

Developing a More Complete Set of DMSMS Solutions

**DMSMS 2011
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History

- In February, 1999 the Defense Microelectronics Activity (DMEA) published the “RESOLUTION COST FACTORS FOR DMSMS”
- This publication:
 - Developed a standard list of solution types
 - Established nonrecurring engineering costs based on industry research
 - Established a methodology for determining cost avoidance
- The DMEA solutions and cost factors were the standard for the DOD until 2010.

DMEA Solutions and Costs

Resolution	Low \$	Average \$	High \$
Existing Stock	0	0	0
Reclamation	629	1,884	3,249
Alternate	2,750	6,384	16,500
Substitute	5,000	18,111	50,276
Aftermarket	15,390	47,360	114,882
Emulation	17,000	68,012	150,000
Redesign— Minor	22,400	111,034	250,000
Redesign— Major	200,000	410,152	770,000
Life of Type (LOT) buy*	-	-	-

*The LOT buy resolution is program-specific and should be calculated by the individual DoD programs.

The DMEA costs were updated in December, 2001 by applying inflation factors and rounding.

- The DMEA solutions were electronic component oriented
 - This was the common focus of DMSMS at that time
- Times have changed!
 - There is a greater focus on the obsolescence of COTS and Mechanical parts in systems
 - The DMEA solutions and costs do not apply outside the world of electronic components

History (Cont.)

- In September, 2010 SD-22, the DoD DMSMS Guidebook, was updated with a new set of solutions and associated cost factors
- The solutions and costs were based on a 2007 Department of Commerce survey of Government and Industry

SD-22 Solutions and Costs

Resolution type	90% confidence (left limit)	Mean	90% confidence (right limit)	Weeks to resolve (average)
Reclamation	\$1,000	\$20,000	\$39,000	12
Alternate source	\$0	\$41,000	\$92,000	11
Administrative substitute	\$1,000	\$3,000	\$5,000	4
Desktop substitute	\$0	\$5,000	\$10,000	8
Normal substitute	\$22,000	\$34,000	\$46,000	25
Complex substitute	\$122,000	\$432,000	\$724,000	40
Emulation	\$29,000	\$73,000	\$117,000	26
Aftermarket manufacturing	\$0	\$33,000	\$58,000	21
Redesign—COTS product	\$82,000	\$1,118,000	\$2,154,000	42
Redesign—Custom part	\$542,000	\$1,094,000	\$1,646,000	61
Redesign—PNHA	\$654,000	\$1,010,000	\$1,366,000	64

Issues

- While the current SD-22 solutions are not strictly focused on electronic components they do not appear to have the range needed accommodate both COTS and component obsolescence costs
- The solutions used in SD-22 may be confusing to non-subject matter experts in the field of DMSMS. Cost avoidance is a touchy subject and the ease of explaining the rationale behind the resolution choice and the implied costs and cost avoidance must be clear.
 - There are 4 types of substitutes
 - Definitions have changed from the earlier DMEA solution set

The Need

- The DMSMS community needs a clear, standardized set of solutions
 - The set of solutions must have the following attributes
 - They must provide enough granularity to accommodate current practices of both Government and Industry
 - They must facilitate the updating of cost data by being clearly defined
 - They should only deviate from the existing solution set when that deviation is required to meet one of the requirements above

Proposal

- The Obsolescence Management Teams at NAVSEA NSWC Crane and NUWC Keyport developed a set of solutions for COTS obsolescence.
- Use the DMEA solution set for components
 - Update the definitions as needed to ensure that there is no confusion when requesting updates on cost information
- Add a set of solutions for COTS and possibly other commodity areas.

Proposed COTS Solutions

The Obsolescence Management Teams at NAVSEA NSWC Crane and NUWC Keyport developed a set of solutions for COTS obsolescence.

Use of Existing COTS Material
Reclaimed COTS Assembly
Replacement COTS Assembly
Extend COTS Manufacturing
Aftermarket COTS Source
Develop a New COTS Source
Minor COTS Redesign
Major COTS Redesign

Benefits

- By reusing the DMEA solutions for components continuity is maintained
- The proposed COTS solutions essentially match the DMEA solutions so both the terminology and the definitions are similar
- They provide enough granularity to gather cost information

Summary

- The current SD-22 DMSMS solutions set does not meet the needs of the DMSMS community
 - Does not adequately address COTS solutions
 - Insufficient granularity to determine costs
- Reusing the original DMEA definitions for components and adding new, similar COTS definitions provides:
 - Continuity
 - Clarity
 - More accurate cost figures (increased granularity)

- The following slides detail the proposed COTS solutions

Proposed COTS Solutions (Cont.)

COTS assemblies are commercially available assemblies that are procured without technical design information and which are typically managed as non-repairable, consumable items. COTS assemblies include electronic assemblies such as network switches and printers, mechanical items such as and hydraulic actuators and fuel injectors, and electrical items such as circuit breakers and electric motors.

* For the purposes of this document, only commercially manufactured assemblies designed for commercial use by the public and commercially manufactured assemblies manufactured for common use by multiple government entities are considered. Assemblies manufactured by commercial entities to meet a peculiar government system's requirements and COTS modified to meet government requirements are not considered.

Proposed COTS Solutions (Cont.)

1. **Use of Existing COTS Material:** The obsolescence is resolved by the use of COTS assemblies already in existence. Since this solution uses an approved COTS assembly, no testing or drawing changes are required. The source of supply can be Residual Stock from the original manufacturer or Shelf Stock from distributors. Costs for packaging, storage, and transportation should be considered in the Business Case Analysis for selecting solutions. This can be accomplished by one of the following:
 - a. Stock On-Hand (SOH)
 - b. Bridge Buy – A bridge buy is made for a sufficient number of parts to allow time to develop another solution.
 - c. Life-of-Type (LOT) Buy – A Life-Of-Type buy procures a sufficient quantity of the obsolete part to ensure full production plus repair requirements are met for the expected life cycle of the system.
 - d. Repair or service agreements with either the original manufacture or with a third party. This solution only applies if the system is out of production and sufficient spares exist to support a repair program.
 - e. Refurbished COTS Assemblies – COTS assemblies are procured from vendors who specialize in salvaging and refurbishing commercial COTS assemblies.

Proposed COTS Solutions (Cont.)

2. **Reclaimed COTS Assembly:** COTS assemblies are obtained from out-of-service equipment or other sources. These COTS assemblies may require screening, testing and repair to ensure they are Ready For Issue (RFI).
3. **Replacement COTS Assembly:** The use of an equivalent, commercially available COTS assembly that can be used without redesign of the Next Higher Assembly (NHA). NRE costs can vary significantly depending on the testing required to accept the new assembly. For cost calculation purposes, this solution type is broken into two sections:
 - a. Simple Replacement – The new COTS assembly can be used without modification
 - b. Complex Replacement – The new COTS assembly requires modification to meet system requirements.

Proposed COTS Solutions (Cont.)

4. **Extend COTS Manufacturing:** Incentivize the manufacturer to continue manufacturing the obsolete COTS assembly. This may involve long term agreements to procure specific quantities of assembly. There will be one-time costs associated with setting up this solution which should be included in any cost and cost avoidance calculations. One variation of this solution involves working with the manufacturer to resolve any obsolescence problems they may encounter with the COTS assembly's piece-part(s), so they are able to continue to manufacture the original COTS part. The Government obtains the COTS Assembly BOM from the OEM, resolves piece-part obsolescence, and then provides the needed parts to OEM as Government Furnished Material to facilitate continued manufacture and repair.

Proposed COTS Solutions (Cont.)

5. **Aftermarket COTS Source:** Aftermarket Manufacturers are companies that obtain or develop and maintain the design, equipment, and process rights to manufacture the assembly after the original manufacturer ceases production. Aftermarket manufacturers have decided to start or already started manufacturing an item without Program investment. The resultant COTS assembly would be an equivalent replacement to the original. The cost of the new assembly may be significantly higher than the original.

Proposed COTS Solutions (Cont.)

6. **Develop a New COTS Source:** New sources of manufacture, either commercial or government can be developed using the original manufacturer's equipment, technical data, and processes or by reverse engineering the product and developing a completely new manufacturing process using a new vendor. New manufacturers typically require Program investment for a onetime set-up cost to start manufacture. The resultant COTS assembly can be either equivalent or identical to the original assembly. The cost of the new assembly may be significantly higher than the original and NRE and setup costs can be high.

7. **Minor COTS Redesign:** A minor COTS assembly redesign only affects the obsolete COTS Assembly's Next Higher Assembly (NHA). A minor redesign typically only deals with the replacement of the obsolete COTS assembly with a non-equivalent COTS assembly, and requires only minor changes to hardware and software of the NHA. For example, new driver software is required to accommodate an updated graphics card but there is no effect on system performance.
8. **Major COTS Redesign:** A major COTS assembly redesign affects assemblies beyond the obsolete COTS assembly's Next Higher Assembly and may require that higher-level assemblies, software, and interfaces are changed.