

DoD Diminishing Manufacturing Sources and Material Shortages (DMSMS) Conference, Exhibition & Workshop

10 - 13 July 2006

Charlotte, North Carolina

Agenda

Tuesday, 11 July 2006

Keynote Speaker: *Department of the Navy Perspective on Obsolescence Management*
• Mr. Nicholas J. Kunesh, Deputy Assistant Secretary of the Navy (Logistics)
Panel: *Life Cycle Management*
• **Moderator**: Mr. Nicholas J. Kunesh, Deputy Assistant Secretary of the Navy (Logistics)
• RADM Charles S. Hamilton, USN, Program Executive Officer, Ships
• Ms. Carla Lucchino, Assistant Deputy Commandant, Installation & Logistics, Headquarters Marine Corps
• Mr. Gary Nenninger, Operations Director, US Army Aviation & Missile Life Cycle Management Command
• Mrs. Lorna Estep, Deputy Director for Supply, US Air Force Headquarters

Luncheon Speaker:
• Mr. John W. Douglass, President & CEO, Aerospace Industries Association
Panel: *Restrictions on Hazardous Substances (RoHS) Panel*
• **Moderator**: Mr. Vance Anderson, Program Manager, Defense MicroElectronics Activity (DMEA)
• Mr. Lloyd Condra, Advanced Platform Systems, Phantom Works, Boeing
• Mr. Charlie Minter, Technical Risk Manager, Office of Naval Research
• Dr. Stephan Meschter, Senior Engineer, BAE Systems
• Mr. Craig Hillman, CEO, Design for Reliability (DfR) Solutions

Panel: *Sustainment Science and Technology*
• **Moderator**: Mr. Jeff Klein, Director C4ISR, Installations & Logistics, Space & Naval Warfare Systems Command
• Mr. Louis Kratz, Vice President, Logistics Business Offi ce, Lockheed Martin
• Dr. Tommy Gardner, Director of Science, Technology & Innovation, Raytheon Technical Services Company, LLC
• Mr. Rick Catoe, Vice President of Sales, Arrow Zeus, Arrow Electronics
• Mr. Bryan Brady, Vice President/Director of Defense Aerospace Business Unit, AVNET, Inc.

Wednesday, 12 July 2006

Keynote Speaker: *New World of DMSMS*
• Dr. Carolynn A. Amberntson, Sr. Staff Procurement Engineer Lockheed Martin Missiles & Fire Control Lockheed Martin Missiles & Fire Control
Keynote Speaker: *DMSMS - The Challenges The Challenges Ahead Ahead*
• Brigadier General E.G. Payne, Marine Corps Logistics Command

Panel:*DMSMS Management, Planning, Implementation, Assessment, and Metrics*
• **Moderator**: Mr. Walt Tomczykowski, Director, Life Cycle Management, ARINC Engineering Service, LLC
• Mr. Kevin Kenney, Systems Acquisition Manager AEGIS Weapon System, Program Executive Office Integrated Warfare Systems
• Lt Col William Hidle, USMC, V-22 Obsolescence Management Team Lead & Avionics Deputy Assistant Program Manager for Logistics
• Mr. John Sells, Product Support Manager for Common Ground Station, Tobyhanna Army Depot
• Mr. Samuel J. Calloway, F-15 Program DMSMS Manager, Warner Robins AFB

Panel: *Contracting for DMSMS in a TLCSM Environment*
• **Moderator**: Mr. David G. Robinson, Defense Logistics Agency, DLA/DSCC-CCD
• Mr. Robert P. Ernst, Head, Aging Aircraft Program, NAVAIR

• SQNLDR Peter Weeding, ESC 551st ELSG XRE, Headquarters U.S. Air Force AWACS Program Office
• Mr. Gordon Taylor, Product Group Director for Ground Transportation and Engineering Systems, Marine Corps Systems Command

Thursday, 13 July 2006

DMSMS Workshop:
• *Opening Remarks*: Mr. David Robinson, DLA-DSCC
• *OSD Perspective*: Mr. John Becker, OSD-DSPO
• *DOD DMSMS WG Update*: Mr. Alex Melnikow, DLA-HQ
• *TDLA Demand Planner*: Debbie Haven, DLA- DSCC
• *DMSMS Essentials*: Mr. Charles Marshall, ARNIC
• *DMSMS Knowledge Sharing Portal (DKSP)*: Mr. Ron Wong, KARTA Technologies, Inc.
• *DAU Partnership*: Mr. William Kobren, OSD-Defense Acquisition University
• *DMSMS Plan Builder*: Mr. Keith McLendon, Army LOGPARS
• *Shared Data Warehouse*: Ms. Susan Dadey, Concurrent Technologies Corporation
• *GIDEP*: Ms. Karen Jackson, GIDEP Operations Center
• *MEP Support DMSMS*: Ms. Natalie Seiling, DLA - DORRA

Monday, July 10, 2006

9:00AM - 4:00PM	Exhibitor Registration & Move In	
12:00PM - 5:30PM	Registration	
5:30PM - 6:30PM	Opening Reception	

Tuesday, July 11, 2006

7:00AM - 5:30PM	Registration	
7:00AM	Continental Breakfast	
8:00AM	Conference Welcome	**CAPT Joe Spruill, USN,** Office of the Deputy Assistant Secretary of the Navy (Logistics)
8:15AM	Keynote Speaker	**Mr. Nicholas J. Kunesh,** Deputy Assistant Secretary of the Navy (Logistics), Topic: *Department of the Navy Perspective on Obsolescence Management*
9:00AM	Keynote Speaker	**Mr. James D. Hall**
9:30AM - 6:30PM	Exhibit Hall Open	
9:45AM	Break (Exhibit Hall)	
10:15AM	**Life Cycle Management Panel** Moderator: Panelists:	**Mr. Nicholas J. Kunesh,** Deputy Assistant Secretary of the Navy (Logistics) **RADM Charles S. Hamilton, USN,** Program Executive Officer, Ships **Lucchino,** Head, Logistics Vision Team, Headquarters Marine Corps **Mr. Gary Nenninger,** Operations Director, US Army Aviation & Missile Life Cycle Management Command **Mrs. Lorna Estep,** Deputy Director for Supply, US Air Force Headquarters
12:00PM	Lunch Luncheon Speaker:	**Mr. John W. Douglas,** President & CEO, Aerospace Industries Association
1:30PM - 2:30PM	Exhibit Hall Visit	
2:30PM	**Restrictions on Hazardous Substances (RoHS) Panel** Moderator: Panelists:	**Mr. Vance Anderson,** Program Manager, Defense MicroElectronics Activity (DMEA) **Mr. Lloyd Condra,** Advanced Platform Systems, Phantom Works, Boeing **Mr. Charlie Minter,** Technical Risk Manager, Office of Naval Research **Dr. Stephan Meschter,** Senior Engineer, BAE Systems **Mr. Craig Hillman,** CEO, Design for Reliability (DfR) Solutions

4:00PM	**Industry DMSMS Panel** Moderator: Panelists:	**Mr. Jeff Klein,** Director C4ISR, Installations & Logistics, Space & Naval Warfare Systems COmmand **Mr. Louis Kratz,** Vice President, Logistics Business Office, Lockheed Martin **Dr. Tommy Gardner,** Director of Science, Technology & Innovation, Raytheon Technical Services Company, LLC **Rick Catoe** Vice President of Sales, Arrow Zeus, Arrow Electronics **Mr. Bryan Brady,** Vice President/Director of Defense Aerospace Business Unit, AVNET, Inc.
5:30PM - 7:00PM	Reception in Exhibit Hall	
	Wednesday, July 12, 2006	
7:00AM - 4:40PM	Registration	
7:00AM	Continental Breakfast	
8:00AM	Keynote Speaker	**Mr. Robert Costello,** Vice President, Materials Acquisition & Management, Lockheed Martin Missiles & Fire Control
9:00AM	Keynote Speaker	**Maj Gen Willie J. Williams, USMC,** Commanding General, Marine Corps Logistics Command
9:30AM - 2:30PM	Exhibit Hall Open	
10:00AM	Break (Exhibit Hall)	
10:30AM	**DMSMS Management, Planning, Implementation, Assessment, and Metrics Panel** Moderator: Panelists:	**Mr. Walt Tomczykowski,** Director, Life Cycle Management, ARINC Engineering Service, LLC **Mr. Kevin Kenney,** Systems Acquisition Manager AEGIS Weapon System, Program Executive Office Integrated Warfare Systems **Lt Col William Hidle, USMC,** V-22 Obsolescence Management Team Lead & Avionics Deputy Assistant Program Manager for Logistics **Mr. John Sells,** Product Support Manager for Common Ground Station, Tobyhanna Army Depot **Mr. Samuel J. Calloway,** F-15 Program DMSMS Manager, Warner Robins AFB
12:00PM	Lunch Luncheon Speaker:	**VADM Walter B. Massenburg, USN,** Commander Naval Air Systems Command
1:30PM - 2:30PM	Exhibit Hall Visit	

2:30PM	**Contracting for DMSMS in a TLCSM Environment Panel**	
	Moderator:	**Mr. David G. Robinson,** Defense Logistics Agency, DLA/ DSCC-CCD
	Panelists:	**Mr. Robert P. Ernst,** Head, Aging Aircraft Program, NAVAIR **Weeding** **Mr. Gordon Taylor,** Product Group Director for Ground Transportation and Engineering Systems, Marine Corps Systems Command
4:00PM	Conference Wrap Up	**Mr. Nicholas J. Kunesh,** Deputy Assistant Secretary of the Navy (Logistics)

DMSMS Workshop

DMSMS Workshop
Thursday, July 13, 2006

8:00AM	*Opening Remarks* **Mr. David Robinson,** DLA-DSCC
8:10AM	*OSD Perspective* **Mr. John Becker,** OSD-DSPO
8:40AM	*DOD DMSMS WG Update* **Mr. Alex Melnikow,** DLA-HQ
8:55AM	*Teaming Opportunities* **Mr. Charles Marshall,** ARNIC Dayton, OH
9:10AM	*Teaming Success Story* **Mr. Sam Calloway,** AF-Robins AFB
9:30AM	*TDLA Demand Planner* **Debbie Haven,** DLA- DSCC
10:00AM	Break
10:30AM - 4:30PM	*DMSMS Essentials (Concurrent with other presentations)* **Mr. Charles Marshall,** ARNIC
10:30AM	*DMSMS Knowledge Sharing Portal (DKSP)* **Mr. Ron Wong,** KARTA Technologies, Inc.
11:00AM	*DAU Partnership* **Mr. William Kobren,** OSD-Defense Acquisition University
11:30AM	*DMSMS Plan Builder* **Mr. Keith McLendon,** Army LOGPARS
12:00PM	Lunch
1:00PM	*Shared Data Warehouse* **Ms. Susan Dadey,** Concurrent Technologies Corporation
2:00PM	*GIDEP* **Ms. Karen Jackson,** GIDEP Operations Center
2:45PM	Break
3:00PM	*MEP Support DMSMS* **Ms. Natalie Seiling,** DLA - DORRA
3:30AM	*Question and Answer Panel* **All Speakers**
4:15PM	Workshop Wrap Up/Adjourn

A New World of DMSMS

DMSMS '06

July 13, 2006

Dr. Carolynn A. Amberntson

Sr. Staff Procurement Engineer
Lockheed Martin Missiles & Fire Control

LOCKHEED MARTIN
We never forget who we're working for™



LOCKHEED MARTIN

$37.2B 2005 Sales
135,000 Employees

Electronic Systems



Aeronautics



Space Systems



Information & Technology Services



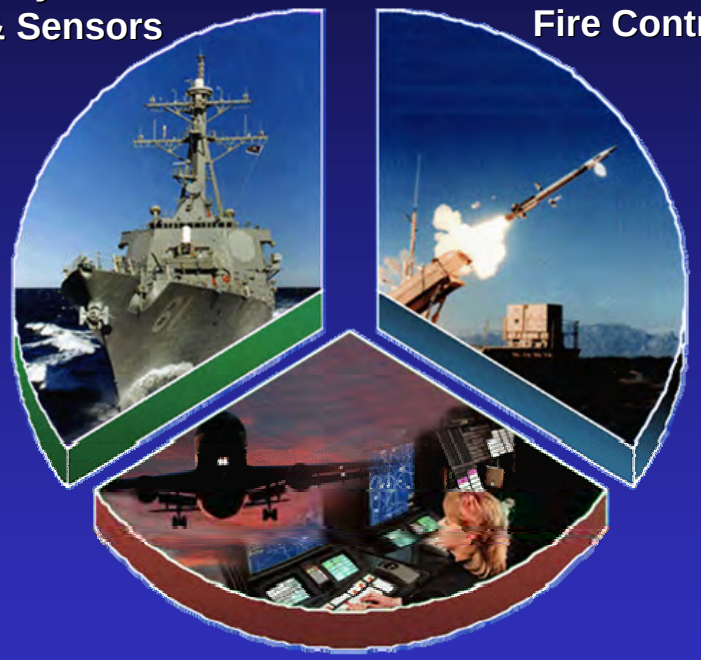
Integrated Systems & Solutions



Focused on Customer Satisfaction and Shareholder Value

Electronic Systems Business

- 30,000 Employees
- 5 Principal Businesses Organized Into 3 Major Business Units
- 18 Primary Locations
  - In 14 U.S. States, Canada, U.K.
- 1,000+ Programs
- Customers Include:
  - U.S. DoD
  - International
  - Civil Agencies



Balanced Weapon Systems and Information-Driven Businesses

Missiles & Fire Control Business



2005 Sales
Approximately $3.7B

- **>70 Products**
- **1,000+ Active Contracts**
- **Approximately 2,000 Proposals**
- **Pursuing Business in 50 Countries**
- **World Class Mission Success**

Major Products



Missiles and Fire Control

Tactical Missiles

- M270/M270A1
- HIMARS®
- MLRS® Rockets
- GMLRS™
- ATACMS®
- NLOS-LS
- MULE™
- UGCV
- Survivability
- Hellfire®
- Longbow™
- JCM™
- CKEM
- Javelin™
- SRAW-MPV (UAW)
- AGS/LRLAP™

Strike Weapons/ Archbald

- JASSM™
- JASSM™ -ER
- WCMD™
- WCMD™-ER
- LongShot™
- SDB™ II
- Paveway II

Air & Missile Defense

- PAC-3™ / MSE Missile
- THAAD™
- MEADS
- Objective Launchers
- Objective BMC4I
- PAC-2 Missile
- Chaparral™
- LEAPP
- MKV

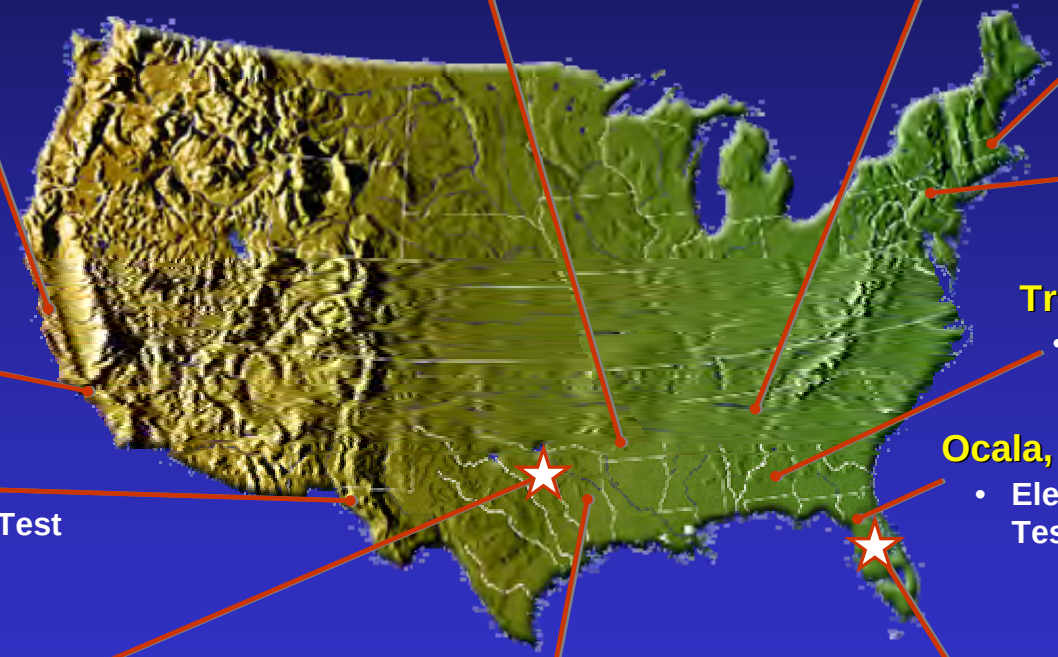
Fire Control

- Arrowhead®
- TADS/PNVS™
- Longbow™ FCR
- FCS R&S Mast
- FCS Auto Tgt Recog
- F/A-22 MLD
- LAIRCM™
- Sniper®
- LANTIRN™ ER
- NITE Hawk™
- JSF™ EOTS
- Target Sight System
- ATIC
- Gunship Multi-Sensor

Applied Research

- Rehearsal & Simulation
- Directed Energy
  - HPM
  - Laser
  - EM
- Special Programs
- Space Systems
- Advanced Research & Technology

MFC Locations



Sunnyvale, CA
- Missile Defense Program Mgmt, Engineering and Manufacturing

Camden, Arkansas
- Rocket and Launcher Manufacturing

Huntsville, AL
- Air Defense C^2, Launcher Engineering and Manufacturing

Chelmsford, MA
- Electronics Design and Fabrication

Archbald, PA
- Engineering, Manufacturing and Assembly

Santa Barbara, CA
- FPA Engineering and Manufacturing

Troy, AL
- Missile Assembly, Test and Integration

Ocala, FL
- Electronics Fab, Assembly, Test and Integration

El Paso, TX
- Missile Assembly, Test and Integration

Dallas, TX
- Program Management, Engineering, Manufacturing

Lufkin, TX
- Electronics Assembly

Orlando, FL
- Program Management, Engineering, Manufacturing

MFC DMS Perspective

- MFC is heavily reliant upon electronic and optical components and assemblies for its products

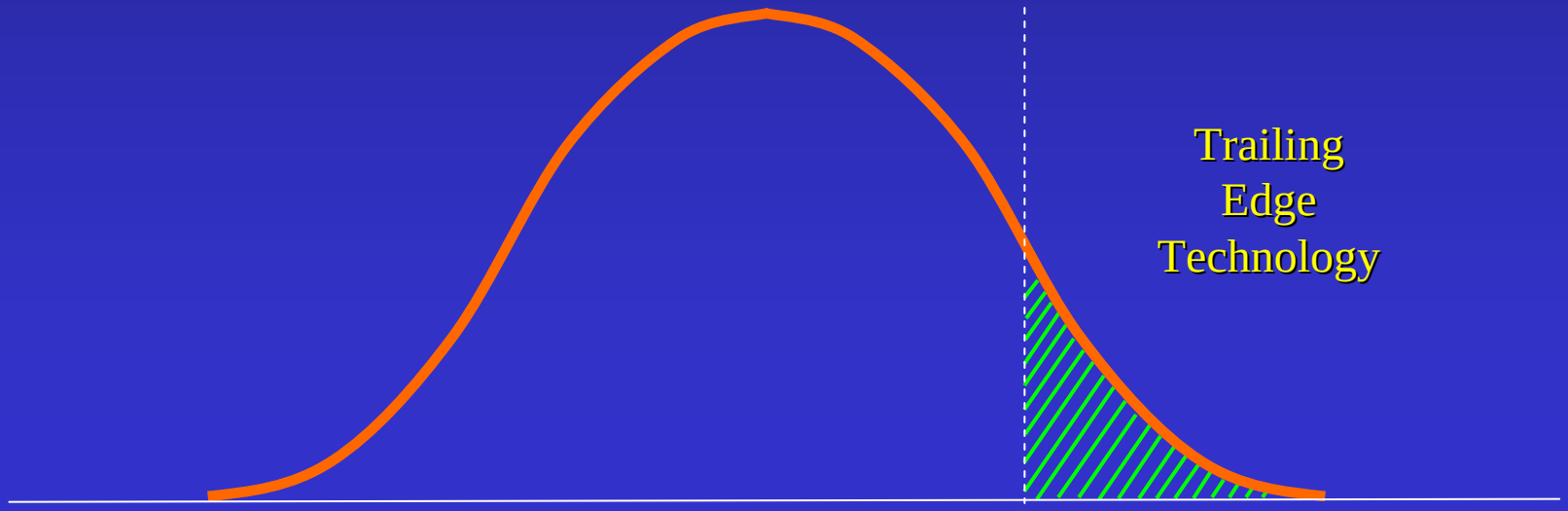
- MFC has been a pioneer in DMSMS strategy
  - Developed procedures, proactive strategies and cross-functional teams
    - Cross Functional Procedures for Component Selection
    - Standardization of Components based on roadmaps
  - Flowed to become an integral part of doing business across MFC and our supply chain
  - Enjoys an industry-leading success rate for low-cost solutions that do not impact product build and/or delivery schedules

DMSMS Influences

- DMSMS has been traditionally defined by DMEA as:

  "…the loss or impending loss of manufacturers or suppliers of critical items and raw materials due to discontinuance of production, leaving the device unprocurable ".

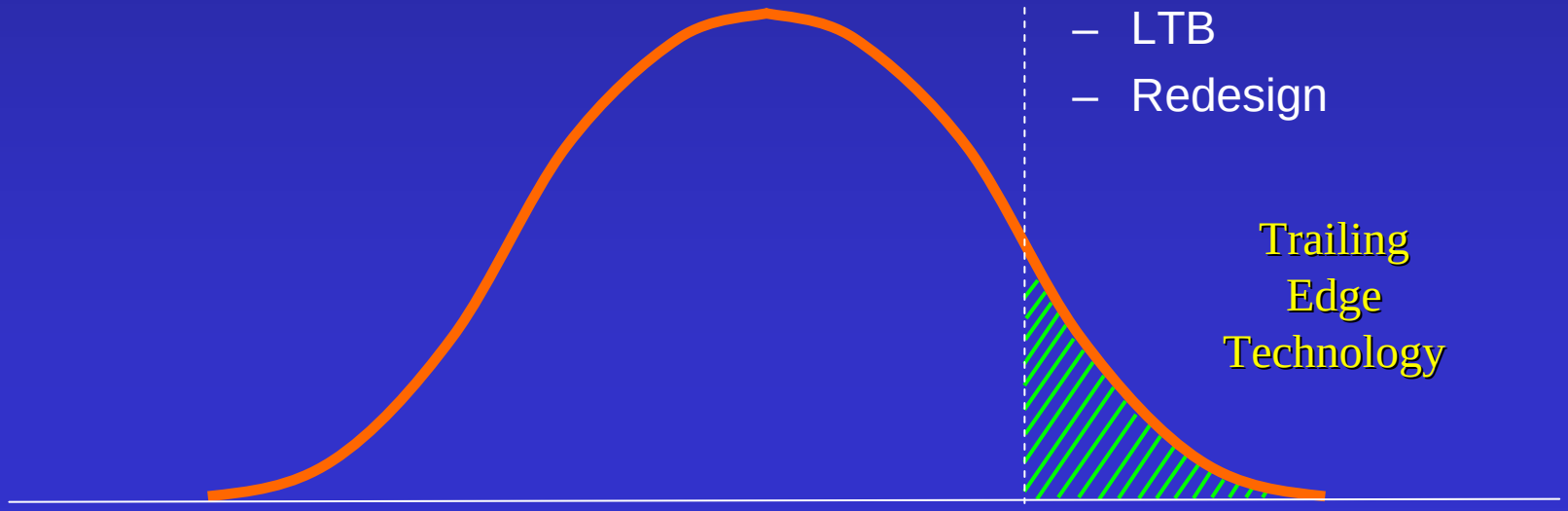
- Typically think of DMS as business-model related due to uneconomical production
  - More challenging due to PBL contracts, product warranties and extended platform service life
- Creates the generally well understood "Trailing Edge" DMS model



DMSMS Influences

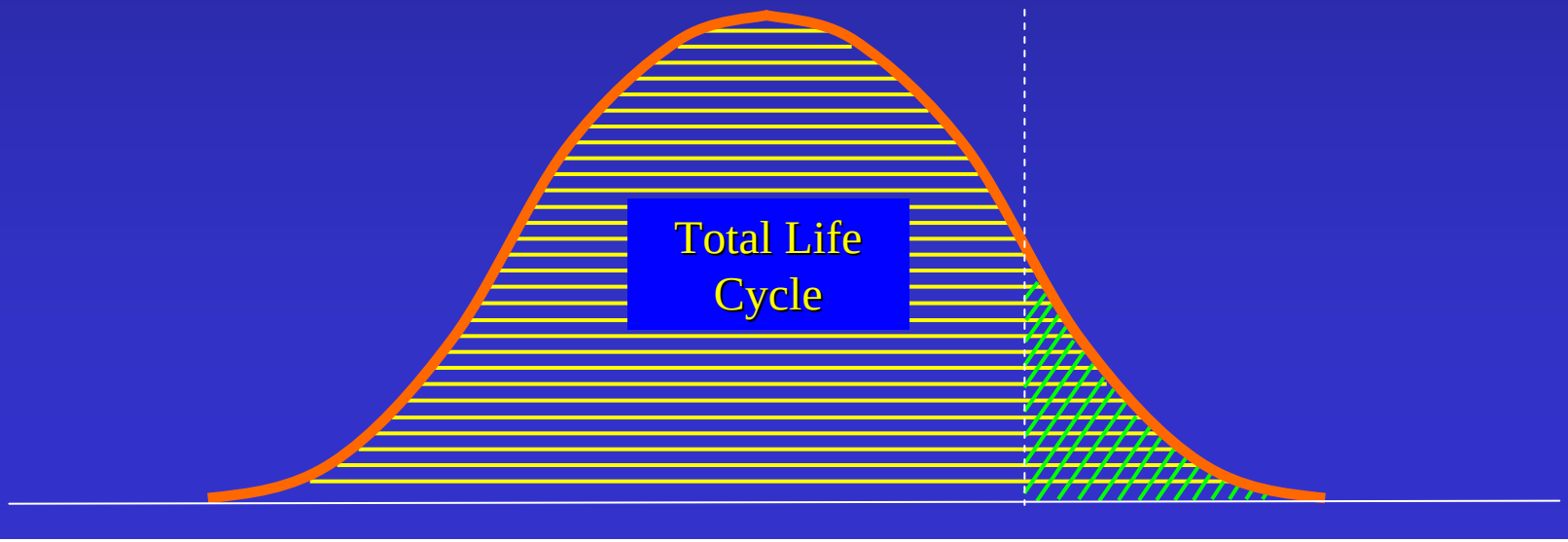
- Traditional tool sets:
  - GIDEP, PCNs, Life Cycle tools
  - Supplier roadmaps, data mining and communication
  - Industry forums

- Traditional solution options:
  - Leverage
  - Alternate sources or parts
  - Commercial Technology Insertion
  - Aftermarket
  - Brokers
  - Repackaging
  - Emulation/Reverse engineering
  - LTB
  - Redesign



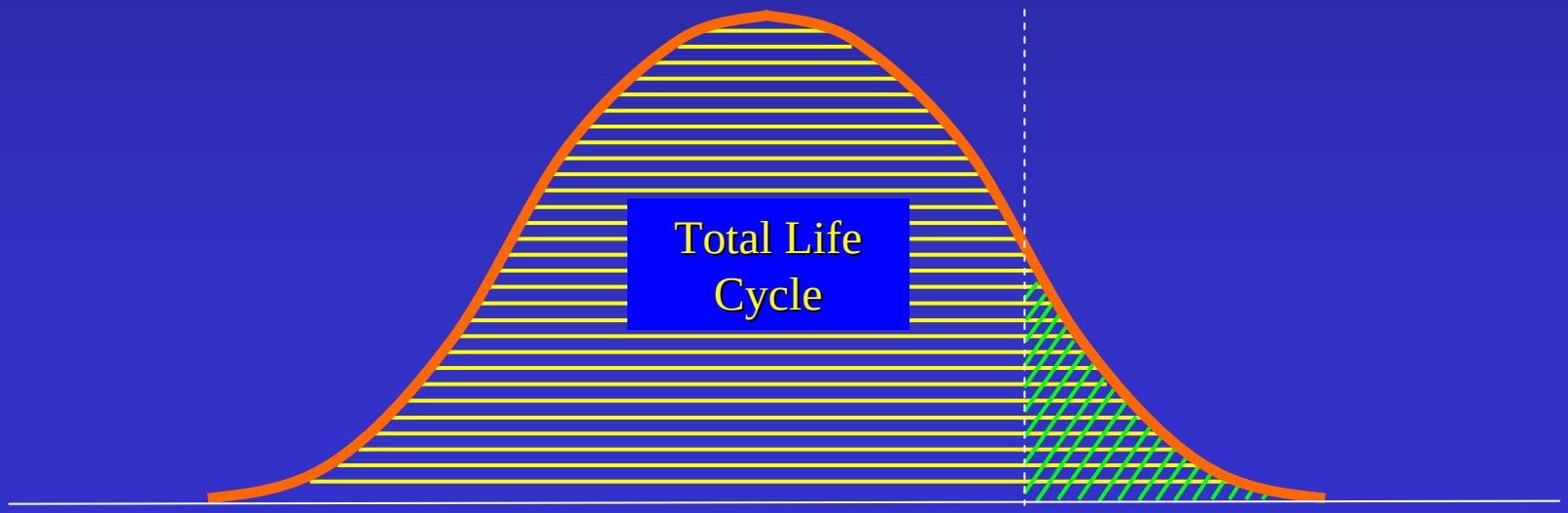
DMSMS Influences

- Non-traditional factors are now contributing
  - More difficult to deal with because you cannot plan for them
  - RoHS, Specialty Metals
- Creates the “Total Life Cycle” DMS model



DMSMS Influences

- Tool sets:
  - GIDEP
  - Data mining and communication
  - Industry forums
- "Solution" options:
  - Leverage
  - Alternate sources or parts
  - Redesign
  - Lobbying
  - Withholds



DMSMS Influences

- New twist on DMSMS issue emerging in high technology fields such as Optics
- Reliance of military systems on optical technology for enhanced performance is increasing
- Current optical materials and shapes cannot meet performance requirements for the next-generation systems
- National Research Council (NRC) report *Harnessing Light: Optical Science and Engineering for the 21st Century*

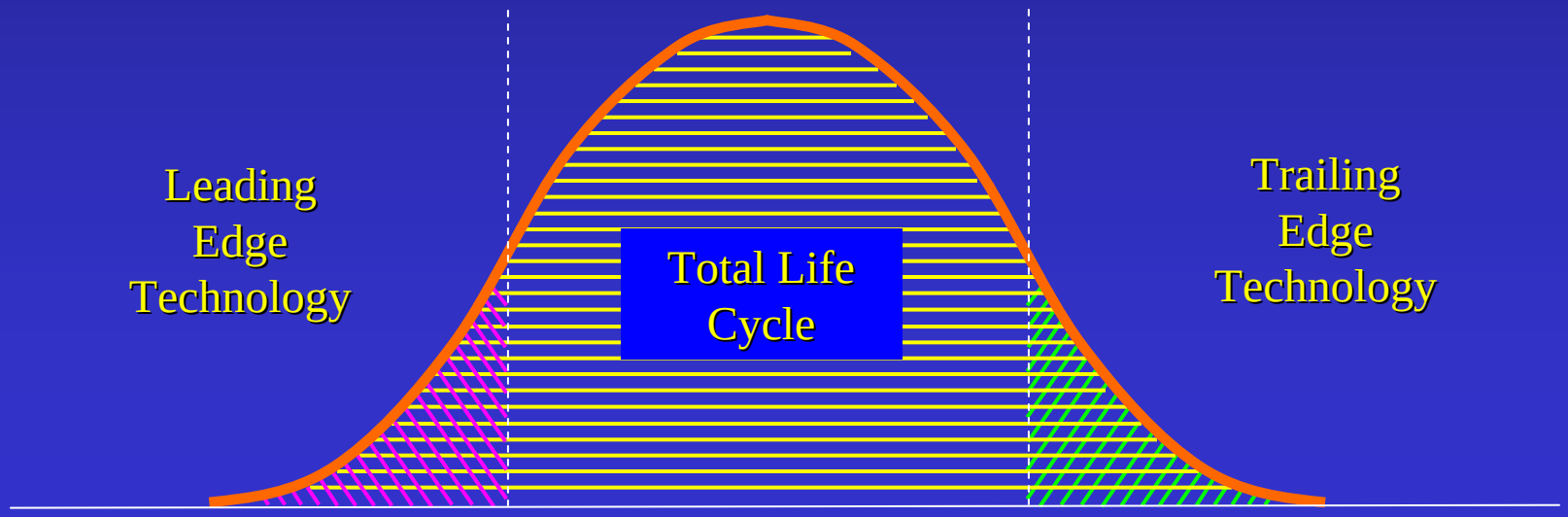
  "… the military viability of new optical system technologies depend upon further improving optical system performance and cost, which in turn requires critical breakthroughs in optics manufacturing capabilities."

DMSMS Influences

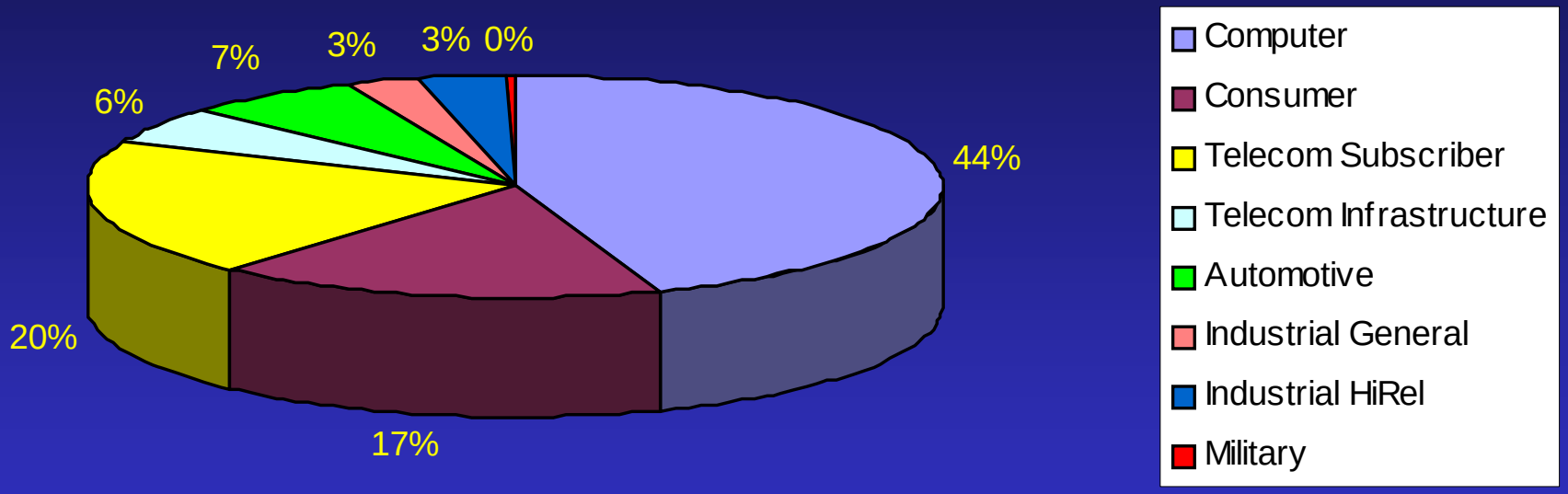
- Performance Requirement Challenges
  - Fabrication accuracies orders of magnitude beyond metal machining
  - Materials very hard and brittle
  - Unusual shapes
- MFC Observations:
  - Tighter packaging constraints
  - More aspheric surfaces
  - Larger diameter components
  - Use of a larger percentage of optical surface
  - More complex coating requirements
  - New materials
- Beyond current capabilities of supply chain
- Negative effects on quality, schedule and cost targets

DMSMS Influences

- Has created “Leading Edge” Technology DMS model
- Double-Edged Sword: As technology advances to meet leading edge requirements, additional DMSMS losses incurred on the trailing edge



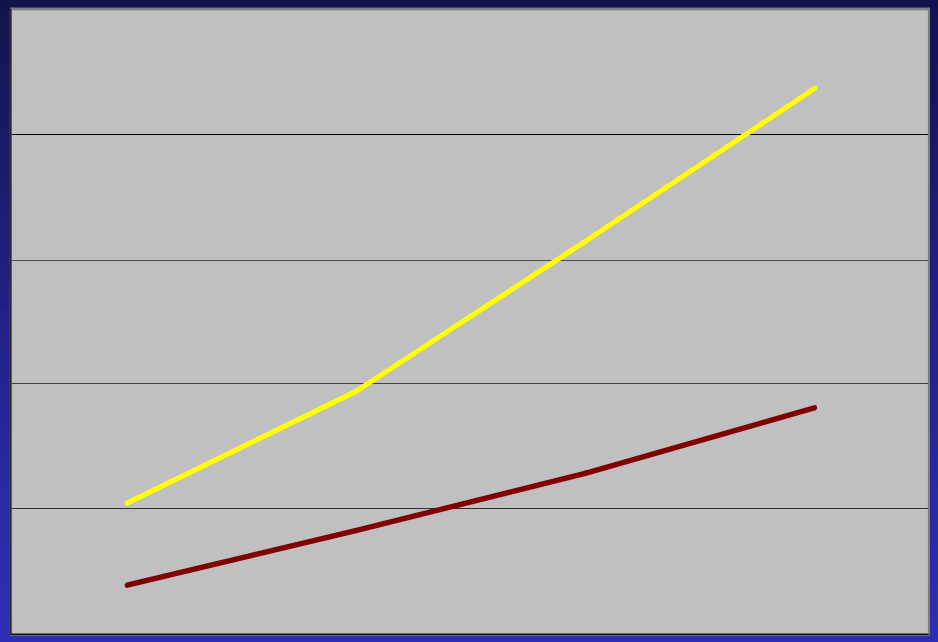
*Worldwide Semiconductor Market **



* Courtesy of Rochester Electronics

- Military market continues to be an insignificant factor
- Must continue to seek innovative solutions to a dwindling supply base

*Worldwide EO Forecast **



Commercial & Dual-Use

Military

* Maxtech International, Inc.

- Majority of dollars remain in military IR systems
- Market erosion by commercial applications
  - Growth rate ~20%
- Optical components comprise larger percentage of commercial system cost
- Military growth not as significant: <10%; led by Airborne applications
  - Requires capture or take-away plan

DMSMS Effects

- Shrinking supply base
  - Unique capabilities required
  - Dependence on labor-intensive equipment and special skills
  - Dramatic globalization-US base has lost the lead in some key areas
  - Increased opportunities in commercial applications
  - Significant consolidation/partnering activity
  - Vertical integration by Prime Contractors
- To counter these challenges we must…
  - Understand the capabilities of our supply chain
  - Form true “strategic partnerships”

DMS & Strategic Sourcing

- OEMS must engage in strategic sourcing activities to mitigate against all life-cycle DMSMS models
  - Started in 1980s by General Motors
  - MFC, like many other OEMs, purchases a significant percentage of products via its supply chain
  - Allows formation of close alliances with supply base to better understand capabilities and technology roadmaps
  - Benefits
    - Minimize costs while reducing risks
    - Improving performance
    - Strong relationships with “best value” supply chain partners
    - Consolidated purchasing power
  - Issues: Suppliers are leery of strategic sourcing initiatives
    - Aerospace industry has been challenged regarding misapplication of strategic sourcing tenets*

* Rossetti, C & Choi, T. (2005). “On the Dark Side of Strategic Sourcing: Experiences from the Aerospace Industry,” Academy of Management Executive, 2005, 19(1).

DMS & Strategic Sourcing Implementation

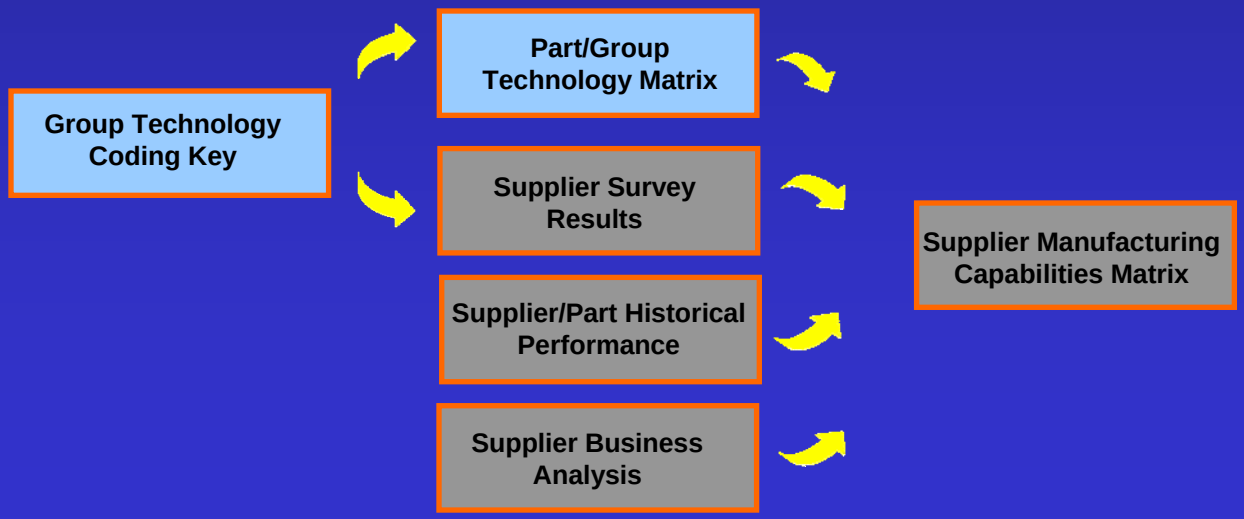
- Strategic sourcing process
  - Assess current supply base purchases
  - Evaluate supply base capabilities
  - Establish optimized supply base
  - Identification of suitable suppliers
  - Implementation of new supply structure
  - Metrics and maintenance

Supplier Manufacturing Capabilities - Introduction

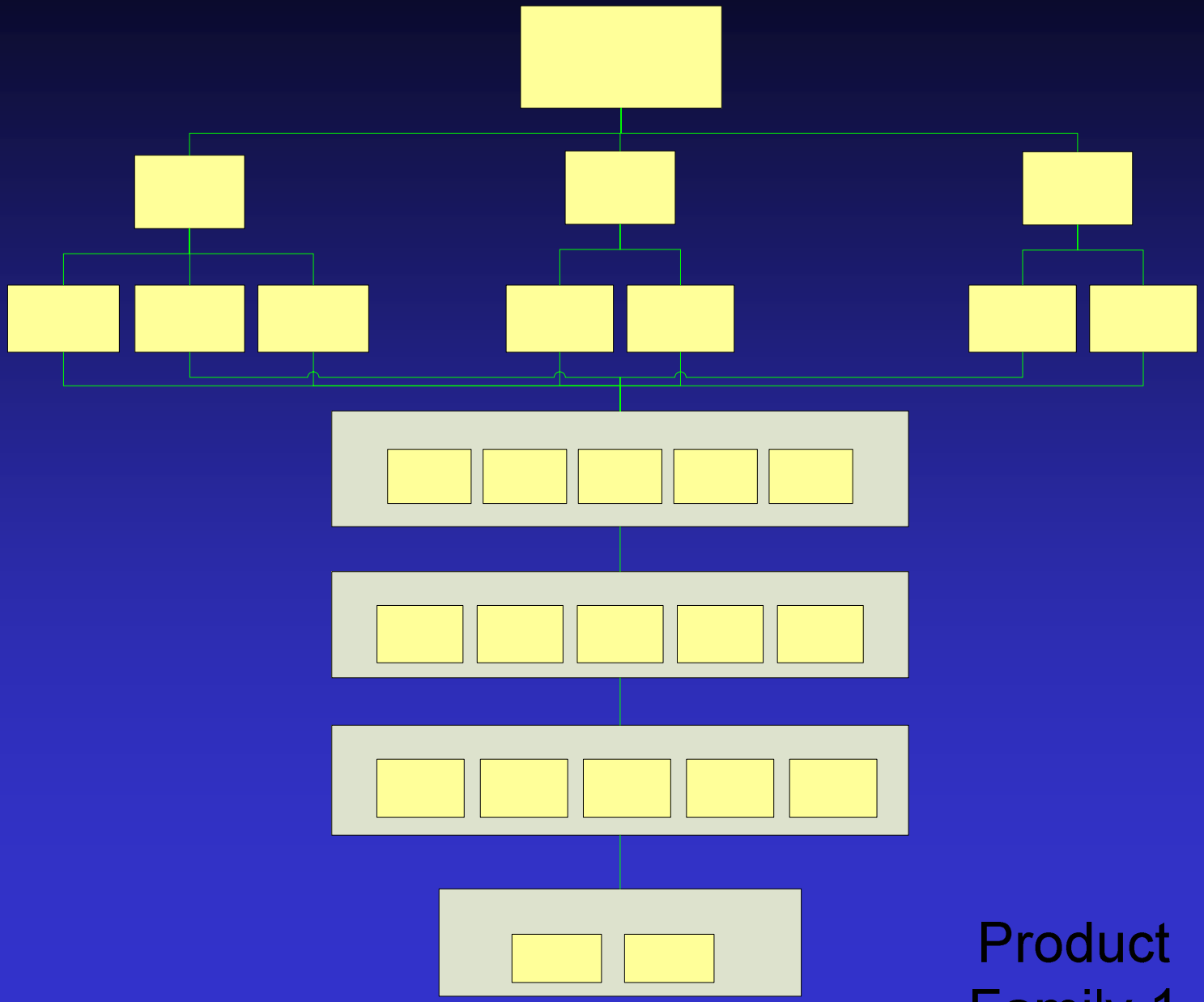
- **Goals:**
  - **To optimize the MFC supply base**
    - **Identify and validate supplier capabilities**
    - **Establish strategic sources**
- **Benefits:**
  - **Provide engineering community with the manufacturing capabilities of the MFC supply base during the design process (design-to-capabilities)**
  - **Provide buyer community and supplier selection community with a tool to assess supplier capabilities and performance to those capabilities during the selection process**

Supplier Manufacturing Capabilities – GT Code

- To effectively compare the supply base, we must establish key characteristics that classify ‘like’ products
- Key characteristics must be based on manufacturing discriminators
- Developed Group Technology coding scheme
  - Uniquely identifies product sets in terms of a hierarchy of manufacturing discriminators
  - Code used to categorize MFC Optics part numbers



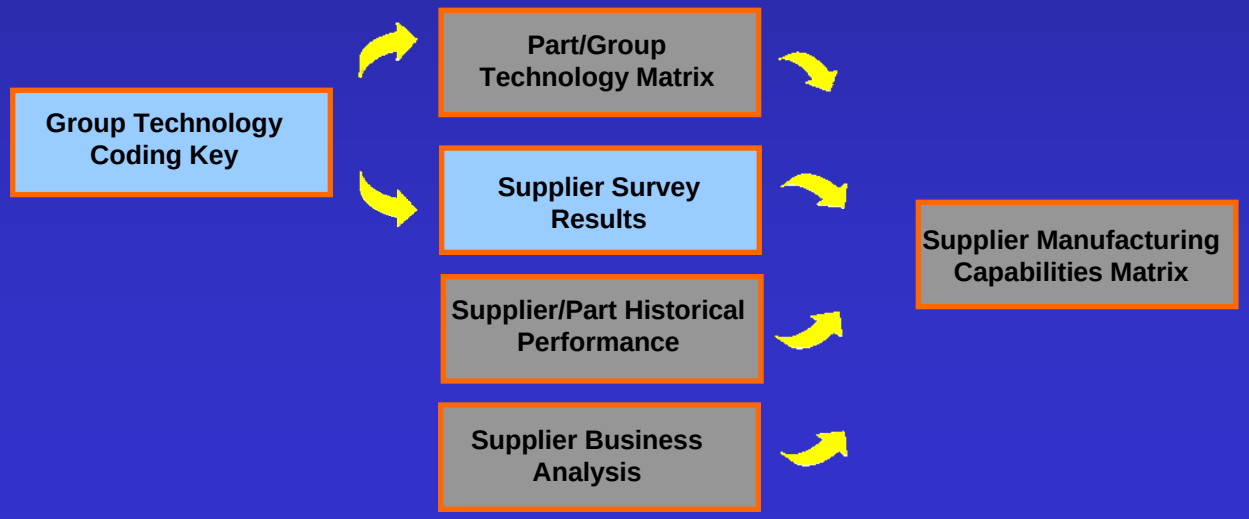
Group Technology Coding - Notional



Product Family 1

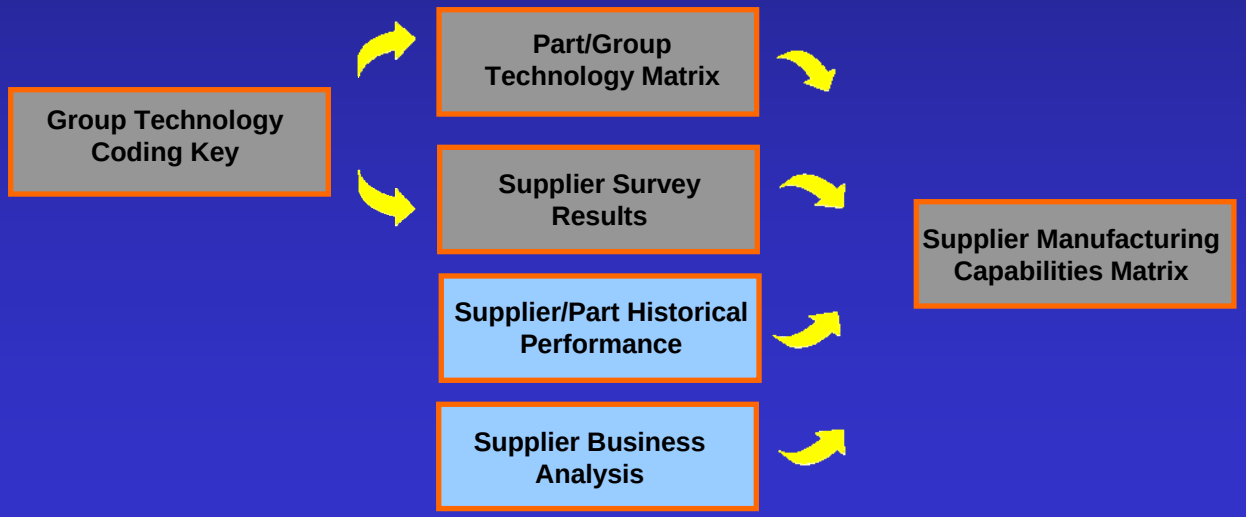
Supplier Manufacturing Capabilities - Survey

- **Determine supplier capabilities**
- **Phase I survey developed and distributed**
  - **Questions focused on establishing capabilities of suppliers relative to Group Technology Code components**
  - **Focused on 4 primary product groups**
- **Demographics & Commodity sections**
- **Business structure & Hierarchical product capabilities**

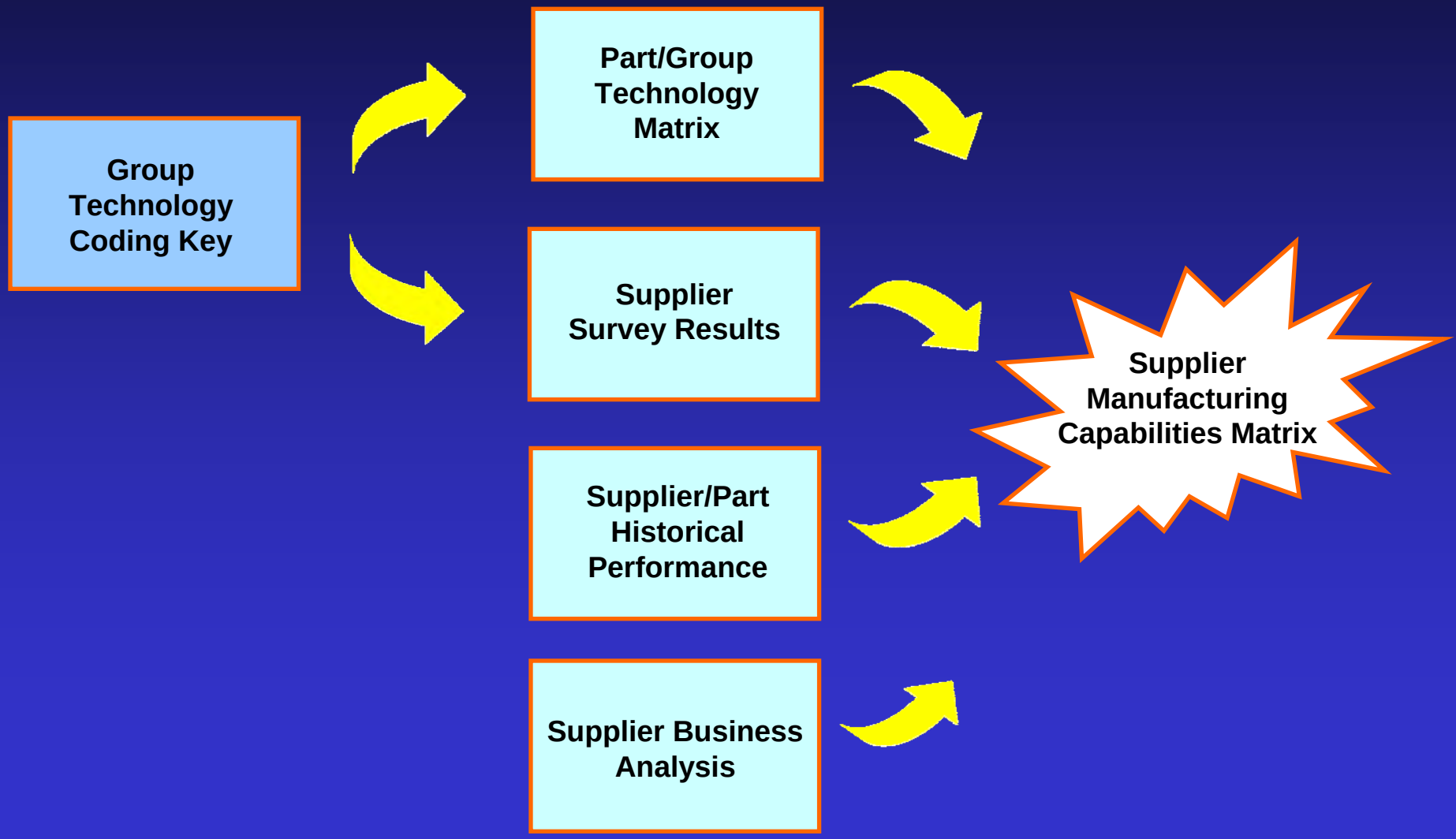


Supplier Manufacturing Capabilities - Validation

- **Validated via historical performance on GT Coded products**
- **Validation of products with no performance history achieved via survey responses and verification**



Data Elements

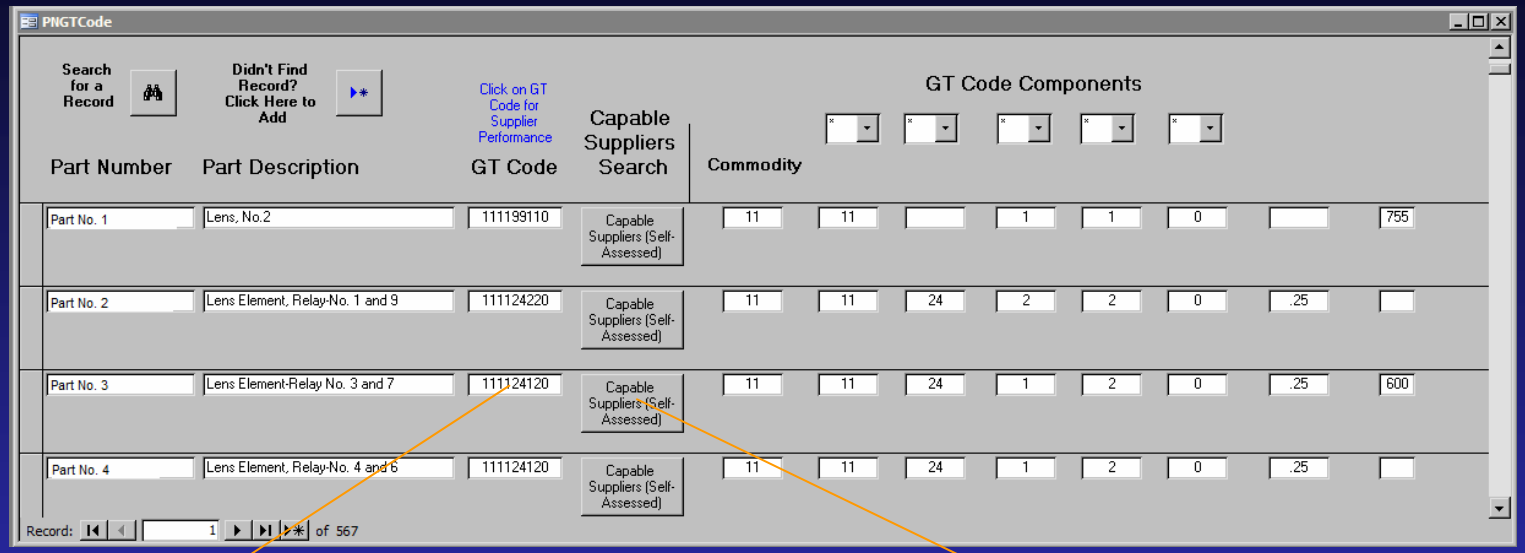


Supplier Manufacturing Capabilities Matrix

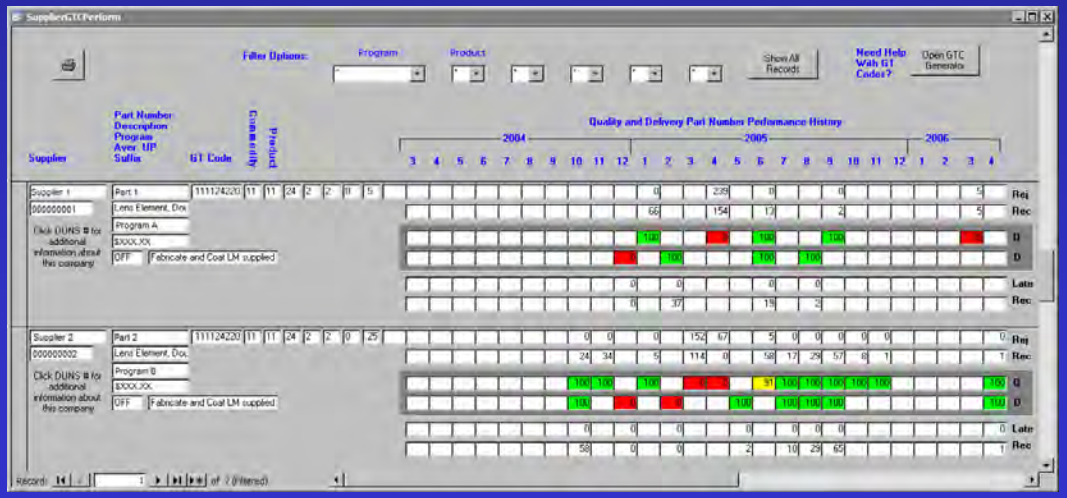
- Supplier Manufacturing Capabilities Matrix
  - Highlights opportunities for resourcing due to poor performance or DMS (Trailing Edge DMS)
  - Identifies supply base to meet product requirements during the design phase (Leading Edge DMS)
    - Identifies if supplier development is required
  - Provides opportunities for supplier engagement
  - Allows review of supply base and performance against any characteristic in the GT Code

Supplier Manufacturing Capabilities

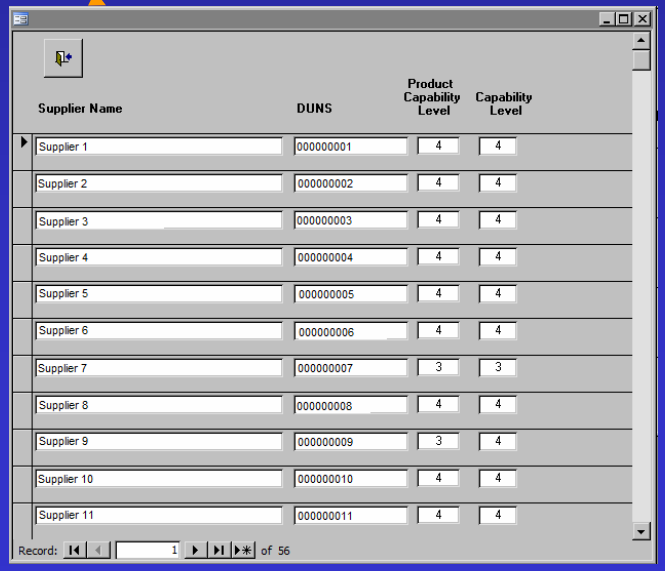
GT Code Assignment/Performance/Capabilities/Company Information



Supplier GT Code Performance

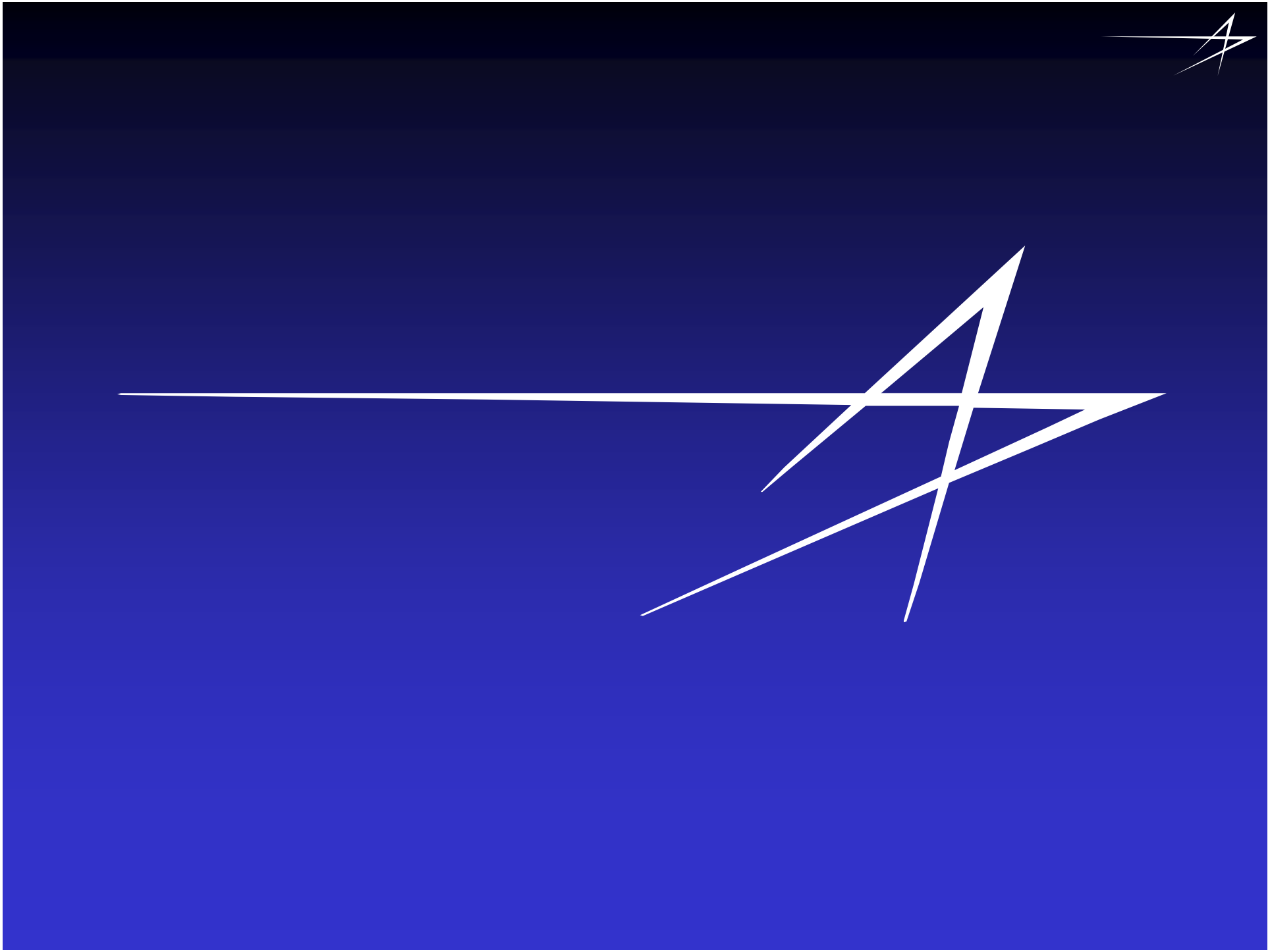


GT Code Capable Suppliers



Closing Remarks

- **As the military supply base continues to dwindle is in inherent upon the OEMs to…**
  - **Understand the supply base**
  - **Identify strategic suppliers**
  - **Engage in and maintain strategic sourcing relationships**
- **Only by teaming can we combat the effects of DMSMS and continue to support warfighter readiness**



Office of the Secretary of Defense

Defense Microelectronics Activity (DMEA)















Restriction of Hazardous Substances (RoHS) Panel

Vance Anderson
Defense Microelectronics Activity
Chief, Microelectronics Design Branch
anderson@dmea.osd.mil
(916) 231-1646

DoD Diminishing Manufacturing Sources and Material Shortages (DMSMS) Conference
July 11, 2006 - Charlotte, NC

www.dmea.osd.mil

Background

There is a global transition to lead-free

- **Reduction of Hazardous Substances (RoHS)**
  - EU Directive banning "placing on market" new electronic equipment containing specific levels of the following after July 1, 2006
    - **Lead**, Cadmium, Mercury, hexavalent chromium, polybrominated biphenyl (PBB), polybrominated diphenyl ether (PBDE) flame retardants
- **Waste Electrical and Electronic Equipment Directive (WEEE)**
  - EU directive aims to minimize the impact of electronic waste
  - Encourages and sets criteria for collection, treatment, recycling
  - Makes the *producer responsible*
- Related legislation underway in China, Japan, Korea, California

Lead-free brings new and re-emerging failure modes in electronics

Why is Lead-free a problem?

- DoD acquisition programs are increasingly dependent on ***commercial*** electronic parts and assemblies (COTS)
- DoD (and Aerospace) systems have unique requirements
  - High reliability systems
  - VERY long service life
  - Extended temperature ranges
  - We still *repair* boards!

Lead-free Impacts on DoD

- The lead-free transition brings a host of issues
  - Lead-free solder issues
  - Tin whisker failures
  - Availability of leaded solder and components (DMS)
  - New repair processes
  - Configuration control

The DoD must continue to field reliable and supportable systems to meet mission requirements

RoHS Panel Members

- **Mr. Charlie Minter**
  Technical Risk Manager
  Office of Naval Research/Best Manufacturing Practices Center of Excellence (ONR/BMPCOE)

- **Dr. Stephan Meschter**
  Ph.D., Senior Engineer
  BAE Systems

- **Mr. Lloyd Condra**
  Advanced Platform Systems, Phantom Works
  the Boeing Company

- **Dr. Craig Hillman**
  CEO and Managing Partner
  Design For Reliability (DFR) Solutions



DMSMS Orientation---OSD View

Presented To

DMSMS Work Shop

13 Jul 2006

Presented by

John Becker, DMSMS Program Director
Defense Standardization Program Office

Agenda

- Background
- DMSMS Strategic Framework
- Perceptions after 12 months
- Way Ahead as a Body
- Accomplishments
- Key Projects
- End State Envisioned

USD/ATL launched us…

Policy memo issued August 16, 2004

Business Objectives

To address this challenge, I direct the Total Life Cycle Systems Management (TLCSM) Executive Council to form a subgroup to achieve the following objectives:

1. Define DoD microcircuit requirements (short and long term) and develop a technology roadmap for all weapon systems.
2. Create consistent predictive techniques for testing, configuration database management, preferred parts lists, and preferred suppliers to control product development, upgrades, and redesigns.
3. Develop and manage the industrial base and organic capability necessary to assure product availability.
4. Optimize the relationship between organic supply and redesign/repair capabilities.
5. Make recommended changes to organization, policy, procedures and design rules to fulfill the above.

Roles and Responsibilities

1. **DMEA: Engineering Solutions**
2. **DKSP/GIDEP/DSPO: IT Enablers**
3. **DSCC/IST: Supply Solutions**
4. **Commodity Council: Procurement Solutions**
5. **DMSMS WG: Policy Recommendations**

USD/ATL launched us…(Con't)

6/23/2005 policy memo accompanied Charter

Subject: Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) Working Group Charter

On August 16, 2004, the Total Life Cycle Systems Management (TLCSM) Executive Council was directed to address the challenges of obsolescence within DOD Weapon Systems, a problem we also describe and is widely known as Diminishing Manufacturing Sources and Material Shortages (DMSMS). Where pro-active DMSMS management efforts are employed, the impact on readiness and the spending to achieve it is mitigated; where the management efforts are merely reactive, DMSMS impacts on readiness and the associated spending are harmful.

Since that time, positive steps have been taken to facilitate the achievement of the business objectives in the aforementioned directive. Among them are the following:

1. Issued the DMSMS Guidebook for Program Mangers, available on the Defense Acquisition University (DAU) website at http://acc.dau.mil.
2. Made available web-based and instructor-led training modules in support of the Continuous Learning Credits Program at DAU.
3. Established an organization that oversees the development of the DMSMS Center of Excellence (COE) to ensure the COE's products and services meet the requirements of the DMSMS Community worldwide.

There is more work required, and the attached charter creates a formal organization to ensure successful DMSMS management. Working Group membership includes representatives from other government departments and agencies because we share a common challenge and desire to share in the development of solutions to DMSMS obstacles. This Working Group is the centralized focal point for DMSMS mitigation planning, policy, and guidance for DoD.

I urge your support of the DOD DMSMS Working Group so that our strategic goals in this important area will be achieved.

Kenneth J. Krieg

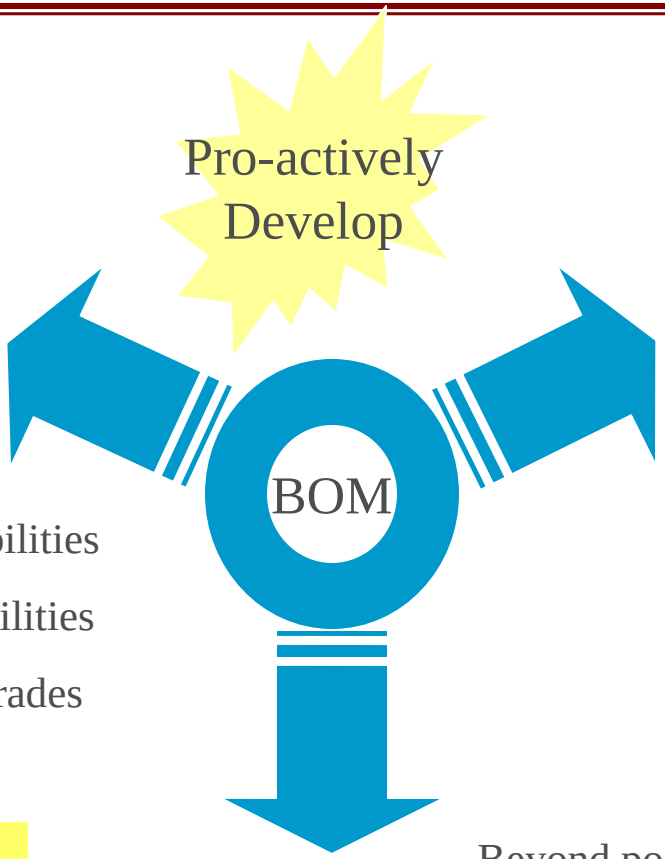
Charter States

- **Purpose and Scope:**
  - This Charter identifies and establishes the Diminishing Manufacturing Sources and Material Shortages (DMSMS) Working Group (WG) as the centralized focal point for DMSMS mitigation planning, policy, and guidance for the Department of Defense (DOD).
  - Develop recommendations to DOD policy and procedures to reduce DMSMS risks and impacts and to encourage aggressive and proactive management of DOD systems by government personnel and with industry advice.
- **Functions:** Meet on a quarterly basis to plan and execute its responsibilities, the Working Group performs the following functions:
  - Develop objectives to institutionalize the DMSMS program and publish them in the DMSMS Working Group Strategic Plan.
  - Promote the utilization of efficient DMSMS management practices through education, training, awareness, and sponsoring DMSMS conferences for data exchange and DMSMS staff education.
  - Serve as the DMSMS problem and solution set Champion for Government and Industry.
  - Identify, define, and establish DMSMS activities and functions as required, to enhance the efficacy and cost-effectiveness of obsolescence mitigation within the DOD.
  - Conduct ongoing selected assessments of adequacy and effectiveness of obsolescence (DMSMS) risk mitigation efforts of Programs and help them to be as good as they can be.
  - Coordinate with other OSD-sponsored initiatives and/or functions as appropriate.

DOD DMSMS Working Group is developing it's own strategic plan

DMSMS for Microelectronics

Strategic Framework



Engineering Solutions

5%...

-Industry Capabilities

-Organic Capabilities

-Pro-active upgrades

-DMEA Lead

Supply Solutions

95%…

-Data Sources

-Search Engine

-Notification Policy

-DSCC/IST Lead

We Offer

Programs Decide

Procurement Solutions

-Beyond pooling

-Beyond preferred parts

-Business Practices

-Commodity Council

Working Group Meeting
Objectives

- To share relevant information
  - Ask not what others can share with you, ask instead what you can share with others.
- To provide evidence that we are making a difference
  - That is not me making up stories, it is based on members providing testimonials, BCA's, studies, data, etc..
- To see their smiling faces occasionally

I want us to have a compelling case to be re-authorized come Mar'08—that is when our sunset clause kicks in

Perceptions after 12 Months

(as chairman of WG)

- For any effort or project or initiative to be maximally effective, Top Leadership must be supportive
  - TLCSM EC supports us
- For any effort to sustain a robust funding stream, there must be a BCA to support it
  - We are building BCA's as we go
- We now have an executive body and a sub-committee structure that needs to be mutually supportive
  - Key role of WG is to find the money

Way Ahead—as a Body

Focus on Needs of Reactive Programs

- **Outreach Committee**
  - Assist Visits
  - Roadshows
  - Work Shops
  - OEM Participation
  - Awards
- **Interoperability Committee**
  - DMSMS focus for sharing with allies.
  - Data exchange protocols.
  - DISA and IC assistance.
- **Common Use Tools Committee**
  - Gap Fillers.
  - Rank-order needs.
  - Rough-cut business case.
- **Conference Committee**
  - Industry Stakeholders
  - Leverage DoD affiliations
- **Working Group**
  - Prioritize and Guide Sub groups.
  - Find the money.
  - Identify policy needs to TLCSM EC.

Diminishing Manufacturing Sources and Material Shortages Working Group

Strategic Plan

To minimize Diminishing Manufacturing Sources and Material Shortages (DMSMS) risks and impacts, USD/ATL issued a policy memo, dated June 23, 2005, for the establishment of a DMSMS Working Group (WG). This memo assigned a set of business objectives and a charter was created forming an organization to share in the development and propagation of solutions to DMSMS impediments. The DMSMS WG strives to achieve these goals, the vision, and their mission by pursuing the strategy outlined below.

Mission

The mission of the WG is to advocate management techniques, tools, and policies that facilitate pro-active DMSMS management practices across all programs.

Vision

The Working Group promotes proactive solution sharing and knowledge propagation to minimize DMSMS impacts. As such, an intelligent mix of management processes, tools, and new technologies are required to alleviate DMSMS impacts expeditiously and economically. These initiatives will link federal agencies, foreign military sales customers, manufacturers, and distributors in the cooperative development and sharing of DMSMS solutions. Ultimately, DMSMS management processes will be institutionalized throughout all system life cycle phases across the community.

Strategy

1. Formulate recommendations to DOD policy and procedures that streamline regulations and practices to reduce DMSMS impacts and further encourage aggressive and proactive management of DOD systems by both Government and industry personnel.

2. Promote the utilization of DMSMS management best practices through education and training.

3. Promote DMSMS case resolution data sharing to facilitate creation of an internal benchmark that may be used by Program Managers and to establish meaningful performance benchmarks by Performance Based Logistics providers.

4. Promote sharing information about progress against the WG's strategic plans, highlighting those areas that need to be continued and those areas that need to be de-emphasized.

5. Identify or develop, as necessary, specific contract language templates beneficial to the Services' DMSMS programs.

6. Accumulate and share examples of accomplishments, best practices, success stories, and performance data attributable to the efforts of the Working Group.

7. Develop and provide metrics pertaining to the effectiveness of the DMSMS programs.

8. To charter, provide leadership and guidance to, and provide necessary resources to sub-groups for ad-hoc tasks required to meet the goals and objectives of the DMSMS WG.

Accomplishments

- WG Organization we can build on
- DAU Distance Leaning Modules
- WG Strategic Plan
- Re-established links to TLCSM EC
- DSPO enhances DMSMS efforts
- DMSMS and related CDF's being coordinated at national level
- DMSMS Guidebook

I have no evidence that facts on the ground have changed in any significant way. Much work to do.

Key Projects Underway

- DMSMS PlanBuilder
- DAU Distance Leaning Module
- Assist Visits
- Data Initiative Consolidation under GIDEP
- Interoperability DEX
- DMSMS & DKSP BAA at Crane
- Trusted Source Policy with IP as lead
- LMT Pilot—ATL Goal #4 & #5

Vision of End State

- PPP based on PBL to assure availability
  - Duplicates, alternates, substitutes
  - Including GEM offering
  - Entire DoD installed base of microcircuits
  - Anticipate future capabilities needed via Technology Roadmap
- DSCC anchor of the Public Team
- Prime Vendor anchor of the Private Team

Key Activities Ahead

- Technology coming on line, processes converging to one, organizations learning to work together. Do we have the willpower to sustain the effort?
- Islands of excellence within and outside government playing solo. Can we form a symphony voluntarily?

Back-up

AT&L Goal 4:

Cost-effective Joint logistics Support for the Warfighter

Outcomes

- **4.1.** Integrated, effective end-to end supply chain operations.
- **4.2.** Optimized equipment/systems design and sustainment reliability
- **4.3.** Achieve DoD/OMB/GAO supply chain management improvement program targets
- **4.4.** Cost-effective logistics and materiel readiness policies and programs

AT&L Goal 5:

Reliable & Cost-effective Industrial Capabilities Sufficient to Meet Strategic Objectives

Outcomes

- **5.1.** Effects of DoD policy and program decisions on the industrial base, and the extent to which industry decisions limit or expand DoD options,understood.
- **5.2.** DoD research and development, acquisition, and logistics decisions expand and sustain the industrial base to encourage competition and innovation for essential industrial and technological capabilities.
- **5.3.** Statutory processes and decisions leveraged to enable a capable,competitive, and reliable industrial base.
- **5.4.** Contract finance and profit policies drive desired results.

DMSMS 2006
A Semiconductor Market Perspective

Bryan Brady

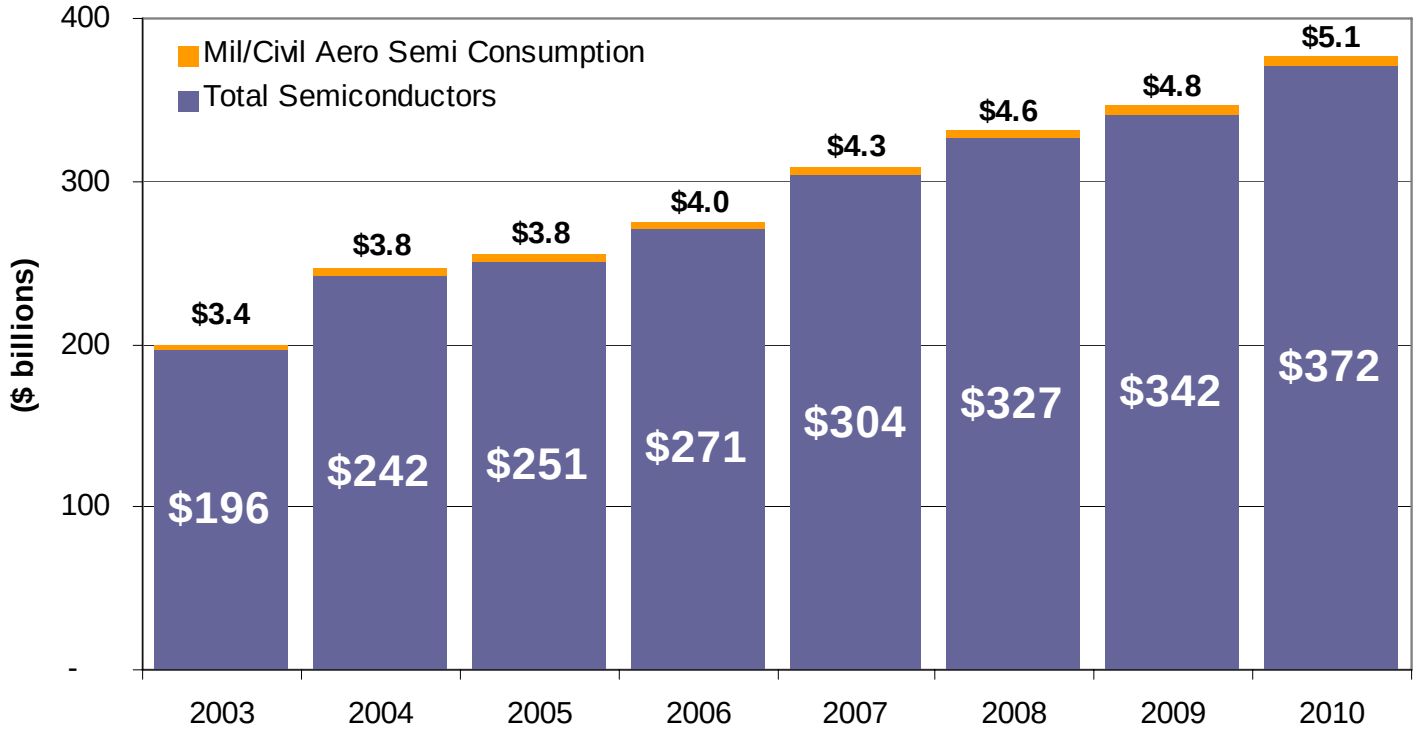
Vice President, Defense Aerospace Business

July 11, 2006



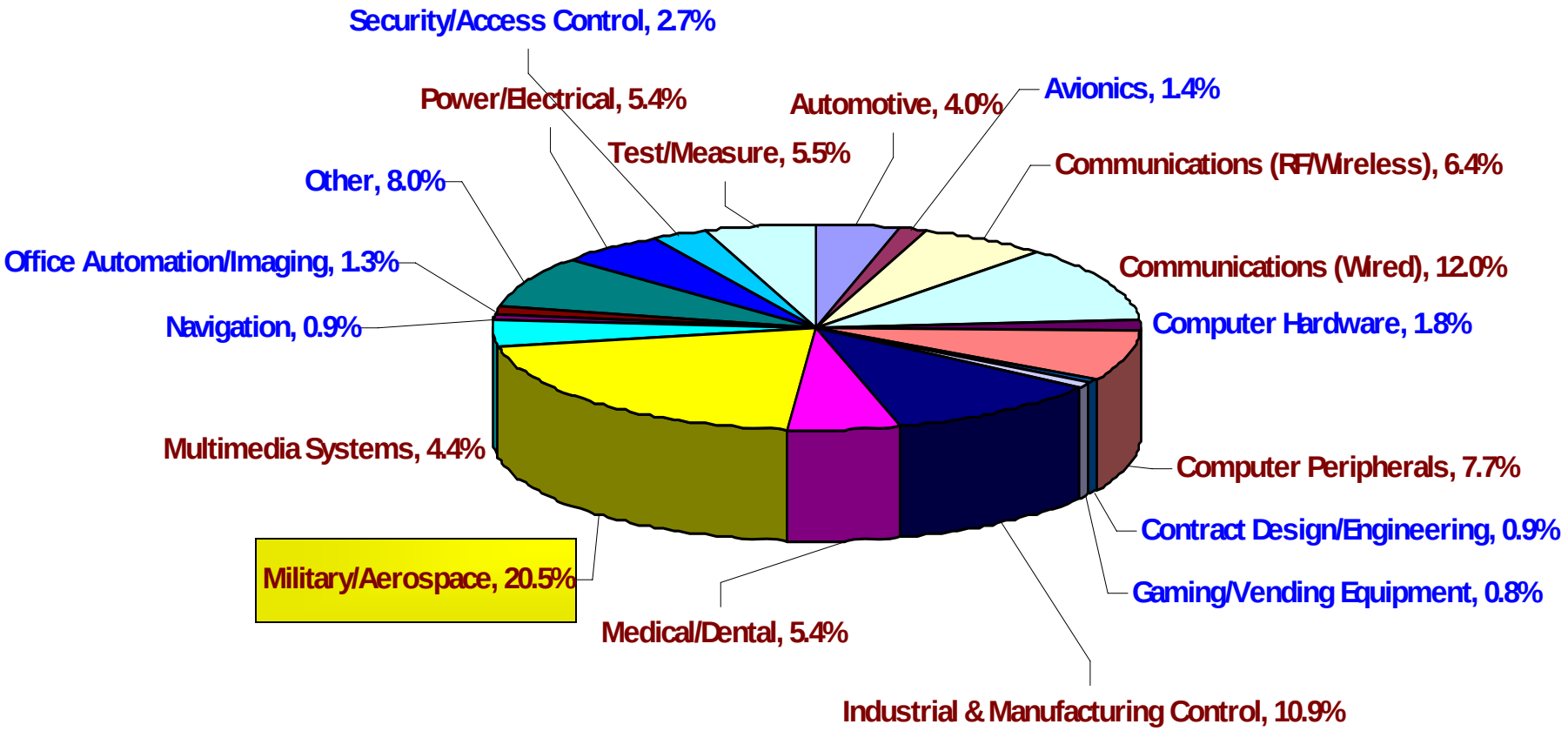
The Situation at Hand

> Not a market driver, a market participant



Source: iSuppli AMFT (6/30/06)

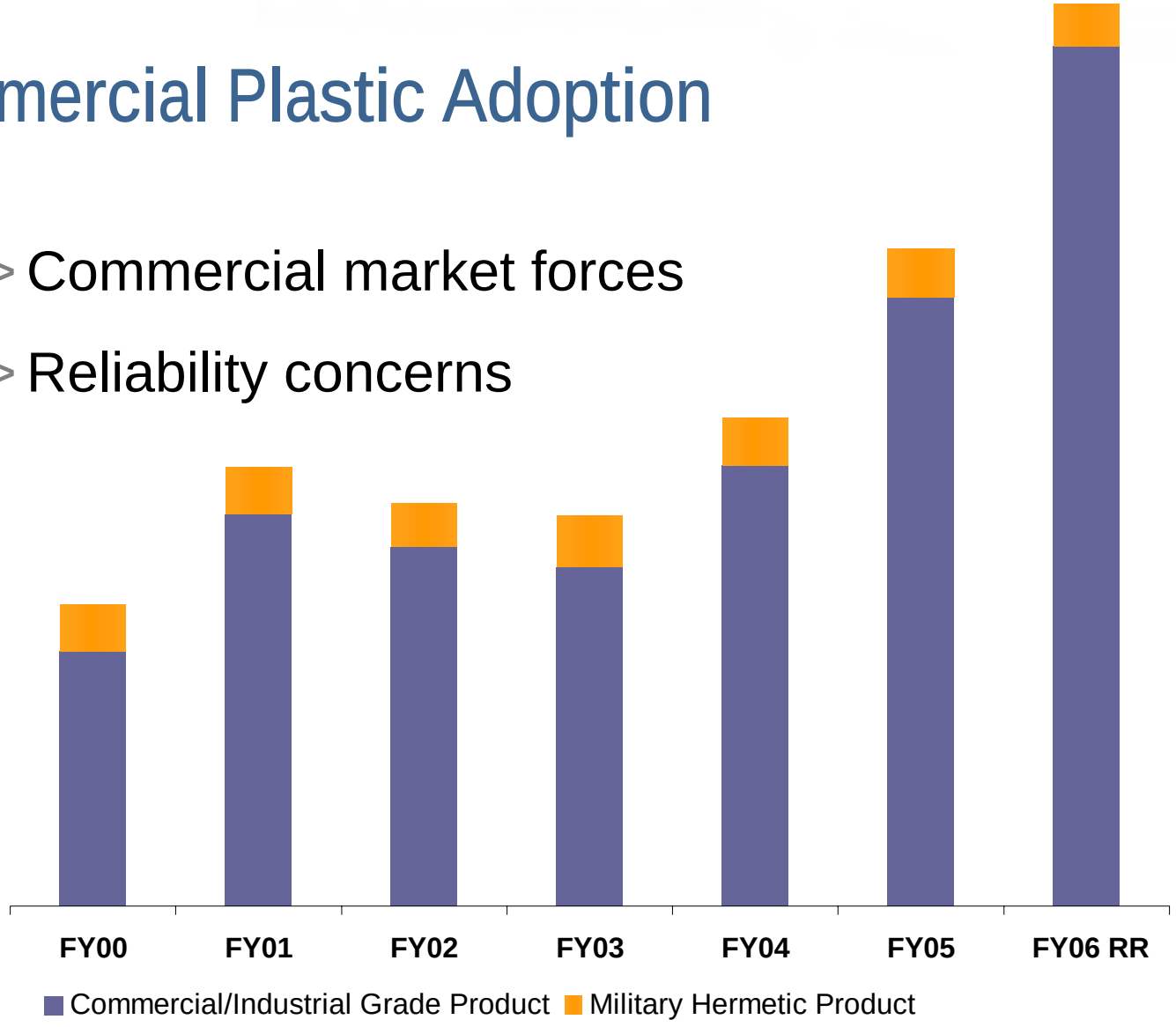
An Important Participant



Commercial Plastic Adoption

> Commercial market forces

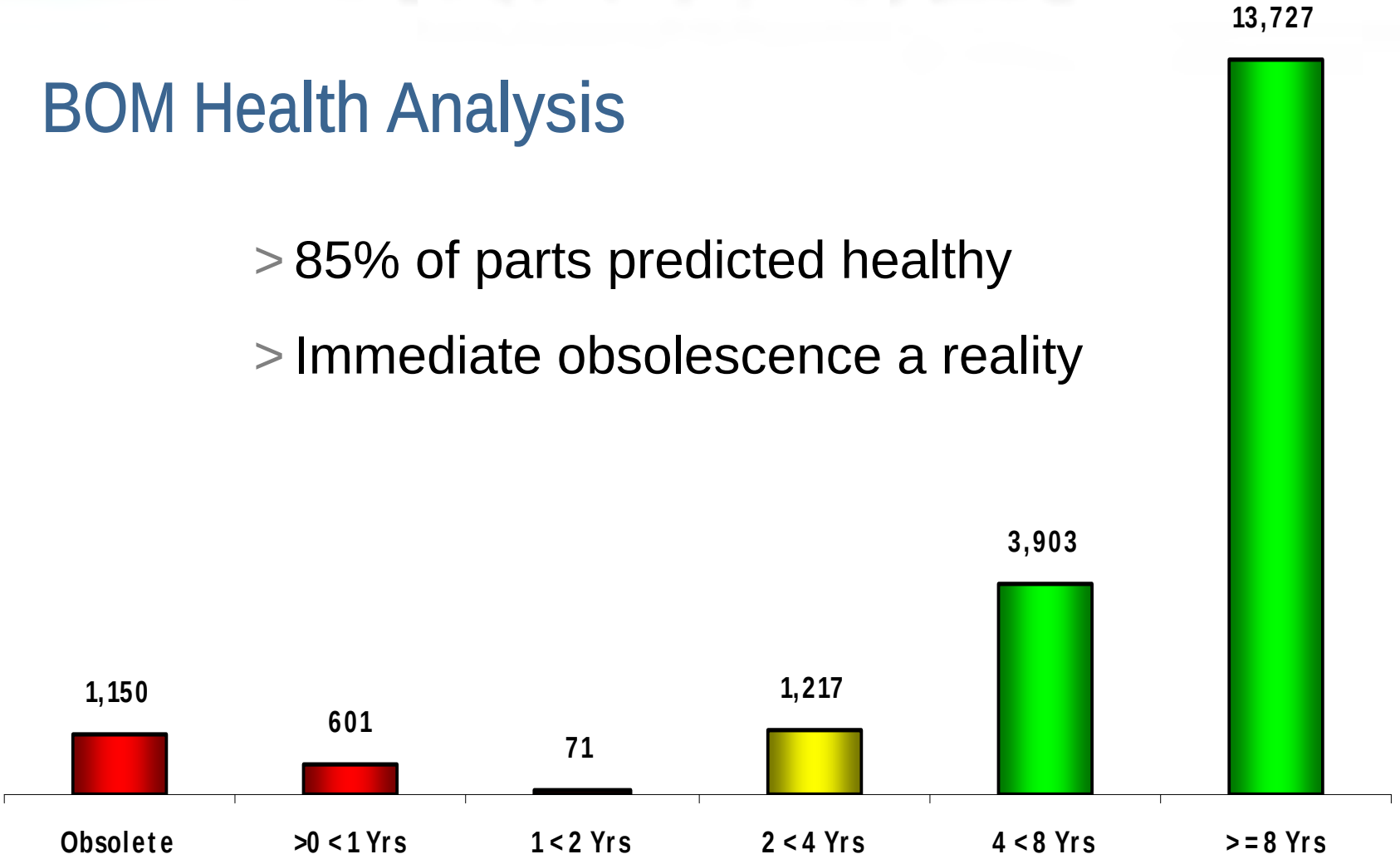
> Reliability concerns



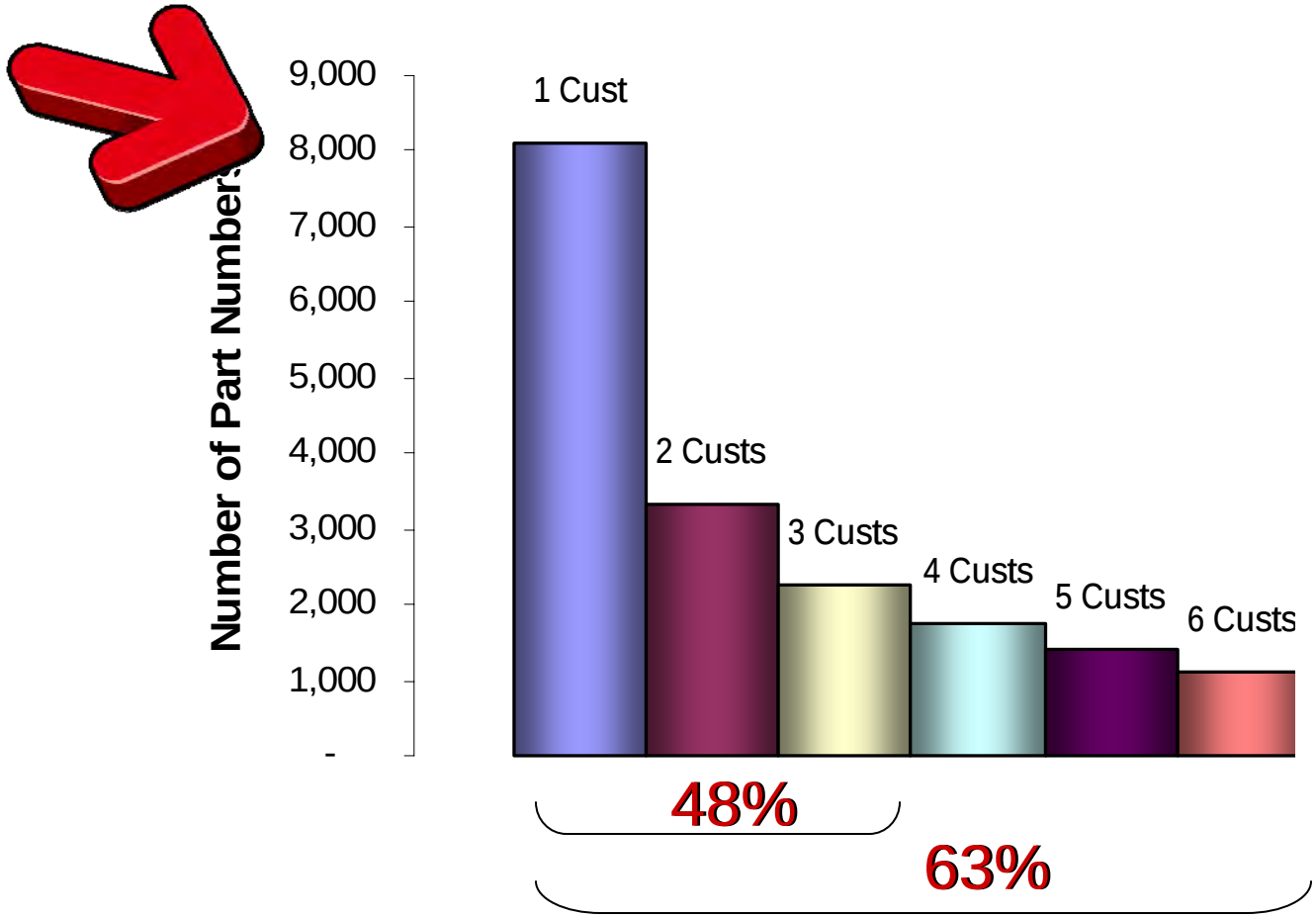
BOM Health Analysis

> 85% of parts predicted healthy

> Immediate obsolescence a reality



Narrow Customer Base Increases Obsolescence Risk



RoHS Trends: Good News, Bad News

- Americas' transition slower than expected
- Lingering demand for leaded product
  - Non-Cancelable Non-Returnable
  - Higher prices
- Aftermarket manufacturers to offer leaded
- Data integrity challenges continue
  - 30% of RoHS parts not changing part number
  - Traditional EOL/PCN triggers may not be sent

Trends in the Aftermarket

- Broker market significant source of supply
- Sophisticated design and manufacturing capability
- Distributors' market data and capital making aftermarket more efficient
- Increase in product line exits over next 2-4 years

In Conclusion

Risk can be reduced through collaboration

- AQEC suppliers can improve your reliability decisions
- Better long term forecasting will improve supply at reduced costs
- Distributors can aggregate and invest more aggressively with good forecasts
- Parts management challenges are a business reality, services are available to assist

A fundamental rule in technology says that whatever can be done will be done.

Andrew S. Grove
Former Chairman of the Board of Intel Corporation



What Makes a Good DMSMS Management Program?
The 782 CBSSS/ENB
F-15 Avionics Hardware Engineering Approach

DMSMS Conference July 2006

Sam Calloway
782 CBSSS/ENB/
F-15 Avionics Hardware Engineering
DMSMS Program Manager

Overview

- Problem Statement
- DMSMS Management Process
- Conclusion

Problem Statement

- The F-15 Sustaining Engineering and Supply Chain Management efforts is being seriously impacted by continuing platform service life extensions and necessitate a proactive engineering response to DMSMS management.

The Process: The First Steps.

- Admit that you have a problem.
- Assess your current state
  - Complete, accurate Design Engineering Data?
    - Bill Of Material
    - Accurate Derivative Documents (e.g. IPB's)
  - Complete, accurate Supply Chain Data?
    - Total Ownership Costs?
    - Complete, Accurate Repair Histories?
    - Funding Sources
      - Monitoring
      - Resolution

The Process: The Next Steps.

- Correct your deficiencies.
  - Bill of Materials
  - Supply Chain Data
- Identify the tools necessary to automate the monitoring, analysis and resolution efforts
  - Advanced Component Obsolescence Management (AVCOM)
  - Logistics Sustainment Analysis Module (LSAM)
  - Lean Depot Management System (LDMS)

The Process: The Next Steps.

- Monitor Your Approved Vendor Base For Continued Product Availability
  - Alerts
    - GIDEP
    - System OEMs
    - AVCOM
  - Requisitions/Back-orders
    - LDMS
    - DLA Inventory

The Process: The Next Steps.

- Act
  - Identify your most urgent problem(s).
  - Determine the best approach for resolution.
    - Circuit Card Assembly redesign.
    - Target the component.

The Process: The Next Steps.

- Communicate
- Form Partnerships and Alliances
  - Inside DoD
  - Outside DoD
- Identify commonality
    - DLA
    - Intraservice (e.g. B-2, C-130, F-16, U-2)
    - Interservice (e.g. USAF, Navy, Army, FMS)

DRARST: An Example of a Working Alliance.

- DRARST (DoD Raytheon Airborne Radar Sustainment Team)
  - Many of the electronic components and microcircuits used in one radar system are common to at least one other platform.
  - DRARST members feel that sharing assets and costs among the services to resolve obsolescence issues is the best solution for the individual Program Managers and Defense Service Centers providing engineering, and logistics and supply support for legacy radar systems.

DRARST: An Example of a Working Alliance.

- DRARST (DoD Raytheon Airborne Radar Sustainment Team)
  - The inaugural meeting was conducted August 2002 with representatives from F-15 System Program Office and F-15 Avionics Hardware Engineering office, the Aging Aircraft Integrated Product Team (AAIPT), Defense Service Center Columbus, NAVAIR F14 & F-18 Program Offices, NAVICP Program Offices, USAF B-2, AC-130U Gunship Program Offices and the Raytheon B-2, F-15, F-18 Program Offices, their Microcircuit Producibility Facility, and Raytheon Systems Limited UK in attendance.

DRARST: An Example of a Working Alliance.

- DRARST (DoD Raytheon Airborne Radar Sustainment Team)
  - Savings realized through shared projects coordinated or managed by DRARST:
    - Savings to the USAF customer realized through identification of life-of-type purchases of existing vs. costly redesign of components: Excess of $49 million.
    - Savings to each program office (DoD (F-15 and B-2) and Raytheon (F-15, F-18, and B-2)) through shared costs to redesign and qualify a manufacturing source for needed components: Excess of $3.5 million.

DRARST: An Example of a Working Alliance.

- DRARST (DoD Raytheon Airborne Radar Sustainment Team)
  - Savings realized through shared projects coordinated or managed by DRARST:
    - NAVAIR/F-18/PMA-265 recently has submitted funds in a cooperative cost sharing effort with 782 CBSSS/ENB to redesign the ASIC common to both the 655879 & 655874 hybrids resulting in a 50% reduction in the outlay of funds by each program to resolve obsolescence issues in both hybrids.

Conclusion

- Engineering And Logistic Support Is Seriously Impacted As The Service Life Is Extended Beyond Original Predictions.
- Proactive Management is the best approach.
- Strategic alliances are a must.
- DRARST works.

F-15 DMSMS Program Manager

Samuel J. Calloway

F-15 System Program Office

Avionics Hardware Engineering

WR-ALC/782 CBSSS/ENB

296 Cochran Street Bldg 300

Robins AFB, GA 31098

478-926-3594

Samuel.Calloway@robins.af.mil

Alternate Point of Contact

Mark A. Stibitz

F-15 System Program Office

Avionics Hardware Engineering

WR-ALC/782 CBSSS/ENB/Raytheon R&M Engineering

296 Cochran Street Bldg 300

Robins AFB, GA 31098

478-926-6547

Mark.Stibitz@robins.af.mil

F-15 Avionics Hardware R & M Engineering

WR-ALC/782 CBSSS/ENB and RAYTHEON



Taking the Eagle into the 21st Century...

DMSMS – A View from the Middle

Component Manufacturer/Arrow Zeus Electronics/Customer

Rick Catoe

Arrow Zeus Electronics

A View from the Middle

- Arrow Zeus Electronics
  Supply chain position
- DMSMS Drivers
- Why DMSMS programs deliver mixed results
- Arrow Zeus' approach to DMSMS

Arrow Zeus Electronics

- The only broad-line electronics distributor focused *exclusively* on servicing the Aerospace and Defense customer base

- Maintain 30+% share of the A& D electronics distribution market

- Franchised distributor for over 600 electronics manufacturers worldwide
    - Component manufacturers view franchised distributors as THE source for timely and accurate information
    - Components Distributor vs. Information Provider

DMSMS Drivers in Electronics Commodities

Component life cycles vs. Program life cycles
- Design to production cycle
- Production cycle + Service/Support
- COTS impact

Market economics
- Commercial market drives electronics industry
- Manufacturers exiting the mil-spec market

RoHS
- inconsistent manufacturer strategies
- “silent killer”

The RoHS Impact

Although A& D applications are exempt from the RoHS legislation, the impact is significant

- Will suppliers continue to build parts on both processes making leaded devices available?
- Impact on Supply Chain
  - Part numbering changes
  - Process change
    - Moving form SnPb to Multiple finish types
    - Qualify and test on new process
- Lead free transition will increase the rate of obsolescence for COTS components

DMSMS Management Delivers Mixed Results

- Reactive structure to program
- Decentralized approach
- Minimal clarity of ownership and escalation path
- Solutions are not program centric
- Down stream lack of focus
- Lack of resources
- Limited front end engineering focus
- Lack of funding

The Arrow Zeus Approach to DMSMS

- Continuing Life Programs
  - extending the life of a device once the manufacturer is no longer interested in producing (Cypress and NSC)

- Significant Inventory Investment
  - finished goods available to sell
  - die form ready to build out

- DMS Management Programs
  - outsourcing the proactive management of component availability and PCN's to Arrow Zeus

Product Change Notices – Types of Alerts Reported

Status Changes	Non-Functional Changes	Manufacturing Changes
End Of Life	Shipping / Packing	Assembly Process
EOL Reversal	Labeling & Packaging	Test Site
Removed From Cost Book - NC/NR	Marking	Wafer Process
Removed From Cost Book - NC/NR Reversal	Nomenclature change	Wafer Site
Not For Design	Molding	Test Process
Alert/Recall	Supplier Edit / Update	Assembly Site
		Lead-Free / RoHs

The Benefits of Arrow Zeus' DMS Program

Delivers component intelligence at critical points along the Product Life Cycle

- Reduces liabilities resulting from designing-in parts that are EOL, likely to become EOL, or are NC/NR
- Allows for evaluation and comparison of multiple parts that meet technical and environmental criteria
- Provides ongoing monitoring of parts on the Master List or Projects List
- Delivers cost and time savings through reductions in redesigns and improved obsolescence visibility
- Allows easy identification of procurable second sources in times of supply crisis

DMSMS Summary

- DMSMS is a significant challenge facing the Aerospace and Defense industry
- Continued economic pressures driven by the commercial market coupled with regulations such as RoHS, will fuel obsolescence
- As a major components distributor and an information provider, Arrow Zeus is well positioned to mitigate the risks associated with DMSMS in the electronics industry

Boeing Technology
Phantom Works

Aerospace Industry Response to the

Restrictions on Hazardous Substances (RoHS) Directive *on Military and Aerospace Systems*

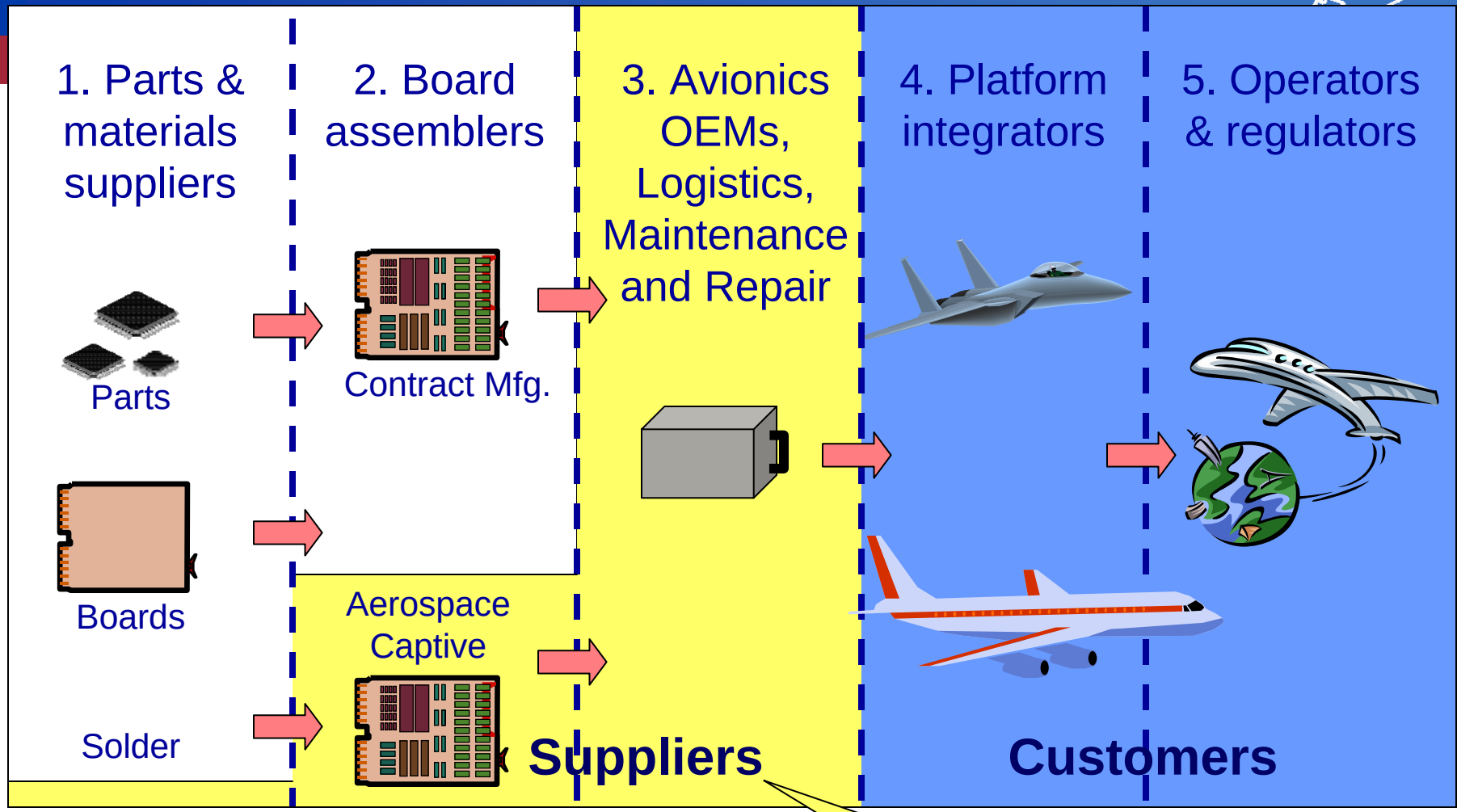
DoD DMSMS Conference

Charlotte, NC

10 July 2006

Lloyd Condra, Boeing
LEAP WG Chairman
206-655-8240, lloyd.w.condra@boeing.com

The Avionics Supply Chain



Non-aerospace Control

Aerospace Control

Majority of costs are incurred here

Suppliers

"Care-abouts"

- **Do I have to make the transition?**
- **How much will it cost?**
- **What do my customers want?**
- **How do I satisfy my customers?**
- **How much will it cost?**

Options

- **Transition to lead-free**
- **Stay with SnPb**
  - **Assembly materials**
  - **Component terminations**
- **Operate parallel lines**
- **Do only what my customers require**

Customer “Care-abouts”

1. **Reliability**
2. **Configuration Control**
   (Obsolescence)
3. **Limitations on Use**
4. **Tin Whiskers**
5. **Repair and Maintenance**
   (Obsolescence)

We care about what we’ve always cared about

What We (Customers) Must *Not* Do

- **Fragment our efforts**
  - **Program-by-program approach leads to confusion**
  - **Potential for conflicting requirements**
- **Solve one problem by causing another**
  Don't impose technical solutions on suppliers
- **View the problem too narrowly**
  This is not just a logistics problem – it involves design, operation, repair, etc.

Industry Activities

- **Lead-free Electronics in Aerospace Project Working Group (LEAP WG)**
  - Formed in 2004 by AIA, AMC, and GEIA
  - Includes international industry and government leaders
  - Addresses primarily technical issues that are (1) unique to aerospace/military, and (2) within control of aerospace/military
  - Deliverables are military and aerospace industry consensus documents, published by GEIA (US) and IEC (international)

- **Executive Lead Free IPT**
  - Formed in 2005 by DoD
  - Includes US industry and government leaders
  - Addresses business, strategy, awareness issues
  - Deliverables are lead-free policy recommendations to government

LEAP WG *Actionable Deliverables*



Boeing Technology | **Phantom Works**

Document Number	Title	Task Leader	GEIA Publication	IEC/PAS Publication
GEIA-HB-0005-1	Program Management/ Systems Engineering Management Guidelines for Managing the Transition to Lead-free Electronics	Pat Amick	30 June 2006	31 December 2006
GEIA-HB-0005-2	Technical Guidelines for Aerospace Electronic Systems Containing Lead-free Solder	Stephan Meschter	31 December 2006	30 June 2007
GEIA-STD-0005-1	Performance Standard for Aerospace and Military Electronic Systems Containing Lead-free Solder	Lloyd Condra	30 June 2006	31 December 2006
GEIA-STD-0005-2	Standard for Mitigating the Deleterious Effects of Tin in High-Reliability Electronic Systems	Anduin Touw	30 June 2006	31 December 2006
GEIA-STD-0005-3	Reliability Testing for Aerospace and High Performance Electronics Containing Lead-free Solder	Tony Rafanelli	30 June 2007	31 December 2007

Objectives of GEIA-STD-0005-1

(Customer "care-abouts")

5.1 Reliability

The processes and materials related to the use of lead free solder are capable of producing reliable products.

5.2 Configuration control and product identification

The configuration of all systems, equipment, assemblies, sub-assemblies, and piece parts are identified and controlled.

5.3 Risks and limitations of use

Risks and limitations of use, due to the use of lead free solder, are identified, and information is provided to control them.

5.4 Deleterious effects of tin whiskers

The deleterious effects of tin whiskers are mitigated.

5.5 Repair, maintenance, and support

Repair, maintenance, and support activities are controlled in a manner that controls effects of lead-free solder materials and processes

Requirement is for suppliers to develop Lead-free Solder Control Plans (LFCP) that document their own processes to satisfy objectives

Program-by-program LFCPs *(most expensive)*

Avionics OEMs and maintenance

Integrators

Operators, regulators















Airlines

FAA

DoD

NASA

Program-specific lead free requirements and processes

Supplier-by-supplier LFCPs *(least expensive)*









Each supplier has a baseline LFCP







Airlines

FAA

DoD

NASA

Common lead-free requirements and processes

Supplier-by-Supplier vs. Program-by-Program Plans*

	Baseline	Program-specific
Life of the Plan	10 yrs.	10 yrs.
No of programs per Plan	25	1
Cost to customize a baseline Plan	0	0.25
A. Cost of Plan development	$5M	0.25 x $5M x 25 = $31.25M
B. Annual cost of Plan administration (0.10xA)	$0.5M	$3.125M
C. Annual cost of Plan execution (0.25xA)	$1.25	$7.8M
D. Annual cost of updating Baseline Plan	$0.5M	$0
E. NRE cost (A)	$5M	$31.25M
F. Annual cost (B+C+D)	$2.25M	$10.925M

**Adapted from a report by Peter Sandborn, U of MD*

Diminishing Manufacturing Sources Shared Data Warehouse



DMSMS Workshop

2006 DOD DMSMS Conference

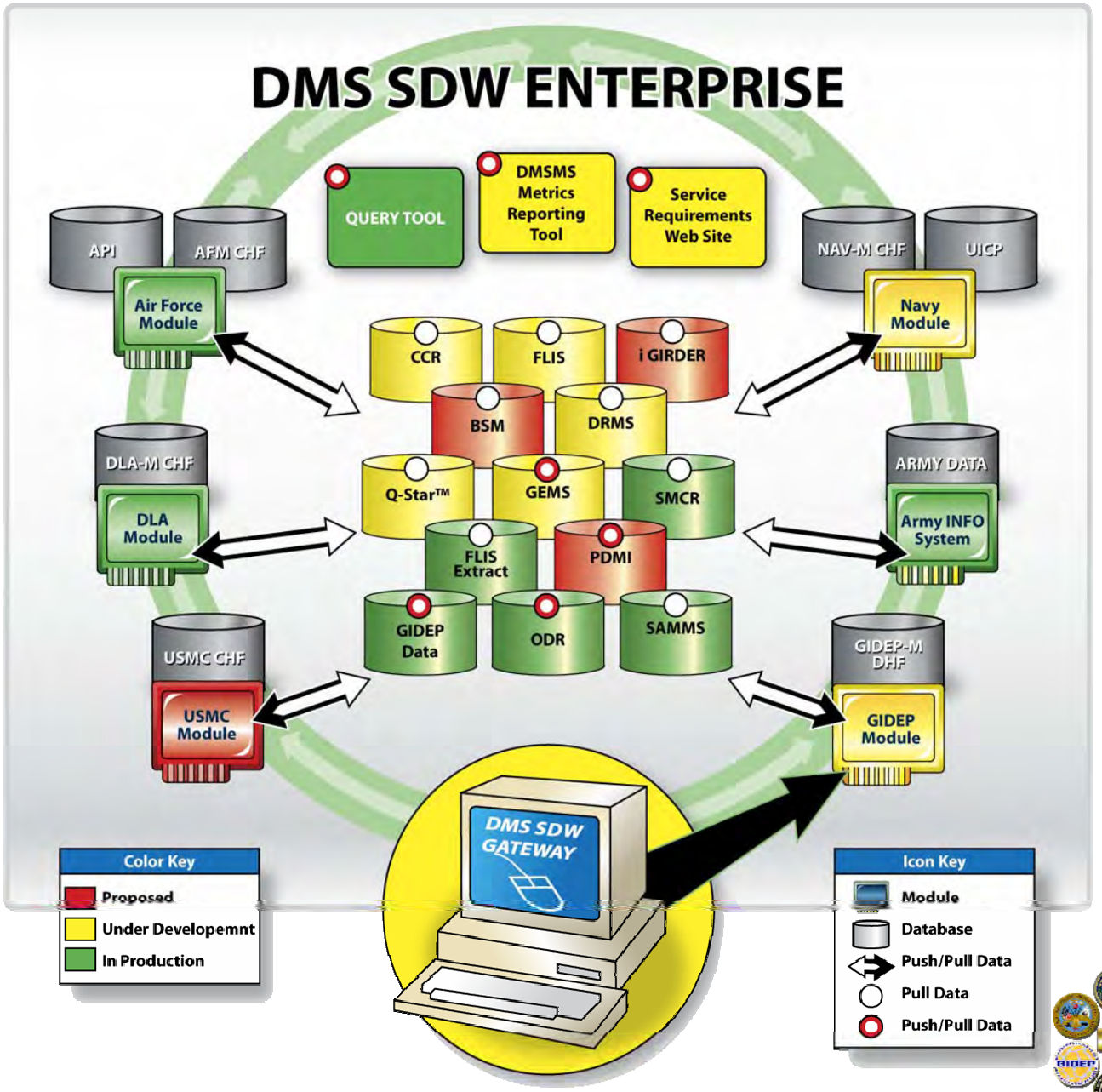
July 13, 2006

S. R. Dadey, Project Manager

DMSSDW

Developed by Concurrent Technologies Corporation

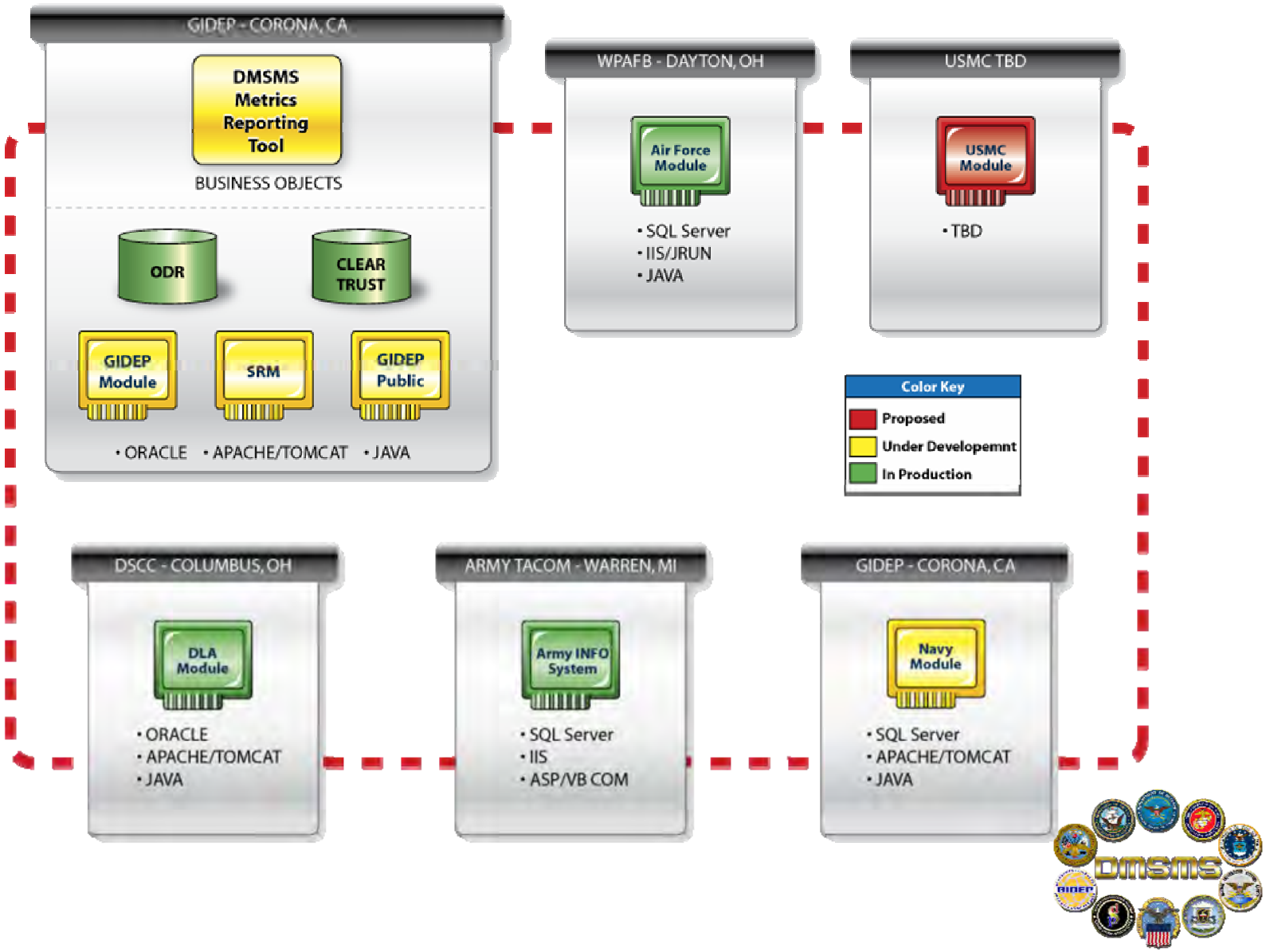
DMSMS



CTC
Concurrent Technologies Corporation

DMSMS

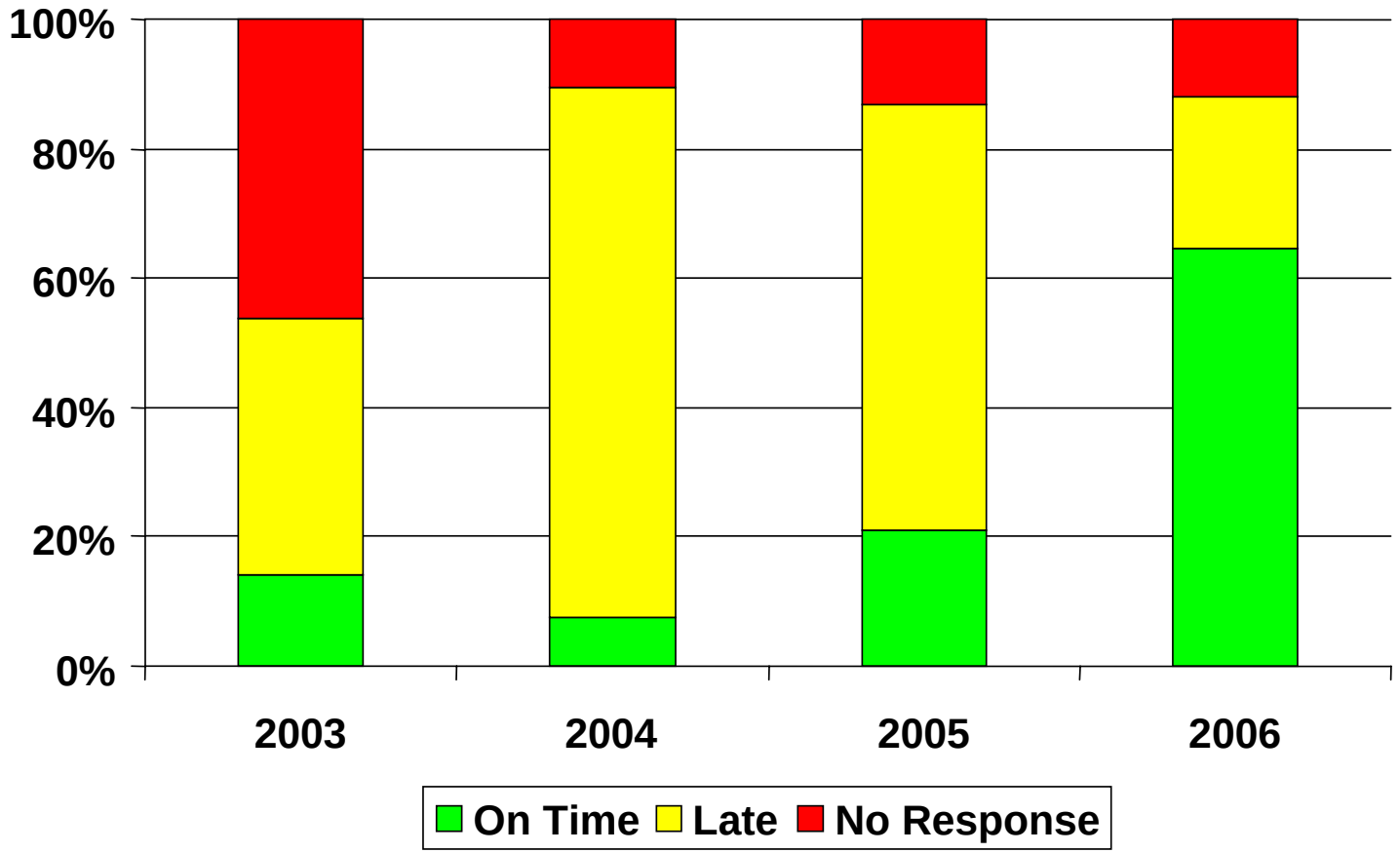
Hosting Environments



CTC
Concurrent Technologies Corporation

DMSMS

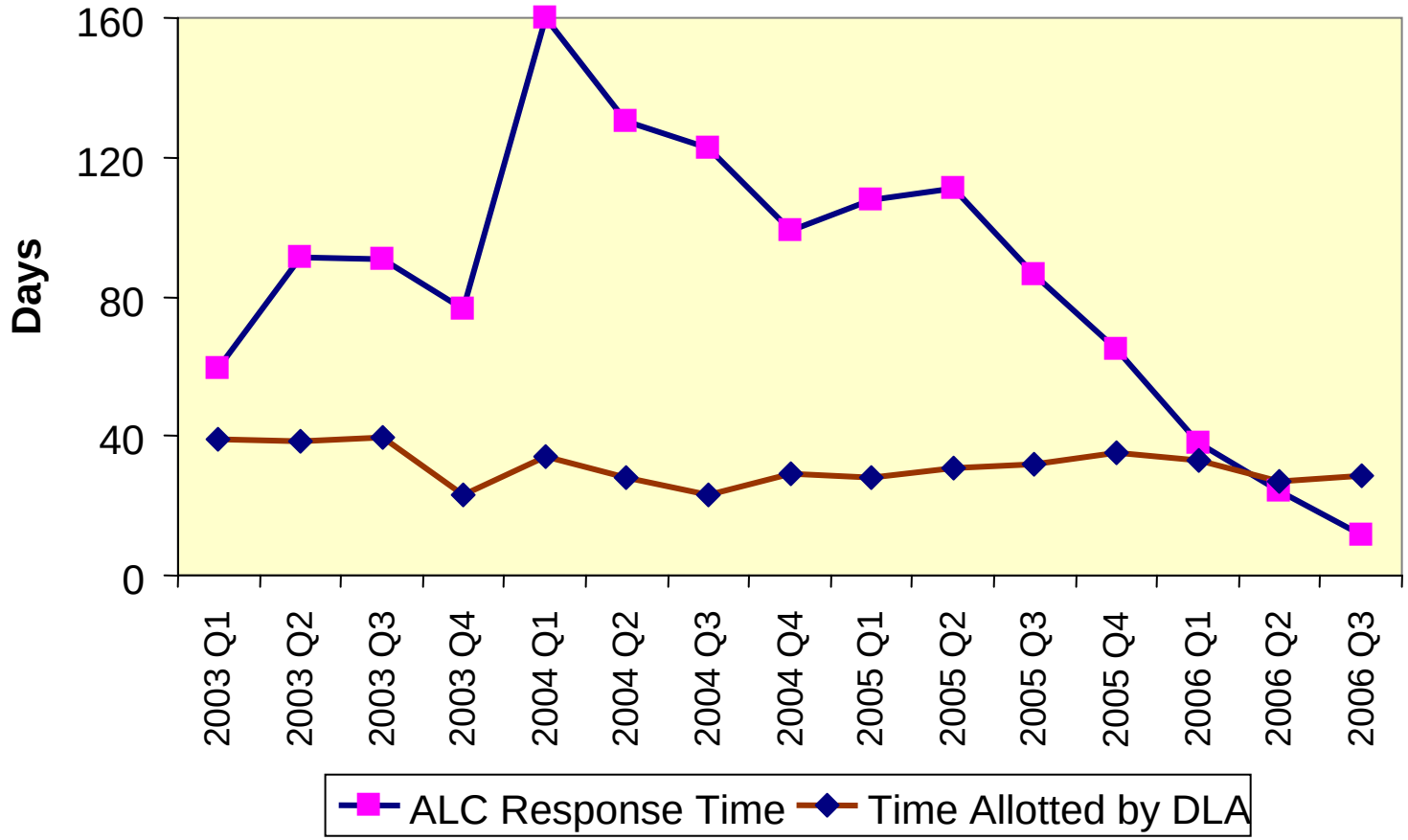
AFM Case Response Metrics



CTC
Concurrent Technologies Corporation

DMSMS

AFM Case Response Processing Metrics



CTC
Concurrent Technologies Corporation

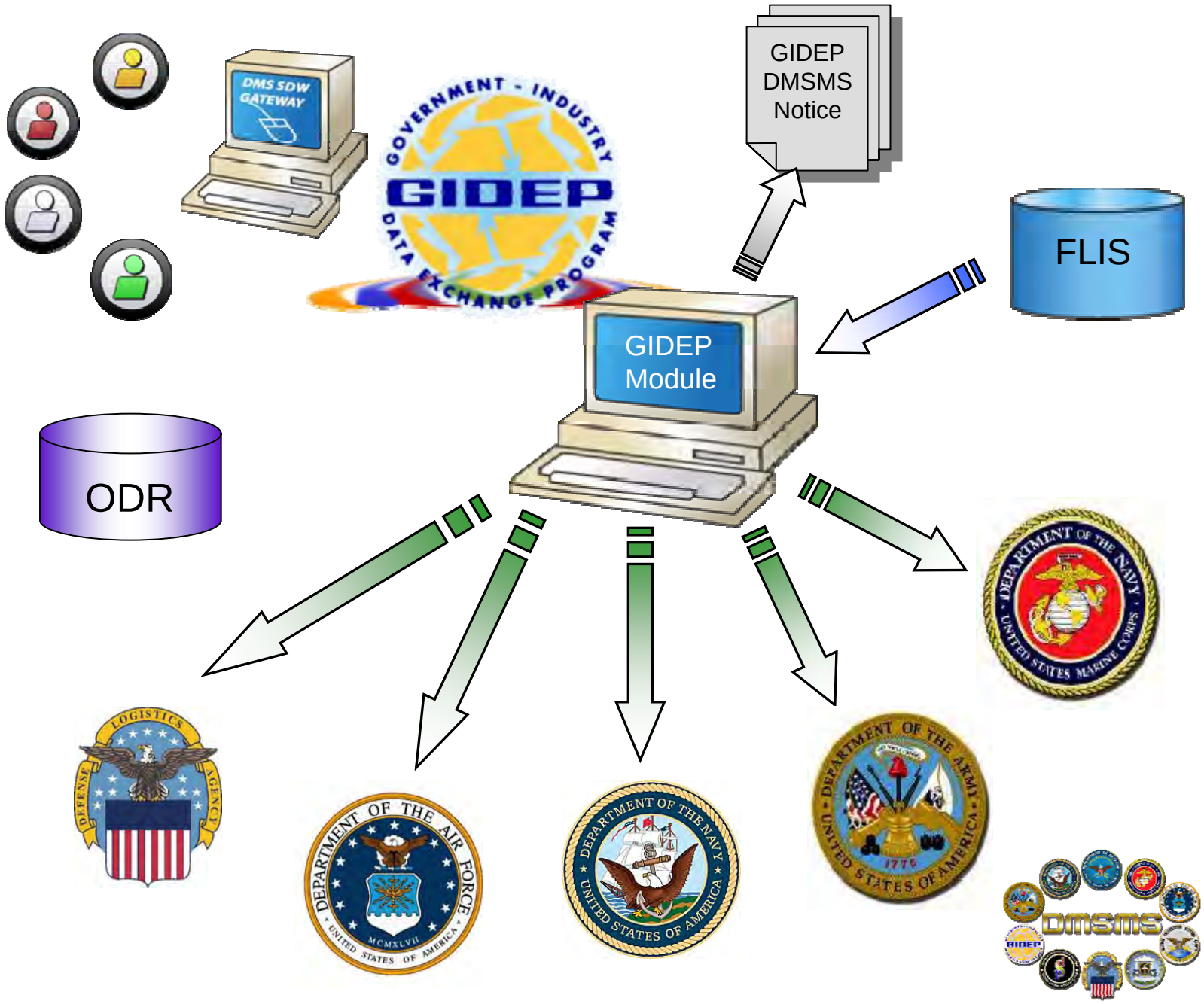
DMSMS

ODR Progress/Activity

- Case Headers
  - 293 Army INFO System
  - 1,485 DSCC Module Case History File (CHF)
  - 4,625 GIDEP Database
  - 591 Teaming Group
- Case Line Items
  - 293 Army INFO System
  - 90,966 DSCC Module CHF
  - 262,657 GIDEP Database
  - 1,454 Teaming Group
- Solutions
  - 835 Army INFO System
  - 1,083 DSCC Module CHF
  - 1,846 Teaming Group
- Affected Entities (NHAs, etc.)
  - 850 Army INFO System
  - 13,458 DSCC Module CHF
  - 1,846 Teaming Group

CTC
Concurrent Technologies Corporation





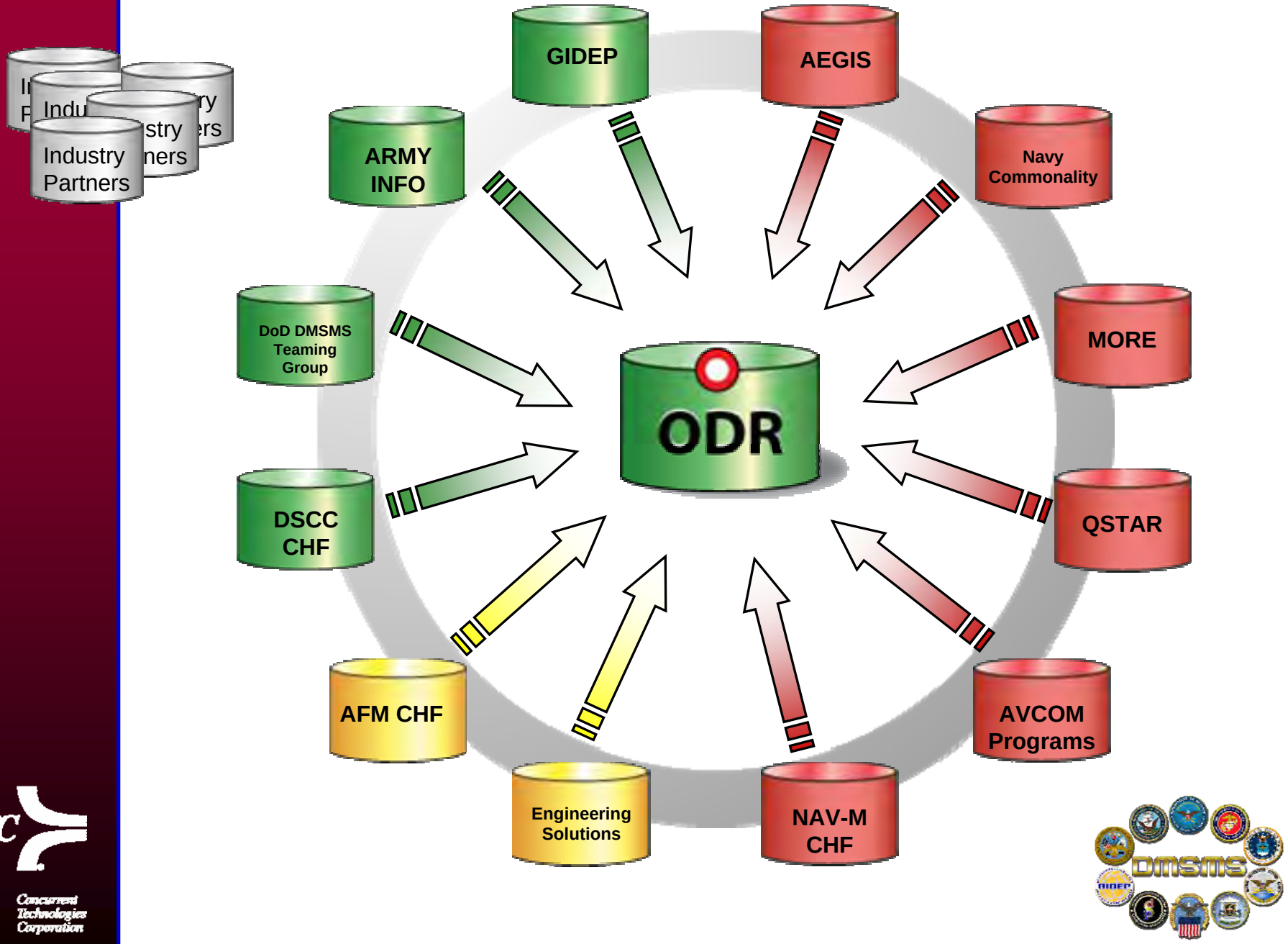
CTC
Concurrent Technologies Corporation

Case Management Modules



Concurrent Technologies Corporation

DMSMS


Industry Partners
GIDEP
AEGIS
ARMY INFO
Navy Commonality
DoD DMSMS Teaming Group
ODR
MORE
DSCC CHF
QSTAR
AFM CHF
AVCOM Programs
Engineering Solutions
NAV-M CHF
Concurrent Technologies Corporation
DMSMS

Metrics Reporting/Query Tool

Last Refresh:
7/7/06 12:54:12 PM

ODR Solutions by Owner

Prompts: Enter Year Received (Start): 0 Enter Year Received (End): 9999

Drill Filters:

Case Owner	Distinct Solution Count
Army Info System	306
DSCC-SDW	1,045
Teaming Group	1,569
Total:	2,920

Case Owner	Solution	Distinct Solution Count
Army Info System		306
Army Info System		306

Case Owner	Solution	Distinct Solution Count
DSCC-SDW	Alternate Source	85
	Existing Source	160
	Life of Type Buy	662
	Other - See Comments	40
	Replacement	24
	Substitute Part	74
DSCC-SDW		1,045

Case Owner	Solution	Distinct Solution Count
Teaming Group	Aftermarket	127
	Alternate	525
	Emulation	42
	Existing Stock	121
	LOT Buy	110
	Not A DMSMS Issue	364
	Reclamation	1
	Redesign-Major	33
	Redesign-Minor	28
	substitute	12
	Substitute	202
		4

Document File Name: ODR140 Solution Counts Summary

CTC
Concurrent Technologies Corporation

DKSP



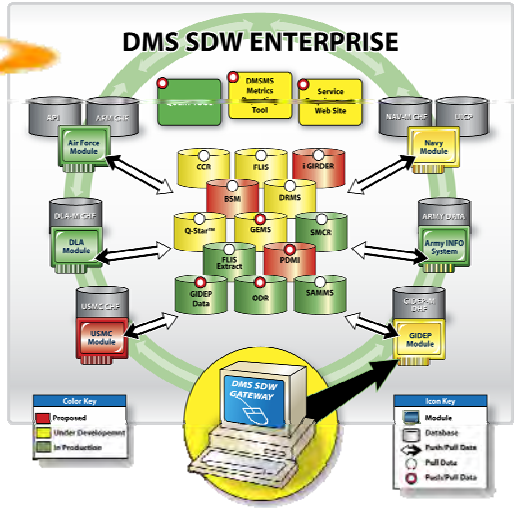
CTC
Concurrent Technologies Corporation

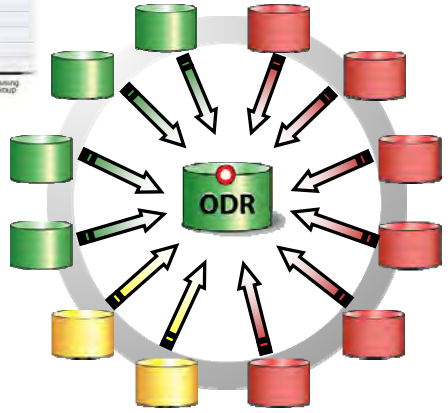














Concurrent Technologies Corporation



Questions?



Concurrent Technologies Corporation



DMSMS and Obsolescence in a TLCSM Environment

John Douglass
President and CEO
Aerospace Industries Association
2006 DMSMS Conference
July 11, 2006

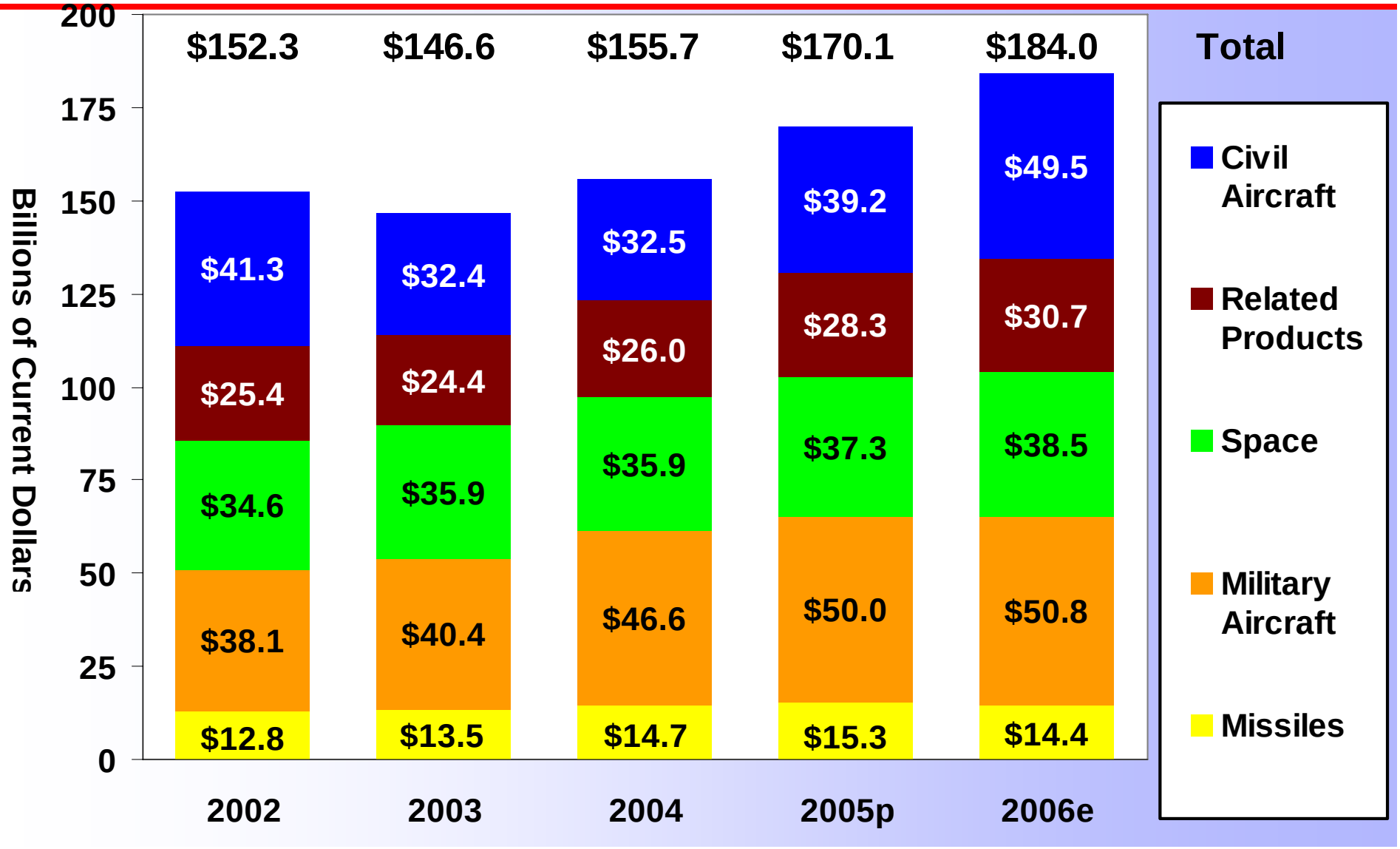
Overview

AEROSPACE INDUSTRIES ASSOCIATION

- **Good News**
  - Defense, commercial, space sectors mission focused for future
  - All key economic metrics up (sales, exports, orders, backlog, etc.)
  - Long-term forecast positive
  - Human capital being rebuilt
- **Bad News**
  - Critical structural issues threaten growth
  - Congressional oversight on contracting issues increasing
  - Budget stresses
  - Possible turbulence in government with elections

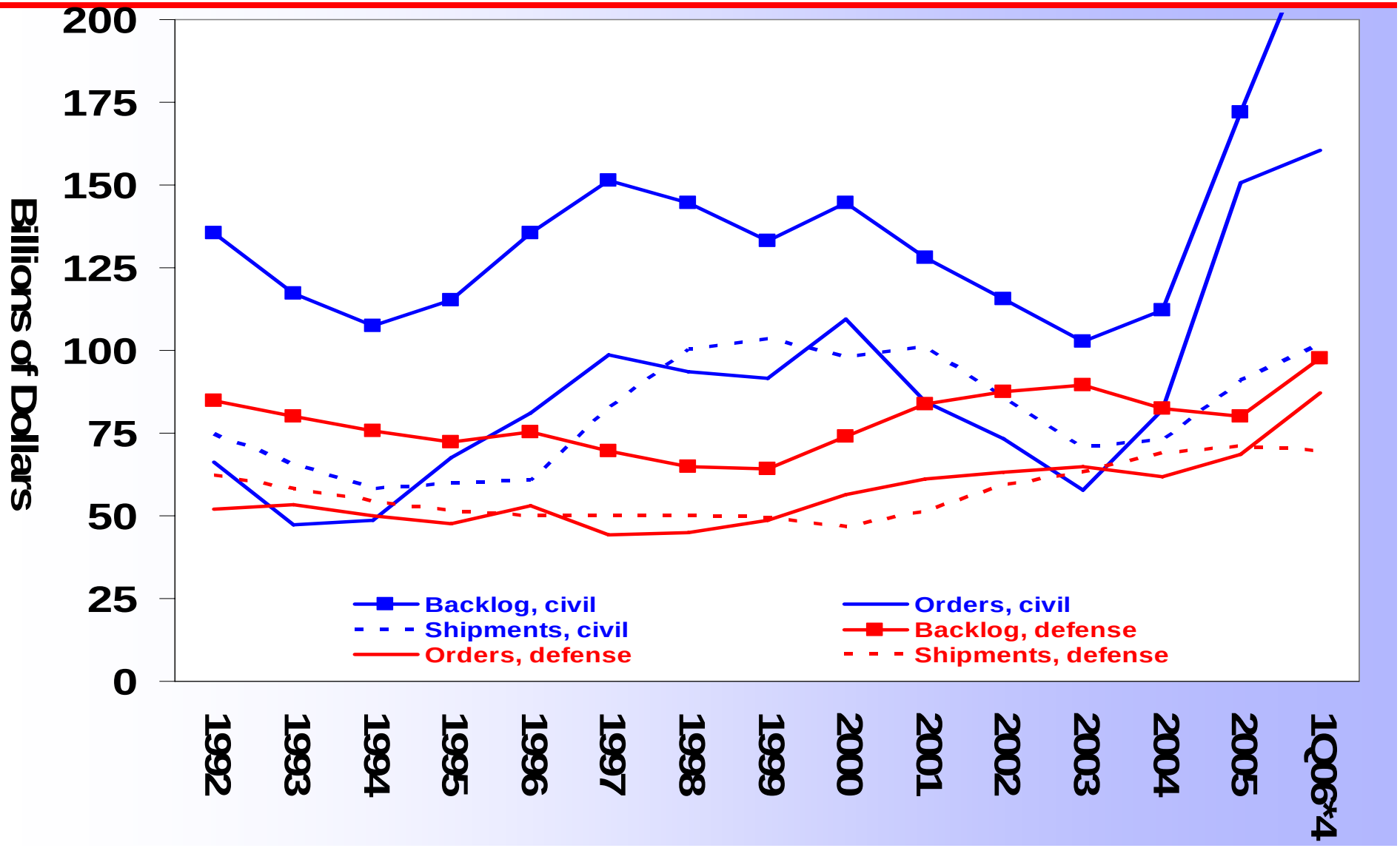
U.S. Aerospace Industry Sales

AEROSPACE INDUSTRIES ASSOCIATION



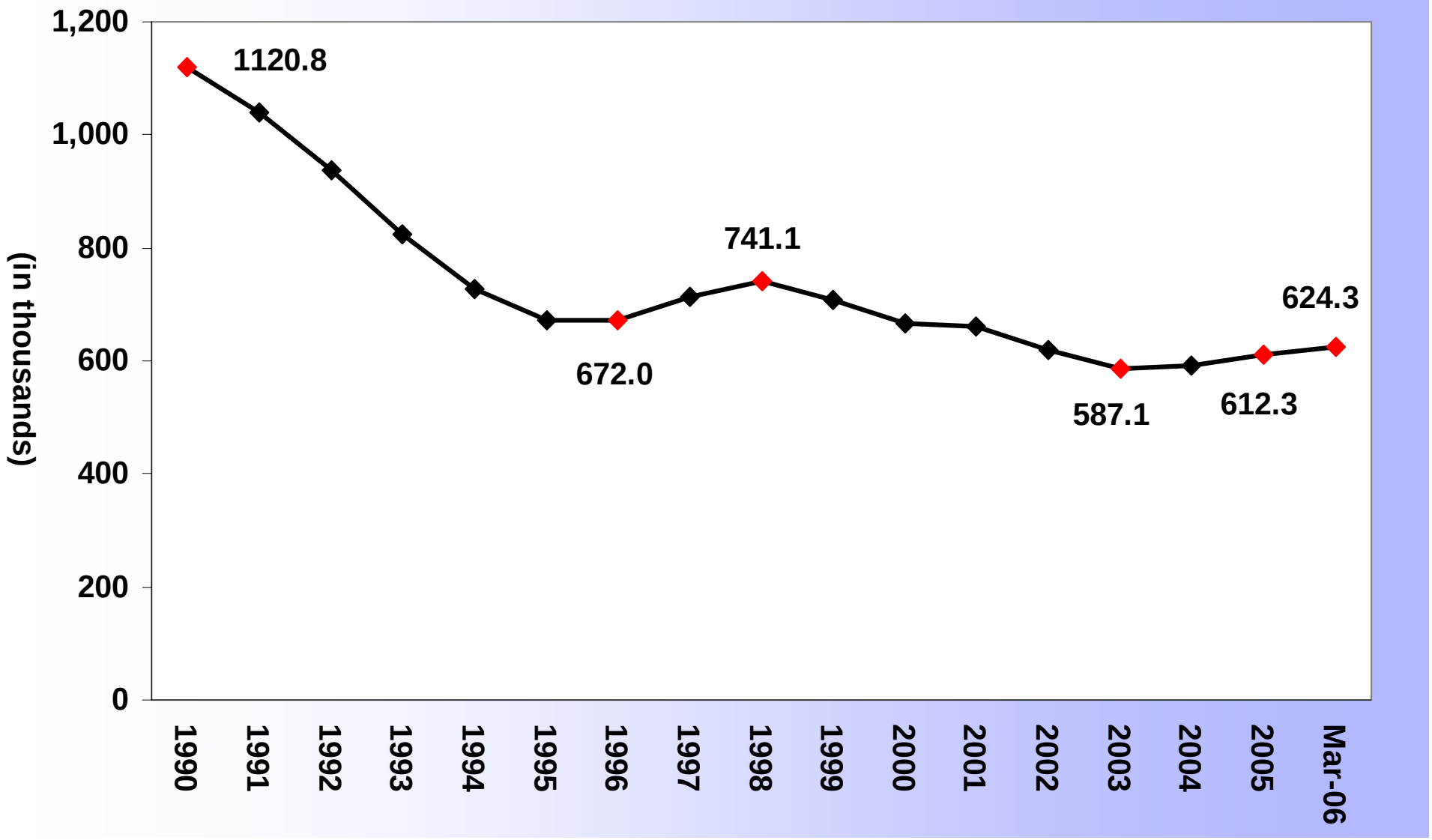
Orders, Shipments, and Backlog
Defense vs. Civil

AEROSPACE INDUSTRIES ASSOCIATION



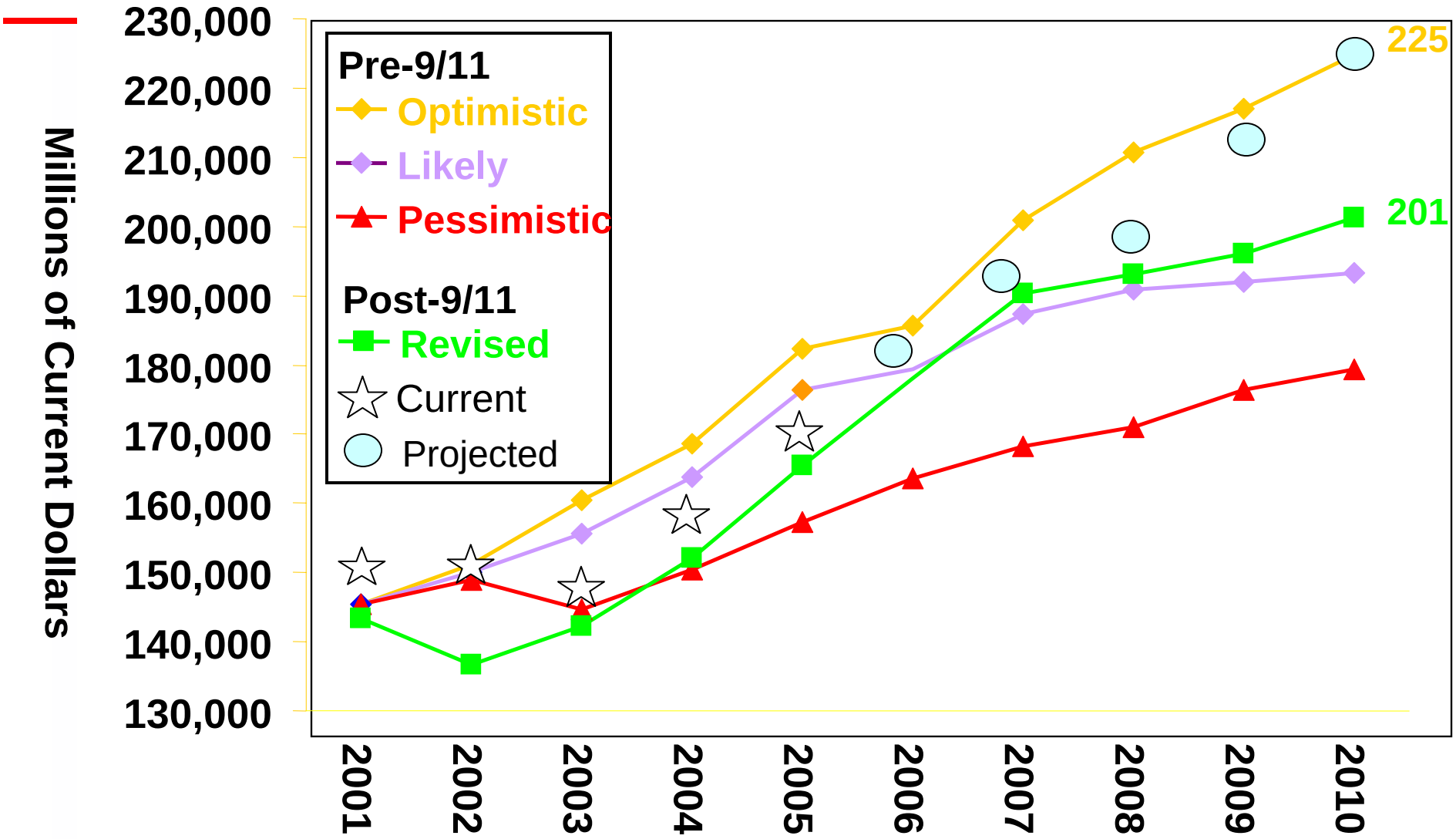
"Aerospace" Employment

AEROSPACE INDUSTRIES ASSOCIATION



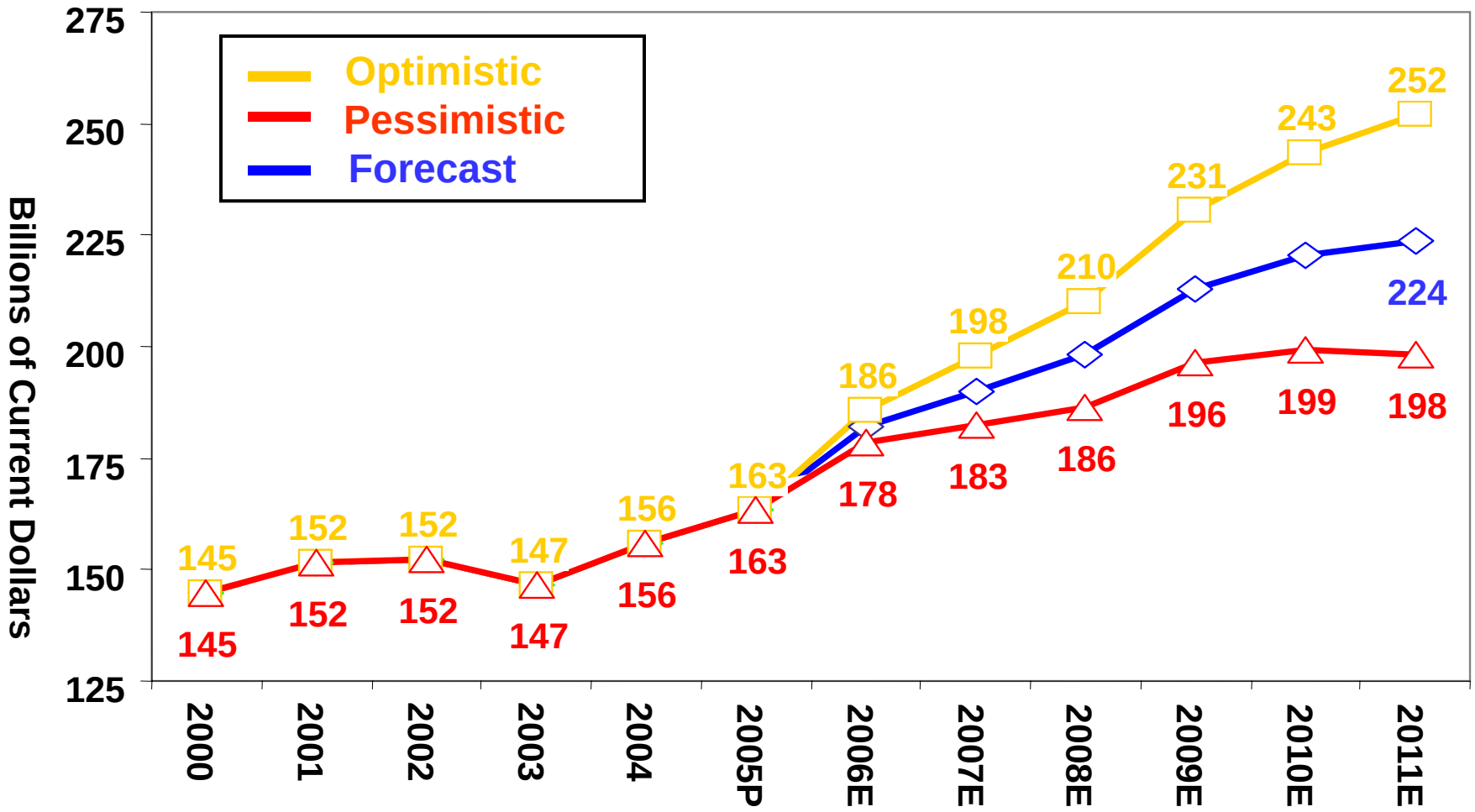
U.S. Aerospace Industry 2001 Sales Forecast
"Four" Scenarios

AEROSPACE INDUSTRIES ASSOCIATION



U.S. Aerospace Industry Sales Forecast
2006-2011

AEROSPACE INDUSTRIES ASSOCIATION



U.S. Aerospace Industry Overview

AEROSPACE INDUSTRIES ASSOCIATION

- U.S. aerospace industry strong
  - Aerospace industry sales were $170 billion in 2005, up 9.2%
  - Military sales in particular were $50 billion in 2005, up 7%
- Industry helping driving U.S. economic growth
  - Aerospace employment added a projected 30,900 jobs in 2005 to reach 623,900
  - Trade surplus in aerospace was $40 billion in 2005
- U.S. aerospace industry exports 40% of product
  - Top markets in Japan, France, United Kingdom

Industry Trends Remain Positive

AIA Top Issues and DMSMS

AEROSPACE INDUSTRIES ASSOCIATION

- **Ensure the Viability of the U.S. Defense Industrial Base**
- **Oppose Unnecessary Buy American Acquisition Policies**
  - **Modify Berry Amendment**
- **Reform the Export Control System**
- **Promote Acquisition Excellence**

AIA's Work on DMSMS Issues

AEROSPACE INDUSTRIES ASSOCIATION

- Maintain viable trusted industrial base
- Managing obsolescence
  - Proactively forecast issues
  - Qualify commercial of the shelf (COTS) alternatives
  - Technology refresh
- Logistics Management
  - Promote performance base logistics
  - Educate members
- Promote good systems engineering
  - Sustainability
  - Supportability
  - Reliability
- Partner with DoD to develop new business models and technical solutions for obsolescence

Summary

AEROSPACE INDUSTRIES ASSOCIATION

- **Good News**
  - Defense, commercial, space sectors mission focused for future
  - All key economic metrics up (sales, exports, orders, backlog, etc.)
  - Long-term forecast positive
  - Human capital being rebuilt
- **Bad News**
  - Critical structural issues threaten growth
  - Congressional oversight on contracting issues increasing
  - Budget stresses
  - Possible turbulence in government with elections

AEROSPACE INDUSTRIES ASSOCIATION

News You Can Use

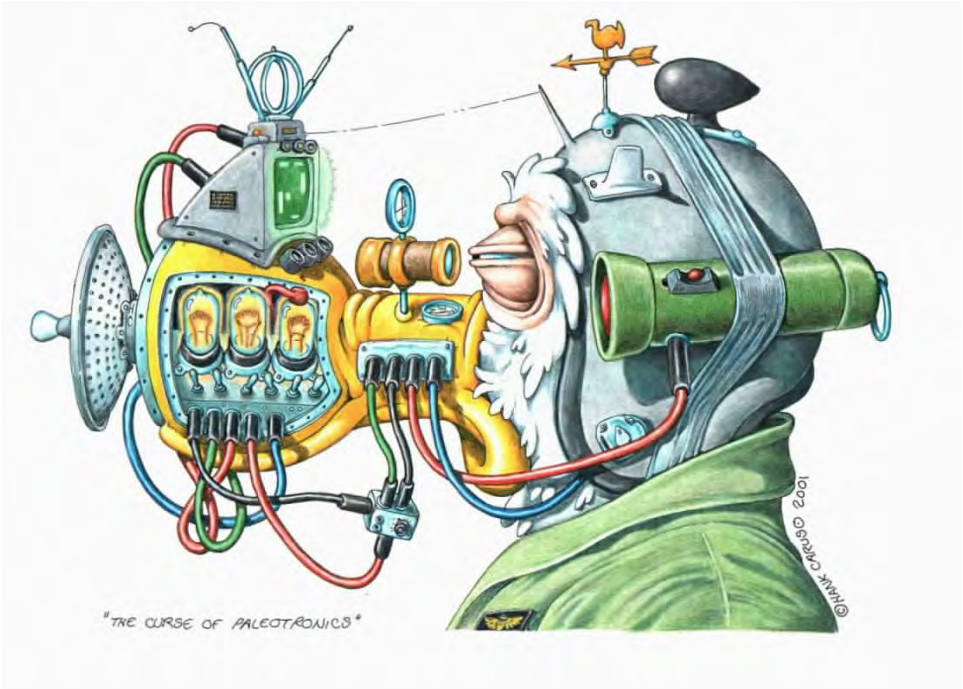


www.aia-aerospace.org

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

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.

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

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…**

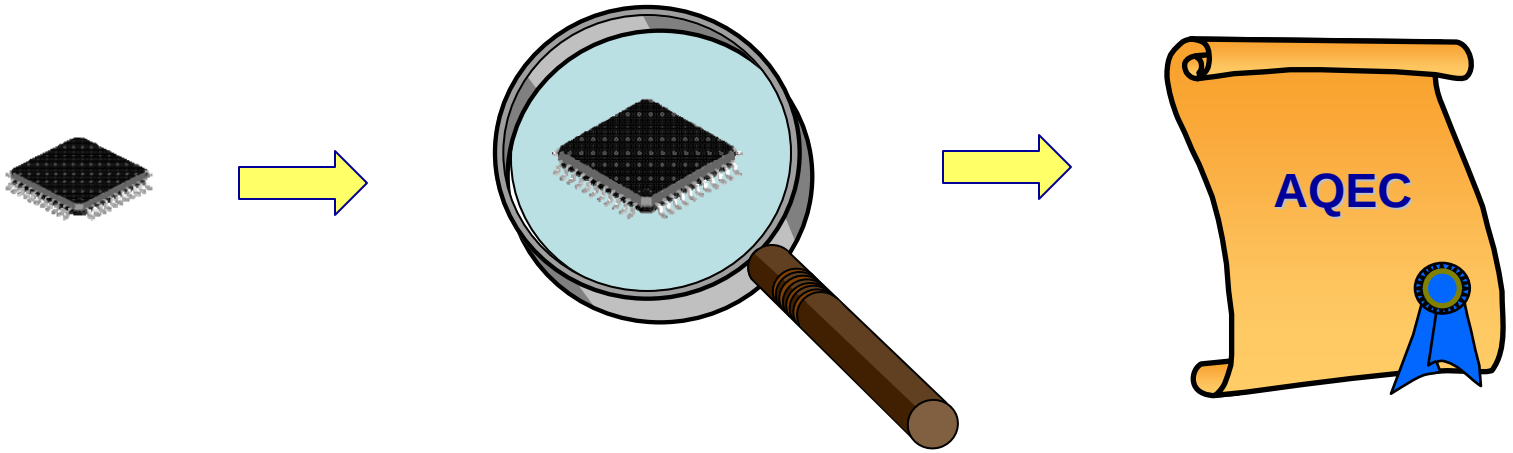
How can we Develop a Pre Milestone C Philosophy?

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)

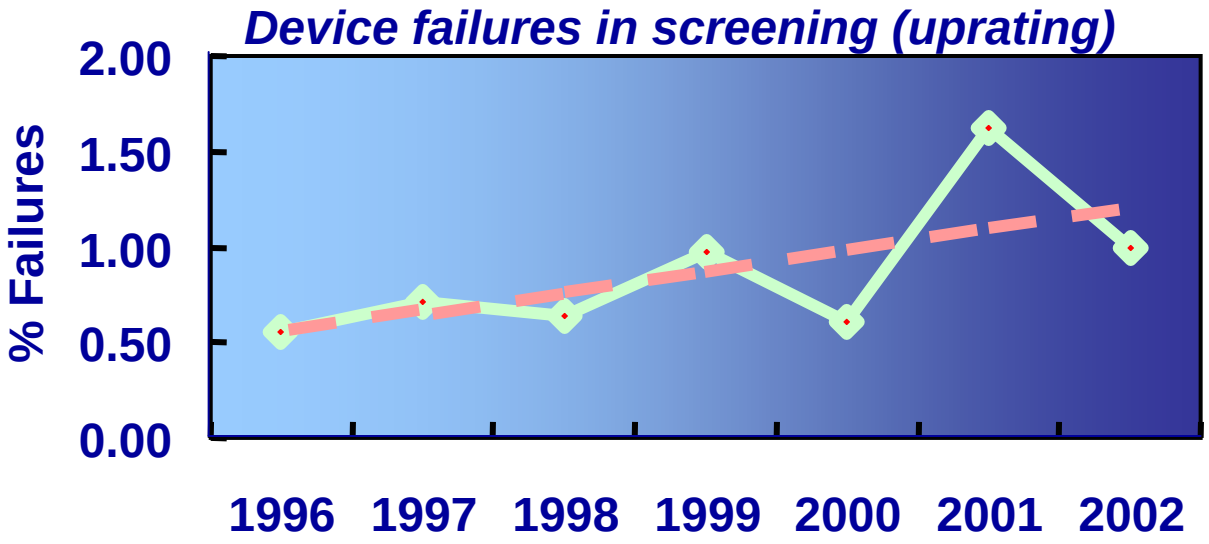


Start with the device manufacturer's "COTS" component

- ***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***

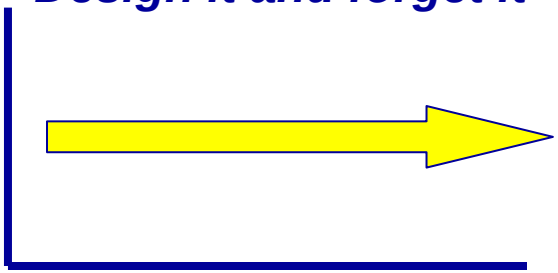
System Challenges:

- ***DMS - Obsolescence***
- ***Continuous upgrades***
- ***System-on-a-Chip***
- ***Open Systems***

Global Industry Trends

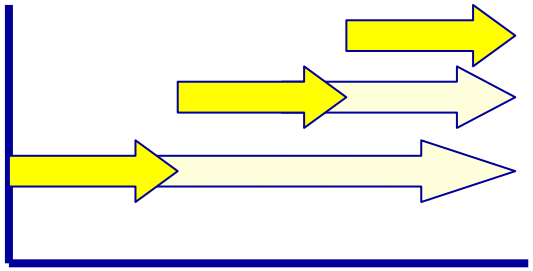
The Past

"Design it and forget it"



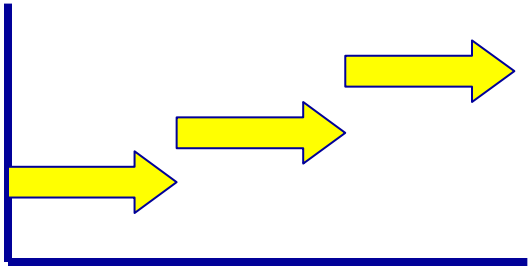
The Present

Reactive incremental upgrades



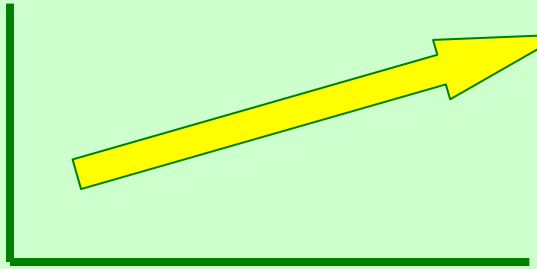
The Near Future

Pro-active incremental upgrades



The Target

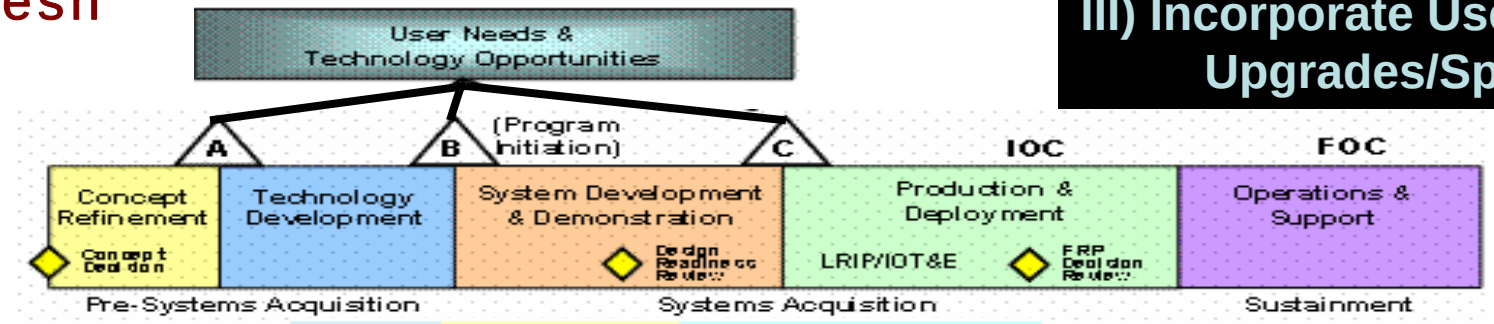
Pro-active continuous upgrades

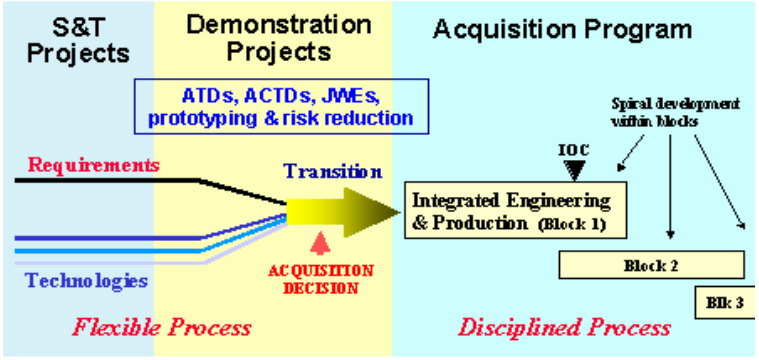


Why is aerospace the only major industry that still designs repairable cards?

Parts Process Management – Planning for Tech Refresh

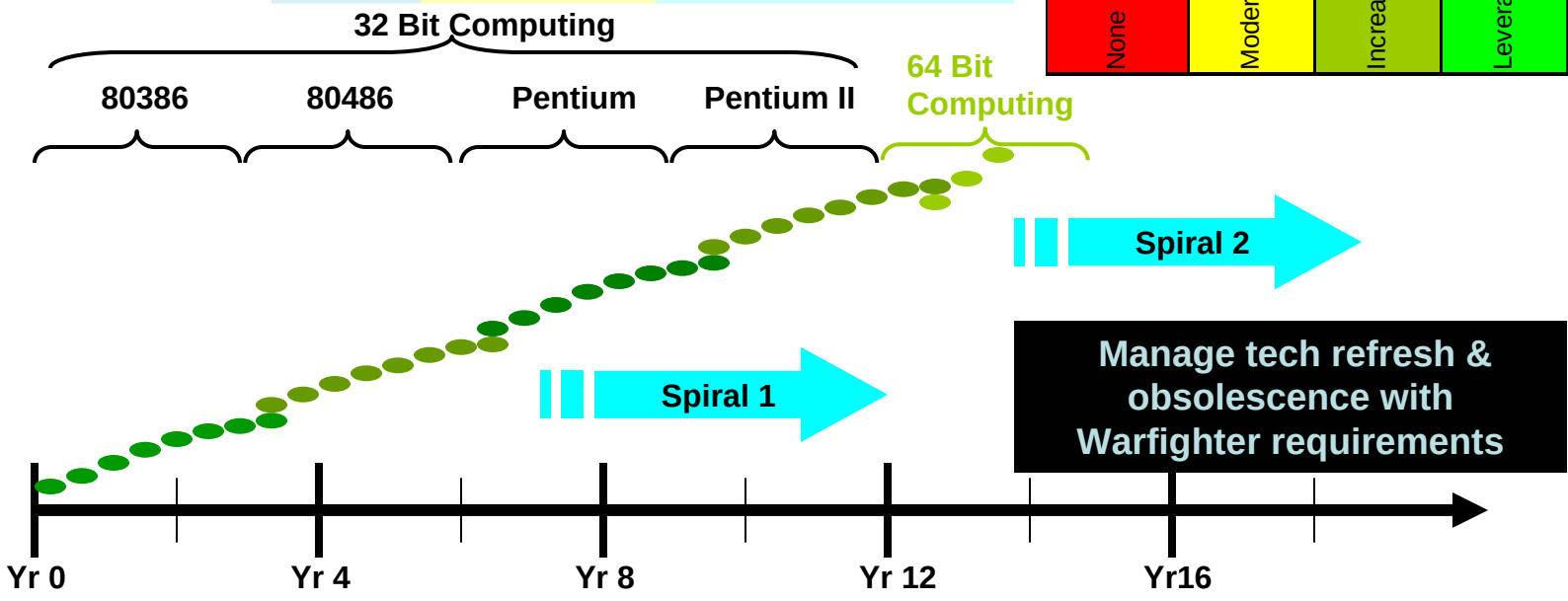
III) Incorporate User Defined Upgrades/Spirals



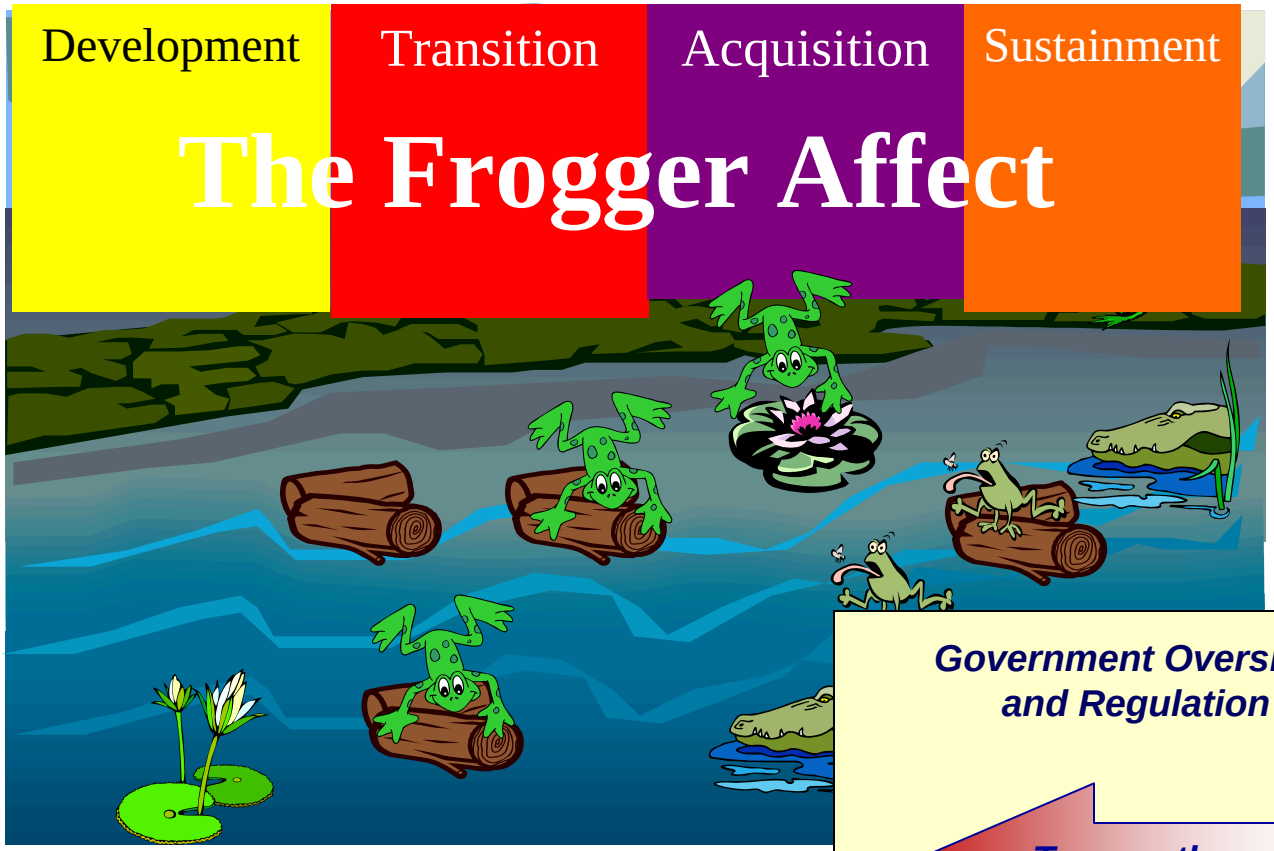


II) Need to work across all levels of industry

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

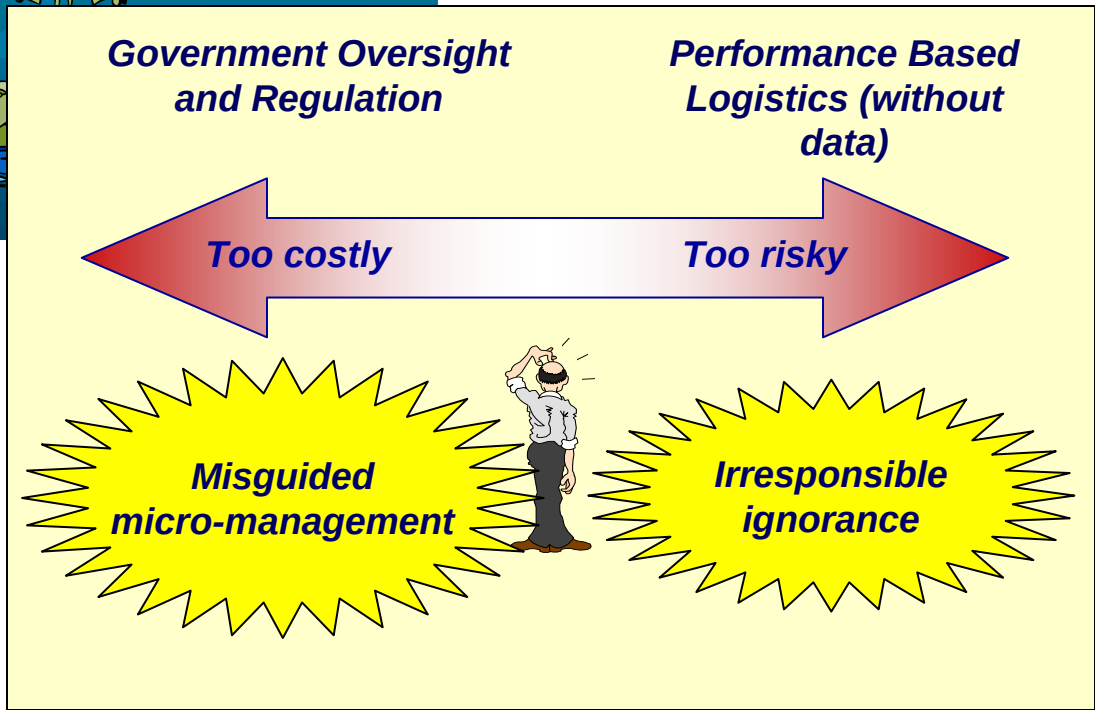


PM Dilemma – Successful Tech Insertion



- 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

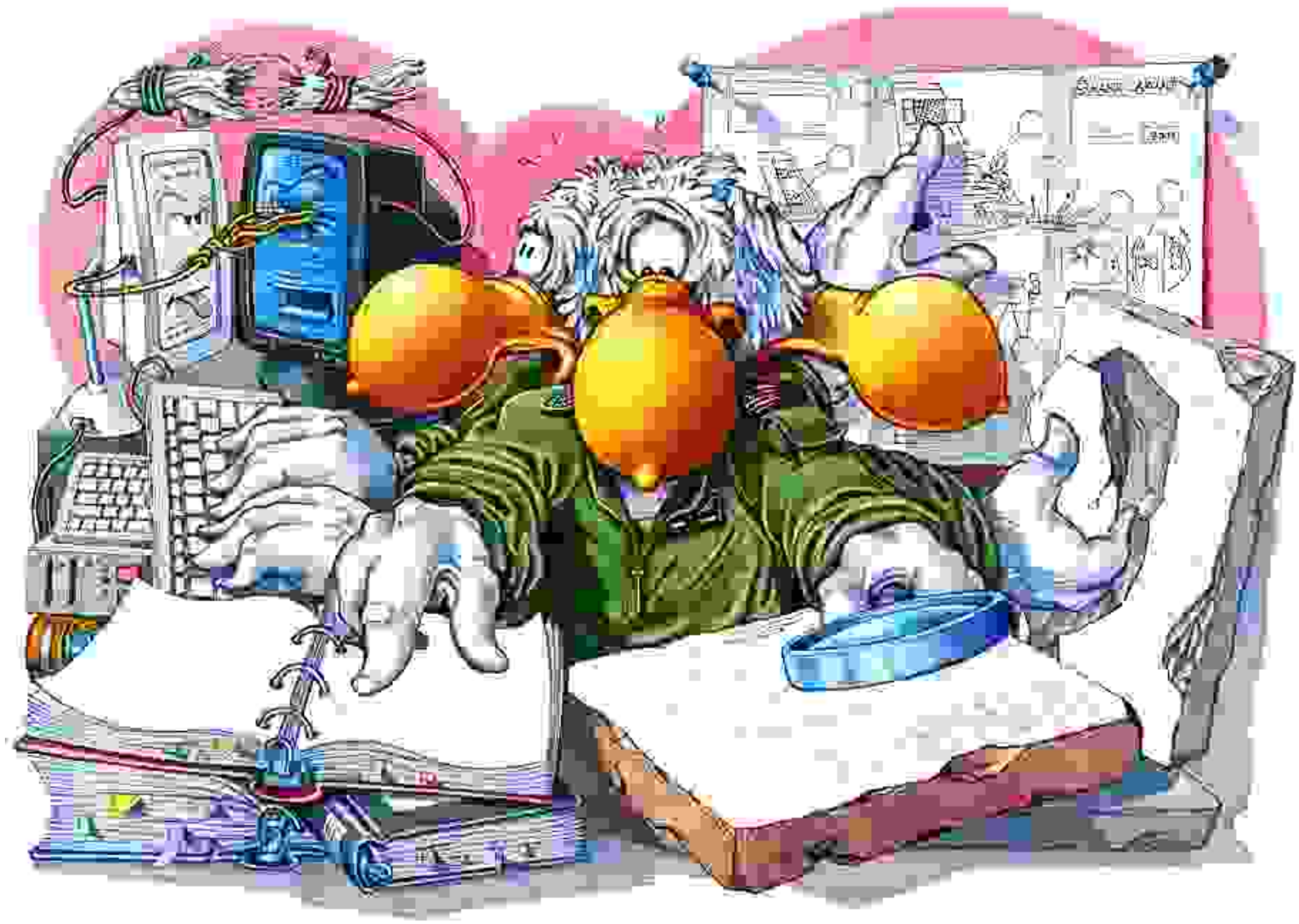
Recognize the Global Nature of Avionics



Bob's followers demand a jihad against the un-herded avionics cats

"We must have an integrated avionics strategy!"

Questions?



Full Spectrum Obsolescence Support



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

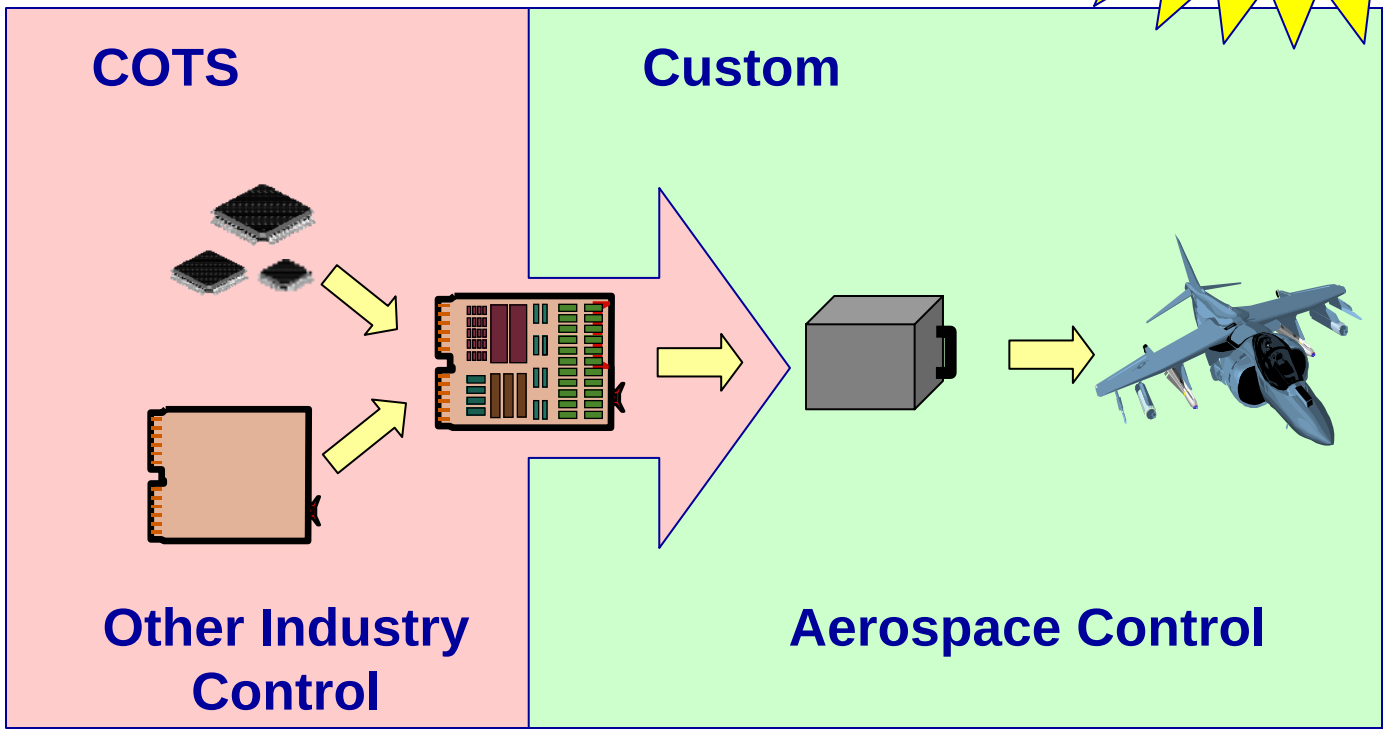
- •Selection of a Set of Common Design Tools
- •Procedures for Design Review
  - ✓Component selection → Transition to Aftermarket
- •Configuration Management — die shrinkage
- •BOM Monitoring
- •Data packages
  - ✓Data Escrow
  - ✓Die Banks

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



Air Force Materiel Command

War-Winning Capabilities … On Time, On Cost



2006 DMSMS Conference
Air Force Life Cycle Logistics and DMSMS Perspectives

11 JUL 06

Lorna Estep
Deputy Director for Supply
AFMC Directorate of Logistics
HQ AFMC/A4(S) Phone # 937-257-3731
Lorna.Estep@wpafb.af.mil

Outline

- About Air Force Materiel Command
- Air Force TLCSM Definition
- Command Initiatives
  - eLog21
  - Sustainment Transformation
- Air Force DMSMS
- Summary

AFMC Command Mission



Commander's Intent

- **Accountable, measurable, continuously improving performance**
  - **Lead implementation of process improvement techniques—inspire participation at all levels**
  - **Set tangible performance targets and expectations; measure, report, compare, and reward results**
  - **Create an environment that inspires trust, innovation … and a *passion* for achieving improved performance**

One Materiel Command

eLog21 Campaign Initiatives

ARCHITECTURE & GOVERNANCE

Logistics Enterprise Architecture (LogEA) | **Portfolio Management** | **Air Force Data Strategy** | **Performance Management**

Product Support and Engineering

- Total Life Cycle System Management
  - Product Support Camp
- Condition Based Maintenance+
- Asset Marking and Tracking
- Demand Management
- Operations Safety Suitability & Effectiveness Tools
- Product Life Cycle Mgmt

Supply Chain Management

- Integrated Planning System (IPS/APS)
- Purchasing Supply Chain Management (PSCM)
  - Strategic Sourcing
  - Commodity Councils
  - Supplier Management Tools
- Strategic Distribution
- Weapon System Supply Chain Management

Expeditionary Operations and C²

- WFHQ/ Agile Combat Support C2
  - Log Supt Centers
- AF Common Operating Picture
  - I&L COP
- Decision Support Tools

Maintenance, Repair and Overhaul

- Field MX & Regional Maintenance
  - CONUS CIRFs
- Re-engineering Depot Maintenance (DMT)
- AF Lean Maintenance Enterprise Integration

ENABLING PROCESSES AND TECHNOLOGY

Future Financials | **Agile Combat Support (ACS)/Assured Connectivity** | **Workforce**

AF Smart Ops (AFSO21) | Change Management (CM) | Capability-Based Programming (CBP)

IT Strategy/Expeditionary Combat Support System (ECSS)

Source: LRS, Col. Paul Dunbar, 12 Apr 06

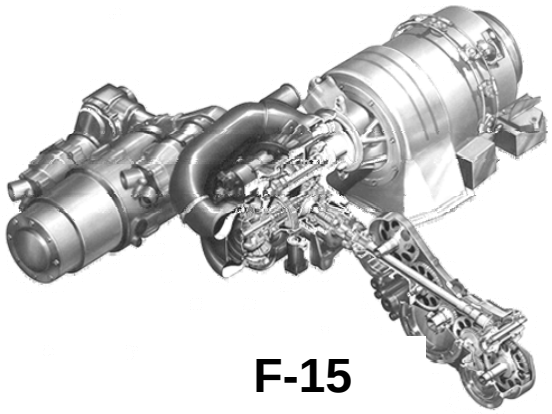
What Are Commodity Councils?

- Cross-functional teams that develop enterprise-wide purchasing supply chain strategies and establish strategic contracts by commodity groups to reduce cost and cycle time, and increase materiel availability and reliability

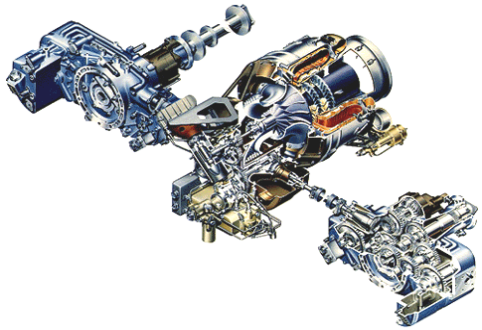
- <u>Responsible for:</u>
  - **Developing and executing AFMC-wide commodity sourcing strategy**
  - **Conducting commodity market research; base-lining performance**
  - **Monitoring and continuously improving performance**

Secondary Power Systems

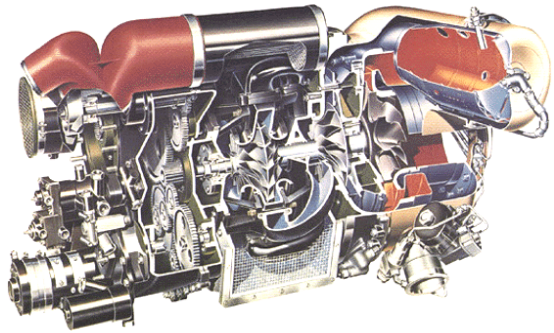
Self-contained power source to start aircraft main engines; provide electrical power on ground and in air



F-15



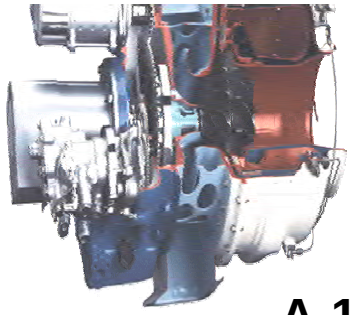
B-1B



C-130/Carts



Load Control Valves



A-10

Services PBL Strategy to Improve Availability, Reduce Cost & increase Reliability

Pre-planned Product Support

- **Initiated development of a template for a Request for Proposal (RFP) at System Demonstration & Development phase**
  - **Conducted a Rapid Improvement Event**
  - **Reps from AF/A4M, HQ AFMC/A4/EN/PK/JA, OO-ALC, WR-ALC, OC-ALC, and ASC**
  - **RFP to address:**
    - **all sustainment elements**
    - **tech data rights**
    - **partnering**
  - **To ensure requirements are supported while USG still has leverage with contractor**

Using PBLs to Improve B-2 Reliability

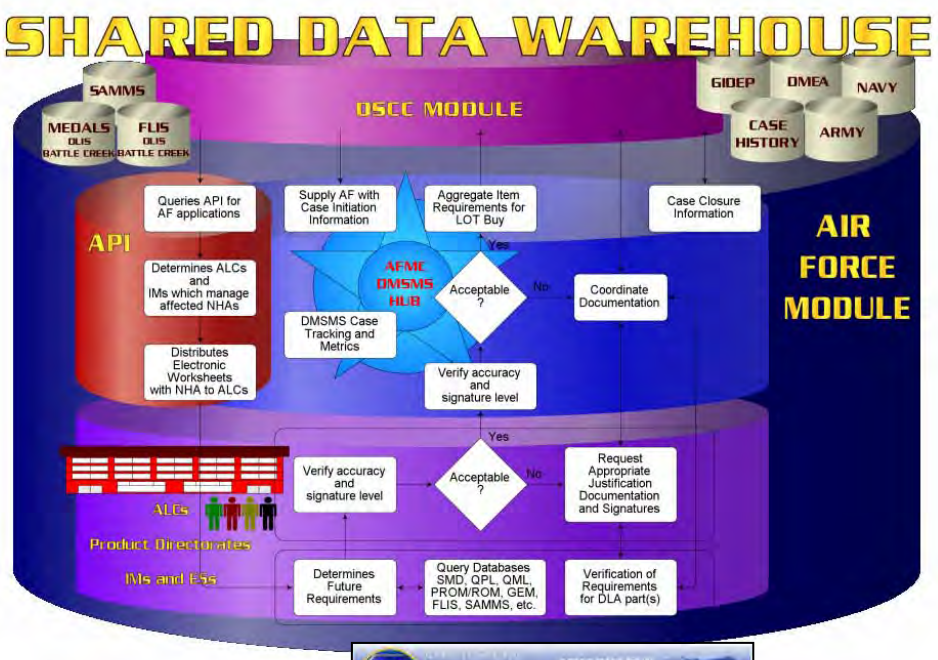
- DoD Pilot program on schedule for implementation
- RFPs released for CY07 contract
- Basic PBL tenet; incentivizes contractor to negate obsolescence



On track to implement in 2007

Command Initiatives: Tools
Shared Data Warehouse Air Force Module

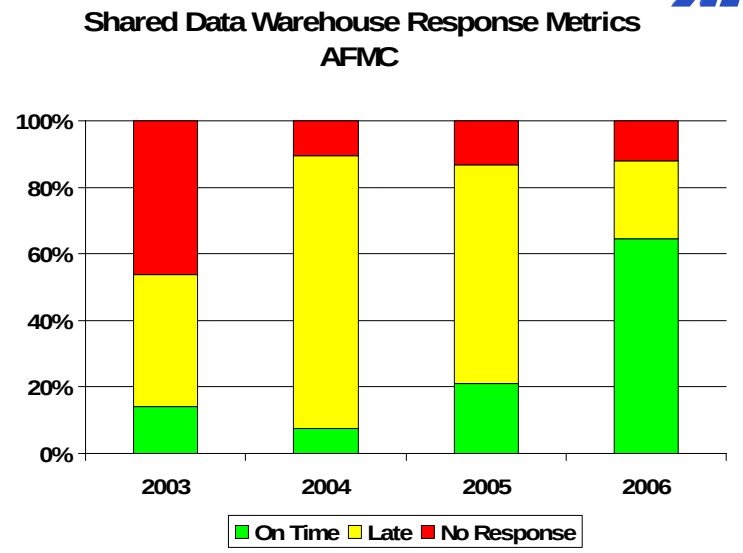
- **Automated Tracking of Case Processing**
- **Access to DMSMS Case Data**
- **Assess Program Impacts**
- **Interfaced with Legacy AF Databases, ALC Focal Points, DMSMS Program Managers, GIDEP and DLA**
- **On-site support to monitor operation and interface with additional tools**

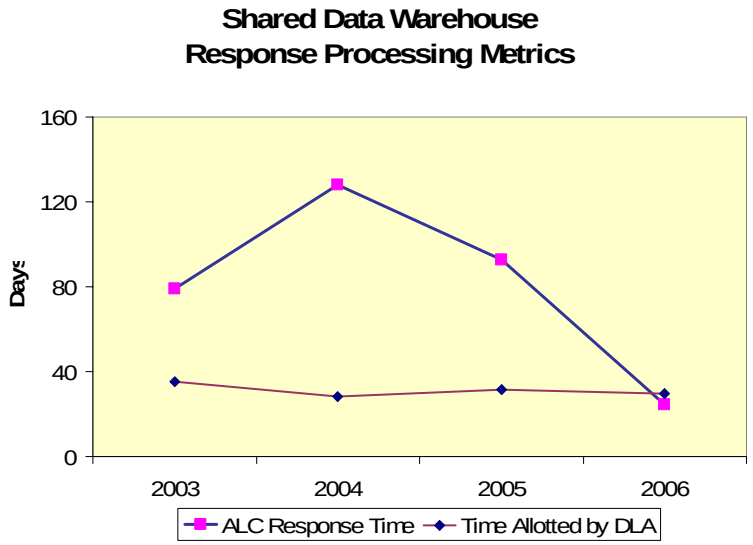




Air Force Progress/Activity

- **On time response increased from 8% to 64%**
- **Non response reduced from 46% to 12%**
- **Average response reduced from 127 days to 25 days.**





Source: AFM SDW as of 3 JUL 2006

AFMC DMSMS Study

- **Current state of DMSMS program in the process of being defined**
  - **Data being gathered includes management plans, metrics captured, and solutions implemented**
- **Weaknesses and areas of improvement being identified and noted**
- **Alternatives will be defined and then compared to current state**
- **Final evaluation will score current state and alternatives in each of these four major categories so that optimal strategy for future of the DMSMS program can be identified**

AFMC Vision



War-Winning Capabilities...

On Time, On Cost

The Bottom Line





We deliver war-winning technology, acquisition, test, and sustainment to the warfighter

Raytheon

Customer Success Is Our Mission

Diminishing Manufacturing Sources and Material Shortages

A view from Raytheon

Dr. Thomas A Gardner

July 11, 2006

Copyright © 2005 Raytheon Company. All rights reserved.

Raytheon

Commercial Off The Shelf

- More fielded military systems are relying on COTS
- New set of issues for DMSMS
  - No longer a component issue, now a device issue
  - Commercial world lives in very,very short product lifetimes
    - Computing devices of all kinds live in a 6 month cycles between products
  - Myriads of part numbers with little functional differences
    - Configuration management nightmare using traditional DoD CM processes
  - Some commercial standards, but innovation reigns over standards
  - It may look military on the outside, but inside it's COTS
  - COTS items force planned obsolescence
    - Must plan for failures to cause an upgrade of equipment
    - This may cause other problems – upgrades may function differently
    - Users will not be comfortable with this problem's solutions

Life cycle management of COTS items - paradigm shift

Raytheon

Integrating logistics elements

- Obsolescence management in the past has been event driven
  - Obsolescence issue arises and requires a response
    - Redesign, cannibalize, alternate part, emulation, lifetime buy
  - Prognostics were available, but limited.
- As our data systems become more robust we have new choices
  - Do nothing about an obsolescence issue
    - Manage inventory to cover needs
    - Manage capability to cover needs
    - Manage supply chain to cover needs
  - Upgrade entire systems at a lower cost than the current maintenance
    - Use COTS based solutions (with the problems on the previous page)
  - Use Predictive Obsolescence (Leading Indicators, Multiple Variables)

Integrating logistics element data gives us new solutions

Program Executive Office

SHIPS

We Are Ships
From Cradle to Grave

DoD DMSMS Conference: Lifecycle Management Panel

RADM Charles Hamilton, PEO Ships

11 July 2006






Distribution Statement A: Approved for Public Release; Distribution Unlimited. (7/13/2006).
This Brief is provided for Information Only and does not constitute a commitment on behalf of the U.S. government to provide additional information and / or sale of the system

We Are Ships From Cradle To Grave

Concept Refinement	Technology Development	System Development & Demonstration	Production & Deployment	Operations & Support
JHSV 	**MPF(F)** 	**LCS**  	**LPD 17** 	**DD 963** 
JHSS 		**DDG 1000** 	**T-AKE** 	**FFG 7** 
JMAC 		**LHA 6** 	**LHD 8** 	**CG 47** 
			LCAC 	**DDG 51** 

DASN-L Requirements Background

- **DMSMS Management Process is informed by the following DoD documents:**
  - **DASN(L) Memo, Evaluation Criteria for DMSMS, 20 August 2004**
  - **DASN(L) Memo, DMSMS, 10 May 2004**
  - **DOD 4140.1-R, Supply Chain Material Management, 23 May 2003**
  - **SECNAV Instructions 5000.2C, 19 November 2004; 4105.1A, 5 March 2004**
  - **NAVSO P-3692, 30 December 2003**

DASN-L Requirements Background

- **PEO Ships and PEO IWS AEGIS Programs have been at the forefront of Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management for 15 years**
- **The AEGIS Weapon System has well established DMSMS management processes, techniques and tools with a proactive approach fully implemented & operational within a collaborative supply chain infrastructure**

DASN-L Requirements Summary

- **The AEGIS Program submitted a detailed DMSMS Management Plan and the Deputy Assistant Secretary of the Navy - Logistics responded with a DMSMS Management Plan and Metrics Assessment Results Memo dated 13 January 2006**
  - **The programs assessed to have the best obsolescence plans and metrics collections are:**
    - **V-22 Osprey (PMA-275);**
    - **AV-8B Harrier (PMA 257);**
    - **Aircraft Mission Computer (PMA 209);**
    - **AEGIS Weapon System (PEO-Ships / IWS);**
    - **Ship Self Defense Systems (PEO-IWS);**
    - **SPQ-9B Radar (PEO-IWS);**
    - **SPAWAR Programs (PMW 150)**
  - **The AEGIS DMSMS management process and tools have been recognized and validated as "Best of Breed" and we continue to make improvements to adapt to the needs of the program and DoD policies**

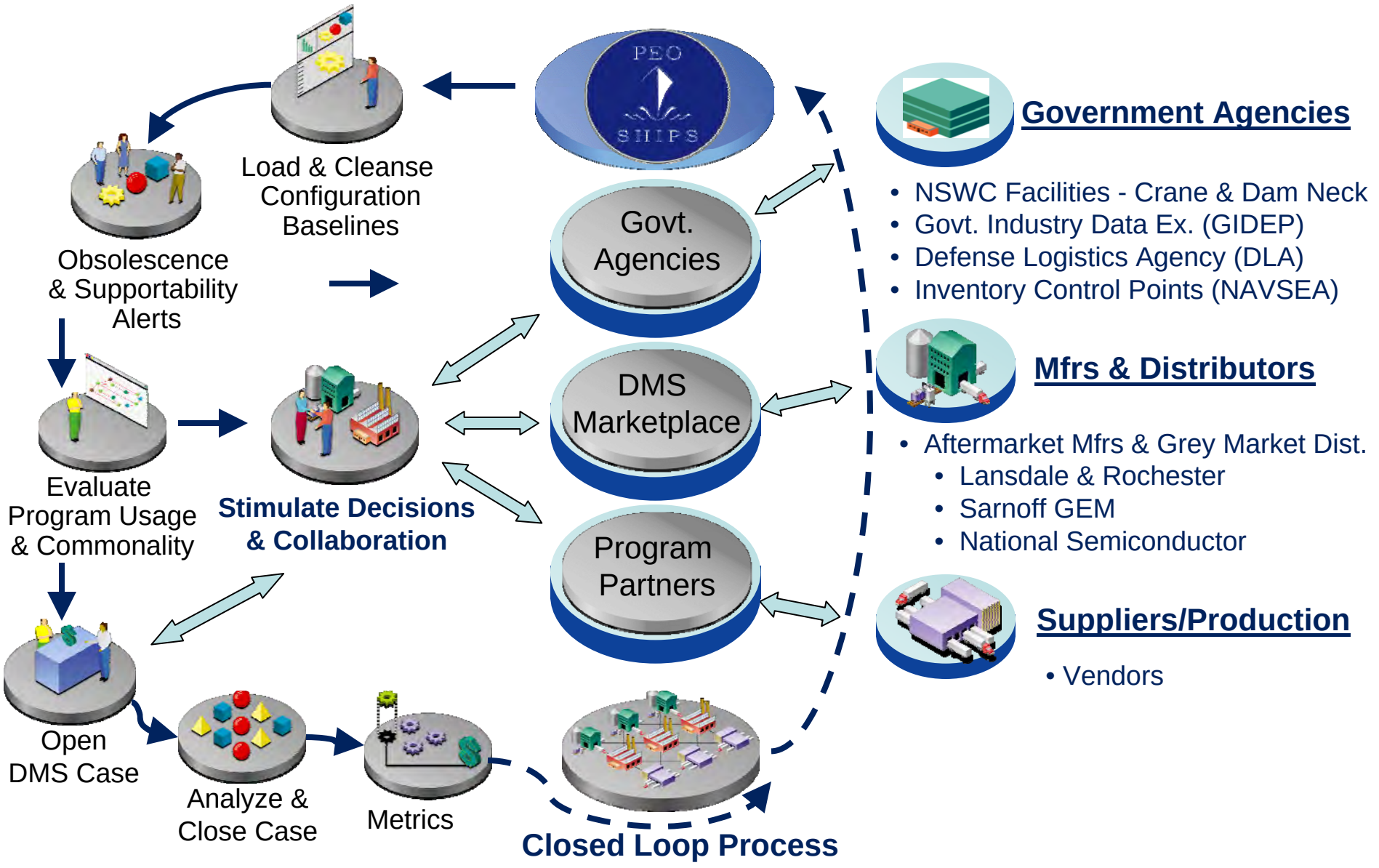
PEO Ships F DMSMS PBL In Service Support Applications

- **DMSMS Applications of PBL for PEO Ships F applies to the AEGIS Weapon System**
  - **Current and ensuing Supply Support contracts with NAVICP include basic DMSMS Management with Lockheed Martin which includes:**
    - **Limited two year Bridge Buy or Life of Type procurement**

Non PBL DMSMS Systems Support Applications

- **PEO Ships F AEGIS Weapon System Lifetime Support Contract N00024-00-C-5139 DMSMS Management, CLIN 04**
  - **Tasking covers all aspects of DMSMS Management which includes:**
    - **Market Technology Monitoring**
    - **Lowest Replaceable Unit and Piece Part level identification and monitoring**
    - **DMSMS Case Initiation and Management**
    - **Technical Refresh Schedule development and implementation**
    - **Engineering Analysis for Case Resolution Options**
    - **Bridge Buy and Life of Type Procurements**

Closed Loop Decision Process



Major DMSMS Process Steps



- **Step 1 - Alert Identification**
  - Utilize all existing tools and methods to proactively identify DMS alerts and distribute notifications. This starts the process and provides guidance & direction.
- **Step 2 - Program Verification**
  - Verify program usage across all systems and determine criticality impacts. System Commonality will play a big factor in the decision path & options
- **Step 3 - Decision Analysis**
  - Evaluate all available solution options and leverage subject matter experts to make an appropriate decision on DMS issues
- **Step 4 - Case Management**
  - Open and manage cases with appropriate delegation in a closed looped process that facilities and optimizes the resolution and cost avoidance
- **Step 5 - Metrics**
  - Centralized assignment and monitoring for all cases with measurement criteria and cost avoidance metrics for value-added and return on investment assessments

Platform Level DMSMS Plan

- **DASN L Requirement for Ship / Platform Level DMSMS Plan and Management:**
  - **PEO Ships is modifying its current in-service DMSMS Plans that will comply with the following format**
    - **Introduction will contain a summary of the various platforms that PEO Ships F manages and their functions**
    - **A matrix is currently under development that will contain all of the Ships Systems and if they have a developed and approved and current System DMSMS Plan**

Direct DMSMS management is done at the system level by each respective program manager

System Design Practices to Mitigate DMSMS in New Acquisition Programs

- **DMSMS management needs to be part of the early system design efforts to mitigate production and life cycle issues**
- **Embed DMSMS / OM into Systems Engineering process to support obsolescence forecasting**
  - **Design for Technology Insertion**
  - **Design using Open Systems Architecture**
  - **Design for reliability**
- **Factor Obsolescence Management (OM) into equipment selection / procurement process**
  - **Select equipment with multiple suppliers**
  - **Conduct market surveillance to anticipate equipment lifecycle**
  - **Review supplier technology roadmaps that will provide form, fit, function upgrades in the future**
- **Consider standardization within the Fleet where possible**

LCS Ongoing Management of DMSMS

- **The LCS Program Office is working with the two Prime contractors (Lockheed Martin and General Dynamics) to manage obsolescence**
  - **Present focus on production with additional emphasis on moving into the support phase with a focus on lifecycle cost and sustainment**
  - **Each company submitted an Obsolescence Management plan that was based on PMS 501's DMSMS plan and experiences on previous programs**
- **PMS 501 has participated in a DMSMS pilot project with Sarnoff**
  - **Sarnoff reviewed the LCS 1 Master Equipment List**
  - **Identified areas of potential DMSMS risks (technologies and OEMs particularly foreign sources)**
  - **Data is being used in planning with LM for Life Cycle Support**

Identified DMSMS Issues

- Despite the relatively short ship production timeline for LCS obsolete items have been identified impacting equipment selection for follow ships and life cycle support
- LM identified a COTS Network Attached Storage device that was discontinued by the vendor
  - LM is working through the mitigation approaches to determine the best solution for LCS 3 production
- During the review of LCS 1 provisioning data and generation of the Ship's Allowance list Obsolete Laptops were identified
  - Issue raised with LM for follow on production
  - Substitute computers that meet form, fit, and function requirements are being purchased

LCS Interim Support Contract

- **The first LCS deliveries provided limited time to ramp up Navy infrastructure support for new LCS systems**
- **An Interim Support Approach has been developed in which:**
  - **GD and LM would provide Class Services similar to a traditional planning yard including DMSMS management**
  - **GD and LM would provide maintenance, supply, engineering, and training support for selected systems on their respective hull types**
  - **Interim contracts would end three years after delivery of each lead ship at which time long term PBL decisions will be made**

Interim Support and DMSMS Execution on LCS

- **Obsolescence Management Sub CLIN**
  - **Scope Monitor, identify, plan, and execute the resolution of DMSMS and parts obsolescence issues for supported systems**
  - **Contractor is paid for systems readiness including the impact of readiness from obsolete components and parts**
- **Combined with the supply support, maintenance and modernization scope of the contract to provide flexibility in executing support**
  - **Contractor able to propose and execute changes based on DMSMS issues or equipment performance within scope of contract**
  - **Can manage DMSMS issues while conducting maintenance and supply support functions**
    - **Modernization through spares**
    - **COTS refresh to mitigate obsolescence or improve performance**
    - **Execute life of type buys, Navy will not pay for until used, contractor takes on risk**

DDG 1000 DMSMS

- **DDG 1000 contract specifications include DMSMS/obsolescence management requirements**
  - **Vendor purchase orders flow down these requirements**
  - **Prime contractors leverage well established corporate DMSMS processes and toolsets**
  - **Prime contractors review design and screen components for potential obsolescence issues**
- **DASN-L approved DD(X)/DDG 1000 DMSMS Plan 13 Jan 2006**

DDG 1000 Standardization

- **Contract specifications also include standardization requirements**
  - **Standardization requirements are flowed down to vendors from shipyards during purchase request process**
  - **References use of Hull, Mechanical and Electrical Data Research System (HEDRS) to implement/enforce Fleet standardization**
- **DDG 1000 Class Common Equipment List (CCEL) and Common Parts Catalogue (CPC) ensure common end items, components and suppliers among both shipbuilders**
- **Standardization is enforced at the hull, class and Fleet levels**
- **Effective standardization will limit scope of obsolescence issues**

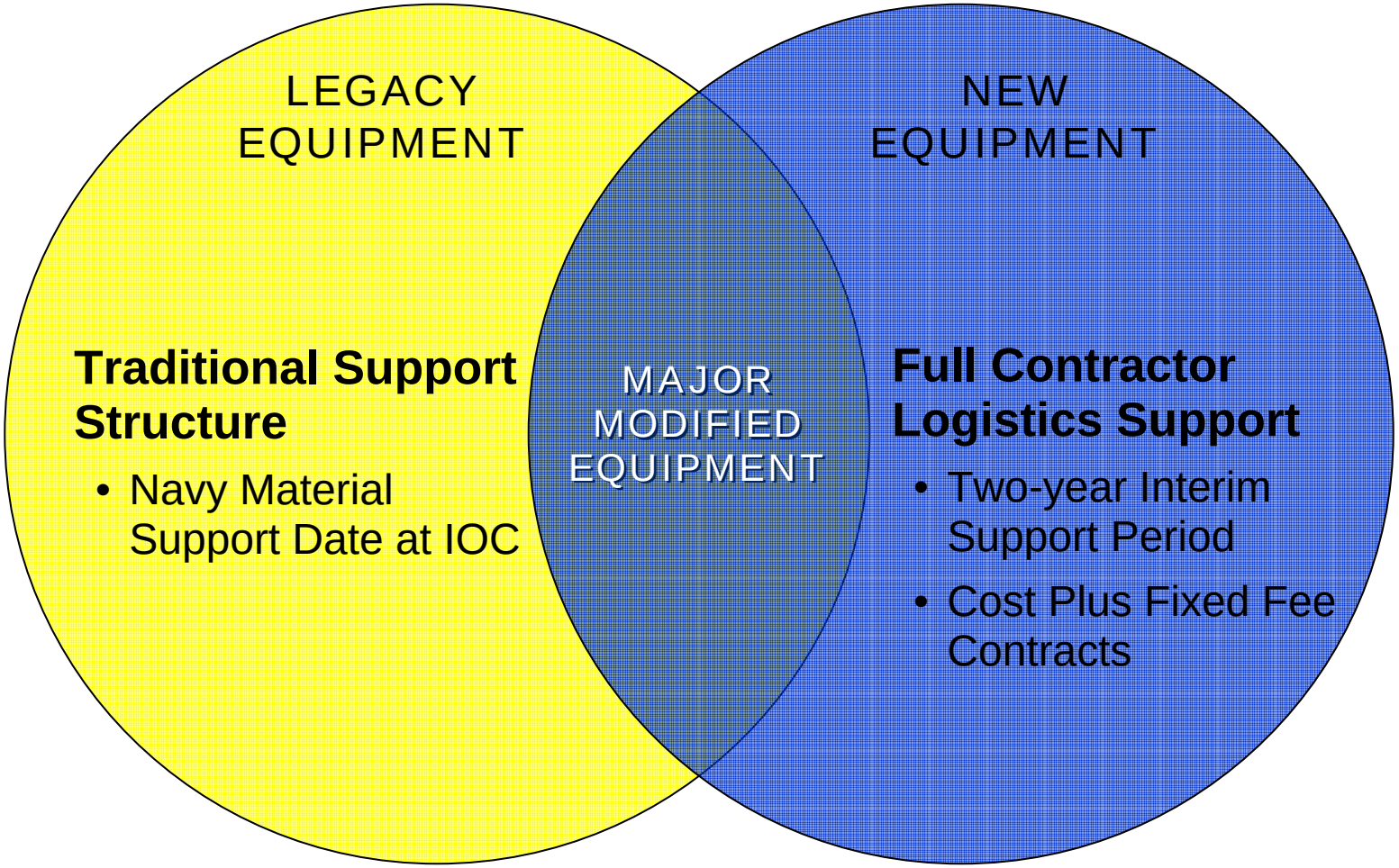
DDG 1000 UID

- DFARS clause 211.274-1 Unique Item Identification invoked on DDG 1000 detail design and construction contracts
- Contract specifications further definitize DDG 1000 UID requirements
- OUSD (AT&L) approved DDG 1000/DD(X) UID Plan 7 Oct 2005
- DDG 1000 Automatic Identification Technologies (AIT) working group overseeing UID implementation across multiple prime contractors
- Effective UID implementation supports DMSMS objectives through enhanced life cycle configuration management and visibility across the program

DDG 1000 PBL

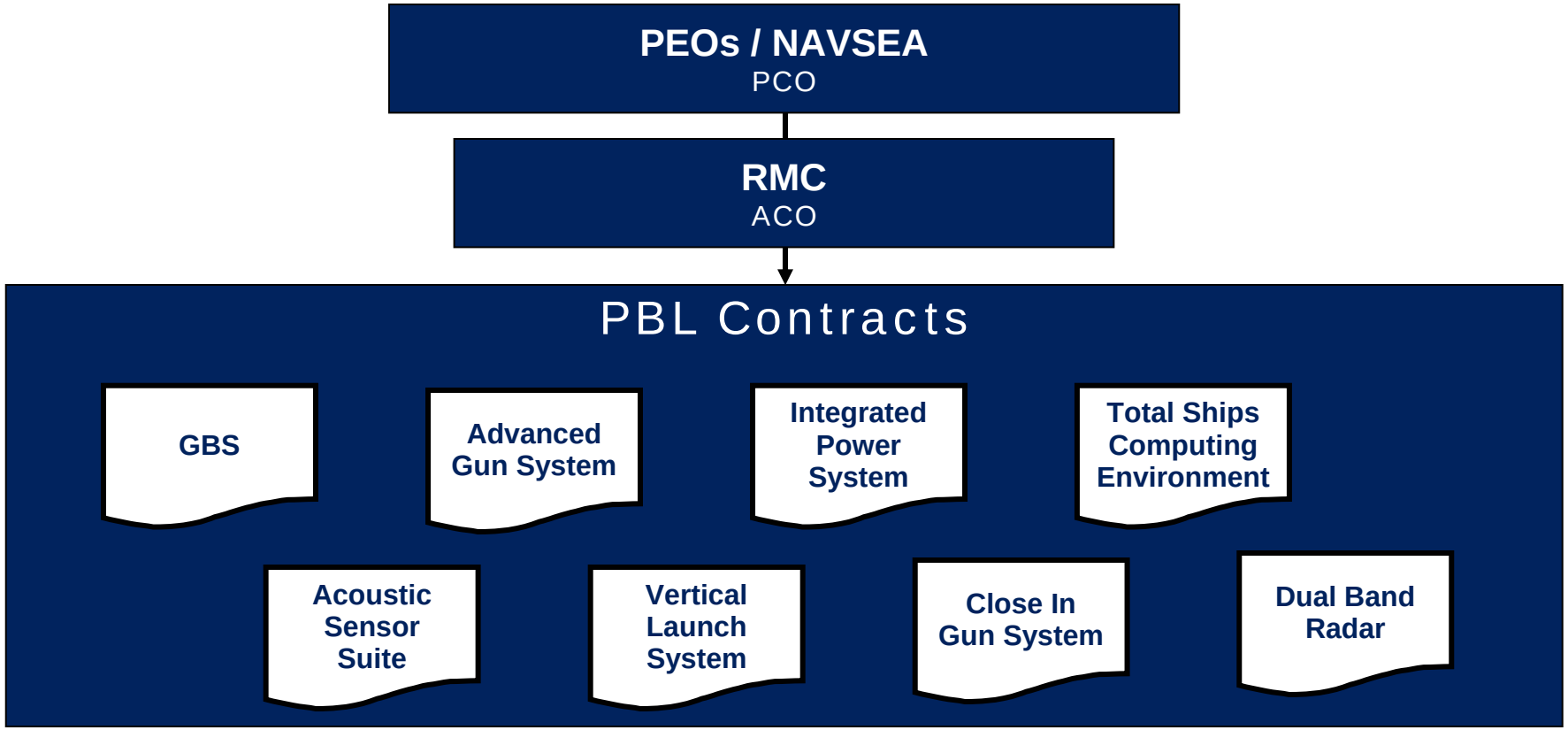
- **DDG 1000 Performance Based Logistics (PBL) approach emphasizes support of class unique equipment at the major system level**
  - **Evolving with Fleet interaction**
  - **Leveraging LCS lessons learned**
- **Obsolescence Management is a DDG 1000 PBL functional element**
  - **Associated metrics and incentives/penalties will be determined when PBL arrangements are definitized**

DDG 1000 Logistics Support Strategy



DDG 1000 PBL Contracting Strategy

- **Full Contractor Logistics Support Contracts**
  - **Two-year Cost Plus Fixed Fee Initial Support Contract**
  - **Cost and performance data collected during initial support period will be used to negotiate Firm Fixed Price PBL support contract**



Summary

- **AEGIS Weapon System has become the standard process for all DMSMS management requirements within PEO Ships F Fleet Support**
- **DMSMS management needs to be part of the early system design efforts to mitigate production and life cycle issues**
  - **Embed DMSMS / OM into Systems Engineering process to support obsolescence forecasting**
  - **Factor Obsolescence Management (OM) into equipment selection / procurement process**
  - **Consider standardization within the Fleet where possible**

Questions?

Back Up

Selected Key Policy Documents

- **DMSMS**
  - **ASN(RDA) Memorandum, DMSMS Management Guidance, 27 Jan 05**
  - **DASN(LOG) Memorandum, DMSMS Program Management Plans and Metrics, 12 Apr 05**
  - **USD(AT&L) Memorandum, DMSMS Guidebook, 25 May 05**
  - **ASN(RDA) Memorandum, DMSMS Guidance for Developing Contractual Requirements, 12 May 06**
- **Standardization**
  - **SD-18, Defense Standardization Program Guide for Part Requirements and Application, Aug 00**
  - **SD-19, Life Cycle Cost Savings Through Parts Management, Jun 01**

Selected Key Policy Documents (cont'd)

- **UID**
  - **ASN(RDA) Memorandum, Policy for Unique Identification of Tangible Items, New Equipment, Major Modifications and Reprocurement of Equipment and Spares, 10 Feb 04**
  - **USD(AT&L) Memorandum, Contract Pricing & Cost Accounting – Compliance with DFARS 252.211-7003 "Item Identification and Valuation", 9 Jul 04**
  - **DoD Guide to Uniquely Identifying Items, 1 Jun 06**
- **PBL**
  - **Product Support for the 21st Century: A Program Manager's Guide to Buying Performance, Nov 01**
  - **USD(AT&L) Memorandum, Performance Based Logistics, 13 Feb 02**
  - **ASN(RDA) Memorandum, Department of the Navy Performance Based Logistics Guidance Document, 27 Jan 03**
  - **Performance Based Logistics: A Program Manager's Product Support Guide, 1 Nov 04**

DLA's Customer & Supplier Collaboration Program

Customer Collaboration
- What it is
- Benefits
- Current Users
- Sample Demand Data Exchange
- Customer Collaboration Worksheet
- What is needed to get started

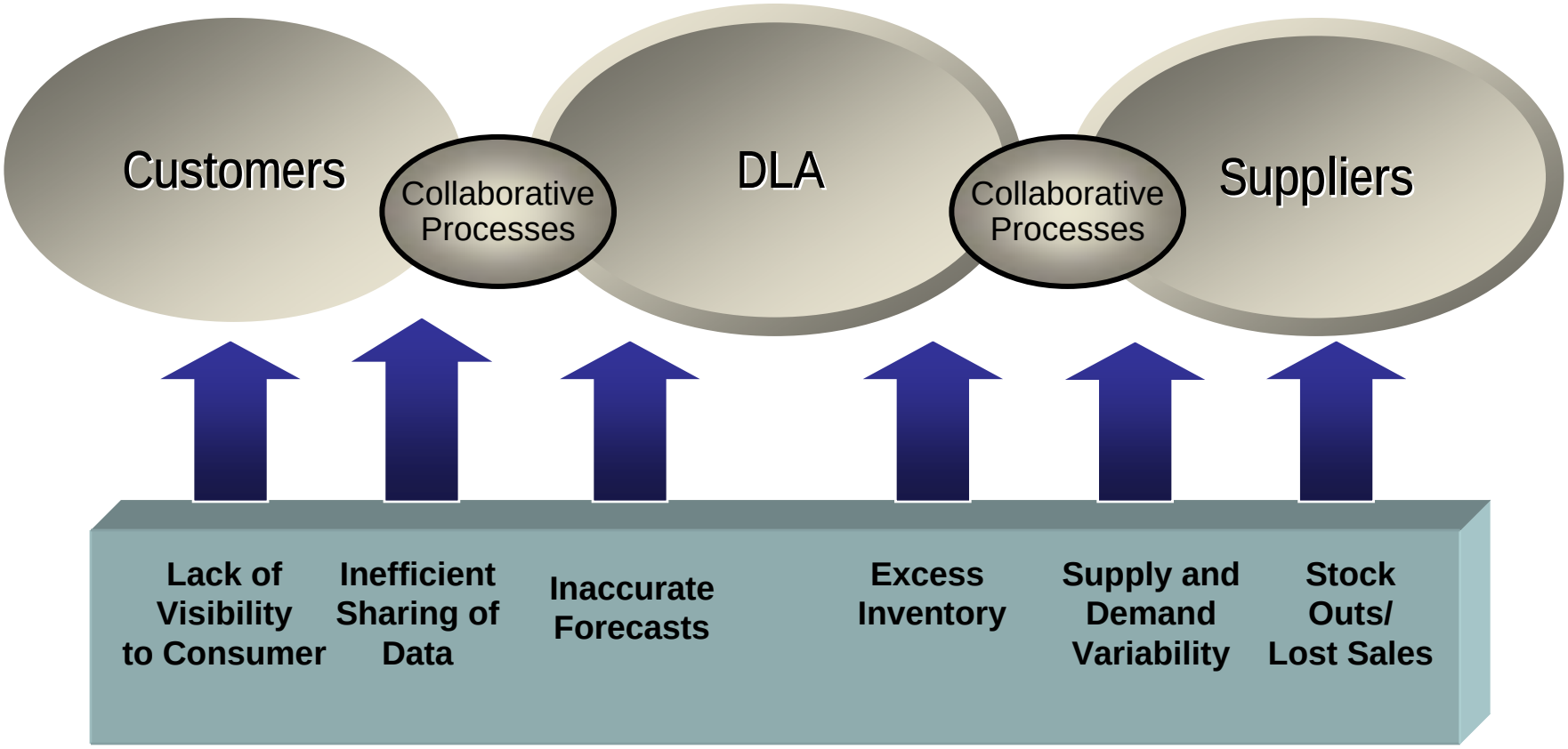
Supplier Collaboration
- What it is
- Benefits
- Supplier Collaboration Worksheet
- What is needed to get started

Debbie Haven
DSCC Collaboration Manager
614-692-7626
deborah.haven@dla.mil

13 June 2006

Collaboration Overview

Goal is to decrease the illustrated inefficiencies



Customer Collaboration

Performance
Transformation
The DSCC Way
Culture

BSM Program
Primary COTS Components

SAP
- Order Fulfillment
- Procurement
- Financial Management

ECF
- Solicit
- Award
- Report

manugistics

Exceptions
DLA DP
Customer DP

Supply Planning

Business rules

Demand Planning

DAASC

Vendors



Supply Chain Partners

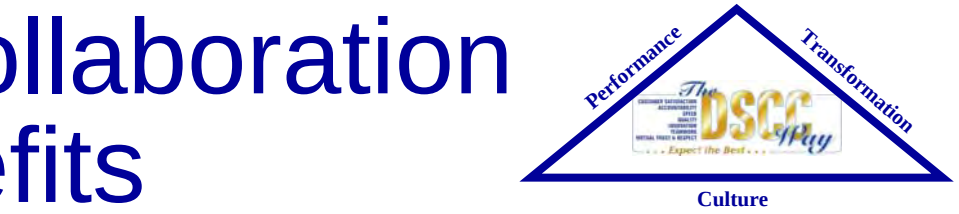


Service Customer
DOCID = CDD
1062 card column



•Manugistics access via Web

Customer Collaboration Benefits



Benefits to the Customer

- **DLA buys the material based on customer need date**
- **No customer funds required until material is requisitioned**
- **Reduce local procurement actions**
- **Improve Customer Support by improving Demand Plan Accuracy (DPA)**
- **Reduce Lead Times and Increase Stock Availability (Reduce Stockouts)**
- **Proactive vs. Reactive demand planning**
- **More accurate forecasts quantities…both increased or decreased**
- **Reduce excess inventory levels**
- **Fewer NSN chasing fire drills**

Eliminate Stock Outs

Enterprise Collaboration

Where We Are Now…..

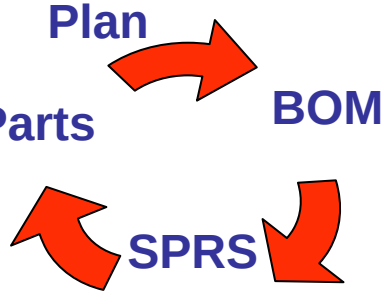
CURRENT DDE CUSTOMERS

Customer Ops	CUSTOMER	GO-LIVE DATE	MAR 06 NIINs	APR 06 NIINs	MAY 06 NIINs	JUN 06 NIINs
Aviation	OC-ALC	Mar-05	14,198	14,766	16,668	21,071
Aviation	OO-ALC	Mar-05	2,200	2,893	2,635	3,060
Aviation	WR-ALC	Mar-05	2,803	2,871	2,875	3,528
Aviation	NADEP-NI	Mar-05	2,893	3,462	3,457	3,497
Aviation	NADEP-JAX	Sep-05	3,229	3,794	4,057	6,529
Aviation	NADEP-CP	Oct-05	9,158	8,676	8,676	9,685
Land	MC-Albany	Oct-05	441 41% 188	643 21% 141	1,234 29% 370	2,040 52% 1062
Land	MC-Barstow	Nov-05	25 82% 23	28 7% 2	35 54% 19	45 68% 31
Maritime	NUWC	Mar-06	435 54% 235	435 1% 5	1,057 11% 124	1,248 20% 249
			TOTAL 35,382	TOTAL 37,568	TOTAL 40,694	TOTAL 50,703

Forecasting

SPRs

PROCESS



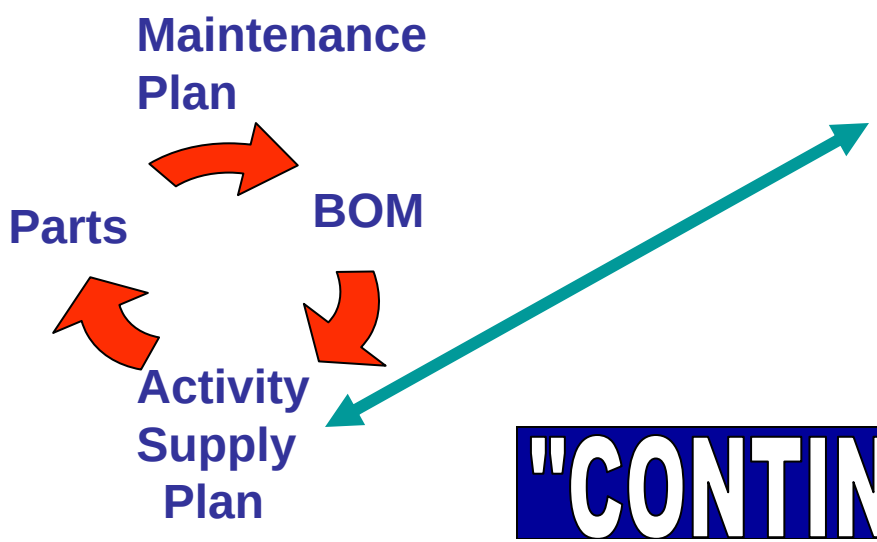
Issues

- No process to accommodate program execution changes
- No systematic review after submission
- SPR accuracy

"FIRE AND FORGET"

BSM Demand Planning

PROCESS



Enhancements

- Forecasts total monthly requirement
- Monthly review and execution
- Engages repair facility in process
- Accepts changes monthly

CHALLENGE...
CULTURE & PROCESSES

"CONTINUOUS REASSESSMENT"

MCLB Albany Sample DDE File for Apr06

Sample DDE File submitted by MCLB Albany on April 1, 2006

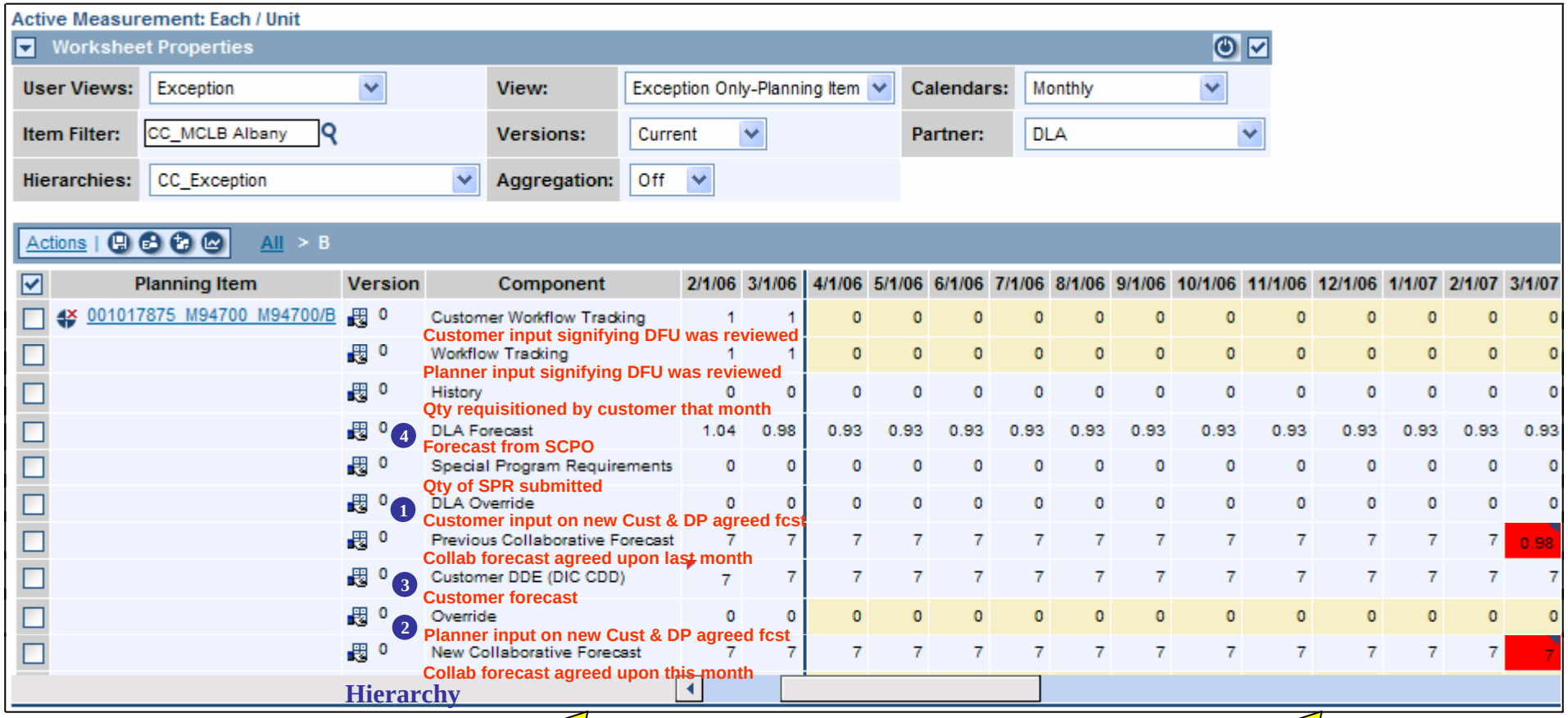
- Each DDE file has a header as demonstrated below, with high level information including the submit date of the file

Body of DDE file submitted by MCLB Albany

- Each DDE file will have a row for each item, identifying the DODAAC, Ship To Location, NIIN, Unit of Measure, etc.
- Each row contains quantities for up to 60 forecast periods, as demonstrated below

Type	SOS	Submitter	Customer	Ship To	NIIN	U/M	Plan Type	Period 1	Period 2	Period 3, etc.
CDD	SMS	M94700	M94700	M94700	000019769	AY	M	26	26	26
CDD	SMS	M94700	M94700	M94700	000036696	AY	M	22	22	22
CDD	SMS	M94700	M94700	M94700	000043220	AY	M	35	35	35

Customer Collaboration Worksheet

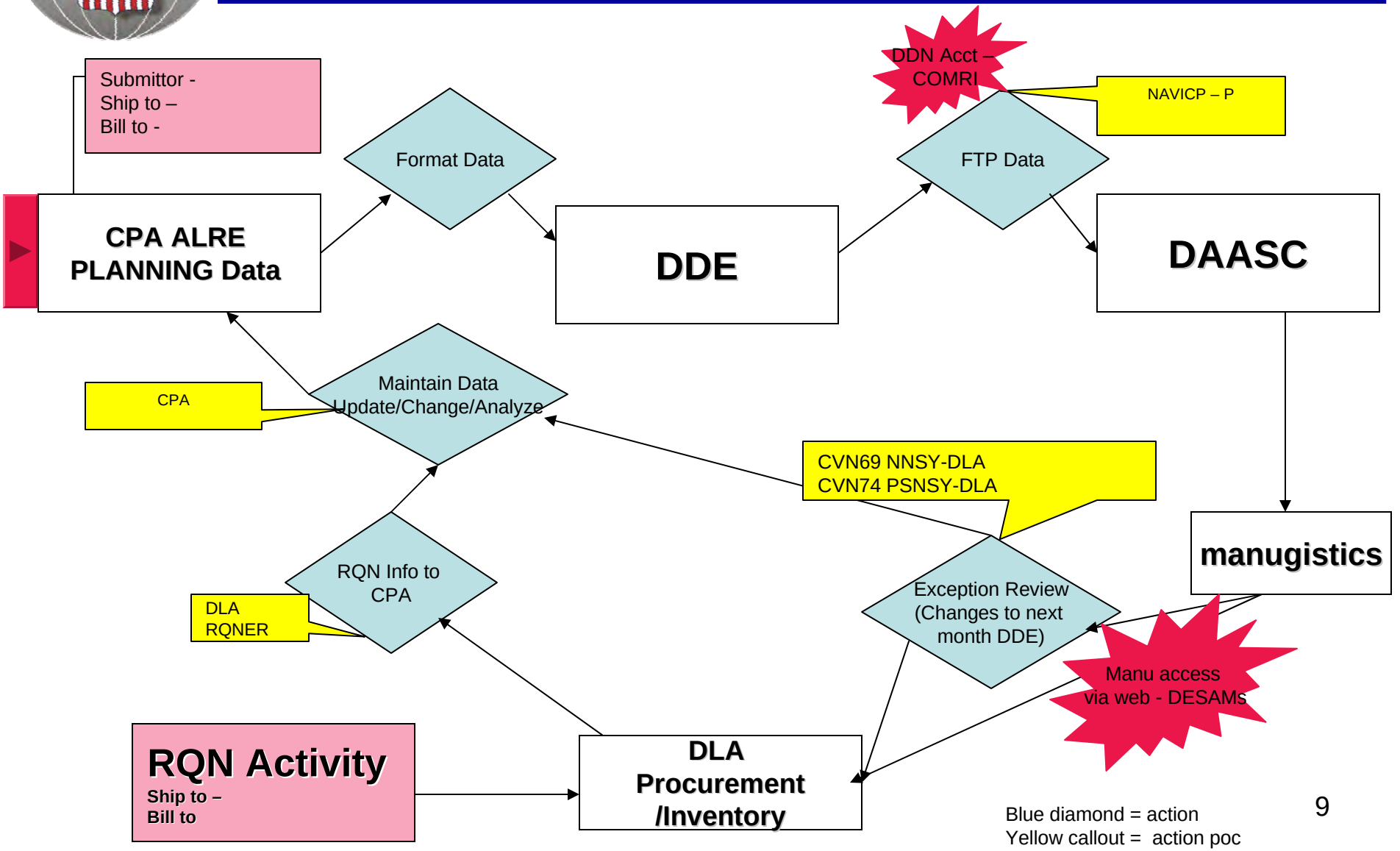


One screen- DLA & Customer see same info

- **Manugistics access via Web**
- **Export capability**

ALRE Collab

CVN74 Jul 07 PSNSY
CVN69 OCT 07 NNSY



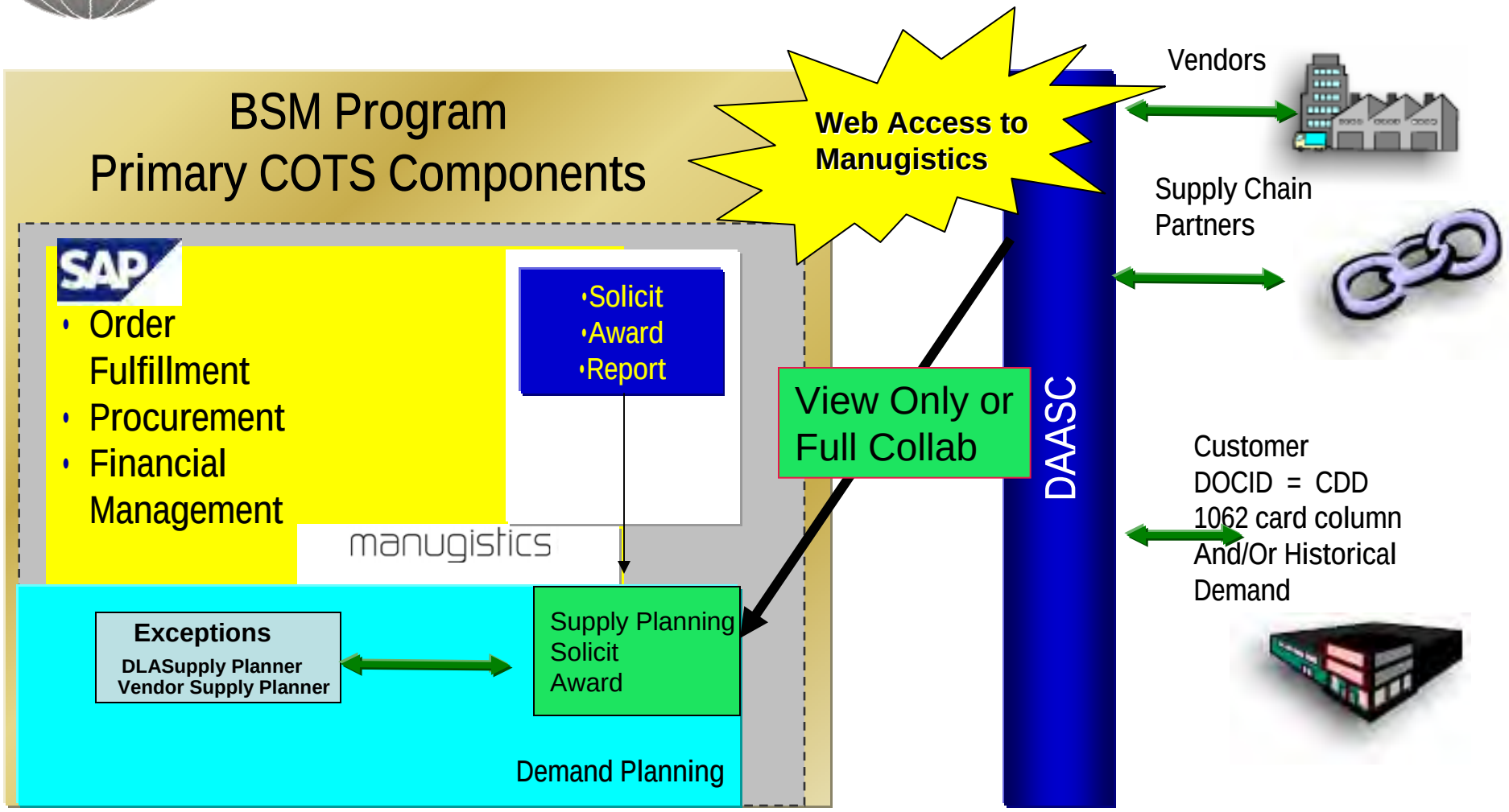
Blue diamond = action
Yellow callout = action poc
Pink rectangle– Ship to & Bill to must match

Customer Collaboration Key Steps for Getting Started

Action Item	*Appx Time*	*Activity POC*	*DLA POC*
DDN Account •Purpose: To transmit the forecast data (DDE) •*Apply on line*	30 days	• Who will apply? • Who will transmit?	Who will be the primary?
DESAMs Purpose: External user web access to Manugistics •*SAAR 2875 - Complete* •*Rules of Behavior- Sign* •*Security Questionaire- Sign*	30 days	• Who will work exceptions? •Who will maintain the data?	Who will be the Demand Planner?
Activity Email Address Purpose: Email customers about DDE receipt & system info		• Who needs to know we did or didn't get the DDE?	

Supplier Collaboration

Sole Source or Long Term Contract Items

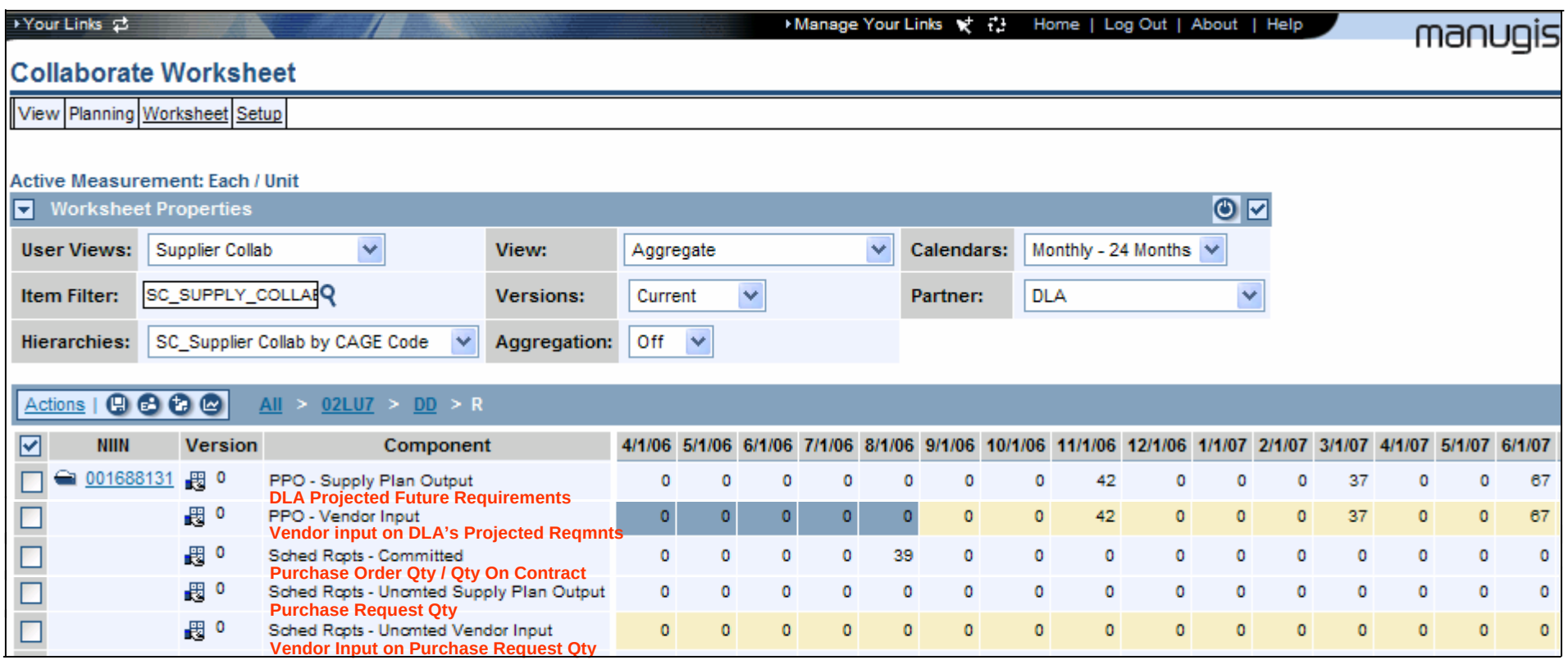


Supplier Collaboration Benefits

Benefits to the Supplier

- **See Time Phased Inventory Plan (TPIP) - future DLA requirements out 24 months**
- **Ability to better plan production lines**
- **Reduce inventory levels**
- **Opportunity to smooth/adjust DLA planned orders before they become purchase orders that the vendor cannot fill**

Supplier Collaboration Worksheet



NIIN	Version	Component	4/1/06	5/1/06	6/1/06	7/1/06	8/1/06	9/1/06	10/1/06	11/1/06	12/1/06	1/1/07	2/1/07	3/1/07	4/1/07	5/1/07	6/1/07
001688131	0	PPO - Supply Plan Output	0	0	0	0	0	0	0	42	0	0	0	37	0	0	67
	0	PPO - Vendor Input	0	0	0	0	0	0	0	42	0	0	0	37	0	0	67
	0	Sched Rcpts - Committed	0	0	0	0	39	0	0	0	0	0	0	0	0	0	0
	0	Sched Rcpts - Unomtd Supply Plan Output	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	Sched Rcpts - Unomtd Vendor Input	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

- **Manugistics access via Web**
- **Export capability**

Supplier Collaboration Step for Getting Started

Action Item	*Appx Time*	*Activity POC*	*DLA POC*
DESAMs Purpose: External user web access to Manugistics •*SAAR 2875 - Complete* •*Rules of Behavior- Sign* •*Security Questionaire- Sign*	30 days		

Site Collaboration POCs

- Collaboration Program Analyst: Debbie Haven

  deborah.haven@dla.mil

  614-692-7626

- Collaboration BPA: Melissa Wright

  melissa.k.wright@accenture.com

  melissa.wright.ctr@dla.mil

  614-692-2460

Osprey

OBSOLESCENCE MANAGEMENT TEAM

2006 DOD DMSMS Conference



LtCol Bill Hidle
V-22 Avionics DAPML
V-22 Obsolescence Management Team Lead
12 July 2006

Outline



- OMT Mission
- Management
- Planning
- Implementation
- Assessment
- Metrics
- Summary
- Questions

Mission



The V-22 Obsolescence Management Team mission is to proactively manage and mitigate obsolescence problems in the V-22 weapon systems with the goal to increase operational capabilities, support Sustainment, reduce Total Ownership Cost (TOC), and reduce the effects of Diminishing Manufacturing Sources and Materiel Shortages (DMSMS) from conceptual design through retirement.

Management



Obsolescence Management Team Lead

- National Technologies Associates Contractor Support
  - Avionics Special Projects Officer
  - Aging Aircraft Integrated Product Team
  - PMA-209 Common Avionics
  - Fleet Support Team Cherry Point, NC
  - Naval Inventory Control Point
  - Legal Counsel
  - Defense Logistics Agency
  - Bell/Boeing Joint Program Office
  - Bell/Boeing Engineering
  - NAVAIR Contracts
  - Manufacturing Technologies, Inc.
  - AIR-4.2 Cost Department

Planning



- Heavy administrative burdens
  - Identify all stakeholders
  - OMT Stand Up
  - Create OMT Plan and Guide
  - Establish and document all required processes to manage and mitigate obsolescence
    - Budget
    - Legal
    - Cost (BCA)
    - Contracts
- Iterative refinement based on lessons learned

Implementation



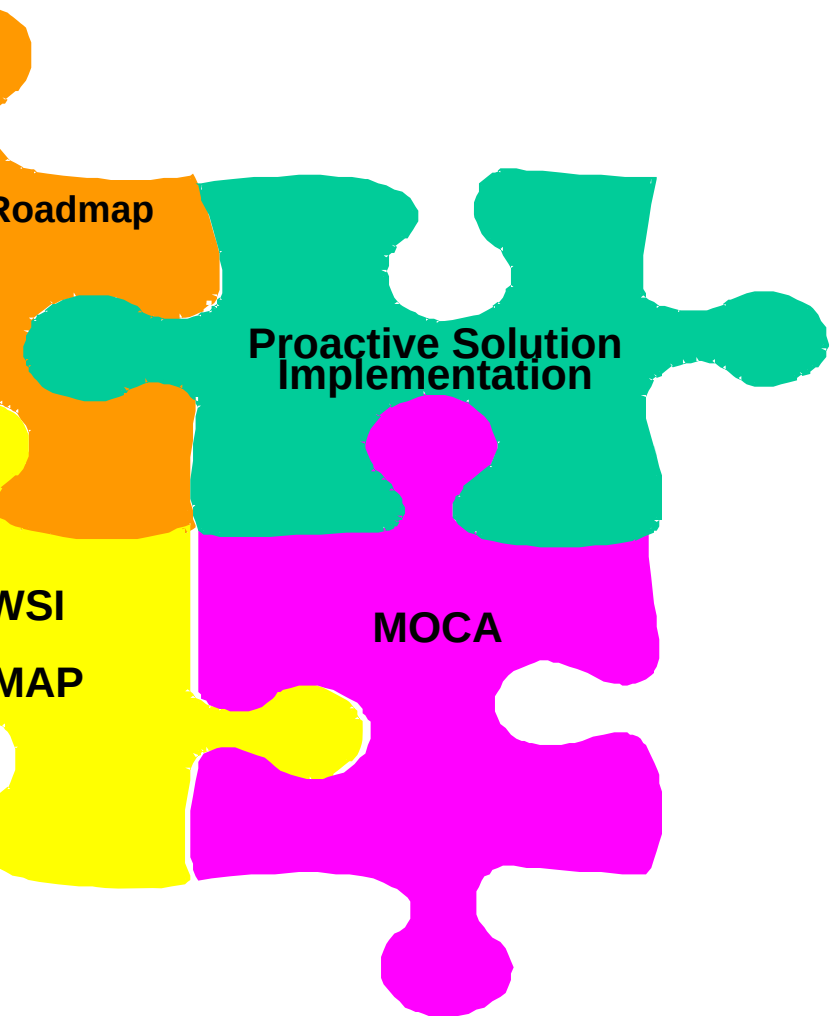
- Processes in place to proactively manage and mitigate obsolescence
  - Auto-Generated Case Sheet
- Weekly / Bi-Weekly teleconferences
- Weekly / Bi-Weekly case sheet working side bars
- Quarterly / Semi Annual reviews
- Focus groups as required
  - Osprey Support Network
  - V-22 OMT/NRE/Cost Metrics
  - Quantitative / Qualitative Spreadsheet

Implementation (Cont)



- Focus groups (Cont)
  - Mitigation of Obsolescence Cost Analysis (MOCA)
  - Health Analysis Cost Analysis Model (BCA)
  - Contracts
  - Spares/RoR
  - AAIPT OMIS
  - EPL / BOM
- Iterative refinement based on lessons learned
- Concentration on Bit Piece/SRA/WRA/System
  - Active and Passive

Implementation (cont)



Assessment



- Imperative to success
  - Facilitate rapid funding
  - Establish priorities for contracts to expedite contracting efforts
  - Obtain and Maintain all EPL and BOMs
  - Integrate Avionics and WSI Roadmaps
  - Implement MOCA
  - Process Visibility
  - Obtain buy-in from OEM/Suppliers
  - Cross platform/department/company/service sharing of information

Metrics



	# of CASE SHEETS	# PARTS
BOEING (OPEN)	66	
BELL (OPEN)	19	
GFE (OPEN)	4	
OTPS (OPEN)	0	
TOTAL OPEN	89	79
RESOLVED CASE SHEETS	9	
CLOSED	384	
TOTAL CASE SHEETS	482	435

Cases Closed

FY04: 17 **FY05: 120** **FY06 to date: 247**

- Over 52,000 components monitored
- Cost avoidance to the program:
  - FY98-FY04 = $38
  - FY05 = $27
  - FY06 to date = $10.8

The OMT continuously refines and streamlines its processes to increase efficiency!

Summary



- Review of accomplishments
  - Auto-Generated Case Sheet
  - Process Documentation
  - Focus Groups
  - Joint Oversight
  - Metrics
- Next step
  - PBL


QUESTIONS?

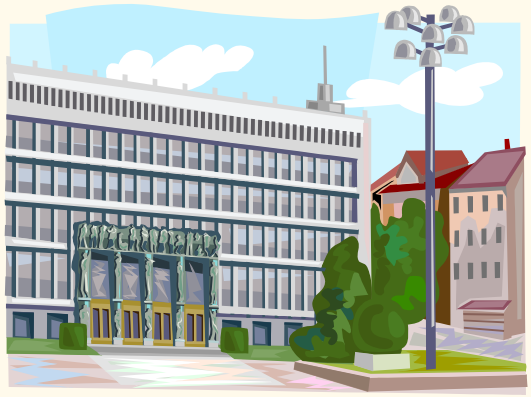
How is the commercial world responding to RoHS?

Dr. Craig Hillman, DfR Solutions
301-474-0607, chillman@dfrsolutions.com

DoD DMSMS Conference **Charlotte, NC** **July 11, 2006**

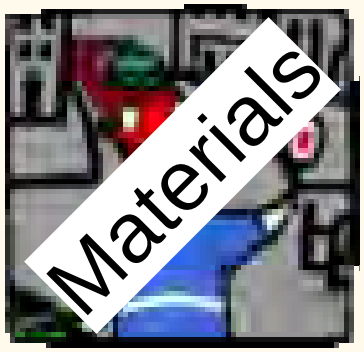
What is RoHS?

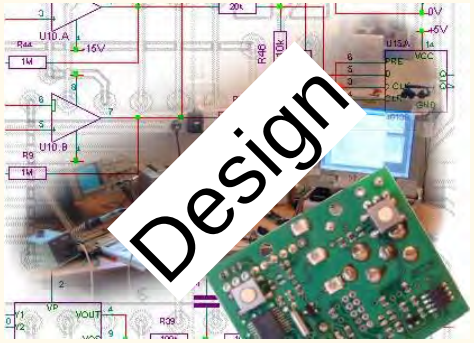
Restriction **O**n the use of certain **H**azardous **S**ubstances in Electrical and Electronic equipment (July 1, 2006)



- Created by the European Union
- What is restricted?
  - Lead, mercury, cadmium, Cr^{6+}, polybrominated biphenyls (PBB), polybrominated diphenylethers (PBDE)
- Who is covered?
  - Household appliances, IT & telecom, Consumer equipment, Lighting, Tools, Toys and leisure equipment, Automatic dispensers
- Copycats spreading around the world
  - China (2007), Korea (2008), California (2010), South America (?)
- The result?
  - SnPb parts hard to find and getting expensive (40-50% increase)

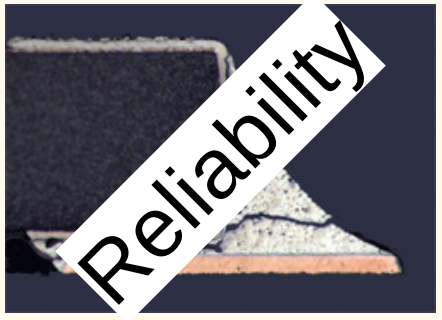
Concerns of the Commercial Marketplace







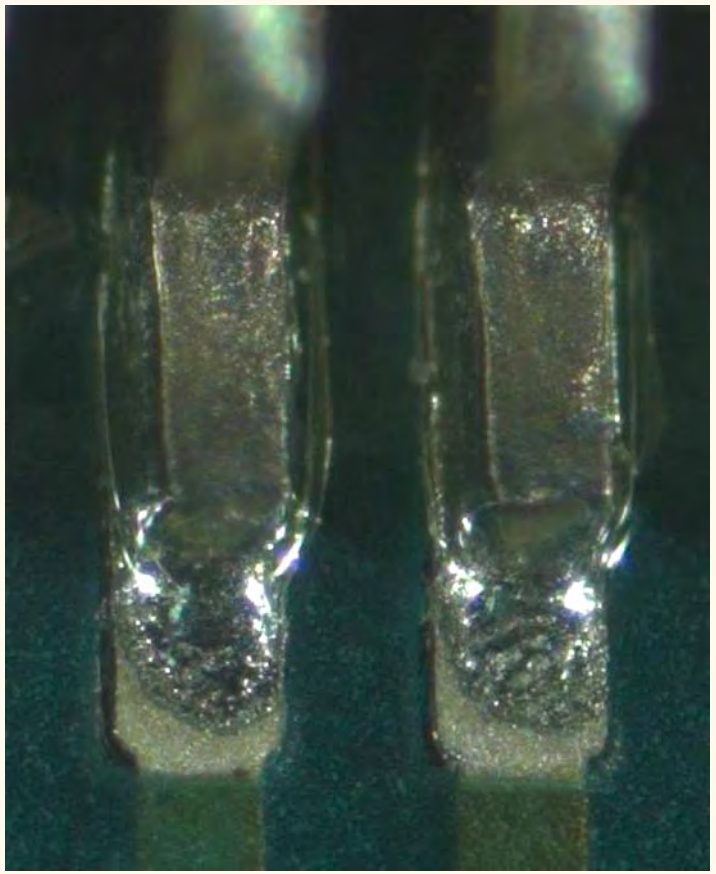
Everything they've always worried about?





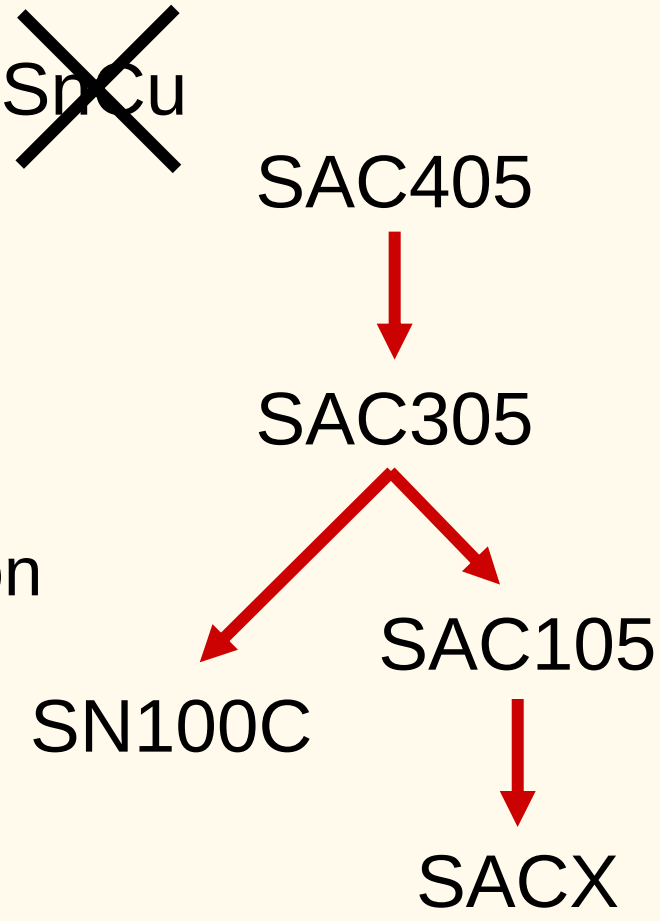
Design

- No major design changes
  - Some reduction in bond pad dimensions
  - Smaller ceramic capacitors for wave soldering



Good News!

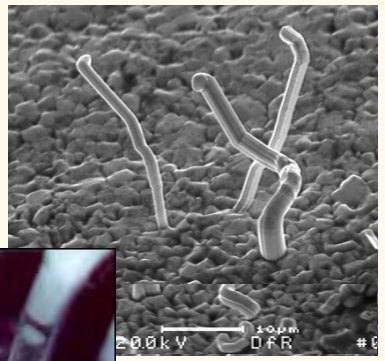
Suppliers (Parts)

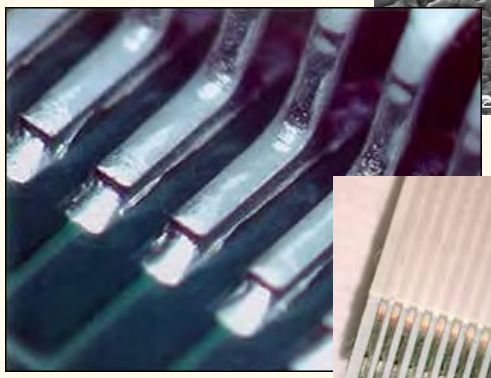


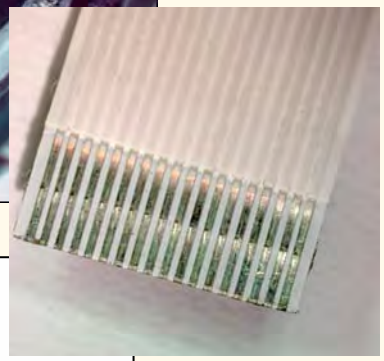
- Tracking of RoHS5 / RoHS6 compliance
  - Update of part control systems
  - Availability (Obsolescence)
- Market still unsteady; proliferation and evolution of material sets
  - Die Attach
  - Platings
  - Solder ball
- Robustness at elevated reflow temp
  - Pretty much addressed
- Tin whiskering

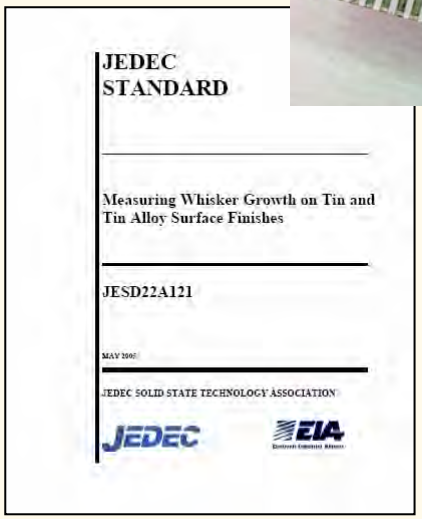
Supply Chain (Tin Whiskering)

- Focus on critical components
  - < 1 mm pitch (0.3 mm spacing)
  - Metal can housing
  - Contact points (flex connector)
  - Welds (electrolytic capacitors)
- Follow industry specifications
  - Perform testing
  - Request test data
- Demand mitigation
  - Anneal for 1 hr at 150C
  - Use nickel underplate (>1.2 μm)
  - Plating thickness > 10 μm
- <u>Request alternatives</u>
  - Not aware of any commercial company considering solder dipping








JEDEC
STANDARD

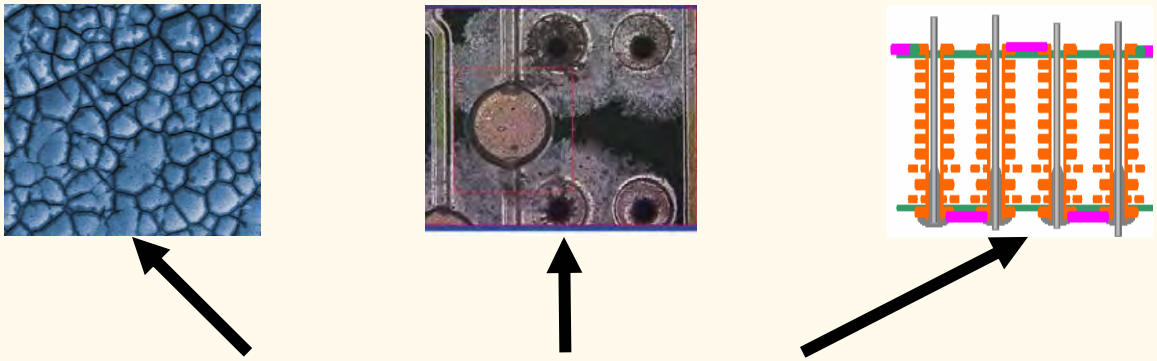
Measuring Whisker Growth on Tin and Tin Alloy Surface Finishes

JESD22A121

JEDEC SOLID STATE TECHNOLOGY ASSOCIATION

JEDEC EIA

Manufacturing (Printed Circuit Board)



- HASL – ENIG – ImAg – OSP – HASL (Pb-free)
  - Better wetting, good co-planarity, long storage life
- Damage during reflow

Board thickness	IR-240~250	IR-260
≤60mil	Tg140 Dicy All HF materials OK	Tg150 Dicy HF- middle and high Tg materials OK
60~73mil	Tg150 Dicy NP150, TU622-5 All HF materials OK	Tg170 Dicy HF –middle and high TG materials OK
73~93mil	Tg170 Dicy, NP150G-HF HF –middle and high TG materials OK	Tg150 Phenolic + Filler HF –middle and high TG materials OK
93~120mil	Tg150 Phenolic + Filler HF –middle and high TG materials OK	Phenolic Tg170 HF –middle and high TG materials OK
121~160mil	Phenolic Tg170 HF –high TG materials OK	Phenolic Tg170 + Filler HF –high TG materials OK
161mil	PhenolicTg170 + Filler HF material - TBD	TBD

HASL – Hot air solder level
ENIG – Electroless nickel/immersion gold
ImAg – Immersion silver
OSP – Organic solderability preservative

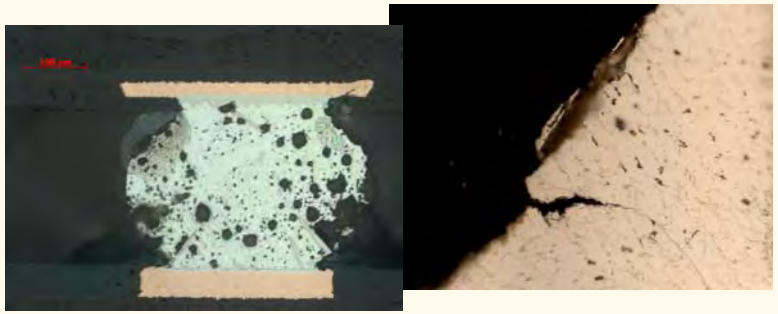
DfR Solutions
reliability designed, reliability delivered

Manufacturing (Printed Circuit Board Assembly)

- Narrower process window
  - Solvable (takes more time then you might think)

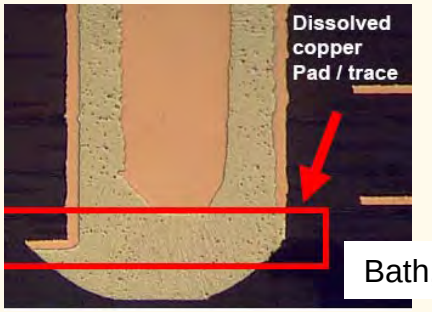
- Hole Fill
  - Higher pot temperatures, avoidance of OSP

- Shrinkage cracks / Hot tearing
  - Solvable



- Optical inspection
  - Pb-free now shiny

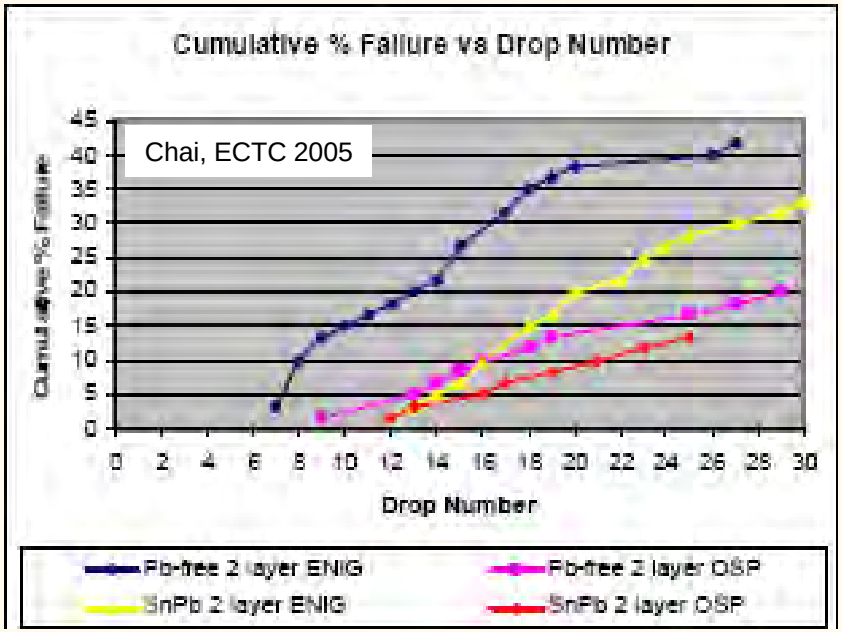
- Copper dissolution
  - Primarily a rework/repair issue
  - Isn't rework/repair <u>always</u> an issue?



Bath, iNEMI

Reliability

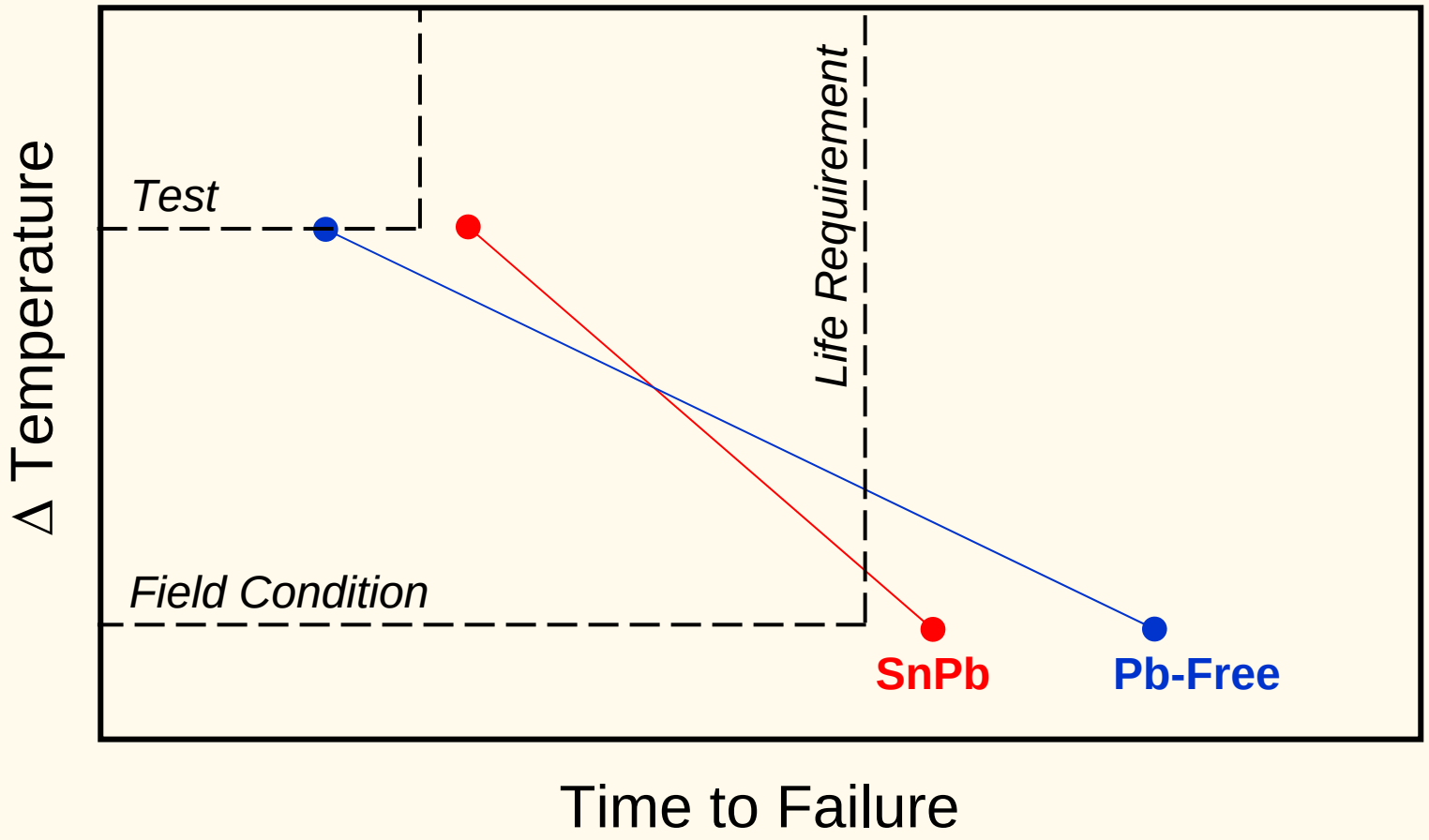
- Number one concern? Mechanical shock
  - High stress, high strain rate event
  - Drop, crash, direct-hit
- General findings
  - SAC less robust than SnPb
  - Plating materials are a greater driver
  - Still some uncertainty and contradiction



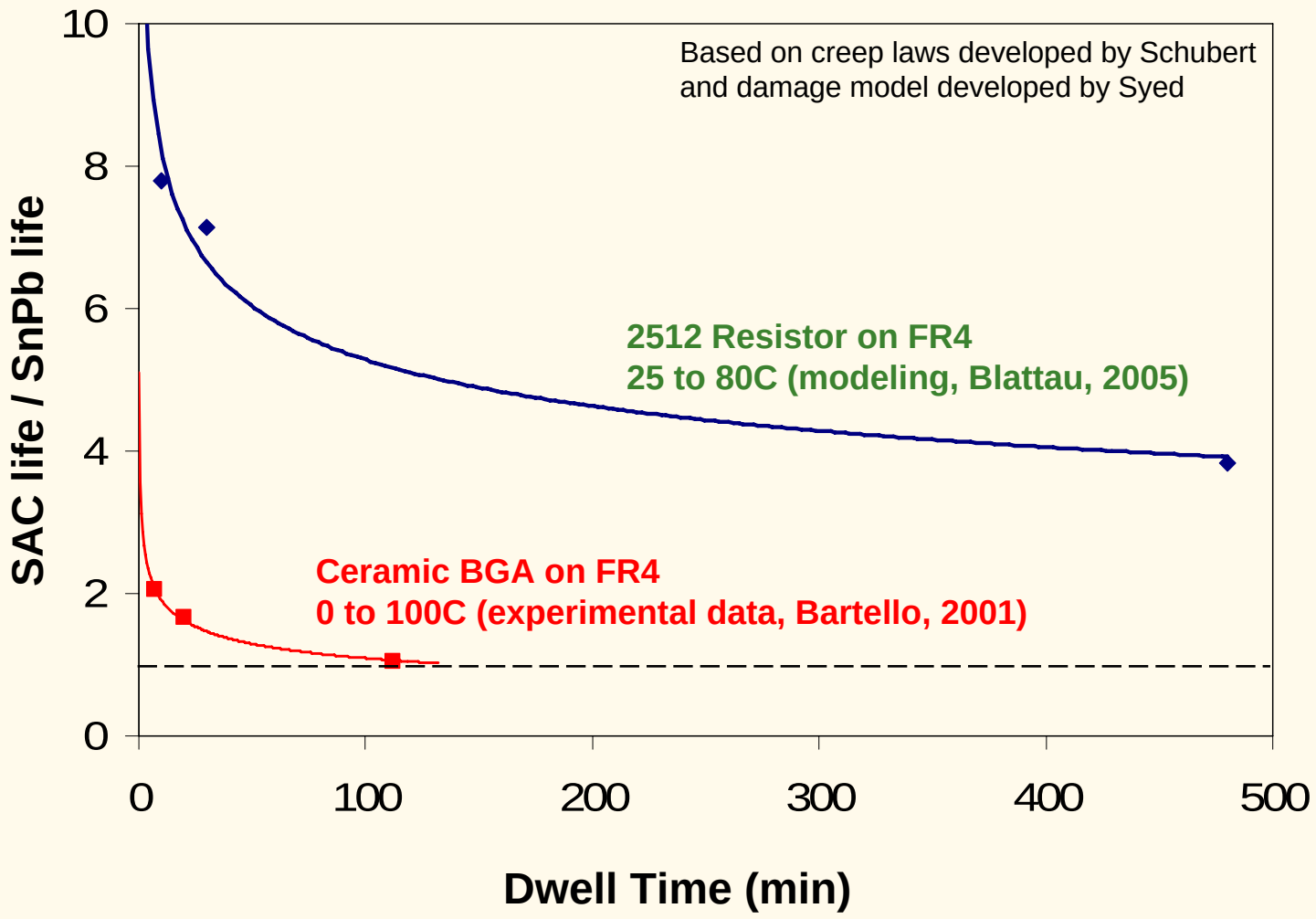
PQFP (28x28mm, 208 I/O)	Failures	
Pb-Free on ENIG	2/6	44/50, 45/50
Pb-Free on OSP	2/6	16/50, 29/50
SnPb on OSP	0/6	--

Chong, ECTC 2005

When is Failure not a Failure?



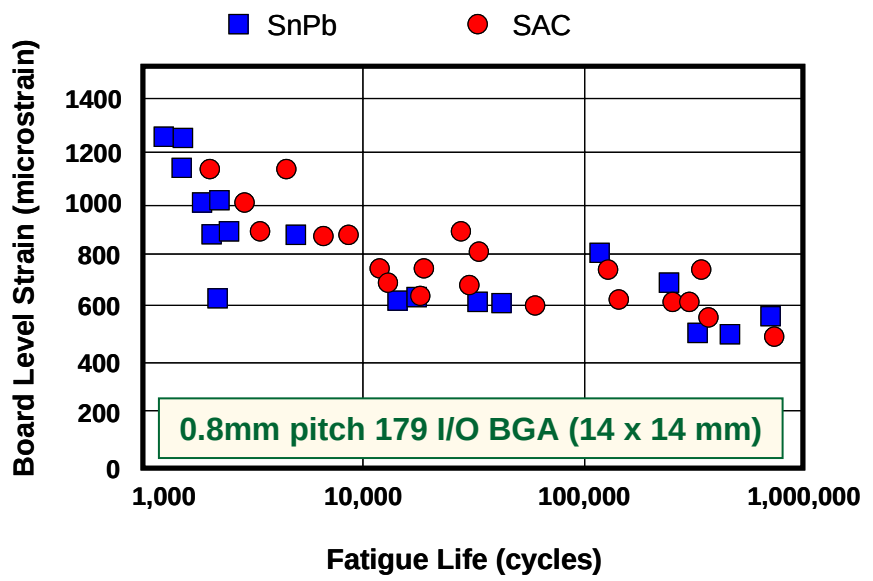
Long-Term Reliability of Pb-Free

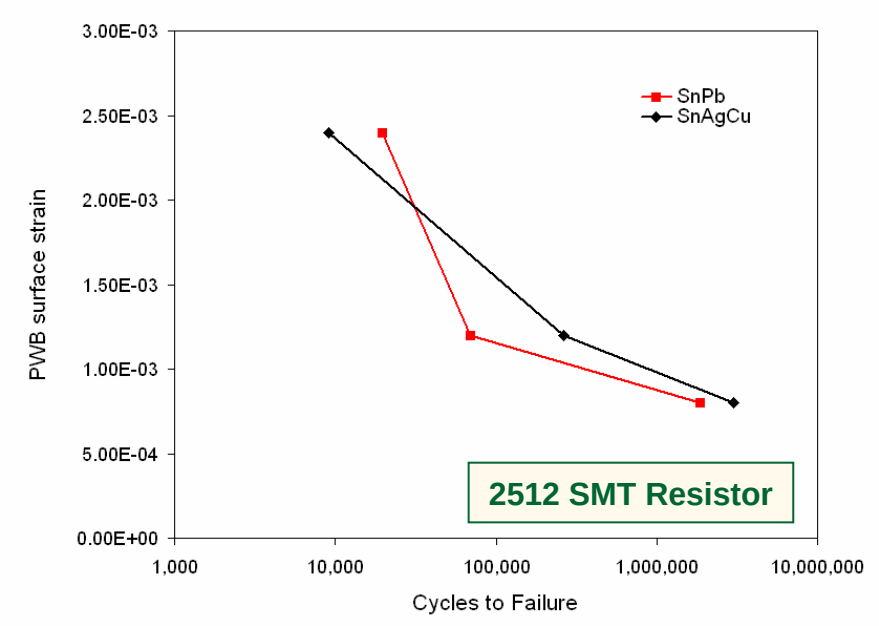


Visual concept courtesy of J.P. Clech

Vibration / Mechanical Cycling

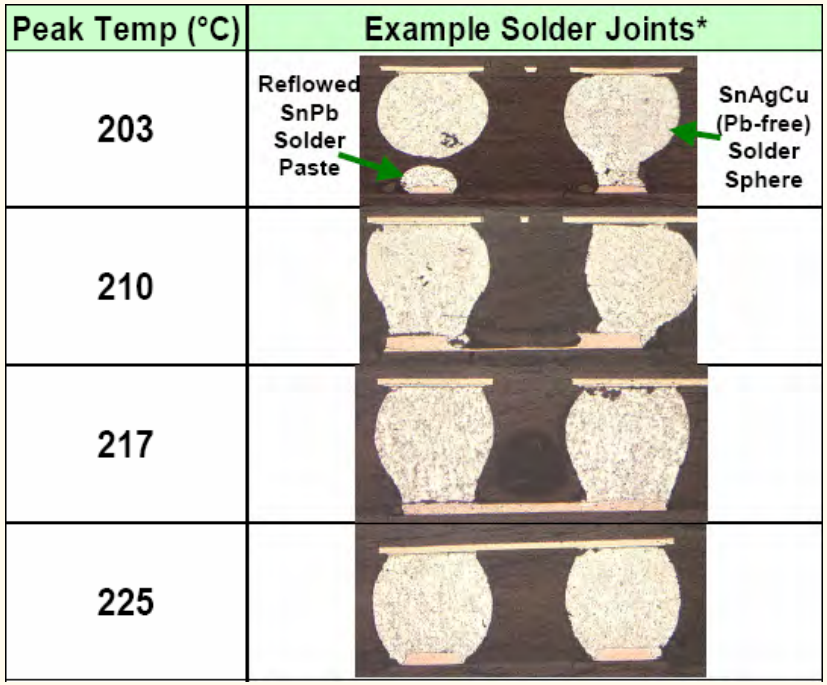
- Findings
  - High strain: SAC worse
  - Low strain: SAC better
- Missing datapoint
  - Leaded devices
  - Failure is in lead, not solder
  - Solder transfers stresses
- What does this mean?
  - Problems with vibration and SnPb → Problems with vibration and SAC
  - No problems now? No problems later

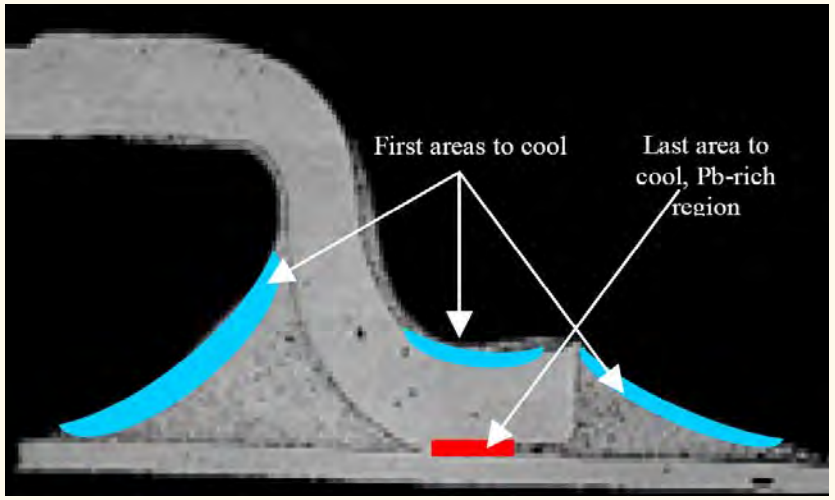




Material Issues 1

- How to combine SnPb and Pb-free?
- Case Study 1: Pb-Free BGA with SnPb solder
  - >225°C to 245°C peak
  - Vibe, Mechanical Shock performance lacking
- Case Study 2: SnPb Lead with Pb-free solder
  - Potential risk





Material Issues 2

- How to segregate SnPb from Pb-free?



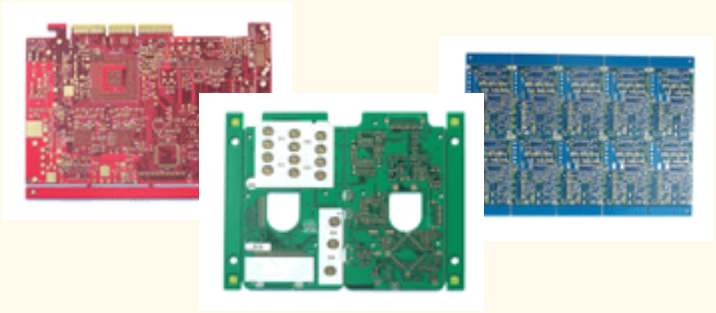
Incoming materials (parts, boards)



Analysis (surprisingly few)



Assembly (different lines, material segregation, change in solder pots)



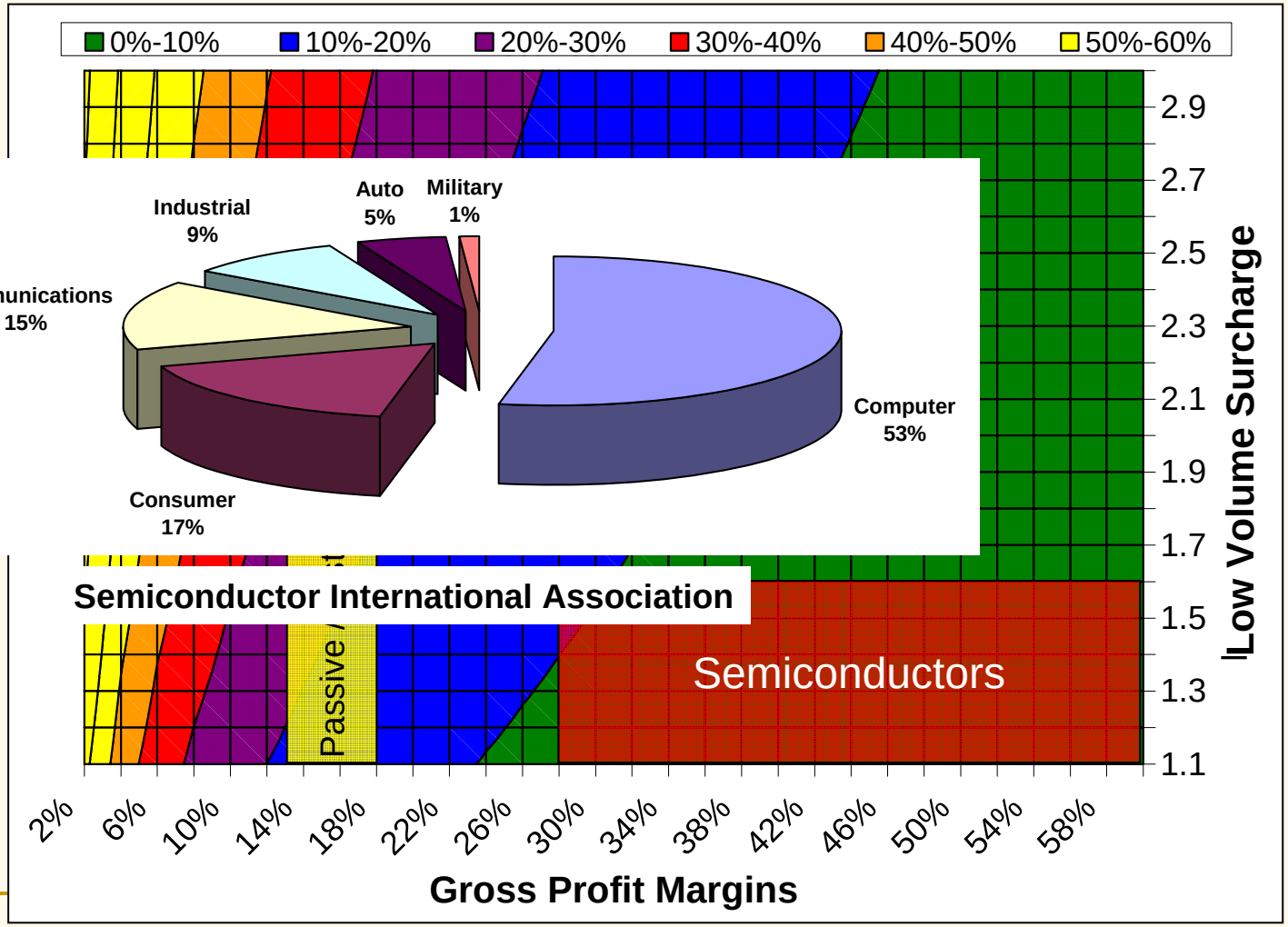
Product markings (part number, label, symbol, solder mask, silkscreen)

Recommendations for Program Managers

- No. 1: Be educated, be aware
  - Most commercial suppliers and OEMS, even if exempt from RoHS, are going Pb-free (General Motors / Ford, Maytag / Whirlpool, even Wal-Mart)
    - Diminishing availability and skill set with SnPb
  - Plethora of good research and experience with Pb-free (find it!)
    - Google.com and Scholar.google.com
  - Whether to ban or accept Pb-free product should be based on the capability of the supplier, reliability expectations, use environment, and maintenance requirements
    - Each program's experiences and concerns will be different

Recommendations (cont.)

- Do not underestimate purchasing power



Assumes 3% market share

DoD DMSMS Workshop



GIDEP and DMSMS
Karen Jackson

Charlotte NC, July 13, 2006

Agenda

- Overview of GIDEP
- GIDEP DMSMS Tools
  - Urgent Data Request (UDR)
  - Batch Match
  - Obsolescence Data Repository
- GIDEP the Next Generation

GIDEP Mission & Vision

MISSION:

"Foster technical information sharing among Government and Industry partners to:
Increase system's safety, reliability and readiness
Reduce system's development, production and ownership costs"

VISION:

GIDEP is the pre-eminent forum to exchange timely, value added, technical information at a reasonable cost. We:

Are integrated into customer business processes

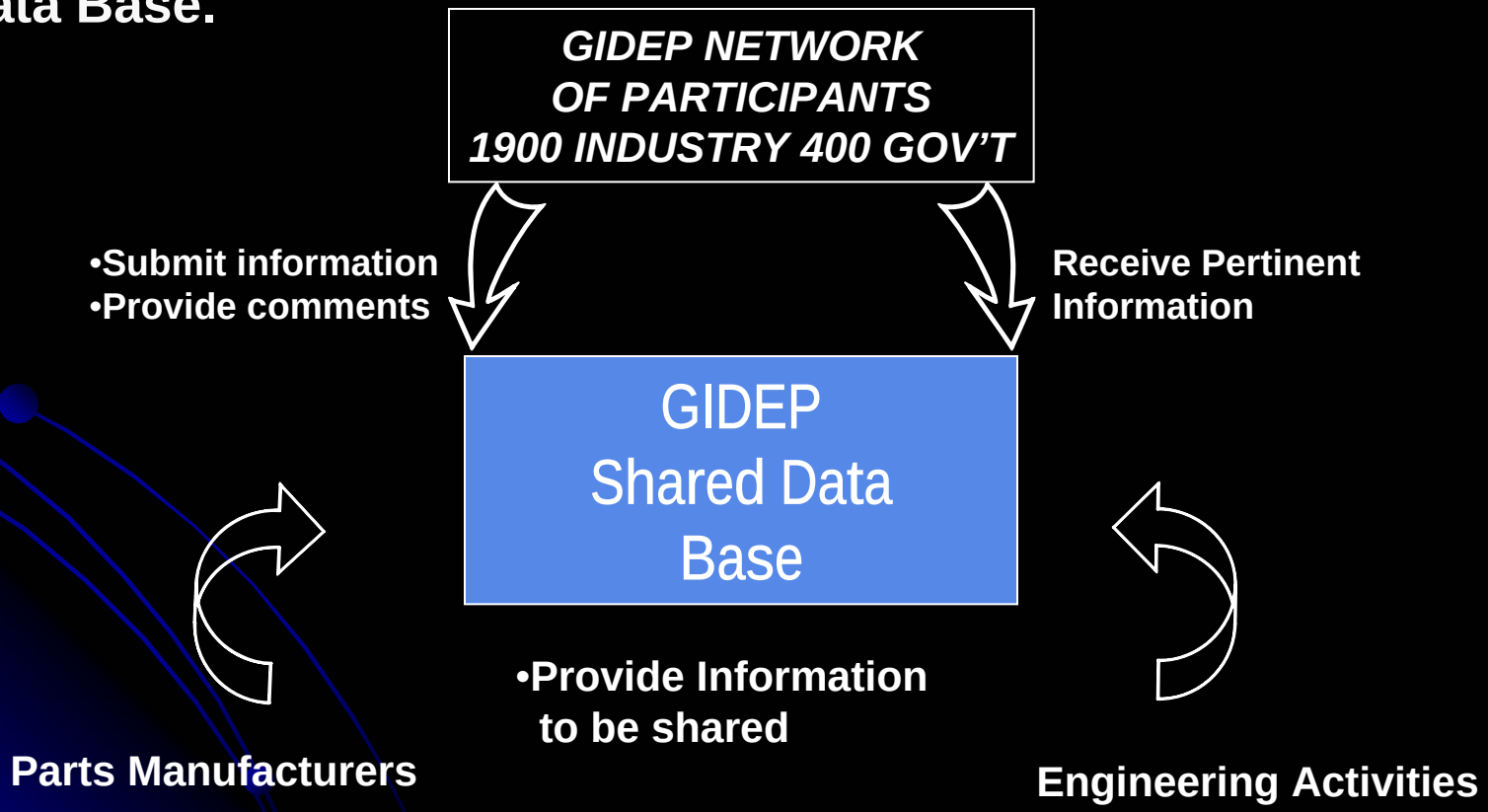
Are the first choice of Government and Industry for technical information

What is GIDEP?

A <u>Partnership</u> Between Government & Industry Teamed to <u>Share</u> Technically Valid, Fact-Based Information.

Scientific and Technical Information is Shared Through

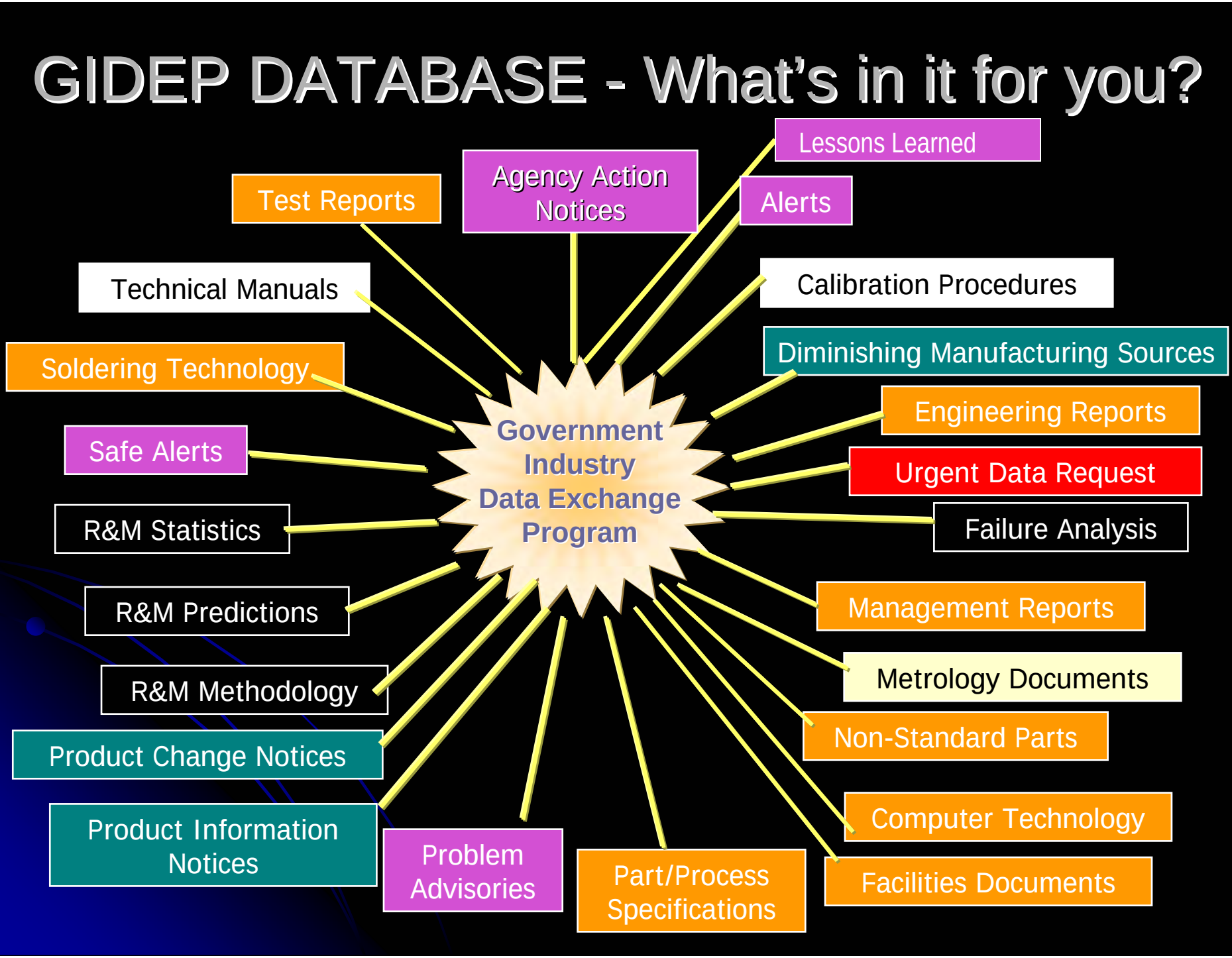
an *Active Network of People* and an On-line WEB Enabled Data Base.



How can I Join GIDEP?

- Requirements:
  - Supply a product or service to US or Canadian Government either directly or indirectly
  - Submit Annual Utilization Report
  - Share your data where applicable !!!

GIDEP DATABASE - What's in it for you?



GIDEP DMSMS TOOLS

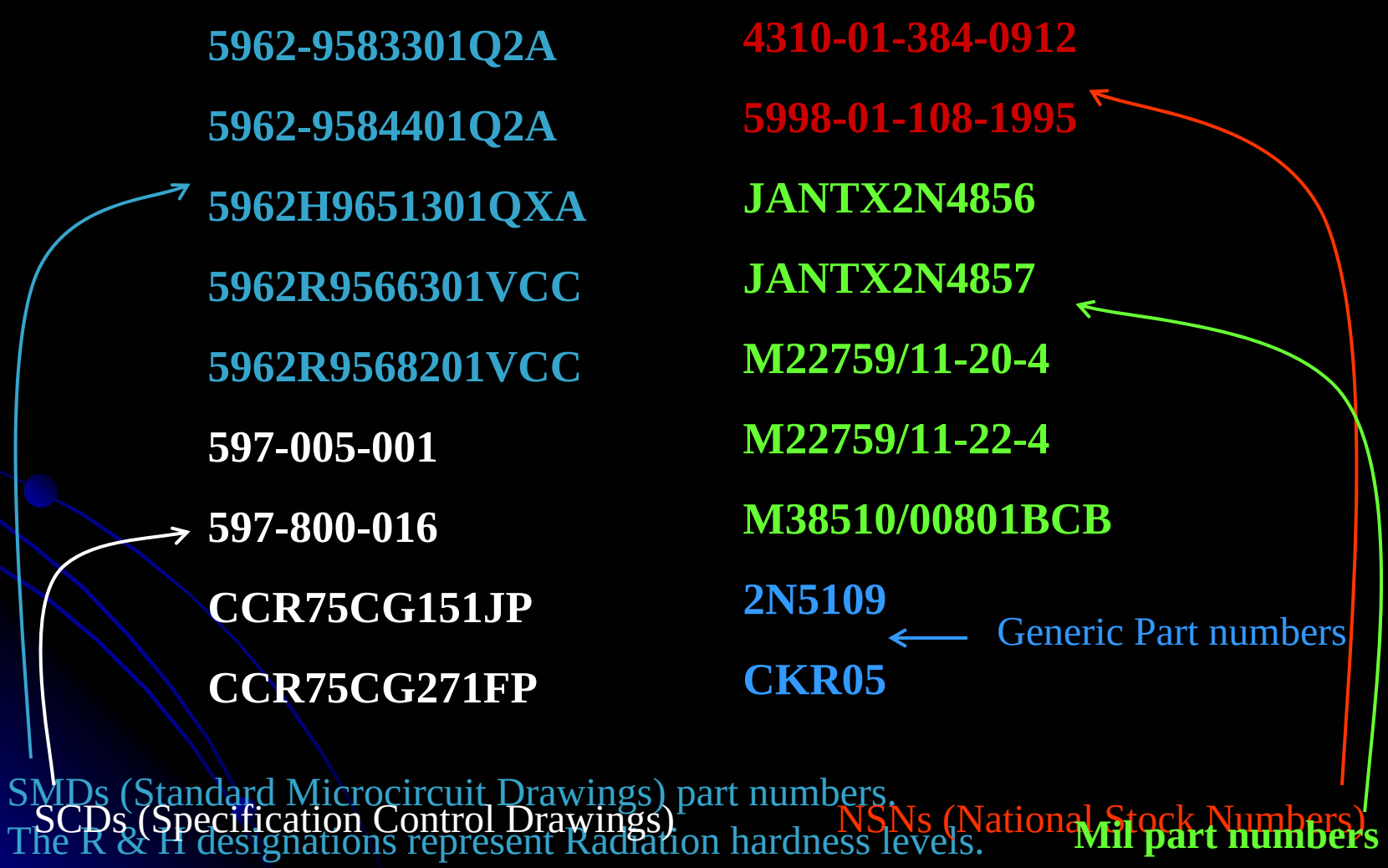
- DMSMS Notices
- Batch Match
- Urgent Data Request (UDR)
- Obsolescence Data Repository (ODR)



Batch Match

- Match parts against database
- Auto-Match w/ e-mail notification
- Exact parts only
- Results = Part/CAGE/MFR/Document #
- Future enhancements
  - Wildcard
  - Web access (real-time match)
  - Custom reports

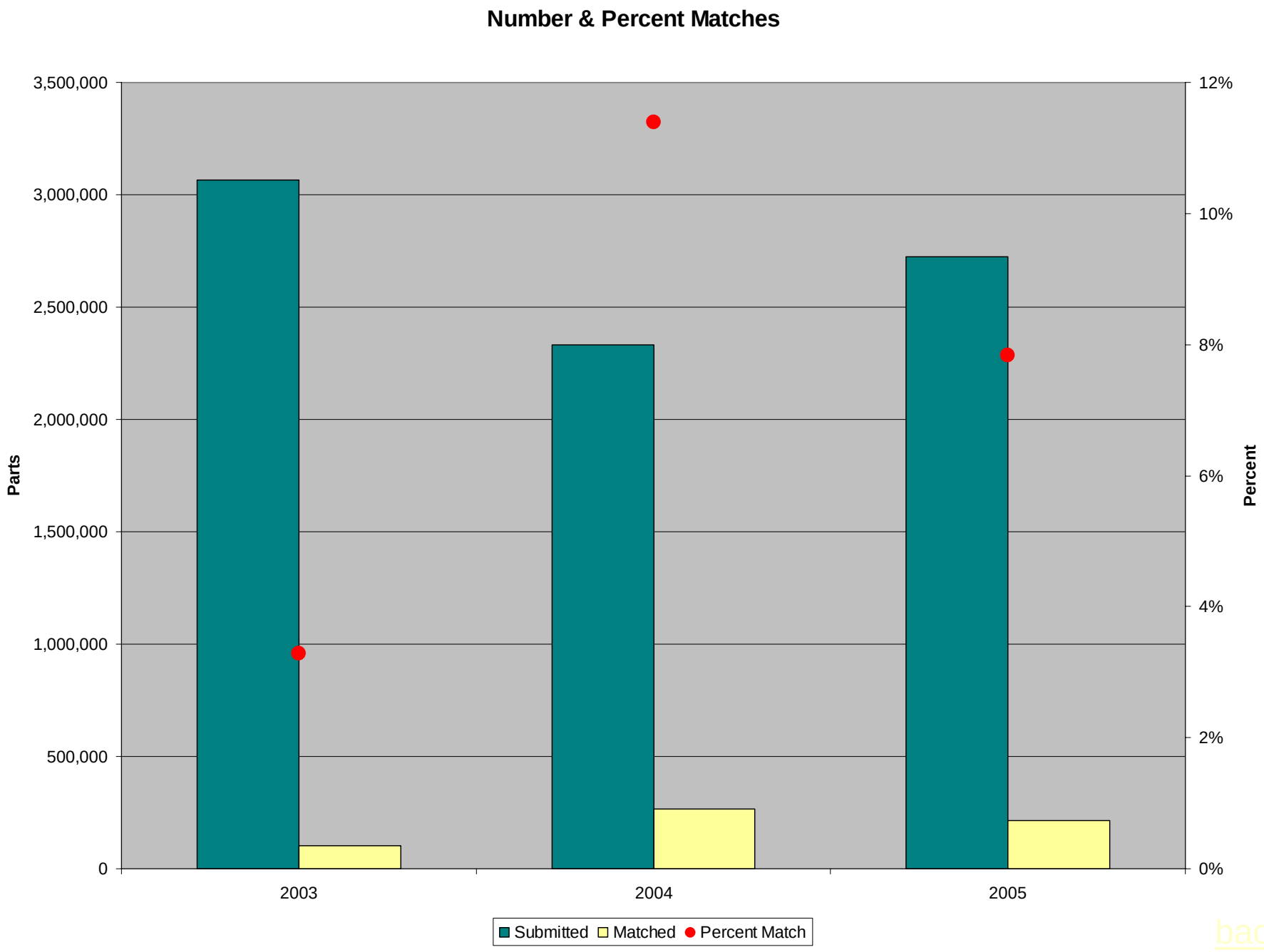
Batch Input


5962-9583301Q2A
5962-9584401Q2A
5962H9651301QXA
5962R9566301VCC
5962R9568201VCC
597-005-001
597-800-016
CCR75CG151JP
CCR75CG271FP
4310-01-384-0912
5998-01-108-1995
JANTX2N4856
JANTX2N4857
M22759/11-20-4
M22759/11-22-4
M38510/00801BCB
2N5109
CKR05
Generic Part numbers
SMDs (Standard Microcircuit Drawings) part numbers.
The R & H designations represent Radiation hardness levels.
SCDs (Specification Control Drawings)
NSNs (National Stock Numbers)
Mil part numbers

Batch Match Results

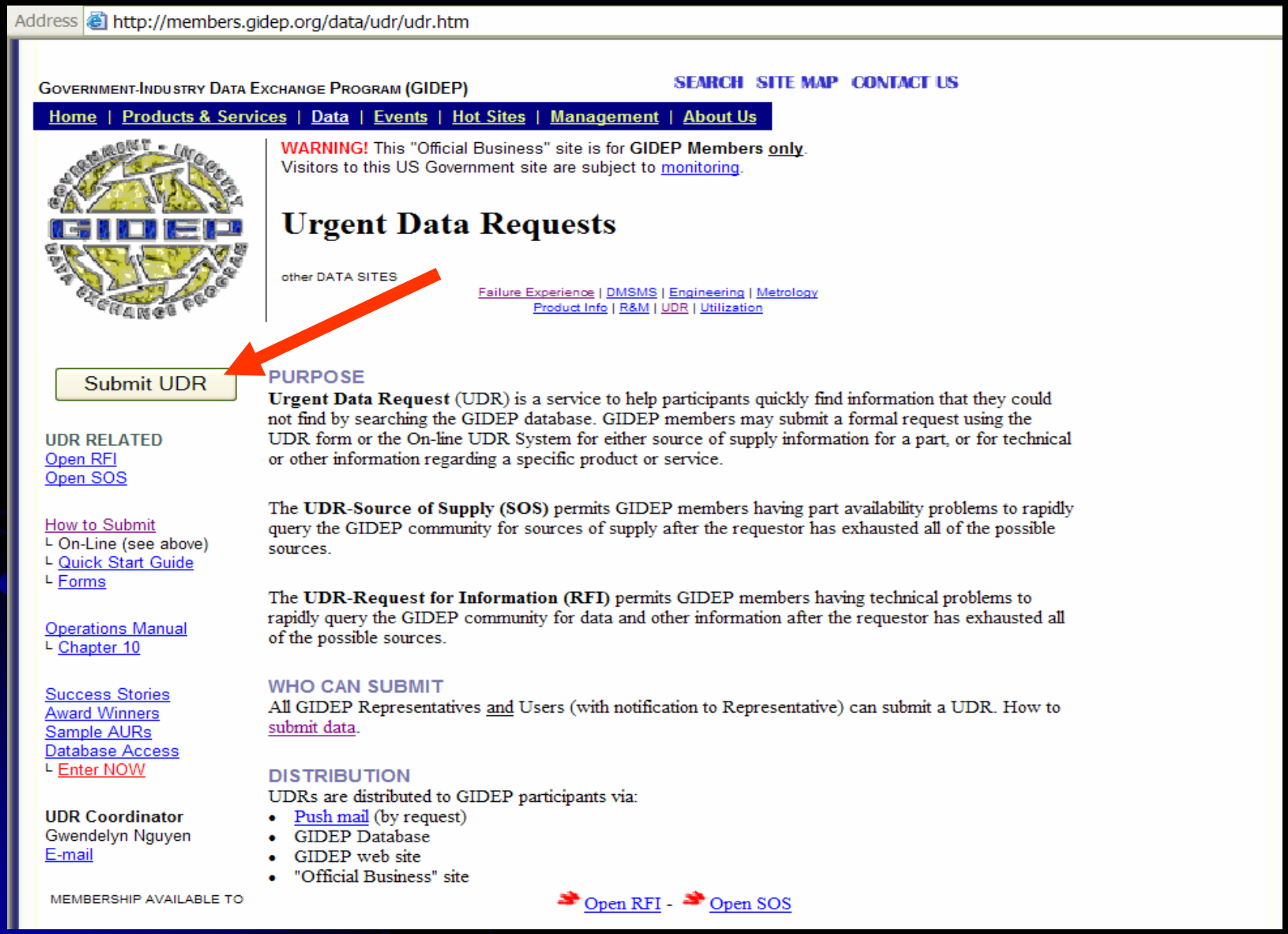
28-Jan-2002 **Results for NAMSA:**

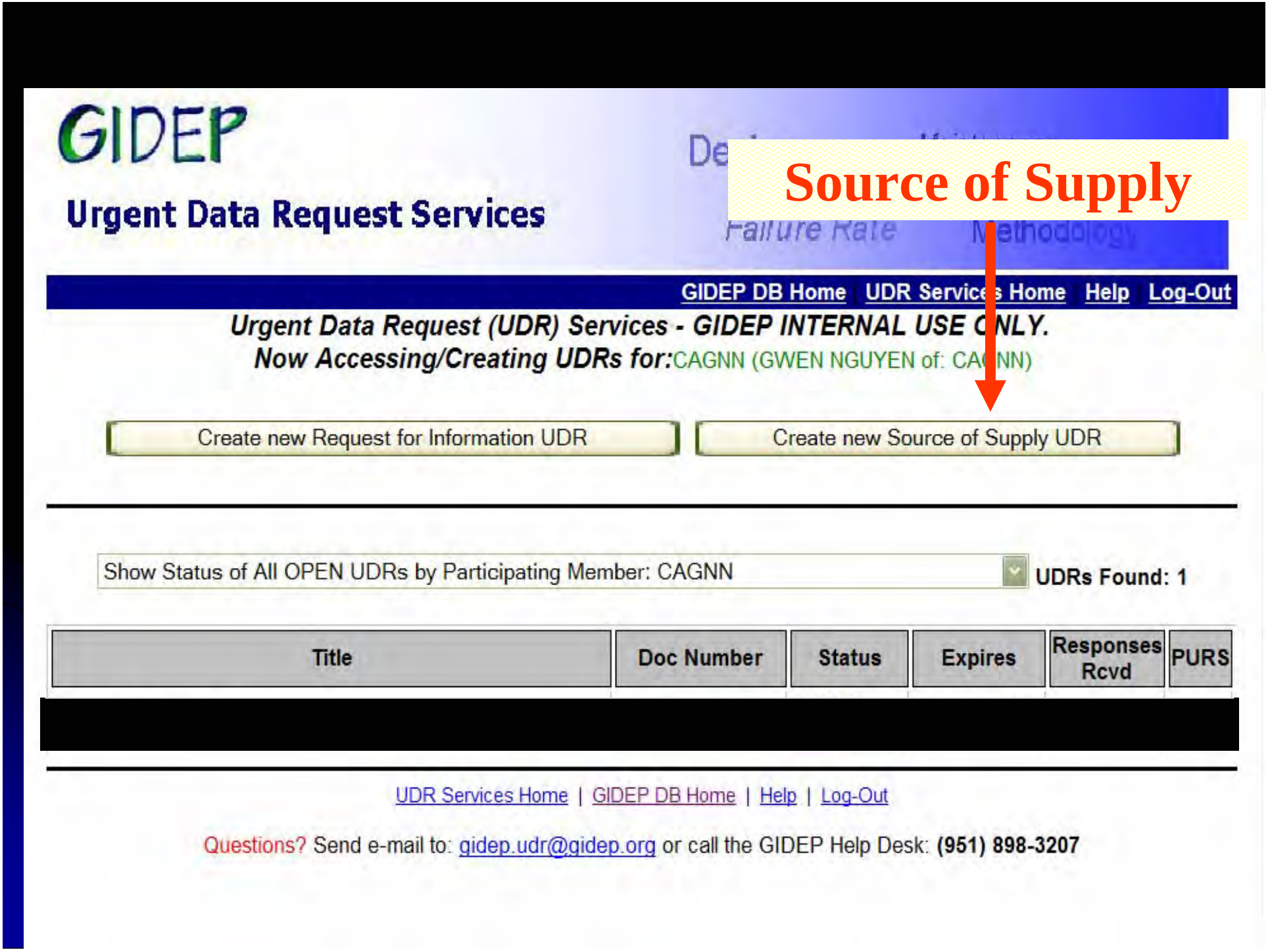
Date	Part Number	CAGE	Doc. Number	Doc. Designator
01/28/2002,	SN74LS00N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS04N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS08N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS109AN,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS123N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS138N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS14N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS157N,	04713,	X9-D-02-37,	DS
01/28/2002,	SN74LS166N,	04713,	X9-D-02-37,	DS


Number & Percent Matches
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Parts
12%
10%
8%
6%
4%
2%
0%
Percent
2003
2004
2005
Submitted
Matched
Percent Match

back

https://members.gidep.org




GIDEP
Urgent Data Request Services
Source of Supply
GIDEP DB Home | UDR Services Home | Help | Log-Out
Urgent Data Request (UDR) Services - GIDEP INTERNAL USE ONLY.
Now Accessing/Creating UDRs for:CAGNN (GWEN NGUYEN of: CAGNN)
Create new Request for Information UDR
Create new Source of Supply UDR
Show Status of All OPEN UDRs by Participating Member: CAGNN
UDRs Found: 1
Title
Doc Number
Status
Expires
Responses Rcvd
PURS
UDR Services Home | GIDEP DB Home | Help | Log-Out
Questions? Send e-mail to: gidep.udr@gidep.org or call the GIDEP Help Desk: (951) 898-3207

UDR - Source of Supply

UDR #: CAGNN-U-04-001

Requester: CAGNN (GWEN NGUYEN)
Single UDR (1 of 1)

Keyword Search: Go
Part # Search: Go

4. SUBJECT CATEGORY *

5. SELECT SOURCE OF SUPPLY FOR (Select one, or Select one plus Other) *

- (•) ANY QUALIFIED MANUFACTURER
- ( ) ANY QUALIFIED NATIONAL STOCK NUMBER
- ( ) SPECIFIC NATIONAL STOCK NUMBER
- ( ) SPECIFIC PART
- ( ) SPECIFIC PART TO NATIONAL STOCK NUMBER
- ( ) SPECIFIC PART TO CAGE
- [ ] OTHER (Please Specify)

6. COMPONENT / PART / MATERIAL / TEST EQUIPMENT / PROCESS DESCRIPTION *

7a. MANUFACTURER	8a. MANUFACTURER PART NUMBER	9a. NATIONAL STOCK NUMBER (e.g., ####-##-###-####)
ANY QUALIFIED MANUFACTUR		0000-00-000-0000
7b. MANUFACTURER CAGE CODE (5 characters)	**8b. PART QUANTITY**	**9b. NOMENCLATURE**
	0	

10. APPLICATION (e.g., Aircraft, Missile, Shipboard)

11. SPECIFICATION NUMBER

12. PERFORMANCE REQUIREMENTS

13. DATA SOURCES SEARCHED

14. COMMENTS TO GIDEP OPERATIONS CENTER

15. REQUEST EXPIRATION DATE (dd-MMM-yyyy or mm/dd/yyyy)

08-NOV-2004

(Date responses will no longer benefit you)

16. RESPONSES WILL BE E-MAILED TO:

uyen.nguyen@navy.mil

Copy to Additional UDR | Save | Delete | Clear All | Preview/Submit

E-mail to GIDEP Users

TO RESPOND TO DOCUMENT: http://gidep-data.gidep.org/cgi-bin/uncgi/key_find?71260
3. DATE: 08 JULY 2003
4. SUBJECT CATEGORY: SOURCE OF SUPPLY REQUEST FOR A ONE TIME PROGRAMMABLE EPROM

5. TYPE OF DATA NEEDED:

TEST
DESIGN
METROLOGY
FAILURE RATE
FAILURE EXPERIENCE
X SOURCE OF SUPPLY
FAILURE MODE
SPECIFICATION
METHODOLOGY
MAINTENANCE
OTHER:

6. COMPONENT/PART/MATERIAL/TEST EQUIPMENT/PROCESS DESCRIPTION:

MYKOTRONX, INC. REQUESTS SOURCE OF SUPPLY FOR A 8K X 8 ONE TIME PROGRAMMABLE EPROM, ORIGINALLY MANUFACTURED BY AMD, PART NUMBER AM27C64-150PC OR AM27C64-120PC IN A 28 PIN PLASTIC DIP. WE HAVE AN IMMEDIATE NEED FOR ABOUT 1,000 PIECES.

7. MANUFACTURER: AMD OR OTHERS
8. MANUFACTURER PART NUMBER: AM27C64-150PC OR AM27C64-120PC
9. NATIONAL STOCK NUMBER (NSN): NOT AVAILABLE
10. APPLICATION: MILITARY
11. SPECIFICATION NO.: NOT AVAILABLE

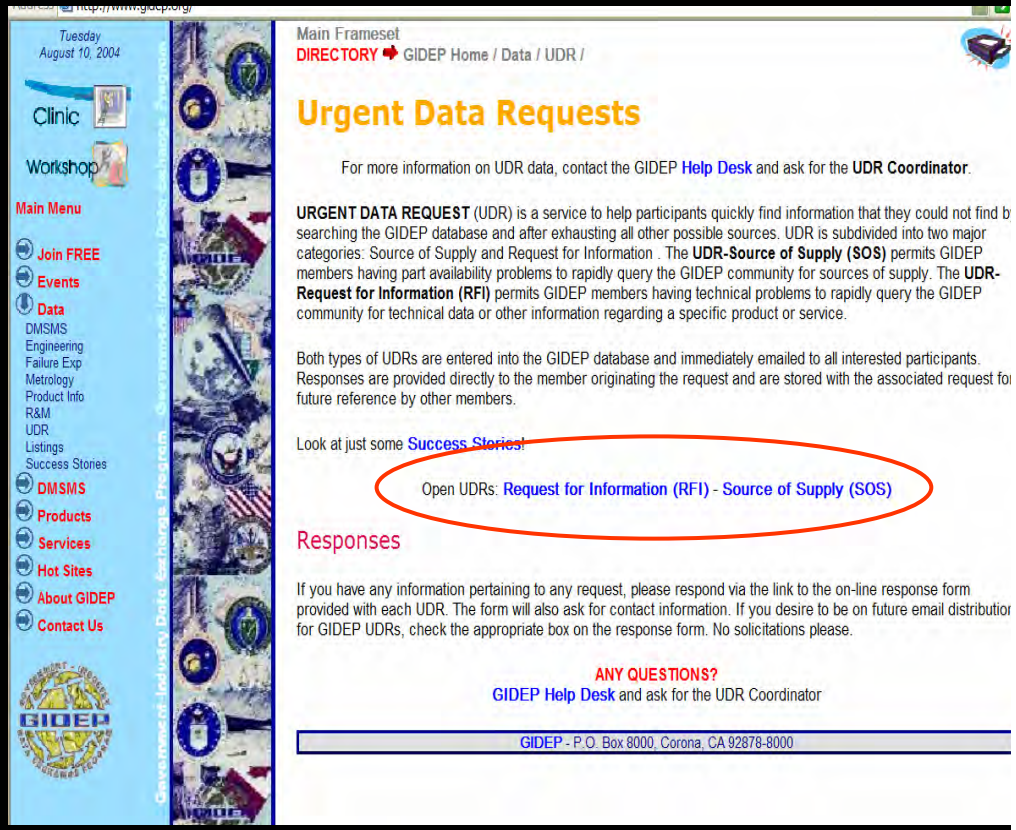
12. PERFORMANCE REQUIREMENTS:

ONE TIME PROGRAMMABLE 8K X 8 EPROM WITH A SPEED OF 150 OR 120 NS IN A 28 PIN PLASTIC DIP.

Membership page (https://members.gidep.org)

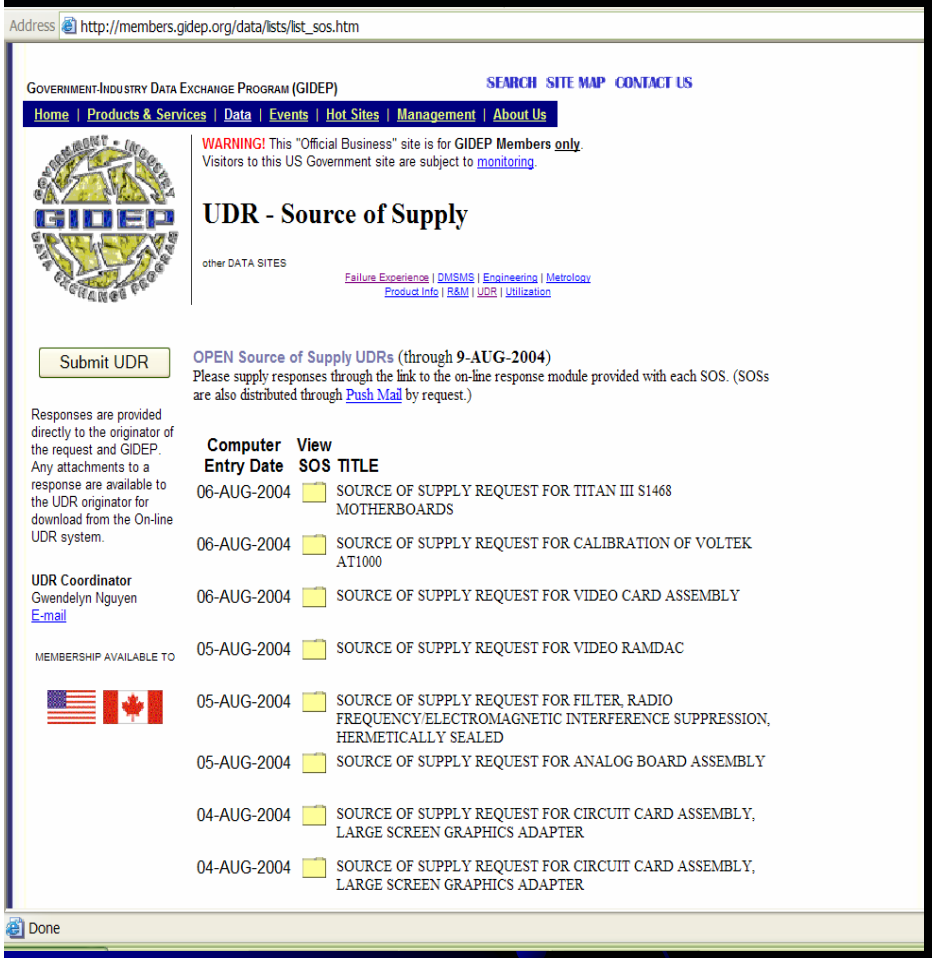
Public page (http://www.gidep.org)



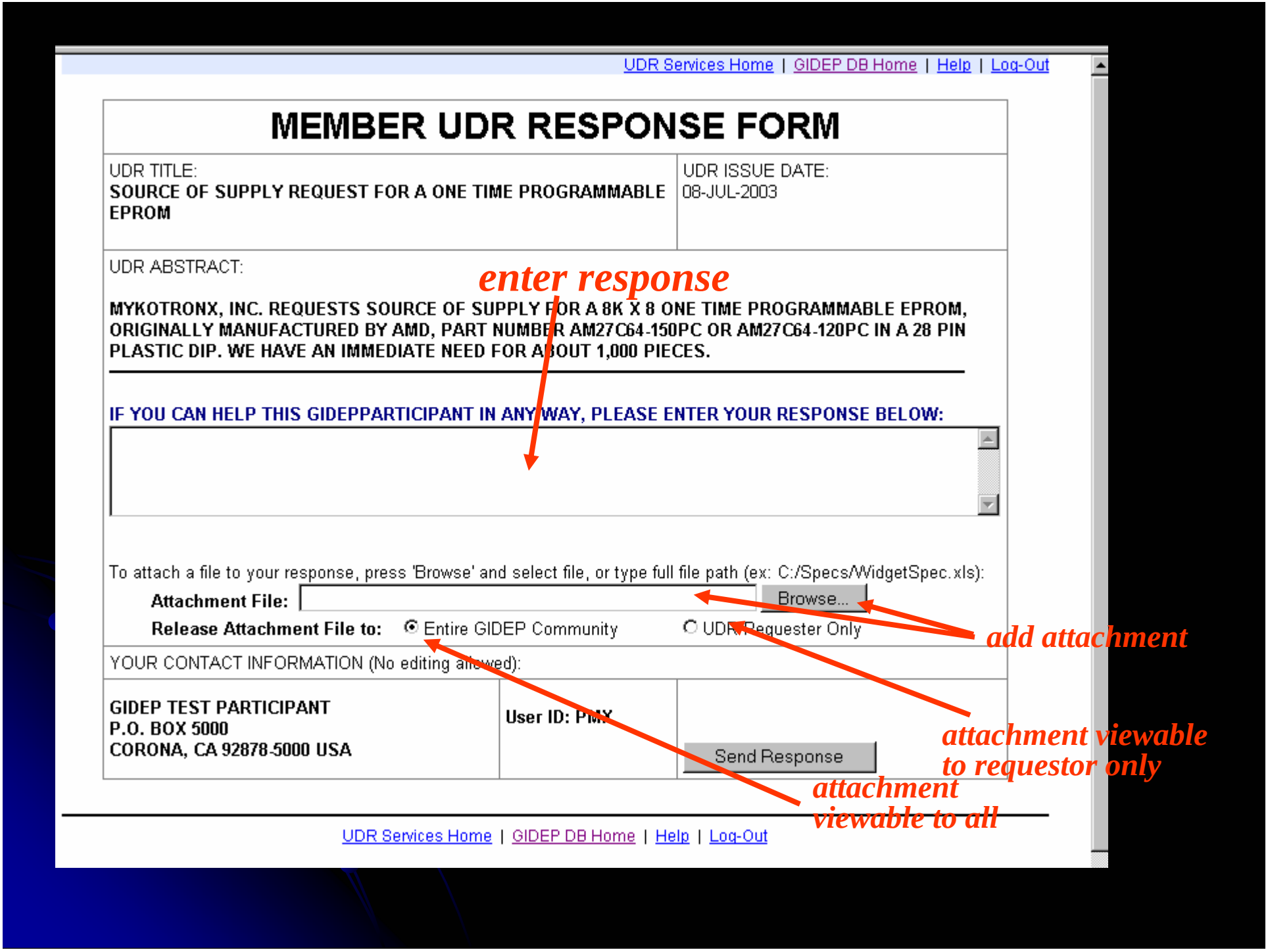


Membership page (https://members.gidep.org)

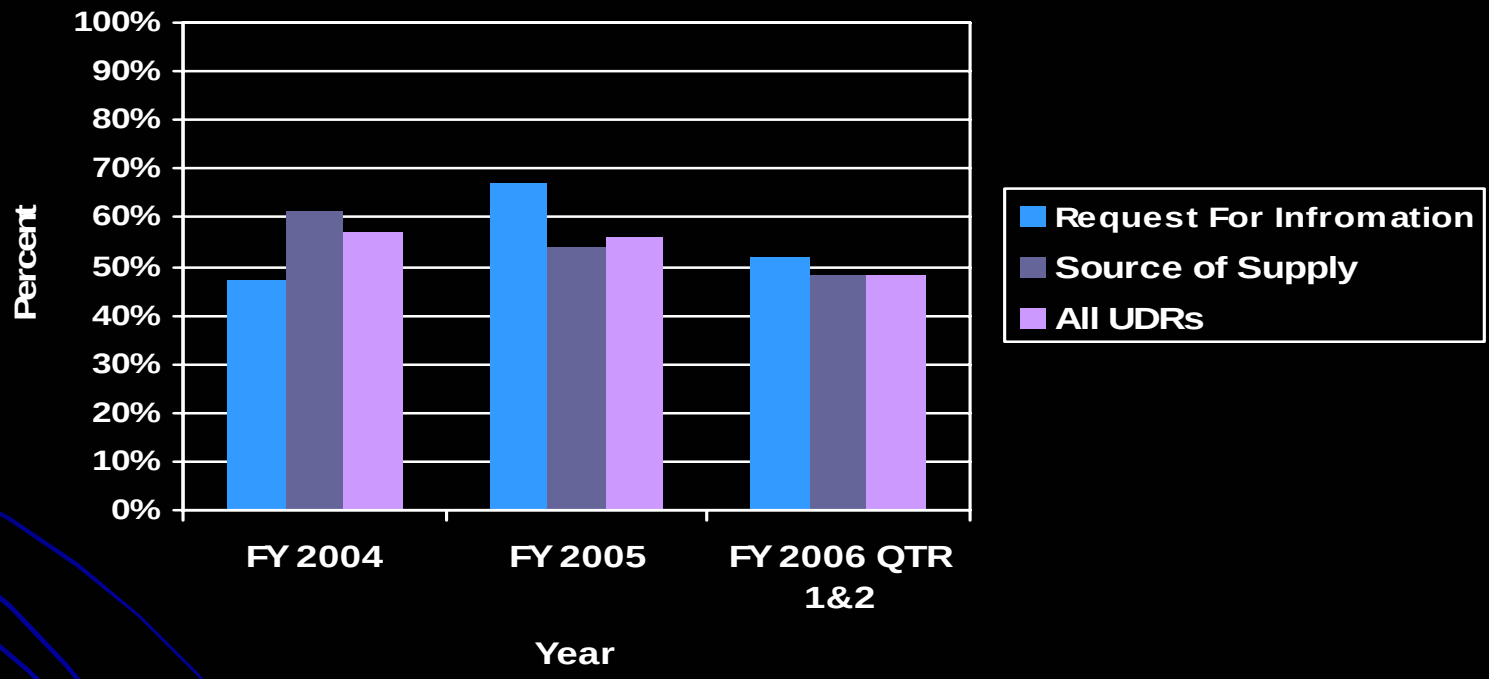
Public page (http://www.gidep.org)






UDR Services Home | GIDEP DB Home | Help | Log-Out
MEMBER UDR RESPONSE FORM
UDR TITLE:
SOURCE OF SUPPLY REQUEST FOR A ONE TIME PROGRAMMABLE EPROM
UDR ISSUE DATE:
08-JUL-2003
UDR ABSTRACT:
MYKOTRONX, INC. REQUESTS SOURCE OF SUPPLY FOR A 8K X 8 ONE TIME PROGRAMMABLE EPROM, ORIGINALLY MANUFACTURED BY AMD, PART NUMBER AM27C64-150PC OR AM27C64-120PC IN A 28 PIN PLASTIC DIP. WE HAVE AN IMMEDIATE NEED FOR ABOUT 1,000 PIECES.
enter response
IF YOU CAN HELP THIS GIDEPPARTICIPANT IN ANY WAY, PLEASE ENTER YOUR RESPONSE BELOW:
To attach a file to your response, press 'Browse' and select file, or type full file path (ex: C:/Specs/WidgetSpec.xls):
Attachment File:
Browse...
Release Attachment File to:
Entire GIDEP Community
UDR Requester Only
add attachment
YOUR CONTACT INFORMATION (No editing allowed):
GIDEP TEST PARTICIPANT
P.O. BOX 5000
CORONA, CA 92878-5000 USA
User ID: PMX
Send Response
attachment viewable to requestor only
attachment viewable to all
UDR Services Home | GIDEP DB Home | Help | Log-Out

Percent of Responses to UDRs FY 04- FY 06

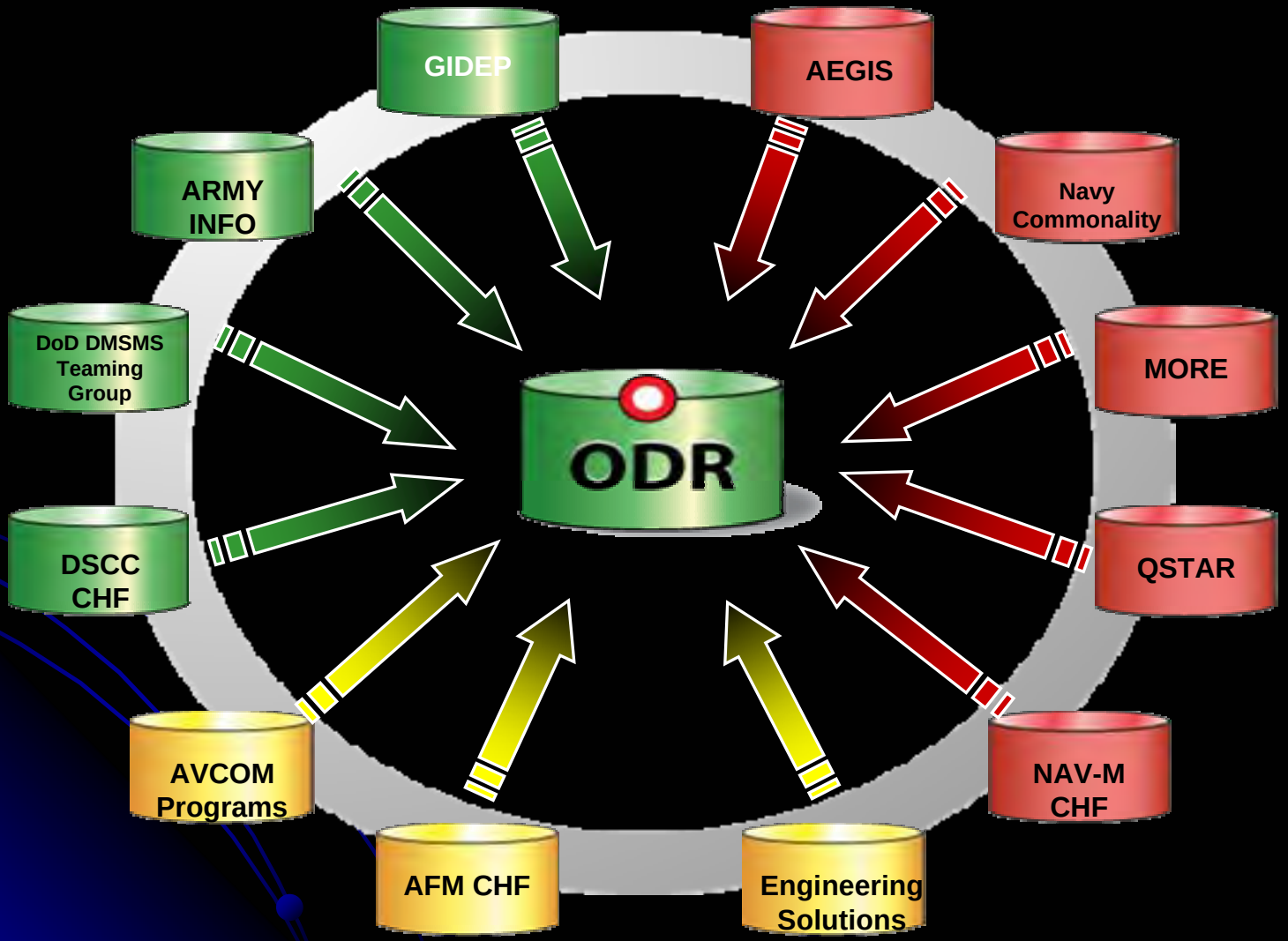


FY 06 Estimate
(Simple Linear Interpolation)

Purpose

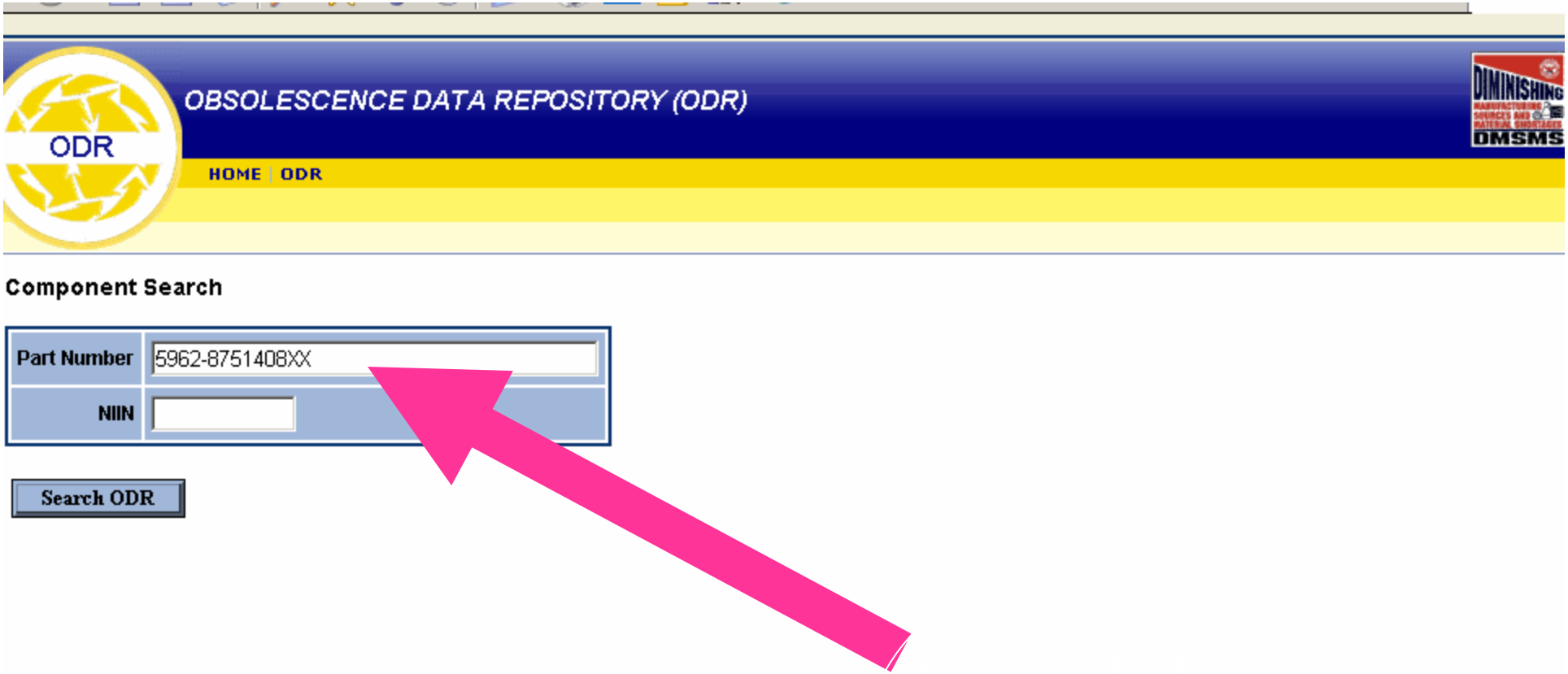
- Provides centralized repository for DMSMS resolution data
- Provides visibility to in-process and historical DMSMS resolutions and cases
- Promotes information sharing across and within Services
- Enables Department of Defense (DoD) wide obsolescence metric reporting

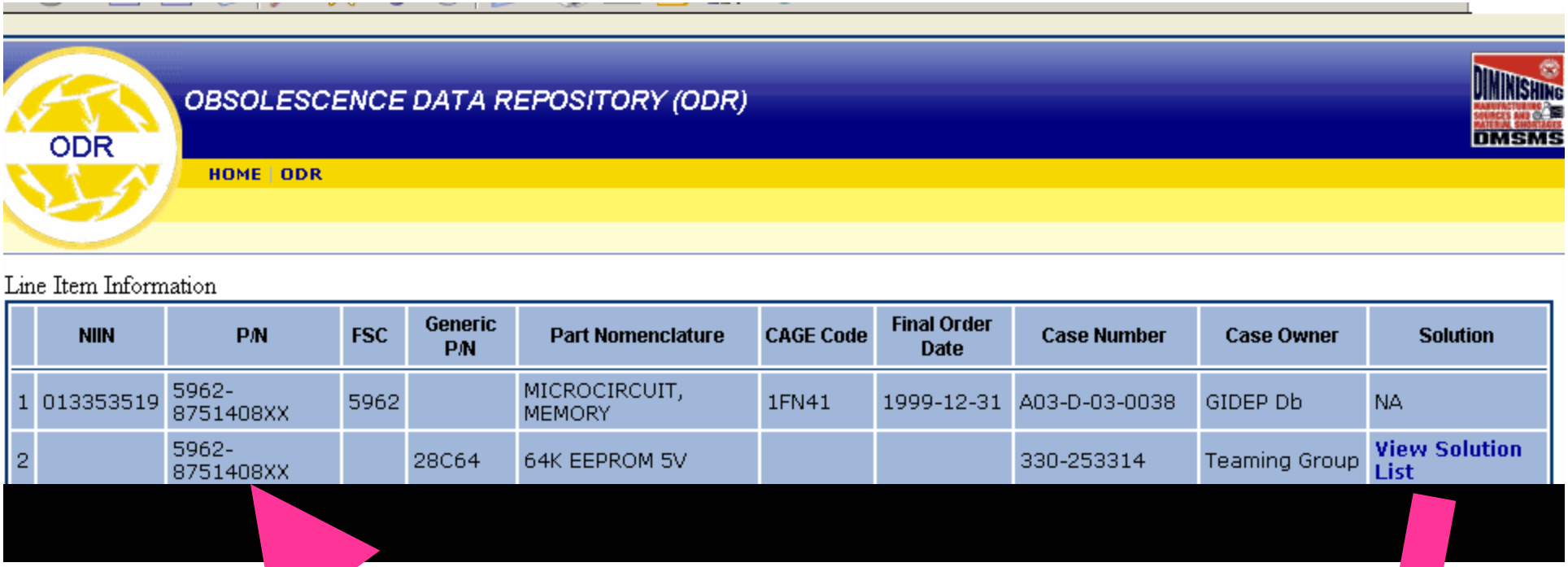
ODR Data Composition



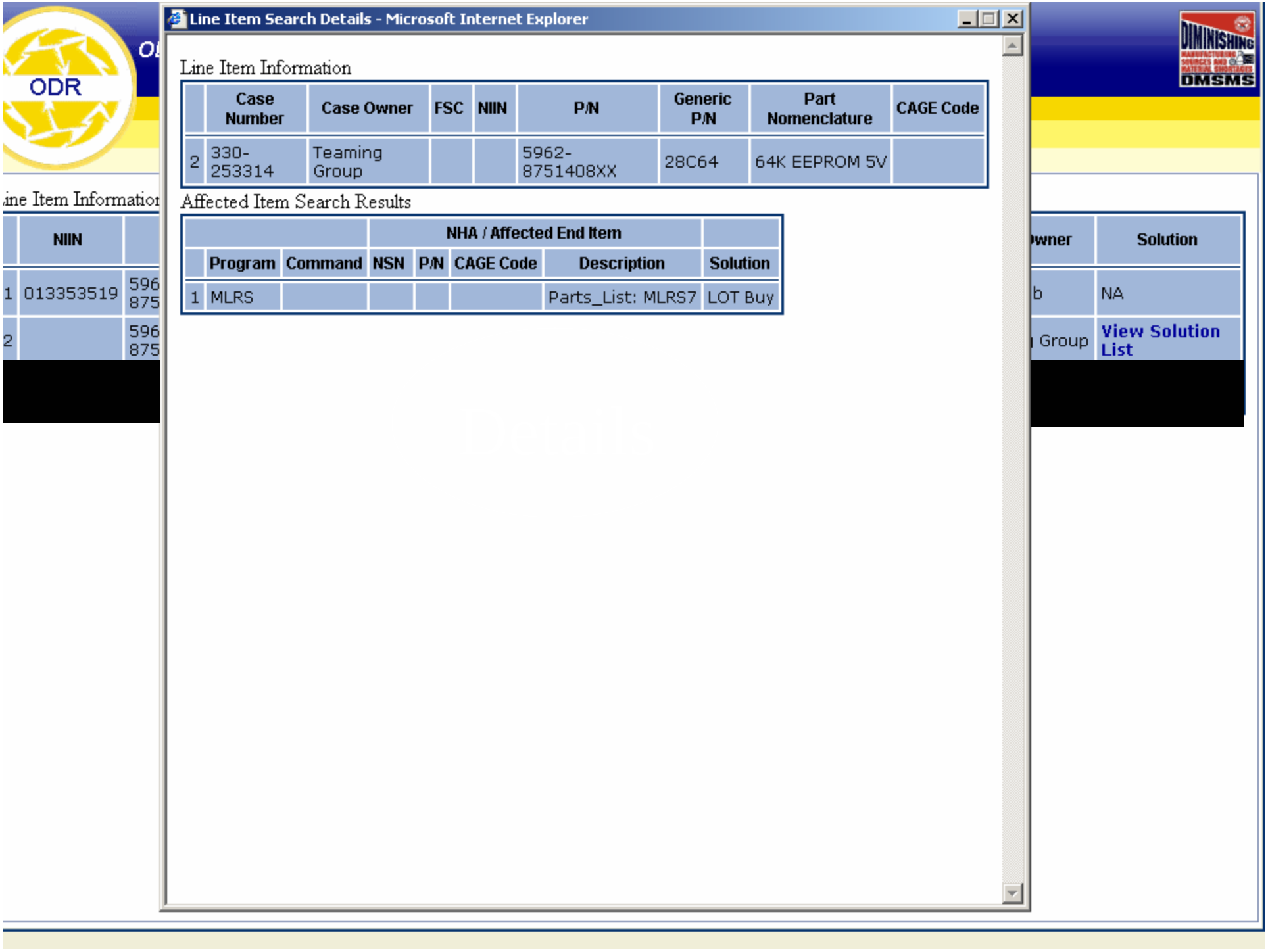
Examples

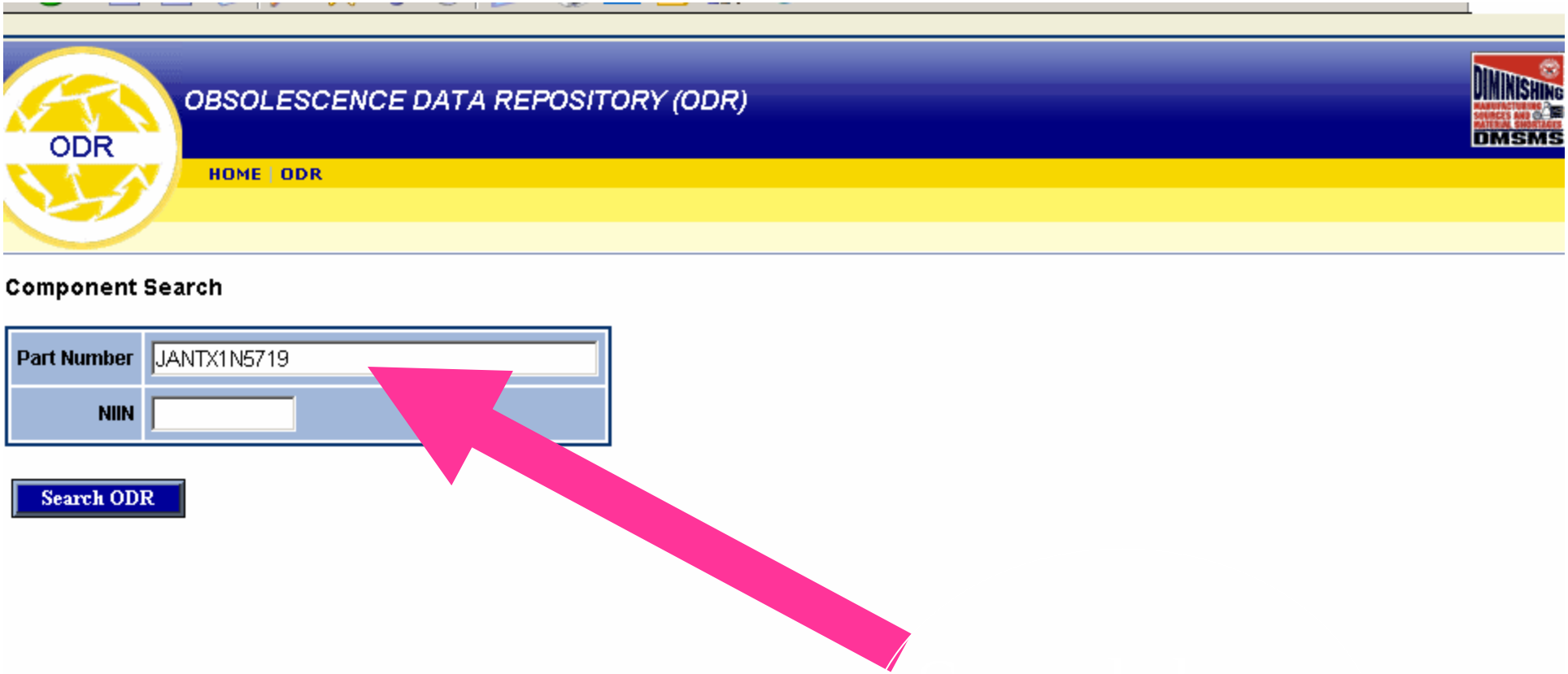
- Searching by
  - Part Number
  - Search by NIIN
  - Search by Case Number


OBSOLESCENCE DATA REPOSITORY (ODR)
ODR
DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES
DMSMS
HOME | ODR
Component Search
Part Number
5962-8751408XX
NIIN
Search ODR
Search by Part Number
Case Search
Case Number
Search ODR



Drill Down for Details


Line Item Search Details - Microsoft Internet Explorer
Line Item Information
Case Number
Case Owner
FSC
NIIN
P/N
Generic P/N
Part Nomenclature
CAGE Code
2
330-253314
Teaming Group
5962-8751408XX
28C64
64K EEPROM 5V
Affected Item Search Results
NHA / Affected End Item
Program
Command
NSN
P/N
CAGE Code
Description
Solution
1
MLRS
Parts_List: MLRS7
LOT Buy
ODR
DIMINISHING
DMSMS
NIIN
013353519
Solution
NA
View Solution List


OBSOLESCENCE DATA REPOSITORY (ODR)
ODR
DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES
DMSMS
HOME | ODR
Component Search
Part Number
JANTX1N5719
NIIN
Search ODR
Case Search
Case Number
Search ODR

OBSOLESCENCE DATA REPOSITORY (ODR)

HOME | ODR

Search Results

Line Item Information

	NIIN	P/N	FSC	Generic P/N	Part Nomenclature	CAGE Code	Final Order Date	Case Number	Case Owner	Solution
1	005999789	JANTX1N5719	5961		SEMICONDUCTOR DEVICE, DIODE	81349		EA-D-01-0027	GIDEP Db	NA
2	005999789	JANTX1N5719	5961		SEMICONDUCTOR DEVICE	21912	1998-10-15	EA-D-98-0055	GIDEP Db	NA
3	012650752	JANTX1N5719	5961		SEMICONDUCTOR DEVICE	21912	1998-10-15	EA-D-98-0055	GIDEP Db	NA
4	013330919	JANTX1N5719	5961		SEMICONDUCTOR DEVICE	21912	1998-10-15	EA-D-98-0055	GIDEP Db	NA
5	005999789	JANTX1N5719	5961				1998-01-01	1998-093	DSCC-SDW	NA
6	012650752	JANTX1N5719	5961				1998-01-01	1998-093	DSCC-SDW	NA
7	013330919	JANTX1N5719	5961				1998-01-01	1998-093	DSCC-SDW	NA
8		JANTX1N5719		1N5719	100V PIN-DIODE			299-252251	Teaming Group	View Solution List
9		JANTX1N5719		1N5719	100V PIN-DIODE			299-252253	Teaming Group	View Solution List
10		JANTX1N5719		1N5719	Diode			299-252261	Teaming Group	View Solution List
11		JANTX1N5719		1N5719	Diode			299-252262	Teaming Group	View Solution List
12		JANTX1N5719		1N5719	Diode			299-252249	Teaming Group	View Solution List
13		JANTX1N5719		1N5719	100V PIN-DIODE			299-252250	Teaming Group	View Solution List
14		JANTX1N5719		1N5719	Diode			299-252252	Teaming Group	View Solution List
15		JANTX1N5719		1N5719	100V PIN-DIODE			299-252254	Teaming Group	View Solution List

Line Item Information

	NIIN	P/N								Solution
1	005999789	JANTX1N5								NA
2	005999789	JANTX1N5								NA
3	012650752	JANTX1N5								NA
4	013330919	JANTX1N5								NA
5	005999789	JANTX1N5								NA
6	012650752	JANTX1N5								NA
7	013330919	JANTX1N5								NA
8		JANTX1N5								View Solution List
9		JANTX1N5719		1N5719	100V PIN-DIODE			299-252253	Teaming Group	View Solution List
10		JANTX1N5719		1N5719	Diode			299-252261	Teaming Group	View Solution List
11		JANTX1N5719		1N5719	Diode			299-252262	Teaming Group	View Solution List
12		JANTX1N5719		1N5719	Diode			299-252249	Teaming Group	View Solution List
13		JANTX1N5719		1N5719	100V PIN-DIODE			299-252250	Teaming Group	View Solution List
14		JANTX1N5719		1N5719	Diode			299-252252	Teaming Group	View Solution List
15		JANTX1N5719		1N5719	100V PIN-DIODE			299-252254	Teaming Group	View Solution List

Line Item Search Details - Microsoft Internet Explorer

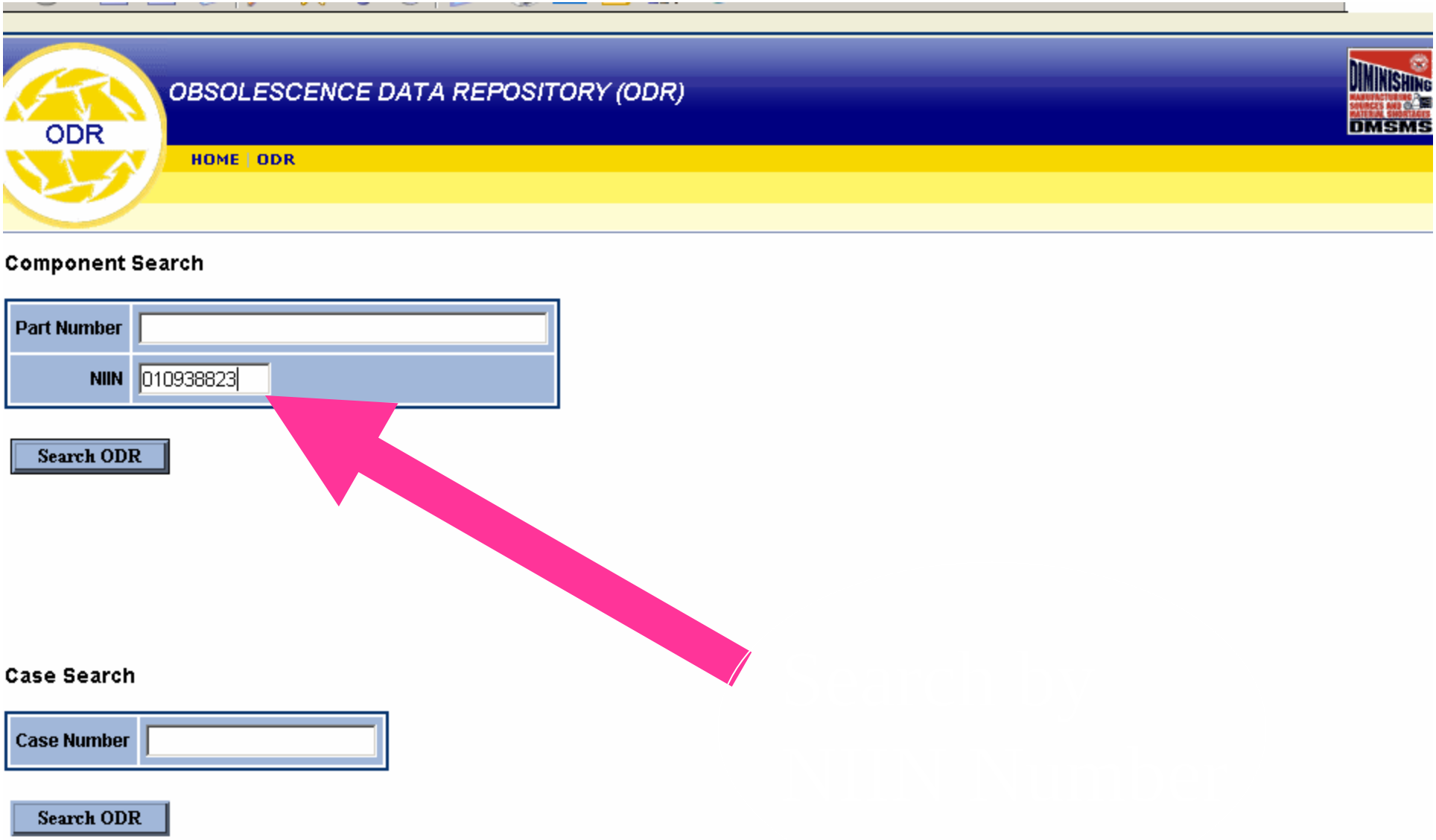
Details

Line Item Information

	Case Number	Case Owner	FSC	NIIN	P/N	Generic P/N	Part Nomenclature	CAGE Code
8	299-252251	Teaming Group			JANTX1N5719	1N5719	100V PIN-DIODE	

Affected Item Search Results

	NHA / Affected End Item						
	Program	Command	NSN	P/N	CAGE Code	Description	Solution
1	AEGIS					Parts_List: AEGISGRP	Substitute

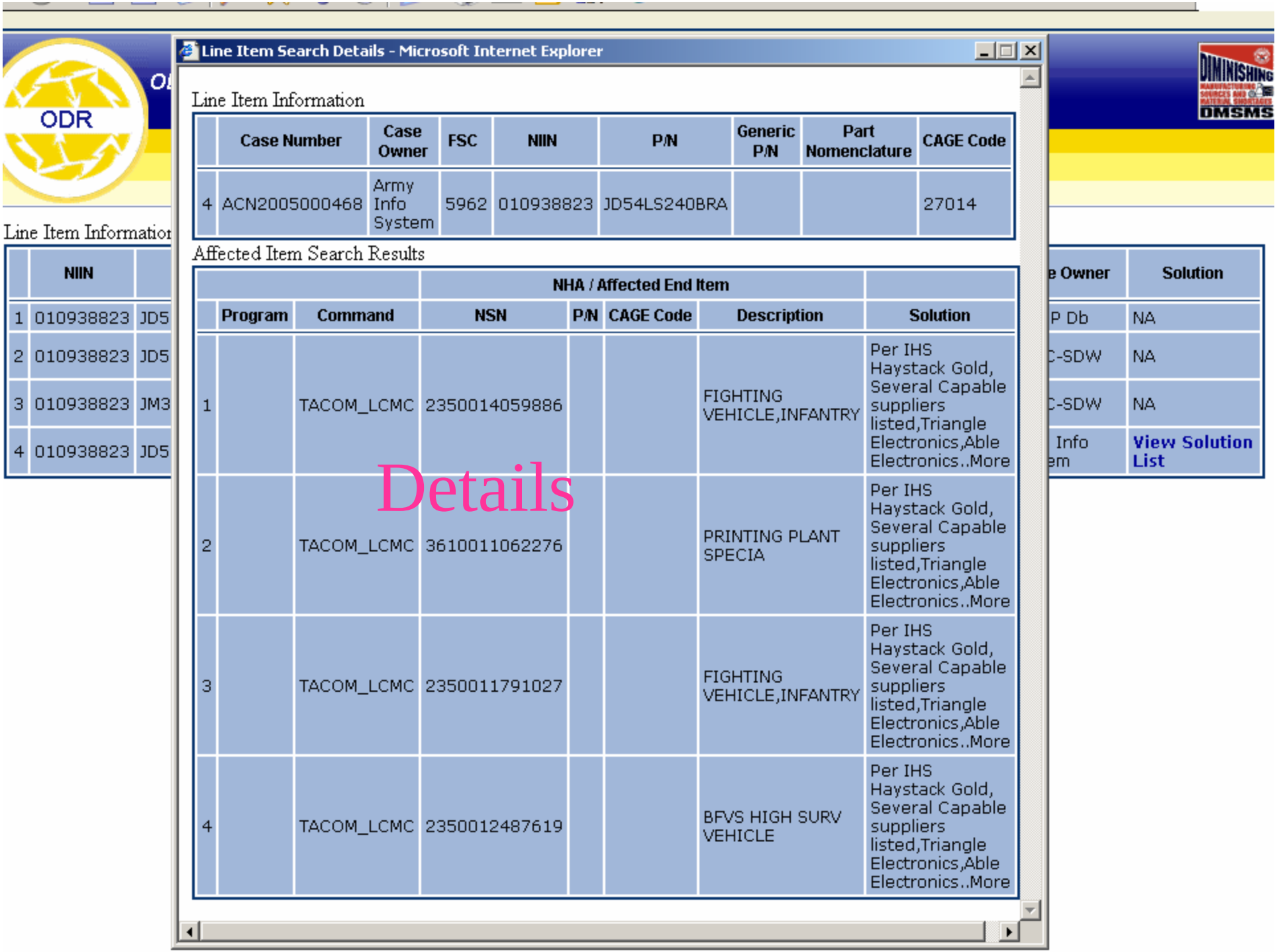

ODR
OBSOLESCENCE DATA REPOSITORY (ODR)
DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES DMSMS
HOME | ODR
Component Search
Part Number
NIIN
010938823
Search ODR
Case Search
Case Number
Search ODR

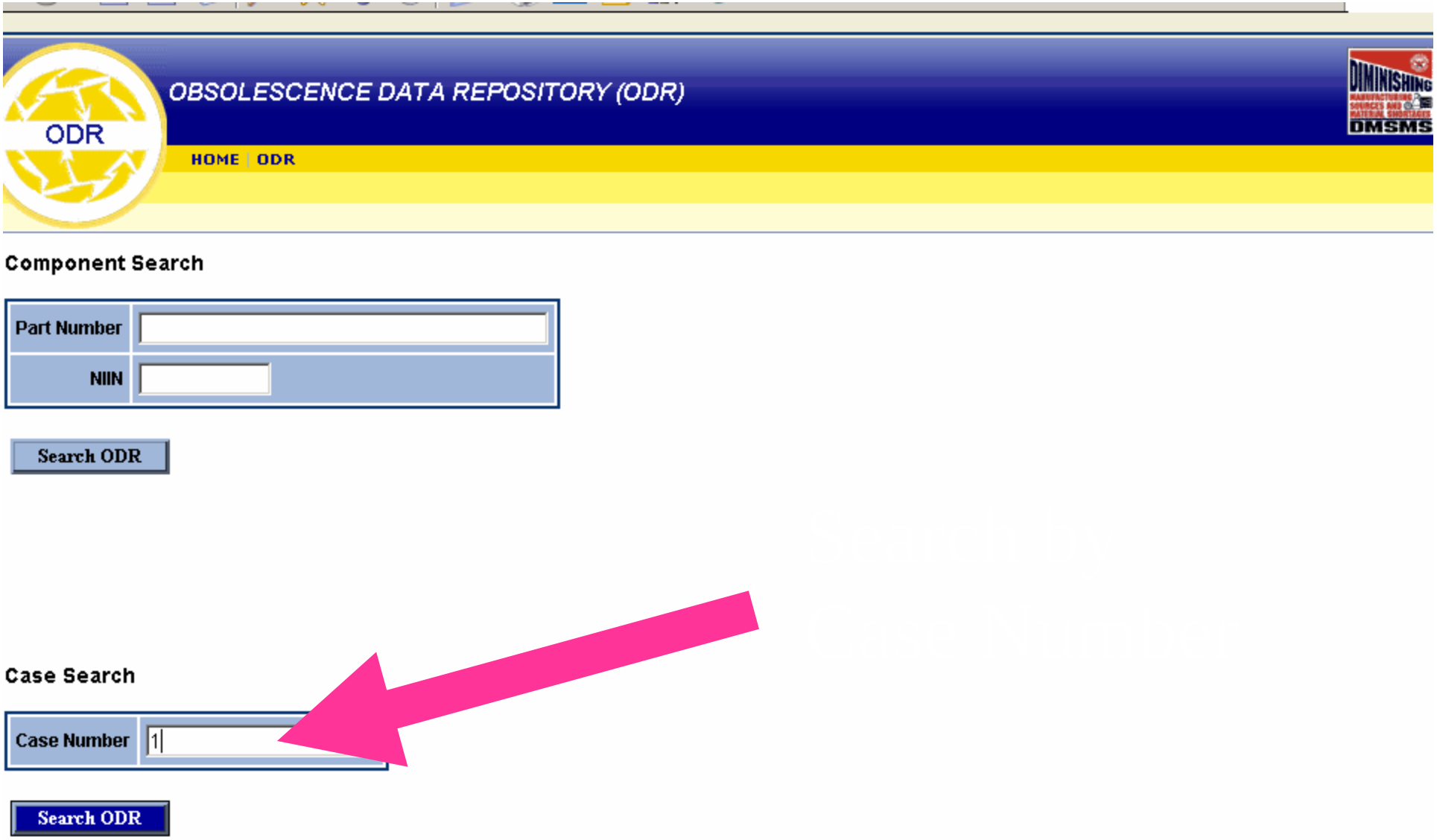
OBSOLESCENCE DATA REPOSITORY (ODR)

HOME | ODR

Line Item Information

	NIIN	P/N	FSC	Generic P/N	Part Nomenclature	CAGE Code	Final Order Date	Case Number	Case Owner	Solution
1	010938823	JD54LS240BRA	5962		MICROCIRCUIT,DIGITAL	27014		VV-D-05-0012	GIDEP Db	NA
2	010938823	JD54LS240BRA	5962		MICROCIRCUIT,DIGITA	27014	2005-09-14	2006-086	DSCC-SDW	NA
3	010938823	JM38510/32401BRA	5962		MICROCIRCUIT,DIGITA	27014	2005-09-14	2006-086	DSCC-SDW	NA
4	010938823	JD54LS240BRA	5962			27014		ACN2005000468	Army Info System	View Solution List


Line Item Search Details - Microsoft Internet Explorer
Line Item Information
Case Number
Case Owner
FSC
NIIN
P/N
Generic P/N
Part Nomenclature
CAGE Code
4 ACN2005000468 Army Info System 5962 010938823 JD54LS240BRA 27014
Affected Item Search Results
NHA / Affected End Item
Program
Command
NSN
P/N
CAGE Code
Description
Solution
1 TACOM_LCMC 2350014059886 FIGHTING VEHICLE,INFANTRY Per IHS Haystack Gold, Several Capable suppliers listed,Triangle Electronics,Able Electronics..More
2 TACOM_LCMC 3610011062276 PRINTING PLANT SPECIA Per IHS Haystack Gold, Several Capable suppliers listed,Triangle Electronics,Able Electronics..More
3 TACOM_LCMC 2350011791027 FIGHTING VEHICLE,INFANTRY Per IHS Haystack Gold, Several Capable suppliers listed,Triangle Electronics,Able Electronics..More
4 TACOM_LCMC 2350012487619 BFVS HIGH SURV VEHICLE Per IHS Haystack Gold, Several Capable suppliers listed,Triangle Electronics,Able Electronics..More
Details
ODR
DIMINISHING
DMSMS
Line Item Information
NIIN
Solution
1 010938823 JD5
2 010938823 JD5
3 010938823 JM3
4 010938823 JD5
P Db NA
C-SDW NA
C-SDW NA
Info View Solution List

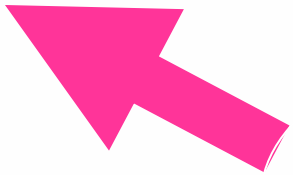

OBSOLESCENCE DATA REPOSITORY (ODR)
ODR
DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES
DMSMS
HOME | ODR
Component Search
Part Number
NIIN
Search ODR
Search by Case Number
Case Search
Case Number
1
Search ODR

OBSOLESCENCE DATA REPOSITORY (ODR)

HOME | ODR

Case Information

Case Number	Type	Status	Date Received	Manufacturer Notice Issue Date
1	Proactive Case	Closed		



Search Results



OBSOLESCENCE DATA REPOSITORY (ODR)



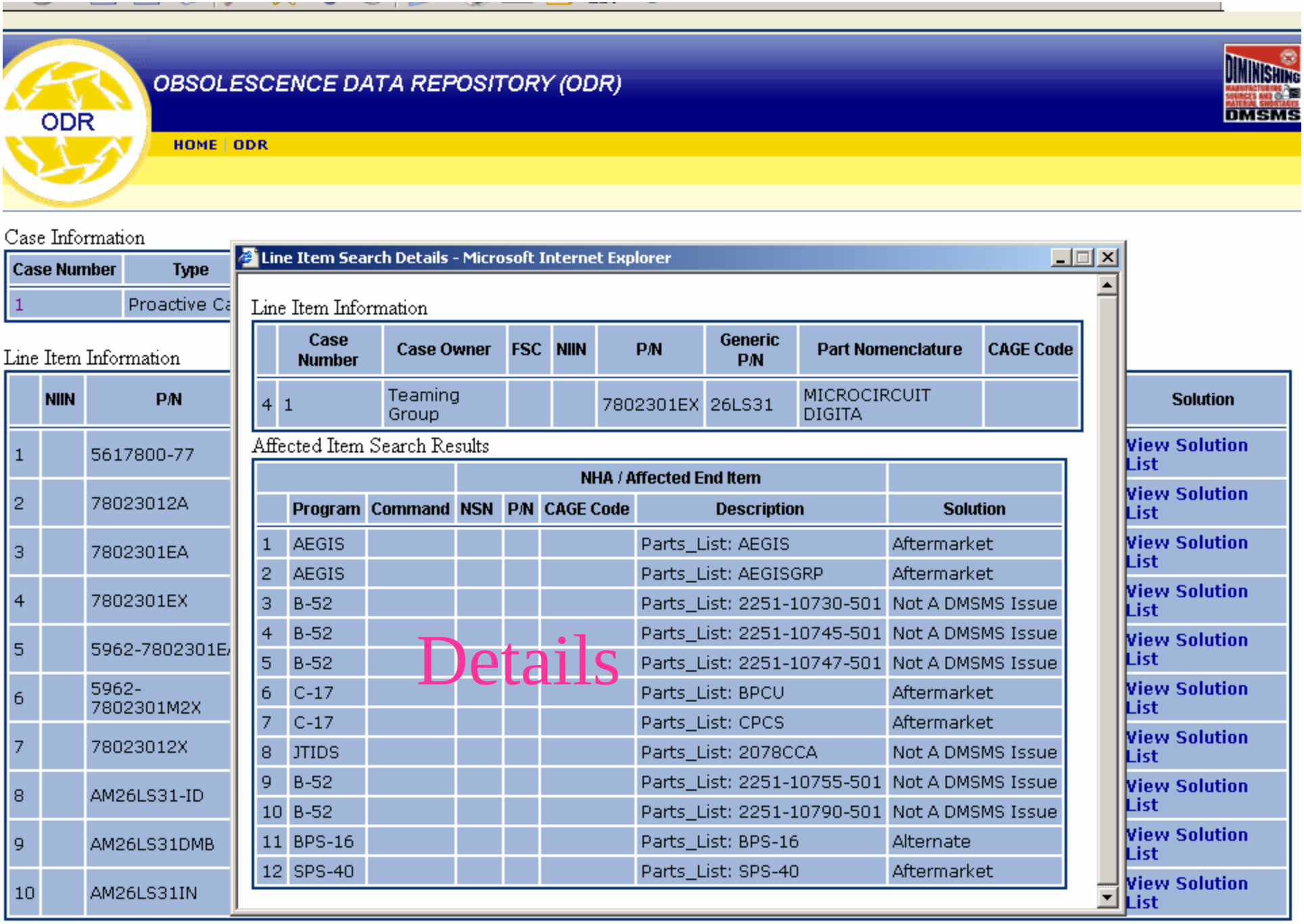
Case Information

Case Number	Type	Status	Date Received	Manufacturer Notice Issue Date
1	Proactive Case	Closed		

Case Information

Line Item Information

	NIIN	P/N	FSC	Generic P/N	Part Nomenclature	CAGE Code	Final Order Date	Case Number	Case Owner	Solution
1		5617800-77		26LS31	Unknown			1	Teaming Group	View Solution List
2		78023012A		26LS31	QUAD DIFF LINE DRVR TS			1	Teaming Group	View Solution List
3		7802301EA		26LS31	QUAD DIFF LINE DRVR TS			1	Teaming Group	View Solution List
4		7802301EX		26LS31	MICROCIRCUIT DIGITA			1	Teaming Group	View Solution List
5		5962-7802301EA		26LS31	IC			1	Teaming Group	View Solution List
6		5962-7802301M2X		26LS31	QUAD DIFF LINE DRVR TS			1	Teaming Group	View Solution List
7		78023012X		26LS31	Driver			1	Teaming Group	View Solution List
8		AM26LS31-ID		26LS31	IC LINE DRIVER			1	Teaming Group	View Solution List
9		AM26LS31DMB		26LS31	MICROCIRCUIT LINE DRIVER			1	Teaming Group	View Solution List
10		AM26LS31IN		26LS31	Microcircuit			1	Teaming Group	View Solution List


OBSOLESCENCE DATA REPOSITORY (ODR)
ODR
HOME | ODR
DIMINISHING MANUFACTURING SOURCES AND MATERIAL SHORTAGES DMSMS
Case Information
Case Number
Type
1
Proactive Ca
Line Item Information
NIIN
P/N
1 5617800-77
2 78023012A
3 7802301EA
4 7802301EX
5 5962-7802301E
6 5962-7802301M2X
7 78023012X
8 AM26LS31-ID
9 AM26LS31DMB
10 AM26LS31IN
Solution
View Solution List
Line Item Search Details - Microsoft Internet Explorer
Line Item Information
Case Number
Case Owner
FSC
NIIN
P/N
Generic P/N
Part Nomenclature
CAGE Code
4 1 Teaming Group 7802301EX 26LS31 MICROCIRCUIT DIGITA
Affected Item Search Results
NHA / Affected End Item
Program
Command
NSN
P/N
CAGE Code
Description
Solution
1 AEGIS Parts_List: AEGIS Aftermarket
2 AEGIS Parts_List: AEGISGRP Aftermarket
3 B-52 Parts_List: 2251-10730-501 Not A DMSMS Issue
4 B-52 Parts_List: 2251-10745-501 Not A DMSMS Issue
5 B-52 Parts_List: 2251-10747-501 Not A DMSMS Issue
6 C-17 Parts_List: BPCU Aftermarket
7 C-17 Parts_List: CPCS Aftermarket
8 JTIDS Parts_List: 2078CCA Not A DMSMS Issue
9 B-52 Parts_List: 2251-10755-501 Not A DMSMS Issue
10 B-52 Parts_List: 2251-10790-501 Not A DMSMS Issue
11 BPS-16 Parts_List: BPS-16 Alternate
12 SPS-40 Parts_List: SPS-40 Aftermarket
Details

Schedule

- GIDEP beta site deployed
- Data findings review with subject matter experts – Ongoing
- Requirements clarification – Ongoing
- Supporting scripts developed and positioned for future Web services interaction
- Initial loads – October 05 through March 06
- Deploy ODR demonstration to beta site July 06

Database Expansion Schedule

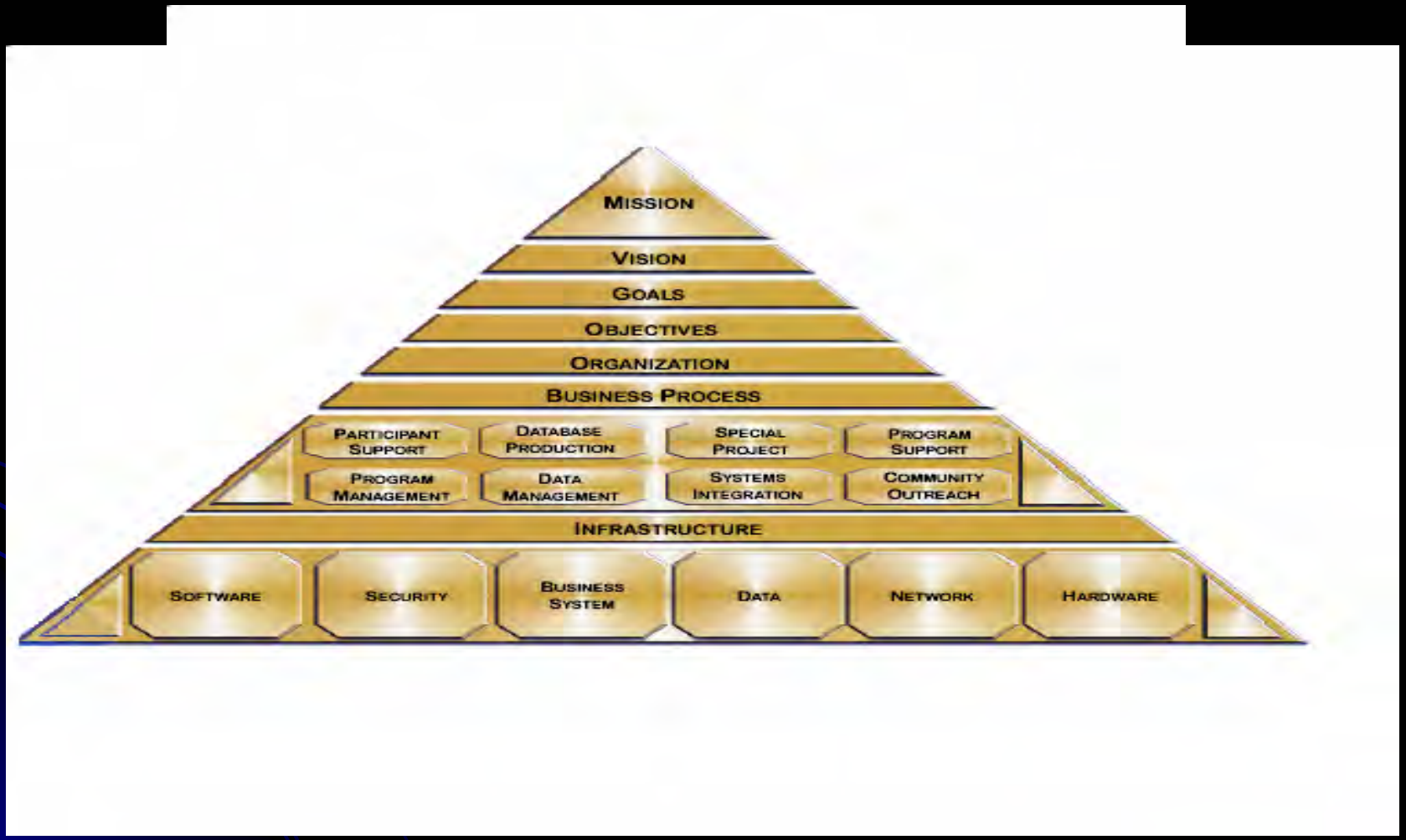
- **July 2006**
  - DSCC Module Case History File (CHF)
  - Army INFO System
  - GIDEP Database
  - DoD DMSMS Teaming Group
  - Air Force
- **August 2006**
  - Navy Module
  - Engineering Solutions
- **September 2006**
  - QSTAR®
  - AVCOM
- **October 2006**
  - MORE
- **November 2006**
  - Navy Commonality
  - AEGIS

Planned Ways to Access ODR

- GIDEP Membership Website
- DMSMS Knowledge Sharing Portal
- Service Modules

GIDEP

TRANSFORMATION



GIDEP TRANSFORMATION GOALS

- Ensure GIDEP Satisfies Customer Needs
- Broaden Active Participation in GIDEP
- Improve the Effectiveness of the GIDEP Management Team
- Promote Good Business Practices
- Improve Efficiency and Effectiveness through Automation

Summary

GIDEP transformation…..





DMSMS Management:

Planning, Implementation, Assessment, & Metrics

Kevin Kenney
PEO IWS 1AQ
Integrated Combat Systems
12 July 2006

Aegis DMS Background



- ***1991 - Requests for increased funding of $3M by Original Equipment Manufacturers (OEMs) for redesign efforts, due to obsolescence issues.***
- ***1992 - Aegis Program forms Diminishing Manufacturing Suppliers (DMS) Working Group to support Aegis Weapon Systems (AWS) Production Programs***
- ***1994 – Implementation of AWS DMSMS Management Plan***
- ***1995 - AWS DMS Working Group expands to include support for fielded equipment and life cycle support activities.***

Aegis DMS Working Group



- *Aegis DMS Working Group*
  - *PEO IWS 1AQ - Chair*
  - *Lockheed Martin – Maritime Systems & Sensors*
  - *Raytheon Integrated Defense Systems*
  - *General Dynamics - Armament and Technical Products*
  - *L3 Communications*
  - *Naval Surface Warfare Center (NSWC) – Crane, IN*
  - *NSWC - Port Hueneme, CA*
  - *NSWC – Corona, CA*
  - *Defense Supply Center Columbus (DSCC)*
  - *Navy Inventory Control Point (NAVICP)*

DMS Management Methodology



AWS DMSMS Management Plan recognized as "Best of Breed" by DASN Logistics in January 2006

AWS DMSMS Management Plan establishes:

- ***Procedures developed for component DMS and COTS equipment obsolescence management***
- ***Continuous monitoring of alerts and announcements from a variety of sources.***
- ***Assessing of impact to production and post production configurations.***
- ***Sharing and communicating status on all DMS cases via bi-weekly telephone conferences and quarterly face to face meetings***

DMS Case Management Process

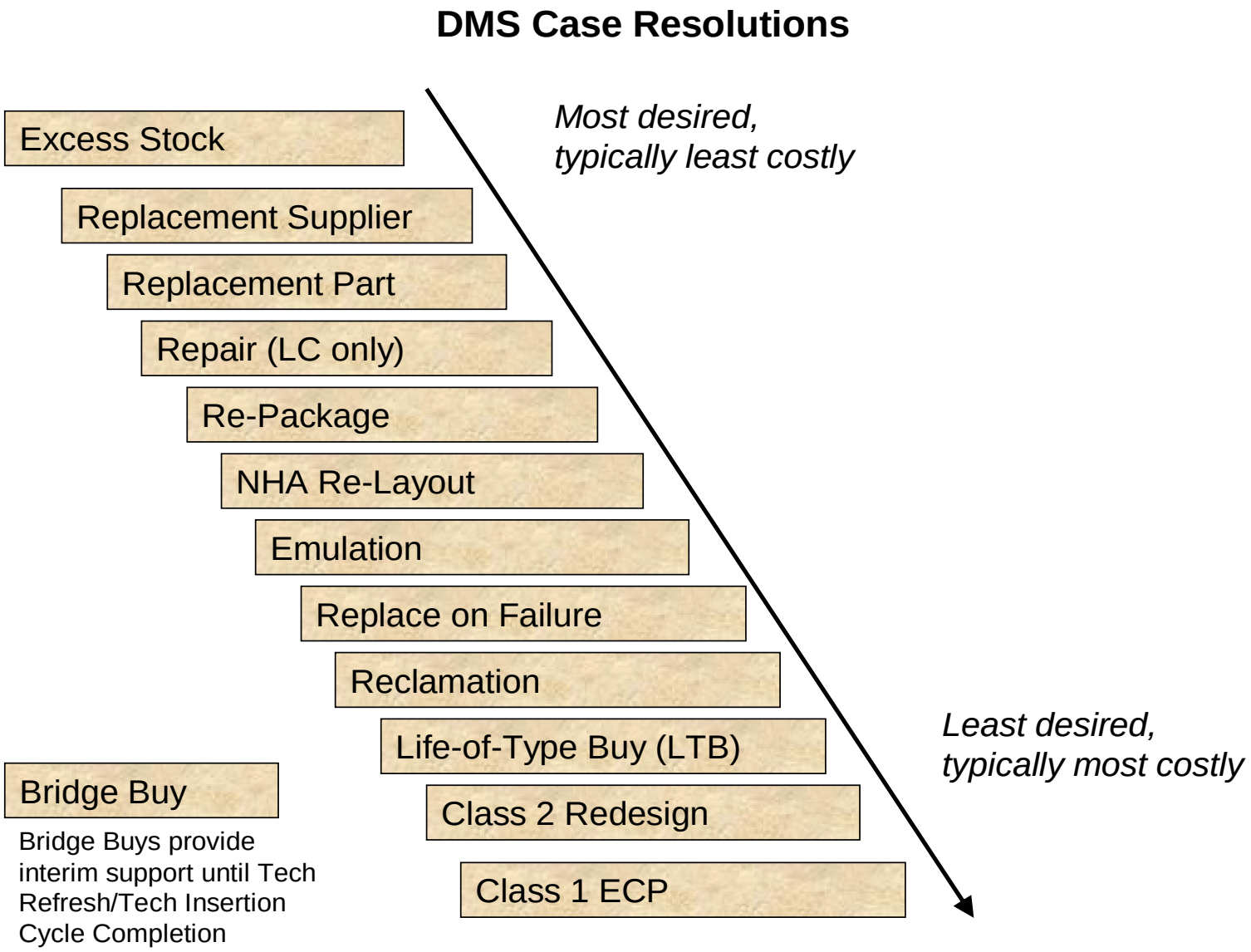
DMS NOTIFICATION	***Suppliers, Government / Industry Alerts, purchased DMS tools and services, Sourcing, etc.***
IDENTIFICATION	***Determine affected items & assess impact***
DMS DATABASE	***Assign DMS Case for tracking***
EVALUATION	***Analyze alternatives and recommend possible resolution path to PEO IWS through Business Case Analysis (BCA) to support lowest cost & lowest technical risk***
IMPLEMENTATION	***Implement Recommendation/ Procure Material***
CASE CLOSURE	***Update database when all requirements are complete***

DMS Management Tools Used in Aegis DMSMS



- *Parts Control System (PCS)*
- *GIDEP*
- *Q-Star*
- *CAPS Expert*
- *COTS Database*
- *Total Parts Plus*
- *I2 TAC TRAC*
- *SMART*

DMS Case Resolutions

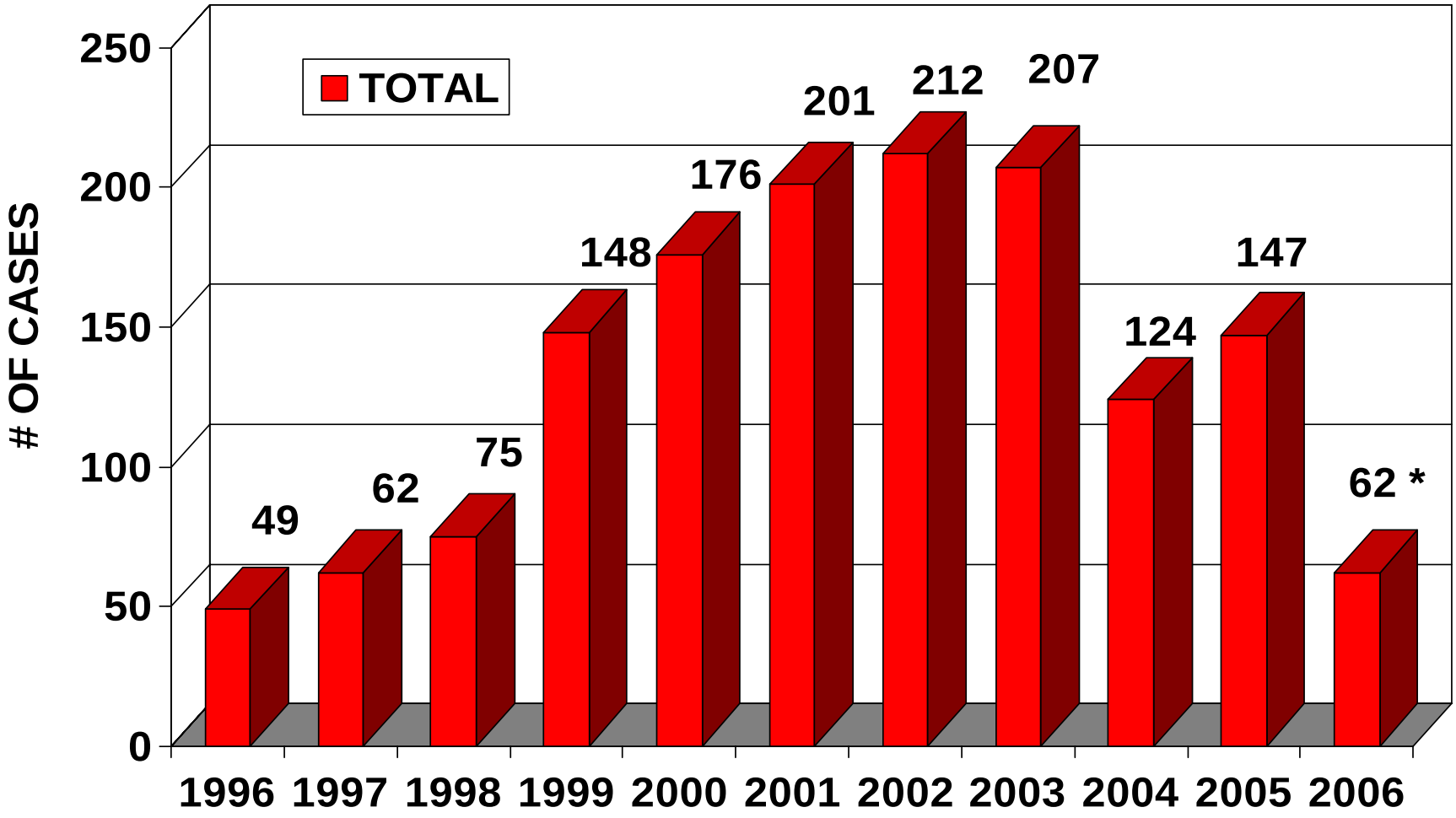


Aegis DMS Metrics



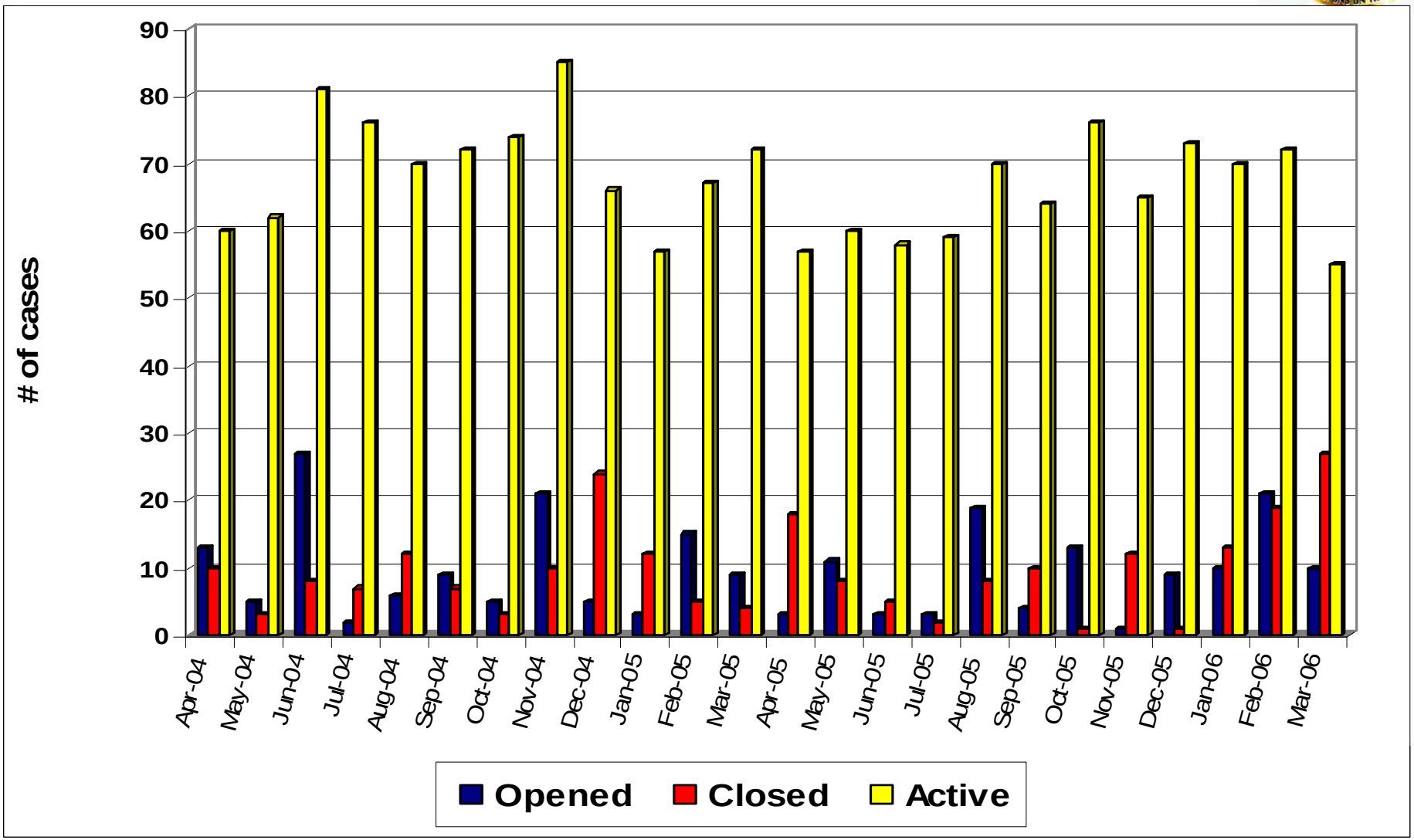
- *DMS Caseload*
- *COTS/MilSpec Caseload Trends*
- *Methods of DMS Case Identification*
- *DMS Case Resolution by Type*
- *Aging of Open Cases*
- *Cost Avoidance*

DMS Metrics – Caseload



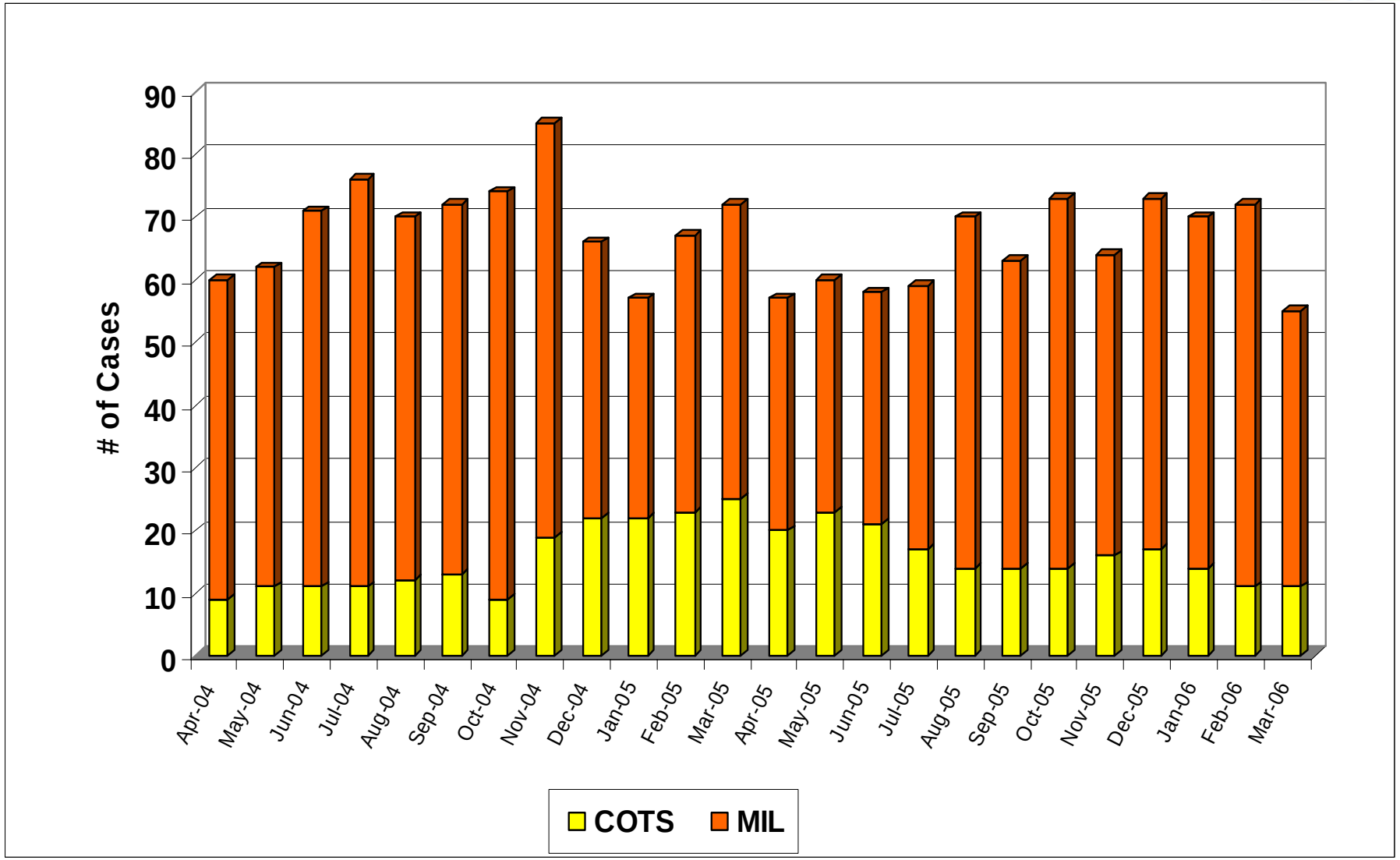
** As of 6/01/06*

Historical Aegis Production DMS Caseload (all OEMs)

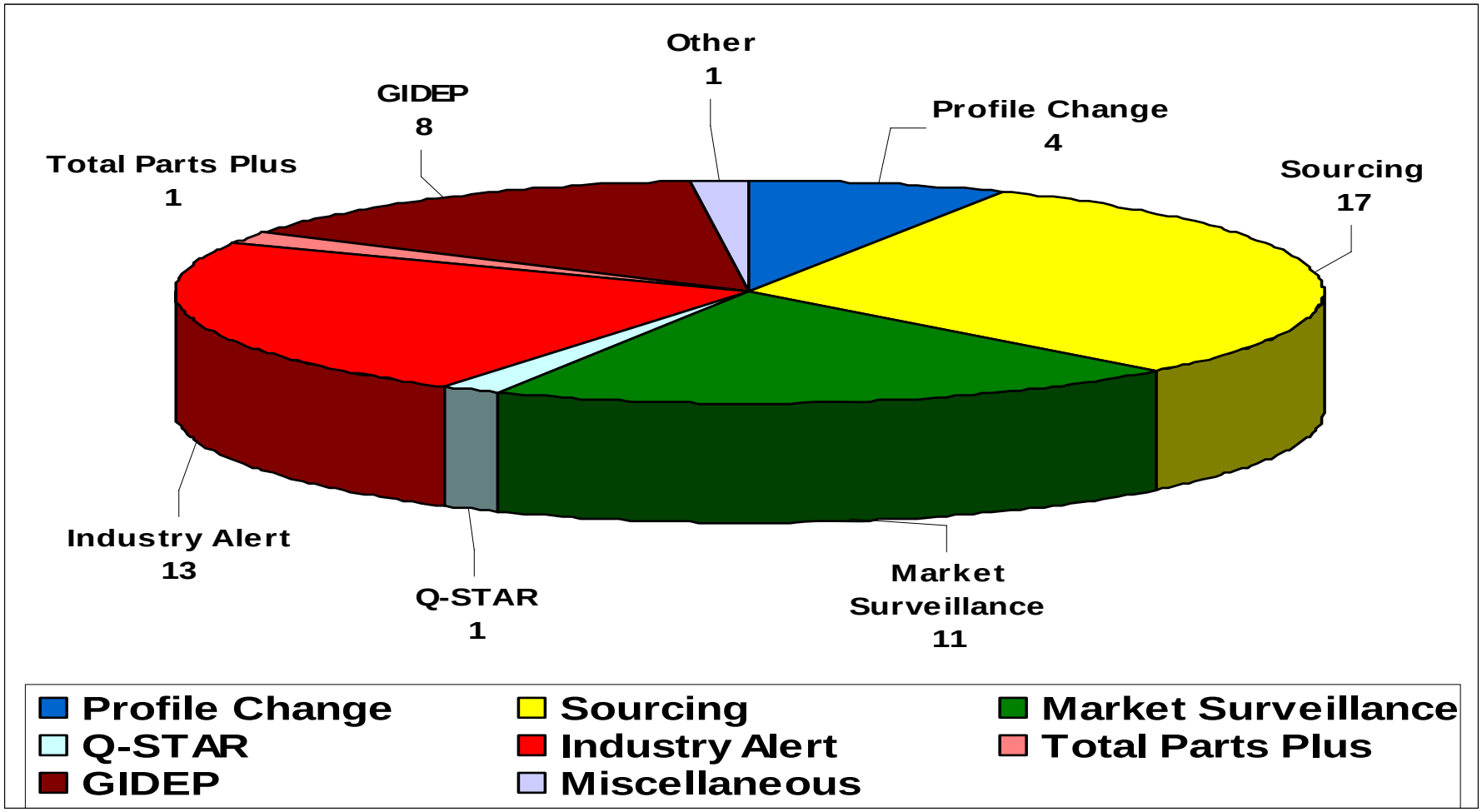


Note: The entire history would extend back to 1992.

Aegis Production COTS and MIL SPEC Caseload Trends (all OEMs)



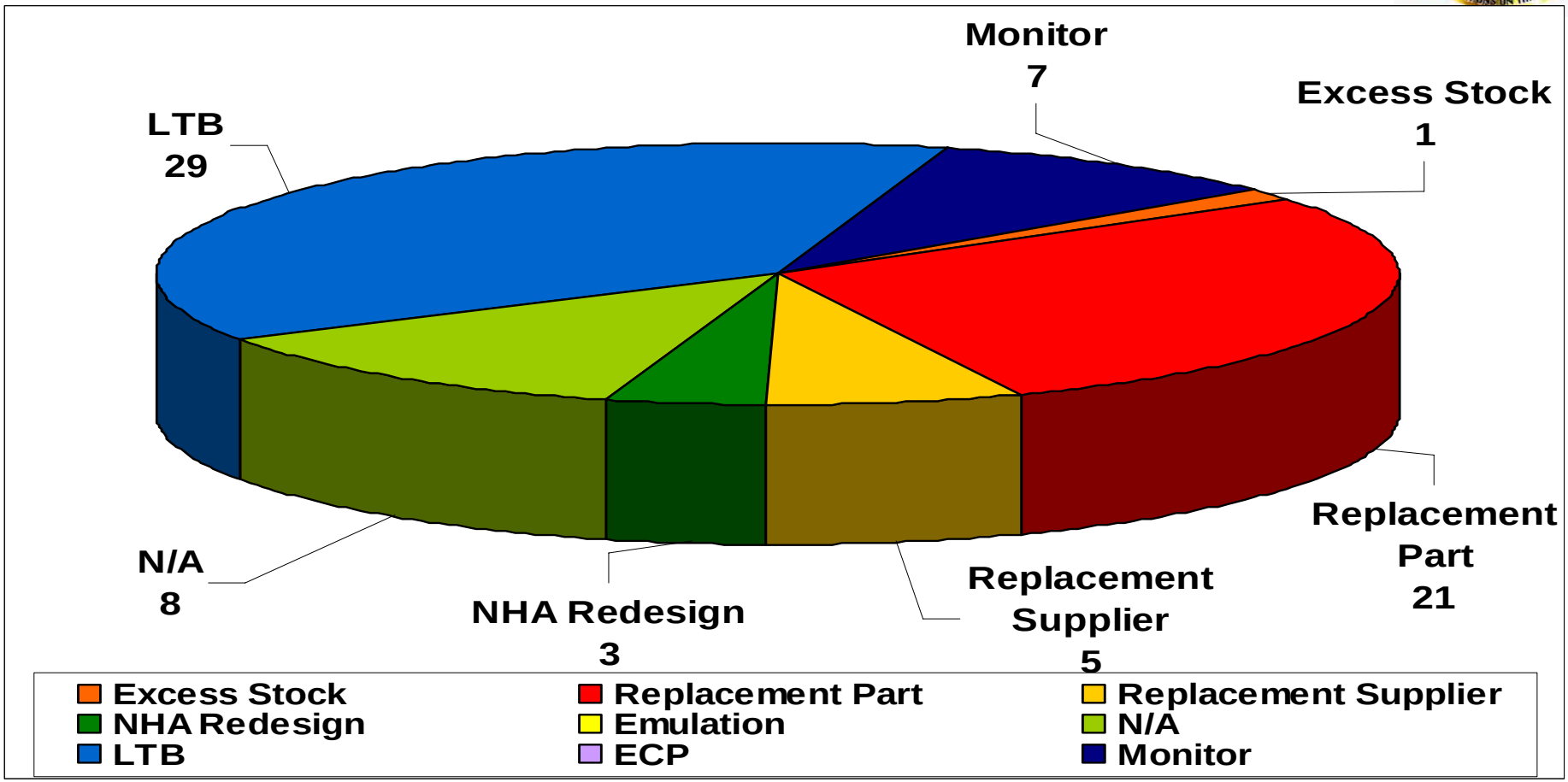
Aegis Production FY06
Methods of DMS Case Identification



Other: 1726-1, PHD notification of DMS issue

Note: Period covered - 10/05 through 3/06. FY06 does not represent Aegis FY06 contract cases

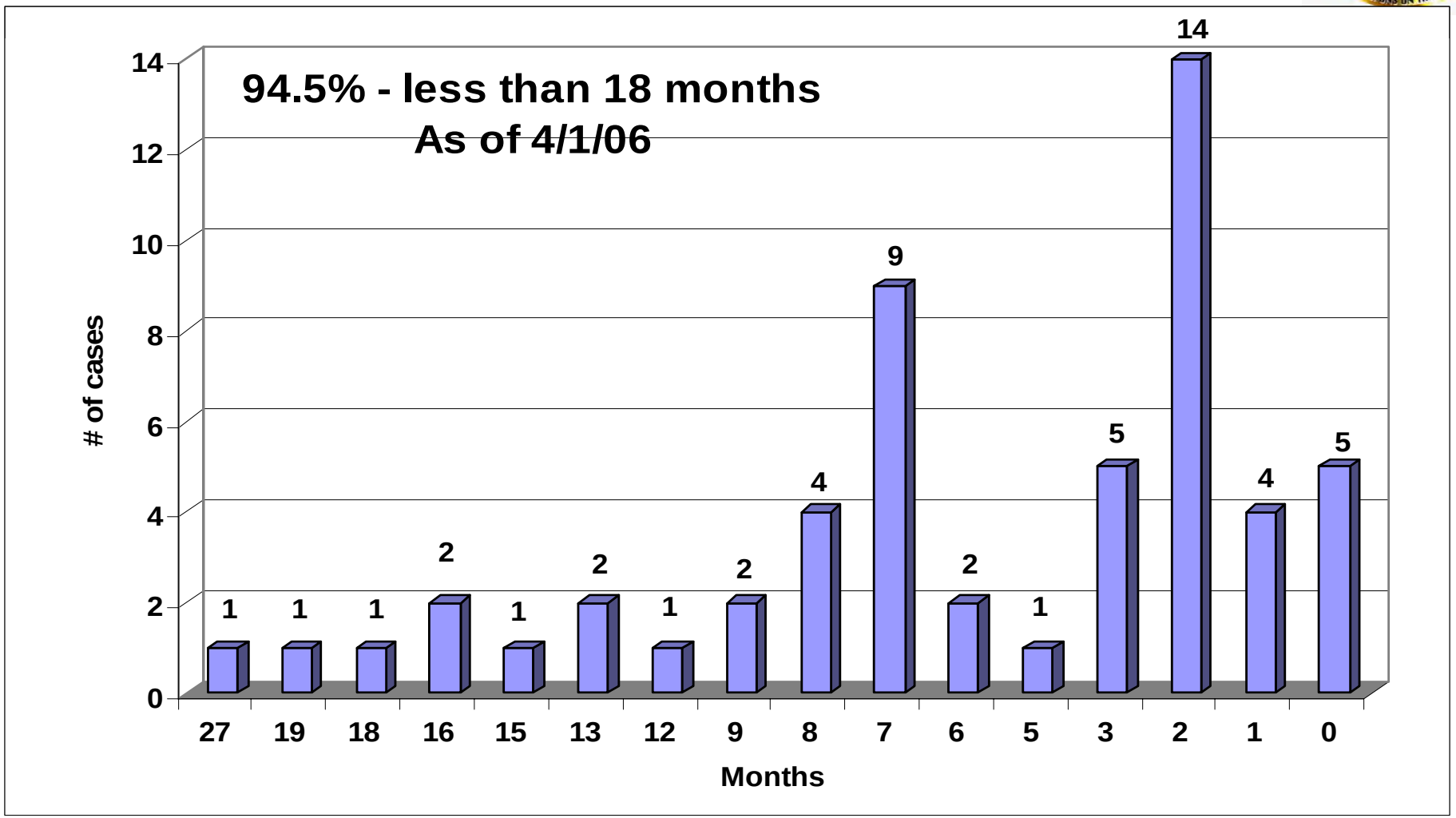
Aegis Production
FY06 DMS Case Resolutions



- *N/A resolutions:*
  - *1515-2, RAVE quantities support profile*
  - *1695-1, 1696-1, 1702-1, Raytheon opened in error*
  - *1699-1, 1700-1, 1701-1, 1705-1, RCR resistor cases closed to original case number*
  - *1725-1, duplicate of previous case*

Note: Total number of cases resolved during this period (10/05 to 4/06) was 74 and does not represent the Aegis FY06 contract cases.

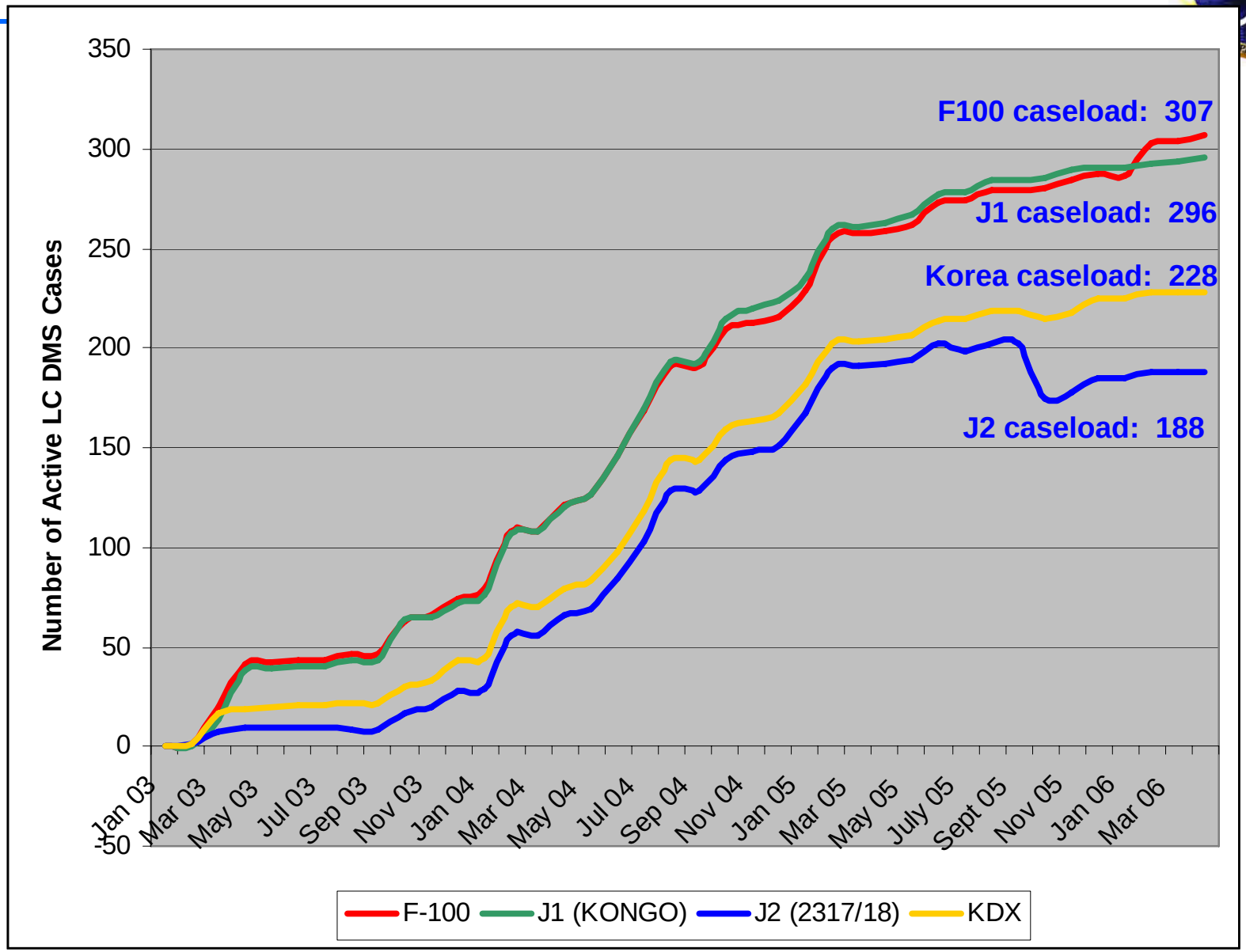
Aging of Open Aegis Production DMS Cases



- *18 months or older*

1536-1 P/N 7012220, LM - Redesign NHA
754-2 P/N 2902230-1, Raytheon - LTB
1589-1 P/N 20516299-1, LM - Replacement Part

Historical FMS Caseload



Defense Acquisition University

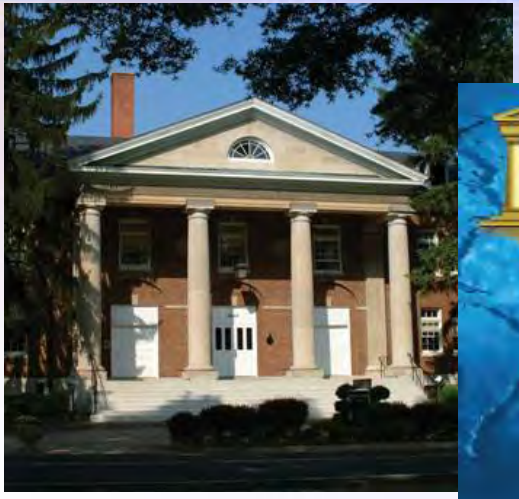
DMSMS 2006 Workshop

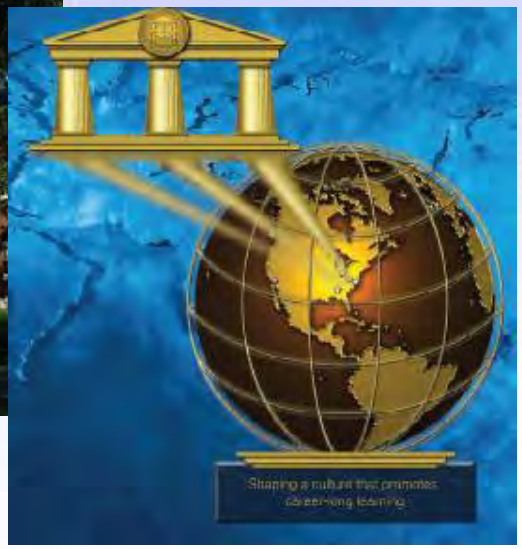
DAU Life Cycle Logistics Resources

Mr. Bill Kobren
Program Director, Sustainment
July 13, 2006

Overview

- DAU Overview
- DAU Performance Learning Model
  - Training Courses
  - Knowledge Sharing
  - Continuous Learning
  - Performance Support
- DMSMS Resources
- DAU Support to DoD DMSMS Working Group





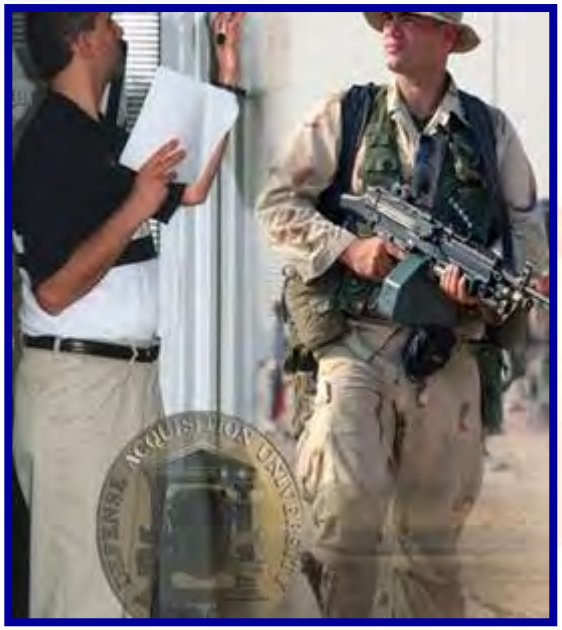


Shaping a culture that promotes career-long learning

DAU Mission

Provide practitioner training, career management, and services to enable the AT&L community to make smart business decisions and deliver timely and affordable capabilities to the warfighter.

- We train the AT&L Workforce through certification and assignment-specific courses
- We promote career-long learning through our Continuous Learning Center
- We offer performance support to the AT&L Workforce through consulting, Rapid Deployment Training, and targeted training
- We facilitate knowledge sharing through on-line resources and communities of practice



DAU Within DoD

SECDEF



Under Secretary of Defense
(Acquisition, Technology & Logistics)
Hon. Ken Krieg



Deputy Under Secretary of Defense
(Acquisition & Technology)
Hon. James Finley

President
Defense Acquisition University
Mr. Frank Anderson



CJCS

NDU

SECAF	CSAF	AETC	Air University	AFIT
SECNAV	CNO	NETC		NPGS
SECARMY	CSA	TRADOC	CASCOM	ALMC

DAU Regional Organization

We are part of the community, not just a place to go to take classes.





Capital and Northeast
(Fort Belvoir)
AT&L WF ~37,000



Mid-Atlantic
(Pax River)
AT&L WF ~23,000

West
(San Diego)
AT&L WF ~26,000

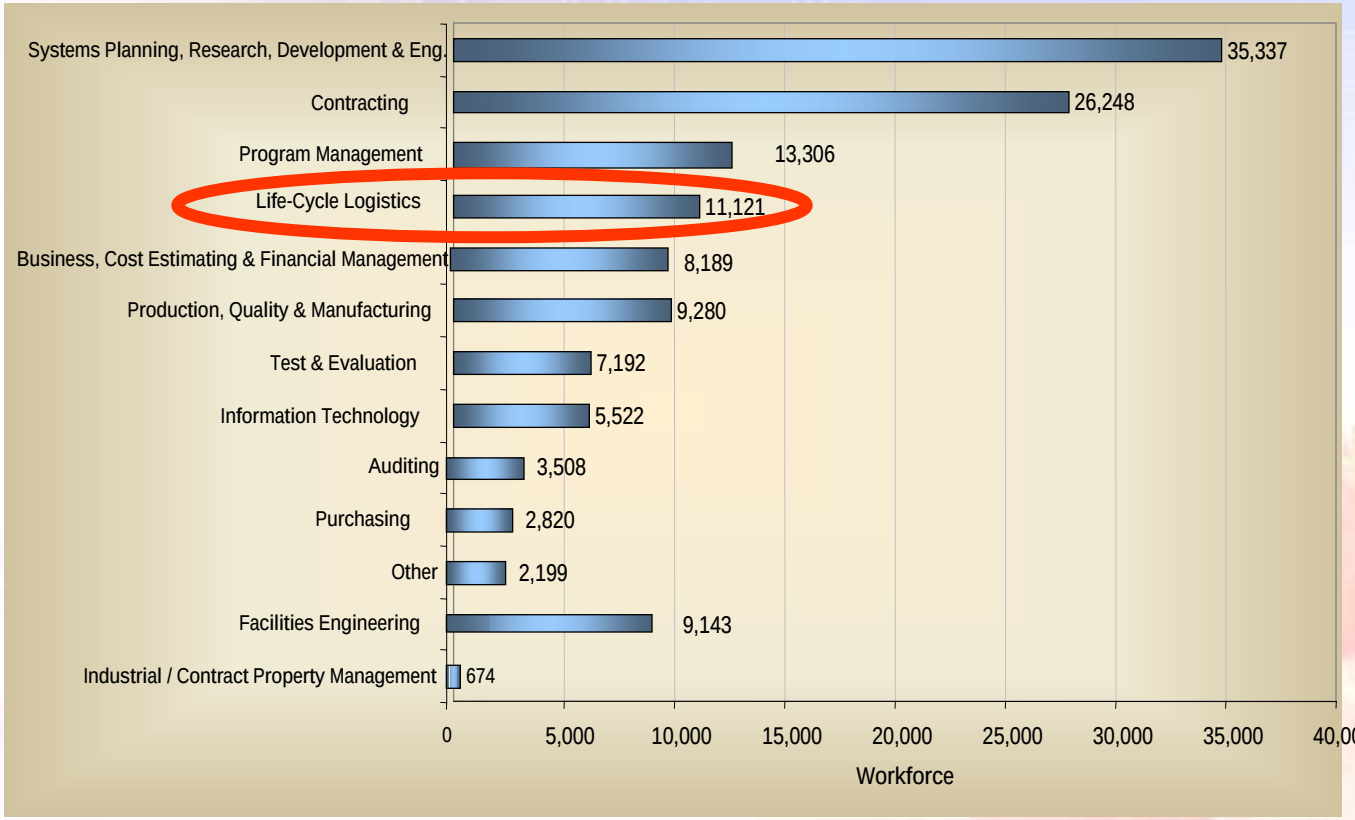
South
(Huntsville)
AT&L WF ~27,000

Midwest
(WP AFB)
AT&L WF ~20,000

Located with DoD Workforce

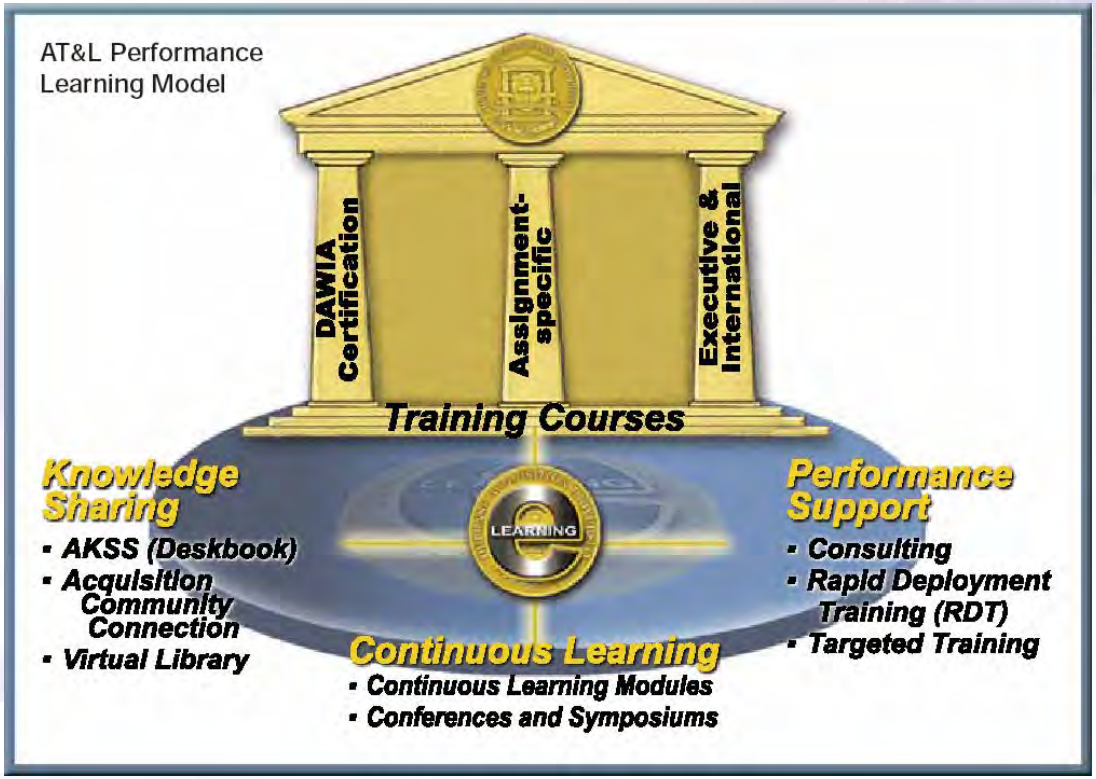
DoD AT&L Workforce

DoD AT&L Total Workforce = 134,539



SOURCE: Refined Packard Data Extract run 30 September 2004

Creating a Strategic Learning Environment is at the Heart of Transformation...



Creating an environment where we learn

- ✓ **Before,**
- ✓ **During, and**
- ✓ **After**

the training intervention…

Balancing:

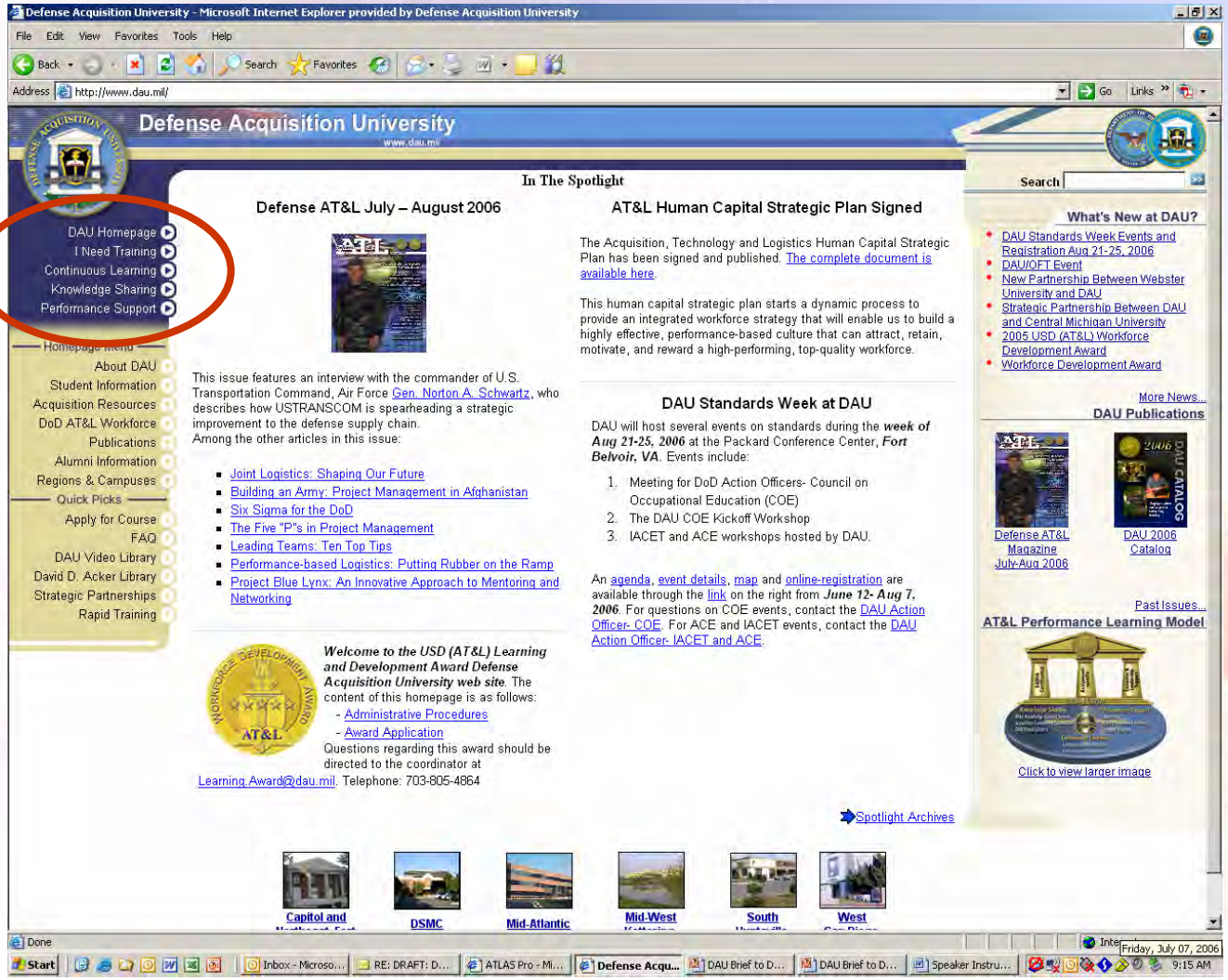
- **Curriculum modernization**
- **Continuous learning**
- **Performance support**
- **Evolving practices**
- **Knowledge sharing / Communities of Practice**

Value – Added Contributions…

Closely Linked to Achieving Senior Leadership Goals

DAU Home Page: Resource Gateway

- **Direct access to information about DAU training, continuous learning, knowledge sharing, and performance support**
- **www.dau.mil**

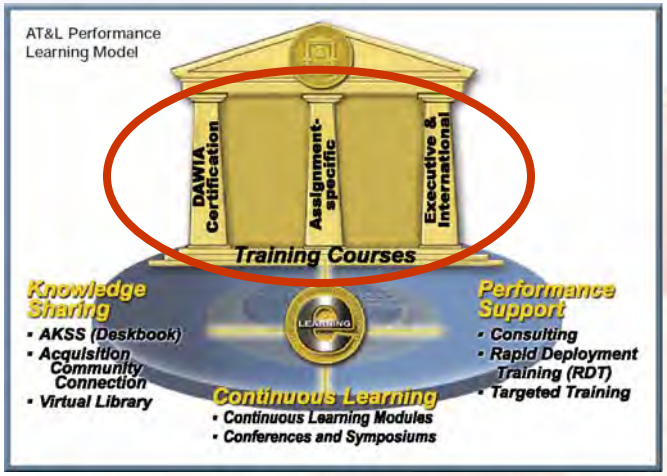


Information on DAU Training Courses

- **"I Need Training" Site (www.dau.mil):**
  - **General Information**
  - **Course Schedules**
  - **Apply for a Course**
  - **Pre-Course Information**
  - **Log-in to Distance Learning Courses**
  - **Browse Distance Learning Courses**
  - **DAU Catalog**



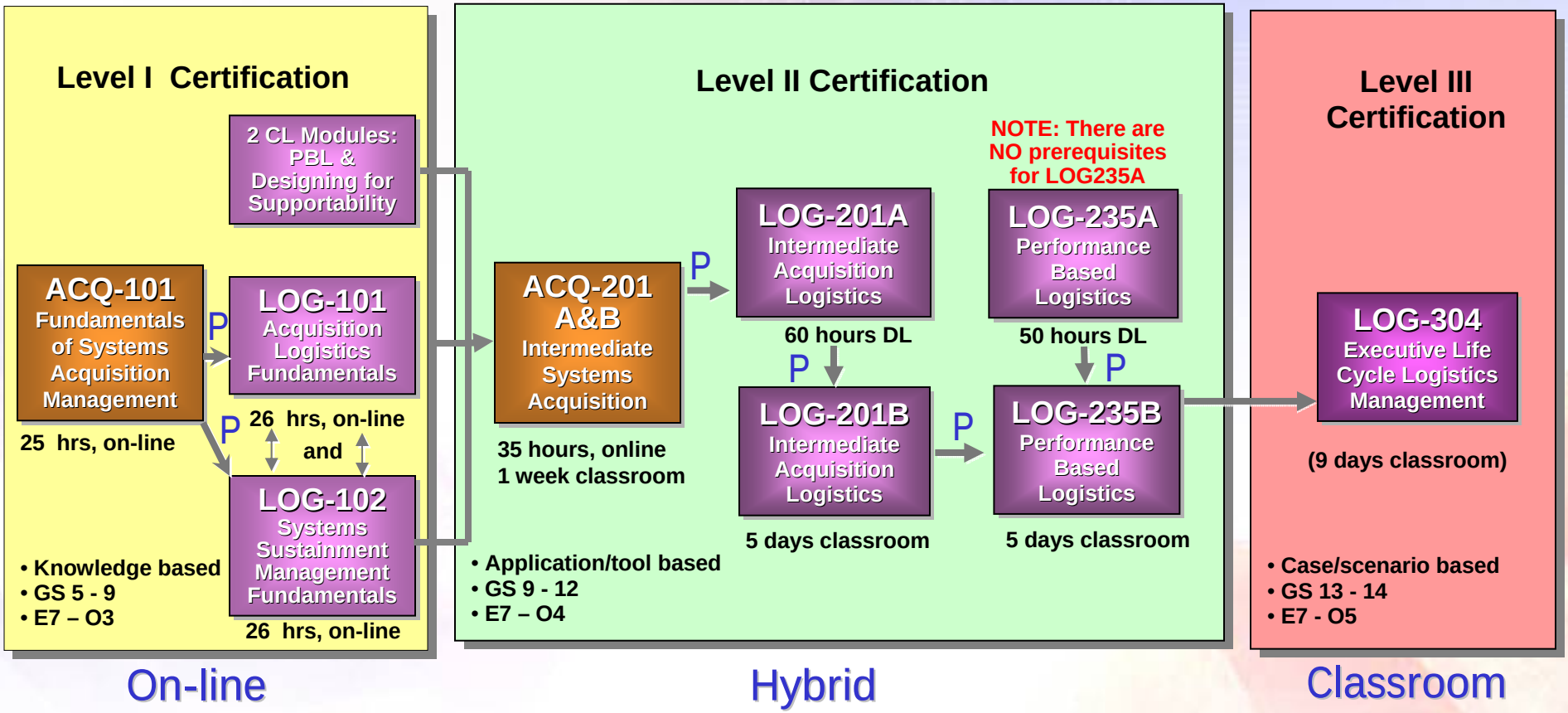
- **DAU Catalog (www.dau.mil/catalog):**
  - **Chapter 1** Defense Acquisition University (DAU)
  - **Chapter 2** Administrative Information
  - **Chapter 3** DAU Learning Assets
  - **Appendix A** DAU Regions
  - **Appendix B** Career Field Certification Requirements
  - **Appendix C** Equivalencies
  - **Appendix D** Continuing Education Units
  - **Appendix E** Acquisition Corps Education Standards
  - **Appendix F** Other DAU Products & Services



Information at the Click of a Mouse

FY 06 Life Cycle Logistics Courses

P = Prerequisite



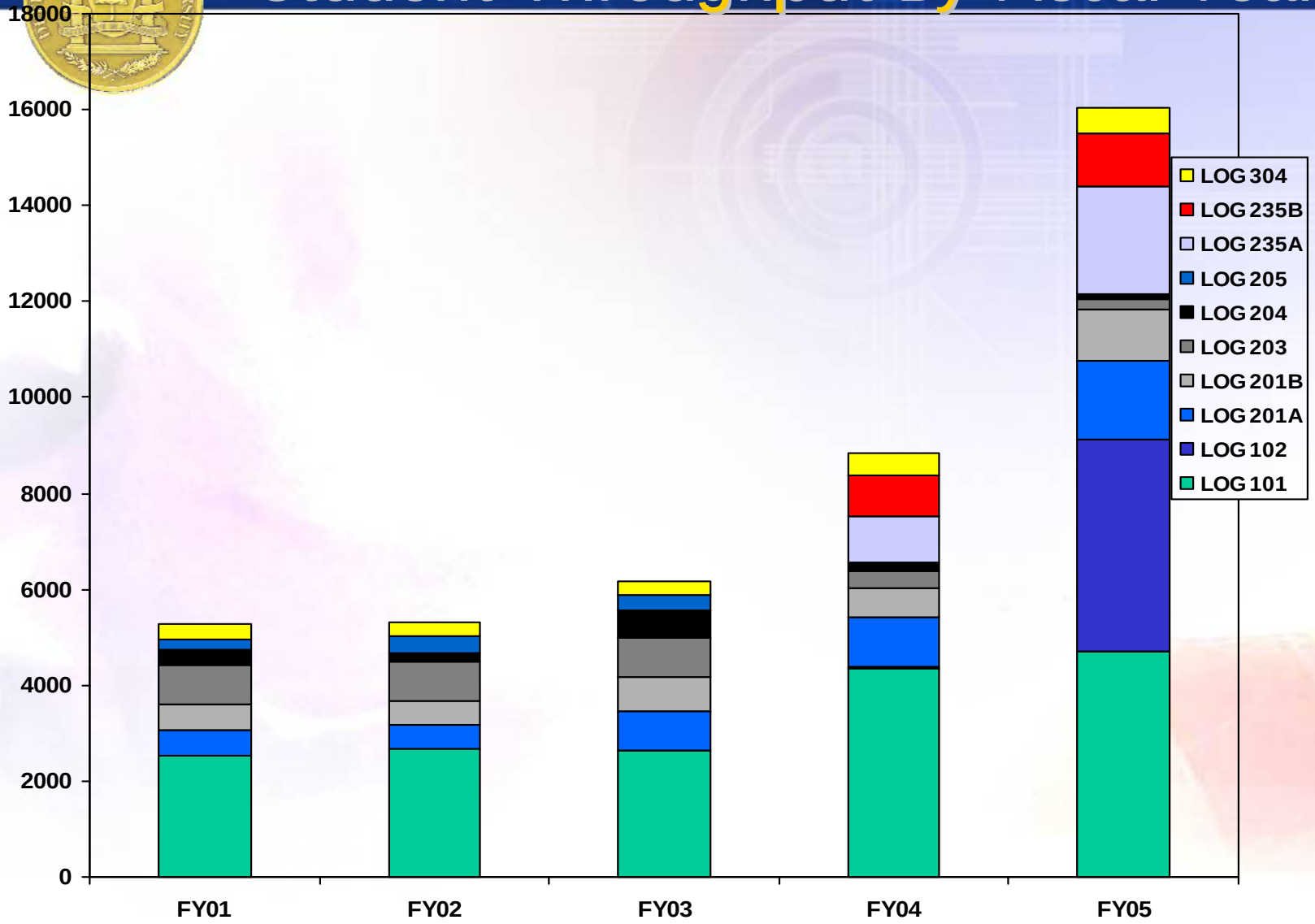
Assignment Specific or Other Acquisition Training

- Reliability and Maintainability
- Configuration Management
- Program Management
- Systems Engineering

Additional Education

Academia – Certificate/Degree
- System Design & Operational Effectiveness (SDOE)
- Supply Chain Management (SCM)

DAU Logistics Courses: Student Throughput By Fiscal Year



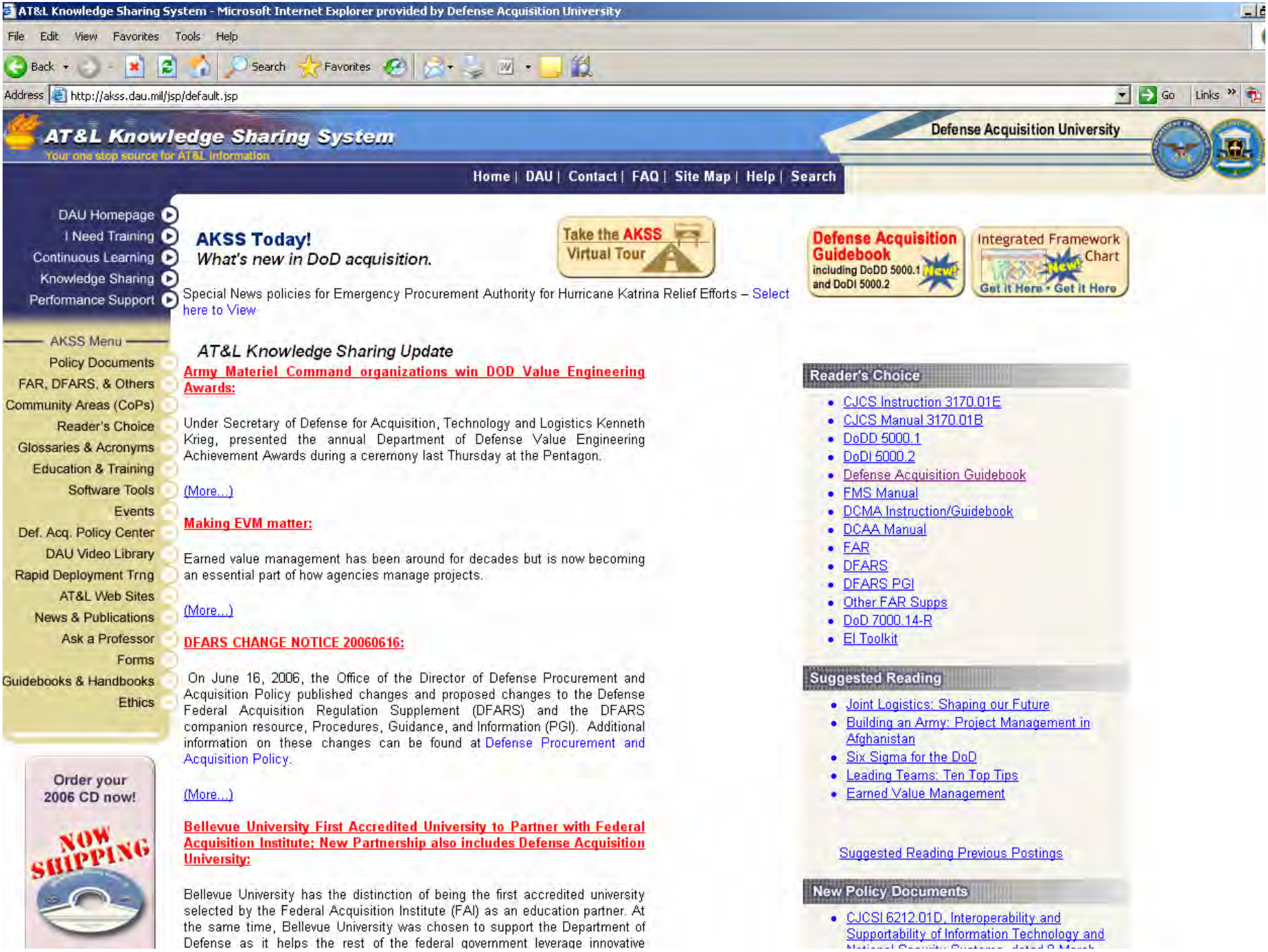
Knowledge Sharing

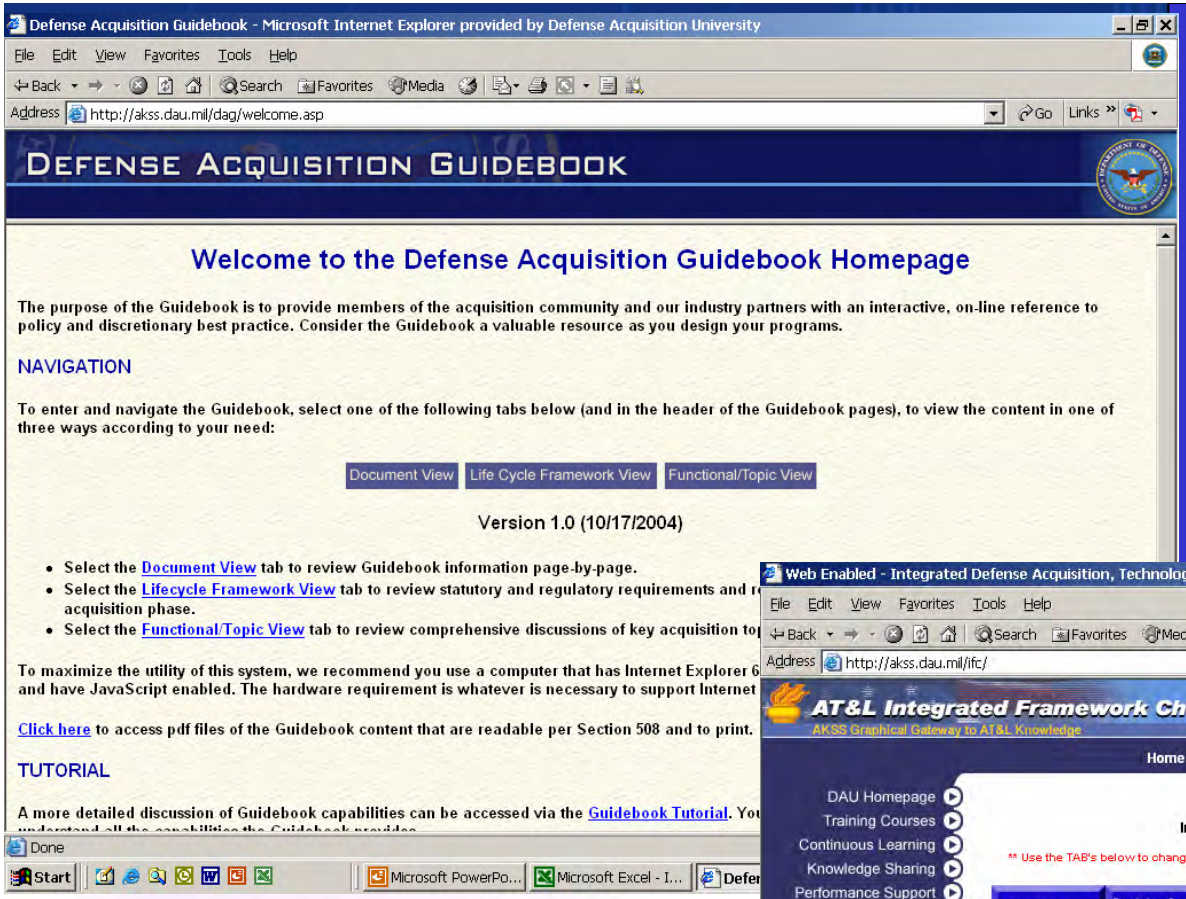
- **AT&L Knowledge Sharing System (AKSS)**
  - Gateway for AT&L Policy, Resources, Information, and Initiatives
  - Primary Reference Tool for AT&L workforce (replaced Deskbook)
  - AKSS incorporated into LOG Courses
- **Benefits:**
  - Save Time
  - Accelerate Problem Solving
  - Enhance Professional Development
  - Access Performance Support Tools



https://akss.dau.mil

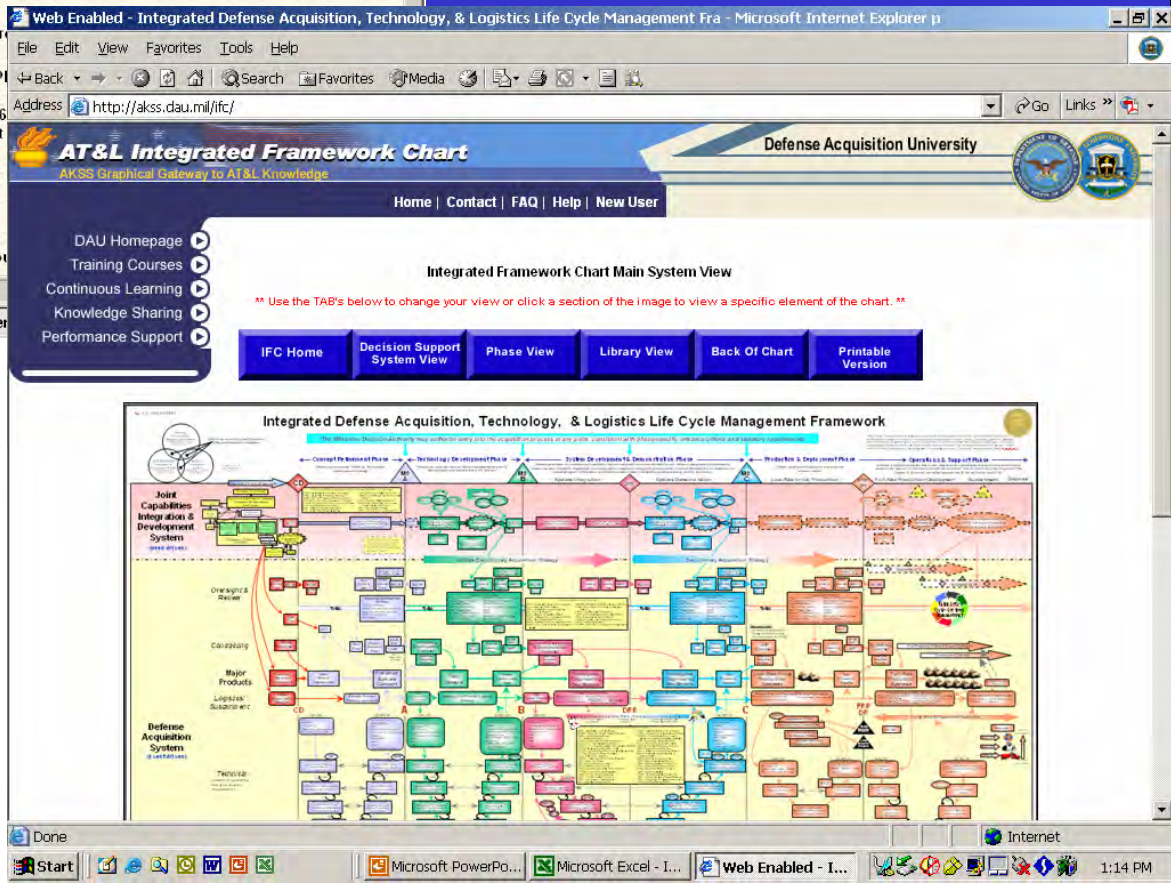
Resources Available Around-the-world, Around-the-clock


AT&L Knowledge Sharing System - Microsoft Internet Explorer provided by Defense Acquisition University
File Edit View Favorites Tools Help
Back Search Favorites
Address http://akss.dau.mil/jsp/default.jsp
Go Links
AT&L Knowledge Sharing System
Your one stop source for AT&L information
Defense Acquisition University
Home | DAU | Contact | FAQ | Site Map | Help | Search
DAU Homepage
I Need Training
Continuous Learning
Knowledge Sharing
Performance Support
AKSS Menu
Policy Documents
FAR, DFARS, & Others
Community Areas (CoPs)
Reader's Choice
Glossaries & Acronyms
Education & Training
Software Tools
Events
Def. Acq. Policy Center
DAU Video Library
Rapid Deployment Trng
AT&L Web Sites
News & Publications
Ask a Professor
Forms
Guidebooks & Handbooks
Ethics
Order your 2006 CD now!
NOW SHIPPING
AKSS Today!
What's new in DoD acquisition.
Take the AKSS Virtual Tour
Defense Acquisition Guidebook including DoDD 5000.1 and DoDI 5000.2 New!
Integrated Framework Chart New!
Get it Here • Get it Here
Special News policies for Emergency Procurement Authority for Hurricane Katrina Relief Efforts – Select here to View
AT&L Knowledge Sharing Update
Army Materiel Command organizations win DOD Value Engineering Awards:
Under Secretary of Defense for Acquisition, Technology and Logistics Kenneth Krieg, presented the annual Department of Defense Value Engineering Achievement Awards during a ceremony last Thursday at the Pentagon.
(More...)
Making EVM matter:
Earned value management has been around for decades but is now becoming an essential part of how agencies manage projects.
(More...)
DFARS CHANGE NOTICE 20060616:
On June 16, 2006, the Office of the Director of Defense Procurement and Acquisition Policy published changes and proposed changes to the Defense Federal Acquisition Regulation Supplement (DFARS) and the DFARS companion resource, Procedures, Guidance, and Information (PGI). Additional information on these changes can be found at Defense Procurement and Acquisition Policy.
(More...)
Bellevue University First Accredited University to Partner with Federal Acquisition Institute; New Partnership also includes Defense Acquisition University:
Bellevue University has the distinction of being the first accredited university selected by the Federal Acquisition Institute (FAI) as an education partner. At the same time, Bellevue University was chosen to support the Department of Defense as it helps the rest of the federal government leverage innovative
Reader's Choice
CJCS Instruction 3170.01E
CJCS Manual 3170.01B
DoDD 5000.1
DoDI 5000.2
Defense Acquisition Guidebook
FMS Manual
DCMA Instruction/Guidebook
DCAA Manual
FAR
DFARS
DFARS PGI
Other FAR Supps
DoD 7000.14-R
EI Toolkit
Suggested Reading
Joint Logistics: Shaping our Future
Building an Army: Project Management in Afghanistan
Six Sigma for the DoD
Leading Teams: Ten Top Tips
Earned Value Management
Suggested Reading Previous Postings
New Policy Documents
CJCSI 6212.01D, Interoperability and Supportability of Information Technology and



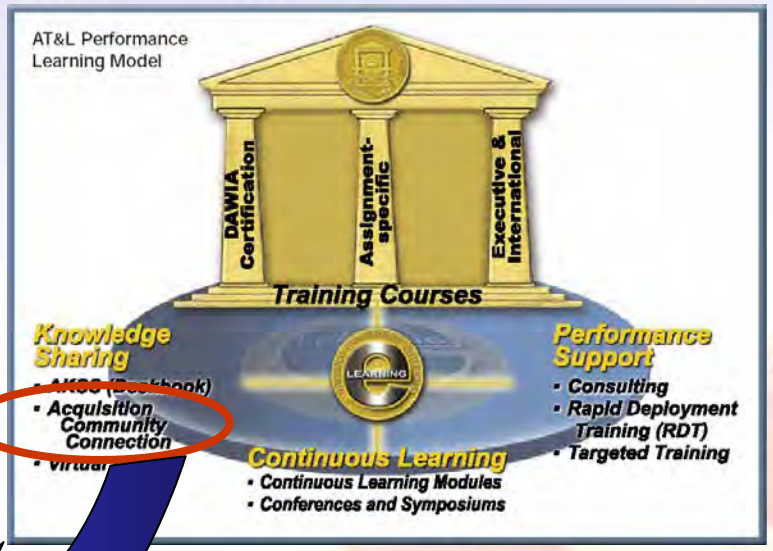
Two Key Hyperlinked AKSS Resources Available On-line

- Defense Acquisition Guidebook (DAG)
- AT&L Integrated Framework Chart (IFC)



Acquisition Community Connection (ACC)

- Twelve Communities of Practice + 25 Other Special Interest Areas
  - Mission Support Contracting
  - Contingency Contracting
  - Data Management
  - Earned Value
  - DoD Wireless
  - Facilities Engineering
  - Information Technology
  - Production, Quality & Manufacturing
  - Program Management
  - Risk Management
  - Systems Engineering
  - Logistics Management
- Expanded Logistics Management Community of Practice (Log CoP)
  - Policy & Guidance
  - Community Connection
  - Training Center
  - Resources & Tools
  - Performance Based Logistics (PBL)
  - Acquisition Logistics
  - Sustainment
  - Logistics Library
  - Logistics Transformation



https://acc.dau.mil

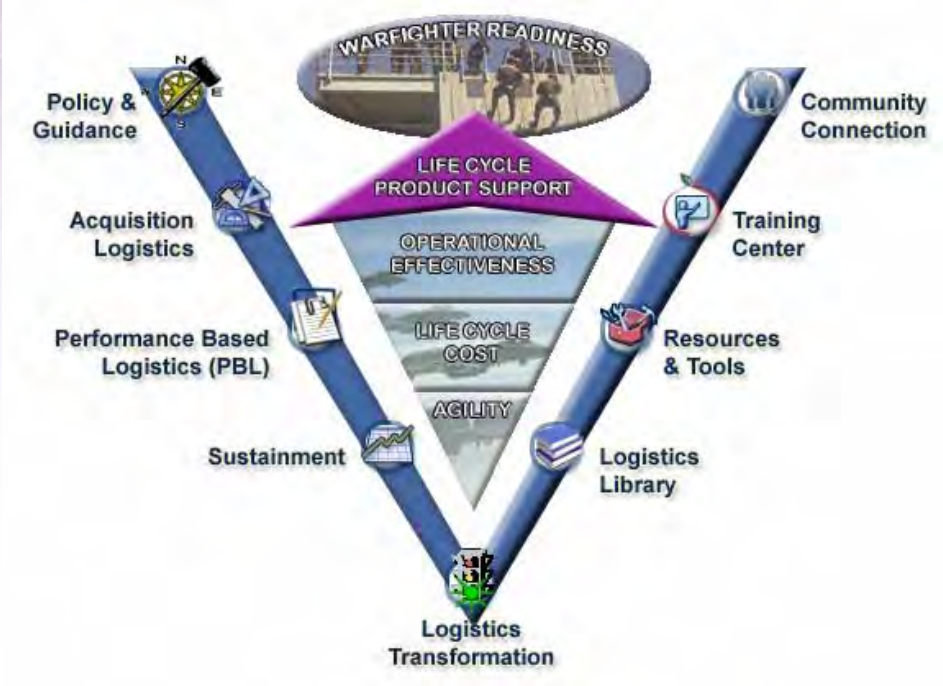
Logistics Management Community of Practice (Log CoP)

Where YOU can ….

Find Great Tools & Templates
- Access Latest PBL Resources
- Supportability Best Practices
- Logistics Lessons Learned
- Sustainment Issues and Initiatives

Get Ahead In YOUR Career
- Logistics Training & Education
- Latest OSD Policy and Direction
- Logistics Conferences/Events
- Link to Top DoD Web sites

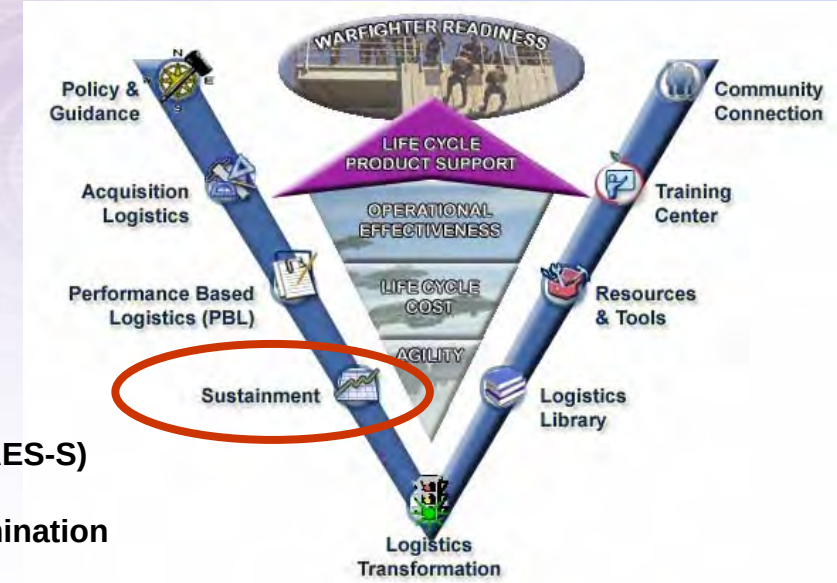
Connect With Professionals
- Share Experiences & Ideas
- Start and Join Discussions
- Locate DoD & Industry Experts



https://log.dau.mil

Sustainment Topics on the LOG CoP

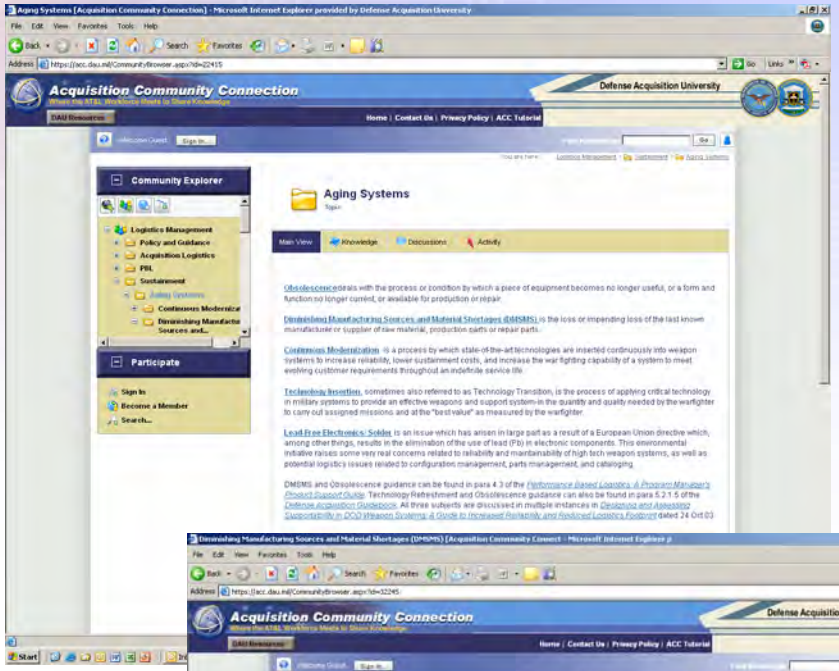
- Aging Systems
- Balanced Scorecard
- Cataloging
- Commodity Councils
- Condition Based Maintenance Plus (CBM+)
- Configuration Management (CM)
- Continuous Modernization
- Continuous Process Improvement (CPI)
- Contractors Accompanying the Force
- Corrosion Prevention & Control
- Defense Acquisition Executive Summary-Sustainment (DAES-S)
- Defense Logistics Management Standards
- (DLMS) Migration & Military Standard Systems (MILS) Elimination
- Demilitarization and Disposal
- Depot Level Maintenance
- Designing for Supportability in DoD Systems
- Diminishing Manufacturing Sources & Material Shortages (DMSMS)
- Distribution Process Owner (DPO)
- End-to-End Customer Support
- Independent Logistics Assessments (ILA)
- Interactive Electronic Technical Manuals (IETM)
- Interoperability
- Lead Free Electronics/RoHS
- Logistics Support Plans
- Maintenance
- Military Specifications, Standards & Related Publications
- Modifications, Upgrades, Service Life Extension Programs (SLEP)
- Munitions & Explosive Safety
- Munitions Maintenance & Sustainment
- National Inventory Management Strategy (NIMS)

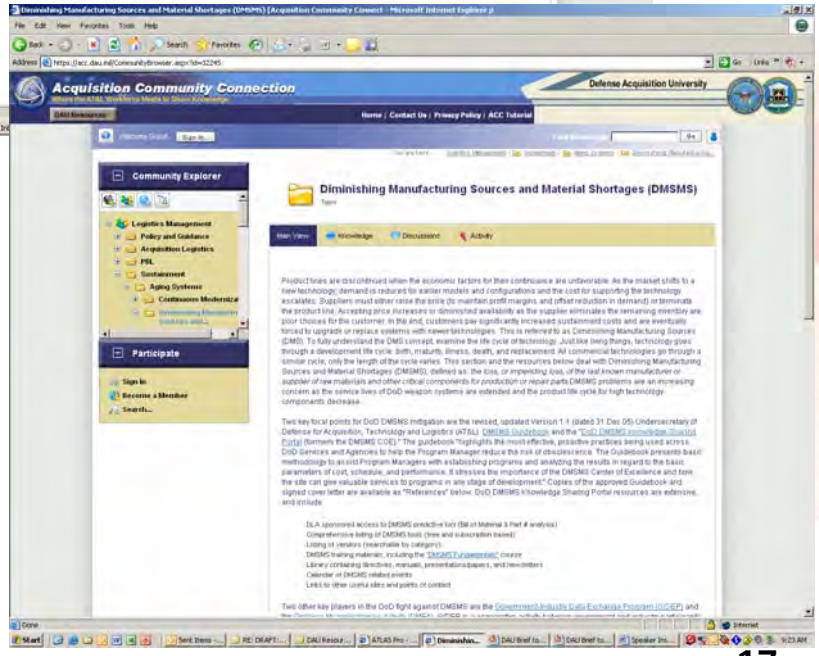


- Obsolescence
- Packaging, Handling, Storage & Transportation (PHS&T)
- Parts Management
- Post Production Support Planning (PPSP)
- Public Private Partnering (PPP)
- Radio Frequency Identification (RFID)
- Sense and Respond Logistics
- Standardization
- Strategic Sourcing
- Structural Integrity Programs (SIP)
- Supply Chain Management (SCM)
- Technology Insertion
- Unique Identification (UID) of Items
- Wide Area Workflow (WAWF)

DAU Logistics Community of Practice Aging Systems & DMSMS Sites

- **Subsections for**
  - **DMSMS**
  - **Obsolescence**
  - **Continuous Modernization**
  - **Technology Insertion**
  - **Lead Free Electronics**
- **Extensive Resources, including links to DMSMS DKSP, training, and information**
- **Aging Systems** https://acc.dau.mil/CommunityBrowser.aspx?id=22415
- **DMSMS** https://acc.dau.mil/CommunityBrowser.aspx?id=32245

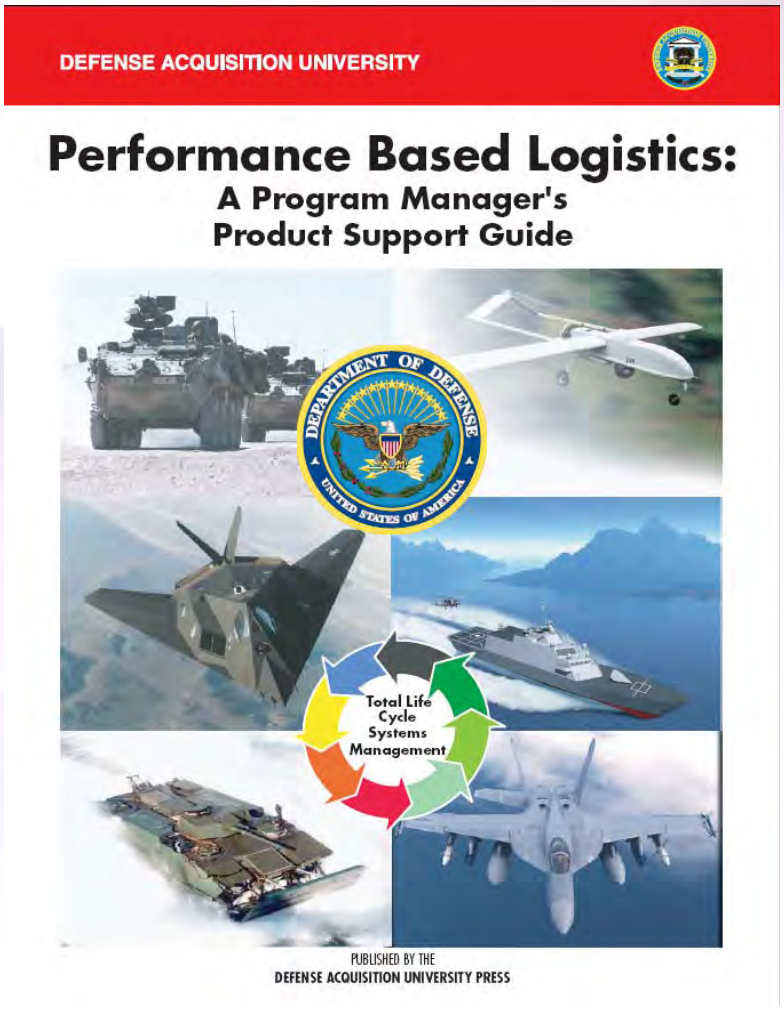


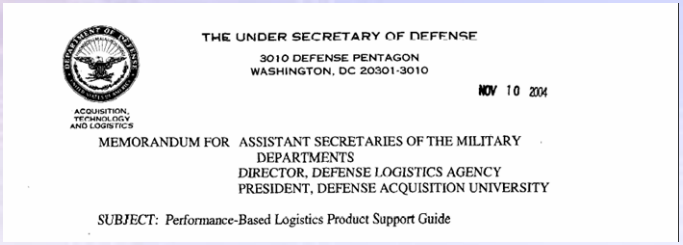


DAU LOG CoP: A Remarkable Success

- **Expanded Rapidly Since July 2003 Launch**
  - ***Over 600,000 hits in last three years!***
- **Most highly visited of 12 CoPs on ACC site**
  - ***Surpassed next most visited CoP (Systems Engineering) by more than 120,000***
- **Averaging over 1,600 hits per week**
- **LOG CoP often comes up in top three of Google search results**
- **Over 1,400 Knowledge Objects posted**
- **Aggressively Incorporating ACC/AKSS Resources into Courses**

Product Support Guide (aka "PBL Guide")





THE UNDER SECRETARY OF DEFENSE
3010 DEFENSE PENTAGON
WASHINGTON, DC 20301-3010

NOV 10 2004

ACQUISITION, TECHNOLOGY AND LOGISTICS

MEMORANDUM FOR ASSISTANT SECRETARIES OF THE MILITARY DEPARTMENTS
DIRECTOR, DEFENSE LOGISTICS AGENCY
PRESIDENT, DEFENSE ACQUISITION UNIVERSITY

SUBJECT: Performance-Based Logistics Product Support Guide

- **Nov 04 Version Supersedes 'Product Support: A Program Manager's Guide to Buying Performance' (Nov 2001)**
- **Describes 12-Step PBL Implementation Framework**
- **Captures 3 Years Progress Implementing PBL**
- **Updated Guidance Based on Service Lessons Learned**

Available Online at https://log.dau.mil

PBL Learning Resources



- **PBL Guide**
- **PBL Learning Module**
- **PBL Online Toolkit**
- **PBL Consulting**
- **PBL Courses**

Available Online at https://log.dau.mil

LOG 235B PBL Course

	MONDAY	*TUESDAY*	*WEDNESDAY*	*THURSDAY*	*FRIDAY*
AM	**Introduction** **PBL Concepts Exercise**	**PBL Supply Opportunities** • **Navy F/A-18 Part I**	**Performance Measurement & Assessment** • **Navy F/A-18 Part III**	**New System Level PBL Strategies** • **Joint Strike Fighter**	**DAU Resources** **PBL Critical Thinking Exercise**
PM	**Legacy System Support Strategies** • **Air Force C-21A Aircraft**	**PBL Workload Allocation** • **Navy F/A-18 Part II**	**Business Case Analysis** •**Army M109**	**PBL Industry Guest Speaker** **New System Level PBL Strategies (Continued)** • **Joint Strike Fighter**	

Comprehensive Guidance on Designing in Supportability



Designing and Assessing Supportability in DOD Weapon Systems:
A Guide to Increased Reliability and Reduced Logistics Footprint

Prepared by the
Office of Secretary of Defense

October 24, 2003

http://www.acq.osd.mil/log/logistics_materiel_readiness/organizations/lpp/html/new_lro.html

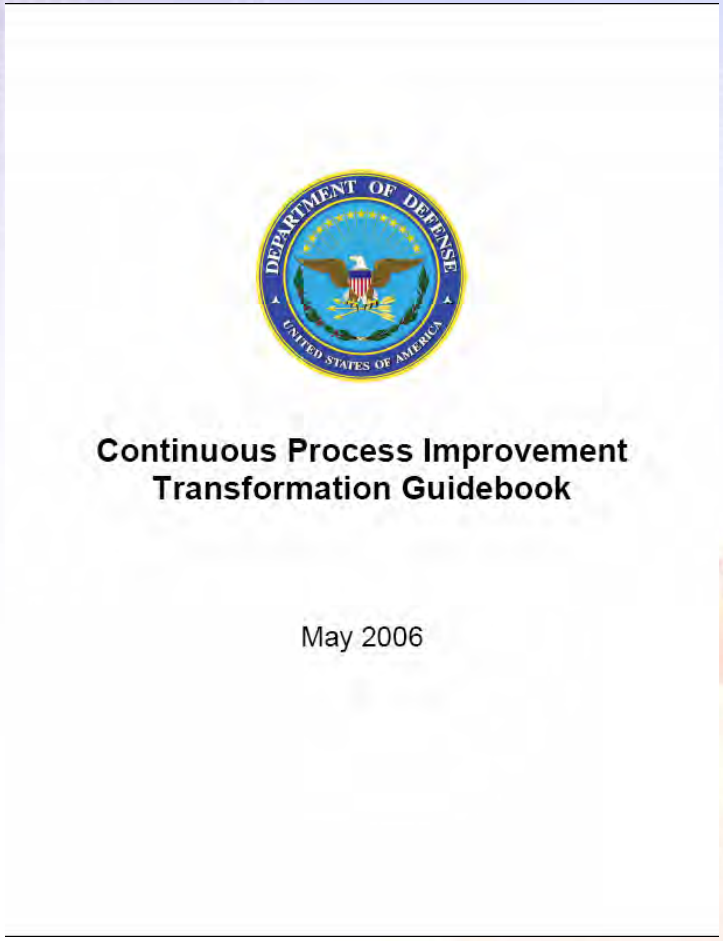
USD/ATL Memo of 24 Oct 03

- PM to guidance to effectively implement TLCSM and PBL
- Incorporates System Design for Operational Effectiveness (SDOE) criteria into the systems engineering process to:
  - ***Increase Reliability***
  - ***Reduce Logistics Footprint***
- Evaluation Criteria for all Milestones
- Establishes IOC and Post IOC Reviews
- Provides template for defining and assessing program life cycle supportability requirements

Supportability Planning is no longer deferred!

DoD Continuous Process Improvement Transformation Guidebook (May 06)

- Applies to all DoD levels & functions
- Outlines DoD CPI framework
- Describes CPI Concepts and DoD Approach
- Explains DoD CPI roles and responsibilities
- Provides tools & resources to support successful CPI implementation
- Available on DAU LOG CoP CPI Site https://acc.dau.mil/CommunityBrowser.aspx?id=22426



DMSMS Guidebook (31 Dec 05)

- Combines best proactive practices for managing the risk of obsolescence from various DoD DMSMS documents into a central repository for quick reference

- Supports principles of TLCSM and PBL

- Lays groundwork for building a proactive organizational DMS program.

- Delineates OSD policy regarding organizations developing a qualified DMSMS management program

- Provides suggestions for measuring effectiveness of a particular DMS program

- Available on DAU LOG CoP DMSMS Site



Continuous Learning

Continuous Learning Modules

- Currently 125+ Modules; 1-3 Hour Duration
- Numerous Logistics Topics

Conferences & Symposiums

- Intl Society of Logistics (SOLE)
- Mid-Atlantic Logistics (MAL)
- RMS Partnership
- DoD Mx Conference
- NDIA Logistics Conference
- USAF Logistics Officer Association
- AIA Product Support Conferences
- FAA Logistics Conference
- and many others…



https://clc.dau.mil

Real-Time Continuous Learning Resources

Logistics Continuous Learning (CL) Modules

Module	Title
CLL002	DLA Support To The PM
CLL006	Depot Maintenance Partnering
CLL008	Designing for Supportability in DoD Systems
CLL009	Force-Centric Logistics Enterprise
CLL010	Assessments of Technology Readiness Levels
CLL011	Performance Based Logistics (PBL)
CLL014	Single Integrated Support Strategy for Joint Systems
CLL015	Business Case Analysis (BCA)

Logistics Continuous Learning (CL) Modules (Continued)

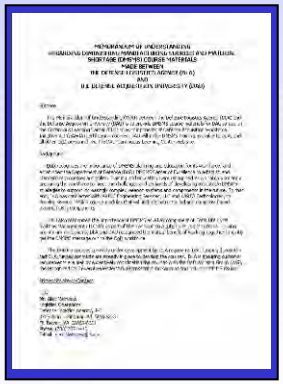
Module	Title
CLL 201	DMSMS Fundamentals
CLL 202	DMSMS for Executives
CLL 203	DMSMS Essentials for DLA Personnel
CLL 204	DMSMS Case Studies
CLL 205	DMSMS for the Technical Professional (In Work)
CLL TBA	Independent Logistics Assessments (ILA) (In Work)
CLE 004	Introduction to Lean Enterprise Concepts
CLE 007	Lean-Six Sigma
CLE 008	Six Sigma: Concepts and Processes
CLE 015	Continuous Process Improvement (CPI) Familiarization

DMSMS Fundamentals
Continuous Learning Module (CLM)

- **A three hour computer-based CL module (one of four) at https://learn.dau.mil/html/clc/Clc.jsp**
- **Working level DMSMS overview in six lessons:**
  - **DMSMS Overview**
  - **Combating DMSMS Problem**
  - **Reporting, Measuring, & Predicting**
  - **Guidance and Reference Sources**
  - **DMSMS Tools for the Program Manager**
  - **Successful DMSMS Management Models**
- **Provides:**
  - **Basic knowledge of DMSMS history, issues, tools,**
  - **Current initiatives and standardization of policy and procedure within the DMSMS community**
  - **Examples of proactive DMSMS programs**
  - **DMSMS Knowledge Sharing Portal (DKSP) Resources**

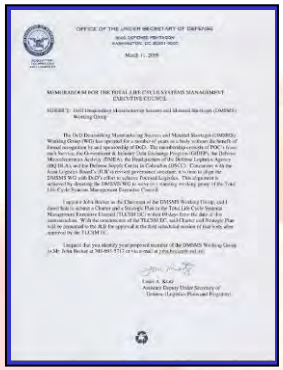
DAU Support of DoD DMSMS Mitigation Effort





- DLA-DAU MOU Signed Oct 04
- Provides for Collaboration on DMSMS Training
- Provides for a wide range of related collaborative efforts
- Incorporation of DMSMS Information into DAU courses





- DMSMS Working Group Guidance
- ADUSD LPP 11 Mar 05 Letter
- Facilitates DAU support of DoD DMSMS Working Group
- Focus on Training & Education
- Supports Life Cycle Logistics and DMSMS Communities

Opportunities for On-line DMSMS Training Development…and Much More

Getting the Word out to a Wider Audience

- **DAU-DLA DMSMS article in May-Jun 05 edition of Defense AT&L Magazine entitled "*Mitigating Diminishing Manufacturing Sources and Material Shortages*"**
- **Can be viewed electronically at www.dau.mil**
- ***Defense AT&L* magazine is a vehicle for transmitting information on policies, trends, events, and current thinking affecting program management and defense acquisition, technology, and logistics**
- **For free subscription to this bi-monthly magazine, download mailer at www.dau.mil/pubs/damtoc.asp**





ACQUISITION EXCELLENCE

Mitigating Diminishing Manufacturing Sources and Material Shortages

Bill Kobren ■ Alex Melnikow ■ David G. Robinson

According to DoD 4140.1-R, diminishing manufacturing sources and material shortages (DMSMS) are "the loss or impending loss of manufacturers of items or suppliers of items or raw materials which may cause material shortages that endanger a weapon system's or equipment's development, production, or post-production support capability." DoD Directive 5000.1 makes the program manager accountable for total life cycle systems management: "The PM shall be the single point of accountability for accomplishing program objectives for total life cycle systems management, including sustainment."

While DMSMS are a fact of life, the key to effective mitigation is long-term, proactive planning by the program manager.

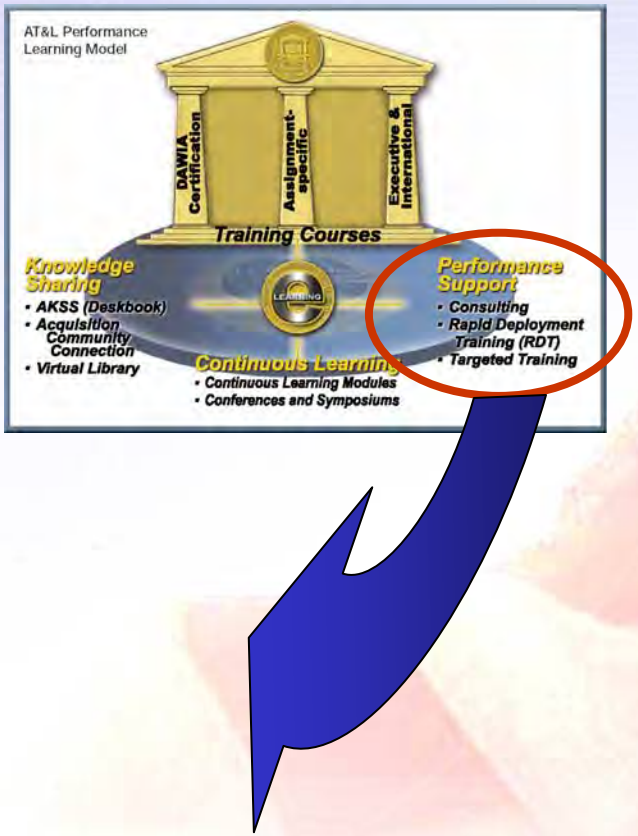
The Challenge for the PM

According to the Office of the Secretary of Defense publication *Performance Based Logistics: A Program Manager's Product Support Guide*, "material obsolescence may occur at the part, module, component, equipment, or other system indenture level. DMSMS obsolescence can occur in any program phase and can severely impact the program schedule, system availability, capability or cost. The PM must insure that performance based logistics product support efforts include an active DMSMS

Kobren is director of the Defense Acquisition University's sustainment program. Melnikow is DMSMS program manager, Headquarters Defense Logistics Agency. Robinson is the Defense Supply Center, Columbus, DMSMS Center of Excellence program manager.

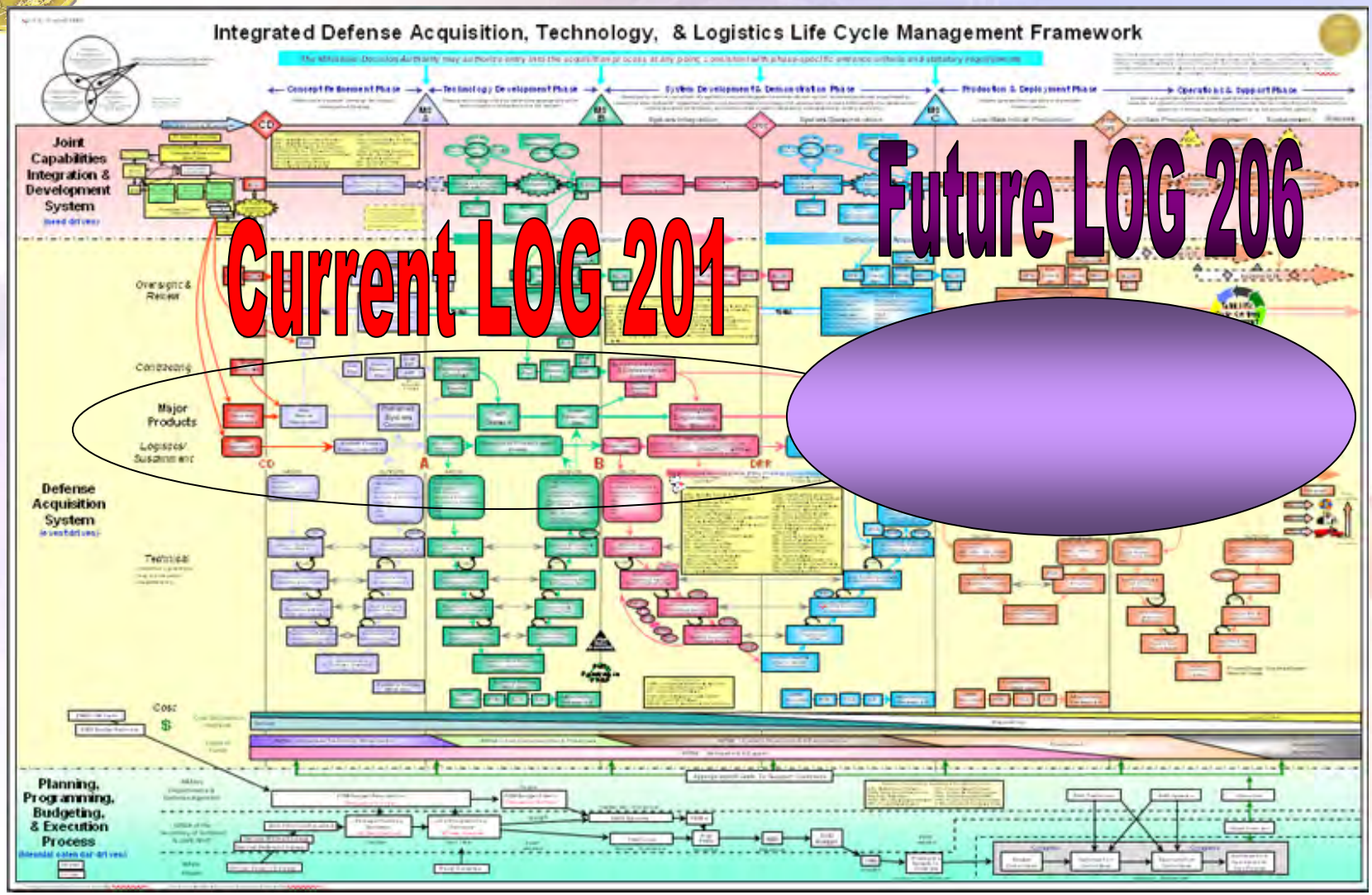
Performance Support

- **Consulting**
  - PBL support to DoD Services, Agencies & Program Offices
  - "Ask A Professor" Queries
  - PBL Tiger Teams
- **Rapid Deployment Training**
  - PBL Roadshows
    - OSD-directed Rapid Deployment Training
    - PMs, PMOs, Industry, DSCR, SOLE, and numerous other organizations
    - Over 3,000 personnel trained
  - PBL Workshops
    - OSD Directed - DAU Facilitated
    - 1-2 day joint PM-Contractor Team
    - Pre-planned agenda



Targeted Rapid Deployment Training

Integrated Level II Strategy

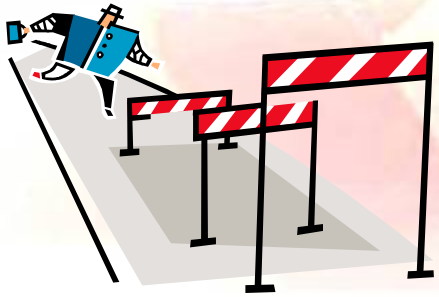


Future LOG 206 Intermediate Systems Sustainment Mgt Course Topics

- Life Cycle Logistician & the PM
- Role of the Logistician in Weapons Systems Sustainment
- 19 Elements of sustainment from DoD 5000.2 Chapter 3 Sustainment
- Log Transformation Initiatives
- Obsolescence, DMSMS, Continuous Modernization, & Tech Insertion
- Product Support & Fleet Management
- Enterprise Integration/ ERP/Logistics Systems/Maintenance Data Collection
- Maintenance, Depots, and PPP
- Packaging
- Operational & Joint Theater Logistics
- Prepositioning, retrograde, in-theater distribution/tactical distribution
- Contractors Accompanying the Force
- Continuous Process Improvement (CPI), Lean, and Six Sigma
- Configuration & Data Management
- RFID & UID
- Commodity Councils/ Strategic Sourcing
- Leveraging PBL to Sustain Systems
- Sustaining Engineering
- Design for Supportability/ Systems Engineering, SDOE
- Systems Safety
- Distribution and TRANSCOM DPO
- Defense Standardization Program (DSP)
- Budgeting, Funding & Contracting Strategies for sustainment
- Independent Logistics Assessments (ILA)
- Managing Major Modification programs
- CSIs, RODs and, PQDRs
- CBM+ and PHM
- Software Support/Management
- Parts Management Reengineering
- FRP decision made – now what?
- Pre-IOC sustainment activities
- Retirement & Disposal

How you can help

- Specific ideas for a future LOG 206 course?
- How can we make the LOG CoP more useful, relevant, and current for you?
- What types of materials would you like to see added?
- Are there other resources you would find helpful?

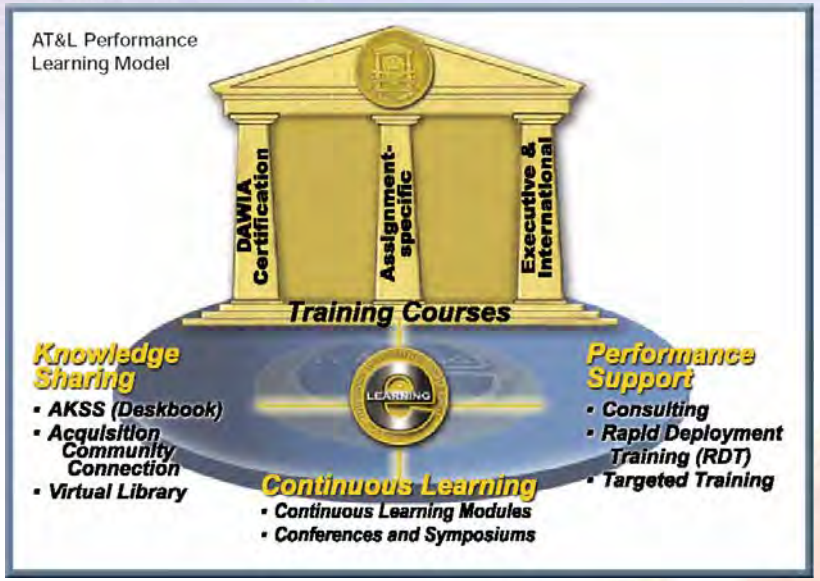


DAU CDSC Logistics Points of Contact

- **Logistics & Sustainment Center Director**
  Randy Fowler randy.fowler@dau.mil
- **Sustainment Program Director**
  Bill Kobren bill.kobren@dau.mil
- **PBL Program Director**
  Jerry Cothran jerry.cothran@dau.mil
- **Acquisition Logistics Program Director**
  Currently Vacant

Summary

- **Extensive and continuously updated resources for the Life Cycle Logistician**
- **Extensive on-line resources available**
- **Engaged in DoD DMSMS Working Group and DMSMS Mitigation Effort**
- **Full range of targeted learning resources -- not just classroom training anymore!**



Numerous opportunities for both AT&L and non-AT&L workforce to leverage DAU learning resources

BACKUP SLIDES





Solving DMSMS
An Industry Perspective



11 July 2006

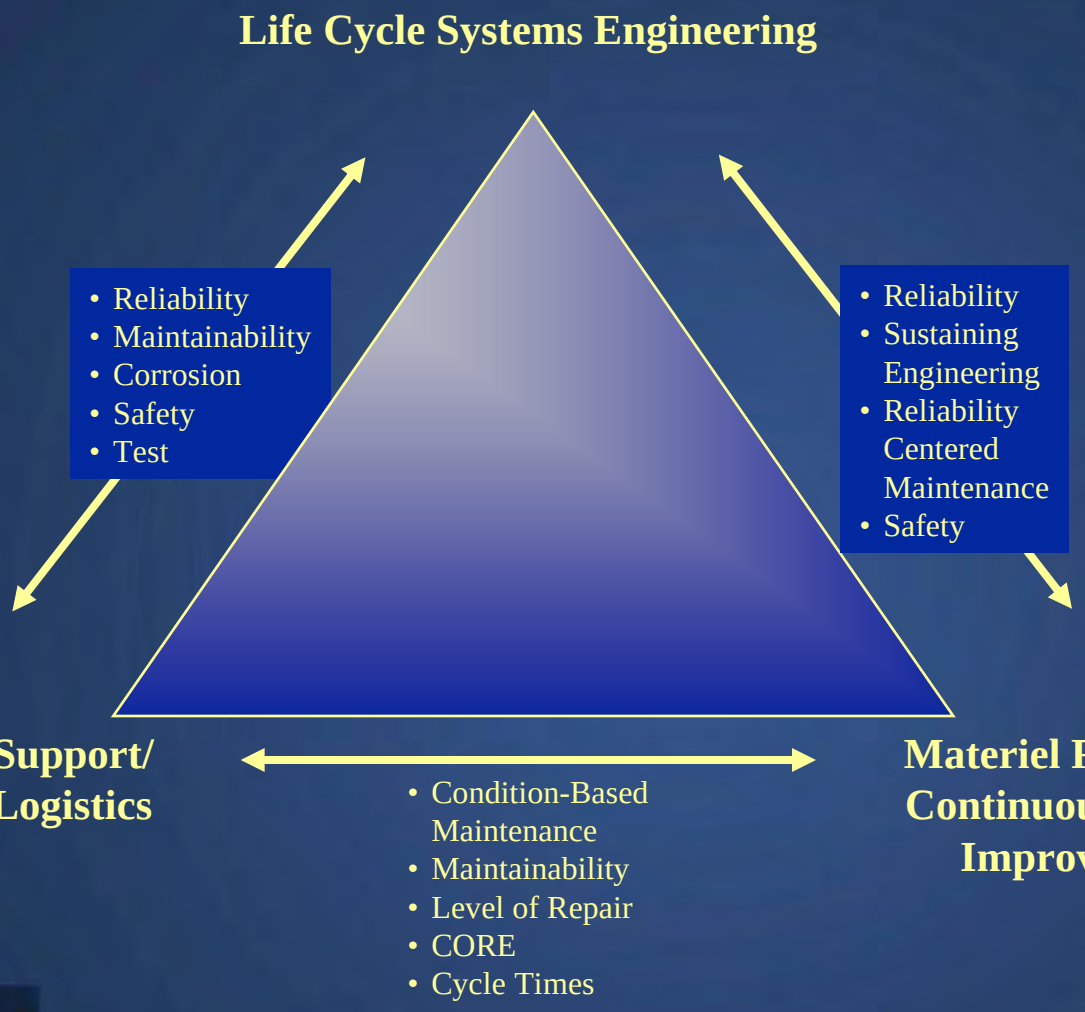
Scope of the Problem*

- **Obsolete Number of Part Numbers Reported**
  - 2005: Nearly 50,000
  - Increase of approx 15K from 2004 and 25K from 2003
  - Culmination of 325,000 parts numbers since 1997
- **Potential Financial Impact: up to $10B per year**
- **Average Microcircuit Life Span is about 10 years**
  - Some components are as little as 18 months
  - Versus weapon system life cycle greater than 30 years
- **Sporadic information flow between Government and Industry**
  - Disaggregated governance

"Effective, Proactive DMSMS Mgt Process is critical to … ready systems … in line with TLCSM and PBL tenets" **DMSMS Guidebook**

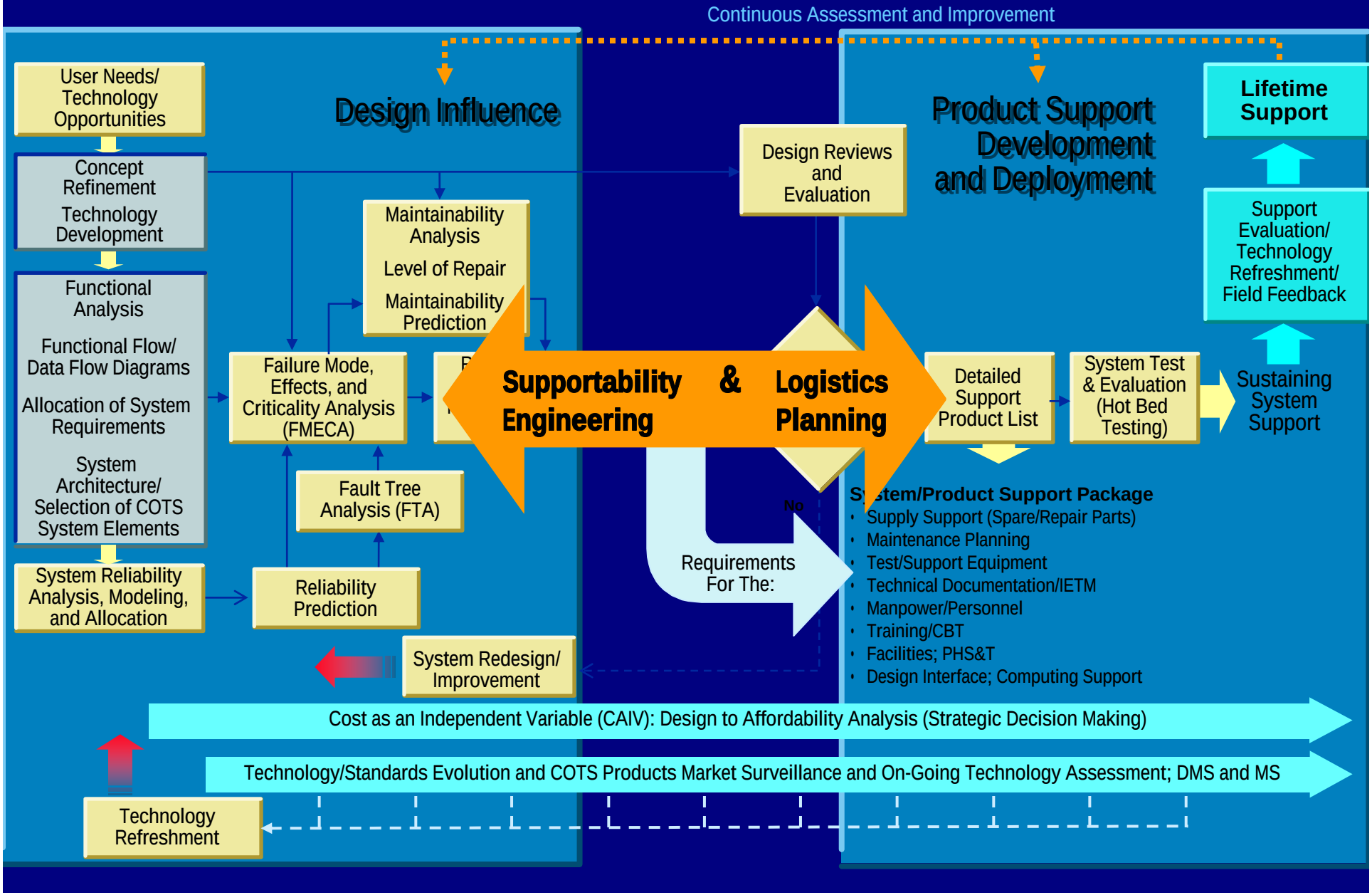
* Source: DoD

The Life Cycle Triangle



Managing Performance Across the Life Cycle

SDOE Life Cycle Framework, linked to the Systems Engineering Process



Performance Based Logistics









Delivering Capabilities NOW!

Acoustic Rapid COTS Insertion (ARCI)

Autonomic Logistics Model



System Parameters Monitored and Logged



Preplanned / On-Demand System Information Transfer (ROHMS)



LOCKHEED MARTIN



SILC™

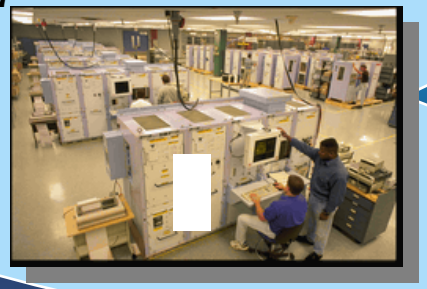
Feedback

Influence System Level Parameter Monitoring

Response Processes Initiated

- Supply Requisition Generated
- Maintenance Action Identified
- Support Team Action Issued
- Feedback to Operator
- Feedback to Design

LCI



Sense

Intelligent Agents and Response Process Triggers



Respond

Optimum and Timely Pier Side Support

Automating System Information Gathering, Transfer, Response and Feedback

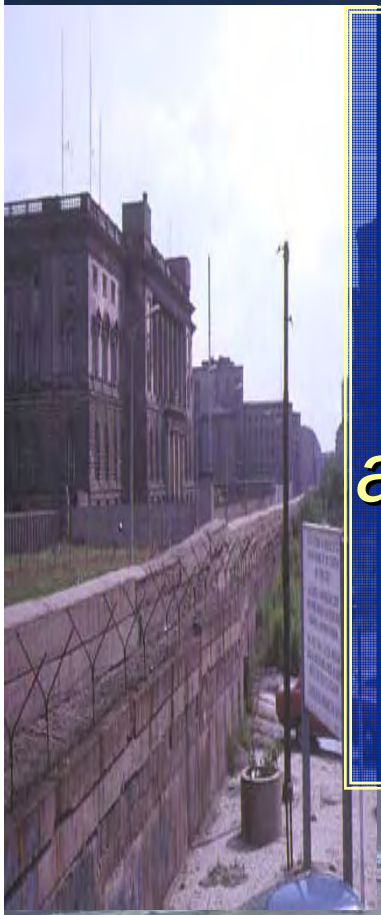
We Need Your Help



- **Industry**
  - Proactively manage DMSMS
  - Take responsibility for your platforms
  - Employ GIDEP
- **Government/Industry**
  - Develop joint solutions
  - Build on consortium solutions
- **Government**
  - Demand performance
  - Build contractual relationships that foster outcomes

Cultural Barriers

Cultural Barriers is a politically correct disease, invented by consultants to justify high fees and adopted by some in DoD as an excuse for a lack of leadership and courage!











Department of the Navy Perspective on Obsolescence Management

Nick Kunesh
Deputy Assistant Secretary of the Navy
(Logistics)

2006 DMSMS Conference

Outline

I The Case for Managing Diminishing Manufacturing Sources and Material Shortages (DMSMS)

II DoN Status - Past/Present/Future

III Microelectronics Market

IV Technology Considerations

V Performance Based Logistics (PBL) and DMSMS

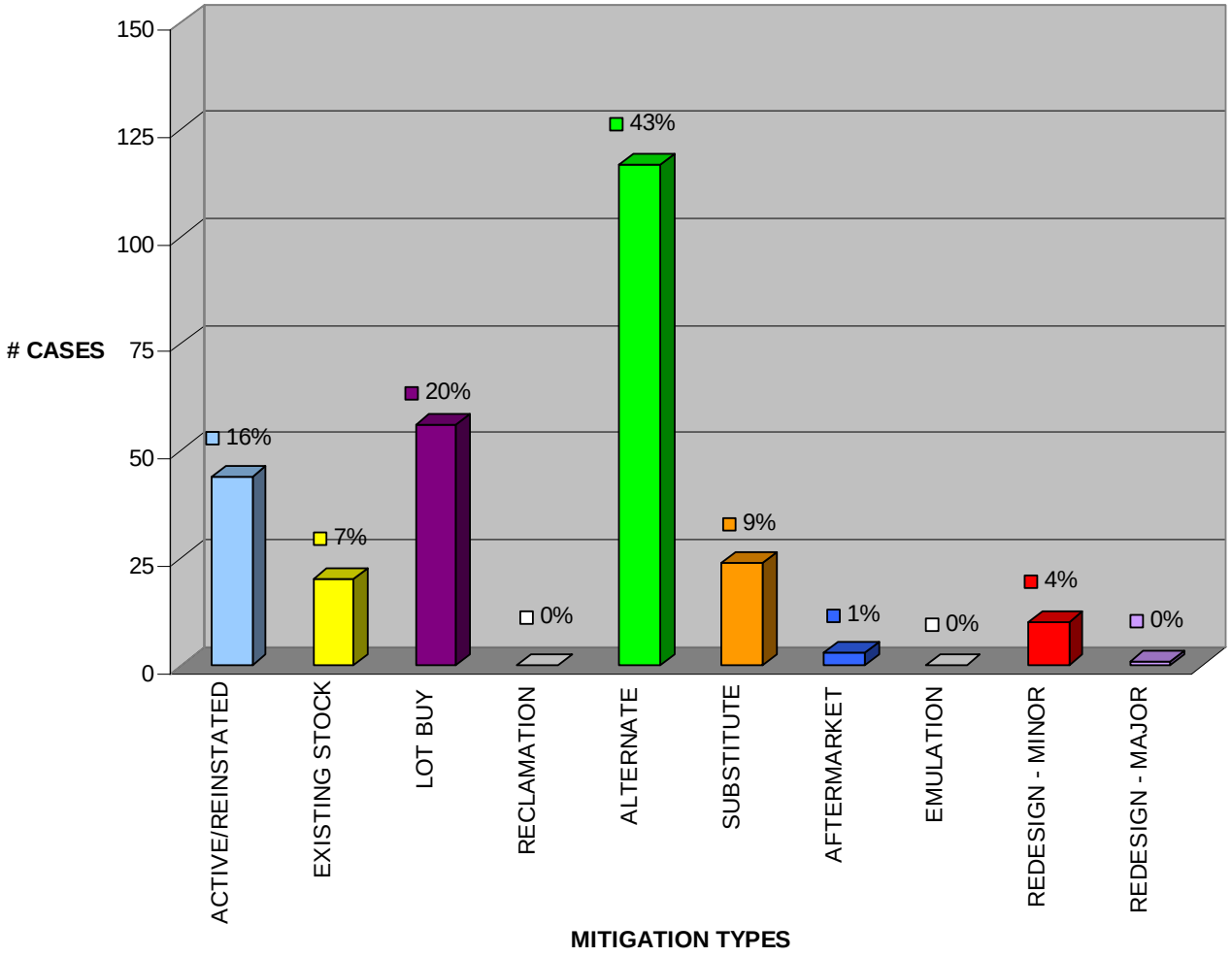
The Case for Managing DMSMS
A Government Perspective

The Case for Managing DMSMS

- Why manage DMSMS proactively?
  - Significant costs to redesign, test, qualify, certify and integrate replacement sub systems and components
  - Schedule volatility prior to introduction to the fleet
  - For deployed product, associated readiness degradation
- DOD cost estimates for DMSMS impacts on deployed systems range upward of $15 Billion
  - DoN share is significant
- A January 06 review of DoN programs showed a healthy Return on Investment for managing DMSMS

The Case for Managing DMSMS

AAIPT DMSMS TEAM COST AVOIDANCE $42,128,799 (DMEA Estimates)
275 Recommendations Made to 13 Platforms since 1/25/05



The Case for Managing DMSMS

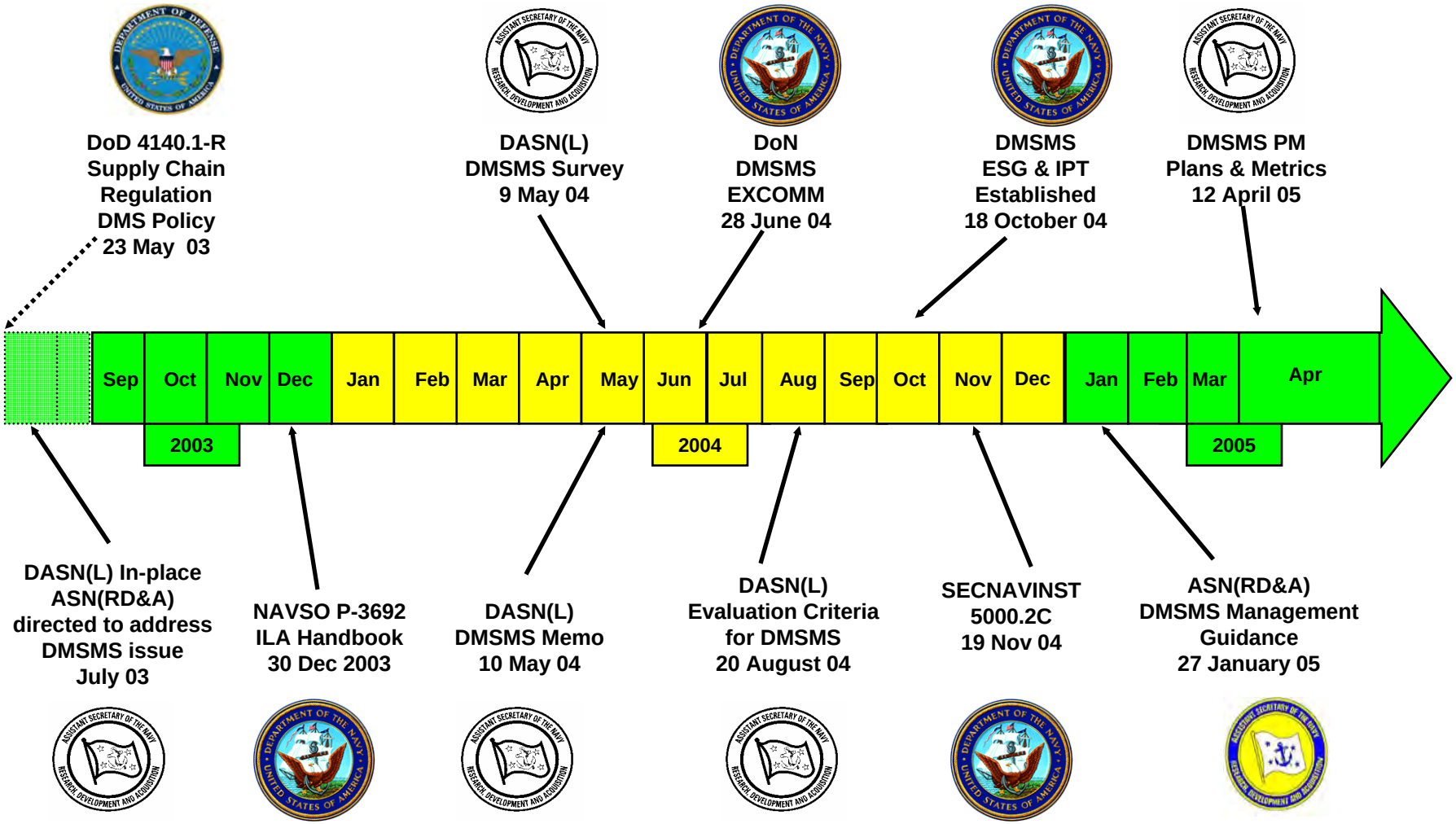
DoN case management data from SSB, Horizon, and OMIS

	Customers	# of Platforms	# of Systems	# COTS LRUs	# Custom LRUs	Est. Cost Avoidance
Jun 06	• 18 NAVSEA • 4 SPAWAR • 16 NAVAIR • 3 USMC • NAVICP-Phil • I Coast Gaurd; 1 Army; 1 AF • 6 Private Party (EDO; Raytheon; Boeing, Northrop Grumman)	**52**	**429**	**6,637**	**8,718**	**$135.4 M**

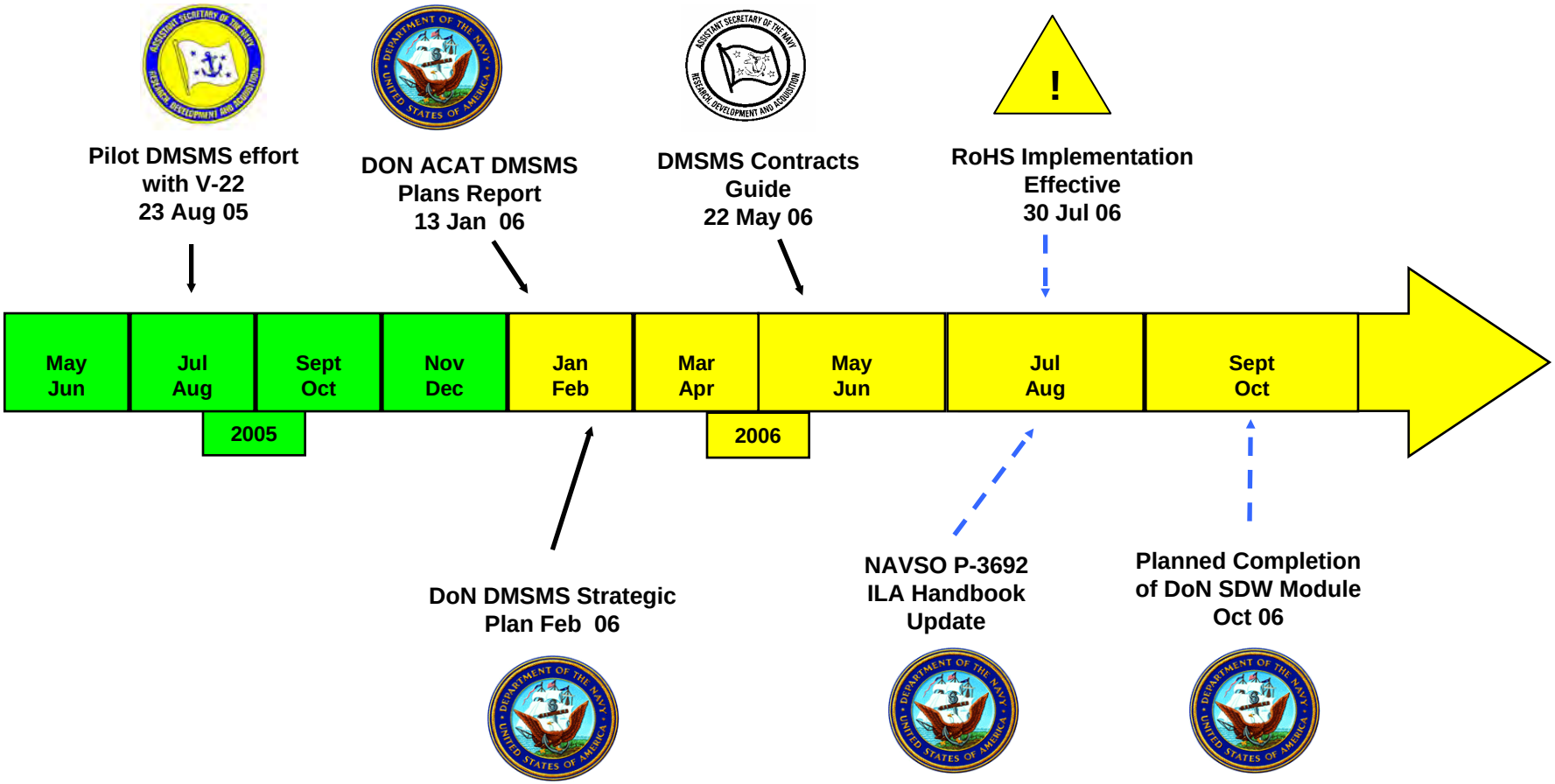
	Customers:	# of Platforms	# of Systems	# COTS LRUs	# Custom LRUs	Est. Cost Avoidance
Jan 05	• 15 NAVSEA • 1 SPAWAR • 8 NAVAIR • 2 USMC • 1 NAVICP-Phil • Private Party: EDO.	**41**	**265**	**5,038**	**5,627**	**$94.2 M**

II. DoN Status – Past/Present/Future

Past


DoD 4140.1-R
Supply Chain
Regulation
DMS Policy
23 May 03
DASN(L)
DMSMS Survey
9 May 04
DoN
DMSMS
EXCOMM
28 June 04
DMSMS
ESG & IPT
Established
18 October 04
DMSMS PM
Plans & Metrics
12 April 05
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
2003
2004
2005
DASN(L) In-place
ASN(RD&A)
directed to address
DMSMS issue
July 03
NAVSO P-3692
ILA Handbook
30 Dec 2003
DASN(L)
DMSMS Memo
10 May 04
DASN(L)
Evaluation Criteria
for DMSMS
20 August 04
SECNAVINST
5000.2C
19 Nov 04
ASN(RD&A)
DMSMS Management
Guidance
27 January 05

Present/Future



Documents available at
http://www.acquisition.navy.mil/

Present/Future

DoN DMSMS Contracts Guidance

- Applicable to PBL and Traditional Contracts
- Provides considerations for:
  - DMSMS Management;
  - Parts Management;
  - Configuration Control;
  - Supplier/Subcontractor Management;
  - Bills of Material (BOM);
  - DMSMS Forecasting and Notification;
  - Open Systems Architecture for Software; and
  - Incentives & Exit Clauses.

Draft ILA Handbook (NAVSO P-3692)

- Incorporates and updates DMSMS criteria from the 20 Aug 04 DMSMS supplement
- Incorporates information from the published ASN(RDA)/ DASN(LOG) DMSMS memos and guidance documents
- Emphasis placed on implementation (# BOM loaded, metrics collection, management practices, etc.)

III. Microelectronics Market

Problem & Challenge

Problem

Microelectronics are increasingly manufactured off-shore, and most OEMs don't know the pedigree or location of manufacture of their microelectronics

Challenge

Do you know where the microelectronics in your systems are manufactured?

Do you understand the risks associated with not knowing?

Do you know how to mitigate the risks?

Process

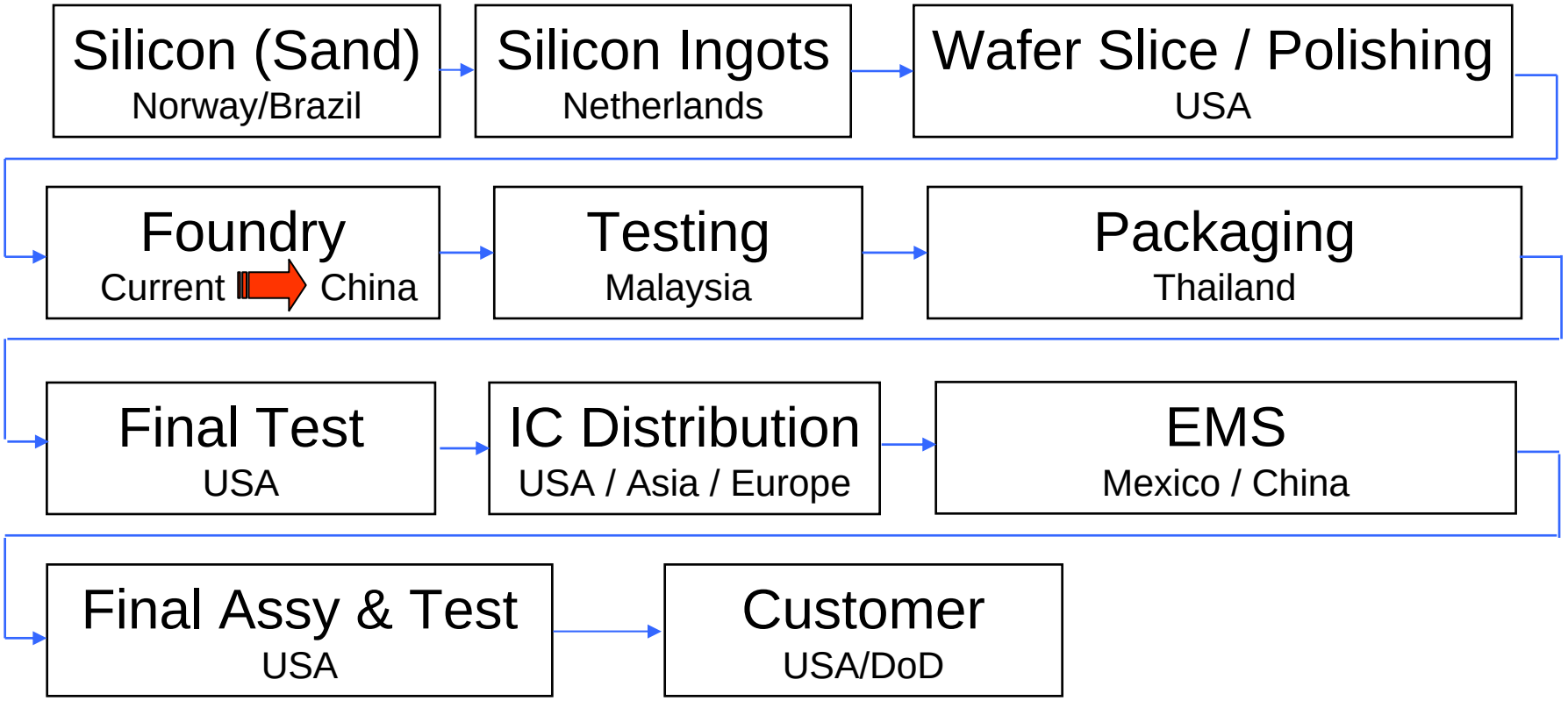
Sand to Silicone – Eleven Steps

1. **Obtain Silicone (Sand)**
2. **Silicon Crystal** (Ingot) 99.99999% Pure Si
3. **Polished Wafer** – Mirror-like surface, credit card thin 100 – 300 MM diameter
4. **Dielectric Deposition** (SiO_2) – a non-conductive layer
5. **Photo Lithography** – Photo resist builds up a pattern of hardened material
6. **Etching** – Strips away hardened patterns to leave a pattern of dielectric
7. **Doping** – Implants various conductive materials
8. **Metalization** – Deposits the final layers of metal (copper) that provide the network of interconnects
9. **Testing** – **Die Level** via wafer probes
10. **Packaging** – Wire bonding and lead frame attachment
11. **Testing** – **Package Level** – via In-circuit or other test methods

Process

Critical Manufacturing Flow (Example)

- Integrated Circuit (IC)

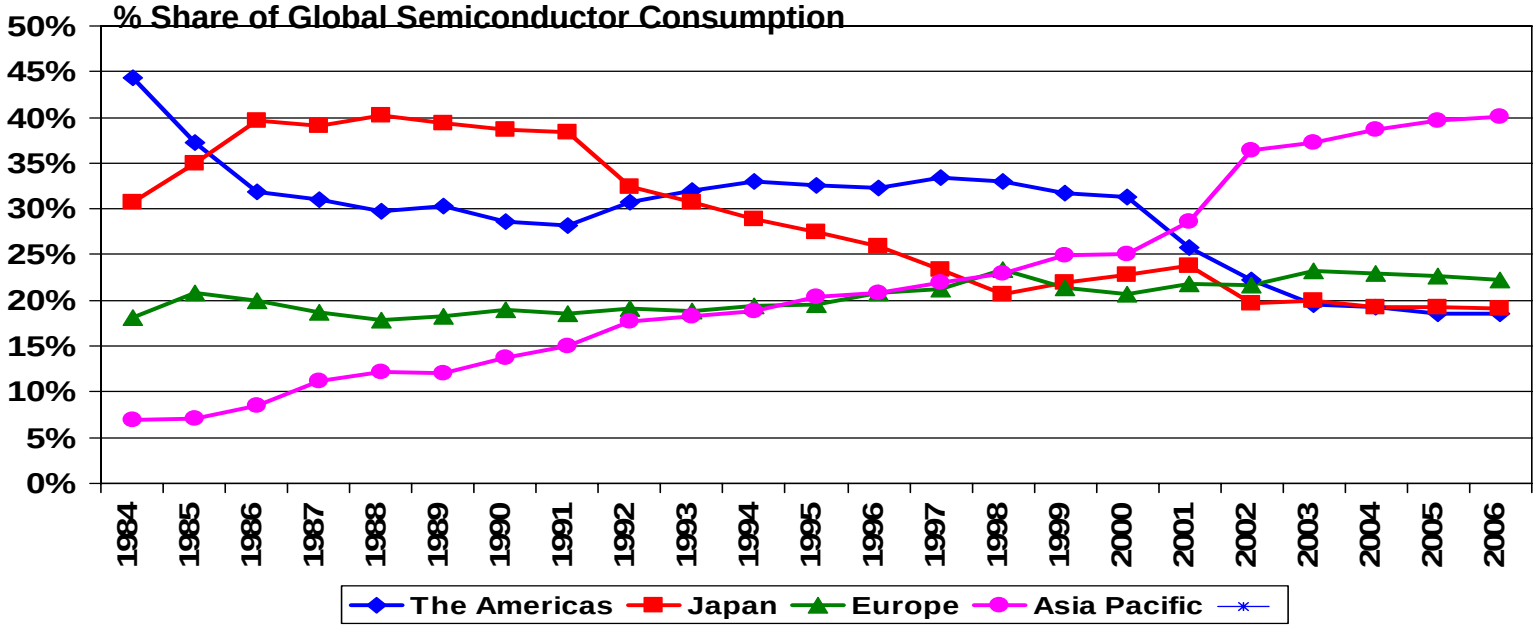


Source: ARROW/ZEUS Electronics

Semiconductor Market

Semiconductor Sales in Millions/$:

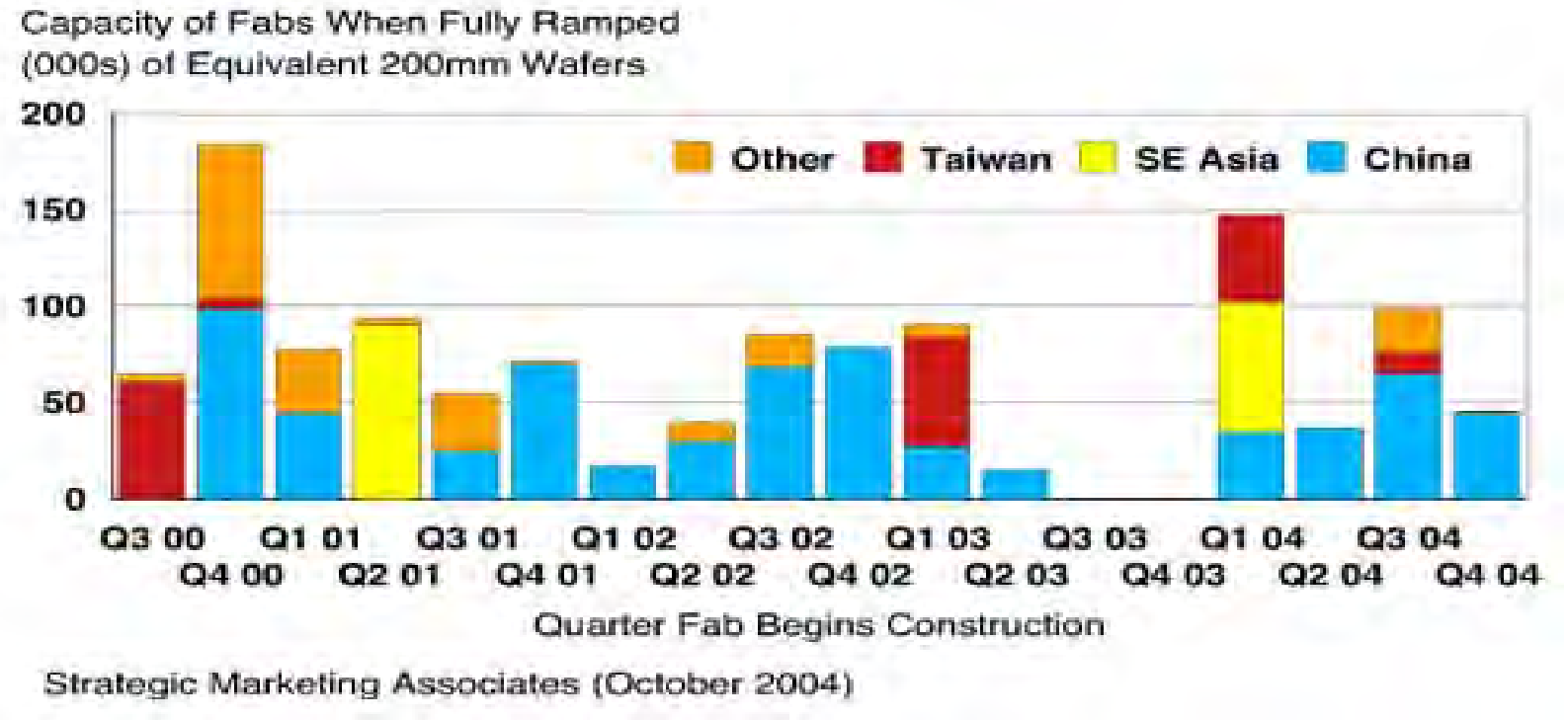
Year	1995	2005
• US	46,998 (33%)	40,736 (18%)
• EUR	28,199 (20%)	39,275 (17%)
• Japan	39,667 (27%)	44,082 (19%)
• ASIA/Pacific	29,540 (20%)	103,391 (46%)



Source: SIA

Foundry Locations

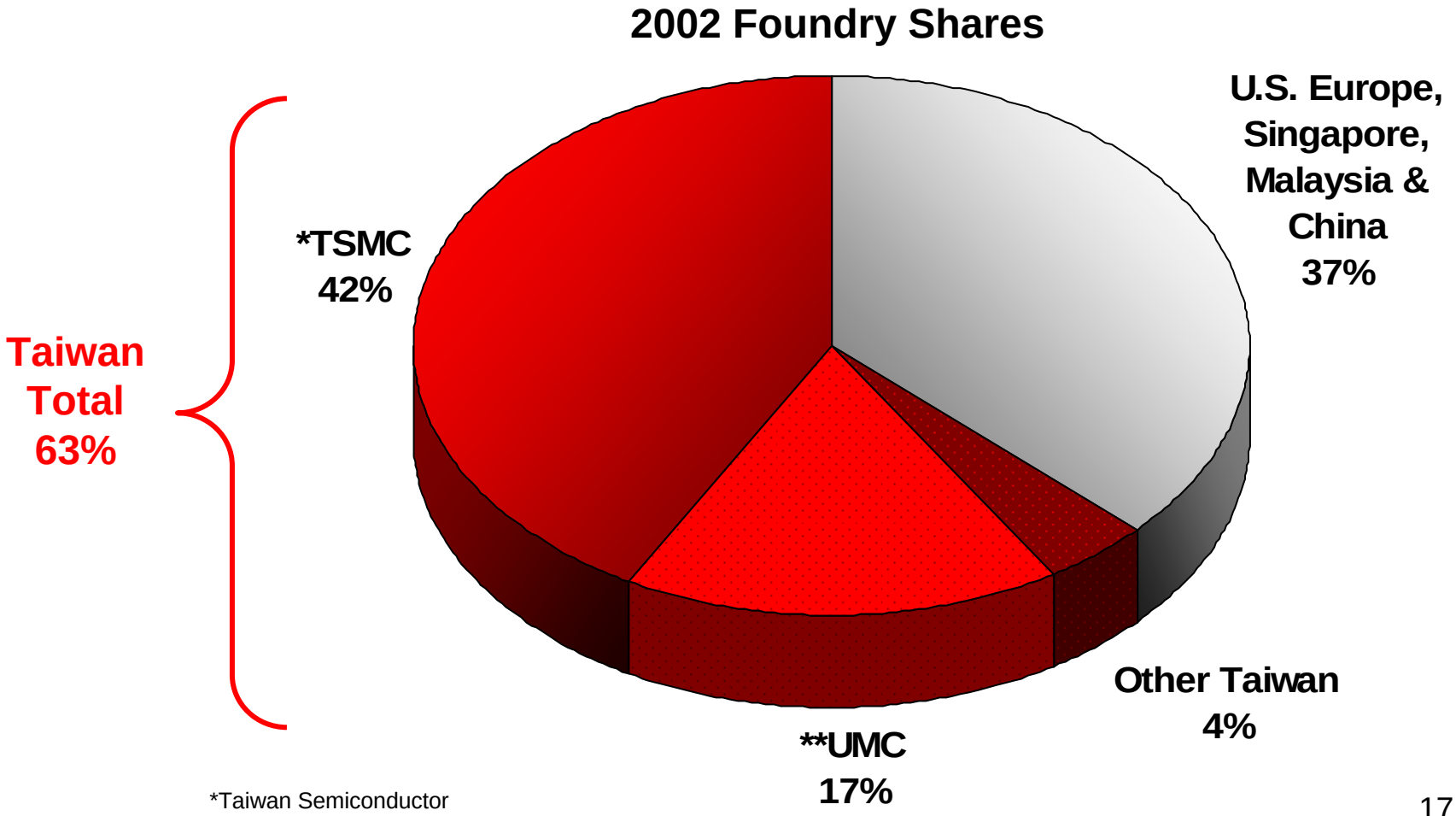
More Than One-Half of the Foundry Capacity That Has Started Construction Since 2000 is in China



Source: Strategic Marketing Associates (2004)

Foundry Locations

World-wide Foundry distribution:

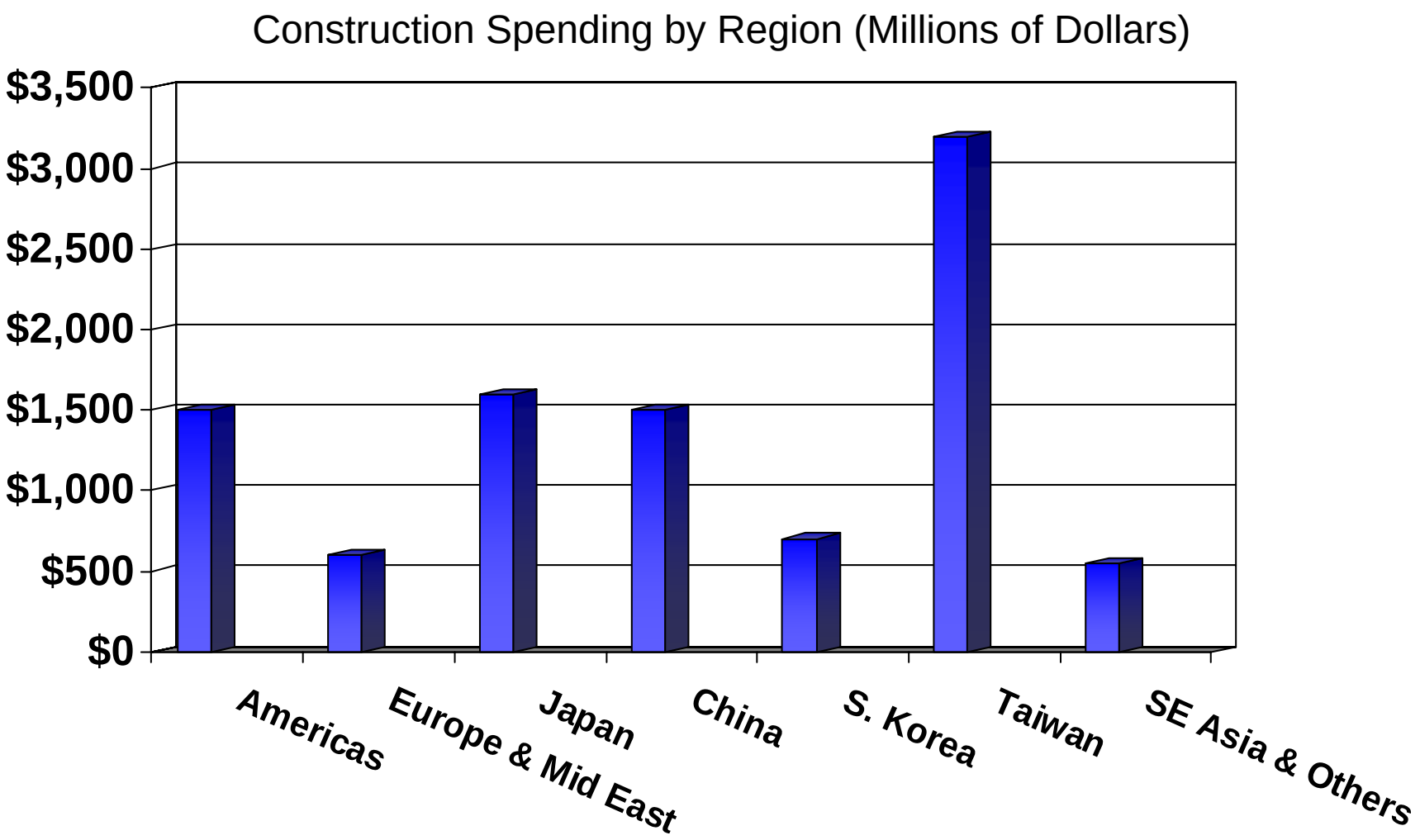


Source: iSuppli

*Taiwan Semiconductor Microelectronics Corp (TSMC)

**United Microelectronics Corp (UMC)

Foundry Locations



Source: Semiconductor Equipment and Materials International (SEMI®)/FabFutures Oct 2005.

Risks and Unknowns

- Even if you get the BOM, you still may not know the following:
  - Pedigree of the part or process;
  - Possibility of Hostile Code;
  - Reliability / Quality;
  - Lead Frame Material Coating Content;
  - Date Code; and
  - Fabrication Process (Die Shrinks).

- Assess the criticality of the item to determine the level of data required

IV. Technology Considerations

Technology Considerations

Support Characteristics

Component Type	Supply Base	Standardization	Rate of Tech Change
Passives	Broad	High	Slow
Discretes	Broad	High	Slow
Digital Logic	Moderate	Moderate	Fast
Linear and Analog	Moderate	Low	Fast
Programmable Logic	Limited	Low	Fast
Memory – Volatile	Moderate	High	Fast
Memory – Non Volatile	Broad	High	Moderate
Processors and Controllers	Limited	Low	Moderate
Application Specific IC	Limited	Low	Slow
Switches, Relays, Displays	Limited	Low	Slow

Source: ARROW/ZEUS Electronics

Technology Considerations

Support characteristics compounded by temperature, packaging, factors, etc.

Component Type	Supply Base	Standardization	Rate of Tech Change
Passives	Limited	High / Drawing Controlled	Slow
Discretes	Limited	High	Slow
Digital Logic	Limited	Low	Moderate
Linear and Analog	Moderate	Low	Moderate
Programmable Logic	Limited	Low	Moderate
Memory – Volatile	Moderate	High	Moderate
Memory – Non Volatile	Limited	High	Slow
Processors and Controllers	Limited	Low	Moderate
Application Specific IC	Limited	Low	Slow
Switches, Relays, Displays	Limited	Low	Slow

Source: ARROW/ZEUS Electronics

Technology Considerations

Product Life Cycle Information is a Subjective Measure

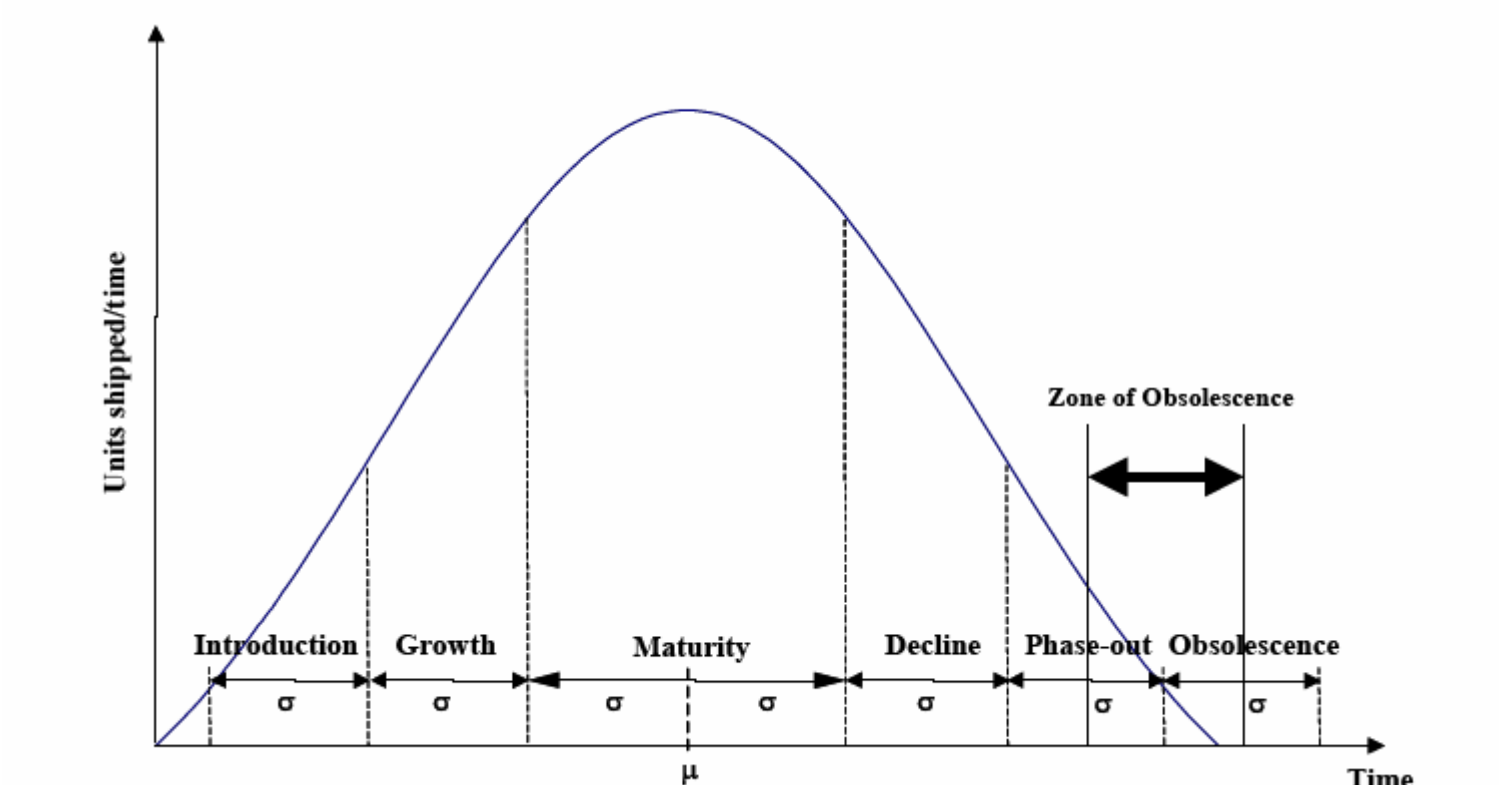
Typical life cycle characteristics for the six generic stages of a part life cycle

Characteristic	Introduction	Growth	Maturity	Decline	Phase-out	Obsolescence
Sales	Slow but increasing	Increasing rapidly	High	Decreasing	Lifetime buys may be offered	Sales only from aftermarket sources, if at all
Price	Highest	Declining	Low	Lowest	Low	Not applicable or very high of available from aftermarket sources
Usage	Low	Increasing	High	Decreasing	Decreasing	Low
Part Modification	Periodic die shrinks, and possible mask changes	Periodic die shrinks	Periodic die shrinks	Few or none	None	None
Competitors	Few	High	High	Declining	Declining	Few
Manufacturer Profit	Low	Increasing	High	Decreasing	Decreasing	Decreasing

Source: ARROW/ZEUS Electronics

Technology Considerations

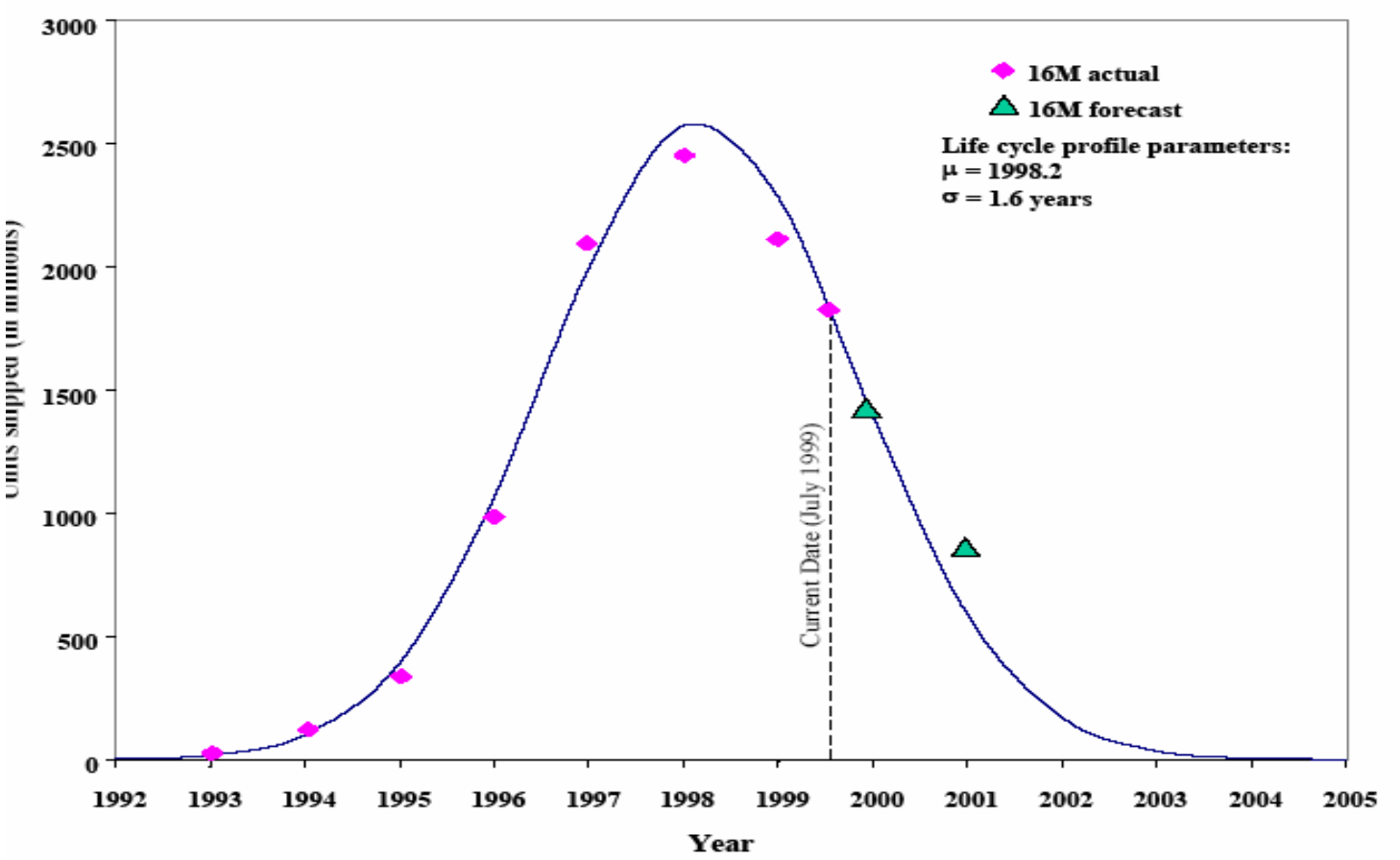
Time to process through the entire cycle varies for different components and technologies



Source: ARROW/ZEUS Electronics

Technology Considerations

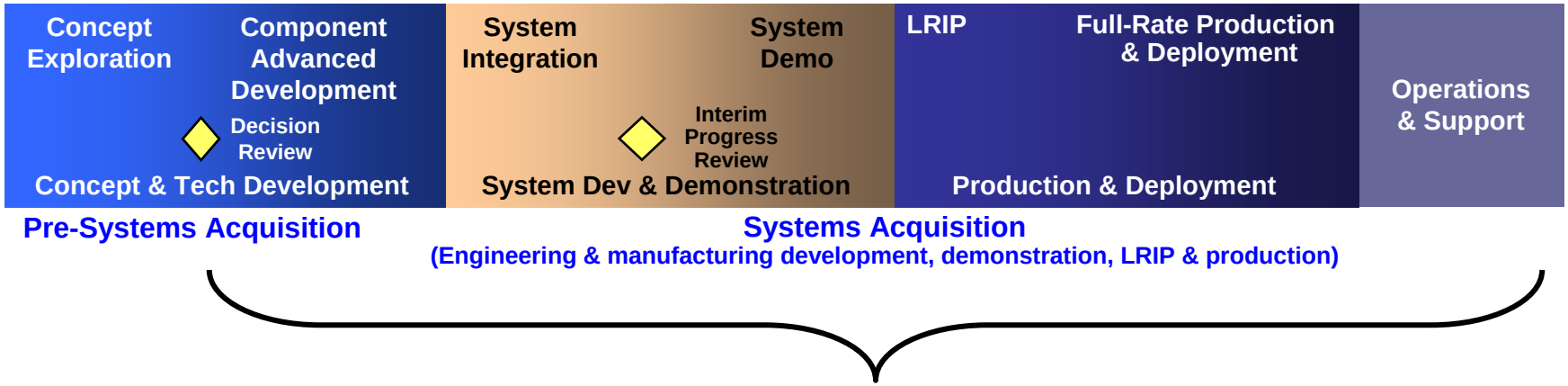
Time to process through the entire cycle varies for different components and technologies.



Source: ARROW/ZEUS Electronics

Typical consumer Electronics Component Life Cycle

Mitigation and Management



Understand the Industry Technology Roadmap and Pedigree of Critical Integrated Circuits/Technologies

- Obtain BOM (or preliminary parts lists during design)
- Map those Roadmaps to the system's Technology Roadmap and address Gaps
- Forecast for Obsolescence, Manage, Mitigate, Track
- Collect Metrics (Use ASN(RD&A) published metrics guidance)

V. PBL and DMSMS

PBL and DMSMS

PBL does not mean that you abdicate responsibility for DMSMS. You should:

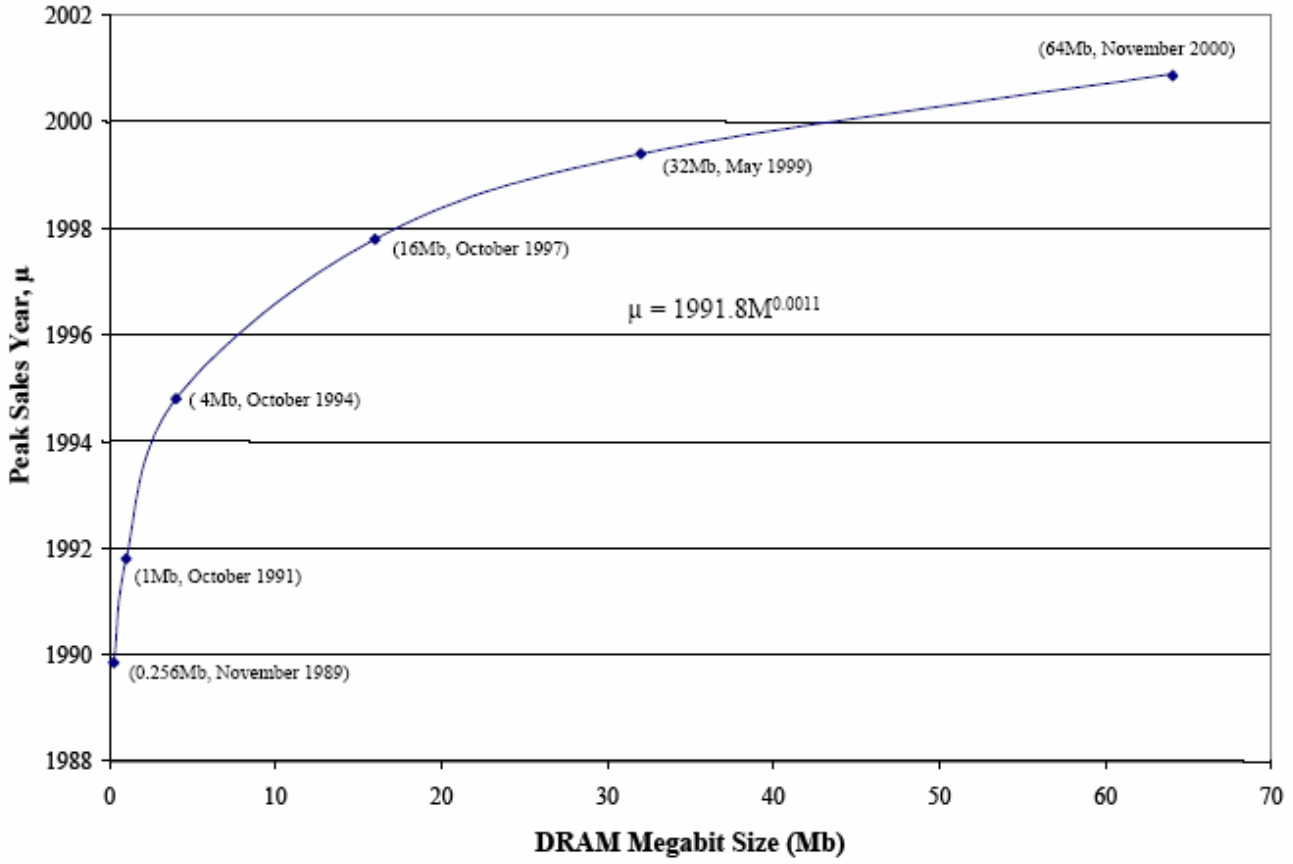
- Require Incremental delivery of the BOM;
- Manage Configuration of the BOM at the piece part level;
- Require Continuous monitoring of the BOM…with periodic feedback;
- Require continuous proactive DMSMS management…employing technology roadmaps;
- Continually identify, track and manage DMSMS cases;
- Ensure cost effective solutions…"Hierarchy of Cost Avoidance Methodology";
- Require Reporting and tracking of performance and cost metrics;
- Maintain Insight into prime contractors management of subcontractors (e.g., design for obsolescence); and
- Utilize Exit clauses that includes delivery of the above as required.

The DoN DMSMS Contractual Guide, May 2006 provides details, available at http://www.acquisition.navy.mil/

Questions/Discussion

Technology Considerations

Moore's Law pushes Critical Characteristics Forward.



Source: ARROW/ZEUS Electronics



Department of the Navy Perspective on Obsolescence Management

Nick Kunesh
Deputy Assistant Secretary of the Navy
(Logistics)

2006 DMSMS Conference

Outline

I The Case for Managing Diminishing Manufacturing Sources and Material Shortages (DMSMS)

II DoN Status - Past/Present/Future

III Microelectronics Market

IV Technology Considerations

V Performance Based Logistics (PBL) and DMSMS

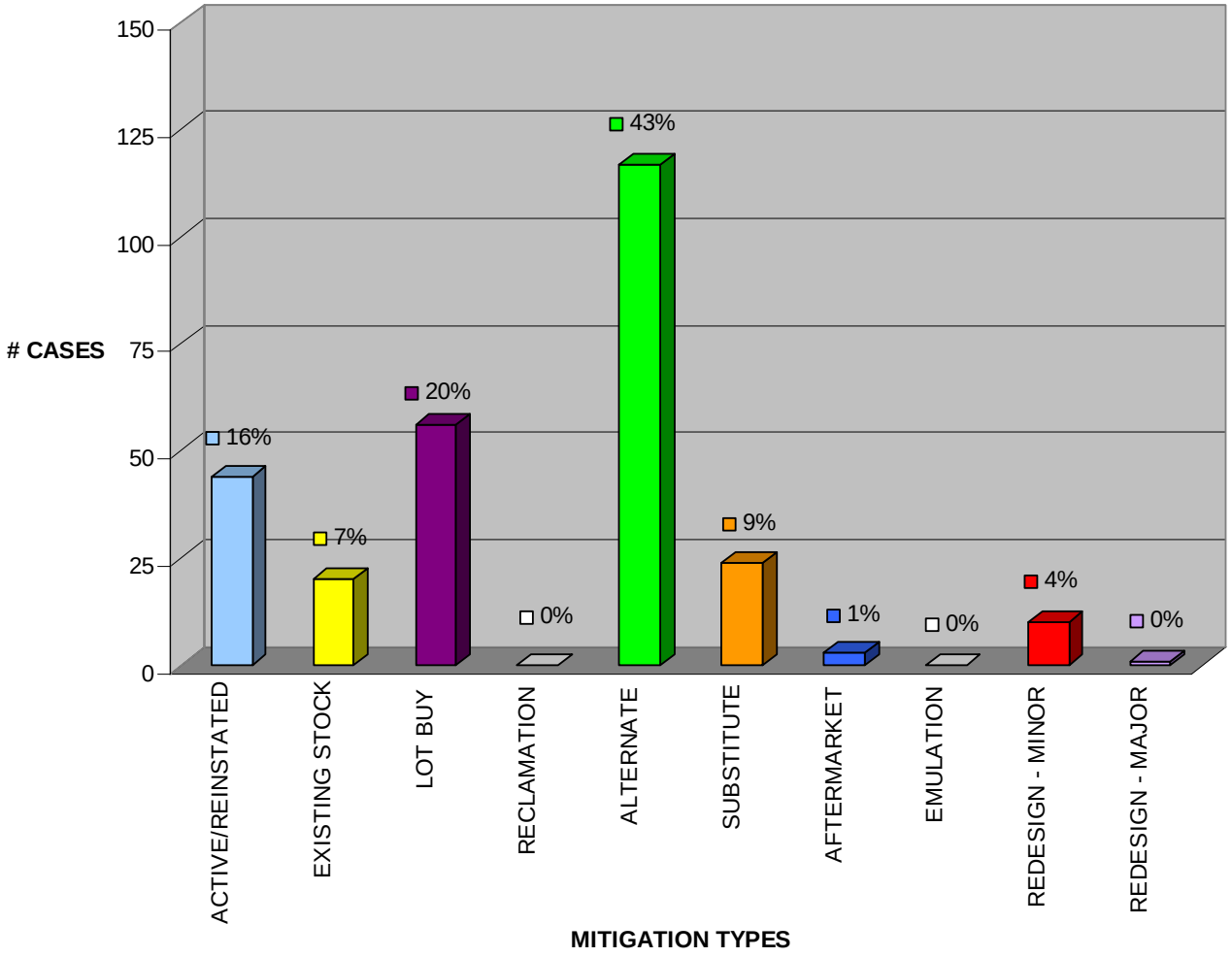
The Case for Managing DMSMS
A Government Perspective

The Case for Managing DMSMS

- Why manage DMSMS proactively?
  - Significant costs to redesign, test, qualify, certify and integrate replacement sub systems and components
  - Schedule volatility prior to introduction to the fleet
  - For deployed product, associated readiness degradation
- DOD cost estimates for DMSMS impacts on deployed systems range upward of $15 Billion
  - DoN share is significant
- A January 06 review of DoN programs showed a healthy Return on Investment for managing DMSMS

The Case for Managing DMSMS

AAIPT DMSMS TEAM COST AVOIDANCE $42,128,799 (DMEA Estimates)
275 Recommendations Made to 13 Platforms since 1/25/05



The Case for Managing DMSMS

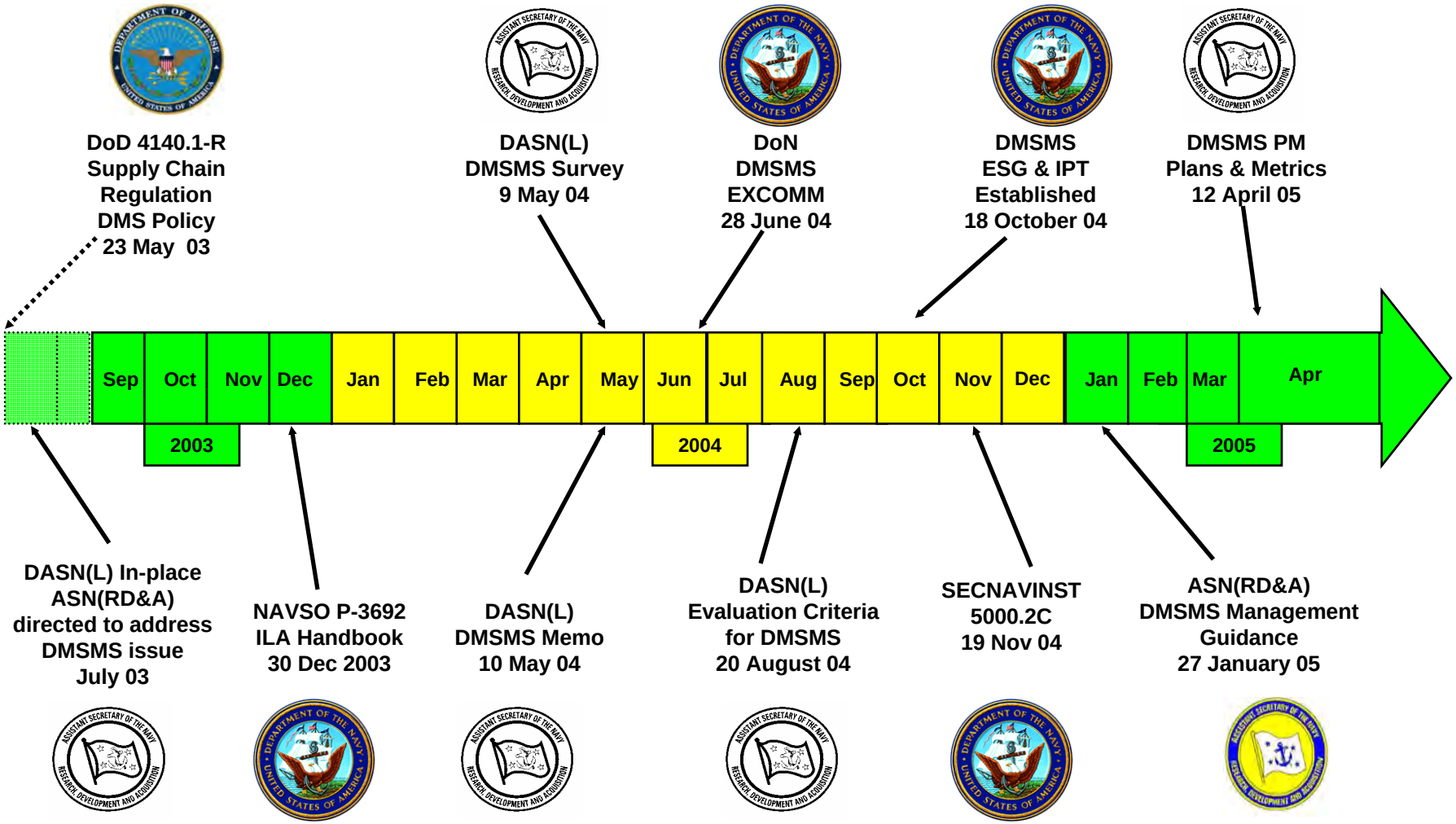
DoN case management data from SSB, Horizon, and OMIS

	Customers	# of Platforms	# of Systems	# COTS LRUs	# Custom LRUs	Est. Cost Avoidance
Jun 06	• 18 NAVSEA • 4 SPAWAR • 16 NAVAIR • 3 USMC • NAVICP-Phil • I Coast Gaurd; 1 Army; 1 AF • 6 Private Party (EDO; Raytheon; Boeing, Northrop Grumman)	**52**	**429**	**6,637**	**8,718**	**$135.4 M**

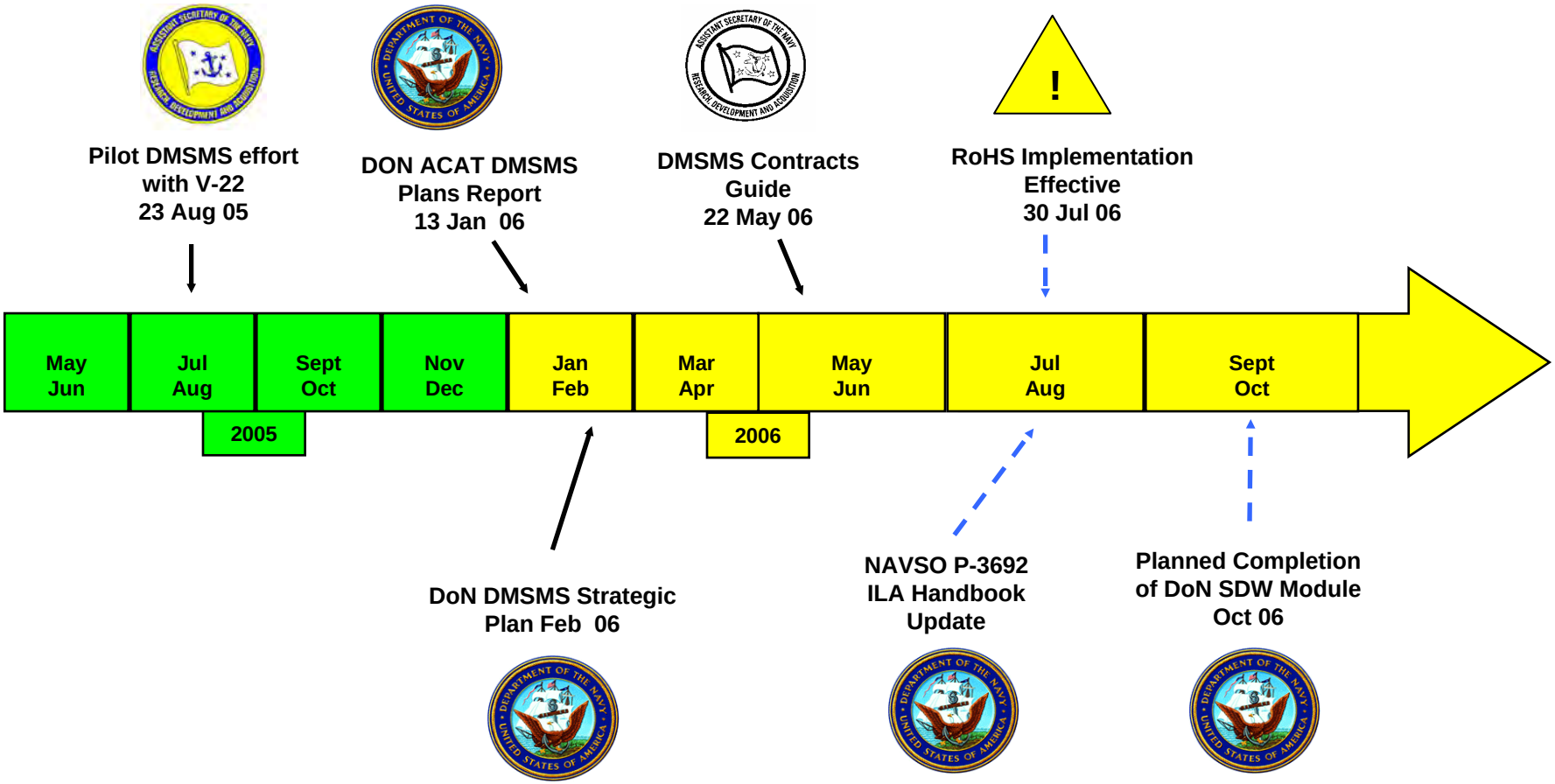
	Customers:	# of Platforms	# of Systems	# COTS LRUs	# Custom LRUs	Est. Cost Avoidance
Jan 05	• 15 NAVSEA • 1 SPAWAR • 8 NAVAIR • 2 USMC • 1 NAVICP-Phil • Private Party: EDO.	**41**	**265**	**5,038**	**5,627**	**$94.2 M**

II. DoN Status – Past/Present/Future

Past


DoD 4140.1-R
Supply Chain
Regulation
DMS Policy
23 May 03
DASN(L)
DMSMS Survey
9 May 04
DoN
DMSMS
EXCOMM
28 June 04
DMSMS
ESG & IPT
Established
18 October 04
DMSMS PM
Plans & Metrics
12 April 05
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
2003
2004
2005
DASN(L) In-place
ASN(RD&A)
directed to address
DMSMS issue
July 03
NAVSO P-3692
ILA Handbook
30 Dec 2003
DASN(L)
DMSMS Memo
10 May 04
DASN(L)
Evaluation Criteria
for DMSMS
20 August 04
SECNAVINST
5000.2C
19 Nov 04
ASN(RD&A)
DMSMS Management
Guidance
27 January 05

Present/Future



Documents available at
http://www.acquisition.navy.mil/

Present/Future

DoN DMSMS Contracts Guidance

- Applicable to PBL and Traditional Contracts
- Provides considerations for:
  - DMSMS Management;
  - Parts Management;
  - Configuration Control;
  - Supplier/Subcontractor Management;
  - Bills of Material (BOM);
  - DMSMS Forecasting and Notification;
  - Open Systems Architecture for Software; and
  - Incentives & Exit Clauses.

Draft ILA Handbook (NAVSO P-3692)

- Incorporates and updates DMSMS criteria from the 20 Aug 04 DMSMS supplement
- Incorporates information from the published ASN(RDA)/ DASN(LOG) DMSMS memos and guidance documents
- Emphasis placed on implementation (# BOM loaded, metrics collection, management practices, etc.)

III. Microelectronics Market

Problem & Challenge

Problem

Microelectronics are increasingly manufactured off-shore, and most OEMs don't know the pedigree or location of manufacture of their microelectronics

Challenge

Do you know where the microelectronics in your systems are manufactured?

Do you understand the risks associated with not knowing?

Do you know how to mitigate the risks?

Process

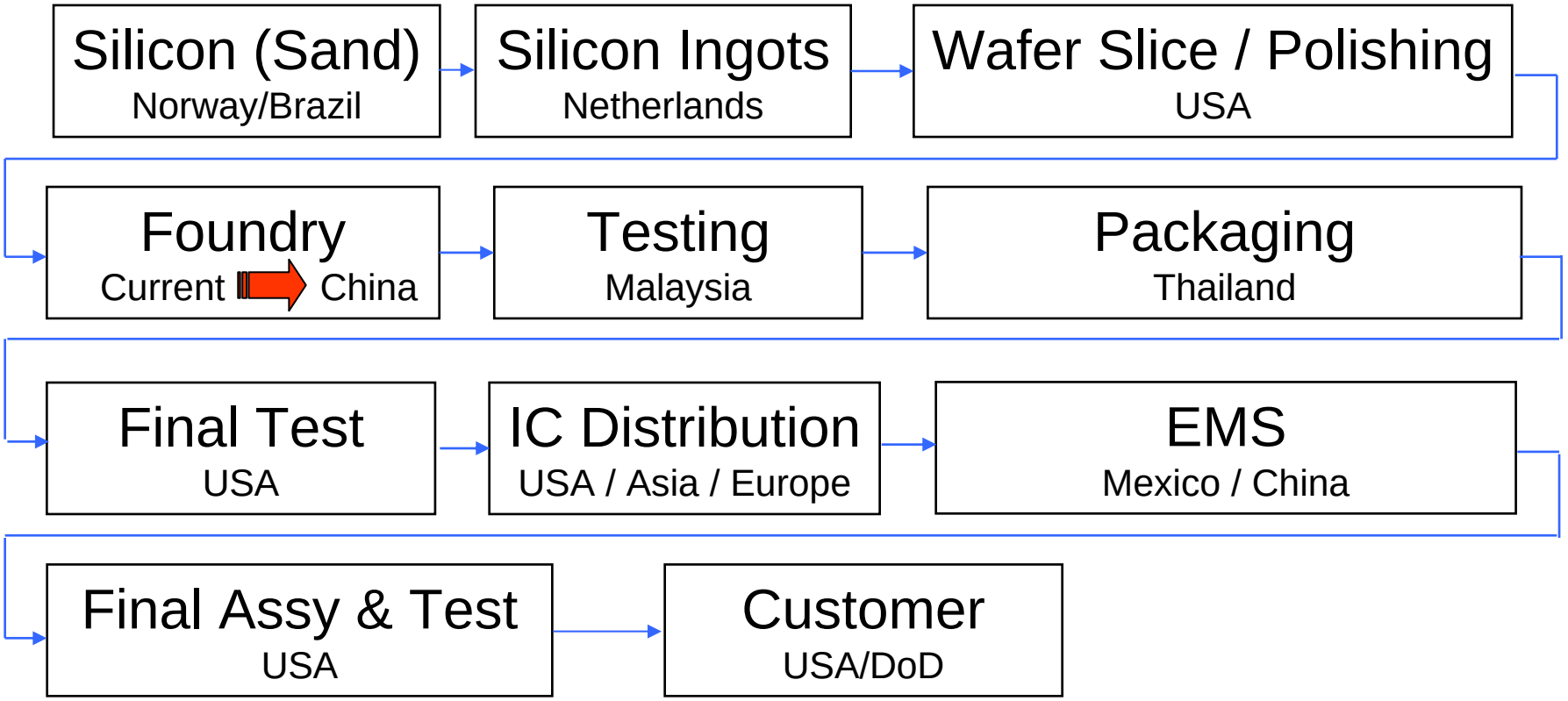
Sand to Silicone – Eleven Steps

1. **Obtain Silicone (Sand)**
2. **Silicon Crystal** (Ingot) 99.99999% Pure Si
3. **Polished Wafer** – Mirror-like surface, credit card thin 100 – 300 MM diameter
4. **Dielectric Deposition** (SiO_2) – a non-conductive layer
5. **Photo Lithography** – Photo resist builds up a pattern of hardened material
6. **Etching** – Strips away hardened patterns to leave a pattern of dielectric
7. **Doping** – Implants various conductive materials
8. **Metalization** – Deposits the final layers of metal (copper) that provide the network of interconnects
9. **Testing** – **Die Level** via wafer probes
10. **Packaging** – Wire bonding and lead frame attachment
11. **Testing** – **Package Level** – via In-circuit or other test methods

Process

Critical Manufacturing Flow (Example)

- Integrated Circuit (IC)

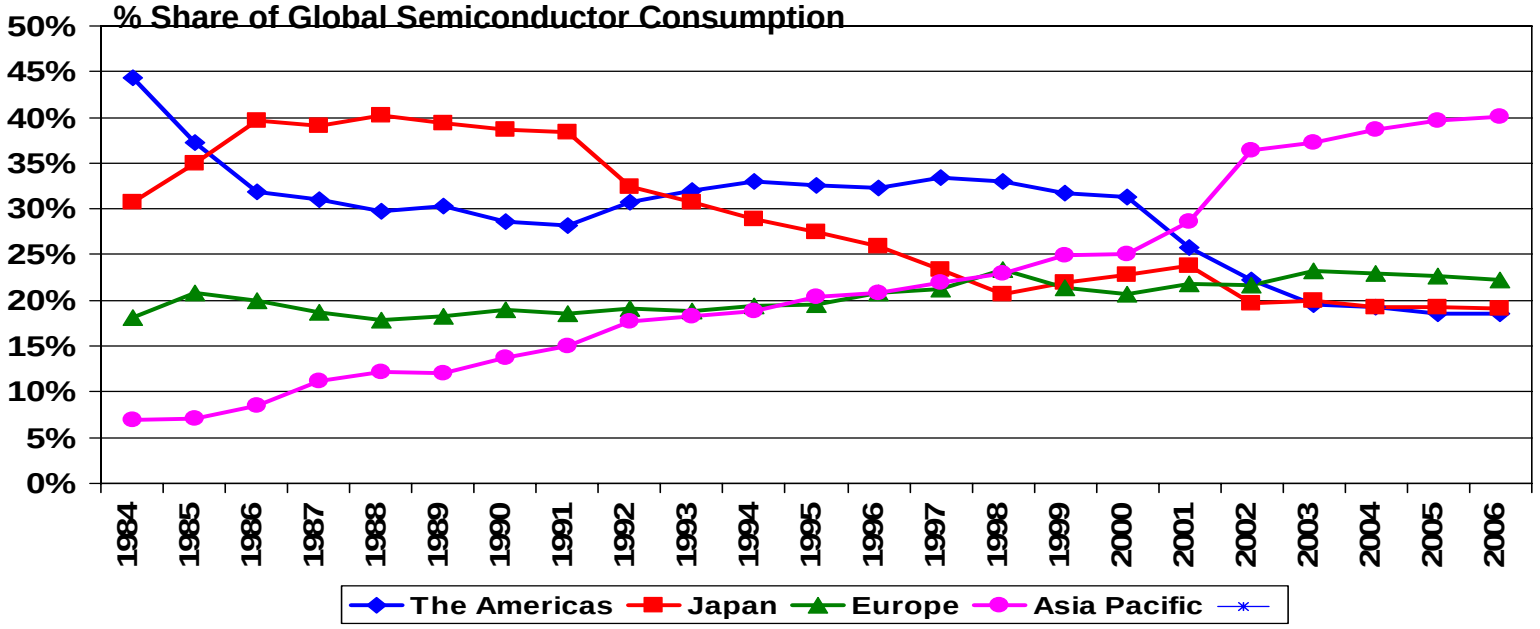


Source: ARROW/ZEUS Electronics

Semiconductor Market

Semiconductor Sales in Millions/$:

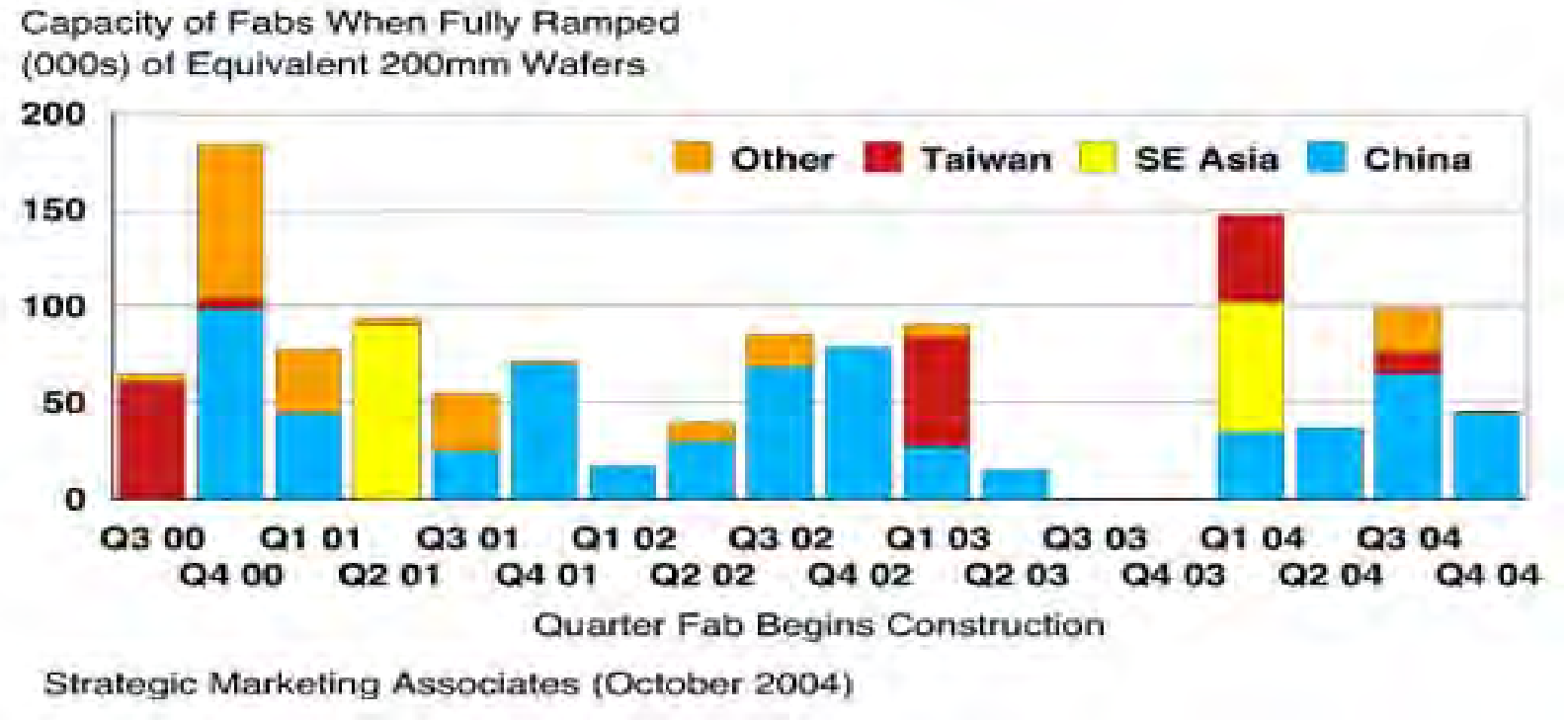
Year	1995	2005
• US	46,998 (33%)	40,736 (18%)
• EUR	28,199 (20%)	39,275 (17%)
• Japan	39,667 (27%)	44,082 (19%)
• ASIA/Pacific	29,540 (20%)	103,391 (46%)



Source: SIA

Foundry Locations

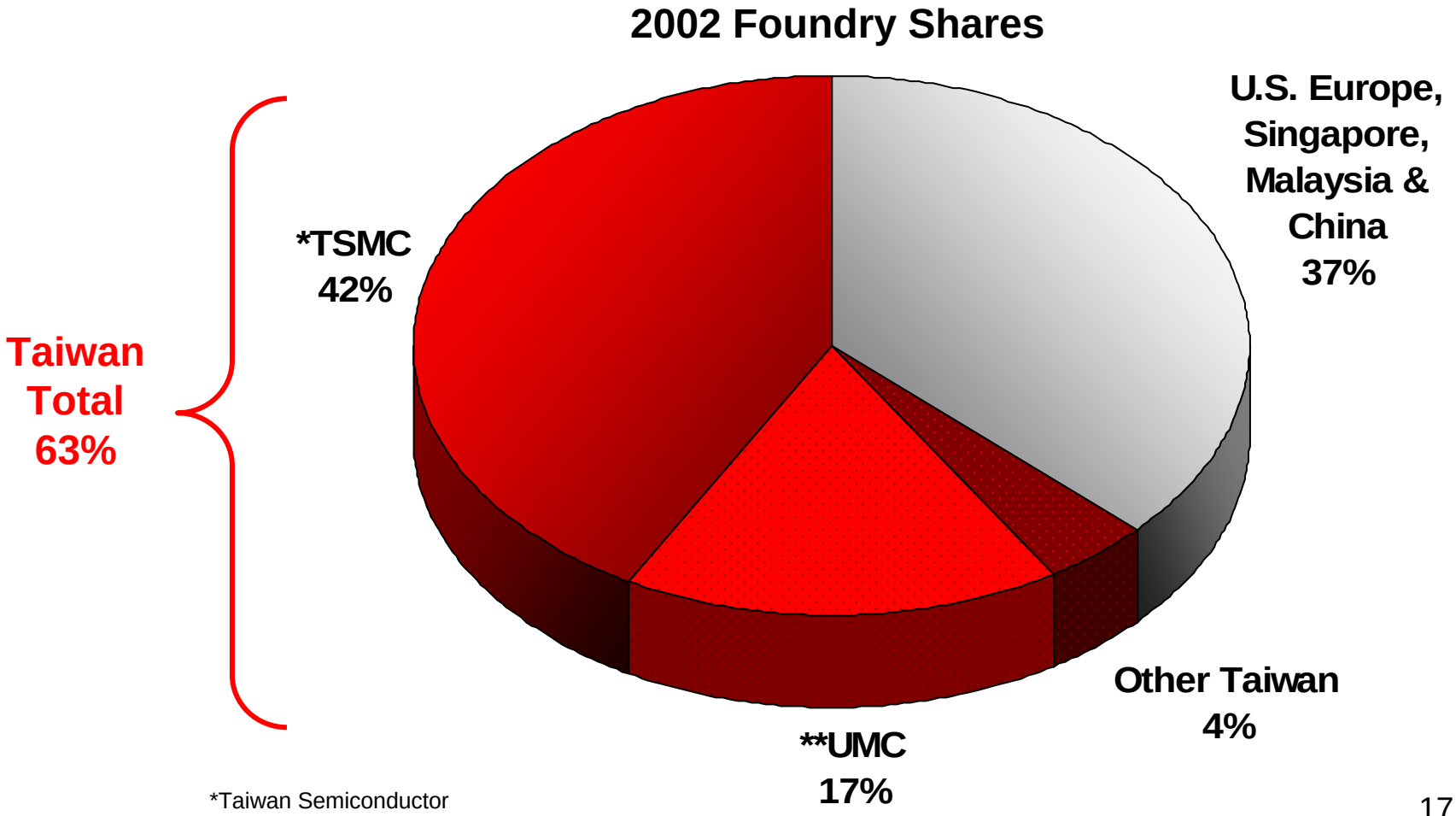
More Than One-Half of the Foundry Capacity That Has Started Construction Since 2000 is in China



Source: Strategic Marketing Associates (2004)

Foundry Locations

World-wide Foundry distribution:

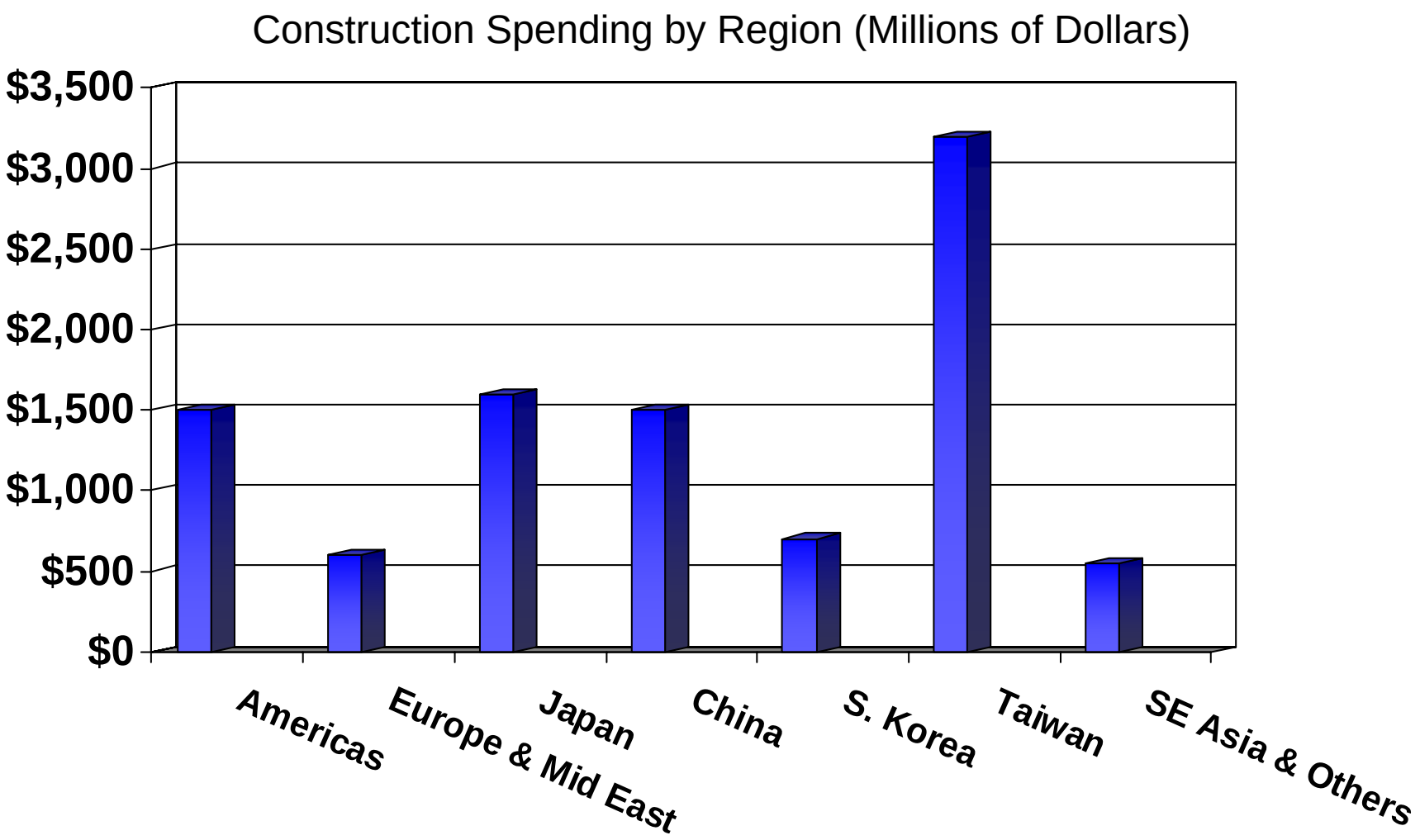


Source: iSuppli

*Taiwan Semiconductor Microelectronics Corp (TSMC)

**United Microelectronics Corp (UMC)

Foundry Locations



Source: Semiconductor Equipment and Materials International (SEMI®)/FabFutures Oct 2005.

Risks and Unknowns

- Even if you get the BOM, you still may not know the following:
  - Pedigree of the part or process;
  - Possibility of Hostile Code;
  - Reliability / Quality;
  - Lead Frame Material Coating Content;
  - Date Code; and
  - Fabrication Process (Die Shrinks).

- Assess the criticality of the item to determine the level of data required

IV. Technology Considerations

Technology Considerations

Support Characteristics

Component Type	Supply Base	Standardization	Rate of Tech Change
Passives	Broad	High	Slow
Discretes	Broad	High	Slow
Digital Logic	Moderate	Moderate	Fast
Linear and Analog	Moderate	Low	Fast
Programmable Logic	Limited	Low	Fast
Memory – Volatile	Moderate	High	Fast
Memory – Non Volatile	Broad	High	Moderate
Processors and Controllers	Limited	Low	Moderate
Application Specific IC	Limited	Low	Slow
Switches, Relays, Displays	Limited	Low	Slow

Source: ARROW/ZEUS Electronics

Technology Considerations

Support characteristics compounded by temperature, packaging, factors, etc.

Component Type	Supply Base	Standardization	Rate of Tech Change
Passives	Limited	High / Drawing Controlled	Slow
Discretes	Limited	High	Slow
Digital Logic	Limited	Low	Moderate
Linear and Analog	Moderate	Low	Moderate
Programmable Logic	Limited	Low	Moderate
Memory – Volatile	Moderate	High	Moderate
Memory – Non Volatile	Limited	High	Slow
Processors and Controllers	Limited	Low	Moderate
Application Specific IC	Limited	Low	Slow
Switches, Relays, Displays	Limited	Low	Slow

Source: ARROW/ZEUS Electronics

Technology Considerations

Product Life Cycle Information is a Subjective Measure

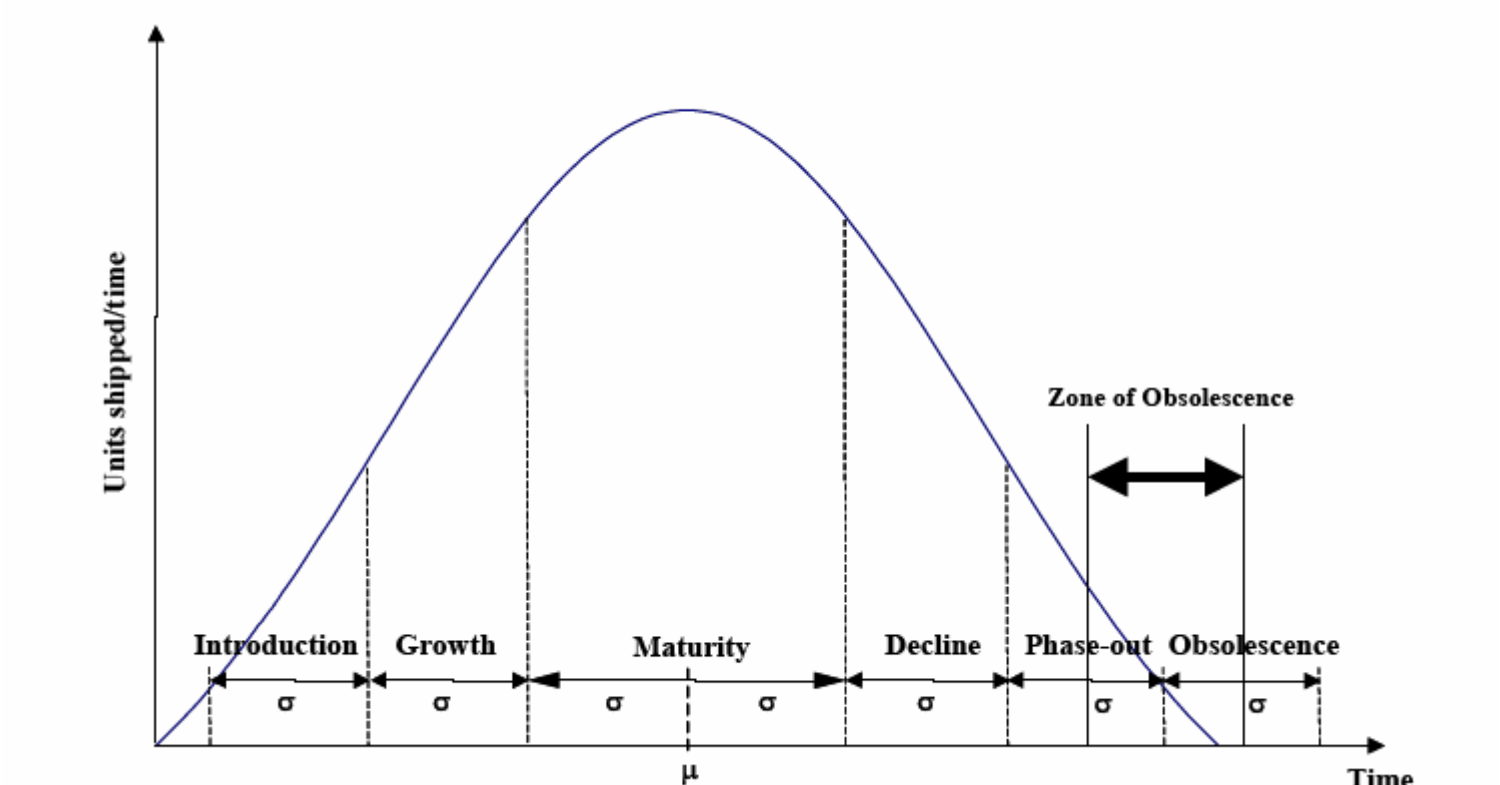
Typical life cycle characteristics for the six generic stages of a part life cycle

Characteristic	Introduction	Growth	Maturity	Decline	Phase-out	Obsolescence
Sales	Slow but increasing	Increasing rapidly	High	Decreasing	Lifetime buys may be offered	Sales only from aftermarket sources, if at all
Price	Highest	Declining	Low	Lowest	Low	Not applicable or very high of available from aftermarket sources
Usage	Low	Increasing	High	Decreasing	Decreasing	Low
Part Modification	Periodic die shrinks, and possible mask changes	Periodic die shrinks	Periodic die shrinks	Few or none	None	None
Competitors	Few	High	High	Declining	Declining	Few
Manufacturer Profit	Low	Increasing	High	Decreasing	Decreasing	Decreasing

Source: ARROW/ZEUS Electronics

Technology Considerations

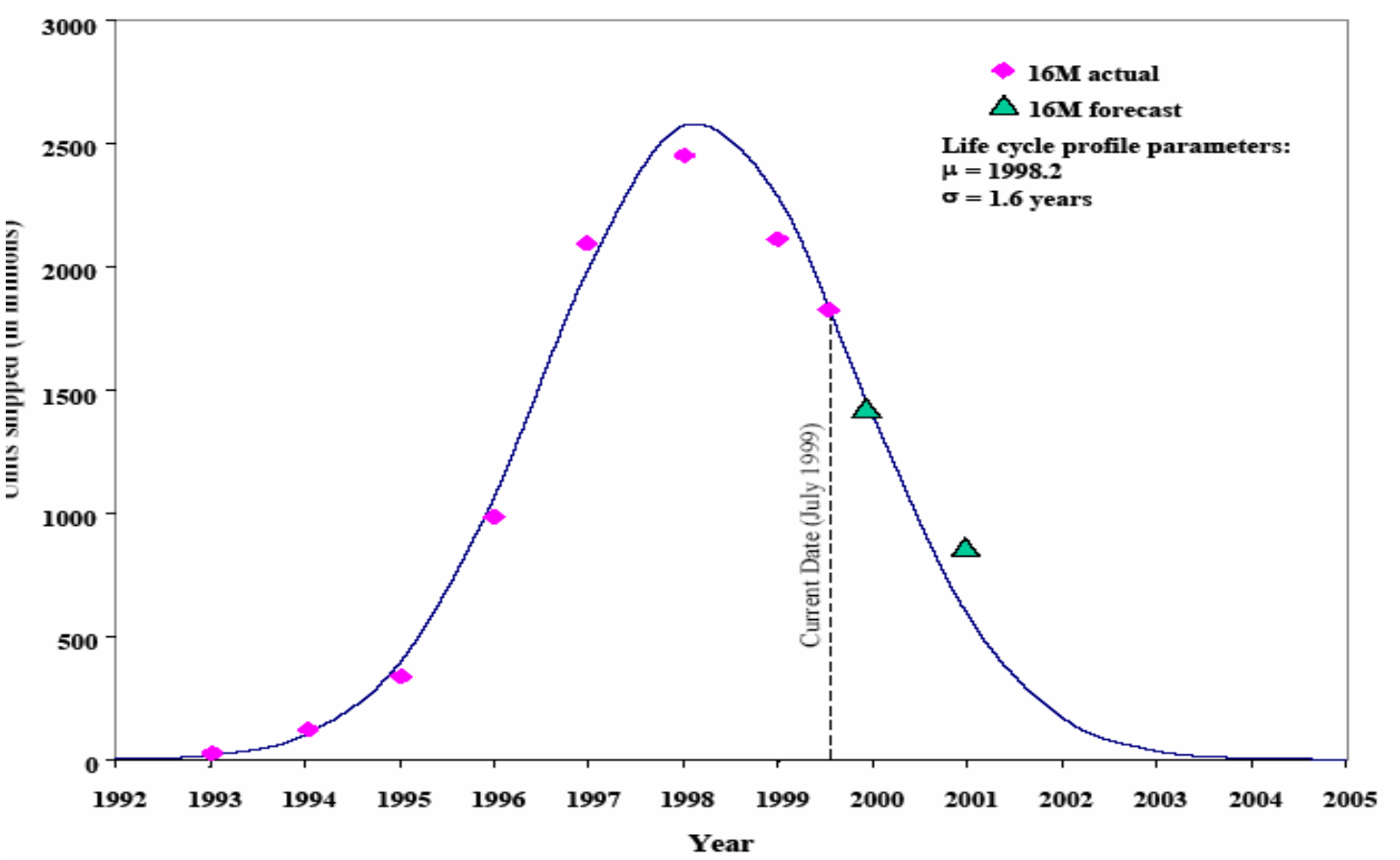
Time to process through the entire cycle varies for different components and technologies



Source: ARROW/ZEUS Electronics

Technology Considerations

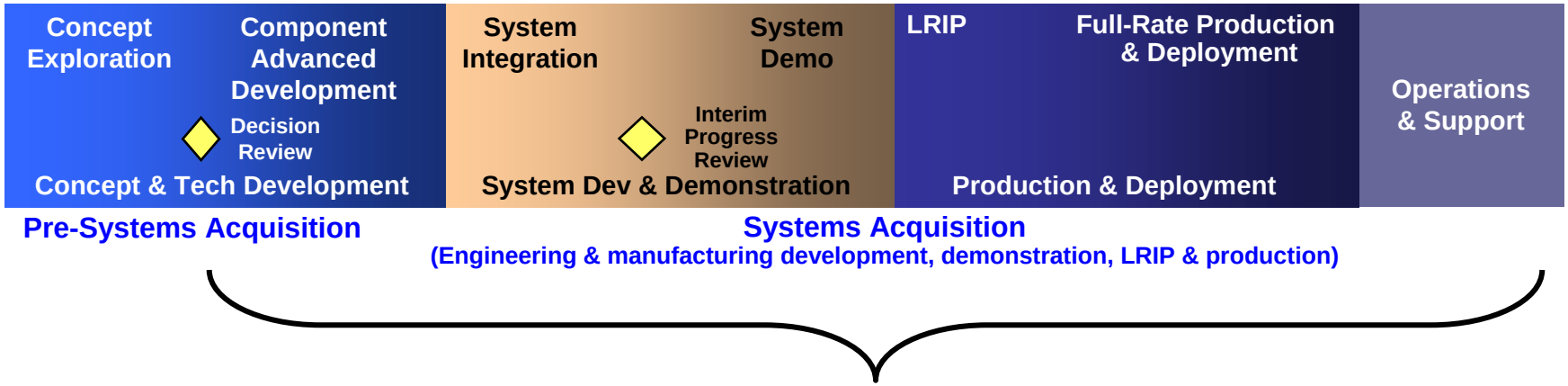
Time to process through the entire cycle varies for different components and technologies.



Source: ARROW/ZEUS Electronics

Typical consumer Electronics Component Life Cycle

Mitigation and Management



Understand the Industry Technology Roadmap and Pedigree of Critical Integrated Circuits/Technologies

- Obtain BOM (or preliminary parts lists during design)
- Map those Roadmaps to the system's Technology Roadmap and address Gaps
- Forecast for Obsolescence, Manage, Mitigate, Track
- Collect Metrics (Use ASN(RD&A) published metrics guidance)

V. PBL and DMSMS

PBL and DMSMS

PBL does not mean that you abdicate responsibility for DMSMS. You should:

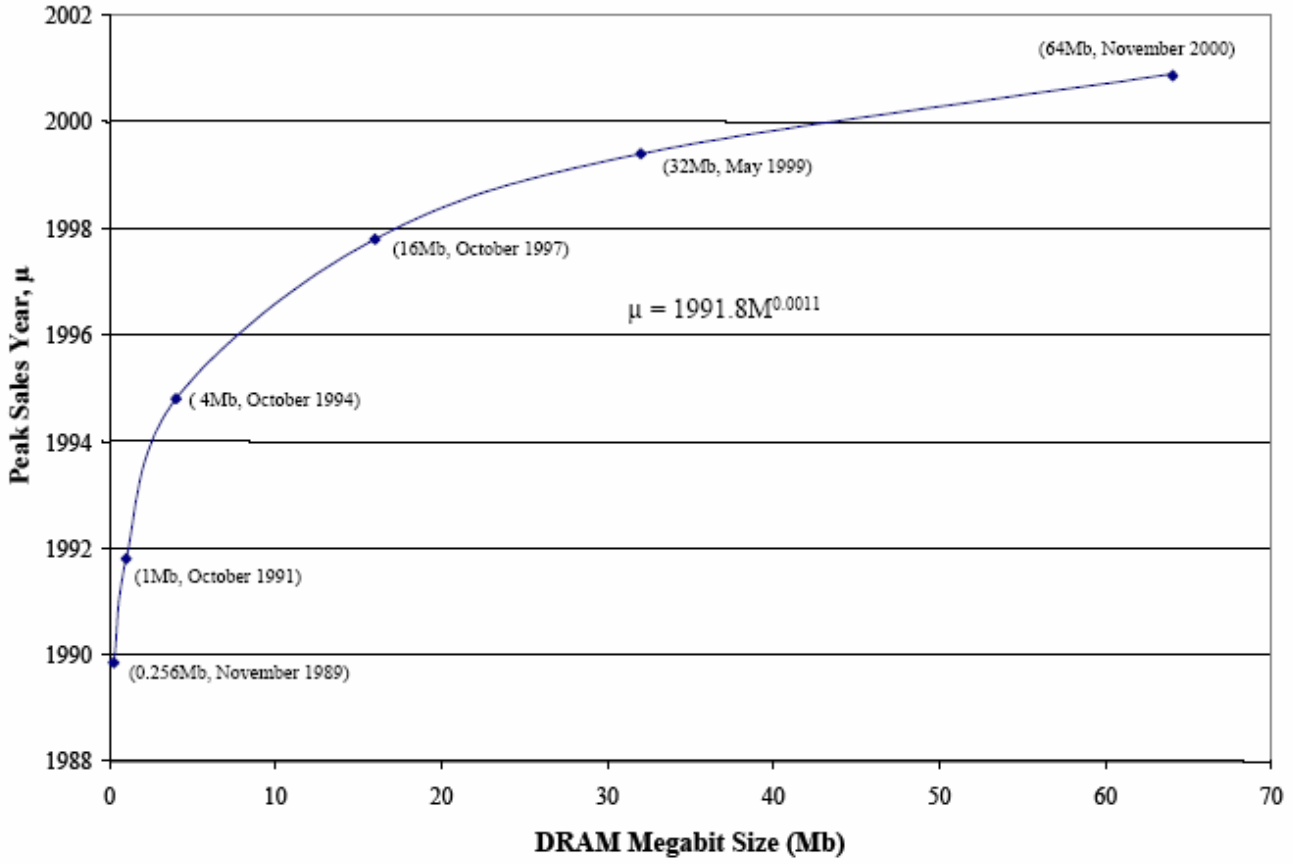
- Require Incremental delivery of the BOM;
- Manage Configuration of the BOM at the piece part level;
- Require Continuous monitoring of the BOM…with periodic feedback;
- Require continuous proactive DMSMS management…employing technology roadmaps;
- Continually identify, track and manage DMSMS cases;
- Ensure cost effective solutions…"Hierarchy of Cost Avoidance Methodology";
- Require Reporting and tracking of performance and cost metrics;
- Maintain Insight into prime contractors management of subcontractors (e.g., design for obsolescence); and
- Utilize Exit clauses that includes delivery of the above as required.

The DoN DMSMS Contractual Guide, May 2006 provides details, available at http://www.acquisition.navy.mil/

Questions/Discussion

Technology Considerations

Moore's Law pushes Critical Characteristics Forward.



Source: ARROW/ZEUS Electronics

USMC
DMSMS & Life Cycle Management

Presented by: Ms. Carla Lucchino
Assistant Deputy Commandant, Installation & Logistics

Impacts of DMSMS to LCM

Key Points:

- Paradigm shift (Proactive vice Reactive)
- Support weapons systems/equipment upfront & early
- Treat Redesigns as New Acquisitions

USMC Assessment

- **Purpose**
  - Evaluate Current State and Establish Baseline
  - Make future decisions on what “it is” vice “what it is believed to be”
- **Approach**
  - Interviewed & Surveyed USMC Members from Marine Corps Systems Command (North & South), Marine Corps Logistics Command (Albany & Barstow)
- **Results**
  - 11 Conclusions
  - 17 Recommendations

Assessment Conclusions

– **Key Conclusions**

- Proactive DMSMS mgmt is the exception
- Aggressive responses, but usually reactive
- Limited awareness of DMSMS resources
- Need for DMSMS training
- Need DLA assistance w/ DMSMS
- Need for central resource at SYSCOM, to include a help desk, contract templates, reporting assistance, and liaison
- Operating with older equipment results in significant problems affecting production and maintenance

USMC Recommendations "Near Term"

- **DMSMS Strategic Plan (signed by Mr. Kunesh, Feb 06)**
  - Implementing goals & objective established jointly b/w Navy & USMC
- **DMSMS Training**
  - Currently offering DMSMS courses to the Acquisition & Sustainment Workforce
  - Certified a USMC representative (LOGCOM) as a DMSMS Instructor
- **SYSCOM DMSMS website**
  - DMSMS references and guides posted w/in the MCSC Total Information Gateway for Enterprise Resources (TIGER) Knowledge Center
- **Shared Data Warehouse (SDW)**
  - Integrating USMC (Ground Equipment) into the SDW
  - Providing USMC with a case management module to accommodate business processes and manage reactive and proactive cases
  - Ensures dissemination and sharing of critical obsolescence and solution information across all services, thus gaining economies of scale in DMS management within DOD

Assessment Recommendations "Long Term"

– **Key Recommendations**

- Establish a "USMC Ground Equipment DMSMS Support Activity (DMSA)
- Appoint a SYSCOM DMSMS Office of Primary Responsibility (OPR)
- Establish a DMSMS help capability (help desk) to facilitate coordination w/ DLA, Other Services, etc.
- Adopt a standard reporting format & develop a specialized database to track the state of DMSMS in MC Equipment



Questions?

DoD DMSMS Workshop



The Teaming Process
Mr. Chuck Marshall, ARINC

Charlotte NC, July 13, 2006

Agenda

- Background
- Why do we Team?
- Teaming Basics
- Teaming Process
- How you can Participate
- Summary

Background

- The old teaming group had the right idea, but was a little ahead of capabilities
  - No real teaming took place
  - Few shared solutions
  - Elementary “not user friendly” software
- The old teaming group has evolved
  - Championed by the DLA DMSMS IST
  - Incorporated as one of DOD DMSMS Knowledge Sharing Portal functions
  - DoD DMSMS Workshop
- The old teaming group database was moved to GIDEP and is available for archival purposes (accessible with GIDEP user ID and password)
- We are refining a new process

Why do we Team?

- There are common use items in all systems
- Eliminate duplication of efforts
  - Avoids using scarce personnel and $$ to solve the same issue
- Share:
  - Research and Solution Information
  - Resources
    - Financial
    - Engineering and Logistics Knowledge
- Help all US and NATO/FMS programs benefit from common solution development
- Facilitates standardization of process, terms, parts, etc.

Defense Supply Center Columbus

Taking the Lead in DMSMS Support

The Impact of a Single Microcircuit













One NSN can have More than122 Unique WSDCs[1]









[1]Weapons system Designator Code (WSDC)

Why DoD Needs to Be Proactive and Team

NSN	TOTAL	ARMY	AIR FORCE	MARINES	NAVY
5962012698025	122	4	27	2	89
5962012878537	122		31	4	87
5962010891912	110	3	26	2	79
5962010203519	98		10	4	84
5962010770803	93	1	23	3	66
5962010511349	87		14		73
5962011017968	84	4	13	4	63
5962013258059	80		16		64
5962010814891	77	2	7		68
5962010786569	75	2	15	5	53
5962012418099	75	4	13	1	57
5962003338323	64		4		60
5962010111335	62		3		59

Teaming Basics

- Identify a potential teaming item
  - Basic Triggers:
    - GIDEP/DLA DMSMS IST Initiated
      - Proactive Management of FSC 5962
      - Normal Notice Process
    - BSM Weapons Team
    - User initiated (DKSP email or call)

- Identify users
  - Programs/ Activities
  - OEMs
  - Contractors
  - NATO/FMS

Teaming Basics

- Identify potential solutions
  - Potential Substitutes
  - Approved Alternates
  - Standardized Parts
  - Aftermarket Program
  - Emulations
  - Engineering Solutions (DMEA,MEP, others)

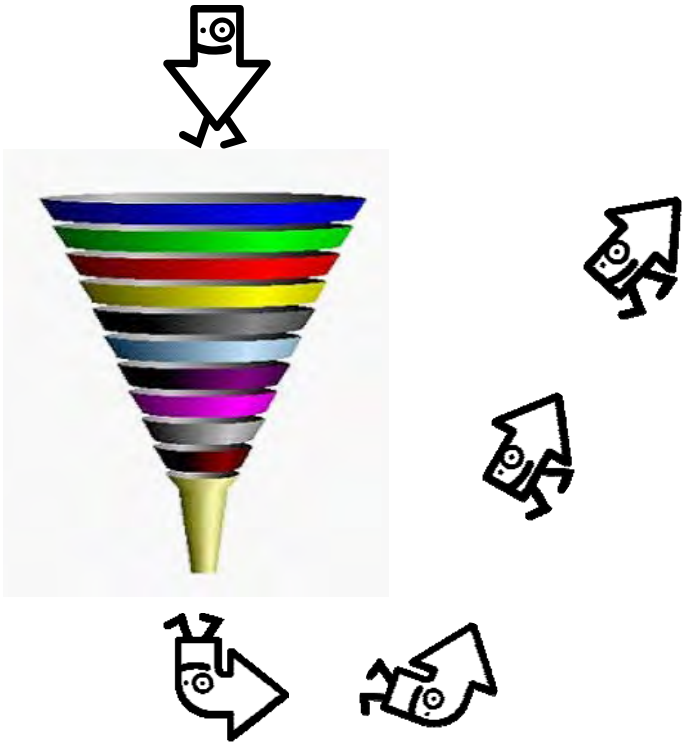
Teaming Basics

- Contact and Coordinate potential solution with interested users
  - Phone Conference
  - Physical Meeting
  - DLA Form 339

- Record and share the solution results
  - Obsolete Data Repository (ODR)

Teaming Overview

GIDEP/DLA DMSMS IST Identified
User Request / Identified



- **Identify users**
- **Identify potential solutions**
- **Contact and Coordinate potential solution with interested users**
- **Record and share the solution results**

Teaming Projects

- Many successful multiple user emulation projects
- Many successful multiple user logistics solutions
- DoD/Raytheon Airborne Radar Sustainment Team (DRARST) is a model of Teaming

GIDEP/DLA DMSMS IST Initiated

- Normal DMSMS process
  - Notices from many sources including:
    - Shared Data Warehouse
    - Predictive Tools
    - GIDEP
    - Manufacturer
    - OEM
  - Proactive Management of Federal Supply Class (FSC) 5962 (other FSCs 5961,5980,5998)

Sample DLA DMSMS IST FSC 5962 Worksheet

FSC	NIIN	Cage	Ref Number	Status	ISC	SOS	AAC	UI	Price	RNCC	RNVC
5962	012680782	96214	2892990-53	R	2	S9E	J	EA	$ 73.70	3	2
5962	012680782	96214	507987	R	2	S9E	J	EA	$ 73.70	5	1
5962	012680782	96214	2698329-2	R	2	S9E	J	EA	$ 73.70	5	1
5962	012680782	96214	2698329-3	R	2	S9E	J	EA	$ 73.70	5	1
5962	012680782	16236	ROM/PROM		2	S9E	J	EA	$ 73.70	5	1
5962	012680783	96214	2892990-6	R	2	S9E	Z	EA	$ 73.70	3	2
5962	012680783	96214	507987	R	2	S9E	Z	EA	$ 73.70	5	1
5962	012680783	96214	2698329-2	R	2	S9E	Z	EA	$ 73.70	5	1
5962	012680783	96214	2698329-3	R	2	S9E	Z	EA	$ 73.70	5	1
5962	012680783	16236	ROM/PROM		2	S9E	Z	EA	$ 73.70	5	1
5962	012680784	96214	2892990-9	R	2	N32	D	EA	$ 84.79	3	2
5962	012680784	96214	507987	R	2	N32	D	EA	$ 84.79	5	1
5962	012680784	96214	2698329-2	R	2	N32	D	EA	$ 84.79	5	1
5962	012680784	96214	2698329-3	R	2	N32	D	EA	$ 84.79	5	1
5962	012680784	16236	ROM/PROM		2	N32	D	EA	$ 84.79	5	1
5962	012680785	80009	160-1329-00	G	2	S9E	V	EA	$ 60.59	3	2
5962	012680785	34649	D2732A-3	R	2	S9E	V	EA	$ 60.59	5	1
5962	012680785	16236	ROM/PROM FAMILY 042		2	S9E	V	EA	$ 60.59	5	1
5962	012680785	67268	8001203JA	Y	2	S9E	V	EA	$ 60.59	5	1
5962	012680786	80009	160-1327-00	G	2	S9E	V	EA	$ 60.59	3	2
5962	012680786	34649	D2732A-3	R	2	S9E	V	EA	$ 60.59	5	1
5962	012680786	16236	ROM/PROM FAMILY 042		2	S9E	V	EA	$ 60.59	5	1
5962	012680786	67268	8001203JA	Y	2	S9E	V	EA	$ 60.59	5	1
5962	012680787	67268	8414301CA	G	1	S9E	Z	EA	$ 3.08	2	2
5962	012680787	67268	84143		1	S9E	Z	EA	$ 3.08	4	1
5962	012680787	27014	54ALS21J/883	Y	1	S9E	Z	EA	$ 3.08	5	1
5962	012680787	01295	SNJ54ALS21AJ	Y	1	S9E	Z	EA	$ 3.08	5	1

- Next Basic Steps
  - Identify users
  - Identify Potential Solutions
  - Coordinate with interested programs/parties
  - Select best solution(s), record and share results

User initiated

- Call to GIDEP/DLA DMSMS IST/DKSP for individual/program request for help

- Next Basic Steps
  - Identify users
  - Identify Potential Solutions
  - Coordinate with interested programs/parties
  - Select best solution(s), record and share results

How can you Participate?

- Identify a problem you have (and hopefully a possible solution)
- Go to GIDEP/ODR/QCCS to see if a teamed solution has already been addressed
- To Initiate a teaming project:
  - Submit email or call the DKSP
  - Call the DLA DMSMS IST
  - Call GIDEP
- When called upon for a potential teaming opportunity: *Participate!*

Summary

- Old Process right “Spirit and Intent”
- There are good reasons to Team
- We have a viable basic processes
- We have common points to store and share solutions
- Your ***Participation*** is key

DMSMS Plan Builder
13 July 06

Mr. Keith McLendon
US AMC LOGSA

U.S. Army Materiel Command





Motivation

- **In preparing for battle I have always found that plans are useless, but planning is indispensable.**
  - **Dwight D. Eisenhower (1890 - 1969)**

- **A good plan, violently executed now, is better than a perfect plan next week.**
  - **George S. Patton (1885 - 1945)**

- **The plans of the diligent lead to profit as surely as haste leads to poverty.**
  - **Proverbs 21:5 NIV**

Why Are We Doing This?

A DoD "expert system" for:

- **Preparing DMSMS plans for Army, Navy, Air Force, Marines, DLA, and Others**
- **Ensuring important requirements are not omitted**
- **Planning resources**
- **Making decisions**
- **Obtaining guidance**
- **<u>Enforcing Planning Process</u>**



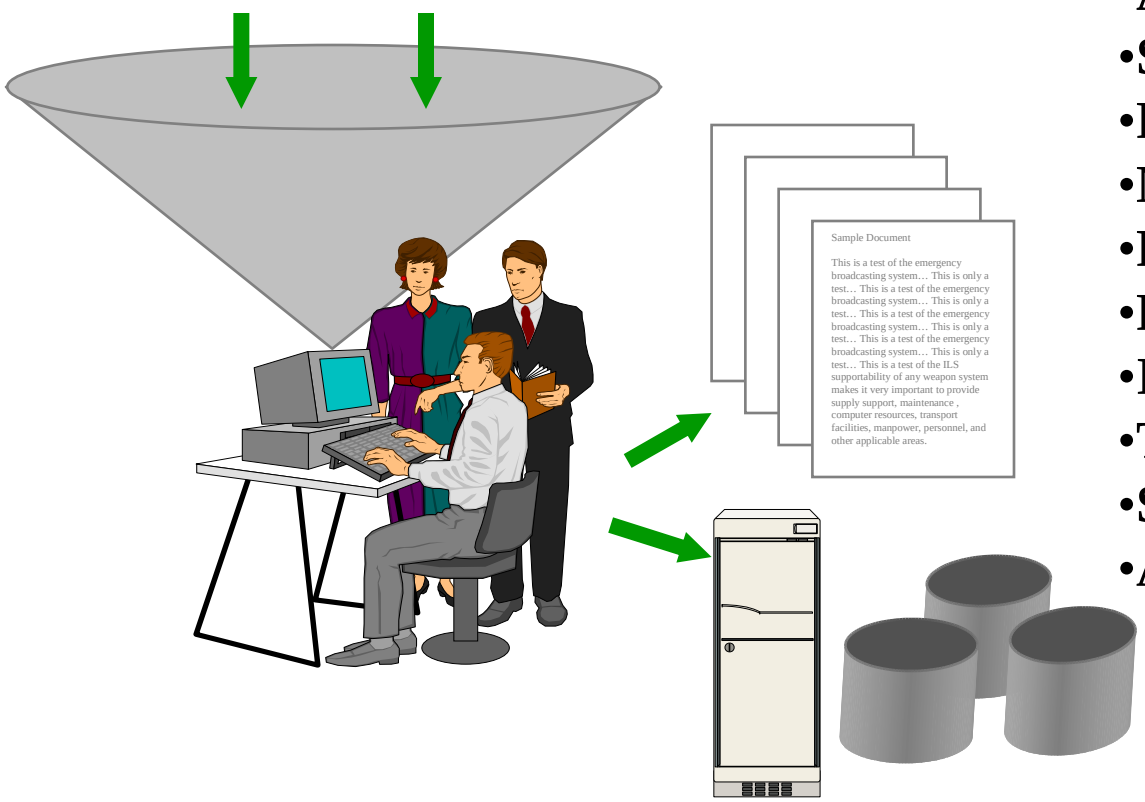
What Will it Do?

- Tailor DMSMS plans according to:
  - Service or Agency
  - Acquisition Type (Developmental, COTS, …)
  - ACAT Level
  - Commodity (Aircraft, Tracked Vehicle, …)
  - Acquisition Phase
  - Many other factors
- Incorporates policy guidance and expert knowledge
- Much more than a template



How Does it Work?

Latest Policy
Training Information
Lessons Learned
Expert Knowledge/Experience



LOGPARS Integrated Documents

- Acquisition Strategy
- Supportability Strategy
- PBL Strategy
- Materiel Fielding Plan
- Provisioning Plan
- Performance Based Agreement
- ILS Statement of Work
- Transportability Report
- Supportability Assessment
- And more…

The Roadmap

- **History**
  - **Brainstorming Session – (September 2005)**
  - **Working Group Approval – (March 2006)**
  - **Code initial outline and questions from brainstorming session – (May 2006)**
  - **Interviews with SMEs – (May/June 2006)**



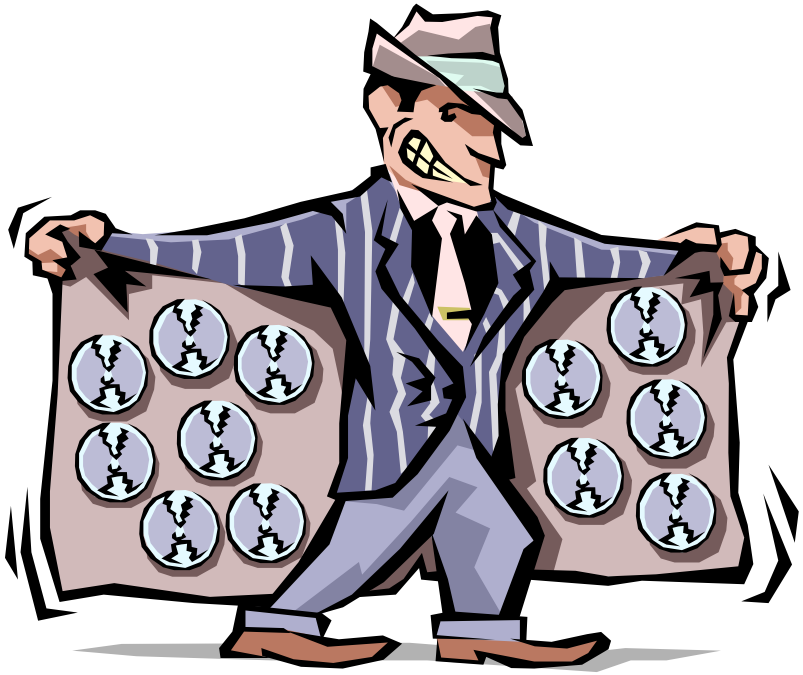
The Roadmap

- **Milestones**
  - **Alfa Test -- 31 July 06**
  - **Alfa Test Comments Due – 18 Aug 06**
  - **Beta Test -- 8 Sep 06**
  - **Beta Test End – 2 Oct 06**
  - **Release Software – 13 Oct 06**



Shameless Plug

- Other Life Cycle Logistics Tools
  - Cost Analysis Strategy Assessment (CASA) Model
    - Engineering Life Cycle Cost Model
  - COMPASS
    - Level Of Repair Analysis (LORA) model
  - powerLOG-J
    - Acquisition Logistics Data Management tool
  - Post Fielding Support Analysis (PFSA)
    - Analysis and metrics tracking tool
- Services
  - Expert consulting

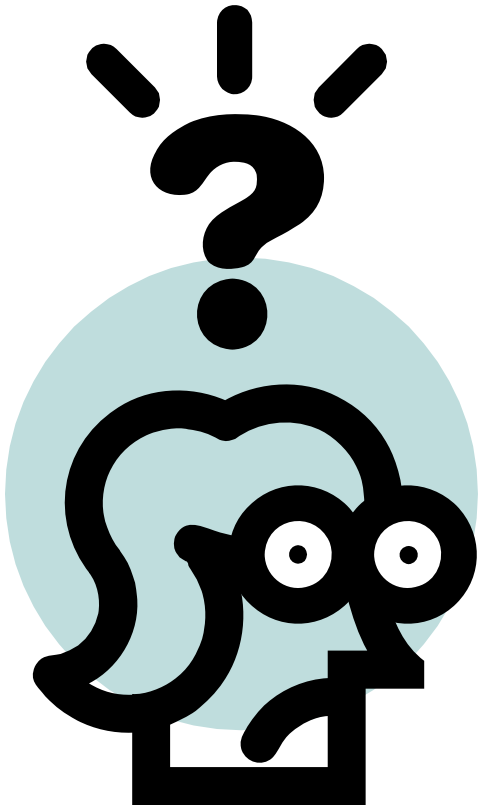


Summary

- It has joint service support
- It is supported
- It is adaptable
- It helps ensure expert knowledge and enforce policy in the planning process



Questions ? Maybe Answers . . .



Come see a demo in the exhibit hall!!

Defense Logistics Agency



DOD DMSMS Working Group Update

Presented To

DMSMS Workshop

13 July 2006

Presented By

Mr. Alex Melnikow, R&D Program Manager

Defense Logistics Agency

DOD DMSMS Working Group Vice Chair

Organizational Structure

DOD DMSMS Working Group

- **Outreach Committee**
  - **OEM Participation Sub Committee**
- **Common Use Tools Committee**
- **Interoperability Committee**
- **Conference Committee**

- DOD focal point for oversight of DMSMS initiatives
- Representation from all military service branches and other functional areas within the DOD as well as other Federal departments and agencies
- Chaired by a staff member of the Assistant Deputy Under Secretary of Defense Logistics Plans and Programs
- Reports directly to the Total Life Cycle System Management Executive Council
- Supported by a committee structure

Strategic Plan
Mission and Vision

- **Mission**
  - **Advocate Management techniques, tools, and policies that facilitate pro-active DMSMS management practices across all programs**

- **Vision**
  - **Promote pro-active solution sharing and knowledge propagation to minimize DMSMS impacts**
  - **Ultimately, DMSMS management processes will be institutionalized throughout all system life cycle phases across the community**

Strategic Plan
Strategy

- Formulate recommendations to DOD policy and procedures that streamline regulations and practices
- Promote the utilization of DMSMS management best practices through education and training
- Promote DMSMS case resolution data sharing
- Identify or develop, as necessary, specific contract language templates
- Develop and provide metrics pertaining to the effectiveness of the DMSMS programs
- Share examples of accomplishments, best practices, and performance data attributable to the efforts of the WG
- Promote sharing information about progress against the WG's service members strategic plans

Outreach Committee

Chairing Organization: DLA-DSCC

- **Responsibilities**
  - **Assist Visits**
    - **Promote initiatives and capabilities to the DMSMS Community**
  - **Training Sessions**
    - **Support the Workshops with scheduled sessions**
  - **Workshops**
    - **Develop agenda from topics submitted by the DMSMS Community**
  - **Achievement Awards**
    - **Develop criterion and administer the process**
  - **DMSMS Knowledge Sharing Portal**
    - **Promote and contribute to the development and administration**
  - **OEM Participation**
    - **Shared Data Warehouse**
    - **DMSMS Knowledge Sharing Portal**

Common Use Tools Committee

Chairing Organization: NSWC Crane

- **Responsibilities**
  - **Plan and formulate DMSMS tool requirements for the WG**
  - **Serve as the DOD executive level subject matter expert for DMSMS tool technology**
  - **Act as the tool requirements advisor to the WG**
  - **Define a set of requirements for a broad based scope of DMSMS tools**
  - **Define requirement gaps in DMSMS tool capabilities**
  - **Develop an out-year budgetary plan to fill the tool gaps**
    - **Utilizing business case analysis methodologies as justifications**
  - **Provide input, comments, recommendations on both existing and developing tools**
    - **Integrate these elements into the committee's action plan**

Interoperability Committee

Chairing Organization: GIDEP

- **Responsibilities**
  - **Establish data exchange protocols for DMSMS information with NATO Allies**
  - **Enable NATO Allies access to GIDEP**
    - **Urgent Data Requests**
    - **Alerts**
    - **Obsolescence Data Repository**
  - **Explore NATO Allies Participation**
    - **Shared Data Warehouse**
    - **DMSMS Knowledge Sharing Portal**

Conference Committee
Chairing Organization: NAVAIR

- **Responsibilities**
  - Establish a Memorandum of Understanding with a private organization to host the annual DMSMS Conference
  - Evaluate facilities/sites with host partner and make recommendations to WG for approval
  - Develop agenda and solicit guest speakers with support of WG
    - Coordinate presentations with primary focus on
      - Promoting the initiatives, capabilities, and partnering efforts of industry, academia and government DMSMS community
      - Common issues and solutions
      - New technology/tools for DMSMS mitigation
  - Support Outreach Committee with the site selection of the semi annual Workshop
    - All future Workshops will be held in conjunction with the DMSMS Conference and the Aging Aircraft Conference
  - Promote the conference and workshops within the services, industry, academia and government agencies

Ongoing Activities

- **Assist Visits**
  - PEO / SYSCOM across the DOD
- **DOD DMSMS Handbook**
  - Revision 3 will include Performance Based Logistics contract language
- **Training Courses**
  - Instructor led and DAU hosted computer based
  - DMSMS for Technical Professional
  - New Mexico Tech developing a case based management team simulation
- **Plan Builder**
  - Utilizing expert system technology to build a DMSMS Management Plan
- **Information Sharing**
  - Amongst DMSMS “Islands of Operations Excellence”
  - NSWC Crane / NUWC Keyport / GIDEP
- **Data Sharing with Industry**
  - Engage NDIA and AIA
  - Dialogue started to formulate pilot projects
    - Lockheed Martin, Boeing, and Raytheon
    - Bill of Materials, Alerts, Case Resolutions

Request for Assistance

- **The purpose of this workshop is discuss topics that are germane to all of you**
- **As members of the DMSMS community the Outreach Committee would like to know**
  - **What are your wants, needs, and desires for future workshops?**
- **Your inputs can be submitted via the DMSMS Knowledge Sharing Portal http://www.dmsms.org/**
- **Please submit your topics and take sometime to review the information on the DMSMS Knowledge Sharing Portal**

Mark Your Calendars!

Next DMSMS Workshop held in conjunction with Aging Aircraft Conference, April 16-19, 2007 Palm Springs, CA



BAE SYSTEMS

2006 DMSMS Conference
Pb-free Solder Technical Issues (Not Including Tin Whiskers)

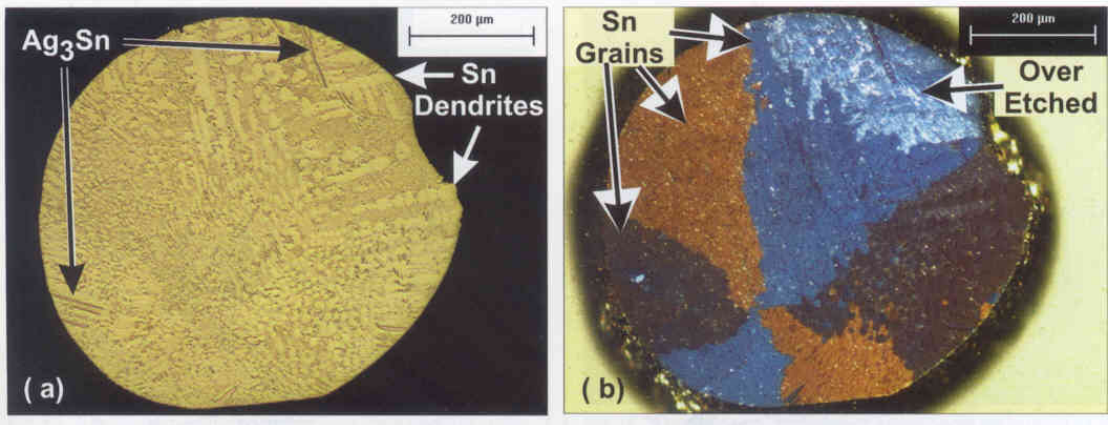
Dr. Stephan Meschter
BAE Systems
LEAP WG Technical Guidelines Handbook Leader
Johnson City, NY
Phone: 607-770-2332, Email: stephan.j.meschter@baesystems.com



BAE SYSTEMS

What's the problem; it is just solder?

- Who would consider changing the alloy of an airplane wing or a turbine blade without a lot of materials testing and analysis?
- It is no longer "just solder"
- Surface-mount technology changed the game:
  - Solder provides structural connection
  - Solder behaves like a viscoplastic material
- During the SMT insertion into high performance applications in the '80s, much was learned that can be applied to Pb-free
- Pb-free solder is different from Sn-Pb



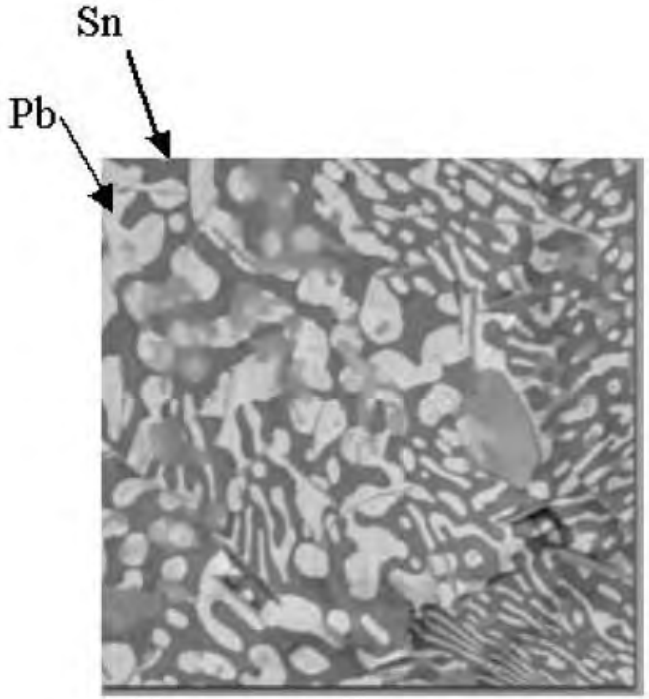
Cross-polarized inspection reveals SnAgCu BGA ball with ~10 grains

L.P. Lehman and S.N. Athanvale et. al, "Growth of Sn and Intermetallic Compounds in Sn-Ag-Cu Solder," J. Electronic Materials, Vol. 33, No. 12 (2004) pp 1429-1439.

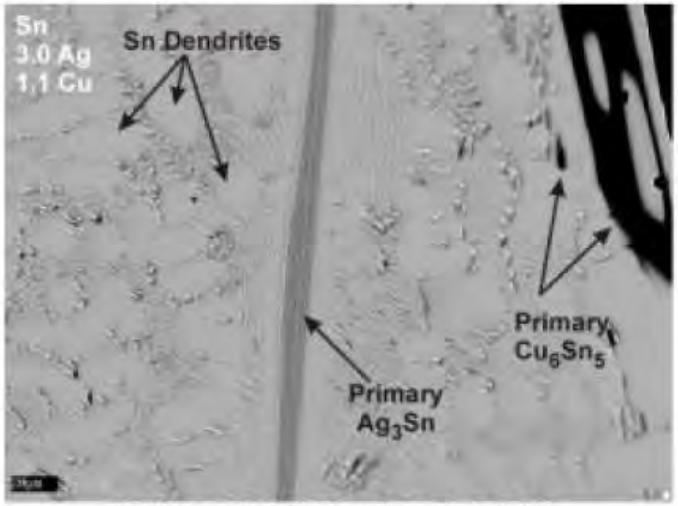
BAE SYSTEMS

Solder Microstructure

- The mechanical response of Sn-Pb Solder is dominated by the micron-scale inclusions of the relatively soft Pb
- SnAgCu structure is more complex - mechanical response is different



Conical PbSn Eutectic

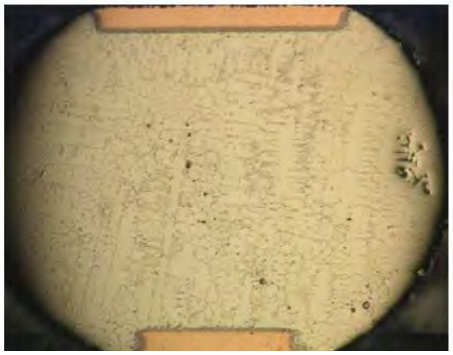


Pb-free SnAgCu near eutectic

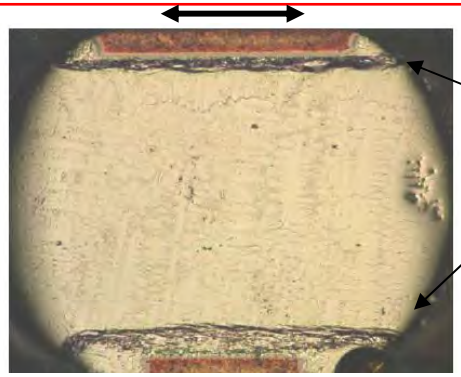
E. Cotts, Binghamton University, at the Universal Instruments Consortium Meeting, June 2006

BAE SYSTEMS

Crack development variation observed

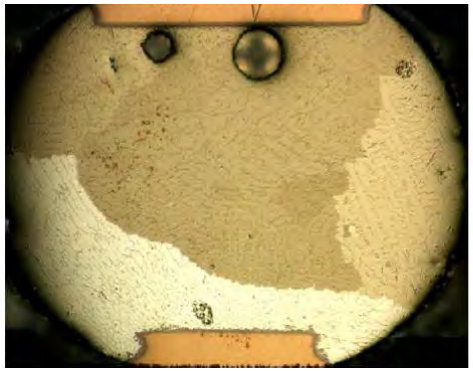


Cross polarized (XP) image of a PBGA solder ball

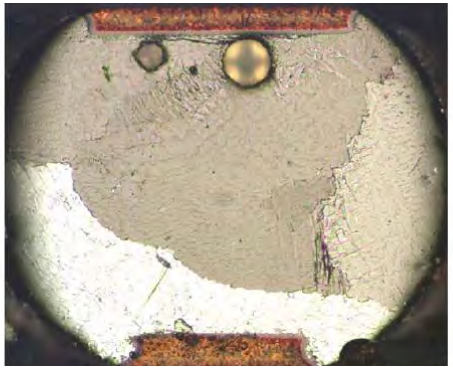


Cross polarized (XP) image of the same solder ball after 100 DTC cycles -45 to +125 ^{o}C

- Deformation occurs near pad area of a single grain solder ball

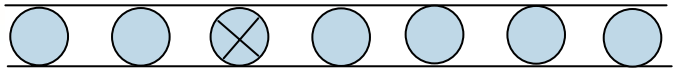


Cross polarized (XP) image of a PBGA solder ball



Cross polarized (XP) image of the same solder ball after 100 DTC cycles -45 to +125 ^{o}C

- Different deformation occurs when many grains are initially present – deformation more distributed



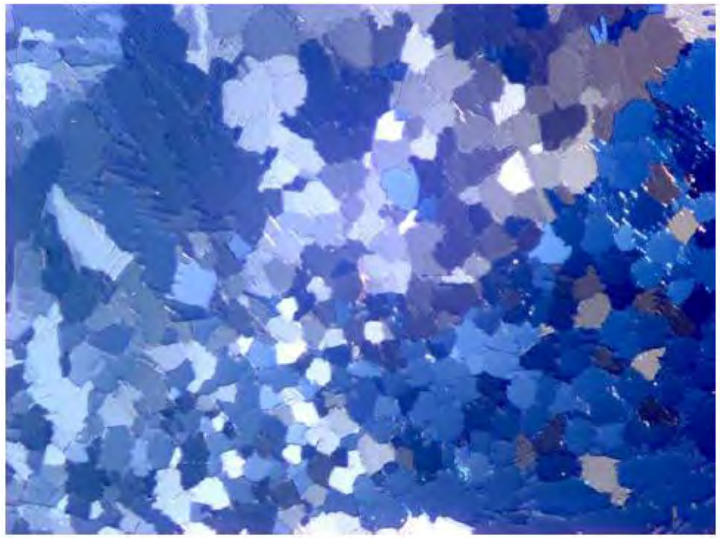
- Grain structure variation could explain why first failures are not always outer most balls of BGAs

E. Cotts, Binghamton University, at the Universal Instruments Consortium Meeting, June 2006

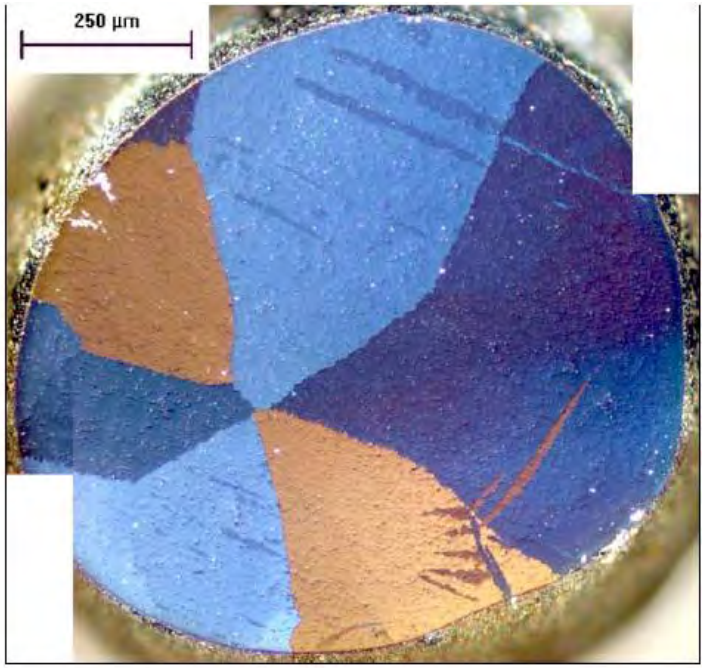
BAE SYSTEMS

Alloy additions impact grain structure

- A little bit of copper significantly changes the grain structure



~Sn-3.5Ag



~Sn-3.5Ag-0.6Cu

L.P. Lehman and S.N. Athanvale et. al, “Growth of Sn and Intermetallic Compounds in Sn-Ag-Cu Solder,” J. Electronic Materials, Vol. 33, No. 12 (2004) pp 1429-1439.

BAE SYSTEMS

Failures in electronics hardware

Environmental conditions

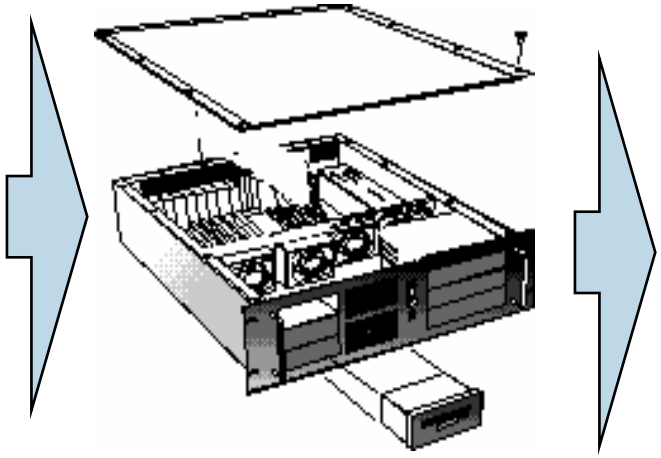
- Temperature
- Vibration
- Acceleration
- Moisture
- Pressure
- Ionic contamination
- Radiation

Operational conditions

- Power
- Current
- Voltage

People

- Training/skill level



Failure modes

- Parameter drift
- Short
- Open

Types of failure

- Overstress
- Wearout

Failure mechanisms

Failure mechanism interactions

- Complimentary
- Competitive

(M. Osterman, CALCE Center - University of Maryland, Presentation at the 9th Meeting of the AIA/GEIA/AMC LEAP Working Group, Tucson, March2006)

BAE SYSTEMS

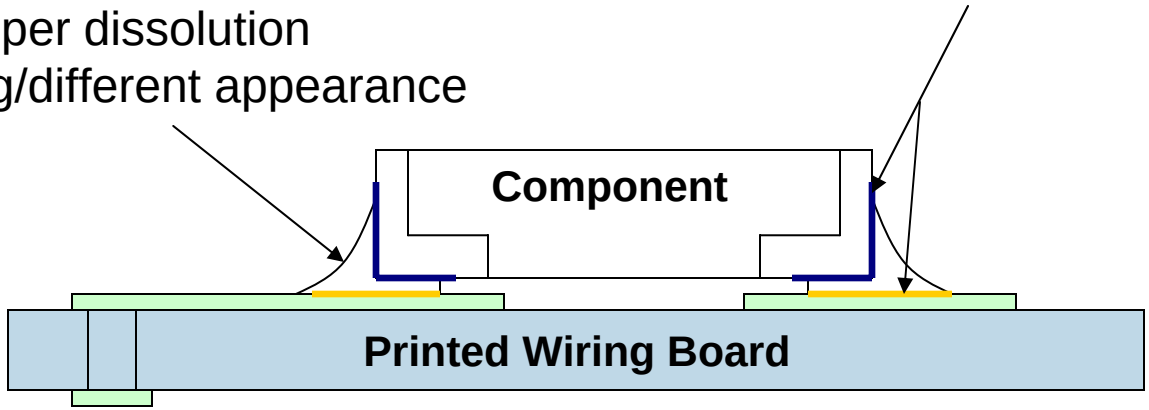
What makes this challenging?

Pb-free solder:

- Multiple Pb-free alloys
- Higher Sn content
- Higher processing temperature
- Higher strength/more creep-resistant
- Different fatigue characteristics
- Solder alloy compatibility
- New solder fluxes
- Greater copper dissolution
- Less wetting/different appearance

Intermetallic

- Increased Sn content yields thicker (i.e., weaker) IMCs
- Voiding of Cu from IMC growth
- Rapid loading is main concern
- Sn-Cu-Ni IMCs nuances



Pb-free solder thermo-mechanical behavior is different from Sn-Pb

BAE SYSTEMS

What else?

Printed Wiring Board and Component

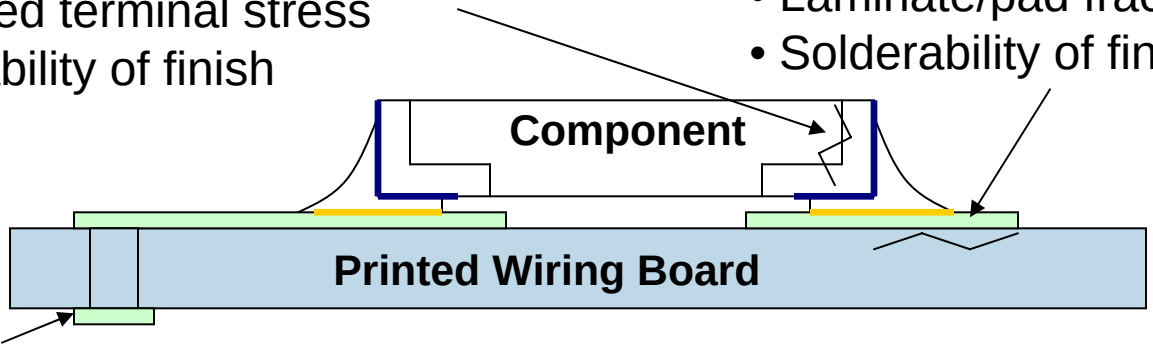
- New materials that can withstand higher soldering temperatures
- CAF/SIR Service risk from high soldering temperatures and new fluxes
- Delamination/decomposition/moisture sensitivity

Component termination metal:

- Increased terminal stress
- Solderability of finish

PWB Pad

- Laminate/pad fracture
- Solderability of finish



Plated through hole

- Higher soldering temperature increases stress
- Pad susceptible to dissolution during “Wave Solder”
- New aspect ratio design rules?

Pb-free transition is driving changes to a majority of the material system

BAE SYSTEMS

In addition, the military has:

- Qualification requirements
  - Both “as built” and when mixed with Sn-Pb
  - Rework/repair: single(multiple) alloy(s) and process(es)
- 20 yr. service, configuration management, solderable shelf life, and solder compatibility issues:
  - SAC, SnCu, Sn-Pb, low melting point alloys, bismuth bearing alloys
- Long-term harsh-service reliability considerations
  - Solder reliability is dependent on the parts, the PWB, the metallurgy and the environment
  - Reliability requirements differ significantly across applications
  - Thermal cycling, vibration/shock, humidity, and other environments



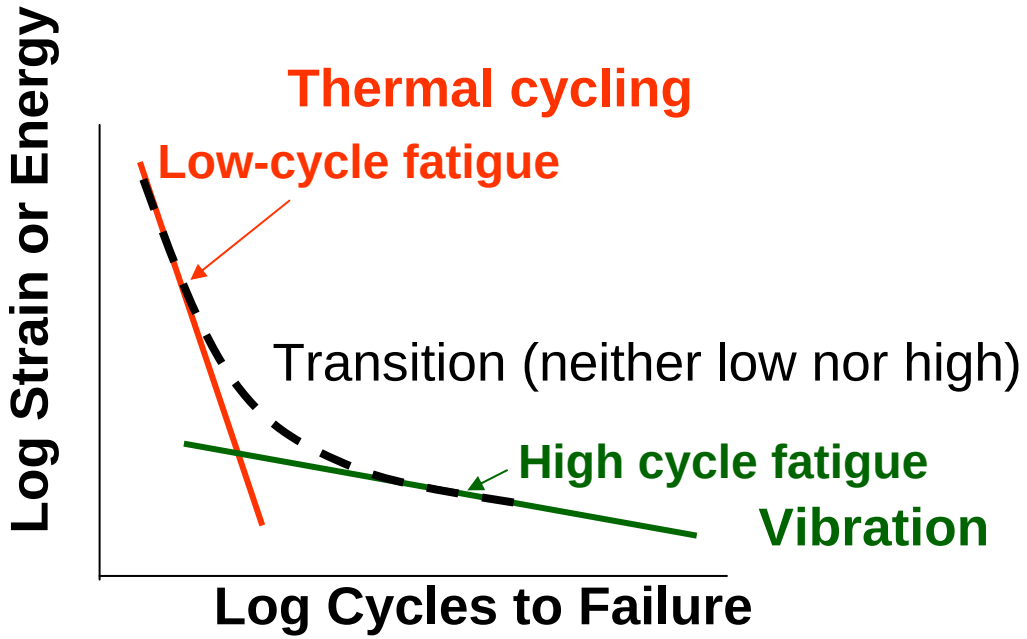


BAE SYSTEMS

Solder interconnect fatigue

•Modeling: Fatigue life can be related to any parameter directly proportional to the damage in the solder failure site

- Some models use cyclic strain range
- Some models use cyclic work dissipation due to cyclic hysteresis



Military equipment experiences a broad range of cyclic loads

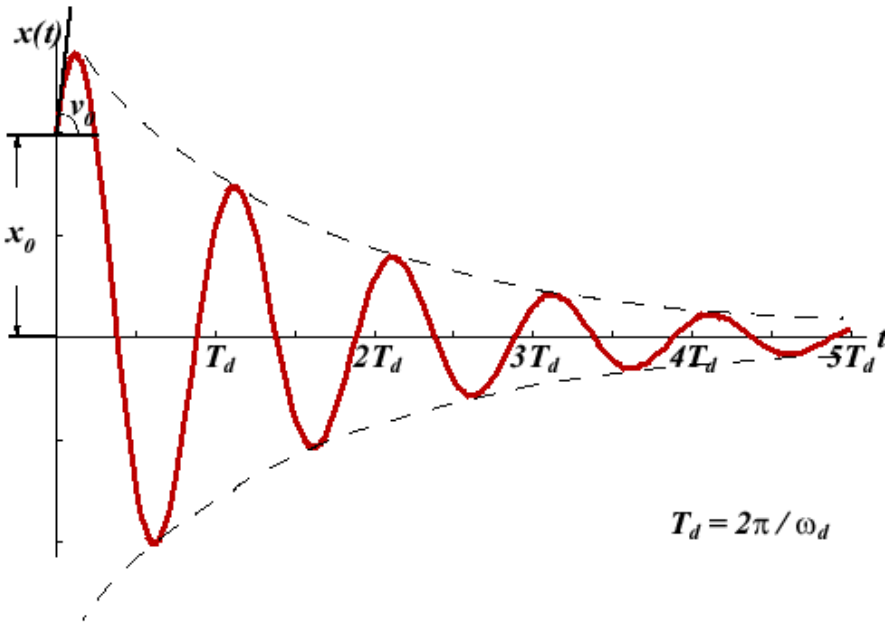
Real missions have combined thermal/vibe/shock

Need to validate combined models

BAE SYSTEMS

Vibration/shock loading

- Vibration/shock performance was a tough topic with Sn-Pb solder,
  - Pb-free didn't make things easier
- Not much vibration/shock data available
  - Cell phone drop-shock testing driving commercial industry
  - Data from JCAA/JGPP testing
- What heritage Sn-Pb tests need to be different for Pb-free?
  - Intermetallics grow thicker
  - Does there need to be thermal preconditioning prior to vibration?
  - Should vibration/shock testing be performed over temperature?
  - CALCE project under way to address some of these issues



MIL-STD-810 tests may need revision for Pb-free

BAE SYSTEMS

JCAA/JGPP tests

- Full military environmental testing of many part types, two Pb-free solders (SAC and SAC with Bismuth) and various rework combinations.
  - http://www.jgpp.com/projects/lead_free_soldering/presentations.html
- Recently completed -55 to +125 ^{o}C thermal cycling test
  - 4743 thermal cycles completed during the 12 month test duration
  - **CLCC 20: SACB > SnPb > SAC**
- In-process - thermal cycle testing -20°/+80°C
  - As of April 2006, 10300 thermal cycles completed. Need ~3000 more.
  - **CLCC 20: SAC = SACB > SnPb**
- Combined environment (thermal cycling + vibration)
  - **CLCC 20: SACB > SnPb > SAC**
- Vibration (room temperature)
  - **CLCC 20: SnPb > SACB > SAC**

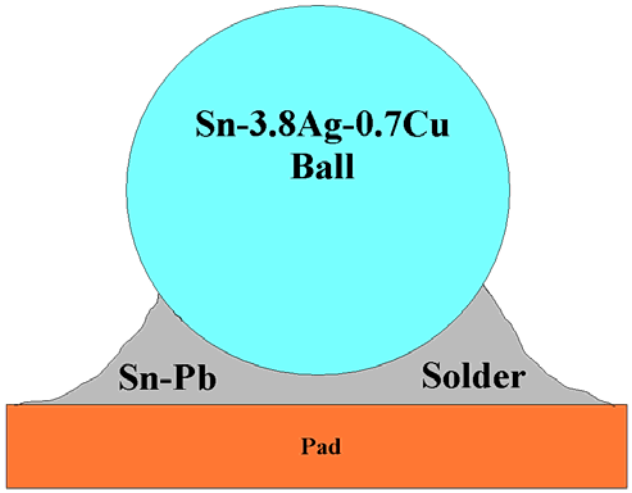
Too Bad SACB is incompatible with Sn-Pb

Need to take test results as a whole
Performance depends upon environment

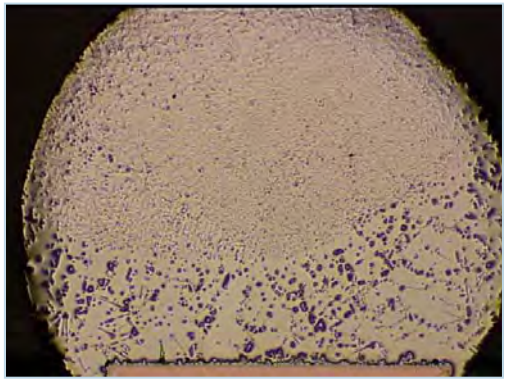
BAE SYSTEMS

Mixing of alloys – today's problem

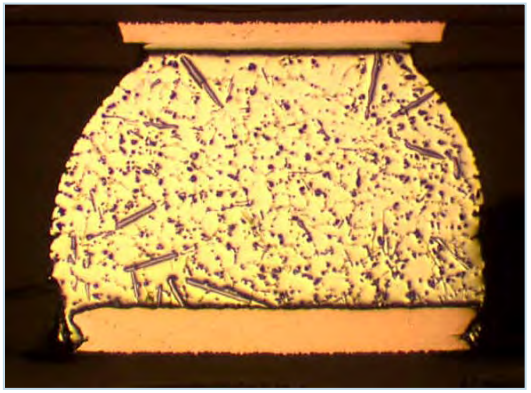
- It would be better not to, but if you have to, what can be done to help mixing without getting hotter?



P. Snugovsky (2006)



Undesirable:
A moderate volume of Sn-Pb results in partial dissolution of Pb-free Ball



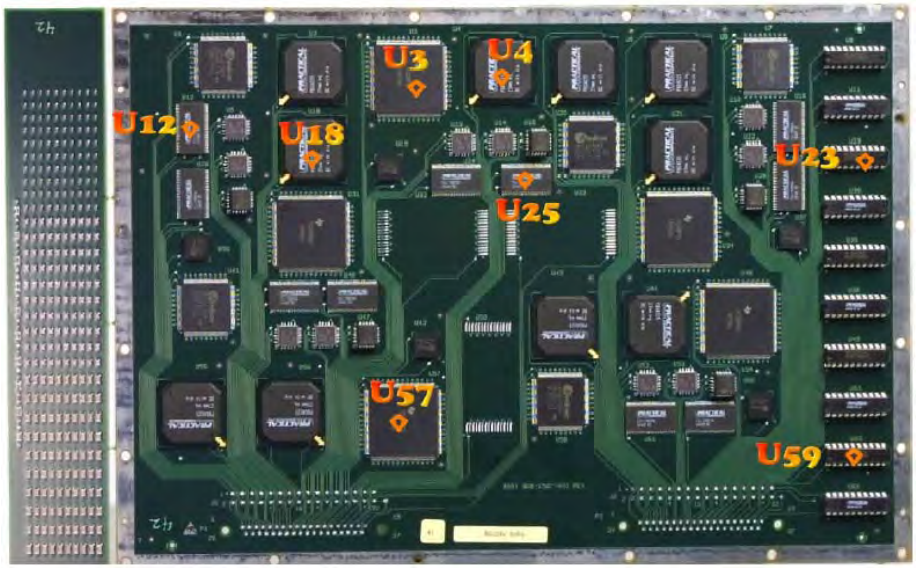
Better:
More Sn-Pb results in a fairly uniform composition and phase distribution

Increasing deposited paste volume improves mixing.
Process details affect both initial manufacturing and repair

BAE SYSTEMS

Technical gap analysis

- Topics needing further study for high performance applications
- Combined environments:
  - High temperature, low temperature
  - Vibration, shock
- Thermal cycling – dwell and mean temperature variation (CALCE Project under way)
- Humidity/SIR/CAF – Testing to failure (CALCE Project under way)
- Solder processes/flux assessment
- Workmanship guidance
- Printed wiring boards – dissolution, PTH, laminate integrity
- Components – moisture/temperature sensitivity
- Mixed alloys (Sn-Pb/Pb-free) – including double sided reflow assemblies.
- Repair of large complex devices



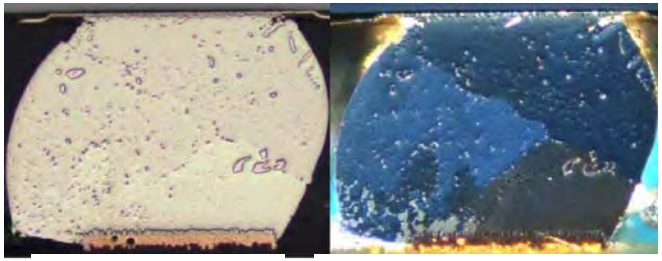
(JCAA/JG-PP Test Board)

A Considerable amount of data is still needed

BAE SYSTEMS

Summary

- Much Good Data Available
  - Need to be sure assembly stiffness and test details are relevant to application
  - Check that adequate thermal cycling dwell time is used to allow proper Pb-free solder alloy creep (dwell time can be modeled, but should be longer than Sn-Pb)
- Considerable data still needed as indicated in gap analysis
- Pb-free alloy(s) are not a drop in replacement for Sn-Pb for all applications
  - Need to examine the details
  - The reliability of solder is a function of the material and the application where it is used.
- Service Center Logistics will be important
  - Configuration management
  - Components/PWB: Finish, temperature rating, moisture sensitivity, shelf life
  - Repair process: temperature profile, solder type, flux



Bright Field Cross Polarizers

E. Cotts, Universal Instruments Consortium Meeting, June 2006

Tin Whiskers: Reliability Risk That Adds a New Dimension to DMSMS

2006 Diminishing Sources and Material Shortages (DMSMS) Conference

10-13 July
Charlotte NC

Charlie Minter
Representing
Best Manufacturing Practices Center of Excellence
240-465-1566 ext 14; FAX 301-403-8103
charlie@bmpcoe.org

Best Manufacturing Practices Center of Excellence

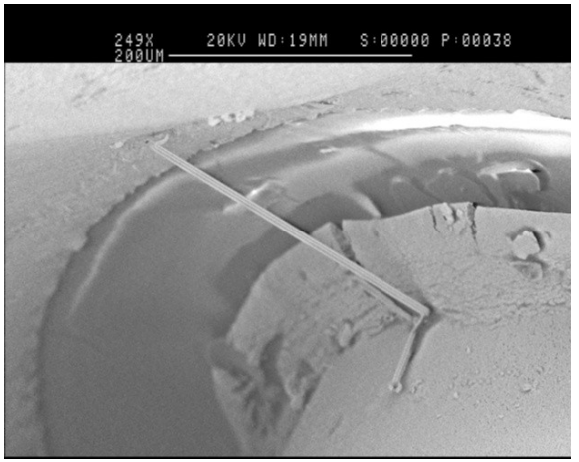
- Department of the Navy Manufacturing Technology Program
  - A National Center of Excellence
  - Approximately 45 People Augmented by More Than 150 Subject Matter Experts

- Heritage
  - Transition from Development-to-Production Templates (1985)
  - Industry Facility On-site Surveys (1985-Present)
  - Practical Engineering Guides for Managing Risk (1985-Present)
  - Support Military Acquisition Activities (1985-Present)
  - Program Manager's WorkStation (1993-Present)
  - Integrated Digital Environment Using Web Technologies (1996-Present)
  - Winner - Innovations in American Government Award (1998)
  - Winner - Vice President's Hammer Award (2000)

www.bmpcoe.org

What Are Tin Whiskers?

- Single Crystal, Hair-like Growths from Surfaces that use **Lead-free Tin (Sn) as a Final Finish**
  - Electrically Conductive
  - May Grow in Days/Weeks/Years
  - Length: 1mm Typical; Some 10mm
  - Electrical, Electronic and Mechanical Parts



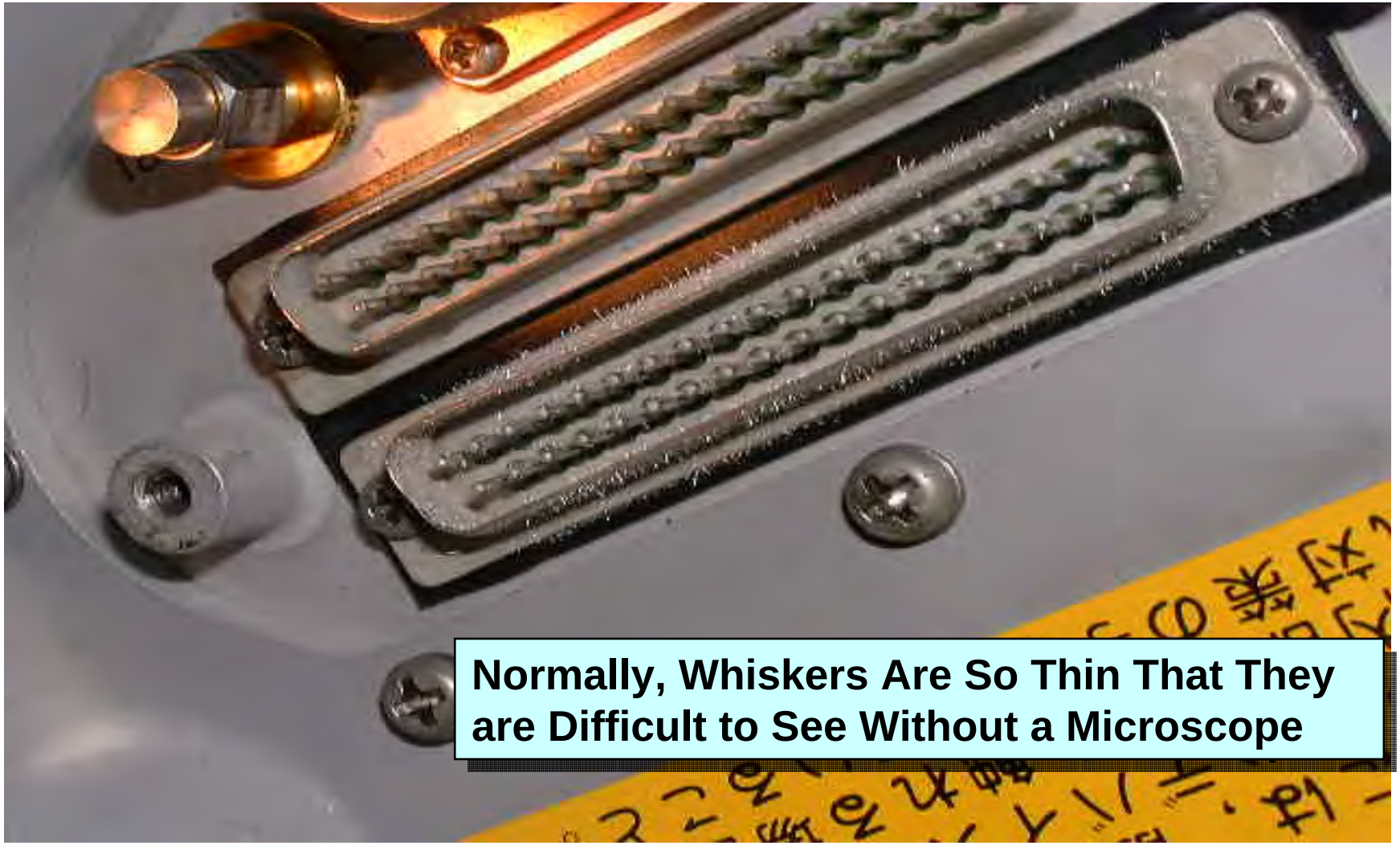
2004 short circuit failure on legacy missile accelerometer

- Growth Mechanism Still Not Fully Understood – Much Conflicting Data
- **No** Effective Tests to Predict Susceptibility
- **No** Mitigation Technique Guarantees Protection Required by DoD

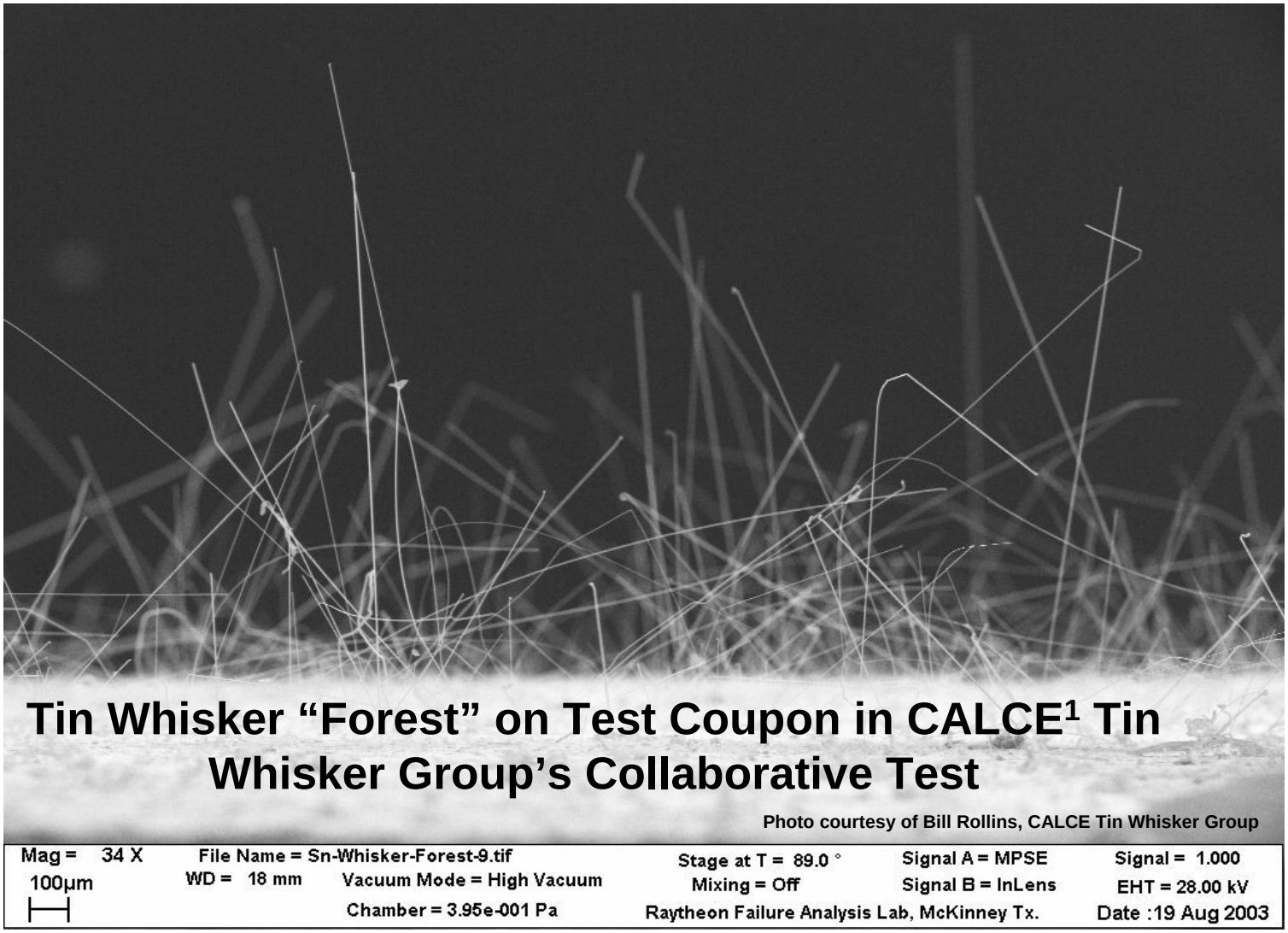
There is No One Solution for All Tin-Plate Applications

Photo Courtesy of CALCE Tin Whisker Group

Tin Whisker Example



Tin Whisker Example

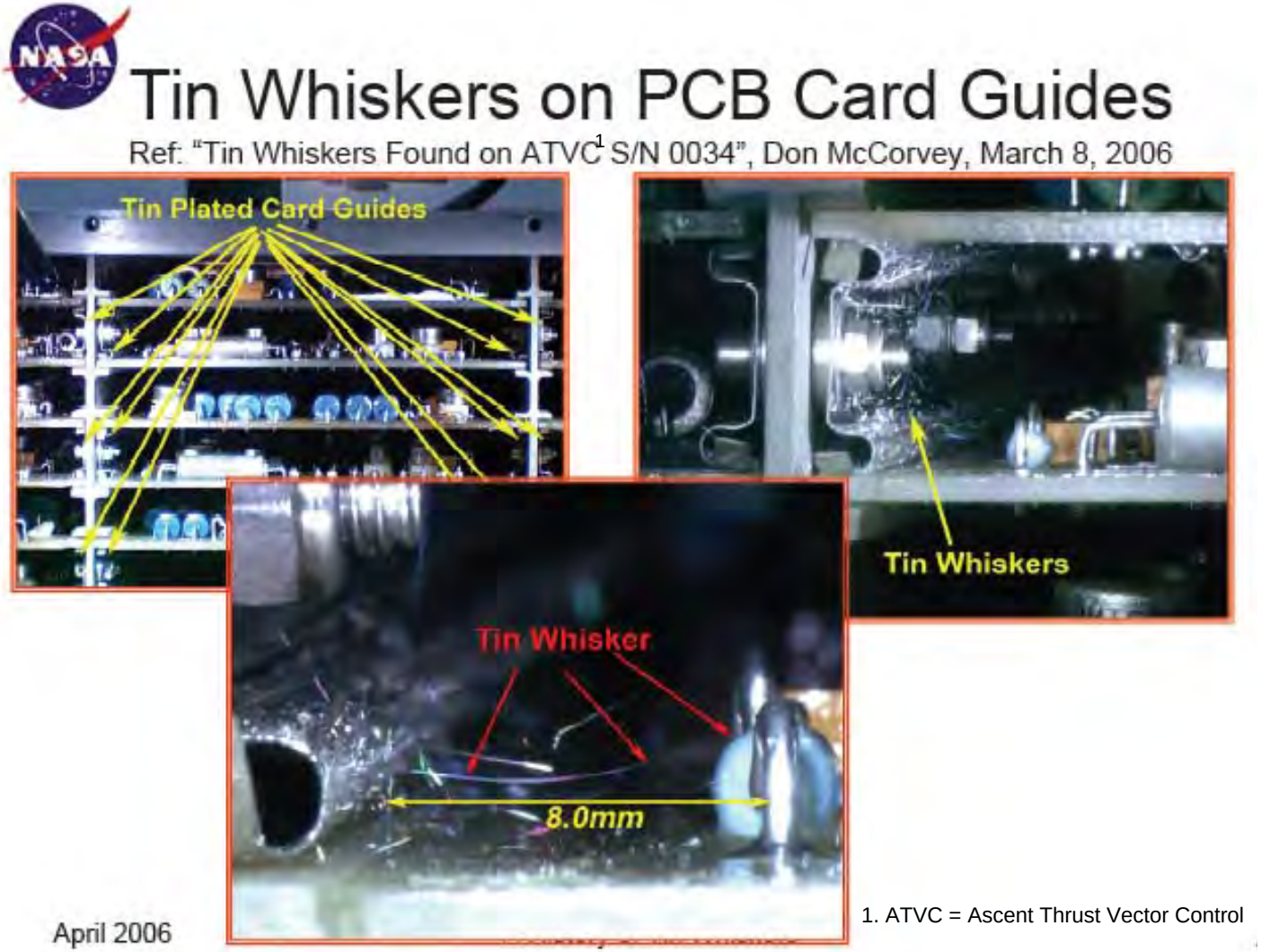


Tin Whisker "Forest" on Test Coupon in CALCE[1] Tin Whisker Group's Collaborative Test

Photo courtesy of Bill Rollins, CALCE Tin Whisker Group

[1]Center for Advanced Life Cycle Engineering, University of Maryland

March 2006 - Tin Whiskers Found in Space Shuttle



1. ATVC = Ascent Thrust Vector Control

Ref: "Tin Whiskers: A History of Documented Electrical System Failures – A Briefing Prepared for the Space Shuttle Program Office," Dr. Henning Leidecker/NASA GSFC and Jay Brusse/QSS Group, Inc, April 2006

Why an Issue Now?

- Smaller Circuit Geometries
  - Whiskers Can Bridge Contacts
  - Adjacent Whiskers Can Touch
  - Broken Whiskers Can Bridge Board Traces, Foul Optics
- Lower Voltages – Whiskers Can Sustain Current

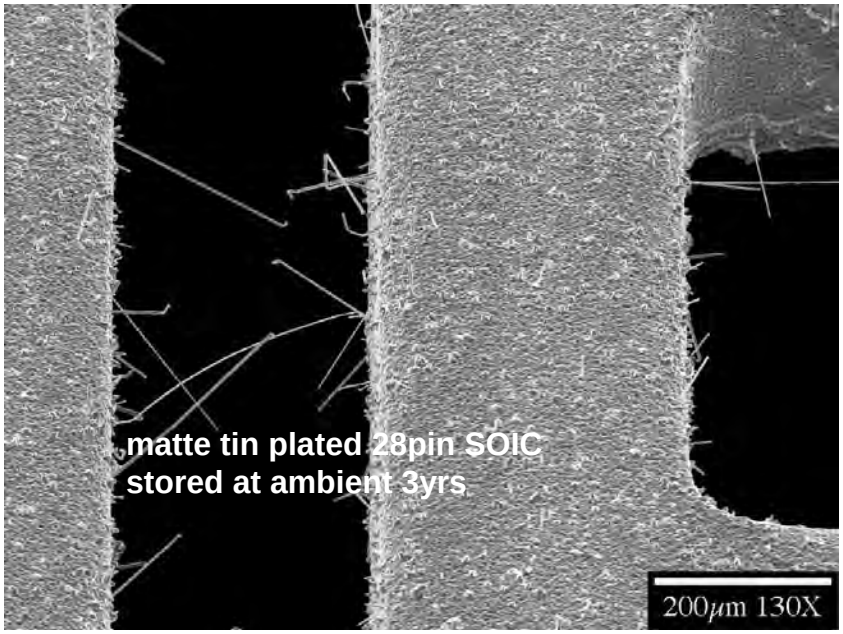


Photo Courtesy Peter Bush, SUNY

- Manufacturers Rapidly Going to 'Green' Materials
  - Compliance with European Union RoHS[1] Directive
  - Pure Tin Plate the Primary Finish of Choice
  - Some Changes Made Without Notice
  - Some Part Numbers Unchanged

[1]Restriction on Hazardous Substances

Tin Whisker Failure Mechanisms

- Stable Short Circuit in Low-Voltage Circuits
- Transient Short Circuit Until Whisker Fuses Open
- Plasma Arcing in Vacuum Potentially Most Destructive - *Vaporized Tin May Form a Plasma that Can Conduct Over 200 Amps!*
- Debris/Contamination: Whiskers May Break Loose and Cause Short Circuits or Interfere with Optical Surfaces
- High-Frequency Circuit Performance (6 Ghz Rf and Above)

Airworthiness Advisory AA-05-01, Lead-Free Solder

- Issued 2005 by the Aeronautical Systems Center (AFMC), Wright-Patterson AFB
- Purpose: "…provides information on the trend within the electronics…community toward the use of lead (Pb)-free solder. To date, no lead-free solders are known to have met the reliability requirements imposed upon military electronics…"
- Scope: "…applies to all USAF aircraft, manned and unmanned..."
- Guidance/Recommendations: **"**Until…a suitable, reliable, lead-free solder replacement is identified, all program managers should ensure their electronic equipment suppliers continue to provide items which meet all performance, compatibility, and reliability requirements.…"

Nuclear Reactor Shut Down by Single Whisker

GIDEP AAN-U-05-093 13 Sept 05: NRC NOTICE 2005-25: INADVERTENT REACTOR TRIP AND PARTIAL SAFETY INJECTION ACTUATION DUE TO TIN WHISKER

- 17 April, 2005 – Millstone Nuclear Generating Station experienced an unexpected safety injection actuation and reactor trip caused by a fault on a protection system circuit card
- Caused "…safety train actuation and reactor trip"
- A single tin whisker created a bridge (short circuit) between a diode and the output trace on a circuit card

Swatch Watch Failures

- Swatch Group Began RoHS Compliance Effort in 2003
- Implemented for Mass Production in 2005
- As of January 2006, 30% of Quartz Crystal Oscillators Had Tin Whiskers
- 5% (And Counting) Have Experienced Short Circuits
- Have Applied for RoHS Exemption

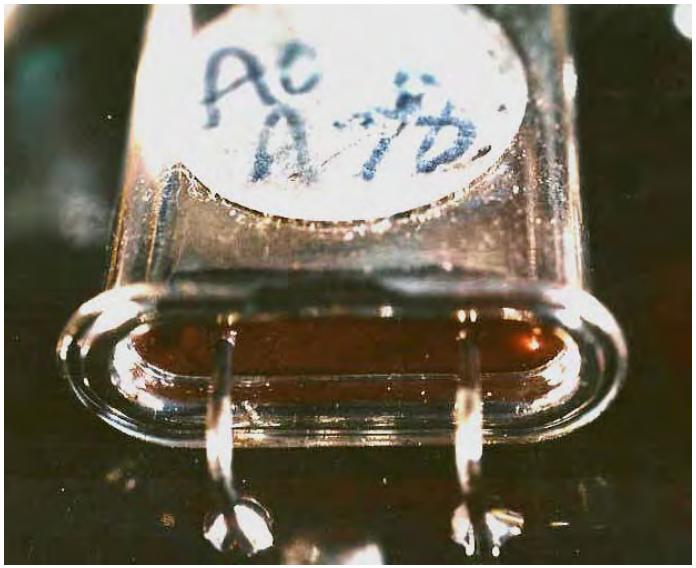
Complicating Factors

- Reliability the Issue, but No Quantifiable Means of Prediction (e.g., Cannot Predict MTTF/MTBF)
- COTS Assemblies (e.g., IMUs) - Little Control Over Design/Manufacturing Processes
- Risk Assessment Methodologies Still Being Developed
  - Whisker Mitigation Levels
  - Raytheon Risk Assessment Algorithm
  - CALCE calceWhiskerRiskCalculator
  - Tyco Risk Methodology
- Most Proposed Partial Mitigation Techniques Still Unproven/Unqualified

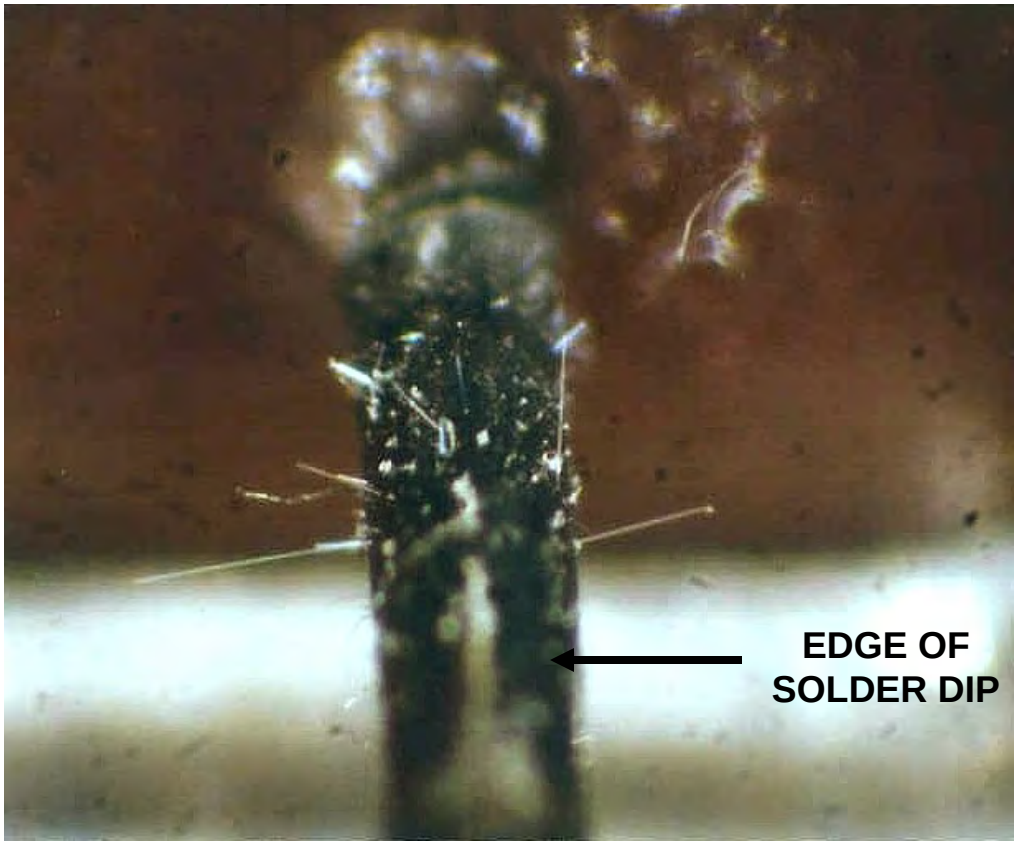
Solder Dipping Mitigation Technique

- Provides a Means of Mitigating Tin Whiskers on Many Component Types
- Replaces Tin (Sn) Finish with Tin-lead (Pb-Sn) Finish (Pb 3% Min)
- Robotic Process Preferred/Required for Fine-Pitch Parts
- Requires Careful Control of Dipping Time, Temperature, Angle, etc.
- Requires Complete Coverage to Ensure Effectiveness in HIREL Applications

Tin Whisker Crystal Solder Dip Failure



- **Through Hole Crystal**
- **Bright Tin Finish**
- **Manually Solder Dipped to within 50 mils of Glass Seal**

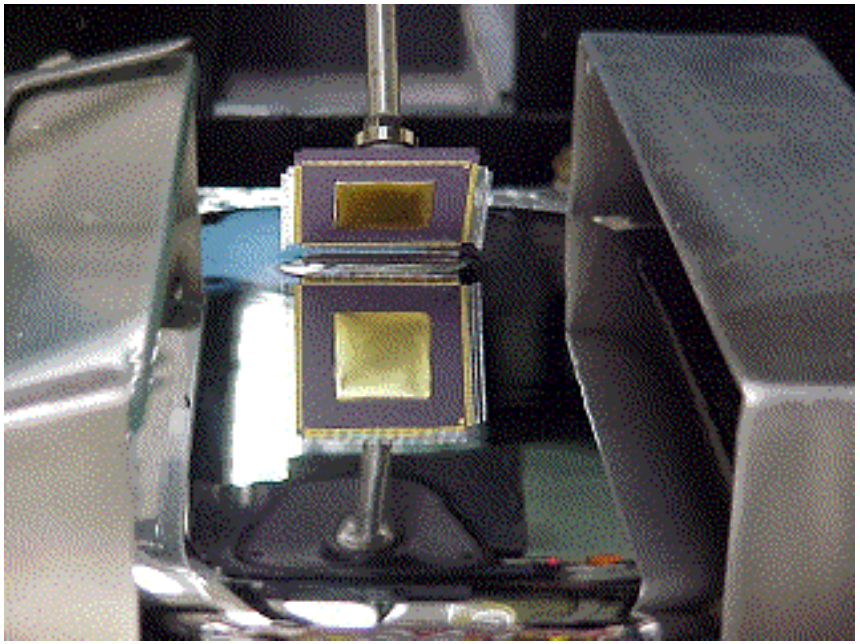


Tin Whisker Growth Noted from Seal to near Edge of Solder Coat. Electrical Failure Traced to a 60 mil Whisker that Shorted Lead to Case

NASA GSFC Tin Whisker Website
http://nepp.nasa.gov/whisker/

One Partial Solution: Robotic Solder Dip

- ONR ManTech Research Project: “The Use of Robotic Solder Dipping to Replace Electronic Part Surfaces Finishes of Pure Tin With a Tin-Lead Finish”
- Qualified a Number of Component Package Types for a Tailored Commercial Process for Robotically Refinishing Component Leads



Robotic Solder Dip Project Benefits

- Project Qualified a Tailored Commercial Process to Completely Replace Pure Tin with Tin-Lead
  - Usable for a Significant Number of Microcircuit Package Styles
  - Will Allow Use of Many Microcircuits Made Obsolete for HREL Users
  - Will Allow Many Programs to Avoid Redesigns/Production Interrupts
  - Can be Incorporated into Supply Chain Process Through Parts Suppliers/Distributors
- Some Component Package Styles Do Not Qualify
  - Existing ‘Advertised Mitigation Methods May Help but Most Offer Limited Protection
  - Conformal Coatings Offer Most Promise; New, Tougher Ones Need to be Developed

Information Sources

- NASA Goddard Space Flight Center Basic Info/FAQ

  http://nepp.nasa.gov/whisker/

- University of Maryland Center for Advanced Life-Cycle Engineering (CALCE)

  http://www.calce.umd.edu/lead-free/

- Project Report for ManTech Research Project S1057: Tin Whisker Mitigation - The Use of Robotic Solder Dipping to Replace Electronic Part Surfaces Finishes of Pure Tin With a Tin-Lead Finish

  http://www.bmpcoe.org/

- "Tin Whiskers: A New DMSMS Issue," DMSMS COE Newsletter, Vol 3, Issue 3, April 2005

  http://www.dmsms.org/

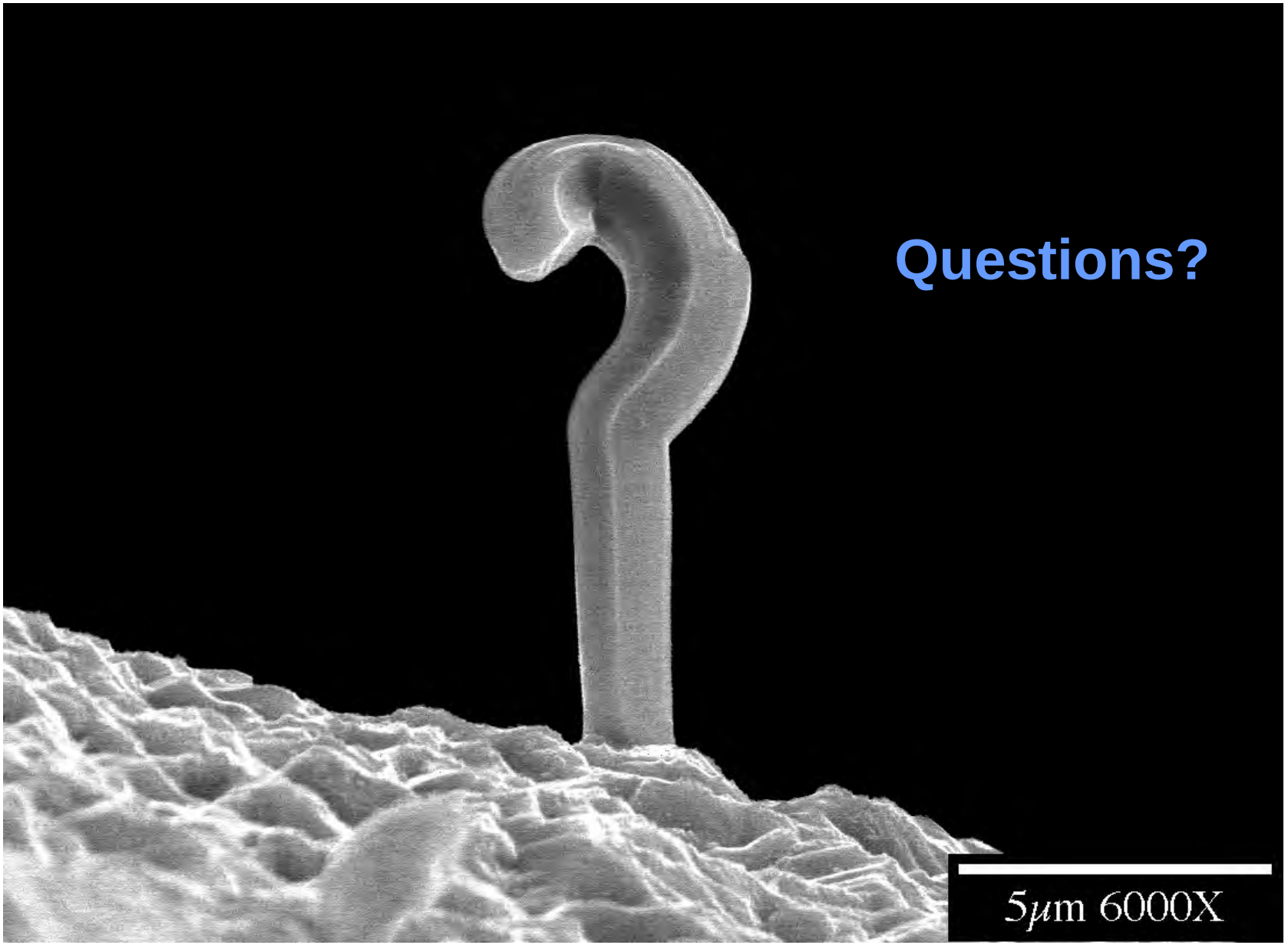


Photo courtesy of Peter Bush, SUNY at Buffalo

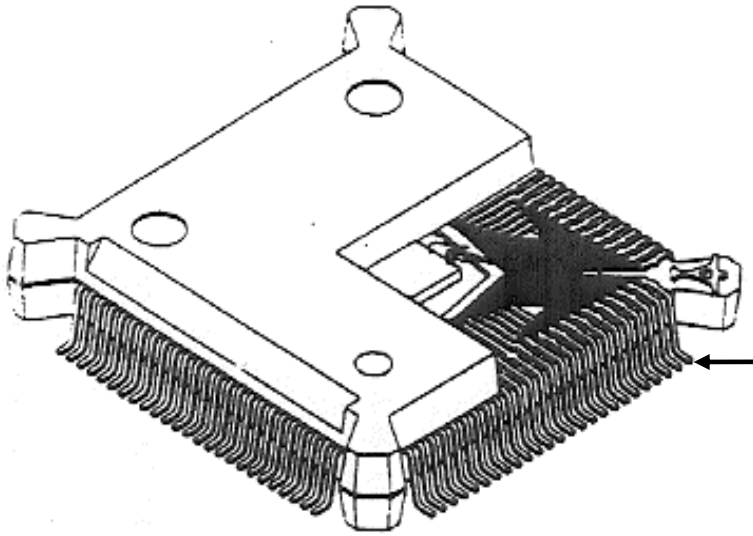
BACKUP

The Problem

- DoD Acquisition Programs are Increasingly Dependent on Commercial Electronic Parts and Assemblies - COTS
- The Commercial World is Going Lead-Free
- Lead-Free Products and Processes Pose a Host of Risks to Reliability — the Most Insidious is the Susceptibility to Growth of **Tin Whiskers**
- The Problem is Only Going to Get Worse
- High Reliability Systems Most Vulnerable
- Many Parts Will be Available but Unusable, and thus **'Obsolete'** for HIREL Systems
- Mitigation Techniques are Urgently Needed
- Robotic Solder Dip Provides One Technique for Many Electronic Package Types

The Solder Dip Technical Challenge

- Smaller Circuit Geometries
  - Partial Coverage
  - Solder Bridging
- Plastic Packages
  - Thermal Effects



Typical PQFP Lead Spacing
9 mil (229 micron)

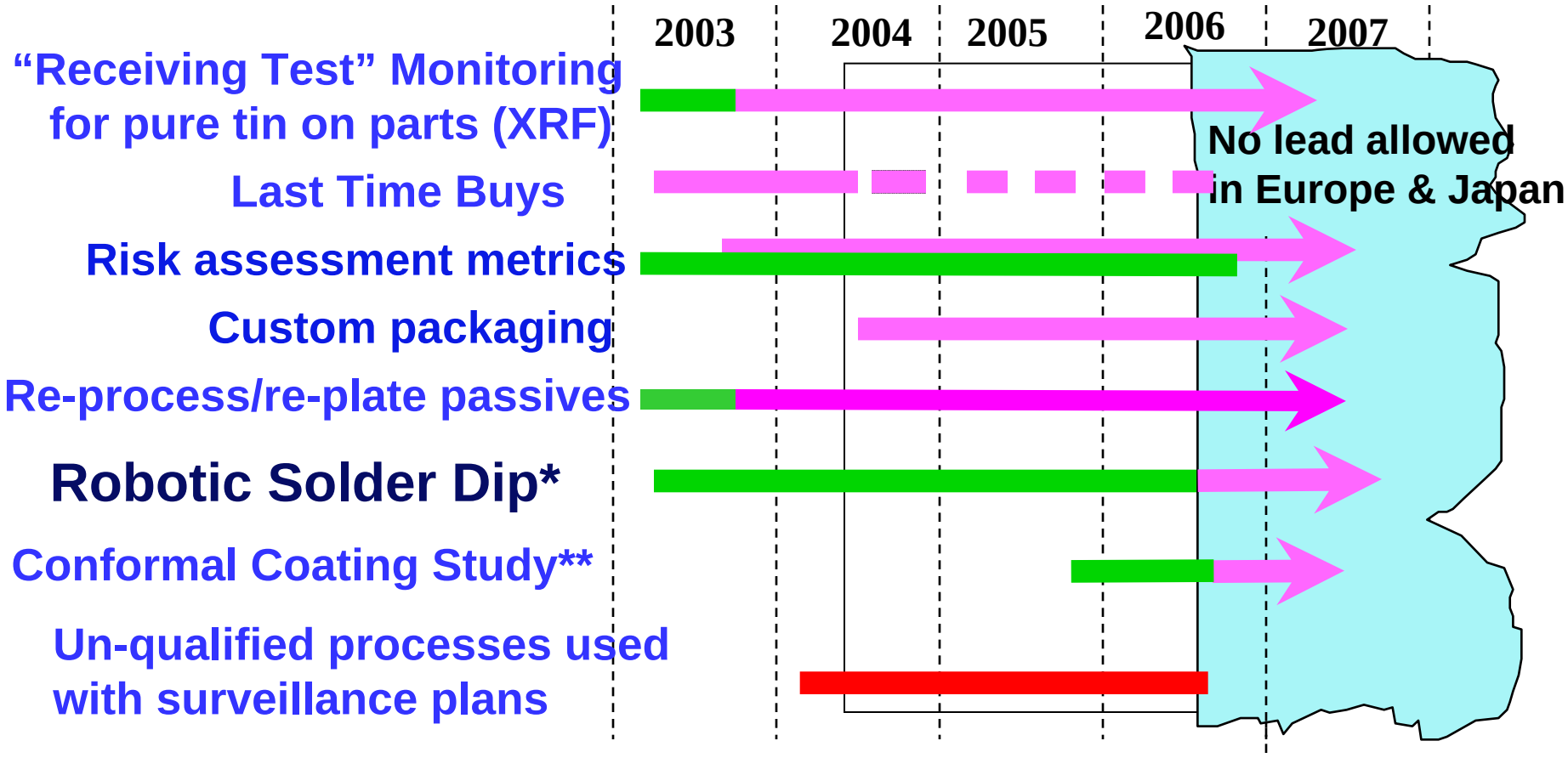
Typical Quad Flat Pack

Some Risks With Lead-free

- Tin whiskers
- Tin plague
- Major Difficulties in Parts Management
  - Mixing Tin-lead and Lead-free
  - Inability of Contractors to Know What Type Parts They are Getting
- Higher Soldering Temperatures – Potential Damage to Parts
- Mixed Technology Boards
  - Temperature and Thermal Expansion Mismatch Issues
  - Rework Issues
  - Cannot be Overemphasized

There are a Host of Issues Associated with Lead-free

Timeline For Tin Whisker Risk Mitigation Tool Development And Implementation



Missiles And Related Weapons Particularly Vulnerable

- Unique Vulnerability Factors
  - Components Not in Continuous Operation
  - Long Term Unobserved Dormant Storage
  - Diurnal Thermal Cycling
  - Transportation/Launch Vibe/Shock
  - Non Redundant Circuits/HW
- Other Factors
  - Generally No LRU
  - Generally No BIT to CCA Level
  - High Unit Cost (e.g., Trident, THAAD, SM-3, Nuclear Weapons)
  - Many Lives at Stake



Life Cycle Management

Diminishing Manufacturing Sources and Material Shortages (DMSMS) Conference

Gary Nenninger
AMCOM G-3

11 July 2006



The Situation

- **Problem: Average Age of Army's Aviation and Missile Systems Continues to Increase**
- **What's Being Done**
  - **New Procurement**
  - **Recapitalization**
  - **Modernization Through Spares**

UH-60 Modernization

UH-60A/L Baseline

Entered Army Service 1979



- **Analog Cockpit**
- **STD Transmission**
- **700 Series Engine**

Today

UH-60M Block I



- **Digital Cockpit**
- **Dual Digital Flight Controls**
- **Fully-Coupled Flt Director**
- **Wide Chord Blades**
- **Rotor Brake Provisions**
- **Folding Composite Stabilator**
- **Improved Durability Gearbox**
- **701D Engine**

Performance Attributes (4K Ft/95^{0}F):

External Lift (lbs @135km): 4500
Air Assault Radius(km): 225

2007

UH-60M P3I Spiral Dev



- **Fly-by-Wire (FBW) Advanced Flight Controls**
- **Full-Authority Digital Engine Control (FADEC)**
- **Common Cockpit - Common Avionics Architecture Sys (CAAS)**

- **Composite Tailcone – *As Ready***
- **JTRS – *As Ready***
- **IVMS / HUMS – *As Ready***
- **CMWS / IMCD – *As Ready***

External Lift (lbs @135km): 4500
Air Assault Radius (km): 225

2009

UH-60M Block II



- **Improved Turbine Engine Program (ITEP)**
- **Improved Transmission**
- **FLIR/MMR**
- **Large Fuel Cell**
- **Improved ASE**
- **Composite Airframe**

External Lift (lbs @135km): 9000
Air Assault Radius (km): 275

2013

Recapitalization

Rebuild	Selected Upgrade
Zero Time Maintenance Standard	Zero Time Maintenance Standard
Technology Insertion	Technology Insertion
Same Model - New Life	Upgrade Warfighting Capability
	New Model - New Life

Two Paths

UH-60A





CH-47F

AH-64D



One Outcome

Organic Depot End Item Workload

- Extended service life
- Reduced Operating and Support (O&S) Cost
- Improved System Reliability, Safety, Maintainability, and Efficiency
- Enhanced Capability

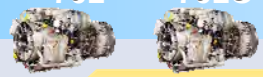
Modernization Through Spares (MTS)
T700 Engine Series Example

Today



AH-64A

-701 -701C





AH-64D

-701 -701C





UH-60L

-701C





UH-60A

-700



- Army Working Capital Fund

DEPOT OVERHAUL

Tomorrow

701D (-)

701D Without Power Upgrade – Run With C Controls



- Reduce O&S Cost up to $100M/yr
- Improve Readiness Thru Commonality and + 30% TOW
- 60 – 75 Day Depot Overhaul

- Increased Power = Increased Payload

Field Upgradeable Power With New DECU/FADEC & HMU

Future Force

701D



701D in UH-60A Control Integration

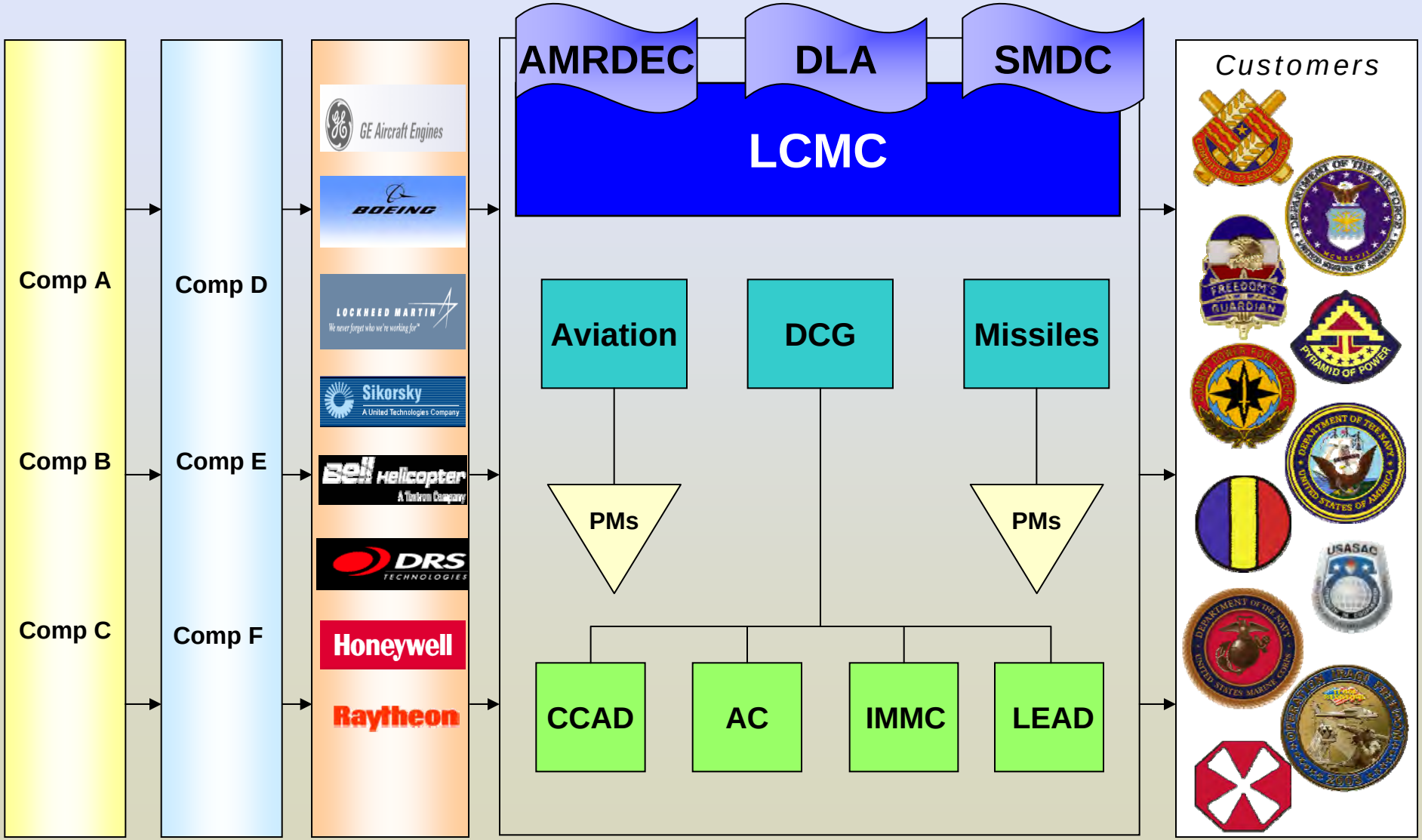
Barriers to Recap & MTS

- **Obsolescence**
- **Non Availability from Original Vendor**

Lack of Data Rights / TDP Inhibits Reprocurement / Competition

Up Front Funding Required To Reengineer Obsolete / Unprocurable Components

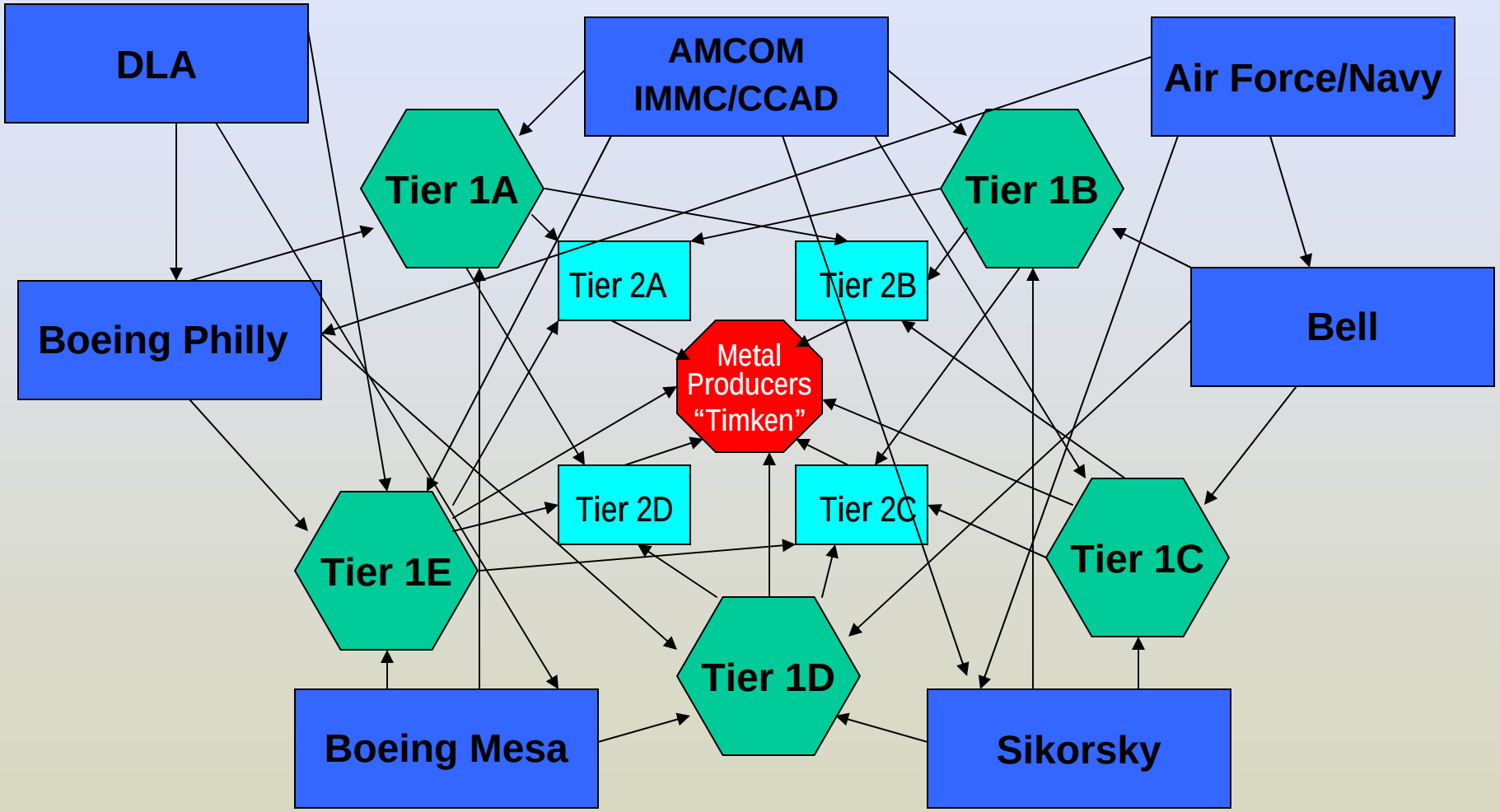
AMCOM Enterprise & Supply Chain



Supply Chain Initiative

- Develop Factory-to-Foxhole View
- Identify Network of Multi-tiered Suppliers for Selected Dynamic Components
- Identify Critical Vulnerabilities in Enterprise Supply Chain
- Identify Opportunities for Lean and Process Improvement Efforts Within Overall AMCOM Supply Chain
- Develop Recommendations for Supply Chain Improvements
- Focus:
  - Increase Throughput Throughout Supply Chain
  - Decrease Production Lead Time
  - Increase Serviceable Inventory
  - Reduce Backorders and Procurement Due-in's
  - Increase Induction of Unserviceable Onhand
  - Increase Flow of Overhaul

Aviation Supply Chain/Web
Heightened Demand on Limited Capacity



All Roads Lead To Timken Latrobe

Supply Chain Initial Findings

Line-of-Balance Reviews of Aviation Items – Intensive Management Required

- Lead Times Too Long
- Better Inventory Management Needed
- Labor Vulnerability at Vendor Factories
- Limited Communication or Visibility of Information in Supply Chain
- Sole Source Restraints/Constrained Capacity for Specialty Metals

Berry Amendment Impacting Specialty Metals Availability

Opportunities For Improvement Exist & Are Being Pursued

Path Ahead

- **Intensively Manage Supply Chain**
- **Pursue Joint Contracting Initiatives**
- **Avoid "Boom or Bust" Procurement Cycles**
- **Consider Bringing Single Source / Foreign Source Items In-house (Eliminate Industry Capitalization Issue – Biggest Barrier to Market Entry)**


USMC
Graphic by
WTC Stephan Harris, USN Ret.

DMSMS

The Challenges Ahead

Brigadier General E.G. Payne
12 July 2006


9:30PM
11/27/1995

DMSMS

What are the options?

Is this your Weapon System?





Sustainment

- USMC LOGCOM has a vested interest
- Failure results in
  - Unfulfilled need
  - Down weapon systems
  - Lots of heat from the war fighter & HQ
  - Loss or injury
- Failure is not an option in today's world
- Just knowing it's obsolete is not a fix

Reactive Costs

10 Billion Dollars +

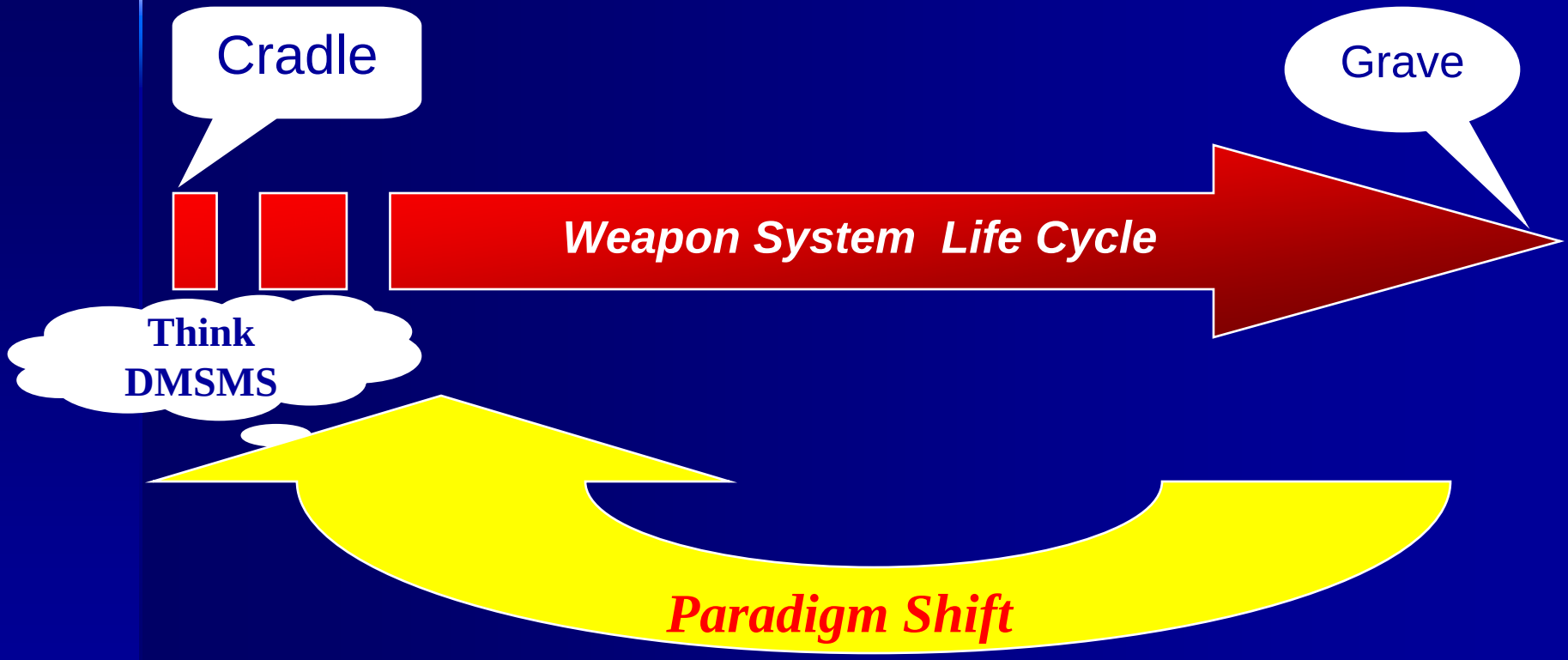
"B"

(Current DoD cost estimate per year)

Budget Future

- Current world Ops or Iraqi ramp down
  - Budgets will shrink
  - Performance requirements stretched
  - Life cycles pushed out
- DoD budget will become target again
- Will loose dollars, people and resources
- Gets harder before it gets easier
- Must work smarter NOW to ease future pain

TLCM & DMSMS



How is your budget doing this year?

USMC DMSMS Survey

- Self Assessment Survey on USMC Ground Equipment programs and practices Aug 05 to April 06
- Ensure decisions are fact based
- W.Edwards Deming – "People closest to the problem usually have the solution to the problem" so we interviewed them to learn from them.
- 3 Prong Approach
  - On Line Survey
  - Interviewed across all disciplines
  - On Site Instructor Led Training
- Available on the DKSP Web Site

Survey Objectives

- Determine current state of processes and capability ….. Including compliance with policy and directives
- Identify and quantify magnitude of DMSMS issues
- Recommend actions for implementing DMSMS policy, processes, and guidance in MARCORSYSCOM and MARCORLOGCOM

Survey Conclusions

- We have a long way to go and a short time to get there.
- Training is our number one issue and priority. “
- It’s a knowing problem and not a doing problem”.
- Need to institutionalize DMSMS in all facets of our Life Cycle Management Processes

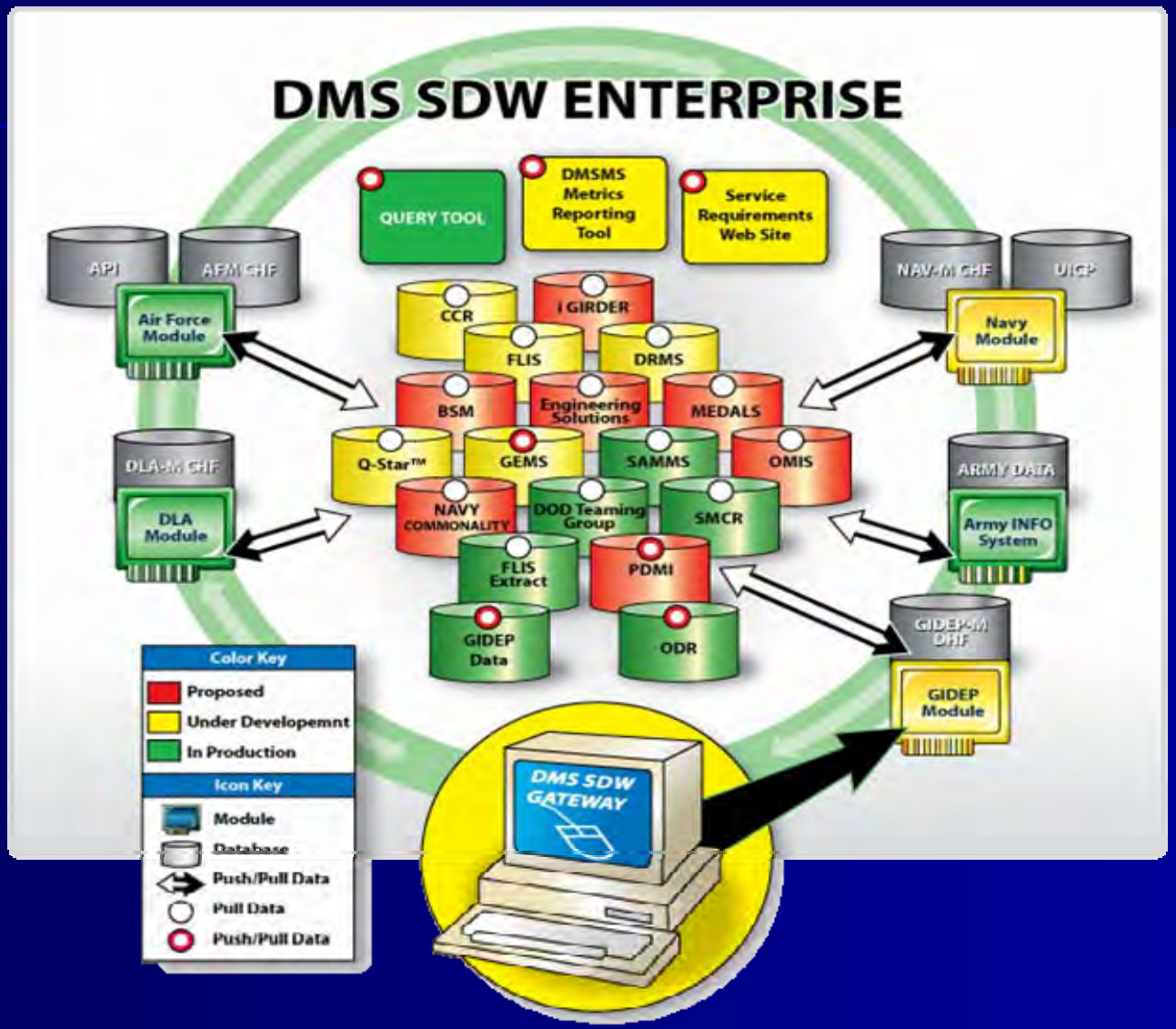
Maintenance Centers
(Depots)

- Organic repair facilities are a vital asset to our national security
- Must remain competitive to survive
- DMSMS is a daily issue and are extremely aggressive in handling reactive DMSMS
- Depots must face DMSMS not only as we know it but Diminishing Technologies too
- Road ahead for depots is to learn to be more aggressive in the Pro-Active world.
- Directly impacts Cost, Schedule, and Quality performance standards

Shared Data Warehouse (SDW)

- Comprehensive DoD system
- Less time on research
- Allow more time on analysis, mitigation, and proactive activities
- ODR within the SDW will avoid duplication of efforts and save dollars
- Cross talk amongst the services vital
- Metrics Reporting Tool to support funding

Shared Data Warehouse



RoHS - A new challenge

- RoHS is the new DMSMS Challenge
- Restriction on Hazardous Substances also know as directive 2002/95/EC
- Lead Free Solder in COTS June 06'
  - Whisker problem and no solution to date
  - More brittle & cracking in high vibration
  - Higher melting temp impacts repairs
- Undeveloped repair procedures
- Configuration uncontrolled
- New disposal regulations

DON Strategic Plan for DMSMS

- Determine the magnitude
- Develop a management process to track DMSMS cases and share resolution data
- Communicate DMSMS goals, promote policies and guidance

…But we can also do one more thing…

...We need to do a better job at being proactive...

...Which we can do if we follow the DON strategic plan...

Conclusions

- USMC has a long way to go
- Education, training, tools, processes, and management oversight are key
- Proper planning & tighter scrutiny during acquisition = huge benefits.
- Must measure it to fund it
- Continuous process improvement is imperative. Status Quo is too expensive

Thank You !

DoD DMSMS Workshop



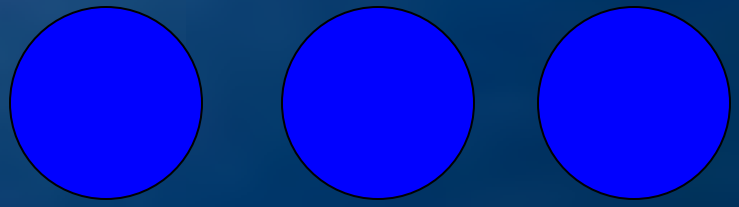
Mr. David G. Robinson
DLA DMSMS IST and GEM Program Manager

Charlotte NC, July 13, 2006

Ever wonder how it all works?

- The DoD DMSMS WG, DKSP, DLA DMSMS IST, SDW and BSM Made Easy…..

http://blueballs2.ytmnd.com/



DMSMS Conference 2006

- Executive perspective on DMSMS
- Representatives from DoD and Industry
- Important Topics Included:
  - TLCSM
  - RoHS/WEEE
  - DMSMS Management and Planning
  - DMSMS Contracting
  - Latest Innovations

Workshop Purpose

- Provide working level information to help you manage your DMSMS problems
- Ensure you are aware of the tools, teams, processes and other developments taking place within the DMSMS community
- Provide networking and teaming opportunities
- Discover new issues to address

Today's Focus

- The DoD DMSMS Team
- Working level information to help you manage your DMSMS problems
- Teaming
- Training
- Initiatives
- Tool Development
- Public Private Partnerships

While You're Here….

- Feel free to ask questions…
- Talk to one of the many SMEs and community leaders in attendance
- Learn something new
- Contribute your expertise to the DMSMS community

DMSMS Workshop

July 13, 200

DMSMS Workshop
Thursday, July 13, 2006

8:00AM	*Opening Remarks* **Mr. David Robinson,** DLA-DSCC
8:10AM	*OSD Perspective* **Mr. John Becker,** OSD-DSPO
8:40AM	*DOD DMSMS WG Update* **Mr. Alex Melnikow,** DLA-HQ
8:55AM	*Teaming Opportunities* **Mr. Charles Marshall,** ARNIC Dayton, OH
9:10AM	*Teaming Success Story* **Mr. Sam Calloway,** AF-Robins AFB
9:30AM	*DLA Demand Planner* **Debbie Haven,** DLA- DSCC
10:00AM	Break
10:30AM - 4:30PM	*DMSMS Essentials (Concurrent with other presentations)* **Mr. Charles Marshall,** ARNIC
10:30AM	*DMSMS Knowledge Sharing Portal (DKSP)* **Mr. Ron Wong,** KARTA Technologies, Inc.
11:00AM	*DAU Partnership* **Mr. William Kobren,** OSD-Defense Acquisition University
11:30AM	*DMSMS Plan Builder* **Mr. Keith McLendon,** Army LOGPARS
12:00PM	Lunch
1:00PM	*Shared Data Warehouse* **Ms. Susan Dadey,** Concurrent Technologies Corporation
2:00PM	*GIDEP* **Ms. Karen Jackson,** GIDEP Operations Center
2:45PM	Break
3:00PM	*MEP Support DMSMS* **Ms. Natalie Seiling,** DLA - DORRA
3:30AM	*Question and Answer Panel* **All Speakers**
4:15PM	Workshop Wrap Up/Adjourn

DMSMS Knowledge Sharing Portal

DoD Diminishing Manufacturing Sources and Material Shortages (DMSMS) Conference

July 13, 2006

Natalie Seiling
(804) 279-5120
Natalie.Seiling@dla.mil

Outline

- Situation
- Issue
- Discussion

Situation







Concurrent Technologies Corporation



Issue

How can we use their capabilities to help DMSMS?

None of us is as smart as all of us!

Discussion…

2006 DoD Diminishing Manufacturing Sources & Material Shortages Conference

NATIONAL DEFENSE INDUSTRIAL ASSOCIATION

STRENGTH THROUGH INDUSTRY & TECHNOLOGY

Subject: Solving Obsolescence in the Army Communications Electronics Inventory

Wednesday, July 12, 2006

Presented by – JOHN SELLS

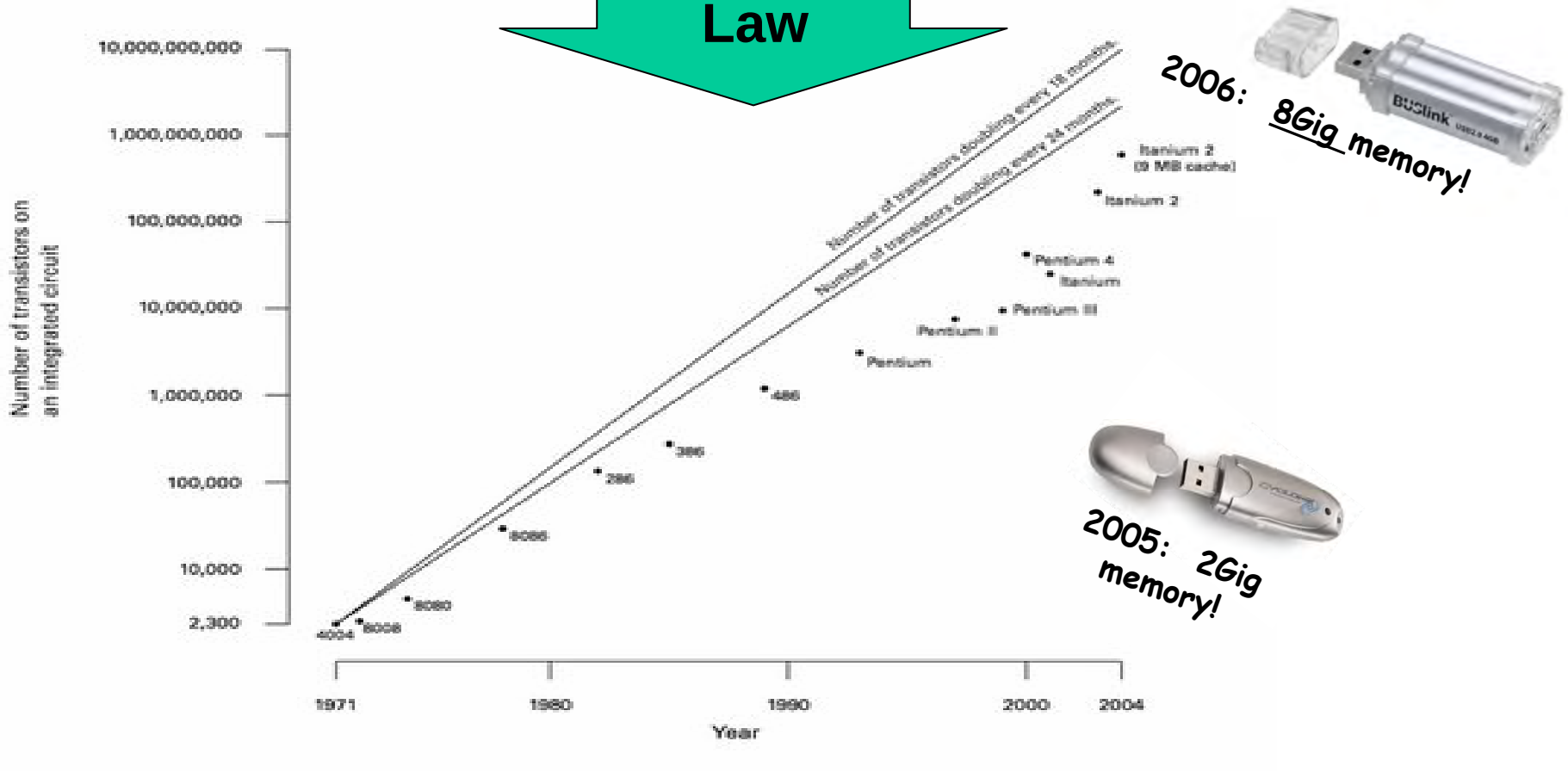
john.sells@us.army.mil 570-895-7585

Agenda

- Technology as a Cost & Schedule Driver
- Communications-Electronics Life Cycle Management Command (CE LCMC) Case Study: *SINCGARS Radio*
- A Proactive Life Cycle Solution
  - Risk Mitigation
  - Pricing Structure
- Results to Date

Obsolescence within the Communications-Electronics inventory today occurs because the physical equipment becomes outdated faster than it can be procured.

Moore's Law



Considering "Cost per Transistor" as an end item cost driver, and Moore's Law as a obsolescence driver, we need a ***proactive*** **DMS/MS management solution**!

CE LCMC Case Study: SINCGARS Radio

- Obsolete components/part impacting readiness
  - An inventory “ICON” of 300,000+ fielded assets
- Long lead times for redesign & production
  - Not just SINCGARS…
- Army Working Capital Fund (AWCF)
  - Lack of obsolescence funding to pursue redesigns of system components

CE LCMC DMS/MS Management Plan

- Develop a usable DMS/MS life-cycle solution
  - Initial effort: SINCGARS radios
    - All variations
- Factor obsolescence cost in unit price
    - Contractor assumes configuration control
- Fund for obsolescence engineering efforts
  - IDIQ contract – no guarantees
    - Maximum government flexibility

Two Part Solution:

Part One - SINCGARS Omnibus Contract (SOC)

- SOC is Firm Fixed Price – IDIQ range pricing
  - 5 years with up to 2 one year options
    - T&M for engineering services and repairs
  - 165 hardware stock numbers - domestic
    - Foreign Military Sales requirements (40 stock numbers, training)
- Total estimated value = $2.5B
  - Combined value of SINCGARS DOD inventory and foreign military sales projections
- Competitively solicited

Two Part Solution:

Part Two - Legacy SINCGARS Omnibus Contract (LSOC)

- LSOC total estimated value = $80M
  - Spares for the General Dynamics Land Systems version of SINCGARS
  - Firm fixed priced – IDIQ range pricing
    - 5 year FLTC
  - Firm fixed price repairs
    - 43 component spares stock numbers
- Competitively solicited

Early Assessment: Right Direction, High Cost

- SOC – sole offeror
  - ITT industries
- LSOC - sole offeror
  - Tallahassee technologies (Talla-tech)
- **Early Results** - **unaffordable solution**
  - Worst case scenario assumed
    - Many unknowns for IDIQ contracts
    - Obsolescence “insurance” cost high

Management Solution: Innovative Pricing!

- Utilization of unique contracting characteristics
  - Implement a dual pricing structure
  - Set up an internal risk reserve fund
    - Controlled by special “H” clause
- Risk mitigation within CE LCMC & industry Partners
- Acquisition Center, Logistics Readiness Center, and Program Manager concur with pricing solution

Dual Pricing Structure

- Main contract pricing solution
  - Base price “loaded” with obsolescence
    - Obsolescence portion flows into fund
      - SOC - 12% for ASIP - 20% for non-ASIP
      - LSOC – 25% for all items and set dollar values for repairs
        - Percentage dependent upon program requirements
- Alternate contract pricing solution
  - Base production price only
  - “Switched on” when “ceiling” is reached
  - “Switched off” when “floor” is reached

Internal Risk Reserve Fund

- Internal to the contractor, controlled by special "H" clause
  - Flexible min / max (floor/ceiling) fund levels
    - SOC - $4M/$18M, LSOC - $2M/$8M
    - Dependent on program requirements
- Funds used for obsolescence redesigns
  - Collaboratively managed – partnership
  - DMS/MS related efforts
    - Life-time buys
  - Pre-approved expenditure limit (optional)
    - CDRL reporting
      - actuals billed to fund

Strategic Advantages

- Reduces government cost
- Reduces contractor risk
  - Funds obligated on contract
  - Proactive DMS/MS management
    - Database of obsolete parts
    - Reduces lead times
    - Pays for obsolescence as needed
- Shared obsolescence cost
  - Obsolescence cost recovered through working capital fund sales
    - Normal AMDF pricing cycle update

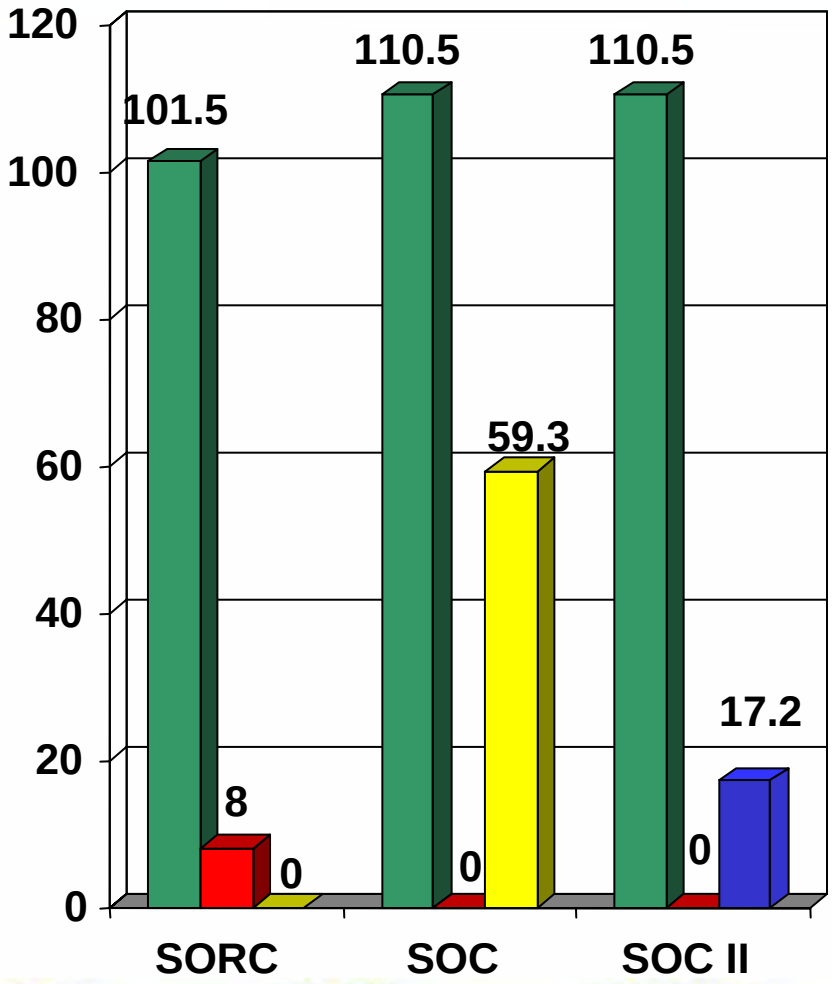
SOC Solution In Action

SORC – SINCGARS OMNIBUS REQUIREMENTS CONTRACT

(SHOWS ACTUAL ORDER)

SOC – AS PROPOSED BY ITT (RECURRING WITH EACH ORDER)

SOC II – ALTERNATE SOLUTION (ACTUAL SPENDING – FLEXIBLE)

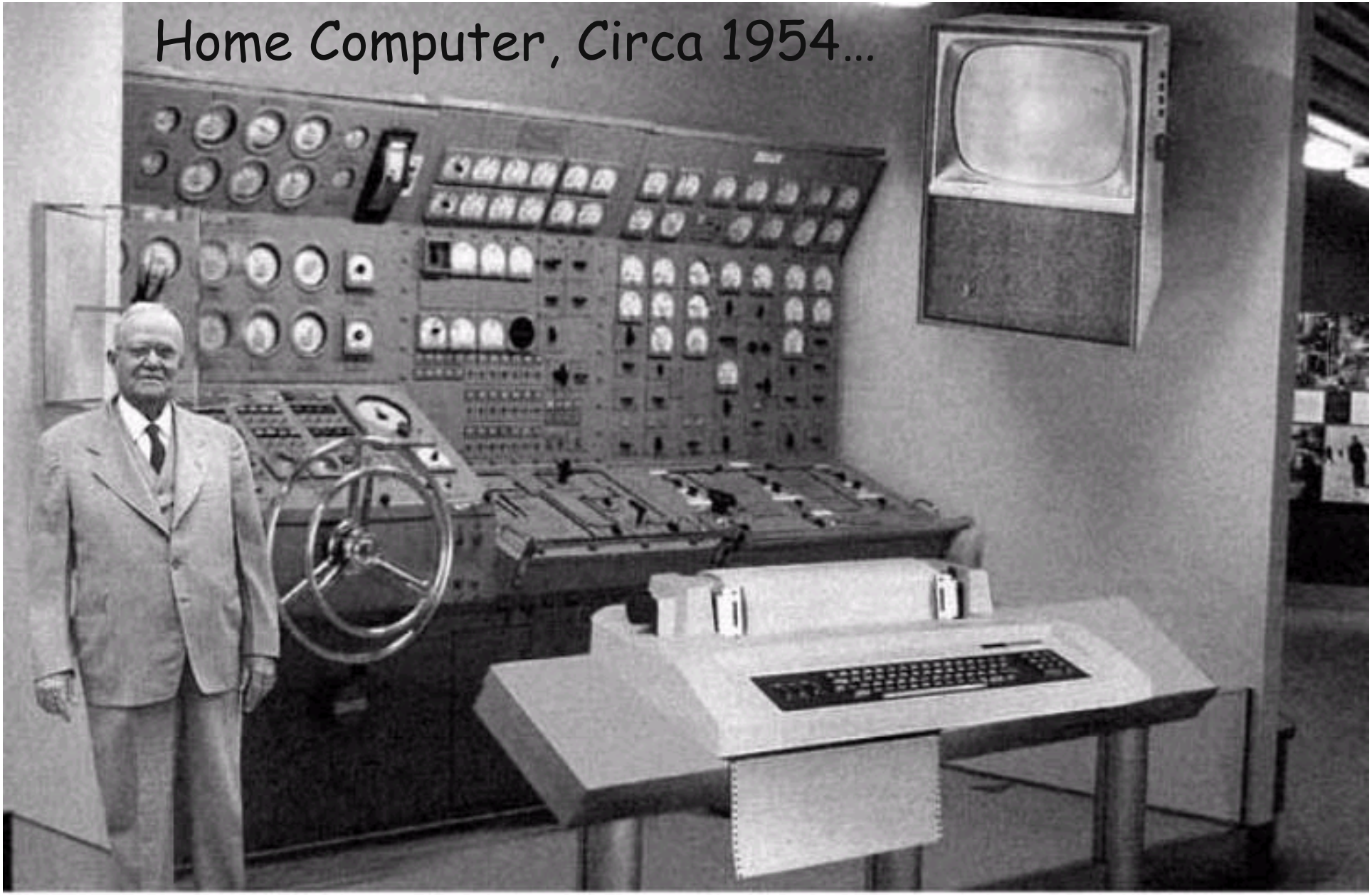


POINT OF CONTACT:
Marie N. Chapman
Chief, SINCGARS Branch
Ft. Monmouth, New Jersey
Commercial 732-532-1975
DSN 992-1975

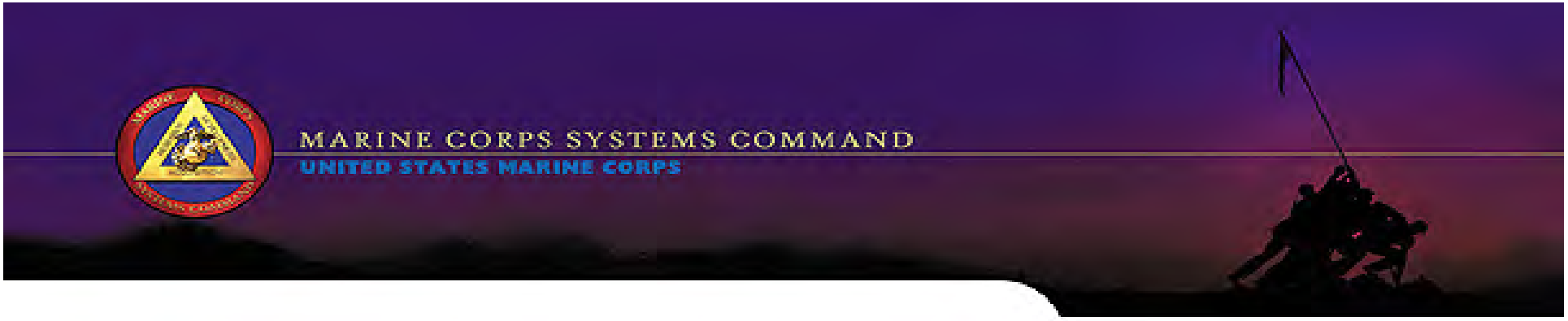
Current Status

- Obsolescence reports received from both contractors
- ITT SOC fund level - $20M
  - 37 items identified as having obsolete components
  - Lifetime buys / redesign initiated
    - 9 redesigns completed
    - $1.8m lifetime buys with $1.7m credited back to pool
- Talla-tech LSOC fund level - $9M
  - 26 items identified as having obsolete components
    - 9 redesigns completed
  - Task execution plan submitted and approved for RT-1523D block upgrade to eliminate obsolescence

Home Computer, Circa 1954…



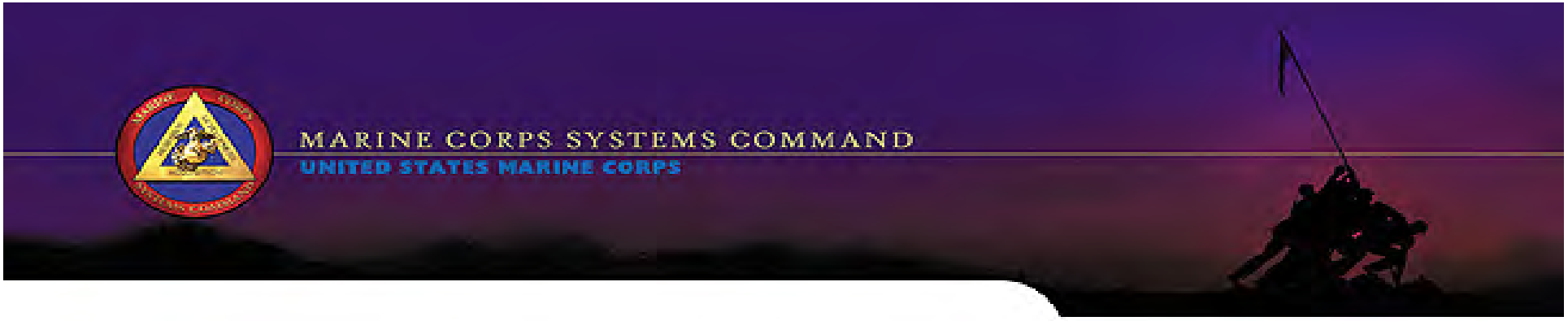
Scientists from the RAND Corporation have created this model to illustrate how a "home computer" could look like in the year 2004. However the needed technology will not be economically feasible for the average home. Also the scientists readily admit that the computer will require not yet invented technology to actually work, but 50 years from now scientific progress is expected to solve these problems. With teletype interface and the Fortran language, the computer will be easy to use.



Contracting for DMSMS in a Total Life Cycle Systems Management (TLCSM) Environment

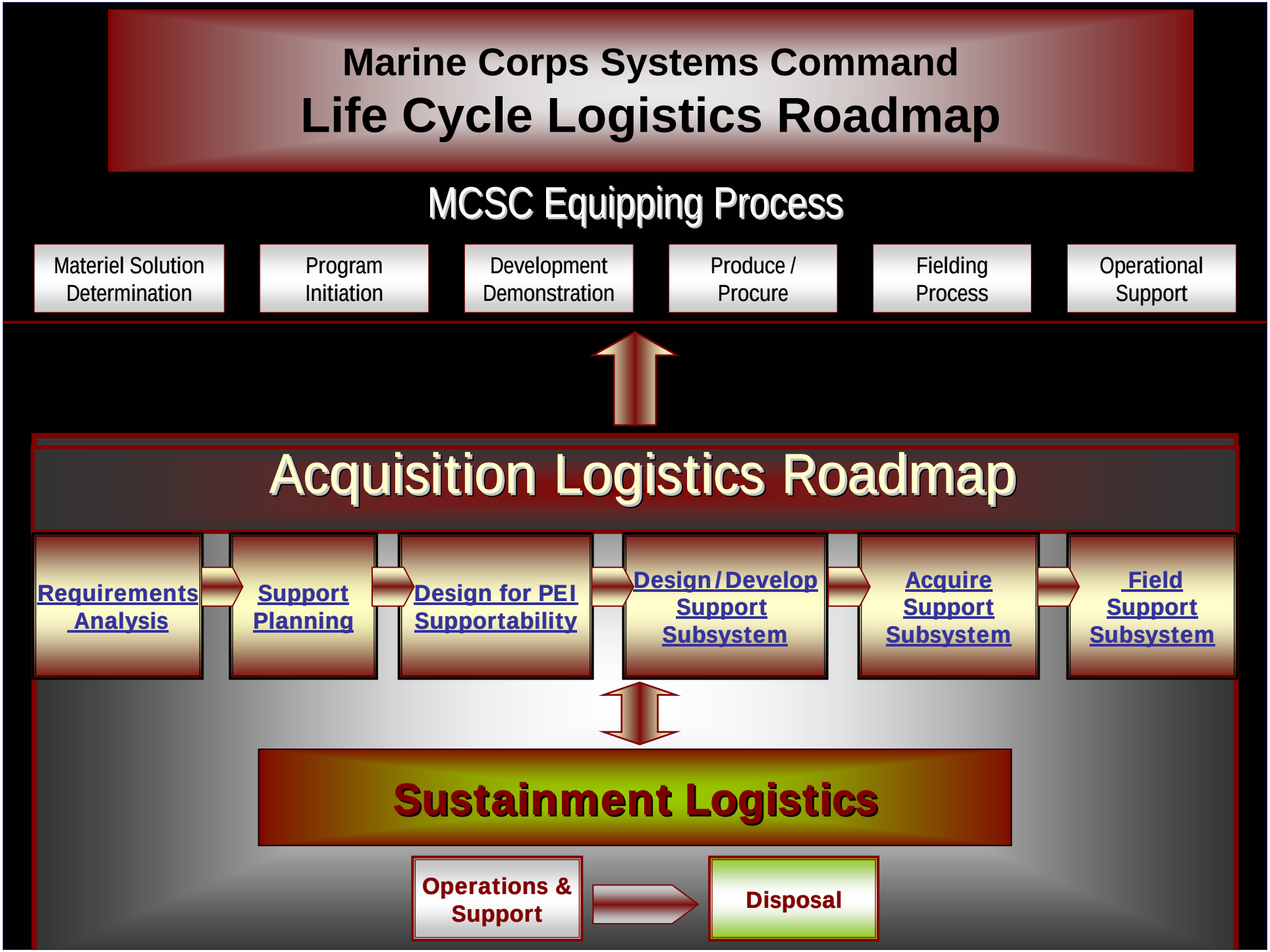
12 July 06

Life Cycle Logistics Roadmap

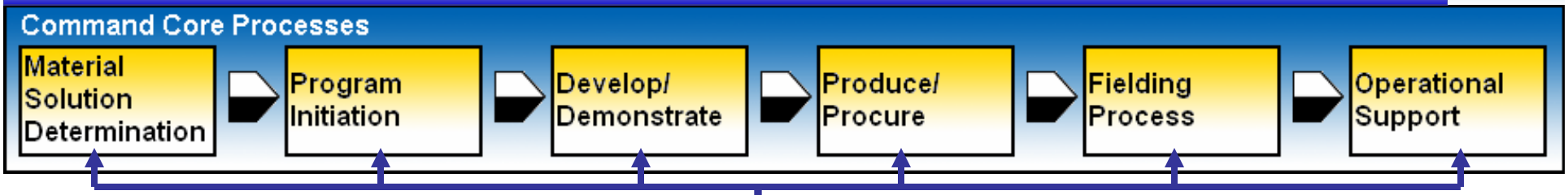


SYSCOM IMPLEMENTATION STRATEGY

- DMSMS is integrated and contracted for as part of our work processes
- Maintenance Planning/Engineering
- Supply Support/ Provisioning
- Performance Based Logistics
- Contracting process
- Using documented repeatable processes


Marine Corps Systems Command
Life Cycle Logistics Roadmap
MCSC Equipping Process
Materiel Solution Determination
Program Initiation
Development Demonstration
Produce / Procure
Fielding Process
Operational Support
Acquisition Logistics Roadmap
Requirements Analysis
Support Planning
Design for PEI Supportability
Design/Develop Support Subsystem
Acquire Support Subsystem
Field Support Subsystem
Sustainment Logistics
Operations & Support
Disposal

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Requirements Analysis

INPUTS

- ICD / CDD / CPD
- COE
- Analysis of Alternatives
- Preliminary LCCE
- Initial Acquisition Strategy
- LOG IPT Members

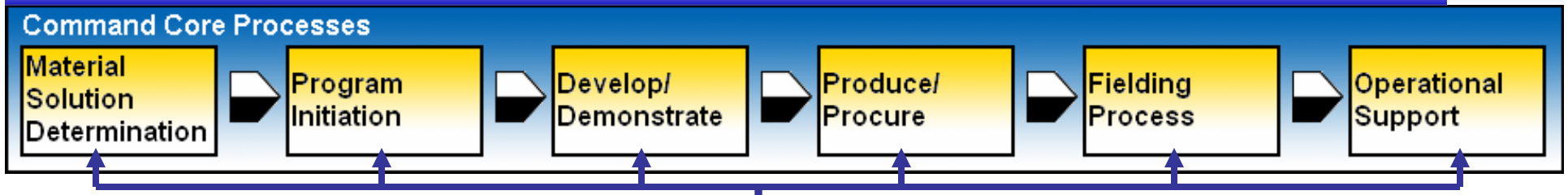
ACTIVITIES

- Analyze Requirements Documentation for Supportability Requirements, Risks, & Cost Drivers
- Build POM

OUTPUTS

- Identification of Support Alternatives
- Identification of Supportability Risks/Cost Drivers
- Logistics Reqts & Funding Summary (LRFS)
- Supportability WBS
- Initial POM Build

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Support Planning

INPUTS

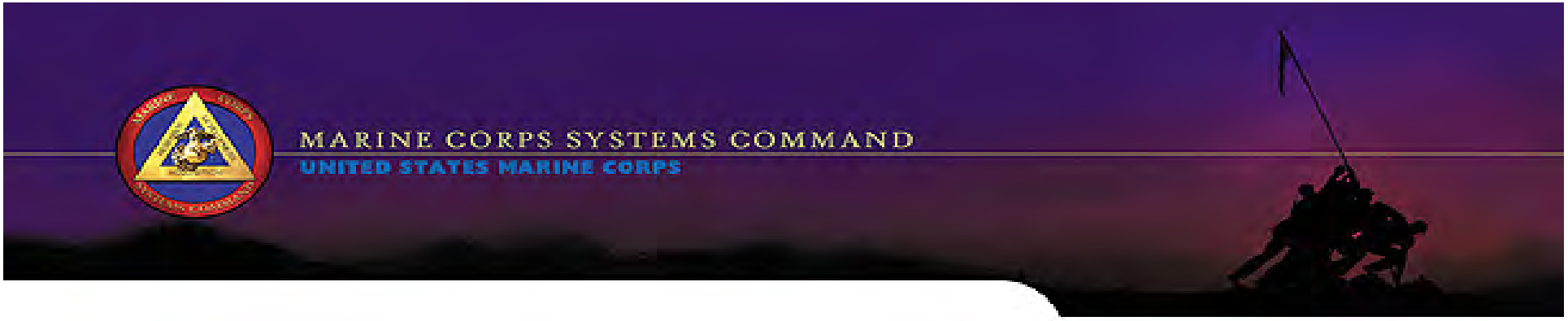
- LRFS
- ICD / CDD / CPD
- Initial Acquisition Strategy
- COE
- Identify Support Alternatives
- Identification of Supportability risks & cost drivers

ACTIVITIES

- Analyze Support Alternatives
- Plan to Mitigate Supportability Risk
- Develop Supportability Requirements
- Update LRFS & Reconcile Budget Documents
- Independent Logistics Assessment Policy Letter
- Independent Logistics Assessment Process

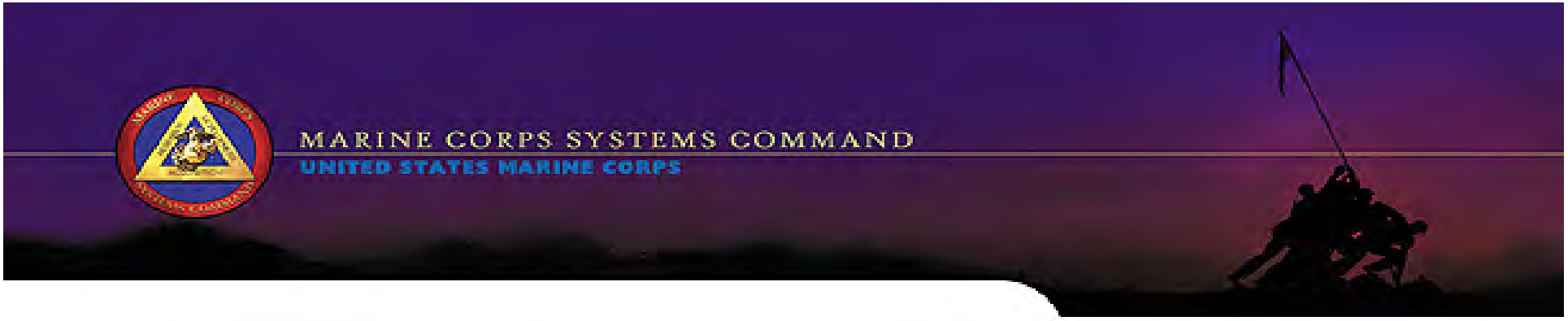
OUTPUTS

- Supportability strategy/plan
- DMSMS Management Plan
- Revised LRFS
- Logistics / Supportability portions of the:
- LCCE
- DLSOR
- Performance Spec, WBS & SOW / SOO input to RFP
- Risk Mitigation Strategy



EFV DMSMS Contract Language

- **DMSMS Management**
  - **DMSMS Management Team (DMT) Organization**
  - **DMSMS Data Management**
  - **Configuration Management Support to DMT**
  - **Product Development Support by Engineering to DMT**
  - **Procurement Support to DMT**
  - **DMSMS Reliability Engineering Support**
  - **DMSMS Industrial Base Analysis Support**
  - **Microcircuit Data Management**
  - **DMSMS Management Plan**
  - **Design Strategies for Engineering Life Cycle Support**

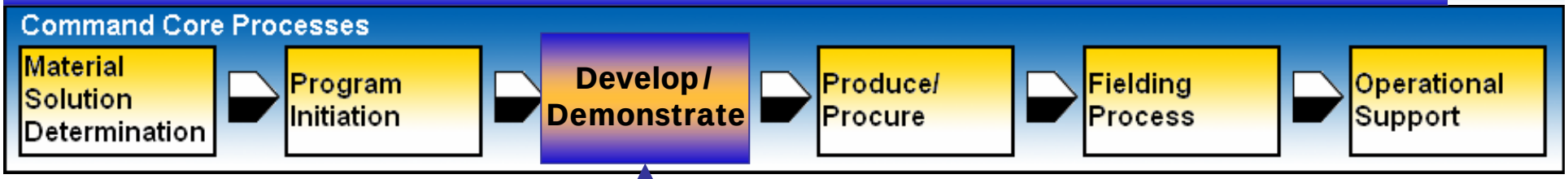


DMSMS
Data Item Descriptions (DIDs)

- **DI-SESS-81656, Source Data for Forecasting DMSMS (BOM from CM database)**

- **DI-MISC-80508A, Technical Report, Study/Services**
  (Tailor CDRL: DMSMS Plan & quarterly DMSMS risk reporting updates)

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Design for PEI Supportability

INPUTS

- Supportability strategy/plan
- TEMP
- RAM allocations
- Supportability Analyses
- LCCE
- Contract (DMSMS)
- ICD/CDD/ CPD
- COE
- DMSMS Mgmt Plan

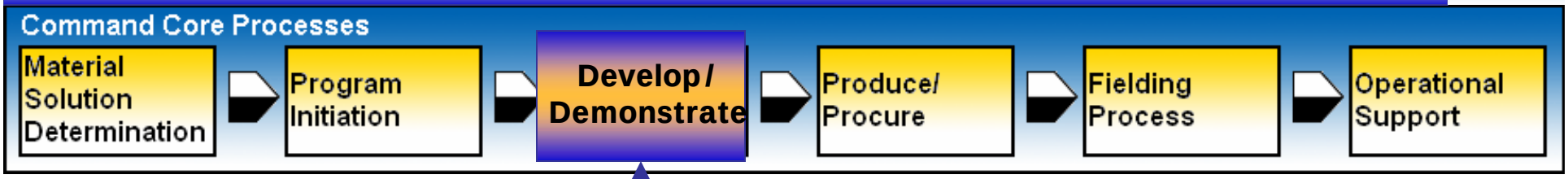
ACTIVITIES

- Conduct SDR / PDR
- Influence design for supportability (DMSMS)

OUTPUTS

- Functional Baseline
- Allocated Baseline
- Supportability Plan/Strategy
- Updated LRFS / LCCE / POM
- Supportability Demonstration Plan
- DMSMS Mgmt Plan

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Design / Develop Support Subsystem

INPUTS

- Quad Model
- RAM predictions
- DT Plans/ Reports
- TEMP
- S-Demo Plan
- Contract (DMSMS)
- ICD/ CDD/ CPD
- COE
- Functional Baseline
- Allocated Baseline
- Supportability & DMSMS Mgmt Plans/Strategy
- Updated LRFS / LCCE / POM

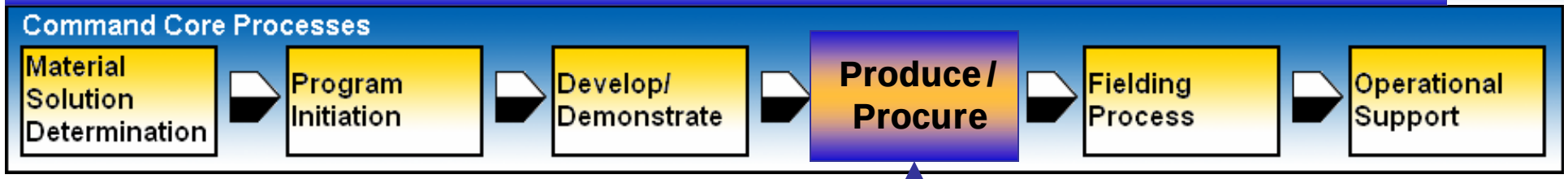
ACTIVITIES

- Using RCM, analyze FMECA, LORA and MTA data to make supportability decisions
- Apply Quad Model to Maintenance Significant Items
- CDR

OUTPUTS

- Draft Fielding Plan
- Supportability & DMSMS Mgmt Plans
- Non-Validated System Support Package
- Test Support Package
- Configuration Baseline
- Updated Supportability Demonstration Plan

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Acquire Support Subsystem

INPUTS

- Draft Fielding Plan
- Contract (DMSMS)
- Supportability & DMSMS Mgmt Plans
- CPD
- Non-Validated System Support Package
- Test Support Package
- Configuration Baseline
- Updated Supportability Demonstration Plan

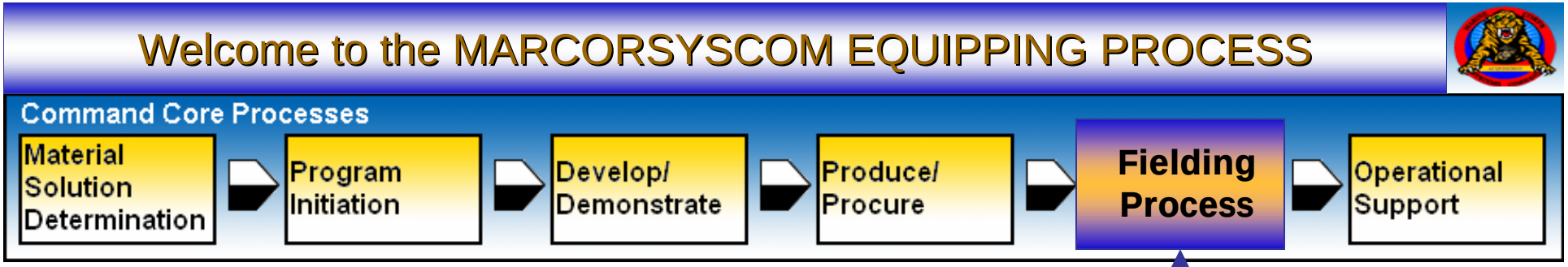
ACTIVITIES

- Conduct Supportability Demonstration
- Finalize Fielding Plan
- Prepare In-Service Management Plan
- Begin Crafting Performance Based Agreements (PBAs)
- Independent Logistics Assessment Policy Letter
- Independent Logistics Assessment Process

OUTPUTS

- Support Subsystem
- Final Fielding Plan
- Validated System
- Logistics Support Contracts & Agreements
- Support Package
- Supportability & DMSMS Mgmt Plans
- In-Service Management Plan (including DMSMS monitoring)

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Field Support Subsystem

INPUTS

Support Subsystem

Fielding Plan

Logistics Support Contracts / PBAs

In-Service Management Plan (DMSMS)

ACTIVITIES

- **Execute MCSC Fielding Process per Policy # 6-04**
- **Monitor DMSMS**

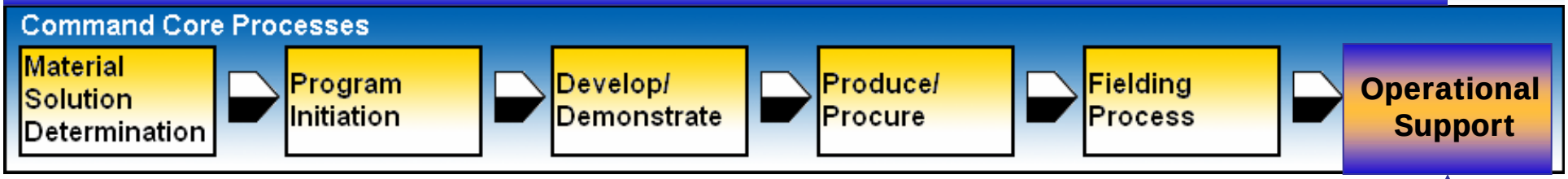
OUTPUTS

Warfighter Receives Total System

Monitor contracts/PBAs

Post Fielding Evaluation

Welcome to the MARCORSYSCOM EQUIPPING PROCESS



Operations & Support

INPUTS

- Post Fielding Evaluation
- Warfighter Receives Total System
- In-Service Mgmt Plan (DMSMS)
- Draft Phase-Out Plan

Activities

- Monitor/Assess: Predicted against actual, RAMSD, OPTEMPO, Mission Profile, possible ILS changes & impacts (DMSMS)
- Modify: change maintainability, update costs, ECPs, update ILS (DMSMS)

OUTPUTS

- Refined Phase-Out Plan
- Configuration changes/updates (DMSMS)
- Revise DMSMS Mgmt Plan
- Revise/Update In-Service Mgmt Plan (DMSMS)

1983 DMSMS Workshop (The first one?)

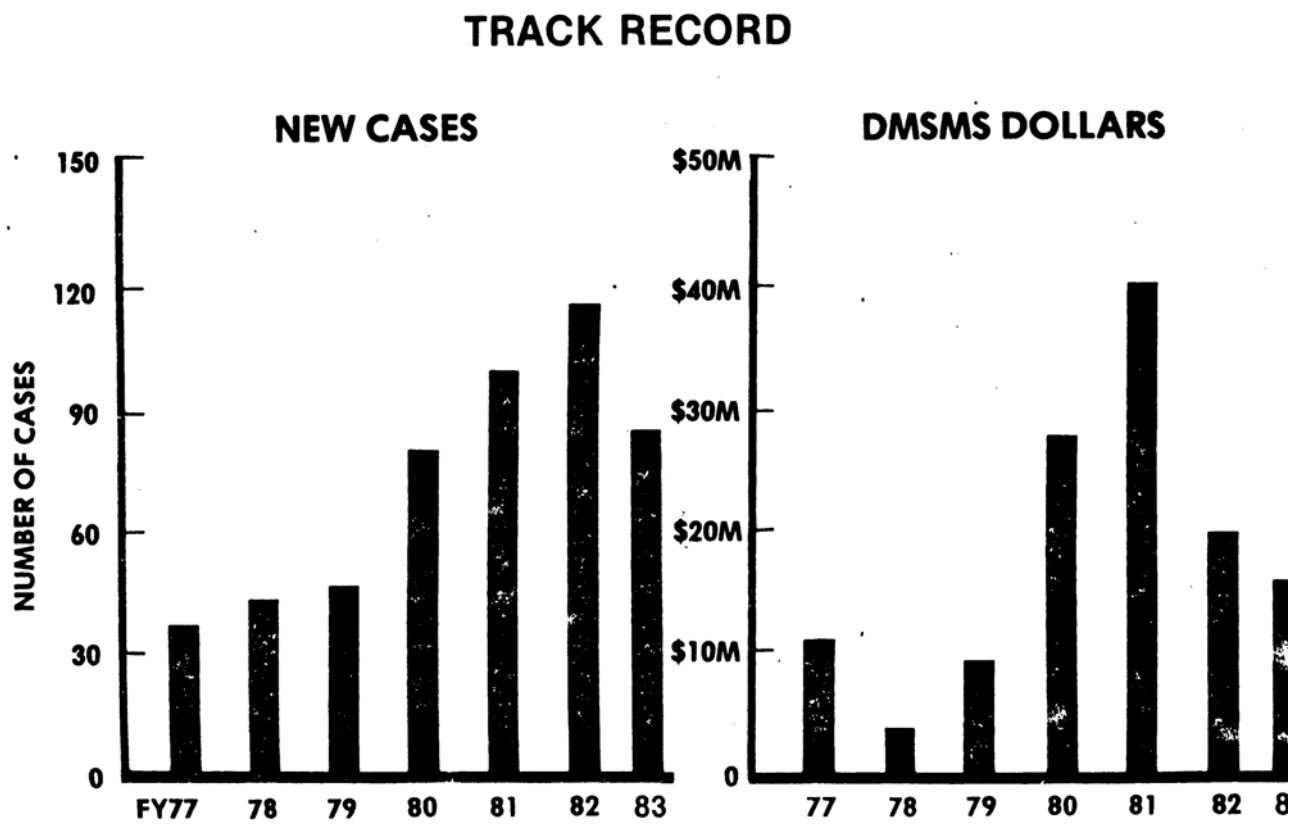


DMSMS WORKSHOP

20-22 September, 1983

DEFENSE ELECTRONICS SUPPLY CENTER

1983 DESC (a.k.a DSCC) Metrics









DMSMS Metrics Panel

ARINC DMSMS Progress Indicator

Presented to

DMSMS 2006

Charlotte, NC

July 10 – 12, 2006

ARINC DMSMS Progress Indicator

- Observation of progress advancement can be measured linearly by the ratio of good events over total events.
- Based on classic availability equation of Uptime over Total Time.
- Therefore the ARINC DMSMS Progress Indicator can be measured as:

$$ADPI = (G + Y1) / (G + Y1 + R + Y2 + B)$$

Where,

G = green, two or more suppliers
Y1 = yellow, one supplier and funded solution
R = red, obsolete part, no solution
Y2 = yellow, one supplier, no funded solution
B = blue, unknown parts

Additional Observations

- Ideally, a macro level assessment was already completed with an Operational Impact Analysis. Knowing how your spares will be depleted, because you cannot repair them because of obsolete parts, takes into consideration:
  - reclamation from assemblies or retiring assets.
  - reliability data (wearout) and varying operating hours.

- Generally progress can be measured by funded solutions over total potential problems. This will take into account all types of solutions, including engineering.

- A ratio of one (1.0) is a perfect score, meaning the program has no problems; a ratio of zero (0.0) means the program has not addressed obsolescence.

What the Score Means

- If you do not have any BOM's then you have all blues and will score a Zero.
- If the predictive tool has many false positives (reds), that will hurt the program. (Yes, this could be used to compare predictive tools.)
- If the predictive tool has many blues (unkowns), that will hurt the program.
- Generally as problems are solved they move to the numerator.
- We normalized each like a test score by multiplying by 100
- The following could be considered tongue and cheek (or is it?)

  - 90 – 100 = A: DMSMS Best Practice program
  - 80 – 89 = B: Solid DMSMS program
  - 70 – 79 = C: Getting close, obtain more $ or research the blues
  - 60 – 69 = D: Tutors may be needed
  - 40 – 59 = F: Let's talk
  - 0 – 39 = Seek the witness protection program or learn to say "would you like fries with that?"

Contact Information

- ARINC Engineering Services, LLC
- Walter Tomczykowski
- Director Life Cycle Management
- 2551 Riva Road
- Annapolis, MD 21401

- 410-266-4535
- wtomczyk@arinc.com

Headquarters U.S. Air Force
AWACS Program Office

Integrity - Service - Excellence

AWACS/ AEW&C CLS approach



U.S. AIR FORCE

SQNLDR Peter Weeding

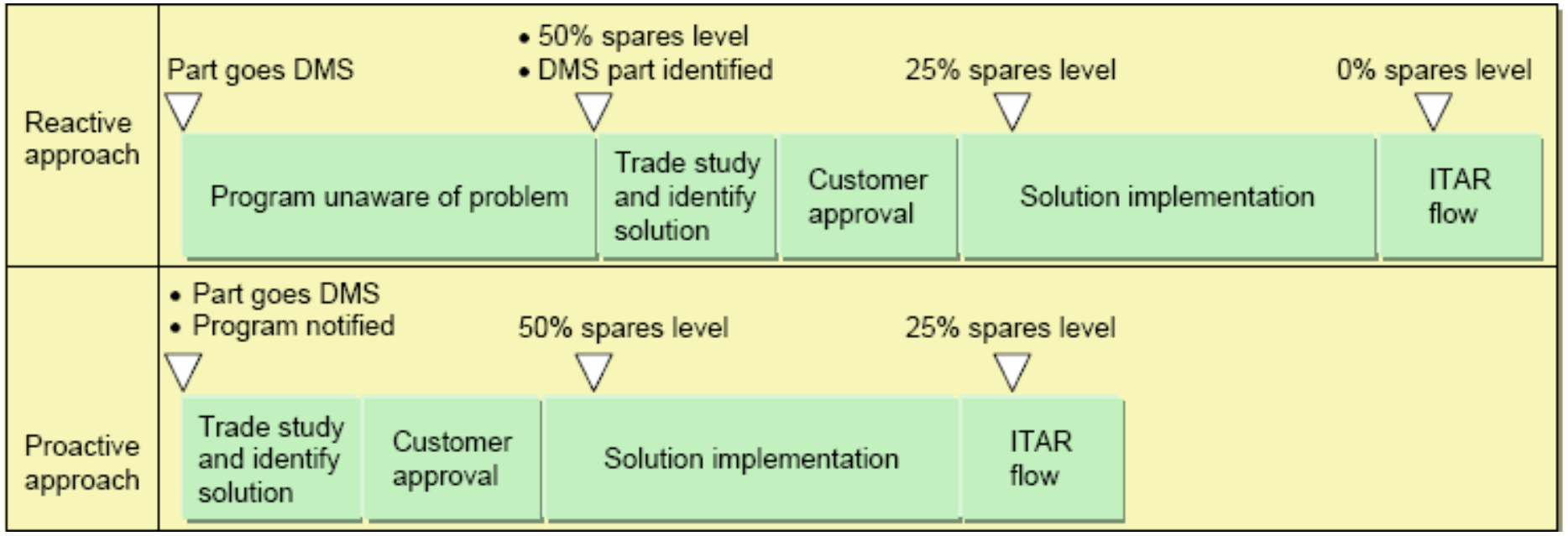
ESC 551st ELSG XRE

11 Jul 2006

U.S. AIR FORCE

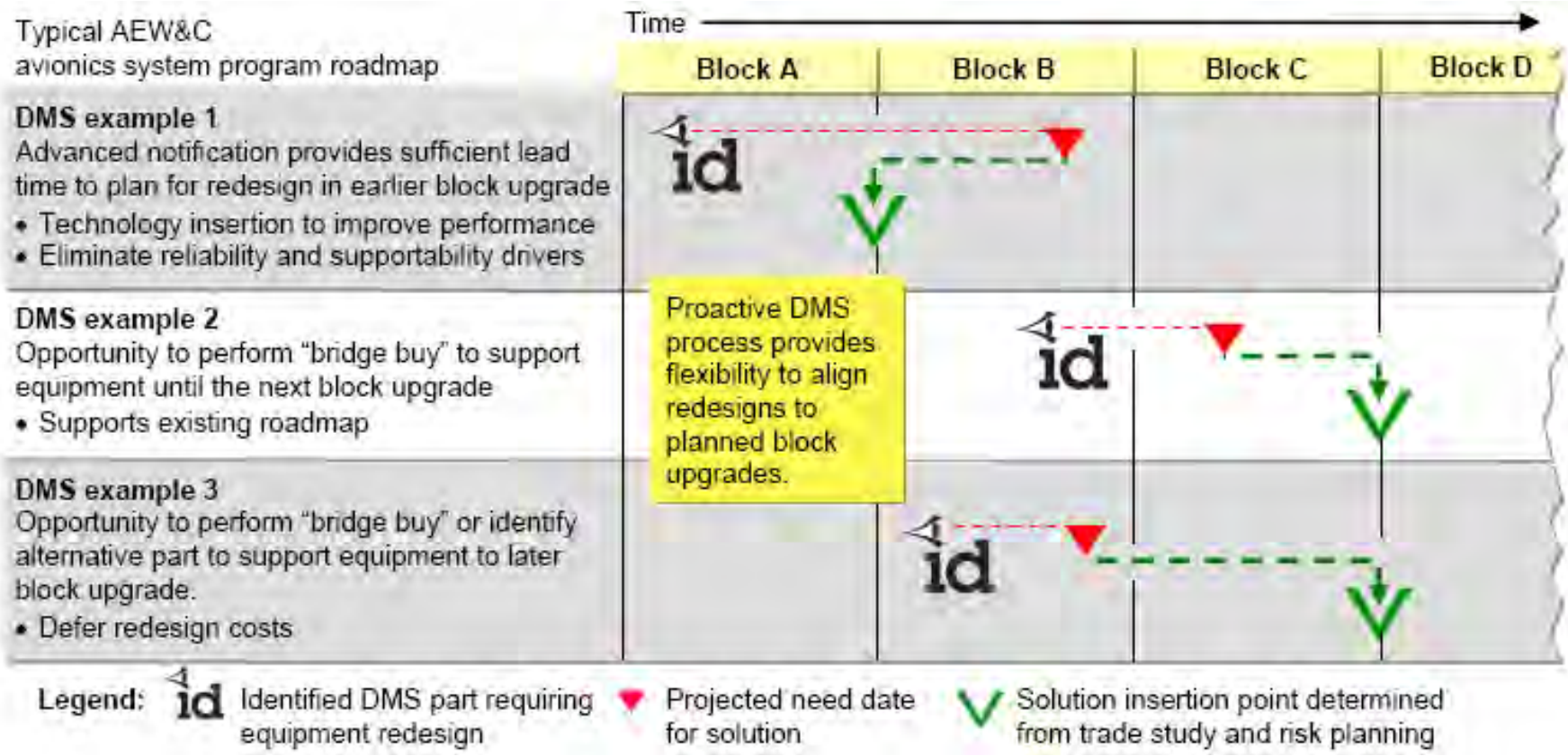
International Approach

- RAF approach
  - TLSC Single Contract, Availability based
- RAAF Wedgetail proposal
  - TLSC
- NATO answer
  - Internal


Reactive approach
Part goes DMS
• 50% spares level
• DMS part identified
25% spares level
0% spares level
Program unaware of problem
Trade study and identify solution
Customer approval
Solution implementation
ITAR flow
Proactive approach
• Part goes DMS
• Program notified
50% spares level
25% spares level
Trade study and identify solution
Customer approval
Solution implementation
ITAR flow

U.S. AIR FORCE

AEW&C Example



BOEING Roadmap Example

U.S. AIR FORCE

US AWACS Approach

- **E3 DMSMS strategy**
  - **approval part of OSS&E baseline**
  - **BOMS or**
  - **Contractual wording**

U.S. AIR FORCE

OSS&E

- **Criteria for Requirements Approval: Do any or all parts involved in this configuration change require a market verification of lifetime parts availability, or DMS analysis?**
- **Approval Criteria for Certification Approval: Was a market verification or DMS analysis completed and reviewed by the Focal Point? What were the results? Will all parts involved in the configuration change be available throughout the lifecycle of the E-3 fleet?**

U.S. AIR FORCE

Australian Issue

- However, the transfer of the risk to the contractor for sustainment of a weapon system, may see an increase in Life Cycle Cost (LCC) at some point in the future, due to a reduction in long term competitiveness that this strategy encourages. Qantas's decision to no longer serve as the RAAF Boeing 707 deeper maintenance contractor is a good example of a reduction in ADF capability, due to reliance on a single contractor, which no longer supported this effort as part of their overall business strategy.



Ron Wong

DKSP Program Manager

Karta Technologies, Inc.

San Antonio TX 78249

- **What is the DKSP?**
  - Diminishing Manufacturing Resources and Material Shortages (DMSMS)
  - DMSMS ***Knowledge Sharing Portal*** (DKSP)
  - Mission:
    - *The DKSP is aimed at providing value added assistance to DOD programs to implement and continually improve proactive DMSMS strategies.*

www.dmsms.org

What does it do?

- **What does it do?**
  - ***You're probably here because you work on or are interested in learning more about DMSMS or obsolescence issues***
  - Initial point-of-entry into the obsolescence DMSMS world
    - Assists in resolving obsolescence issues
    - Checks availability of component parts or higher assemblies
    - Provides links to authoritative sources – original data source
  - Website for supply specialists, logisticians, engineers and program managers to access various obsolescence data
  - First comprehensive collection of DMSMS training courses
    - Available as instructor led or web based courses

- **DKSP Home Page**

www.dmsms.org



- **DMSMS Library**
  - Contains information that may assist in the understanding or help in the management of obsolescence issues:
    - Directives
    - Manuals
    - Guidelines
    - Technical Papers
    - Technical Reports & Informational Briefings
    - Presentations
    - Newsletters
    - List of Acronyms and Military Abbreviations
    - GIDEP Documents



Training Courses

- Developed introductory DMSMS courses
- Developed courses to meet specific functional needs
- Will be developing future courses to meet specific skill & Service needs
- Developed courses that comply with Defense Acquisition University requirements
- The following courses are currently available as instructor-led or web-based courses:
  - DMSMS Fundamentals
  - DMSMS for Executives
  - DLA DMSMS Essentials
  - DMSMS Case Studies



DMSMS Working Group

- Definitive guiding body on DMSMS issues within the Department of Defense
- Established by DOD Memo & Charter in June 2005
- Includes Voting Members from all four Services and DLA
- Initiates Services-wide subjects for discussion and resolution
- Recommends changes and program improvements to the Total Life Cycle System Management (TLCSM) Executive Council

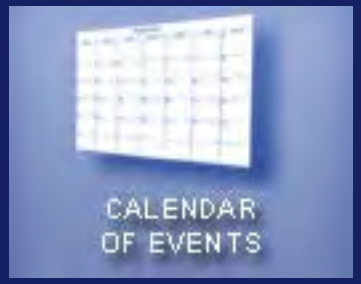


- **DMSMS Working Group**
  - Supported by four working committees:
    - **Outreach Committee** – for training, conferences, workshops, assist visits
    - **Common Use Tools Committee** – reviews tools and databases for applicability to the DMSMS community
    - **Conference Committee** – establishes annual conference schedules
    - **Interoperability Committee** – establishes liaison with Allies for non-US DMSMS problem solving



Calendar of Events

- **Calendar of Events**
  - Provides a listing of DMSMS events of interest to the community
    - Conferences, workshops, symposiums of DMSMS-related events
    - DOD DMSMS Working Group meetings and Committee meetings



- **Tools & Management Aids**
  - Informs the DMSMS community of various tools and aids available
  - Provides brief description of tools organic to Government agencies and commercial tools
  - Provides links for additional information – direct to authoritative sources
  - Allows for introductory information so they user can narrow the search and follow up to meet individual needs
  - Provides free access to a predictive tool -- Q-STAR



GIDEP Access

- **Government Industry Data Exchange Program (GIDEP) Access**
  - Cooperative activity between government and industry participants
  - Share in the technical information available
  - Provides automatic change notices to users



- **Future Look**
  - Increase capabilities for users to find parts
  - Provide more information and more data points to resolve DMSMS issues
    - Direct Links to vital authoritative DMSMS sources and information
    - Direct links to Shared Data Warehouse
    - Direct link to Plan Builder
  - Create unique solutions sets through partnerships
    - Single BOM Loading
    - Link to additional commercial tools and databases
  - Create synergy for solving system-wide DMSMS problems

- ***Comments always welcome!***

dksp@dmsms.org