

Government/Industry Microelectronics DMSMS Workshop 2001

May 3, 2001

MINUTES

The Government/Industry Microelectronics DMSMS Workshop 2001 was conducted at Lake Natoma Inn in Folsom, California.

BACKGROUND

More than ever, new and ongoing acquisitions and legacy systems are being impacted by obsolescence. To reduce the impact of obsolescence, many of the legacy programs have implemented Diminishing Manufacturing Sources and Material Shortages (DMSMS) risk management strategies. Sharing the good ideas and lessons learned from these programs can facilitate the incorporation of DMSMS risk management into future acquisition strategies in various DoD programs in development, production, and sustainment. Recognizing that 1) Acquisition Reform, 2) Performance-Based Specifications, and 3) single page Statement Of Objectives (SOO) may limit the amount of contractual language, the DoD must ensure that DMSMS management and technology refresh is planned into the acquisition process.

This workshop addressed how government and industry can work together on the following objectives:

- Incorporate the minimum DMSMS management contractual language;
- Share in the DMSMS risk management process;
- Ensure that DMSMS management is inherent in all weapon system programs;
- Minimize Total Cost of Ownership.

INTRODUCTION

Mr. Ron Shimazu from the Defense Microelectronics Activity (DMEA), the DoD Executive Agent for DMSMS, welcomed over eighty government and industry DMSMS representatives to the 3rd Government/Industry Microelectronics DMSMS Workshop. In February 1999, the DoD and DMSMS community was asked, *"What are the top issues related to DMSMS, and how can the DoD help?"* Mr. Shimazu thanked the many respondents to the first and subsequent surveys, and summarized key events since the 1999 survey:

Orlando 1999 – 1st Government/Industry Microelectronics DMSMS Workshop had panel members from the F-22 Program Office, Aviation Missile Command (AMCOM), AEGIS Program Office, Warner Robins Air Logistics Center, Northrop Grumman, Honeywell and the integrated circuit (IC) industry. Three top issues identified during the Workshop were: 1) documenting DMSMS management practices, 2) using of commercial parts, and 3) putting DMSMS Management on contract. This third issue was further refined to state, *"What are the acquisition strategies and how should they be implemented, and does the use of COTS have an impact on the strategies?"*

Jacksonville 2000 – 2nd Government/Industry Microelectronics DMSMS Workshop and DMSMS 2000. This workshop addressed issues presented in the prior Orlando Workshop. To address the first issue of the Orlando Workshop—Documenting DMSMS Management—two handbooks were developed, the [*Program Managers Handbook—Common Practices to Mitigate the Risk of Obsolescence*](#), published by ARINC Incorporated for DMEA in the fall of 2000, and the [*DMSMS Management Practices*](#), developed by GEIA. The *DMSMS Management Practices* handbook has been adopted by the DoD. To address the second issue—Use of Commercial Parts—two handbooks were developed by the IECQ Avionics Working Group, and DoD they are

[Guide for Component Management Plans](#) and [Guide for Using Components Outside the Manufacturers' Specified Temperature Ranges](#).

This workshop addressed acquisition strategies. All information collected at this workshop and from the Acquisition Guidelines Survey will be published in the summer of 2001. It will also be used in the development of the Acquisition Guidelines Document to be developed by DMEA.

Ms.Carolynn Drudik (Workshop Moderator) opened the workshop by describing the overall theme of the morning and afternoon sessions. Session One was to identify the problems with DMSMS management that industry and government face in today's acquisition environment. Session Two was to focus on solutions to those problems.

Each session was initiated with a set of preplanned question to each panel member. This set of questions was followed by questions from the audience to various panel members. In these minutes, the questions (and audience comments) are shown in bold print, while the panel members' answers are not bolded. The documented questions and answers that follow are not listed verbatim. If the question was succinct, then it is documented in its entirety. Non-succinct questions were edited down to their essence. All answers were edited down to their essence for reasons of brevity and practicality. A sincere effort was made to avoid altering the meaning of any answer. Attachment A provides a summary of the workshop survey. Attachment B provides the workshop attendance list.

SESSION ONE—THE CHALLENGES IN ADDRESSING DMSMS MANAGEMENT IN ACQUISITION

Panel Members

Steve Buss—Northrop Grumman
Daryll Cameron—General Dynamics Information Systems (GDIS)
Bob Gibbs—Aviation and Missile Command
Mike Jackson—Air Force Materiel Command

Introductory Questions

Carolynn Drudik – In this new environment of acquisition reform and the trend towards long-term contractor logistics support (CLS), what is your experience in pricing DMSMS management and potentially costly obsolescence solutions in a DoD contract, and what are the problem areas in being able to do that?

Steve Buss – Companies and services struggle on how to best apply DMSMS obsolescence management practices. The more successful programs have implemented Integrated Product Team (IPT) strategies. The prime, the customer, and strategic partners all work together to develop common solution sets. IPTs are important for a number of reasons. You need to get the right people on the IPT (i.e., reliability, quality, design engineering, component engineers, and procurement personnel). The IPT is charged with managing the standardized (preferred) parts list. The standardized parts screening process will prevent the designers from using a part that is in the declining phase of its useful life. The IPT will also develop the tools that are necessary to manage their standardized parts list. Northrop uses all the commercially available database tools plus two homegrown tools. Those tools will import the bills of materials into the database and match them up against the part numbers that have life codes. It is the IPT's responsibility to assign the life codes to those components. The IPT will then support the program, review their parts list, and communicate when potential problems are identified. One of the problems the IPT encounters is the need to cross-reference specifications and source control drawings to a generic or manufacturer's part so they can be tracked. Creating the cross-referenced list is a lengthy and time-consuming process, and sometimes the information is not available. Once the project database is populated, you can start working the obsolescence issues with the customer. Using the database, you can show the customer where the problems are expected to be in the future. You need to start planning. Typically, you won't have the budget, and you must work with your customer to POM for the technology refresh cycles. Programs can have a significant investment in this process. Smaller programs can't

afford this process. Typically, you want the IPT as an overhead function. There is enough visibility now in obsolescence, aging avionics, and aging aircraft that you can support the business decision to provide the IPT as an overhead function. Another problem is that design engineers want to use "favorite parts" that are not on the standard parts list, and they battle with the IPT over the use of these parts. Unfortunately, the IPT loses the battle, and the design engineer is allowed to use the part.

There are some good business cases that show managing DMSMS is beneficial even though DMSMS it is not in the contract. Typically, you can generate new business from this process by showing the customer where the problems will be in the future.

Carolynn Drudik – Daryll, what is your experience in proposing DMSMS management and obsolescence solutions in a DOD contract, and are there issues that you would like DOD to address to help resolve?

Daryll Cameron – Comment on Mr. Buss' Question: The GDIS/Raytheon IPT that supports the Phalanx Program has been very effective. I support your approach and words about IPTs. I'm very familiar with the problems of having to bid DMSMS. You discuss including DMSMS activities in overhead rates or in other areas with management, but that becomes a big battle. We are all trying to keep our overhead costs down to remain competitive.

I have worked programs as both a prime and a sub, and I have yet to see a DMSMS requirement in a request for proposal (RFP) or request for quote (RFQ). This is one area that we really need to look at. In a competitive proposal, DMS must be included in the RFQ. Whether the requirement is a preliminary obsolescence management plan, or something else, you must include a DMS requirement for contractors to bid against. If there is no DMS requirement, the contractors will focus on keeping their costs down so they can win. The proposal management section should show the contractor's DMS experience. For example, "Here is our experience working with DMEA, IPTs, Teaming Group, etc."

Another perspective to look at DMSMS issues is the business perspective. Management is incentivized on gross profit, cash, etc. There is no management incentive to fund DMSMS. Management is focused on improving profit and cash flow. From the business perspective, you should look at what you are asking people to bid against, and create greater DMS awareness with executives.

Carolynn Drudik – In this new environment of acquisition reform and the trend towards long-term contractor logistics support, what kinds of contractual issues are you finding in managing DMSMS, and what would you like to see being addressed in this workshop?

Bob Gibbs – We have had very little experience so far in long-term CLS activity at our command. We did have the Apache program as one of the premier programs to determine if CLS was cost-feasible. I had the opportunity to read the language in that contract. That review highlighted the need to address this topic in more depth. Some of the issues are predicting and pricing the future cost of obsolescence. If a program has not been proactive, there is no basis upon which to predict what is going to happen over the life of the contract (10, 15, 20 years). What are the costs that can be evaluated and put on contract for obsolescence and DMSMS? Another issue is looking at a combination of both Mil-Spec and COTS items. COTS items are supposed to be reducing TOC and increasing reliability. What are the savings that are going to be associated with COTS DMSMS in the contract?

Next, we need to define obsolescence management in a contract. The Apache only had three sentences, and those were insufficient to clearly define an obsolescence management process. Neither the contractor, nor the government, has any leverage to ensure a good obsolescence program. The contract needs to define when and where technology insertion should occur and who should identify the technology. It should ensure that proactive obsolescence management is implemented at all levels, and that it flows down to subcontractors. It should also endorse the idea of IPTs; however, the problem with IPTs is in defining roles and responsibilities. When an IPT has a problem, you need a contact to fall back upon. Some other concerns to consider:

- What happens at the end of a contract? What becomes government property?
- The government needs insight into what has happened over the period of performance. The government needs data to be able to price the next contract.
- What happens when a contractor is acquired or goes bankrupt?
- What happens if the government decides to take over logistics support?
- What role does a depot or program office play in support of DMS management?

Carolynn Drudik – From the Air Force perspective what kind of contractual problems are you seeing, and what would you like to see being addressed in this workshop?

Mike Jackson – Air Force contractual problems are in three major areas. These problems all center around the fact the government is no longer a major player in the electronics market.

1) The prime contractors do not have a lot of experience in down-the-road planning and predicting tomorrow's DMS cost. When the primes bid for the support contract, they want to take over all supply issues, item management, and engineering. The contractor bases everything on today's problems and today's costs and are not looking two, three, or six years down the road. Contractors want to completely manage the items and not share information with other program managers (PMs).

2) Modification and Redesign programs – Three years ago, an assembly in the F-16 had DMS problems. Foreign Military Sales (FMS) customers were very concerned because FMS customers are often placed low on requisition priority lists. The FMS customers pushed for redesign with the intent to design out DMS. The contractor did not screen parts used in the redesign. Before production, the contractor notified the government that there were DMS problems, and that the assemblies could not be manufactured. The FMS customer was stuck purchasing life-of-type parts for FMS production. Now, because of DMS, two configurations are managed. The assembly is completely supportable on the Air Force side, but not the FMS side.

3) No bids on RFQs for repair of assemblies and individual parts - The reason for no bids is the prevalence of DMS problems. The F-16 Program has 31 versions of the DMS RFQ clause. The intent of developing the clause was to include it on every F-16 contract. The clause requires the contractor and government to work as a team to solve DMS issues as they arise. If the DMS problem cannot be resolved, the clause allows for termination for convenience.

What I would like to see out of this workshop, or DOD wide, is more discussion to see who else is having these types of problems. Can contractual language on clauses be shared? Somewhere in the DOD there should be a pot of money to draw upon for both management and for short suspenses on LOT buys for DMSMS problems.

Open Discussion

Jack McDermott – ARINC. Depending on how you place the question in a SOW, prime and subs may bid full-time DMS support. How do you minimize the cost of doing DMS and remain competitive?

Daryll Cameron – If you are doing a competitive proposal, the playing field must be level so it is not skewed in favor of anyone. If you want to emphasize DMS, you must have standard language in the RFP. Include DMS as a "rating criteria" to convey what is expected in the proposal. To be successful in DMS management, there needs to be some element of trust. Contractors must feel a sense of ownership of their products; they must take the responsibility of supporting their product.

The government will often ask for a quote on a simple item. However, when the quote is returned, the government says "we can build it cheaper ourselves." Processing an order takes time from many of the contractor's people. All the contractor's time is traceable; whereas, the government may spend more making the item, but it appears cheaper because of incomplete cost tracking.

Harvey Waldron – Boeing B-1 Program. We're not finding any obsolescence contractual language in the contracts that we are working today. My question is: When using COTS hardware in an EMD program, by the time you are ready to start production, the COTS supplier has moved on to next generation of that product family. The prime contractor is in the position where his product meets the requirements, but product design is not producible. Where does the responsibility lie? Moreover, how do we get through the production stage?

Steve Buss – The prime has the responsibility. To minimize the problem, the prime must increase strategic alliances with vendors and prepare roadmaps. You must work together with the engineering group and the vendor. Use Boeing leverage and perhaps the vendor will license someone else to build the design.

Daryll Cameron – There are people who say, "COTS is the answer to DMS." However, COTS presents a different type of DMS problem. Existing COTS products change quickly so you need to plan ahead with software and interfaces. In the "rotating mass memory market," new COTS products become available every 18 months. Who is responsible? I believe it is our (government and prime) responsibility (i.e., IPT). As commercial users replace systems, secondary markets could provide solutions, but used equipment may require refurbishment.

Bob Gibbs – If you have gone through EMD, the contract is basically over. You have defined your configuration, and you are going into production; then you must allow for configuration changes. The production contract must allow for changes to configuration for resolution of DMS impacts. Plan ahead and predict during concept and EMD. Define the technology and plan for periodic change-out. To minimize lack of foresight, you need to define technology insertion refresh points and plan during design. There is a need to sustain equipment even after production. COTS users should try to standardize interfaces and look at backward capability. The best approach is a flexible design to be able to handle change-outs throughout the life cycle, and this flexible design should be defined during EMD.

Mike Jackson – The F-16 has many political challenges related to FMS. The F-16 program has the Falcon Flex office, who's responsible to redesign systems and to make them more reliable using form, fit, function, and interface. This is accomplished with performance-based acquisitions (PBA), [ideally] the contractor is tasked to redesign system so that it does not fail. If it does not fail you do not have DMSMS problem.

Jerry Zahn – GRC International. If you are developing a strategy for a major program in its early stages, how do you work with the government to identify risk areas?

Bob Gibbs – There is a need to have a champion in government to work with the PM to convince the PM that it is good to perform DMSMS Management. There is also a need to convince PM to have a budget line item.

Steve Buss – Risk needs to be evaluated on a case-by-case basis. For example, on the Joint Strike Fighter (JSF), a modular open system easily facilitates the insertion of new technology and defines refresh points. Cost effective opportunity may not be available for smaller programs. Plug and play is tough but you still need to try to do it. Open systems are more difficult for legacy and RF equipment.

Daryll Cameron – I always bid a level of DMS support. DMS is a part of everyday life. Whether you are supporting a manufacturing line or performing continuation engineering, part of the every day activity involves performing life assessments, running models, and providing early warning. The champion is key. The business manager is the champion for the Raytheon Phalanx Program.

Tom Chakupurakal – General Dynamics. How can we improve awareness during EMD?

Steve Buss – Awareness is being elevated. A General will be in charge of the new Aging Aircraft SPO. Aggressive education is needed because of rotating assignments. Every 2-3 years the program manager moves on. The rotational assignments impact continuity within programs.

Bob Gibbs – Most of our PEOs are very aware of DMS, however, they do move on and their replacements need to be trained. It is essential to be aware of DMS during EMD. I believe that if the outcome of this workshop establishes suitable contract language and incentive clauses that both government and industry could agree upon, this would help our cause greatly. Some of our programs are very successful at managing DMS without contract language because the issues were worked at the lower levels as a team. We work some DMS issues using influence, not contract language or leverage. Having a champion and education must be continual.

Mike Jackson – Different program directors, through DSMC, are saying management classes are providing information on DMS. The management courses are going to help management turnover in the future. The managers don't need to be experts, but they do need to know who to get a hold of to get help.

Eric Brandiff – Raytheon Tucson. Raytheon has been successful in obtaining funding for DMS management, but unsuccessful in getting subcontractors on contract. Raytheon offers subcontractors their DMS services. Have other primes experienced this technique?

Steve Buss – Yes, Northrop Grumman uses that technique, primarily our field quality uses site surveys to qualify vendors. A typical audit question is, "What is your DMS obsolescence management system?" If they don't have one, and you want them as a supplier, you need to work with them to develop one.

Mike Jackson – Yes, that is the F-16 contract clause that goes out on every RFQ. The contract clause offers government services to help solve DMS issues.

Bob Gibbs – Yes, we have used that approach before and have been successful. A lot of my contracts do not have contract language going all the way down. The contractor is on the hook to perform, and they are going to have to address the problem. We must work together to solve problems.

Daryll Cameron – I know that on the Phalanx Program they had some problems with subs too. I go back to the IPT again; subs and primes must work together as part of the IPT to encourage increased ownership from the other subs. Most of the key subs are becoming more involved. There must be communication between design, production, and DMS people.

Chris Wentworth – Maxwell. Given that senior executives at the primes will not be incentivized to do long term DMS – why can't higher levels of DoD insist that primes handle DMS issues up front so we are not playing catch-up? As a manufacturer, I'd like to see a list of pooled requirements so that I can convince my senior management this is a worthy goal to go after. Who are the champions for DMS in the highest levels of government?

Steve Buss – One of the strongest champions right now is General Raggio. General Raggio is setting up a new Air Force SPO on aging aircraft and aging avionics. Industry must follow FAR regulations; legal incentives are regulated by FAR. A VP may make an investment in a program that lowers his bottom line and reduces his bonus if there is something worthwhile in the future, such as becoming more competitive and looking forward to technology refresh. The OSD should provide the champion. There are many groups managing obsolescence, developing tools and models but there is no central point that has the ownership.

Bob Gibbs – The champion at OSD is DMEA, the Executive Agent for microelectronics DMS. Ted Glum is a person who can help get the highest level of government officials at the OSD level involved and educated. We try to recruit champions by putting on the DoD DMSMS Conference. The hosting of the conference is rotated among services. This time it is the Army. The Army is attempting to get the highest levels of management from the Army and the industry as keynote speakers. In the Army Materiel Command, we have the Obsolescence Working Group that helps spread word within the command.

Daryll Cameron – The new administration's Secretary of the Navy nominee, Gordon England, may have insight. Gordon has a lot of experience, and he understands parts obsolescence. Gordon may be receptive and willing to discuss parts obsolescence. Concerning the question on how to provide an incentive, there is no clear-cut answer when you consider that DMS is a long-term problem, and business is measured by quarter-to-quarter revenue. For business, the big incentives are revenue, profit, sales, and cash.

Jack McDermott – ARINC. I think we need a champion at the policy level because there are a lot of things like funding to support their products. There must also be a champion at the program level to make sure DMS has some priority. We need to figure out how to change the policy to help us do our procurements. The COTS contractors are a problem because they want to sell the last product before they release the new products. We are forced to figure out what the road map is and how fast it is changing. We contracted with the prime to develop a roadmap for COTS, and they were not able to obtain those answers. How can we develop a roadmap? Given funding constraints, how do we justify COTS refresh?

Bob Gibbs – In the Army, both the CTR and OSCAR (Operating and Support Cost Reduction) are examples of programs that provide funding for spares refreshment, if a good business case is submitted. Congressional plus-ups are needed for block upgrades. For our customers, we try to predict the future cost and the cost for technology refresh. These predictions are used to POM for money. In the past we would do predictions and resolutions, but it sat in someone's drawer because of lack of funding. FMS customers supply a lot of funds for upgrades and support.

Daryll Cameron – Planning and communications are necessary in order to predict when funding is required. One of the things I use has been labeled a "Daryll Chart" by Raytheon. The chart(s) show the status for the modules and computers that we offer to our customers. The chart shows the obsolete parts and how many parts the customer and GDIS have on hand. The chart also shows the number of modules that can be built and the plan after the parts are used. Programs need a champion that can move money around.

Steve Buss – Roadmaps are essential, Northrop Grumman makes investments in core technologies, and we make roadmaps out ten years. If you get down into core IPT, you can see the generation roadmaps and develop those requirements from there. You need to start at a low-level and build up. It is much more difficult to start at the high-level and see what will be available years down the road. Regarding multi-year buys, Northrop Grumman has no guarantee that follow-on procurement will be initiated. If we had confidence in the future acquisitions, we would probably make those buys so the modifications could all be the same configuration.

Rob Holmes – TITAN Visicom. Regarding the Program Managers Guide for Performance-Based Logistics (PBL). New acquisitions will use PBL that are supposed to dramatically reduce the logistic support requirements. The government will mandate significantly higher reliability; therefore, you won't have DMS problems because nothing is going to fail. To what extent is it realistic to assume that there are greater achievements in reliability that can be used as a DMS solution?

Mike Jackson – What we look at first are the failure rates, repair costs, repair frequency, and other issues to place the candidates on a priority list of what should be redesigned first. If you integrate that team with your DMS team, as we have done with the F-16, a lot of DMS issues pop up that you can handle. We have redesigned systems; but remember it is costly and takes a great deal of time. We have seen a lot of great benefits from doing that. We have achieved unbelievable mean-time-between-failure on these items. Setting high levels of reliability is part of the Performance-Based Acquisition.

Dave Thornhill – TRW. Are you aware of any contracts that have specific DMS language that is effective? How about DMS language that provides contractors with the opportunity to incorporate future upgrades in programs as a matter of course that will prevent them having to come back for

additional funding and contract modifications? What percent of the contract money is spent on DMS? How much of this money was actually spent solving DMS problems?

Steve Buss – I'm not aware of any contracts that have that language. Northrop Grumman would often like to do things that are 'out of scope,' but are good for the program. We spend too much time negotiating. For example, we could use tomorrow's technology today, but can't because the program is baselined.

Mike Jackson – I am not aware of any incentives to go beyond what is required. The F-16 contractors are continually suggesting ways to do things better. We run into roadblocks, however, on funding and can't implement the idea.

Daryll Cameron – A Value Engineering format can be used that splits the money between the government and contractor.

Dave Thornhill – TRW. What tools are you using today that you have found to be effective in helping 1) manage your parts obsolescence issues, 2) predict when a part will become obsolete, and 3) find an appropriate response in a timely manner? What is working?

Steve Buss – Northrop Grumman's internal database tracks all parts (approximately 60,000), with the associated life codes. It is the IPT's responsibility to keep these up to date. We use MTI's AVCOM database and i2's TACTRAC. Those databases are regularly dumped into our internal database. Our internal database gives us additional information, such as when a vendor provides a DMS notice, and when procurement receives no bid for an item. We issue DMS notices internally when parts are no longer available. We use cost modeling developed by ARINC and DMEA.

Daryll Cameron – Good relationships with suppliers and customers are needed (e.g., use the IPT for communication of notices).

Mike Jackson – We use the same tools as everyone else. Not any one tool is going to get the job done; you need a whole toolbox. We use AVCOM, i2, GIDEP alerts, Northrop Grumman on the 20/20 contract, and internal databases. A problem is that the configuration needs to be loaded into the API first. This needs funding. We must prioritize what is loaded into the API first. The lesson we have learned is not to focus on parts, but focus on systems instead.

Tom Chakupurakal – General Dynamics. We constantly do market surveys and we follow the roadmaps. We come up with some interesting situations. For example, Motorola is giving parts to Thompson. Thompson says those parts will be given to Atmel. Atmel says they are discontinuing the parts. We go back to square one and start designing over again. Who is going take over?

Steve Buss – Aftermarket suppliers may pick up the product lines, but it may take over a year to get the license agreements. For a year, you won't know what is going on.

Joe Chapman – Chapman Consulting – Rochester currently has 20 IC manufacturers where they are the only authorized distributor for their part when they cease production. When they cease production, Rochester is often able to pick up finished goods, die and tooling. Long-term negotiations are a problem. If you know that the company has a key product line that will be discontinuing a product you need, get your top management to provide assistance. Have them call the IC manufacturer and put pressure on them to get the part to the aftermarket sooner.

Ron Marfil – Rochester – There are 22 suppliers on board, and we're talking to 10 more. The last thing the semiconductor companies are thinking about is obsolete parts. We have been using customers as advocates to get lines. You can have a say in terms of continuing life if you go to a semiconductor house and say, "Do you have any after life plans besides last time buy?" Never in 30 years was I asked for a

post-life plan on a part; we only provided last-time buys. No semiconductor house is asked, "Do you have an after life plan? Do you have a franchise guy?"

Steve Buss – There are other types of obsolescence. Software obsolescence is a problem. New programmers are trained in C++ and do not understand the old FORTRAN, etc., that run in our systems. How do we get old software upgraded to today's standards? This may be a potential topic for a future workshop panel.

Carolynn Drudik – DMEA. In these days of Acquisition Reform and one page SOOs, will industry propose DMSMS management be part of their development contract? Does it really matter if it is a component of a contract or not?

Steve Buss – I would prefer the government not mandate a plan in the proposal. I would prefer to provide a plan in my proposal, and you could use that as a discriminator when you make the contract award.

Daryll Cameron – The concern that I have in competitive procurements is that the proposal evaluators must be informed and aware that DMS is critical. Then you can propose DMS and not get a negative for it. There must be some criteria for evaluating DMS in a competitive proposal. A comprehensive plan should be part of the program IPT.

Jack McDermott, ARINC. EMD transitions to production. In production, sustainment is often not addressed. How do we get the contractor to consider sustainment during production?

Steve Buss – The F-22 seven-year EMD program had many DMS issues. I would not like to have certain DMS requirements mandated; however, the SOO should include DMS requirements. If it is not in the contract, it is likely that it won't get done. From the business side, we are responsible to the shareholders to make a profit. They may ask why are you spending \$750K a year on DMS management when it is not part of the contract?

George Sacarellos – Lockheed Martin. DMS has to be in the beginning of every contract. All designers have to take into account DMS, and show what they are doing to make the design DMS resistant. We are putting that in contract language to all of our suppliers.

Daryll Cameron – Industry needs something to keep the playing field equal. There have to be words in the RFP such as, "Here is how DMS will be evaluated." For competitive contracts, DMS words are needed in the RFP. Existing contracts should require DMS collaboration as part of an IPT.

Summary of Session One

Carolynn Drudik summarized the Session One by listing the following challenges:

- Funding
- The Need for a Champion
- Define a program
- Contract Language
- Communication
- Multi-year buys

SESSION TWO—POTENTIAL SOLUTIONS IN A DYNAMIC ACQUISITION ENVIRONMENT

Panel Members

Bob Ernst, Aging Aircraft Office-NAVAIR Patuxent River
John Lasken, Lockheed Martin
Jon Moss, Rockwell Collins
Steve Tanemura, Boeing

Introductory Questions

Carolynn Drudik - What is your experience in proposing DMSMS management in a DoD contract? Were there any problems in being able to do that?

Jon Lasken – From my point of view, DMSMS is not just a contractor issue or a government issue; DMSMS is an active duty service issue. The user who needs the parts is the person affected. The AEGIS community got very active in DMS around 1993 and put a team together. The approach was to establish a cooperative team (IPT) where the four prime contractors met and developed a process in conjunction with the program office and other supporting government activities. We worked on communication and data, and established a common database. The database contains all the DMS data from all the primes. There were a couple of issues in putting together proposals and establishing statements of work. We talked about clear definitions of roles with respect to "inside and outside the box." The prime contractors are totally responsible for things inside the box by the statement of work. Things outside the box require external funding. The only things outside the box are Next Higher Assembly (NHA) redesigns and LOT buy opportunities. Things inside the box are: finding replacement parts, qualifying a second source, and minor redesign. To defend our funding, we have used average occurrence, average costs, and metrics. I see three issues driving DMS in our community, 1) LOT buys and the need to know Navy ship requirements and FMS opportunities. What do you do after you have done a LOT buy and the requirements increase? Build more ships than planned? 2) We have a proactive customer on the production side. There is no direct contract tie, however, between design, production and life cycle. The life cycle shop does not yet understand the need to fund LOT buys to support the ships 20 years from now. We are working on life cycle side awareness. 3) If FMS Nonrecurring Engineering (NRE) money is spent by an FMS customer, the US Navy cannot use the same solution. A totally new solution must be found for the Navy. Therefore, the Navy funds almost all NRE.

Carolynn Drudik – What's your experience in proposing and negotiating DMS management and obsolescence solutions in DoD contracts? Are there any innovative ideas that you have found that the rest of the DoD can take as lessons learned?

Jon Moss – In terms of proposing and negotiating DMS management into DoD contracts, we have been able to get DMS management, technology insertions, and some redesigns covered. We have a program called the Parts Control Program. This is an agreement on how we handle obsolescence issues. I think that helps foster partnerships in dealing with these issues. DMS requirements should be inside the quote because DMS management is part of our cost of producing products. For innovative ideas, I think consideration needs to be given to opening up the configuration control. The customer should control the "what" aspects of the units (i.e. the form, fit and function), and leave the "how" aspects to the contractors. Lines of communication must be open between the prime, the subcontractors, and the customer. We need to know where the customer is going with the product (e.g. aircraft, ship). We want to know what the production life cycle is to help us plan. It also helps us plan for redesigns and technology insertions. One of the things we think has helped us is to design with sustainment in mind. We challenge our designers to start considering sustainment early in the design phase. To get top management buy-in, all program reviews must have an obsolescence line item. The review includes obsolescence resolution plans. We report in terms of the product's activities, challenges, and inventories. All bridge and LOT buys are reported to the VP of Operations. We are encouraged to be more proactive because DMS will be brought before top management.

Carolynn Drudik – What is Boeing doing to address DMSMS management in production and sustainment contracts? Are you pricing in inherent obsolescence solutions?

Steve Tanemura – On the military side Boeing is just like all the other primes. What may be a more interesting scenario is what happens in the commercial airline world. In that area, we do have an advantage because of multi-year contracts. Most of our OEMs have a five to ten-year contract. We share the roadmaps and production rates for each model aircraft with them. From this information, we see how much it costs to build a plane. DMS management is not specifically funded; however, there is a production overhead budget negotiated with each supplier. This overhead budget is an add-on to the unit cost. The purpose is to fund engineering staff to do all the activities that are needed to maintain the unit through the production cycle. That includes DMS management, activities to improve the reliability and producibility of the equipment, and to fund any equipment redesign. We have a clause in our contracts called the Product Support Agreement. This long-term support agreement is for the product's lifetime, but it is not free. After the warranty runs out, the OEM must retain the capability to repair the unit. The production units are fixed price, so if the OEM can reduce the cost to manufacture and support the equipment, the rest is profit. We have found that subcontractors need an incentive to work with you; increase the amount of money they can potentially make by effectively managing DMS, and they will be willing to work with you.

Carolynn Drudik – Are there any unique contractual strategies that address DMSMS management and contractor logistics support?

Bob Ernst – NO! Unfortunately, there is not a lot new going on. The Navy is doing a mixture of contract business as usual (e.g. parts control plan, MIL-STD-965), direct vendor deliveries, and performance-based logistics. How much do you put on contract? What value do you place on that? Another issue is how long these contracts last. The FAR says we can have a contract for five years and in some cases ten years. What happens when your five-year support contract runs out and you have to re-compete it, or renegotiate it? We have a tendency to focus on short-term issues, and try to get well next time we compete the contract. We may get a good deal for the first few years of a contract, but we need to look at the whole life cycle.

We have organized four basic thrust areas:

- We are trying to get better tools and be more proactive in obsolescence management. We must determine which tools are needed. What is the best-cost decision? You need to look at the integration of supply and demand. To aid in this effort, we are developing a Program Manager's toolbox.
- One of our major thrust areas is the prevalence of legacy systems. Many of the legacy systems have missing data and configuration control problems.
- We need to develop the "right words" to go into a contract. We need to determine the level of response for DMS management in proposals. What are the metrics? What percentage of the production system should be retained for obsolescence management? We need to brief these metrics to policy makers and comptrollers. Also, what is the minimum amount of data needed to share the management of obsolescence? There is big difference in the cost of DMS management between sole source contracts versus competitive contracts. Finally, what have we done to articulate the true cost of DMS as an industry and government team to the comptrollers, Congress, and policy makers?
- Open Systems Architectures: We need to move out of discrete components and move into open systems. We are not going to be able to retrofit everything!

Open Discussion

David Thornhill – TRW. We have a contract to replace a computer in the E-2C. We have a unique contract requirement to provide a 15-year renewable warranty. Additionally, we must be able to replace any malfunctioning computer within 48 hours. This is the first time for this type of warranty, and it was difficult to get past our VPs. TRW can upgrade the hardware as required, as

long as the original source code will continue to run. This is a requirement to avoid the software revalidation cost.

Bob Ernst – Sometimes we are paying 30-40% to manage sustainment. We need to develop more standards on “what are the values for DMS management?” For example, given some complexity factors, I can tell you exactly how much it will cost to modify a drawing package, but I can’t tell how much managing DMS will cost.

Bob Nichol – Department of Commerce. I gather that many of the comments that are made are referring to US producers. The DoD over the past few years has been more inclined to buy from overseas sources. Not just FMS, where we are providing stuff. In the future, do you envision buying from foreign sources is going to provide unique challenges?

John Lasken – FMS offsets are already becoming an impact. I agree that this is becoming a piece of the equation.

Steve Tanemura – Yes, we have offsets with offshore countries. Our approach to dealing with that is to insure that all our suppliers have approved DMS management plans. The IECQ-type standards should help, in addition to other international standards. The biggest complaint that we have had at Boeing is that our military divisions would not recognize the commercial standards. We do not have enough people on the commercial side to manage DMS on all aircraft models. We want the subs to perform DMS management, and that is why we use a process verification methodology. Trust is a major component in how we are managing DMS.

David Thornhill – TRW. As a contractor, I don’t want any more elements added to the proposal evaluation criteria. However, from the taxpayer point of view I’d like to see DMS specifically addressed. Possible evaluation criteria are: 1) How are you going to address DMS on the contract you are proposing? 2) How are you going to evaluate DMS, especially the past performance on DMS? 3) What have you done on DMS in the past that demonstrates your ability to successfully manage DMS issues?

Bob Ernst – The evaluation criteria, Section M, is usually very big. We write evaluation factors that the contractors never see. We try to let the contractors be creative. Don’t just show me a plan; tell me how you are going to mitigate obsolescence issues? We don’t want a checklist mentality. The risk is that the Navy must have people educated in DMS to evaluate the proposals. This is very difficult because we are experiencing brain drain with all the reductions in force. We are trying to do more evaluations that include life cycle cost estimates. We are sharing past performance data via CPARS. We rate all contracts. The Navy throws out proposals from companies that performed badly in the past.

John Lasken – If I’ve spent the time to convince management that DMS is important and have placed the resources to work the issues, I want to be measured on my DMS performance! I want that to be part of my contract competition or selection. This will show the CEO that managing DMS is a tangible benefit.

Steve Tanemura – A DMS Management plan is part of the JSF parts management plan.

Jon Moss – It is important to bring our customer through both the reactive and proactive side. We share data with customers to build confidence.

George Sacarelos – Lockheed Martin. The contractors should create a list of things that demotivates them (e.g. FAR, profit restrictions). Can we make changes in the FAR?

Bob Ernst – The DoD should team up with those companies that are happy with 12-15% profits. To change the FAR, industry needs to inform their congressman. If we can prove the case, we can make the changes. Acquisition reform, for all the bloodletting, tried to do some good things. Possible FAR changes may be tested using a pilot program.

Rob Holmes – TITAN. There were some discussions yesterday (at the DoD Teaming Group Meeting) about ASICs. What are you doing to protect yourself from ASIC obsolescence in the future? Are your data rights to custom ASICs directly purchased or held in escrow?

Steve Tanemura – Boeing-Commercial Airplanes does not design any ASICs. However, many of our equipment subcontractors use ASICs and we do require them to have plans in place to determine what data is retained when you use an ASIC. Until yesterday, I was very comfortable having the VHDL but now realize the *type* of VHDL data you have is also important.

Bob Ernst – We need to provide a tie between past performance and a sunset plan (or aftermarket plan) for custom ASICs. I think ASIC data rights are something we can put into evaluation criteria. One possible way to handle data rights is to get trusted vendors that will put data in escrow and will work out some type of agreement with the aftermarket.

Pat Pey – Raytheon Astor UK. We have been struggling awhile with obsolescence, contractually. Would the panel agree that the customer must communicate clearly with contractor on expectations, roles, and responsibilities?

Bob Ernst – I agree with you that it is hard to negotiate scope, when you don't know what you are negotiating. Write down the roles, have metrics, and tell the government what you are doing. A clearly defined SOW is most important, followed by metrics.

John Lasken – There is a need to have the data, and the costs associated with managing obsolescence.

Bob Gibbs – Redstone Arsenal. I'd like to issue a request for everyone to look at his or her contracts, SOOs, RFQs, RFPs for DMS language or clauses, or write some "proposed" contract language. Send that information to Ron Shimazu, so he can consolidate the information and publish it in a report. We need something to start with so we can begin to get DMS into contracts.

Ron Shimazu – We will sanitize all information that is sent to DMEA to insure company confidentiality. I would also like the group to include contractual strategies as well.

David Thornhill – TRW. My question is about VLSI design databases and the desire of the government to obtain rights so the government can continue to build the part if the OEM goes away. We were dismayed to see public law that required the delivery of the VHDL source code along with every IC that was developed under a government contract. We knew we were developing very valuable intellectual property. The VHDL source code does not necessarily provide you the ability to re-procure an IC. Would the government be willing to pay for intellectual property (IP)?

Bob Ernst – Usually the IP price tag is too high. We have to work out some type of transition plan such as, 1) if the developer is willing to produce the part, we'll purchase it from them, 2) once they decide not to produce the part we will use the data from escrow to find someone who is interested.

Hugh White – Northrop Grumman. I have a comment on the development of contract language. There are many different contract types (e.g. concept exploration, acquisition, sustainment). The language is going to differ based on the contract type.

Bob Ernst – You must have a matrix since there are different issues for each phase.

John Lasken – I think that in any phase of a contract, you should consider the handoff to the next phase. There should be some type of recognition about the relationships between phases. What are the obsolescence management obligations from one phase to the next? We would be better off in the big programs if we took more time on the transitions between phases.

Steve Tanemura – DMS Strategies will change as a system progresses. The key is having a DMS resistant design. Types of DMS solutions/concepts that a program will want to use will differ for each phase:

- Concept – Make designs DMS resistant
- EMD – Redesign-tolerant phase
- Production – Component-level solutions to minimize impact on configuration
- Support - Component-level solutions and align solutions with block upgrades

Jon Moss – Because there is change, you must allow for flexibility.

Bob Nichol – Department of Commerce. If we are trying to enter long-term agreements with a company for DMS, at least two of the seven SECA exceptions could apply. Can they be sole source?

Bob Ernst – There are two that we use, 1) one responsible source, and 2) urgent and compelling need. Urgent and compelling need undergoes a great deal of scrutiny.

George Sacarellos – Lockheed Martin. On the F-22, we have told the government that yearly contracts do not give the supplier any confidence that there will be another contract, so the subcontractors are not motivated to manage DMS. We really need multi-year procurements to minimize the risk of obsolescence. Long-term relationships with suppliers allow them to make smart decisions because they have more than a one-year contract. What are your thoughts?

Bob Ernst – Multi-year funding is difficult with four-year administrative and three-year money that must be spent in one year. With a multi-year contract, I cannot touch that money for discretionary funding. We need to put the things that make sense under a multi-year contract, not the entire effort.

Steve Tanemura - Multi-year procurement contracts is one of the main reasons why Boeing Commercial Airplane has been successful in getting subcontractors to proactively address DMS. The larger value of multi-year procurements provides added incentives to take a long-term approach to DMS management, which reduces total costs. The military should also get the same benefits if they took this approach.

Harvey Waldron – Boeing. There is a significant infrastructure within the government to address DMS issues and store DMS parts. This is driven by the depot-level maintenance performed by the government. I see a paradigm shift to a two-level maintenance environment where the contractor is taking on more of the responsibility. What do you see happening to the infrastructure to maintain systems in the field today? What are the advantages and disadvantages of the prime taking on a bigger role?

Bob Ernst – The government involvement in DMS has increased over the last few years. Most DMS issues we resolve are not for organic depot repairs. I would say that 90% of our solutions are for OEM repair issues. We are working on making the right decisions for OEM repair. The OEMs prefer to redesign, and that may not be in the best interest of the government. The increased reliability of our systems has allowed us to shift to two levels of maintenance.

John Lasken – I don't know that the change from depot to contractor level support will change the DMS impact. If a contractor accepts a PBL contract that includes contractor support, there must be measurement criteria as an incentive.

Steve Tanemura – You want incentives to increase reliability, to make design more DMS bullet proof, and to encourage OEMs to redesign using their own money. They will perform given the proper incentives.

Bob Nichol – Department of Commerce. Has industry considered taking some of the issues we have discussed, and elevating them up through some type of representative organization such as

National Defense Industry Association (NDIA)? We could ask them to sponsor discussions on some of the problems, as opposed to trying to get the working-level to solve the problem.

Bob Ernst – Who owns the processes and documents for DMS? A central point of contact is needed; briefings at Defense Maintenance Symposium would provide visibility. Who will put all of this together and send it to the policy makers? The policy makers are not receiving any guidance.

Joe Chapman – **The group in this room is in the best position to raise this up to higher levels. DoD is not going back to the policy of mandating standards; it is moving towards consensus standards. Only guidance will be provided.**

Carolynn Drudik – **We have MTI, i2, and Internet companies with obsolescence data. Can industry price the cost of obsolescence for a firm, fixed price in a CLS contract for a period of five to ten years.**

Steve Tanemura – Our commercial avionics group performed a study to compare outputs from several prediction sources. We used TACTRAC, MTI, Aspect, and custom prediction tools developed by Honeywell, Collins and Boeing to evaluate 30 parts. There was zero correlation among the results. These differences occur because prediction algorithms are created based on the developers perception of what foreshadows a part going DMS. This is extremely subjective which is why differences occur and Users need to recognize this. You also need to recognize that algorithms are designed to allow large numbers of parts to be quickly analyzed.

Jon Moss – Rockwell has done a similar analysis, used a variety of tools, and looked at several programs. The results were only an estimate of the world as we saw it today.

John Lasken – We track cases and resolutions, but we have never gone back and looked at the predictions.

David Thornhill – **TRW. Is there no ability to predict when the DMSMS problem is going to occur? I have a perfect record of doing LOT buys incorrectly. Now, I don't have the ability to predict DMS?**

Bob Ernst – This is really risk management. Obtain good tools, buy extra parts (management reserve), and keep track of data and obsolescence notices.

John Lasken – DMS is risk management. Buy what you think is appropriate; try to use as much as possible.

Jon Moss – Keep in mind your approach to managing DMS. Too often we focus on managing at the piece part level. We buy and buy inventory; we can't keep doing that. In the long term, you must move away from piece part solutions, and think about modules and subassemblies. That reinforces the need for understanding of the product life cycle. More internal and external partnering may give the justification to redesign.

Steve Tanemura – Jon Moss and John Lasken said that this essentially comes down to roadmapping. You have to understand where you are going, when are you planning redesigns, and do bridge buys in conjunction with that plan. You have to have the roadmap first. Look at everything that requires you to do redesigns, such as reliability and producibility, not just DMS. You must also realize that roadmaps are living documents.

Bob Ernst – Roadmaps are important to sustainment as well. A roadmap can be used to shut programs down. You cannot have full repair capability until the day the program dies.

Jon Moss – In addition to the piece part costs, you also have resource issues. We can't afford to look at circuit cards one part at a time. It is strategically important to know your customer, your product life cycle, and understand where they are going so that you can intelligently go after redesigns.

Mike Amspacker – MTI. Tools are not there to make decisions; tools are there to support your decisions. The tools monitor program status. Projections will be similar between tools. Tools will often tell you the obvious.

Tony Haley – Aging Aircraft Program Office Dayton. We are trying to introduce source selection language for evaluation purposes. This has been done for the C-130 AMP and JSF. C-130 AMP source selection is ongoing. Feedback is still needed on our process. What does industry want to see in terms of contract language? We are working with all aircraft and commodity item program offices in setting up roadmaps.

Greg Kromholtz – Boeing. Strategic radiation hardened parts are not a large market. DoD is the entire market for this technology. There are not going to be any IC's strategically radiation hardened tomorrow.

SUMMARY OF WORKSHOP

Ron Shimazu – I hope the workshop was an informative and entertaining day for all of you to discuss issues, debate with, and educate each other. We intend to collect and publish the information we talked about today in the Acquisition Guidelines we are developing. I want to emphasize again, if you have some examples of contractual language from your program for a specific type of work, I would look forward to seeing it. We all have the same problem. We all work with the same FAR. We all have the same funding problems, and contractual problems. This is a DoD issue, not just a service issue. That is why DMEA is trying to collect this information.

Notes that I took:

- We need a champion for DMS. What is the priority of DMSMS at the GEIA? DMSMS is generally number 14 on a priority list of 20 issues. The more profitable issues are higher on the list.
- It is our challenge to educate our leaders on the problems. When we talk to them, we should provide solutions, strategies, and processes.
- Develop guidelines that help insure consensus between industry and government.
- Address software obsolescence (Steve Buss).
- I would like to talk to David Thornhill and Mike Jackson on clauses and contractual strategies for the Acquisition Guidelines.
- We need to develop matrices for contract type versus development phase, to determine the desired contractual language.