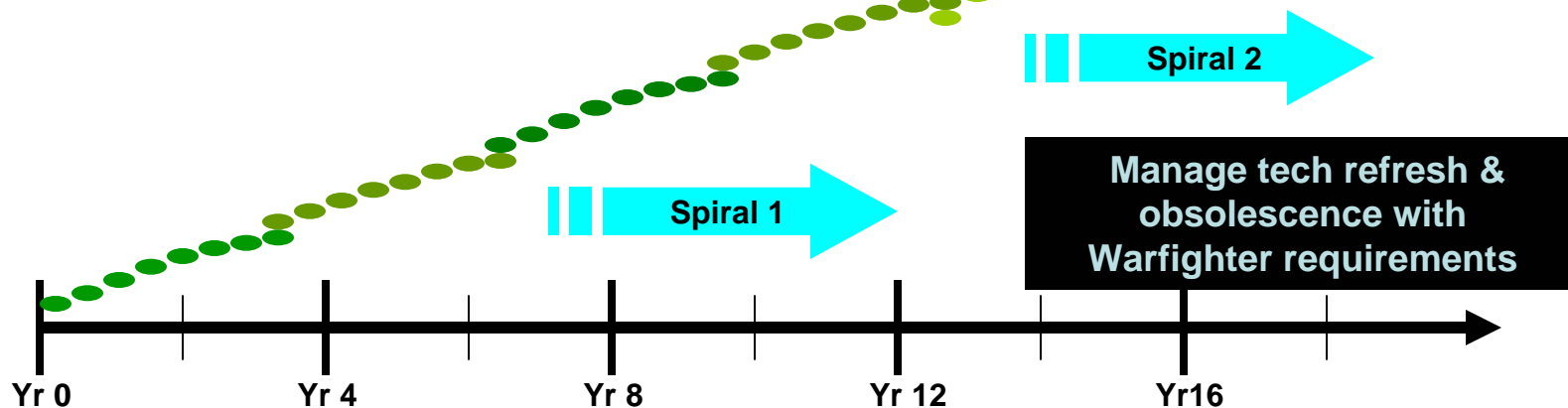
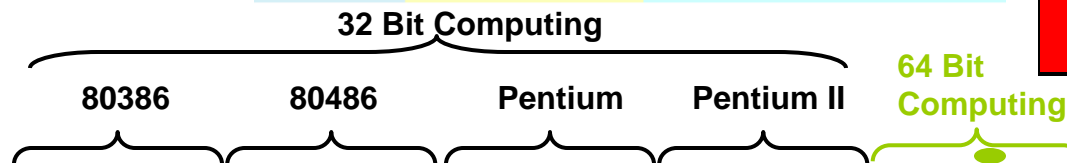
Parts Process Management - Planning for Tech Refresh

III) Incorporate User Defined Upgrades/Spirals

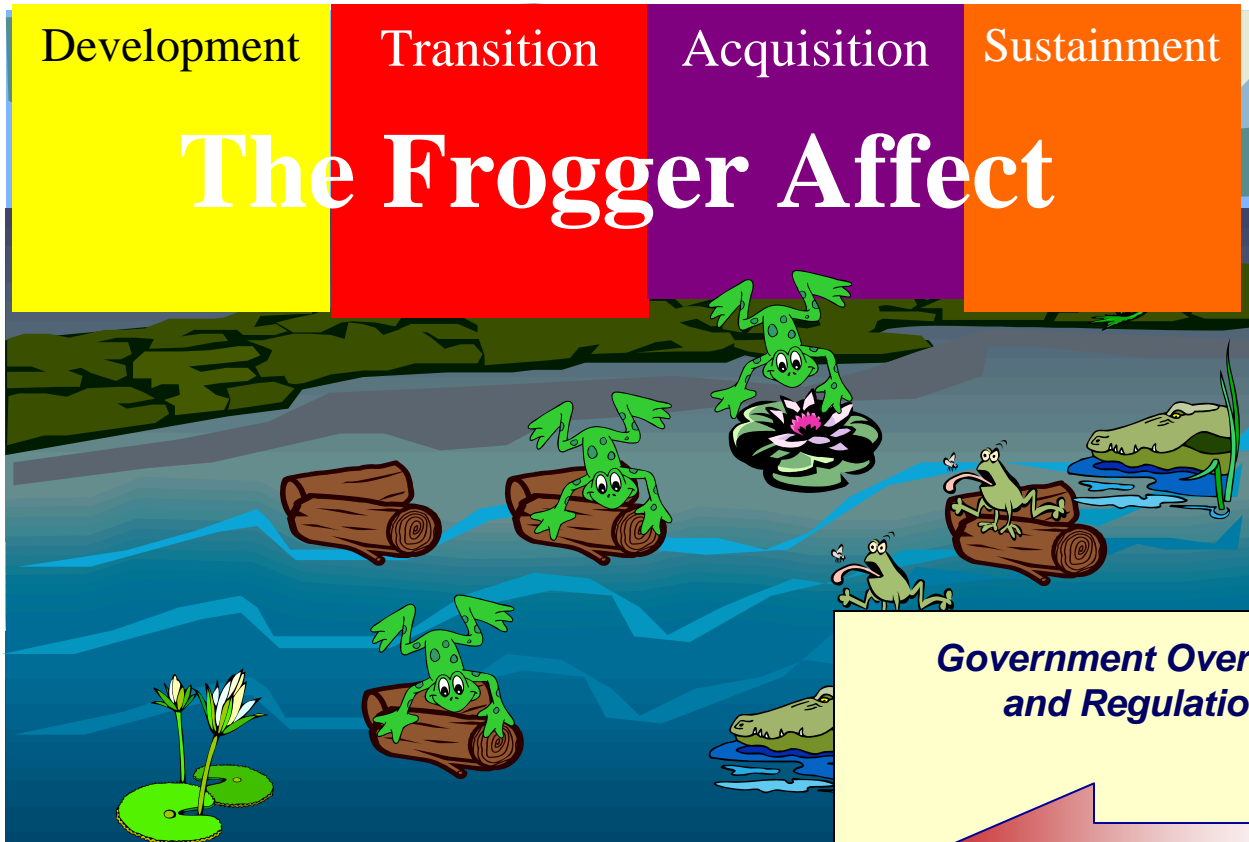


II) Need to work across all levels of industry

Component /ICs	Cards Boards	Box System	OEM Integrator	User
None	Moderate	Increasing	Leverage	Leverage

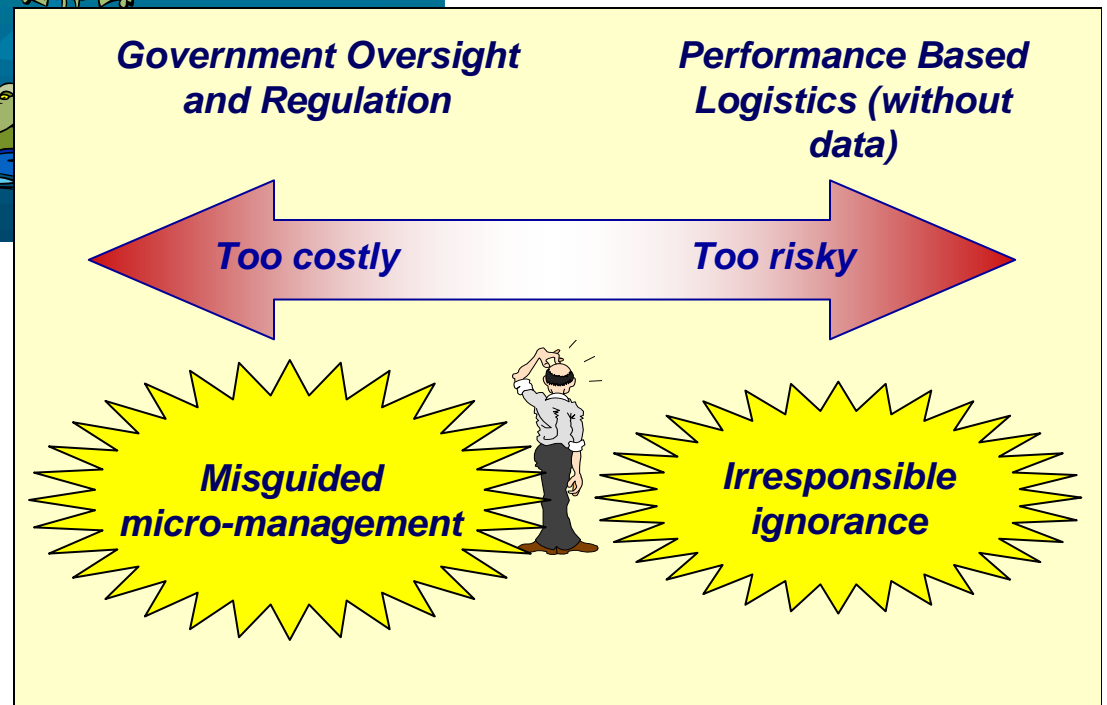


PM Dilemma – Successful Tech Insertion



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

We cannot expect industry to develop technology without government sharing the risk



Path Forward

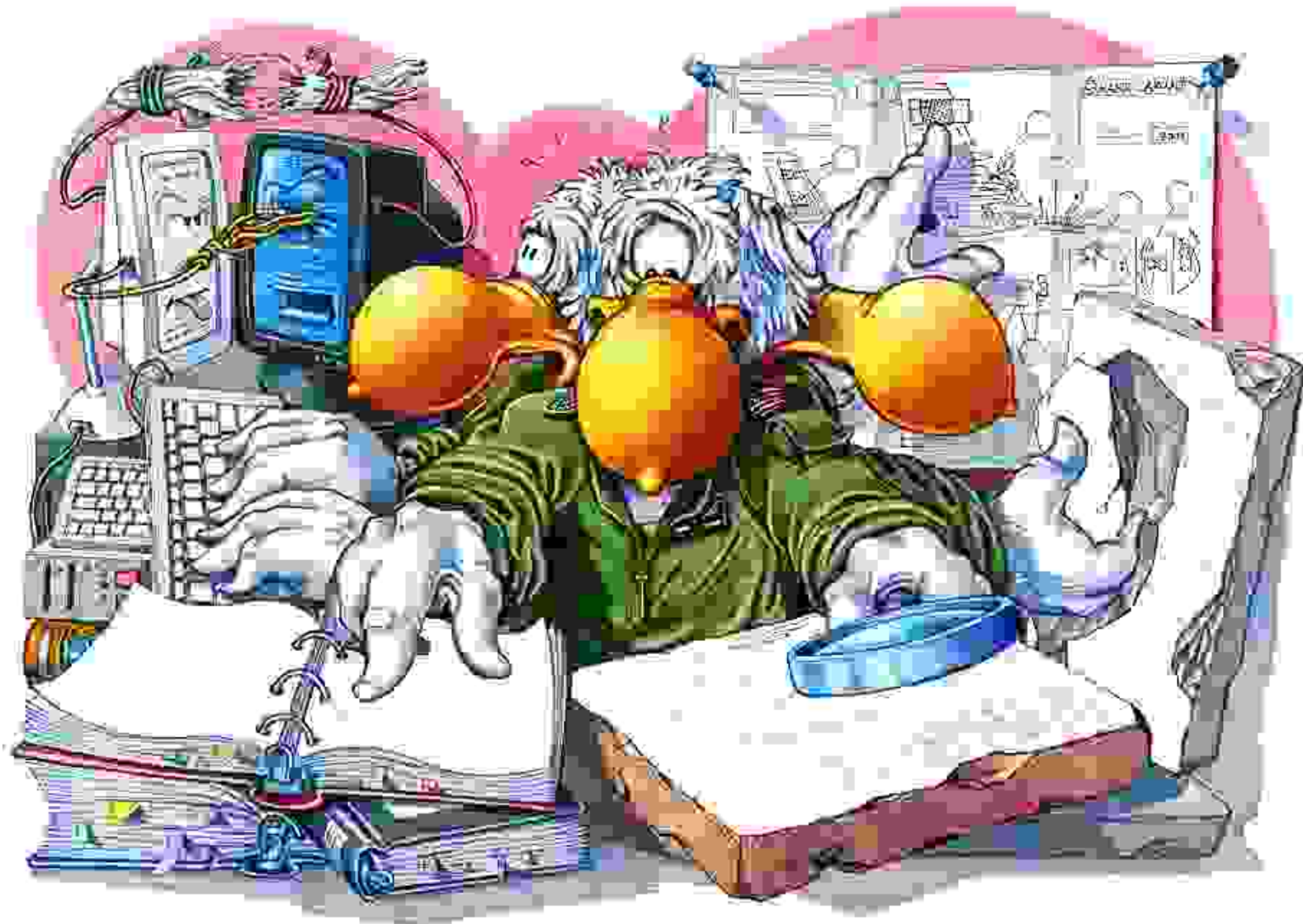
1. Continue adoption of AQEC standards
 - Reference EIA documents in acquisition
2. Revise Navy and DoD DMSMS policy to Encourage AQEC as a “preferred” process
 - Develop BCA
 - Select Pilot Programs
 - Draft AQEC language (Navy Complete)
3. Brief Senior Leaders on AQEC Strategy
4. Modify Source Selection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

Recognize the Global Nature of Avionics

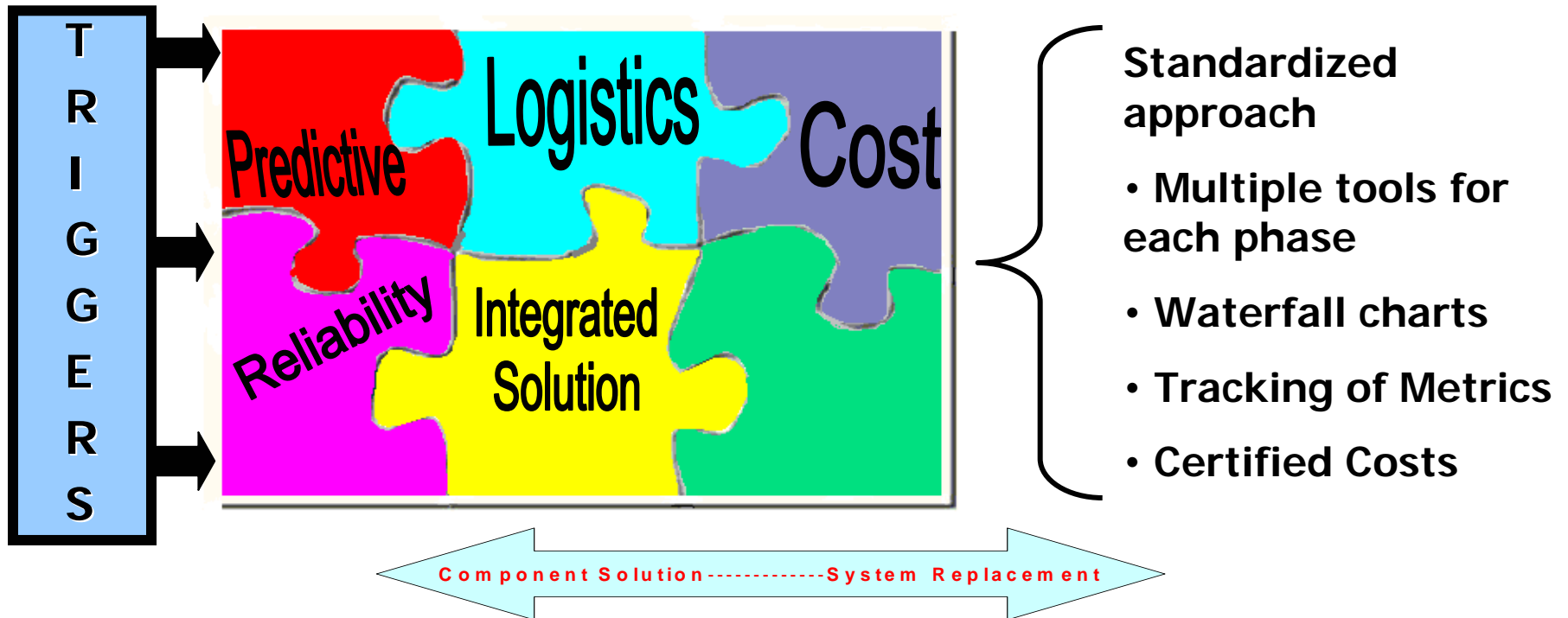


Bob's followers demand a jihad against the un-herded avionics cats
"We must have an integrated avionics strategy!"

Questions?



Full Spectrum Obsolescence Support



- 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
- 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

