Understanding and Planning for the Challenges of Obsolescence

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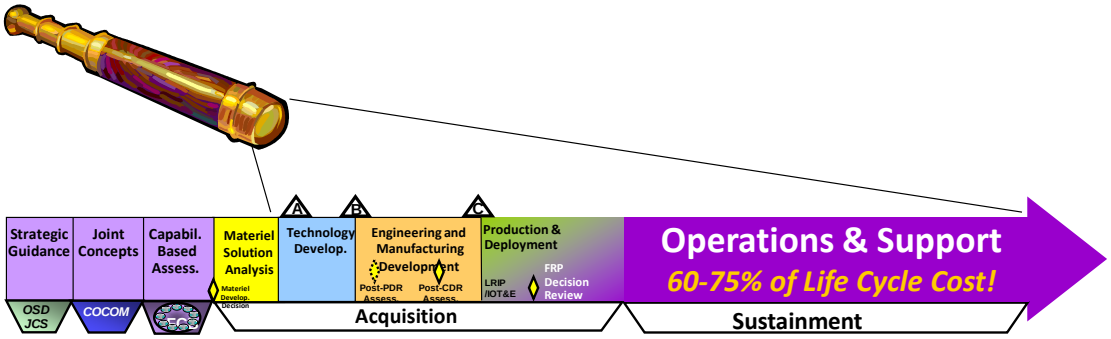
Lunch and Learn Briefing
July 9, 2014

Agenda

- Definitions
- Planning
- Management
- Mitigation Strategies
- Obsolescence Myths
- Take Aways
- Resources

He Who Fails To Plan is Planning To Fail



Definitions

What is Obsolescence?

- **Obsolescence is a broad and often-misunderstood term because it is defined in different ways by different constituencies and industry sectors**
- **According to the Defense Acquisition University's Glossary of Defense Acquisition Acronyms & Terms, 14th ed.:**
  - **Lack of availability of an item or raw material resulting from statutory and process changes, as well as new designs**
  - **Deals with the process or condition by which a piece of equipment becomes no longer useful, or a form and function no longer is currently available for production or repair**
  - **Implementation of new technology causes older technology to become less supportable because of the diminished availability of parts and suppliers**

Definitions

What is DMSMS?

- According to the SD-22 DoD Diminishing Manufacturing Sources & Material Shortages (DMSMS) Guidebook
- "the loss or impending loss of manufacturers of items or suppliers of items or raw materials may cause material shortages that endanger a weapon system's or equipment's development, production, or post-production support capability."
- Directly impacts system readiness, system availability, potentially costing the Department of Defense hundreds of millions of dollars annually

Definitions

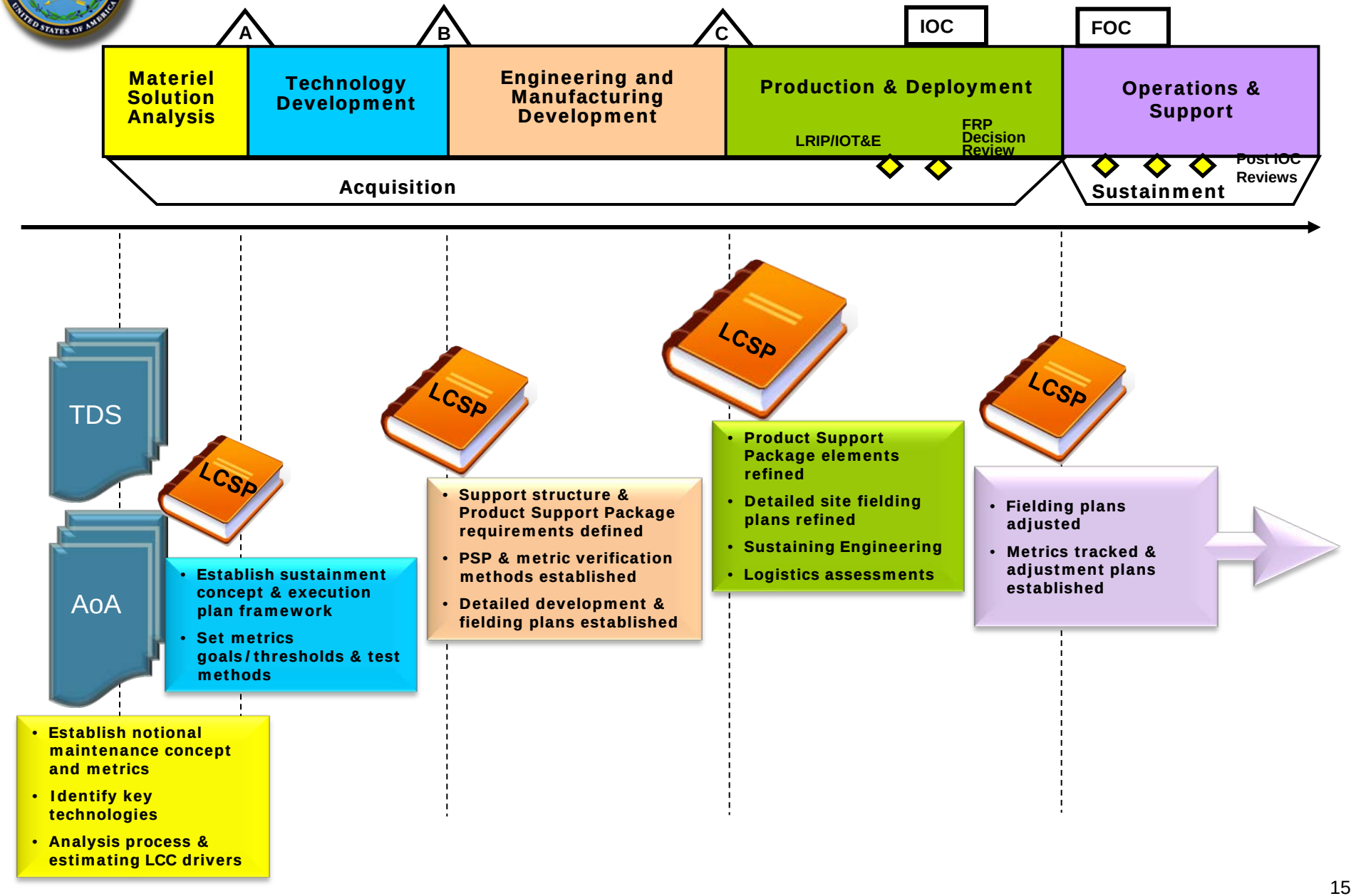
What is the difference between Obsolescence and DMSMS?

- While very closely related, obsolescence is not exactly the same as DMSMS
- Obsolescence deals with the process or condition by which a piece of equipment becomes no longer useful, or a form and function no longer current, or available for production or repair
- Implementation of new technology causes older technology to become less supportable due to diminished available of parts and suppliers
- Obsolescence must be resolved before DMSMS begins to occur, especially if the system is still in production

Planning

- PMs should develop a proactive plan to effectively resolve obsolescence problems before they have an adverse impact on the LCC and system availability
  - Design features that facilitate change/insertion of new technology
  - Establishing a rigorous change management process for life-cycle support
  - Using performance-based logistics contracts that provide significant latitude to manage technology refreshment
    - Insuring they are incentivized to maintain currency with state-of-the-art technology and use readily available items to avoid the high cost of diminishing manufacturing sources and materiel shortages over the system's life

The LCSP


A
B
C
IOC
FOC
Materiel Solution Analysis
Technology Development
Engineering and Manufacturing Development
Production & Deployment
Operations & Support
LRIP/IOT&E
FRP Decision Review
Post IOC Reviews
Acquisition
Sustainment
TDS
AoA
LCSP
LCSP
LCSP
LCSP
• Establish notional maintenance concept and metrics
• Identify key technologies
• Analysis process & estimating LCC drivers
• Establish sustainment concept & execution plan framework
• Set metrics goals/thresholds & test methods
• Support structure & Product Support Package requirements defined
• PSP & metric verification methods established
• Detailed development & fielding plans established
• Product Support Package elements refined
• Detailed site fielding plans refined
• Sustaining Engineering
• Logistics assessments
• Fielding plans adjusted
• Metrics tracked & adjustment plans established

Management

- **Obsolescence management is a discipline in and of itself. As the service life of a product extends beyond the technology life cycle incorporated in the design, problems with obsolescence and DMSMS arise**
- **Both the defense and commercial markets must find ways to plan for and manage obsolescence and DMSMS because every product is subject to their effects**
- **Successful parts management must address DMSMS throughout the product's life cycle and necessitates the need to address DMSMS in the proposal, design, and sustainment phases of a product (to include the systems and support elements)**
- **Extensive life of our systems and rapid technology change has heightened the importance of technology refreshment and obsolescence management**

Mitigation Strategies

- Mitigation practices include reviewing proposed parts lists for obsolescence and being proactive in the engineering design process prior to production
- Large capital systems, particularly military hardware, are expected to last many years longer than the refresh cycle of their component technologies
- Weapons systems will be fielded containing relatively obsolescent components, perhaps even before initial deployment
- To what extent should obsolescence be allowed to impact mission requirements, and how can obsolescence costs best be mitigated?
  - In today's cost estimating models, obsolescence is not even directly accounted for, despite its impact
  - As the pace of technological change quickens and technologies obsolesce more rapidly, the need to plan for and mitigate its effects will grow

Mitigation Strategies

- Performance Based Logistics (PBL) is an important obsolescence mitigation strategy directly attacking the problem of aging by instituting incentives between the government and the weapon system Product Support Integrator (PSI) to ensure support providers continuously modernize and improve their systems and methods of support
- Each Military Service has ongoing initiatives to execute continuous modernization throughout the life of a product
  - Lowers sustainment costs, improves availability, and continues modernization efforts
  - These initiatives will be significantly enhanced as PBL continues to be implemented throughout DoD
- Powerful tool for mitigating obsolescence and making continuous modernization a reality for legacy weapon systems

Mitigation Strategies

- With PBL, the program manager contracts for availability rather than the logistics elements that contribute to availability
- Long-term contract with an organic support source or a commercial contract source with documented performance objectives, such as system availability or supply effectiveness
- Buying output capability at an agreed to level and price
- Supplier has the financial incentive to continuously improve performance because it has a bottom-line impact:
  - Optimized supply support reduces inventory investment
  - Increased reliability of systems and subsystems
  - Open system design increases use of very reliable plug-and-play components that can be renewed or replaced quickly
  - Continuous modernization extends the system's useful life of the system and the life of the contract
  - Continuously refreshed technologies increase the residual value of the systems, subsystems, components, repair parts

Mitigation Strategies

- Engineering Change Proposals (ECP) is traditionally been one of the primary tools to mitigate obsolescence
- Program and item managers use engineering support contracts with the OEM to implement Pre-Planned Product Improvement (P3I) and to respond to product safety issues, manufacturing concerns, and reliability problems while the weapon system is in active production
- P3I is a long-range strategy for upgrading weapons systems capability to meet war fighter requirements and funded through acquisition funds
- ECP process is sometimes slow and ponderous and shifts a significant portion of the responsibility for identifying and mitigating the risk of obsolescence from the OEM to the Government

Mitigation Strategies

- Value Engineering (VE) is guided by FAR 52.248-1. The goal of the VE program is to retain required system performance and quality while reducing cost
- Provides incentives for DoD contractors to reduce the total cost of ownership for weapon systems, but it does not specifically address the issue of obsolescence risk
- Instant Cost Savings , Concurrent Cost Savings , Future Contract Savings
- The traditional VECP process, though well-intentioned, holds limited potential for resolving the issue of material and software obsolescence associated with legacy systems that are fundamental to continuous modernization

Mitigation Strategies Comparison

	ECP	VECP	PBL
Purpose	Maintain configuration and production; implement P3I	Lower contract price through redesign efforts	Guarantee system availability and logistics support
Responds to…	Safety, reliability, production support issues	Manufacturing cost reduction initiatives	Weapon systems support issues
Design strategy	Reactive	Reactive	Proactive
Type of contract	Time and material	Time and material	Fixed price per unit per period
Contractor incentives	Fixed fee	Sharing of savings for instant, concurrent, and future contracts	Profit proportional to output or support cost reduction
Risk sharing	100% Government	100% Government	50/50 Gov./contractor
Investment in modernization	100% Government	100% Government	100% contractor
Impact	Incremental system improvement; no real mitigation of obsolescence risk unless it affects production	Price reduction on current, concurrent, and future contracts for the same subsystem; no modernization or obsolescence mitigation	Continuous Modernization, increased reliability; higher residual value of equipment assets; indefinite system life

Obsolescence Myths

- Obsolescence is a problem - if you think of it as something that can be avoided
- Actually a reality for the embedded industry and the dark side of relentless innovation
- In the face of obsolescence, mature, mission-critical programs need to continue
- Problem is not obsolescence, but how we try to manage obsolescence through the reactive approach of EOL.
- Effectively dealing with the reality of embedded obsolescence requires a paradigm shift from an industry “normal” of EOL cycles and forced technical upgrades – an approach that doesn’t take into account ongoing legacy need
- Proactive legacy management approach can acknowledge the inevitability that systems will be needed much longer than their parts’ active life cycles
- Forecasting actual lifetime needs instead of constraining the forecast to available funding.

Obsolescence Myths

- **<u>If we have access to the components / Intellectual Property (IP), then every product could be supported indefinitely</u>**
- Considering the numbers of programs and versions of programs that exist in the field, even getting the IP/components is not enough to ensure legacy sustainment
- OEMs can't support every version of a product that they have ever developed indefinitely
- Sometimes the OEMs don't even exist long into a program's life cycle and the IP is then lost forever
- Must focus on legacy sustainment – while the supply chain is secure, managing the larger, strategic plan in parallel
- Working with Extended support providers who specialize in assuming responsibility for OEMs or investing in the organic capability to perform these functions indefinitely

Obsolescence Myths

- **Old products have no demand**
- What do the B-52, KC-135, the Phalanx, the USS Mount Whitney, and the THAAD Missile system all have in common?
  - **Tried-and-true defense programs that have had their life cycles extended far beyond their original anticipated need**
  - **Mission-critical in the lives of soldiers and civilians, requiring they be functional and reliable each time they are in service**
- OEMs work hard with customers to provide drop-in replacements for mission-critical systems, things are rarely that straightforward, and there must be a solution for those programs that simply cannot afford the cost or risk of upgrading
- The fact is, older products have demand, and their demand is often robust and complicated to assess when coming from a place of obsolescence management through Last Time Buys, redesign, and bridge buys
- Challenge is to acknowledge the value to everyone in creating a legacy sustainment plan for these products for as long as they are needed

Obsolescence Myths

- **Repeated LastTime Buys (LTB)s are a good solution for End Of Life (EOL)**
- Government contract cycles typically run anywhere from 2-5 years and face continuous scrutiny for unnecessary spending
- Contract lengths, reduced funding, and defense-wide impacts like government sequestration, programs have become more cautious about how much stock they keep on hand, and money isn't as available to support the costs of increasing program life cycles
- **Historic background is completely at odds with an LTB sustainment solution and experienced program managers know it (Figure 2)**
- Really only a solution for programs that need a bridge to help them along toward an upgrade
- Brings with it a false sense of security
- Ends up being a situation of "buy what we have the money for, right now, and we will have to figure out the rest later."
- Supporting a program through its total life cycle then involves forecasting lifetime needs … instead of constraining the forecast to available funding

Obsolescence Myths

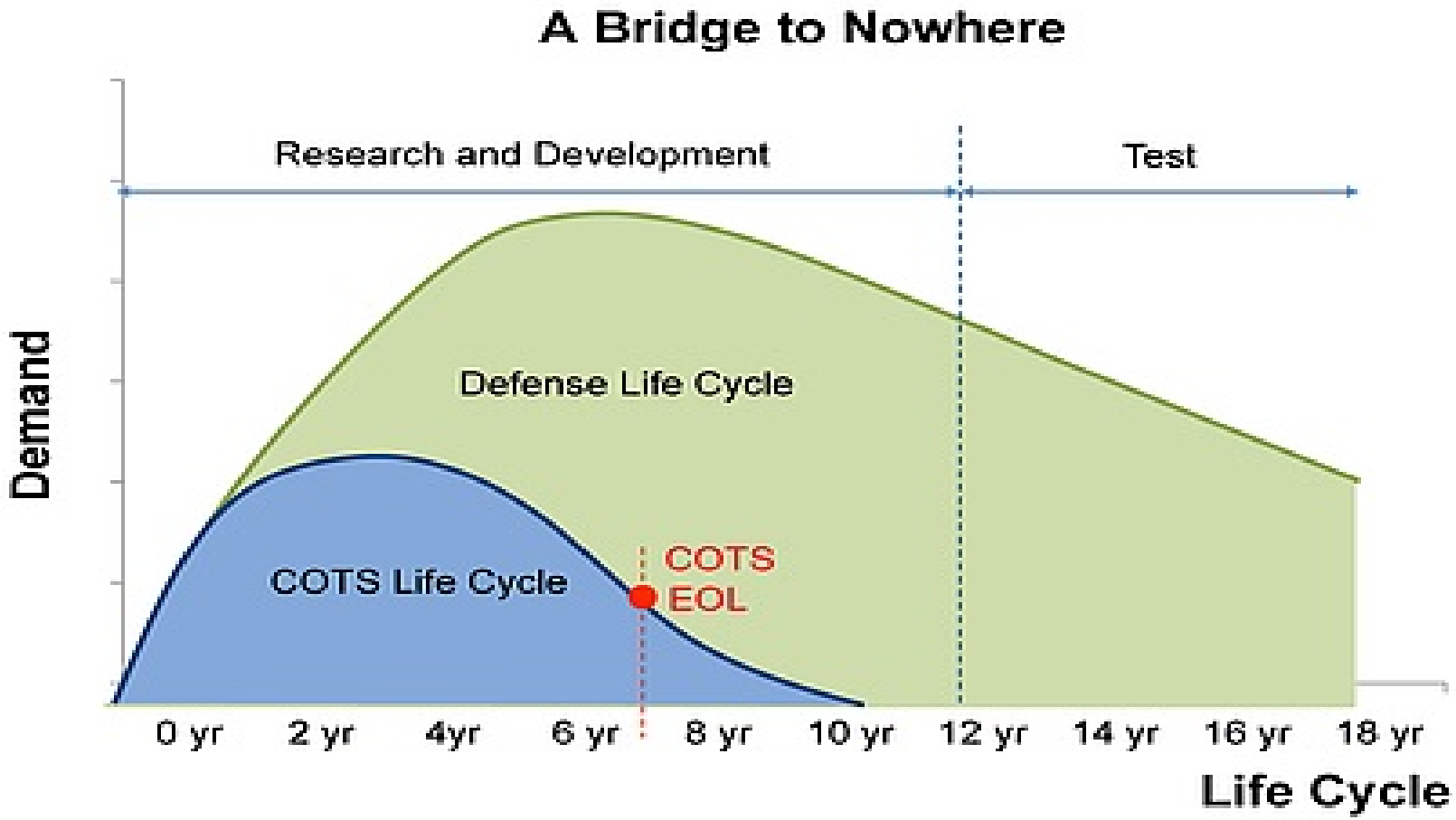


Figure 2: A Last Time Buy (LTB) brings a false sense of security, and doesn't account for follow-on sales or the logistics challenges of stocking and storing parts for the length of a program.

Take Aways

- **OBSOLESCENCE is a reality that will one day happen**
- **Must Be Addressed Upfront and Early and Continuously Throughout the Life Cycle**
- **Problems arise when there is no PLAN for the eventuality that one day components will (with valid reasons) be EOL'd by their OEMs**
- **Relationships, processes, plans, engineering, and energy to will keep the plane in the air … whether or not the original parts are now EOL**

Questions?

Training Resources

- CLL-201 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Fundamentals
- CLL-202 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Executive Overview
- CLL-203 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Essentials
- CLL-204 Diminishing Manufacturing Sources and Material Shortages (DMSMS) Case Studies
- CLL-205 Diminishing Manufacturing Sources and Material Shortages (DMSMS) For Technical Professionals
- CLL-206 Introduction to Parts Management
- LOG-201, Intermediate Acquisition Logistics
- LOG-350, Enterprise Life Cycle Logistics

Additional Resources

- **Four obsolescence management myths that kill defense programs**
  - http://mil-embedded.com/articles/four-myths-kill-defense-programs/
- **DMSMS Guidebook**
  - https://acc.dau.mil/adl/en-US/46237/file/65278/SD-22%20DMSMS%20Guidebook%20(1%20Aug%2012).pdf
  - https://acc.dau.mil/dmsms-guidebook
- https://dap.dau.mil/acquipedia/Pages/ArticleDetails.aspx?aid=d3f23881-7a0e-4a3f-83cd-a157e5969666
- https://acc.dau.mil/CommunityBrowser.aspx?id=32247&lang=en-US
- http://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=275490
- http://www.navysbir.com/05_3/77.htm

Additional Resources

- https://dap.dau.mil/acquipedia/Pages/ArticleDetails.aspx?aid=d3f23881-7a0e-4a3f-83cd-a157e5969666
- http://www.k2bdefence.com/obsolescencemanagement/index.html
- https://acc.dau.mil/CommunityBrowser.aspx?id=46237&lang=en-US
- **Defense Acquisition Guidebook, Policies, Directives, Regulations, Laws [Suggest Change]**
  - Defense Acquisition Guidebook, Chapter 5, Paragraph 5.4.3.4.2, Technical Refreshment & Obsolescence Management,
  - DoD 4140.1-R, 23 May, 2003 DoD Supply Chain Material Management Regulation
  - DMSMS Plan Guidance, Office of the Secretary of the Navy
- **Best Practices, Lessons Learned, Stories, Guides, Handbooks, Templates, Examples, Tools [Suggest Change]**
  - Parts Management Guide SD-19