



DMSMS and Parts Management Updates & Discussions

17 June 2021

AGENDA



- **DMSMS & Parts Management status and update**
- **Projects of interest**
- **Microelectronics Cross Functional Team**
- **Open Discussion/Q&A**

Today's Speakers



Robin Brown

Defense
Standardization
Program Office,
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Management Program
Officer



Tracy Daubenspeck

Senior Consultant,
Acquisition Logistics,
LMI



Morgan Thoma

Army Representative
to the DMCFT



Strategic Parts and Material Management – a Proactive Lifecycle Approach to Handle Obsolescence

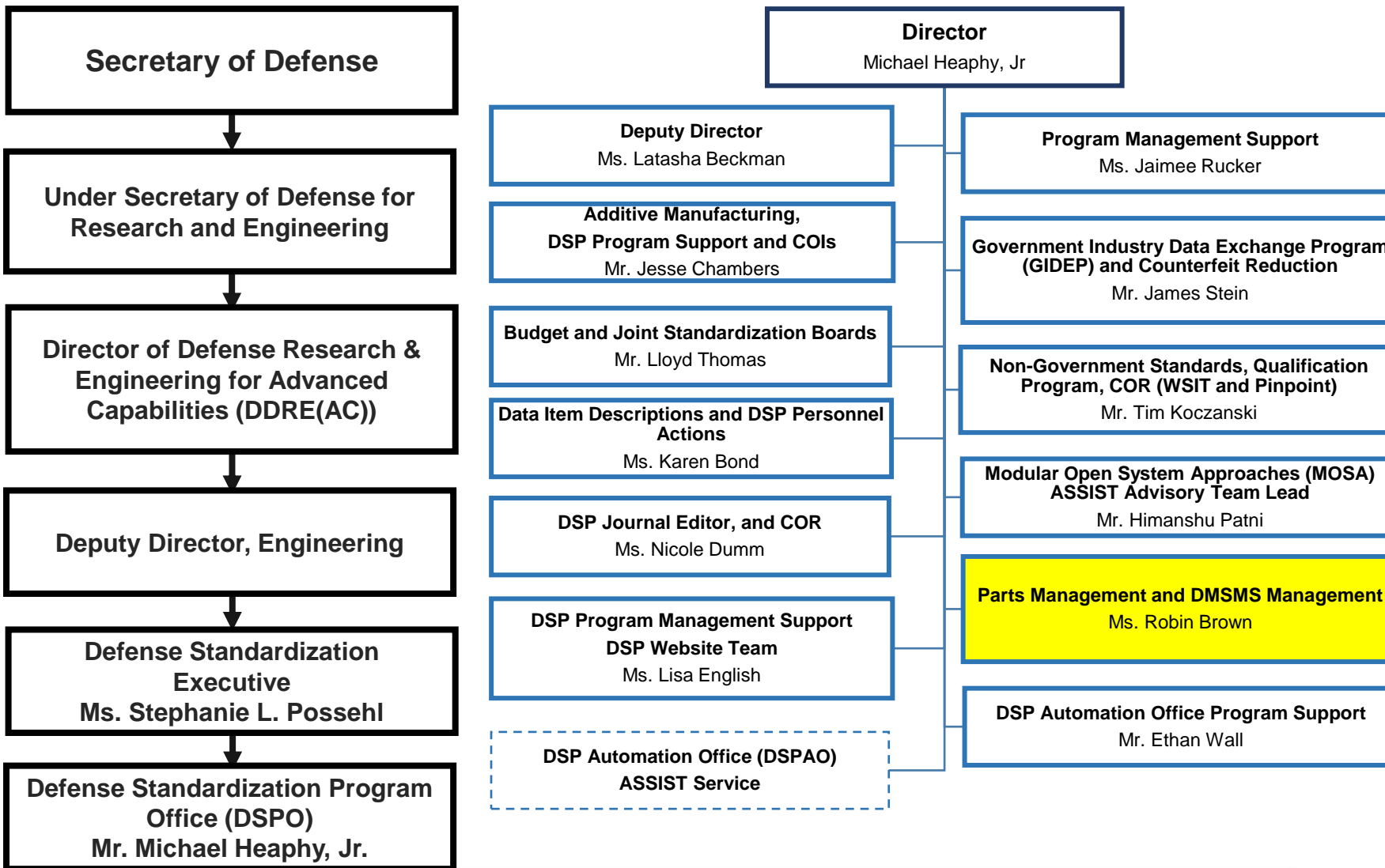
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Defense Standardization Program Office (DSPO)

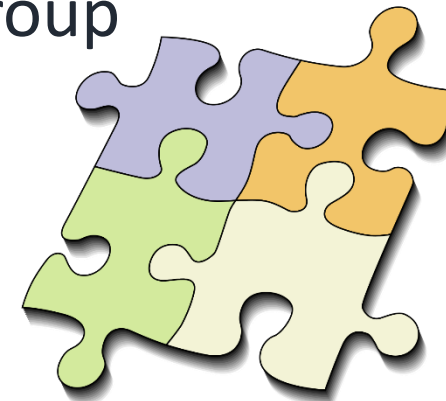




Agenda



- Parts Management and DoD Parts Management Program
- Diminishing Manufacturing Sources and Material Shortages (DMSMS) and the DoD DMSMS Management Program
- Synergy Between Parts Management and DMSMS
- Parts & Material Management Working Group
- Strategic Objectives / Resources
- Q&A





Challenges We Face Today



- Rapidly changing technology and accelerated acquisition timelines
- Service life extensions
- Increased use of commercial parts
- Offshore manufacturing
- Obsolescence / DMSMS
- Counterfeit parts
- Use of lead-free electronic parts and other environmental considerations



Parts Selection is Key!

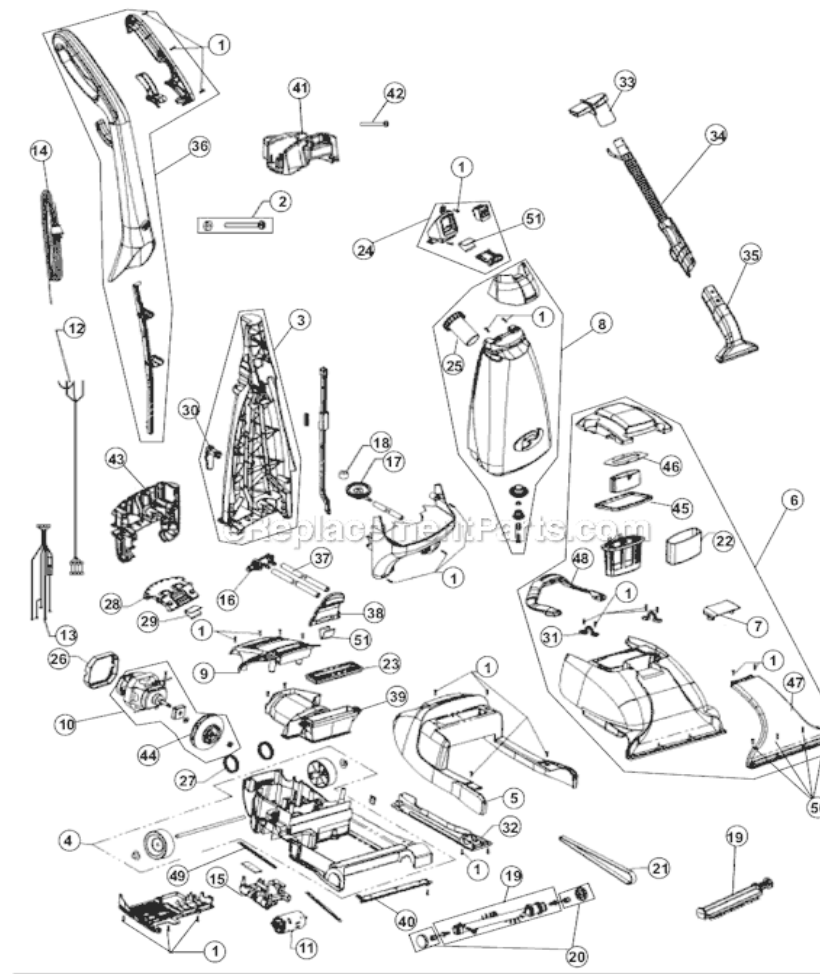


Parts Selection / Parts Management



Process of using **most optimum parts during design**. Benefits of this are:

- Reduced Costs
- Enhanced Readiness and Interoperability
- Reduced Acquisition Lead-Time
- Increased Supportability and Safety
- Enhanced Reliability and Maintainability
- Reduce Logistics Footprint





Parts Management Program



- Establishes best practices across DoD to increase availability and reduce total ownership costs. We do this by -



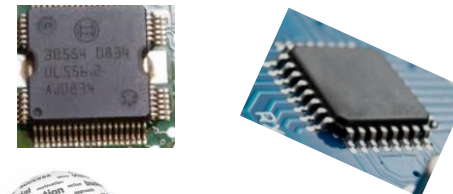
- Creating and revising DoD policy & guidance;
- Assessing the effectiveness of activities;
- Preparing and publishing SD-19, “Parts Management Guide”;
- Promoting education and engagement;
- Establishing and pursuing DoD-wide strategic objectives



Why DMSMS?

The loss or impending loss of Manufacturers or Suppliers of items, raw material, or software

Marketing (ex. Sales Decrease vs, New Offer)



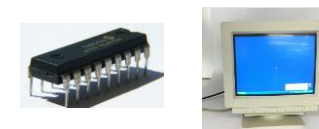
Business Strategy (ex. Restructuring, Acquisitions)



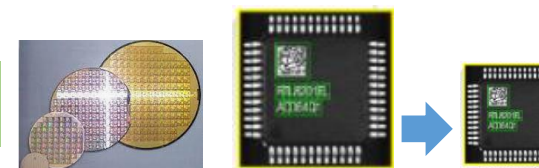
Product Catalog Rationalization



Means and Tools



Changing Technology, Manufacturing Efficiency (ex. Size reduction)



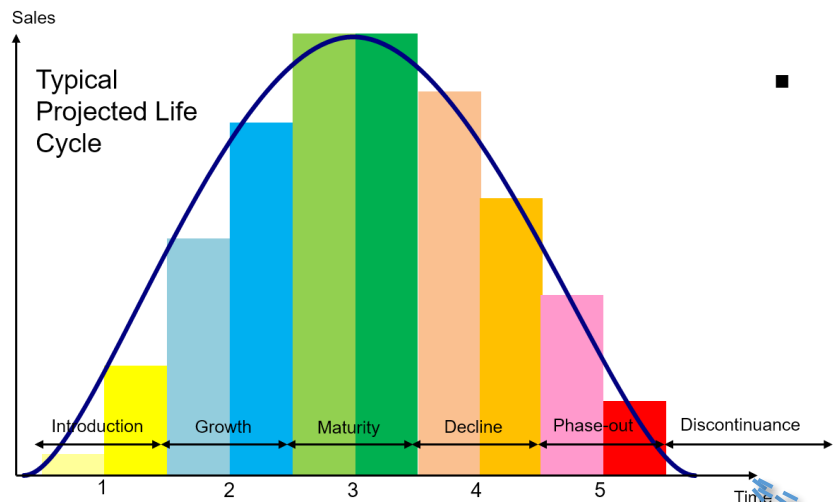
Environmental Regulations/Directives (ex. Materials)



DMSMS issues can arise with any PART within a system



And ... DMSMS is INEVITABLE!



- DoD systems can require a decade or more to develop and then have a fielded life that spans decades
- Yet the life cycles of many items that make up a DoD system's design are brief by comparison –
 - As low as 18 months for COTS and electronic items
 - Approximately 5 years for COTS software
 - Environmental or regulatory restrictions can happen at any time

Life Cycle Examples

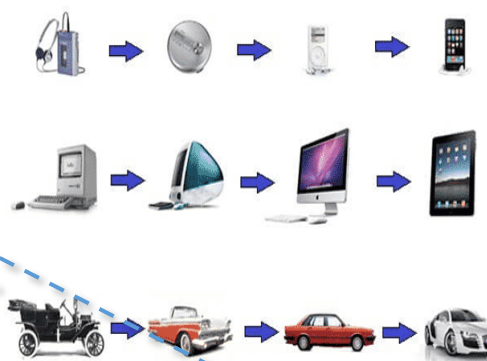
2 – 3 Years **Memories (DDRx)**

2 – 3 Years **Processors, Digital FPGA**

8 – 10 Years **Discrete (Transistors) & Analog Devices**

> 10 Years **Passive Devices (resistors, capacitors) & Connectors**

Technology Obsolescence



www.electricalfundablog.com

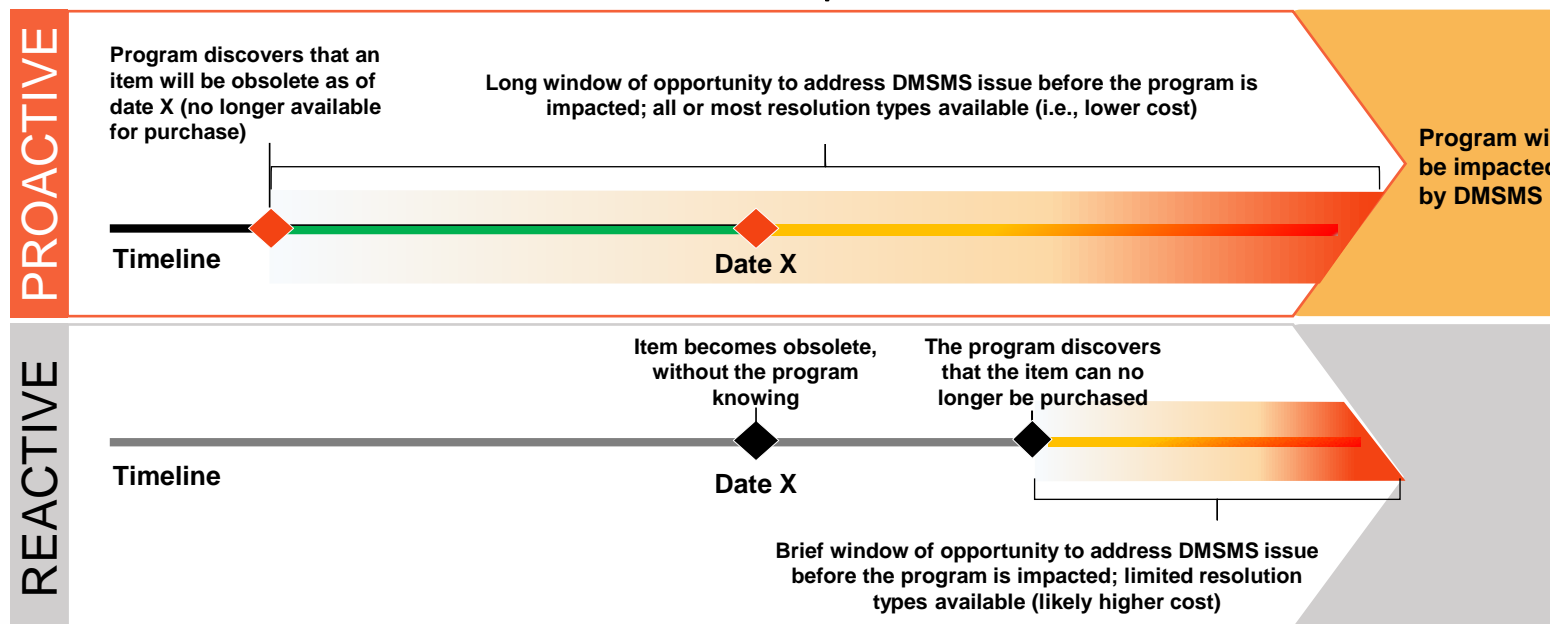
Robust Management is Necessary!



Proactive DMSMS Management



- DMSMS Forecasting and Resolution -
 - Increases the likelihood of implementing a lower cost resolution / More time to consider all applicable options
 - Minimizes DMSMS-related out-of-cycle redesigns
 - Eliminate DMSMS-related schedule impacts
 - Increases operational availability
 - Reduces or controls total ownership cost



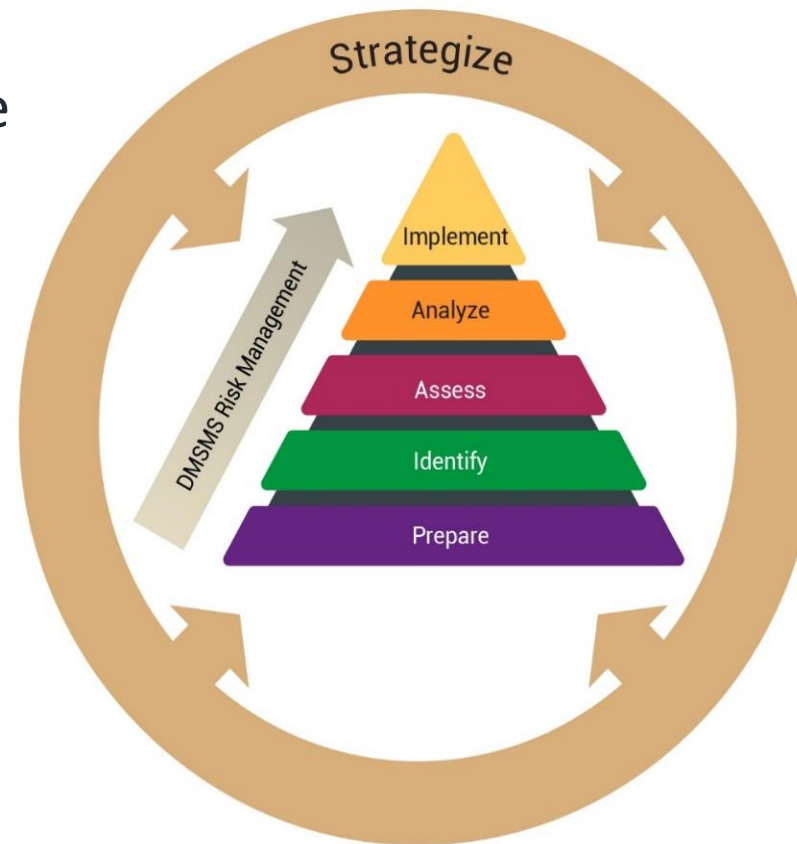
Can We Do Better Than This?



DMSMS Management Process



- **Prepare:** Establishment of a DMSMS management program infrastructure
- **Identify:** DMSMS monitoring and surveillance
- **Assess:** DMSMS impact assessment
- **Analyze:** Resolution determination
- **Implement:** Implementation of DMSMS resolutions





DMSMS Health Assessment



Item #	Item Type	Sub-System	Status Characteristics	FYx	FYx+1	FYx+2	FYx+3	FYx+4	FYx+5	FYx+6	FYx+7	FYx+8	FYx+9
123	Microprocessor	Sub-System 1	Starting Balance	4	3	2	0	-1	-2	-3	-5	-6	-7
			Predicted/ Actual Usage	1	1	2	1	1	1	2	1	1	1
			Ending Balance	3	2	0	-1	-2	-3	-5	-6	-7	-8
456	Amplifier	Sub-System 1	Starting Balance	135	122	108	92	75	55	33	8	-18	-44
			Predicted/ Actual Usage	13	14	16	17	20	22	25	26	26	26
			Ending Balance	122	108	92	75	55	33	8	-18	-44	-70
789	Touch Screen	Sub-System 2	Starting Balance	16	15	14	13	11	10	9	8	7	5
			Predicted/ Actual Usage	1	1	1	2	1	1	1	1	2	1
			Ending Balance	15	14	13	11	10	9	8	7	5	4
211	Motherboard	Sub-System 2	Starting Balance	12	10	7	4	2	-1	-4	-7	-9	-12
			Predicted/ Actual Usage	2	3	3	2	3	3	3	2	3	3
			Ending Balance	10	7	4	2	-1	-4	-7	-9	-12	-15
222	Graphics CCA	Sub-System 2	Starting Balance	11	11	11	11	11	10	10	10	10	10
			Predicted/ Actual Usage	0	0	0	0	1	0	0	0	0	0
			Ending Balance	11	11	11	11	10	10	10	10	10	10
233	Ethernet interface	Sub-System 2	Starting Balance	18	14	11	7	3	-1	-5	-9	-13	-17
			Predicted/ Actual Usage	4	3	4	4	4	4	4	4	4	4
			Ending Balance	14	11	7	3	-1	-5	-9	-13	-17	-21
244	Serial I/O CCA	Sub-System 2	Starting Balance	2	-38	-83	-128	-173	-218	-263	-308	-353	-398
			Predicted/ Actual Usage	40	45	45	45	45	45	45	45	45	45
			Ending Balance	-38	-83	-128	-173	-218	-263	-308	-353	-398	-443
255	Notebook Computer	Sub-System 2	Starting Balance	11	10	9	7	6	5	4	2	1	0
			Predicted/ Actual Usage	1	1	1	1	1	1	2	1	1	1
			Ending Balance	10	9	7	6	5	4	2	1	0	-1
			Legend:										
				Sufficient Assets to Support More than 5 Years									
				Sufficient Assets to Support Next 5 Years									
				Zero Quantity Reached Within 4 Years									
				Zero Quantity Reached Within 3 Years									
				Insufficient Assets (0 or Negative)									



Resolution Options



TYPE	RESOLUTION
	No Solution Required
Logistics	Approved Item
Logistics	Life of Need Buy
Logistics	Repair, Refurbish, Reclaim
Logistics/ Engineering	Extend Production or Support
Engineering	Simple Substitute
Engineering	Complex Substitute
Engineering	Develop a New Item or Source
Engineering	Redesign—NHA
Engineering	Redesign—Complex/ System Replacement



DMSMS Management Program



- Facilitates the implementation of proactive DMSMS management to reduce the adverse effects of obsolescence issues on readiness, schedule, and cost. We do this by:
 - Creating and revising policy & guidance;
 - Championing best practices, synergies, standardization through education, training, and outreach
 - Defining and assessing effectiveness
 - Establishing and pursuing DoD-wide strategic objectives
 - Facilitating common, collaborative resolutions to cross-cutting obsolescence issues



DoDI 4245.15 DMSMS Management



- Establish and implement risk-based, proactive DMSMS management throughout the life cycle of all DoD items
- Evaluate all DoD system designs and redesigns for potential DMSMS cases that could arise during the life cycle of a DoD item
- Implement resolutions if necessary, to mitigate or minimize negative impacts from risks of DMSMS throughout the life cycle management of DoD items
- Implement improvements to DMSMS management processes throughout the life cycle of all DoD items across the DoD enterprise

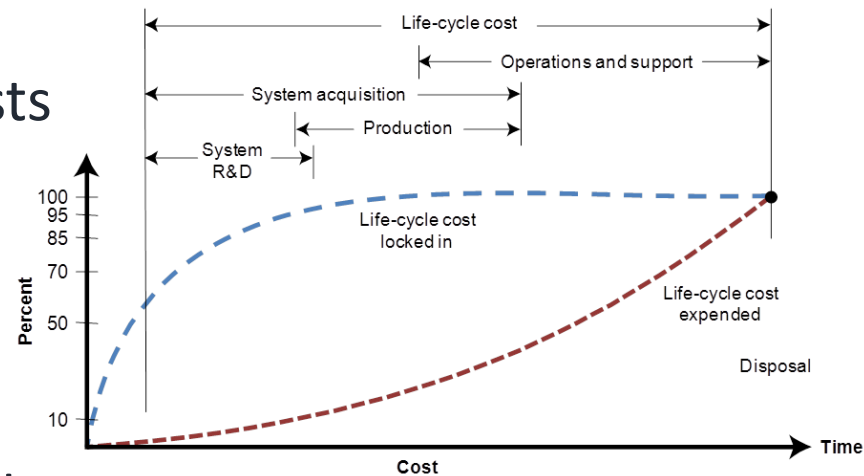
<https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/424515p.PDF?ver=1nGN1Q4HzmReR3-nCo59UQ%3d%3d>



DMSMS Resilient Designs



- Early design decisions substantially impact operations and support costs (sustainment)
- DMSMS is one product support design tradeoff consideration
- So, why not create DMSMS-resilient designs (and apply future system modification / refresh planning to avoid DMSMS issues altogether or delaying their occurrence?)
 - Selecting long life cycle items
 - Avoiding single sources of supply
 - Using open architecture in designs





Parts & Material Management WG





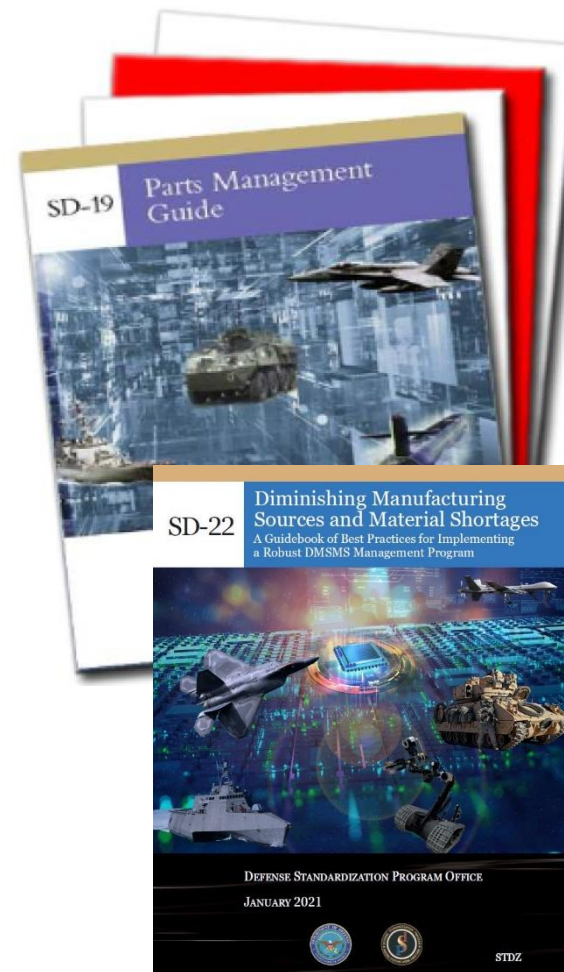
Strategic Objectives / Resources



- Assessment of Parts Management
 - SD-19 Parts Management Guide
https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=119791
 - Websites, Tools, Databases

- DMSMS Policy and Guidance
 - Draft DoD DMSMS Manual
 - SD-22, DoD DMSMS Guidebook
https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=275490

- DMSMS Management Plan Template
<https://www.dau.edu/cop/dmsms/>





Strategic Objectives / Resources



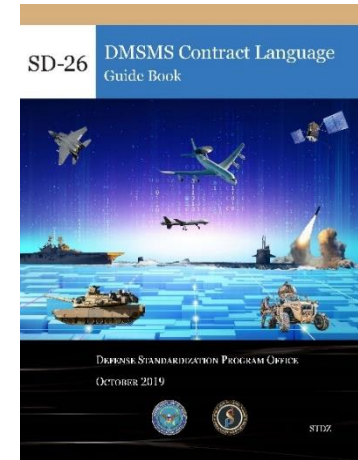
- Contracting

- SD-26, DoD DMSMS Contracting Guide

https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=283456

- IEC 62402, DMSMS Management
- SAE-STD-0016, DMSMS Management Plans
- MIL-STD-3018, Parts Management

https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=275861



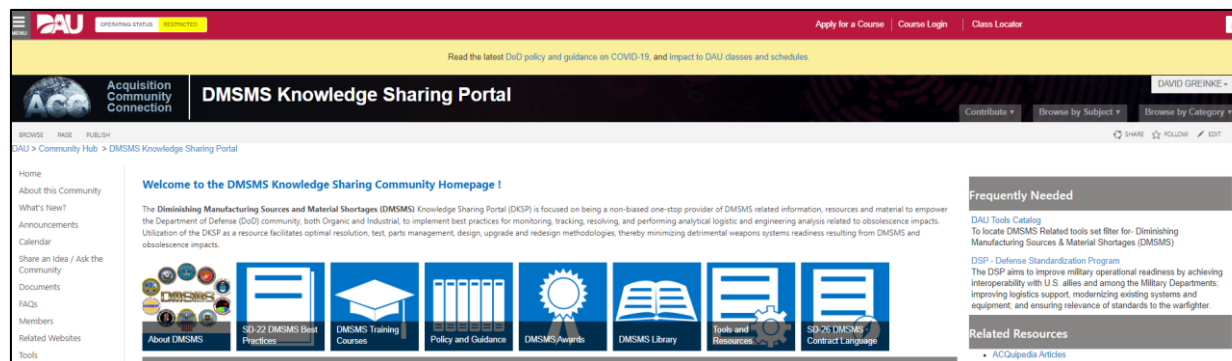
- Standardized format for Product Change and Discontinuation Notices
- Metrics - Parts Management and DMSMS
- Software DMSMS Management
- Training / Outreach



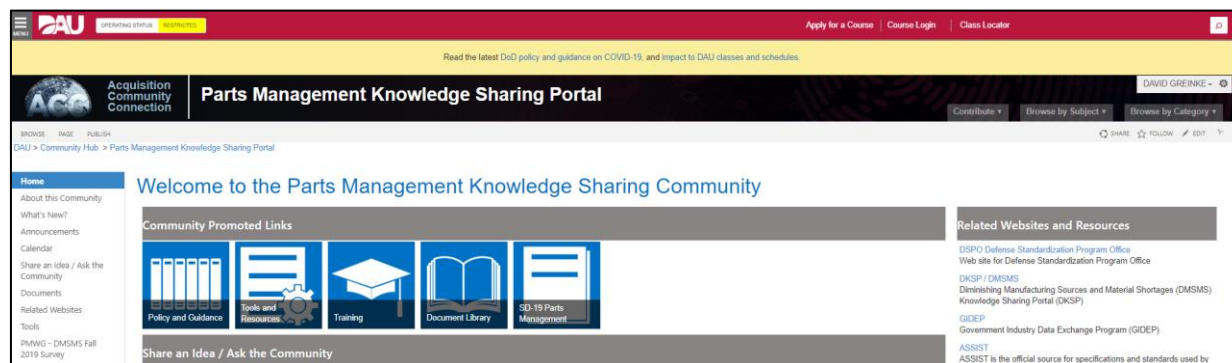
DAU Knowledge Sharing Portals



DMSMS Knowledge Sharing Portal (DKSP):
<https://www.dau.edu/cop/dmsms/>



Parts Management Knowledge Sharing Portal (PMKSP):
<https://www.dau.edu/cop/pmksp/>





Things to Remember!

- Good **PARTS SELECTION** is **KEY TO SUCCESS**
- Make sure you have the right **CONTRACT LANGUAGE**
- Build **DMSMS-RESILIENT DESIGNS**
- Create **TECH ROADMAPS / REFRESH PLANS** and follow them
- **BE PROACTIVE** - If risks are unavoidable, it is better to find out early so plans can be made to mitigate
- **DON'T SUFFER IN SILENCE** – There are people and resources that can help

Pay now; or Pay more later!



Questions?



The Changing World of DoD's Microelectronics Supply Chain

Tracy Daubenspeck

June 17, 2021

```
[cpu] done / done / password found / operation 129 22  
[cpu] negative / negative / time 0 / end / operation 228  
[cpu] done / negative / error 001  
[cpu] error / error / restart  
[cpu] done / done / access / complete / operation 122 334  
[cpu] error  
[cpu] negative / analyzing / operation 332 390  
[cpu] preparation complete / code xxx00x0xxx0x0
```

The state of the DoD's microelectronics supply chain

- Production of microelectronics in the US has been diminishing for many years.
- Currently, the US consumes 34% of the world's electronics but produces less than 12% of them.
- DoD consumes less than 2% of the world's electronics.
- The DoD is dependent on a reliable and secure supply of microelectronics to develop and maintain its systems but is not a large enough consumer to have much impact on the global market.
- Many of our electronics come far off-shore.

What's been happening?

- The government has not been idle in trying to address microelectronics supply chain issues.
- Many actions have been initiated and more are planned. (More to follow)
- From the perspective of DMSMS/Obsolescence management, the number of initiatives and the potential impact on the supply chain are an area of concern.
 - If the bar is raised too high:
 - Companies may move out of the DIB
 - Product lines may be trimmed
 - Products may become unavailable because of policy changes (e.g. Huawei)
- If production of microelectronics are brought on shore or other remedies are implemented, production changes may require requalification (at least)
- More changes are being implemented and more are planned.
- The following slides mention some of the activities that are going on without a ton of details, just to set the stage

Title VIII, Section 889 NDAA 2019 Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

- From a Diminishing Manufacturing and Material Shortages (DMSMS) management perspective
 - Certain equipment from certain manufactures is effectively obsolete
 - The requirements placed on contractors may result in some deciding to stop contracting with the Government resulting in more obsolescence
- From a parts management perspective, 889 adds a requirement for additional scrutiny during parts selection and limits the market for certain devices
- It should be noted that there is currently no definitive list of parts or companies.

Title II, Section 224 of the 2020 NDAA

- Requiring Defense Microelectronics Products And Services Meet Trusted Supply Chain And Opera
- Requires the establishment of operational security standards that will protect the United States, the DOD, and defense contractors that do business with the DOD from the theft of intellectual property and ensure national security and public safety in the application of new generations of wireless network technologies and microelectronics.
- Section 224's required security standards are to be developed in consultation with civilian agencies and industry to ensure that differing perspectives will be considered.
- Contractors that sell, or wish to sell, microelectronics and wireless network technology products and services to the DOD should be prepared for the imposition of the security standards developed under this program.
- ...required to be developed and effective by January 2021.
- ...likely will not be enforced until January of 2023...

Sect. 224 Implementation Considerations

- Quantified Assurance across supply chain
 - Risk Assessment methodology
 - System Program Perspective
 - Supply Chain Perspective
 - standard process for assessment, reporting, validation, etc. •
- Tiers of Trust/Assurance
 - What categories and quantitative levels are appropriate to enable tailored risk assessments
- Standards applicability to address above?
 - Mapping, analysis, effectivity evaluation, gaps, translation
- Incentives and valuation of tiers of quantified assurance
 - within acquisition for DoD, USG?
 - within the DIB and critical domestic infrastructure
 - auxiliary industries (insurance, finance, medical, automotive, IoT etc.)
 - with allied and partner nations

Title XCIX, Sections 9901 – 9908 2021 NDAA, Creating Helpful Incentives to Produce Semiconductors for America (CHIPS Act)

- The largest effort to coordinate US government support for the microelectronics industry since SEMATECH was established in the late 1980s.
- Focuses on incentives to build or modernize fabs so that more chips, and more advanced chips, are made in the US.

Cybersecurity Maturity Model Certification (CMMC)

- CMMC is a unifying standard for the implementation of cybersecurity across the Defense Industrial Base (DIB).
- It includes a comprehensive and scalable certification element to verify the implementation of processes and practices associated with the achievement of a cybersecurity maturity level.
- Is designed to provide increased assurance to the Department that a DIB company can adequately protect sensitive unclassified information, accounting for information flow down to subcontractors in a multi-tier supply chain.
- DFARS Case 2019-D041 became effective as an interim rule on November 30, 2020
- Requires that offerors have their NIST SP 800-171 DoD assessment posted on SPRS

Executive Orders

- EO 140177 America's Supply Chains
 - Requires reports on the supply chain and recommendations for actions
- EO 14005 Ensuring the Future is Made in All of America by All of America's Workers
 - Directs federal agencies to maximize the use of goods, products, and materials and services offered in the US.

Rapid Assured Microelectronics Prototypes (RAMP)

- Phase 1: \$24.5M awarded to advance commercial leading-edge microelectronics physical “back-end” design methods with measurable security.

State-of-the-Art Heterogeneous Integration Prototype (SHIP)

- Phase 2 effort: \$172.7M Awarded to demonstrate a novel approach towards measurably secure, heterogeneous integration and test of advanced packaging solutions

Defense Microelectronics Cross-Functional Team

- Established January 11, 2021
- Purpose: to Develop a DoD strategy, implementation, and transition plan that will minimize vulnerabilities within the Department's microelectronics supply chain.

Summary

- There is a lot going on in the microelectronics world
- More is planned
- Changes in the supply chain to make it more secure from a DoD perspective will likely have both negative and positive ramifications
 - Positive:
 - Improved security
 - Improved access
 - US based design and manufacture
 - Negative:
 - Reduction of available suppliers
 - Discontinuance of components
 - Requalification required if production lines change



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Make It Possible With Us



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