Logistics Directions

Newsletter of

The Council of Logistics Engineering Professionals

May-June 2012

In This issue:

From the President:

I hope that everyone has the Graduation Season behind them and are looking forward to enjoying the summer.

As always, I want to keep you abreast of what plans and upcoming events that your CLEP Board of Officers are involved in.

To begin with, CLEP is planning to host the **2012 Life Cycle Engineering Workshop and Symposium** on September 25 and 26 at the Waterford – Springfield, VA. (see page 3 of this newsletter).

We do have a "Call for Papers/Presentations" announced on our website (www.logisticsengineers.org). The themes for the two presentation tracts are:

- Systems Analysis Approach to Cost Reduction
- Logistics Engineering in a Sustainment Environment

I would like to ask all members and non-members to consider submitting your paper/presentation to be considered for this workshop to our VP Programs, Mr. Stephen Brunner at programs@logisticsengineers.org. Sharing ideas that are being incorporated into programs gives others the opportunity to consider them on their programs … and this could equal cost savings and efficiency for everyone. SO PLEASE CONSIDER.

We are also planning to host a workshop on September 24 – the day prior to the symposium. The workshop , titled "**The Art of Supportability Engineering**" will be presented by Mr. James V. Jones.

Lastly, and as you already know from our previous newsletters, our 2012 nominations and elections will process will begin soon. I encourage all members of CLEP to consider serving as an officer in our organization. If you do not feel that you can serve as an officer, please consider volunteering and serving on one of our committees.

Have a wonderful summer.

Bill Horne

Face of Defense: Sailor Serves Country, Saves Lives

By Marine Corps Lance Cpl. Mark Garcia, Regimental Combat Team 6

To serve his country, Navy Petty Officer 3rd Class Lamar Jackson decided to follow in his father's footsteps.

Growing up, Jackson said, he saw the camaraderie his father shared with his fellow Marines, and he wanted to be a part of that experience.

"Seeing that brotherhood that they had was something I always admired," said Jackson, a corpsman at the battalion aid station for 1st Battalion, 7th Marines, Regimental Combat Team 6.

Jackson said he enlisted as a Navy corpsman because of his admiration for Marines and the desire to do something with his life.

"I also wanted to start getting into the medical field," the Atlanta native added. "It was the one job that allowed me to do both. I just didn't want to be in the same place my whole life. I wanted to get out and see different things and experience different things in the world."

Jackson has been a corpsman for three and a half years. Before enlisting in October 2008, he played college football and worked full-time at a retirement home kitchen.

"When I was in college and I played sports, my teammates and I had close relationships, but it was nothing like the bonds I have with people in Afghanistan," he said. "You have to trust them with your life, so you grow close to people."

Jackson has been stationed at Camp Pendleton and Twentynine Palms, both in California, and said he enjoys the high-pressure situations he often faces.

"You're the guy once everything starts to go south," Jackson said. "You're the person everyone's looking for. I like being in the situation where everyone is counting on you. There was one time some Afghan locals were injured by an improvised explosive device, so we had to provide them with aid and ensure they were stabilized before they were moved anywhere."

Jackson is on his first deployment, and said it has been a life-changing experience. He recalled

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Calendar of Events

2012 S1000D User Forum - June 18-21, 2012, Sheraton Denver Downtown Hotel, Denver, CO; http://www.cvent.com/events/2012-s1000d-user-forum/event-summary-d7b2099dcc494f9891b77f64ab136854.aspx?i=0a6dda61-aee0-4cf1-b17c-dcb6a4e82ef8

NDIA Supply Chains Conference & Exhibition Featuring DLA Land and Maritime – June 11-13, 2012, Hyatt Regency Columbus, OH; http://www.ndia.org/meetings/2780/Pages/default.aspx

22th Annual International Council on Systems Engineering (INCOSE) International Symposium – July 9–12, 2012, Rome Marriott Park Hotel, Rome, Italy; https://www.incose.org/symp2012/

PBL 2012 - July 16-18, 2012, Washington Plaza Hotel, Washington, D.C.; http://www.wbresearch.com/pblusa/home.aspx

Diminishing Manufacturing Sources and Material Shortages (DMSMS) & Standardization 2012 Conference – August 27–30, 2012, Hyatt Regency New Orleans, New Orleans, LA; http://www.dmsms2012.com/

46th Engineering and Technical Management (ETM) Annual Workshop – September 10–13, 2012, Indianapolis, IN; https://www.geia.org/index.asp?bid=7739

AUTOTESTCON 2012, - September 10-13, 2012, Disneyland Resort and Conference Center in Anaheim, CA; http://www.autotestcon.com/general/autotestcon-2012

Fleet Maintenance & Modernization Symposium 2012 – September 18-19, 2012, Virginia Beach Convention Center, Virginia Beach, Virginia; https://www.navalengineers.org/events/individualeventwebsites/FMMS2012/Pages/ASNELandingPage.aspx

LOA 2012 (US Air Force Logistics Officers Association) – October 8-12, 2012, Omni Shoreham, Washington, DC; https://s3.goeshow.com/loa/conference/2012/index.cfm

15th Annual NDIA Systems Engineering Conference – October 22–25, 2012, Hyatt Regency Mission Bay, San Diego, CA; http://www.ndia.org/meetings/3870/Pages/default.aspx

Department of Defense Maintenance Symposium and Exhibition - November 13-16, 2012, *DeVos Place Convention Center, Grand Rapids, MI;* http://www.sae.org/events/dod/

Defense Logistics 2012 - December 3-5, 2012, Marriott Crystal Gateway, Arlington, VA; http://www.wbresearch.com/defenselogisticsusa/home.aspx

ASNE Day 2013 - February 21-22, 2013, Hyatt Regency Crystal City, Arlington, VA; https://www.navalengineers.org/events/individualeventwebsites/Pages/ASNEDay2013.aspx

29th Annual National Logistics Conference and Exhibition – March 18-21, 2013, Hyatt Regency Miami, Miami, FL; http://www.ndia.org/meetings/3730/Pages/default.aspx

Reliability Tools

AMSAA provides various Reliability Growth tools written in Microsoft Excel. The Reliability Scorecard provides a structured engineering and analytical approach to track the achievement of reliability requirements and the adequacy of the overall Reliability Program throughout the program's acquisition life cycle. AMSAA has also developed Mathematica based Test Design Analysis tools that quickly and accurately evaluate proposed designs. *Note: Distribution of the reliability tools is restricted to U.S. Government organizations and their contractors.*

Reliability Growth

Reliability Growth is the improvement in a reliability parameter over a period of time due to changes in product design or the manufacturing process. It occurs by surfacing failure modes and implementing effective corrective actions. Reliability growth management is the systematic planning for reliability achievement as a function of time and other resources, and controlling the ongoing rate of achievement by reallocation of these resources based on comparisons between planned and assessed reliability values. To help manage these reliability activities throughout the development life cycle, AMSAA has developed reliability growth methodology for all phases of the process, from planning to tracking to projection.

Reliability Growth Planning Tools

The AMSAA developed reliability growth planning methodology allows the feasibility of achieving a requirement to be assessed, given program schedules, amount of testing, and resource constraints. The model uses historical values for parameters, such as growth rate. The analysis performs trade-offs between test time, initial reliability, confidence levels, requirements, etc. to develop an achievable solution. The planning is quantified and reflected in the construction of a reliability growth program plan curve which establishes interim reliability goals throughout the program.

For more information of these Reliability Tools and other AMSAA-developed Reliability Tools, visit their website at: www.amsaa.army.mil/ReliabilityTechnology/Planning.html

2012 Lifecycle Logistics Engineering Conference

Hosted by :
The Council of Logistics Engineering Professionals

September 25 & 26, 2012
(with Pre-Conference Training Opportunity of September 24th)
at
The Waterford – Springfield, VA

The Council of Logistics Engineering Professionals (CLEP)

Presents

2012 Lifecycle Logistics Engineering Conference

"Logistics Engineering Approach to Life Cycle Cost Reduction"

Make plans now to join us for this educational event.
Registration will open soon – check often at this site for updates.

Call for Presentations at
www.logisticsengineers.org/?page_id=300

The Optimal Program Structure

By Mr. Frank Kendall, Under Secretary of Defense (Acting) for Acquisition, Technology and Logistics

Not too long ago, I was asked during a Q&A session with one of the courses at DAU what I thought the optimal program structure was. The question itself suggests a misunderstanding of how programs should be structured, and more importantly, it may be an example of a type of behavior that I've seen too much of in the past two years since I came back to government service.

The answer to the question is either: (A) There is none, or (B) There are an infinite number. There is no one best way to structure a program. Every program has its own best structure, and that structure is dependent on all the many variables that contribute to program success or failure. To paraphrase and invert Tolstoy, happy programs are each happy in their own way, and unhappy programs tend to be unhappy in the same ways.

As I went around the country a year ago to discuss the Better Buying Power initiatives with the workforce, one thing I tried to emphasize repeatedly was that the BBP policies were not set in stone. All were subject to waiver. The first responsibility of the key leaders in the acquisition workforce is to think. One of the many reasons that our key leaders have to be true professionals who are fully prepared to do their jobs by virtue of education, training, and experience is that creative, informed thought is necessary to optimize the structure of a program. The behavior I'm afraid I've seen too much of is the tendency to default to a "school solution" standard program structure. I've seen programs twisted into knots just to include all the milestones in the standard program template. I'm guessing that there are two reasons our leaders would do this: first, because they don't know any better, and second, because they believe it's the only way to get their program approved and through the "system." Neither of these leads to good outcomes, and neither is what I expect from our acquisition professionals.

So how does one determine how to best structure a program? Whether you are a PM, or a chief engineer, or a contracting officer, or a life cycle support manager, you have to start in the same place. You begin with a deep understanding of the nature of the product you intend to acquire. The form of the program has to follow the function the program will perform: developing and acquiring a specific product. The nature of the product should be the most significant determiner of program structure. How mature is the technology that will be included in the product? What will have to be done to mature that technology, and how much risk is involved? In addition to the technology that is included, how complicated will the design be? Is it like other designs that we have experience with, or is it novel? How difficult are the integration aspects of building the product? Is the manufacturing technology also mature, or will work have to be done to advance it prior to production? These questions on a large scale will begin the process of determining if a technology development phase is needed prior to the start of engineering and manufacturing development. They will also affect the duration of these phases, if used, and the number of test articles and types of testing that will have to be performed to verify the performance of the design.

Beyond a deep understanding of the product itself and the risk inherent in developing and producing it, one must consider a range of other factors that will influence program structure. How urgently is the product needed? How prepared is industry to design and produce the product? How much uncertainty is there about the proper balance of cost and capability? What are the customer's priorities for performance? What resource constraints will affect program risk (not just financial resources, but also availability of competitors, time, and expertise in and out of government)? Is cost or schedule most important and what are the best ways to control them on this program? What is the right balance of risk and incentives to provide to the contractors to get the results the government wants?

We are not in an easy business. This is in fact rocket science in many cases. As I look at programs coming through the acquisition process, my fundamental concern is that each program be structured in a way that optimizes that program's chances of success. There is no one solution. What I'm looking for fundamentally is the evidence that the program's leaders have thought carefully about all of the factors that I've mentioned—and many others. I look for that evidence in the nature of the product the program is acquiring and in the structure the program's leaders have chosen to use. The thinking (and the supporting data) that went into determining that specific and often unique structure is what I expect to see in an acquisition strategy, and it is what I expect our leaders to be able to explain when they present their program plans.

A Parts Management Approach to Reducing the Risk of Non-Authentic Parts, By Bob Ricco

As the supply chain supporting the military and defense industries grows larger and more complex, the appearance of parts of questionable authenticity is an all-too-common occurrence. According to the Department of Commerce, the rise of counterfeit parts in the supply chain is exacerbated by demonstrated weaknesses in inventory management, procurement procedures, recordkeeping, reporting practices, inspection and testing protocols, and communication within and across all industry and government organizations.1

The Government Accountability Office notes that DoD draws from a large network of global suppliers and manages over 4 million different parts at a cost of over $94 billion; therefore, counterfeit parts can enter its supply chain. Almost anything is at risk of being counterfeited including fasteners used on aircraft, electronics used on missile guidance systems, and materials used in body armor and engine mounts. Counterfeit parts have the potential to cause a serious disruption to DoD supply chains, delay ongoing missions, and even affect the integrity of weapon systems. Counterfeits are not limited to the DoD supply chain and exist in other government entities, such as the National Aeronautics and Space Administration and the Department of Energy, as well as in many commercial settings.

The systems at risk are diverse including: software, commercial aviation, automotive parts, and consumer electronics all of which can threaten the safety of consumers.2

Unfortunately, counterfeit parts are only a subset of a larger group of parts of suspect authenticity. Non-authentic parts are common in the electronics supply chain, including distributors, brokers, and other parts supply entities. In many cases, the parts are not "counterfeit" in the sense that they are illegal copies of parts; instead, they may be parts whose pedigree has been lost due to multiple ownership or genuine parts that may have entered the supply chain through uncontrolled sources. In any event, such parts can result in degraded performance, reliability, and availability of critical systems.

Therefore, it is crucial that all defense contractors take steps to prevent non-authentic parts from entering the supply chain. One important step is to adopt the process specified in a new military standard—MIL-STD-3018, "Parts Management"—authored by the DSPO-chartered Parts Standardization and Management Committee (PSMC).

The MIL-STD-3018 Parts Management Process

MIL-STD-3018 addresses the issues of parts management as a necessary discipline in the design, development, and acquisition of systems for DoD applications. The new standard, which provides a set of design requirements, seeks to reduce the number of unique, specialized, and defined problem parts used in a system (or across systems) in order to enhance standardization, reliability, maintainability, and supportability. It also

seeks to mitigate occurrences of parts obsolescence due to Diminishing Manufacturing Sources and Material Shortages (DMSMS). These inherent benefits result in increased operational and logistics readiness, enhanced interoperability, reduced logistics footprint, and reduced total ownership cost. Effective parts management is the cornerstone that helps program managers achieve their objectives.

MIL-STD-3018 defines requirements based on parts management best practices.

The standard addresses the following specific areas:

- Counterfeit parts
- Customer-contractor teaming
- Lead-free parts
- Obsolescence management
- Part and supplier quality
- Part level documentation procedures
- Parts list or bill of materials
- Parts selection and authorization process
- Parts selection baseline
- Subcontractor management
- Substitute and alternative part procedures.

The risks related to counterfeit parts and lead-free parts are key topics in the standard because these risks are of high concern in the supply chain. However, this article looks at the broader issues of non-authentic parts. Of course, the methods used to prevent the introduction of non-authentic parts are much the same as those used for counterfeit parts.

One of the principal advantages of using the MIL-STD-3018 approach to parts management is that it advances consistency and discipline in the parts management process. This is particularly important in the area of non-authentic parts. Some of the major drivers introducing non-authentic parts into the supply chain are cost, schedule, and obsolescence. These issues are a problem when the procedures used by engineering, design, and procurement teams are not specifically designed to prevent behaviors that result in lapses in supply chain integrity. MIL-STD-3018 addresses the areas of parts selection and authorization and obsolescence management.

MIL-STD-3018 also contains requirements to have two plans, one addressing DMSMS management (in accordance with TechAmerica Standard 0016, "Diminishing Manufacturing Sources and Material Shortages"), and the other addressing the avoidance, detection, mitigation, and disposition of counterfeit electronic parts (in accordance with SAE International's standard AS5553, "Counterfeit Electronic Parts; Avoidance, Detection, Mitigation, and Disposition"). AS5553 focuses on the following areas:

- Counterfeit electronic parts control plan
- In-process investigation
- Material control

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Reducing the Risk of Non-Authentic Parts - *Continued from Page 5*

- Parts availability
- Purchasing
- Purchasing information
- Reporting
- Verification of purchased product

Incorporating these requirements into MIL-STD-3018 significantly strengthens it in the area of non-authentic parts and provides an effective system to avoid them. It also makes MIL-STD-3018 a powerful tool for establishing the discipline necessary to mitigate the risks of non-authentic parts entering the aerospace supply chain. Properly applied, the MIL-STD-3018 process will implement a system of checks and balances that will institutionalize those best practices necessary to significantly reduce the risk of obtaining non-authentic parts. In addition, if MIL-STD-3018 is implemented using the approach outlined in Electronic Industries Alliance Standard 4899, "Standard for Preparing an Electronic Components Management Plan," the implemented process can be assessed by a third-party registrar as additional insurance of proper implementation and demonstration to customers of the adequacy of the system. The plans outlined in SAE AS5553 and TechAmerica Standard 0016 also can be similarly verified.

There is no substitute for vigilance in the drive to protect the DoD supply chain from non-authentic parts. Human errors in the procurement process, failure to follow established procedures to meet pressing business needs, and the rapid ability of parts counterfeiters to adapt will continue to challenge our parts management systems.

Conclusions

Strong measures are required to keep the DoD supply chain free of non-authentic parts, whether from counterfeiters or other less obvious sources. As part of those measures, a MIL-STD-3018 parts management plan can be a solid base upon which to begin to improve a parts management system. The standard addresses the issue of non-authentic parts as well as the issues traditionally associated with parts management. PSMC will update and improve the standard and the system as the military and defense supply chain demands.

1 Department of Commerce, Defense Industrial Base Assessment: Counterfeit Electronics, January 2010.

2 Government Accountability Office, Defense Supplier Base: DoD Should Leverage Ongoing Initiatives in Developing Its Program to Mitigate Risk of Counterfeit Parts, GAO-10-389, March 2010.

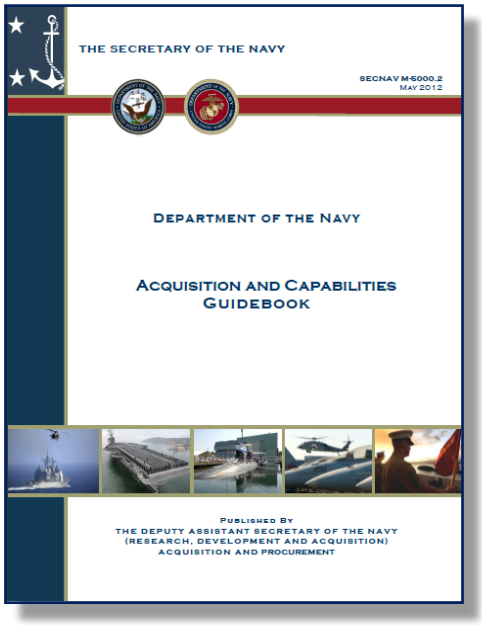
About the Author

Bob Ricco is working in mission assurance at Northrop Grumman. He has extensive experience in manufacturing, reliability, quality process development, and engineering management.

This article appeared in the July-September 2011 Defense Standardization Program (DSP) Journal, (www.dsp.dla.mil)

New Acquisition and Capabilities Guidebook Released by SECNAV

May 2012 SECNAV M-5000.2 Department of the Navy Acquisition and Capabilities Guidebook is now available. Though the document is release by the Department of the Navy, there is some very useful information and reference material that applies to all defense service branches. The Guidebook provides Department of the Navy Acquisition and Capabilities Guidance for Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System (JCIDS) and is intended to be used as a companion document to *support* *SECNAVINST 5000.2E Department of the Navy Implementation and Operation of the Defense Acquisition System and the Joint Capabilities Integration and Development System*, implementation of *DoDI 5000.02 Operation of the Defense Acquisition System*, *CJCSI 3170.01 Joint Capabilities Integration and Development System* (JCIDS), and the *JCIDS Manual*.



The Guidebook is structured after the chapter/paragraph numbering sequence of SECNAVINST 5000.2E. Major paragraph titles or headings from SECNAVINST 5000.2E are cited in this Guidebook for continuity and even for cases where no additional discretionary guidance is provided. The chapters in the Guidebook include paragraphs for discretionary guidance other than those paragraphs included from SECNAVINST 5000.2E that are mandatory policy.

Chapter 6 of the Guidebook contains extensive information of interest to the Life Cycle Logistician, including such important topics as:

- Acquisition Logistics and Sustainment
- Life Cycle Logistics (LCL)
- Total Life Cycle Systems Management (TLCSM)
- Program Manager's LCL Responsibility
- Warfighter Supportability-Related Performance
- Supportability
- Supportability Analyses
- Support Concepts
- Support Data
- Sources for Support Related Data
- Support Resources
- Open Architecture
- Reliability, Availability, and Maintainability (RAM)

Embedded in this chapter are also information on Performance Based Logistics (PBL) in Para 6.1.3.7 (Integrated Product Support Concepts) and the Product Support Manager (PSM) in Para 6.1.3.3 (Program Manager's LCL Integrated Product Support Responsibility).

NEW SYNERGIES BETWEEN SYSTEMS ENGINEERING AND DMSMS

By Chet Bracuto, Alex Melnikow, and Ed Zelinski

Focusing on Diminishing Manufacturing Sources and Material Shortages (DMSMS) in systems engineering (SE) is a vital means of improving DMSMS risk mitigation. The Systems Engineering Directorate, within the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, and the defense industry's SE community agree that closing the gap between DMSMS policy and practice would help ensure effective life-cycle support. Adverse impacts on weapon system availability can be reduced by applying SE principles and best practices to enhance reliability, availability, maintainability, and sustainability and by actively addressing DMSMS concerns throughout the entire life of the program.

Impacts of New Acquisition Reform Bill and Policy on Systems Engineering

The Weapon Systems Acquisition Reform Act (WSARA) of 2009, Public Law 111-23, reformed the way Pentagon contracts and weapon systems address the cost growth and delays in acquisition. The bill, signed into public law on May 22, 2009, focuses on starting programs right by renewing the focus on SE early in a program's life cycle and strengthening DoD's developmental testing and evaluation capability in order to reduce risk. The bill reflects the position that managing major programs effectively requires sound SE, technology readiness assessments, developmental testing, and reliable independent cost estimates. In that regard, the bill establishes the position of director of Developmental Test and Evaluation (DT&E). The bill also directs the Secretary of Defense to develop and implement mechanisms to ensure that requirements for major weapon systems consider tradeoffs between cost, schedule, and performance. WSARA furthers these provisions with additional certification requirements at Milestones A and B, for mandatory competitive prototyping and with a system-level preliminary design review (PDR) before Milestone B for all major defense acquisition programs. The statute requires the completion of a PDR and a formal post-PDR assessment before a program receives Milestone B approval. Figure 1 compares the acquisition life-cycle frameworks since 2003.

WSARA requires development and tracking of measurable performance criteria as part of the systems engineering plan, test and evaluation strategy, and test and evaluation master plan. It also requires the Office of the Secretary of Defense to provide Congress an annual assessment of component capabilities for SE, development planning, and DT&E. In addition, WSARA emphasizes life-cycle management and sustainability.

Central to these improvements is a program's up-front attention to SE through parts management and DMSMS. SE design trades should allow the program to select appropriate parts and to identify potential DMSMS issues early, which will in turn enable the program to manage parts and DMSMS proactively throughout the life cycle.

DMSMS cases may occur at any phase in the acquisition life cycle, from design and development through post-production, and they may have a severe impact on weapon system sustainability and life-cycle costs. The majority of DMSMS cases have been in the electronics area (primarily microcircuits); however, DMSMS problems affect all weapon systems and material categories. In addition, DMSMS problems are not always confined to piece parts. Material obsolescence situations may occur at the part, module, component, equipment, or other system level.

DMSMS is becoming the new pervasive threat to system sustainability. To rectify this issue, the Systems Engineering Directorate established four goals to enable proactive DMSMS risk management.

GOAL 1. ENSURE THAT SE DESIGN TRADES CONSIDER DMSMS CONCERNS

Industry is developing company-wide capabilities and practices to combat DMSMS issues prior to the critical design review phase of a program. However, gaps exist between policy and practice. For example, DMSMS considerations usually are not given high priority, and design activities need early integration with DMSMS prediction/mitigation tools. In addition, proactive DMSMS methods need assessment during technical and program support reviews.

GOAL 2. REACH OUT TO PROGRAM MANAGERS AND SENIOR LEADERS REGARDING THE IMPORTANCE AND BENEFITS OF A PROACTIVE DMSMS APPROACH

DMSMS activities include engagement of both government and industry through the DMSMS Working Group. Government and industry harvest ideas through many forums such as periodic conferences. The DMSMS Working Group addresses investigations of lead-free and counterfeit electronics, cost metrics of obsolescence, and other leading- edge issues that will benefit the DMSMS community. Awareness programs, along with DMSMS training resources, are available to avoid the consequences of DMSMS. Those resources include the following:

Defense Acquisition University (DAU) course material incorporating basic DMSMS knowledge and techniques.

SD-22, Diminishing Manufacturing Sources and Material Shortages: A Guidebook of Best Practices and Tools for Implementing a DMSMS Management Program, published by DSPO in September 2009. SD-22 compiles materials from various DoD DMSMS manage-

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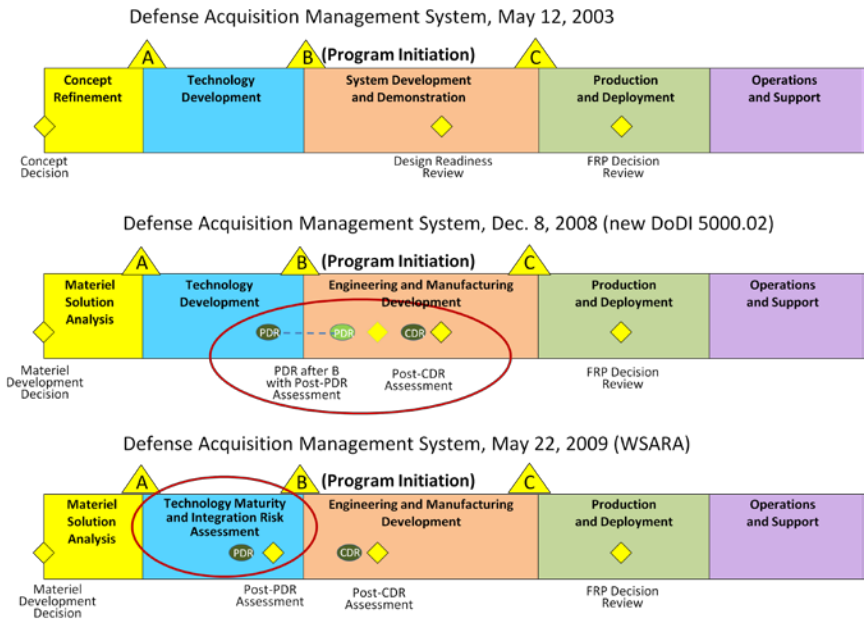
Figure 1. Comparison of Acquisition Life Cycles



Notes: CDR = Critical Design Review, FRP = Full Rate Production, PDR = Preliminary Design Review

NEW SYNERGIES BETWEEN SYSTEMS ENGINEERING AND DMSMS

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ment documents and best practices from across DoD services and agencies for managing the risk of obsolescence. SD-22 also identifies assorted measurement tools that may be useful for analyzing and tracking the effectiveness of DMSMS programs. SE and program managers should make the DMSMS guidebook their desktop reference for quickly pinpointing key actions required to manage DMSMS issues and concerns.

Outreach activities involving the DMSMS community, such as the annual DMSMS and Standardization Conference, have been successful in spreading awareness of the issue and availability of DMSMS logistics and predictive tools. Through the conference, participants should make it a priority to forge strategic partnerships between logistics and SE for long-term systems supportability for DoD weapon systems. Strong strategic partnerships at all levels within DoD, industry, and academia will enable quick response to material shortages and improve readiness and support of the warfighter.

DMSMS considerations could be better integrated into DAU courses. Leaders in the services need to provide active, consistent advocacy for DMSMS issues in programs. Investments are necessary to dramatically decrease DMSMS impacts on the warfighter. In addition, consolidation and justification of long-range DMSMS program resource requirements need to be aligned with spending priorities against defense objectives. Although reactive mitigation solutions for DMSMS will always be necessary, both DoD and industry need to move toward proactive and strategic solutions having noteworthy benefits.

GOAL 3. IMPROVE THE EARLY IDENTIFICATION AND DISSEMINATION OF POTENTIAL DMSMS ISSUES AND WARNINGS

DoD is increasingly sharing DMSMS analyses and solutions across multiple systems. Partnerships with industry have begun to pay off with common access to shared data. In addition, DoD programs are implementing international standards for end-of-life warnings in nonproprietary systems.

Legislative and environmental protection activities will increasingly restrict material availability outside the usual electronics domain. DoD and industry need to increase partnerships to share data using common standards at the part, card, and box levels in order to gain a consolidated view of inventory and demand. DoD acquisition programs need better access to shared data across services and industry. In addition, DoD and industry need to embrace measures to support the combating of counterfeit parts, the restriction of hazardous substances, and the European Union's regulations on registration, evaluation, authorization, and restriction of chemical substances. To further enhance dissemination of DMSMS issues, programs should leverage the Government-Industry Data Exchange Program for establishing standards to enable collaboration to resolve DMSMS issues. SE professionals in both DoD and industry have a clear opportunity to share knowledge regarding DMSMS issues.

GOAL 4. IMPROVE THE METHODOLOGICAL FOUNDATION OF THE DMSMS RISK MANAGEMENT PROCESS

DoD, academia, and industry need to publish documented processes to assist programs with identifying, assessing, and resolving DMSMS problems. Guidebooks should include a discussion of the potential synergy between value engineering and DMSMS. MILSTD-301 8, "Parts Management," and two DSPO documents—SD-22 and SD-1 9, *Parts Management Guide*—provide additional implementation details.

The DMSMS community needs to ensure tighter coupling between the SE process and the DMSMS risk management process. This connection requires more standardized techniques and the implementation of prediction and mitigation tools across a broad spectrum of government and industry to better manage obsolescence issues. Techniques to evaluate DMSMS program cost-effectiveness also are needed. DMSMS considerations should be integrated into DAU courses and into industry awareness and training programs.

Conclusion

SE's focus must be on a balanced solution that drives improvements, early in the life cycle, regarding affordability, safety, sustainment, reliability, availability, maintainability, mission performance, and system-level operational effectiveness.

With regard to sustainment, efforts need to be directed toward addressing prospective DMSMS situations during the initial phases of weapon system development or modification. This effort includes identifying current and potential DMSMS items early in the SE phase and making associated design tradeoffs to minimize life-cycle vulnerability. The foundation for effective life-cycle obsolescence management resides in careful integration of DMSMS program elements within SE activities. With a life-cycle DMSMS management program in place, SE would support cost-effective identification and resolution of DMSMS problems throughout the life cycle before they become critical situations affecting weapon system supportability and readiness. Incorporating timely and cost- effective engineering practices during all life-cycle phases will minimize the impact of DMSMS.

Acquisition reform for SE means an improved foundation of the DMSMS risk mitigation process. The transition of DSPO into the Systems Engineering Directorate will allow SE principles and best practices to enhance reliability, availability, and sustainability. Actively addressing DMSMS concerns throughout the entire life of the program will help ensure effective life-cycle support and will reduce adverse impacts on readiness or mission capability.

Note: This article is based on an expanded discussion of the presentations made by Mr. Terry J. Jaggers, Principal Deputy Director, Systems Engineering, Office of the Director, Defense Research and Engineering, and by Mr. Christian T. Orlowski, Corporate Director, Engineering and Technology, Northrop Grumman Corporation, the government and industry keynote speakers at the 2009 DMSMS and Standardization Conference.

About the Authors

Chet Bracuto is a senior systems engineer in the Systems Engineering Directorate. He leads efforts on reliability, availability, and maintainability; production, quality, and manufacturing; supportability; reduction of total ownership costs; and value engineering.

Alex Melnikow is the deputy director for DMSMS within DSPO. He is responsible for establishing DoD DMSMS policy and guidance.

Ed Zelinski is the strategic operations director and lead of the Common Commodities Management System Program at Northrop Grumman Corporation. Dr. Zelinski's responsibilities include strategic investment planning and enterprise-wide parts management/standardization and liaison with government and industry activities to support standards and guidance for the industry in all areas of parts management and DMSMS.

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Gentlemen, start your engine: U.S. Navy, Air Force develop engine modification that may save billions

The U.S. Navy and Air Force stand to save more than $2 billion after jointly developing an engine modification that will keep critically important aircraft flying for years.

The two services and industry worked together to develop and field a modification to CFM International's CFM56-2 (F108) engine, allowing them to restore exhaust gas temperature margins, increase fuel economy and extend their time between overhauls from 10 to 15 years.

The CFM56 engines are used on the Navy's E-6B Mercury command and control aircraft and the Air Force's C-135 series tankers and reconnaissance aircraft. The E-6B is managed by the E-6B Airborne Strategic Command, Control & Communications Program Office, PMA-271.

CFM International (CFM), the engine's maker, is scheduled to receive the Federal Aviation Administration (FAA) certification of the engine modifications by the end of May, Navy officials said.

"As incredible as these achievements are, both the Navy and the Air Force were struggling to reclaim lost engine efficiency," said Andy Noble, the Navy's CFM56 propulsion engineer. "In our case, only half of the engine life was being regained after the first overhaul. We could not gain back the performance we saw with the original engine build. Even with improved build techniques and test cell procedures, we would be doing well to recover half of the original time on wing between overhauls."

About four years ago, the Navy CFM56 engine team, having exhausted all known means to reclaim lost engine performance, asked CFM to make design improvements.

That effort paid off and resulted in Jeff Bauer, the CFM program manager, submitting a proposal in April 2009 for commercially proven design improvements used in newer models of the CFM56 engine family, Noble said.

"The recommendations proposed by CFM addressed the Navy and Air Force concerns of reclaiming lost engine efficiency, as well as introduced fuel efficiencies that would bring additional benefits," he said.

Realizing incorporating these improvements were too costly for the Navy to implement on its own, the E-6B CFM56-2A engine manager, Gerry Cronkrite, pursued a collaborative effort with Tim Misner, the Air Force's CFM56-2B (F108) engine lead program manager. Their coordination resulted in a plan that could be advantageous to both services.

Empowered with this information, the Navy's E-6B program manager here and the Air Force's Headquarters Air Mobility Command provided authorization to pursue the design improvements in early 2010. They then combined efforts to share the costs of flight and ground testing as well as gathering the necessary data required for FAA certification.

Over the next few months, the updated engine would be tested, overhauled and tested again four times. This extensive barrage of ground testing helped reduce the amount of flight test time required and provided CFM engineers a controlled environment to capture FAA certification data. When the ground tests were complete, the engine was rebuilt and certified ready for flight tests by Navy and CFM engineering.

To help prepare for the upcoming flight testing, Lt. Stephen "Merle" Haggard, a test pilot at Air Test and Evaluation Squadron (VX) 20 here, recommended flying all test points in the Navy E-6 Level "D" flight simulator. Those simulated flights were done in August and September 2011.

In early December 2011, having met all the readiness review requirements, VX-20 Chief Test Pilot Cmdr. Jason Rider authorized flight-testing to begin. Testing was conducted between Dec. 9 and Jan. 11 through the coordinated efforts of VX-20, Navy Propulsion Engineering and CFM Engineering.

"I was excited and fortunate to have the opportunity to be a part of this joint service engine upgrade program that will provide both the Navy and Air Force huge cost savings over the life of the program," Haggard said. "This was a unique test program for the E-6B test team, requiring the skills of professional test pilots, flight engineers and flight test engineers. The team used Crew Resource Management training to safely operate and maneuver this large multi-engine, multi-piloted aircraft to capture all the performance and operability data required to obtain FAA certification."

Cronkrite and Misner are coordinating acquisition and logistics for the effort, with the plan to incorporate design improvements into the engines at the Oklahoma City Air Logistics Center during depot-level overhauls for Navy and Air Force aircraft in fiscal 2013.

Watch CFM56-2A engine manager Gerry Cronkrite explain the CFM56 engine modifications and how it will save the DoD billions of dollars. Visit: www.navair.navy.mil/index.cfm?fuseaction=home.NavairNewsStory&id=5002

From left, Petty Officer 2nd Class Jason Perreault, Petty Officer 2nd Class Michael Richards and Seaman Recruit William Cumming, from Fleet Air Reconnaissance Squadron 4 (VQ-4) located at Tinker Air Force Base, Okla., preflight one of four CFM56 engines on the E-6B Mercury on the flightline at Naval Air Station Patuxent River, Md. (U.S. Navy photo by Kelly Schindler)

Galaxy rising: With C-5M a 'super' culture, capability change are taking place by Air Mobility Command Public Affairs

The culture of the Air Force C-5 community is changing...and it's changing in a "super" way

As the Air Force transitions to the C-5M Super Galaxy, the upgraded airframe has quickly become an integral part of the airlift mission. It has set dozens of airlift world records and spanned the globe completing historic missions. In October 2011, the C-5M was also a force in the C-5 "surge" where for a week 18 active duty and 23 Air National Guard and Air Force Reserve Command crews and 41 total force C-5 Galaxy aircraft flew cargo in support of combatant commanders across the globe -- also an Air Force first.

The C-5 has long been known as the "Air Force's largest airlifter." In the future, Air Mobility Command officials say the goal is to have all C-5s become C-5Ms that would further strengthen the airframe's worldwide airlift capabilities.

The Air Force began an aggressive program to modernize all remaining C-5Bs and C-5Cs and many of the C-5As in its inventory when the C-5 Avionics Modernization Program, or AMP, was instituted in 1998. This effort included upgraded avionics, improved communications, new flat panel displays, improved navigation and safety equipment, and a new autopilot system. The first flight of the first AMP-modified C-5 occurred on Dec. 21, 2002.

The second part of the C-5 modernization plan is the Reliability Enhancement and Re-engining Program, or RERP, which includes new General Electric CF6-80C2 engines, pylons and auxiliary power units, with upgrades to the aircraft skin and frame, landing gear, cockpit and pressurization system. With both AMP and RERP upgrades, the C-5M was born. Dover AFB received the Air Force's first production C-5M in November 2010.

The Air Force plans to upgrade 52 Galaxies to "super" status by the end of 2016, said Lt. Col. Bob Shelton, A3 Strategy and Integration Officer with Headquarters AMC's Directorate of Operations.

"The C-5M significantly increases strategic airlift capability. We'll see tremendous improvement in reliability, direct-delivery capability and fuel efficiency. In turn, all of these will help reduce the demand on tanker platforms and the number of air refueling missions required," said Shelton, who has over 600 hours experience flying C-5s. "As our new strategic guidance looks towards operations in the Pacific, the improved capabilities of the 'M' will be especially beneficial to strategic airlift in the region and for overcoming the 'tyranny of distance.'"

The C-5M is also an airframe that aircrews and maintainers are talking about and eager to fly on.

"The C-5M is the future," said Staff Sgt. Steven Dow, a flying crew chief with the 436th Aircraft Maintenance Squadron at Dover AFB, Del. "I love the C-5 -- always have in any variant -- but the C-5M is spectacular."

Dow, who's been a C-5 maintainer for more than 10 years, was among 14 aircrew members who took a C-5M on the Air Force's first direct delivery airlift mission through the Arctic Circle from the United States to Afghanistan in 2011. On the 14-hour-plus flight to Afghanistan, the C-5M carried cargo for the Operation Enduring Freedom mission and "proved a strategic direct delivery concept."

On its way back, the same C-5M was also refilled with cargo from Kyrgyzstan, Southwest Asia and Western Europe that needed to be returned to the U.S. -- making efficient use of nearly all the 270,000 pounds of cargo capacity in the plane. All of the thousands of miles back to Dover AFB, the plane performed as well as expected by the crew, and added to the upgraded airframe's reputation as a "solid performer."

"The C-5M is a great mobility weapons system," Dow said. "During our mission to Afghanistan the plane flew all the way and had zero discrepancies or write-ups."

Lt. Col. Scott Erickson, a C-5 pilot from the Air Force Reserve's 709th Airlift Squadron at Dover, discussed the C-5M's capabilities and capacity.

"Having been with the M from the beginning, I'm always proud to show off what it can do," Erickson said. "Thanks to the engines, we can now carry more [with the C-5M], carry it farther and use less gas. In overflying places we used to stop for gas, or where we would have required an air refueling, the savings in time, money and maintenance adds to an already impressive package."

Dover AFB is also home to the 436th Aerial Port Squadron -- one of four original units that ushered in the "cargo precision loading" age that "standardizes air cargo build-up from depot suppliers and AMC aerial ports to maximize volume and weight utilization," according to an AMC talking paper.

According to Master Sgt. Mitch Pykosz, precision loading program manager for AMC's Directorate of Logistics, Air Transportation Cargo Policy team, one area where efficiency comes into play with precision loading is utilizing as much pallet space as possible on both contract and military airlift missions -- which in turn requires fewer missions to complete.

The effort includes building pallets to their maximum weight or volume goals, based on specific aircraft requirements including the C-5M, Pykosz said. Through February 2012, the precision loading initiative has enabled a 9 percent mission utilization increase which led to an avoidance of 195 air missions saving the Air Force and AMC millions of dollars in flight costs.

Combine the precision loading initiative with the C-5M's cargo capability -- including a world record of 176,450 pounds -- and there is a greater possibility for increased efficiency. A C-5M can actually hold up to 245,000 pounds of cargo depending on a number of factors to include runway length and atmospheric conditions, said Master Sgt. Andy Hoots, command manager for C-5 loadmaster standards and evaluations at Headquarters AMC.

Staff Sgt. Norterious Jenkins, a C-5 loadmaster with Dover AFB's 9th Airlift Squadron, said he thinks the C-5M is the airlifter that, when flying on it, feels like "you're always going to be back on time." It changes the "broke on the flightline" mentality that some historically have said the C-5 had been known for.

"The M is not like the C-5s we've always known...they have the ability to do more," Jenkins said. "Some of the things this plane has done, compared to the B-model [for example], are mind boggling."

And maybe that's the best way to describe the C-5M -- "mind boggling" possibilities. Dover AFB is the current home to all three of the C-5Ms delivered to the Air Force. Eventually, other C-5 wings, such as the 60th Air Mobility Wing at Travis AFB, Calif., will have the aircraft as part of their daily operations. In turn, having the C-5M available may change the culture and the history of the C-5 community in a "super" way.

Maintenance crew chiefs from the 436th Aircraft Maintenance Squadron and aircrew Airmen from the 9th Airlift Squadron prepare a C-5M Super Galaxy for a mission at Dover Air Force Base, Del., on June 5, 2011. The C-5Ms mission was to complete the first Arctic overflight from Dover AFB to Bagram Airfield, Afghanistan. The plane successfully landed at Bagram just over 15 hours later on June 6, 2011. (U.S. Air Force Photo/Master Sgt. Scott T. Sturkol)

FED Bravo Vehicle Puts Efficiency on Display

By Bob Fehringer, USTRANSCOM Public Affairs

It's possible that no single project represents the Defense Department's willingness to break with convention and think in new ways about reducing fuel consumption than the latest Fuel Efficient ground vehicle Demonstrator, known as FED Bravo.

When FED Bravo made its public debut at the recent Society of Automotive Engineers World Congress and Exhibition in Detroit, one of the most frequently asked questions was, "when is it going into production?" But Carl Johnson and Rachel Agusti — the engineers at the U.S. Army Tank Automotive Research, Development and Engineering Center (TARDEC) who coordinate the project — have to answer the same way: the two FED vehicles were funded by the Office of the Secretary of Defense to test and transfer technology, not to field the vehicles.

"This is a concept vehicle," Johnson stated from the floor of TARDEC's SAE exhibit, where a steady stream of visitors sat in the FED vehicle and fired off questions about its fuel economy systems at the event April 24-26. "The vehicle itself won't go into production, but the components, technology and lessons learned will be transitioned to the current fleet and allow us to improve the future fleet. The FED vehicles were built to evaluate whether existing fuel efficiency solutions will be effective on a military platform."

The level of those improvements can be summed up in a simple sentence that Johnson and Agusti will repeat many times as they display the FED Bravo from here to Washington, D.C., and the vehicle undergoes performance and durability testing throughout the year:

"This vehicle can perform the same mission as a Humvee [High Mobility Multipurpose Wheeled Vehicle], but with 90 percent better fuel efficiency."

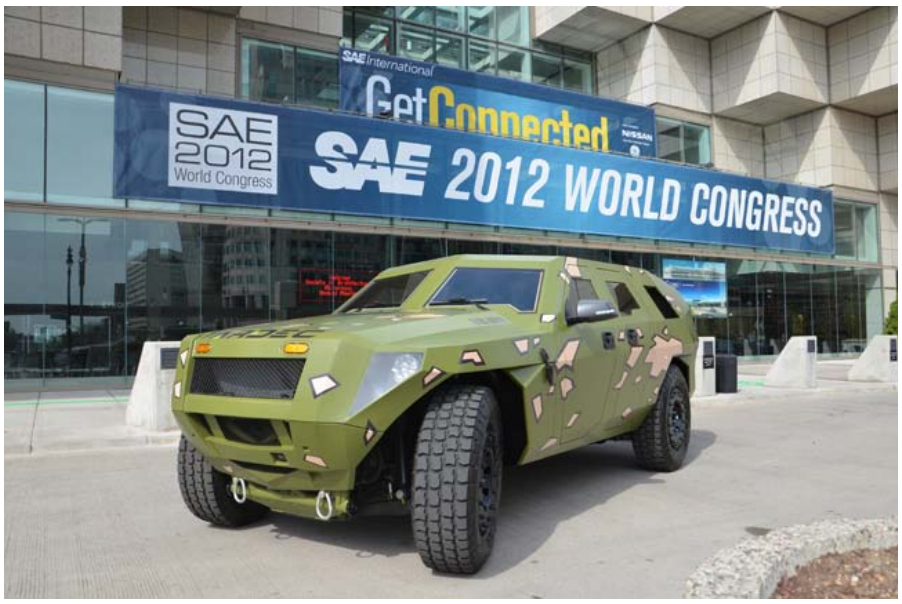
Life-Saving Implications

That's the first illustration of how the FED Bravo — which follows the earlier FED Alpha into the demonstrator fleet — proves that the Department of Defense (DoD) and the Army are serious about achieving higher miles per gallon ratings for its vehicles and using less fuel.

The FED Bravo offers 9.58 combined mpg, which represents a mixture of urban mission and convoy escort (highway) driving. The current HMMWV model the FED uses for comparison generates about 4.8 mpg. That increase in fuel mileage has profound significance for the Soldiers deployed in escort convoys for fuel deliveries to Soldiers in the field — the Secretary of the Army has stated that those units report one casualty for every 46 convoys sent on refueling missions.

"[Improved fuel efficiency] means less time securing fuel convoys and doing IED sweeps, which leaves more time for fighting the enemy and helping train the Afghanis," commented MAJ Joseph Morrison, Associate Director of TARDEC Special Programs Office. "The amount of effort that goes into getting every gallon of fuel to the Soldiers is tremendous, with thousands involved from Port to COP [combat outpost]. When you take that into account, that gallon of fuel is fairly expensive by the time it gets there. Better fuel efficiency will allow the military to use taxpayer dollars more wisely by being able to allocate troops and money to other missions."

TARDEC engineers worked with industry partner ASRC Primus to produce a military demonstrator vehicle that could perform the same mission as a High Mobility Multipurpose Wheeled Vehicle (HMMWV) but with 90 percent better mpg ratings. FED Bravo made its public debut in the TARDEC exhibit at SAE World Congress and Exhibition, April 24-26.



The Fuel Efficient ground vehicle Demonstrator (FED) Bravo vehicle, designed by TARDEC and industry partner ASRC Primus, made its public debut at the Society for Automotive Engineers (SAE) World Congress and Exhibition April 24-26 at Cobo Center in Detroit. The Secretary of Defense funded the Army program to test commercially available fuel-efficient systems on a military application. (U.S. Army TARDEC photos.)

Bear in mind that the Army cannot omit the third "P" in the fundamental ground vehicle equation: performance, payload and protection. Because ground vehicles have to provide an armor skin to protect Soldiers and Marines in the crew compartment who may get attacked on patrols, the survivability trade-off for the armor's added weight will always be part of the equation.

To overcome that and other military vehicle requirements that enable missions but also drag down the mpg numbers, TARDEC's Advanced Concepts Team worked with a prolific cast of automotive contractors to design and build two Fuel Efficient ground vehicle Demonstrators they named FED Alpha and FED Bravo.

TARDEC partnered with Select Engineering Services (SES) and Ricardo llc to create the FED Alpha, which remains in testing, and collaborated with private industry contractor ASRC Primus on the FED Bravo vehicle. The teams identified as many commercially available fuel-saving, aerodynamic and safety features for both vehicles to move the needle on fuel economy while continuing to satisfy the Army's requirements for a tactical vehicle.

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FED Bravo Vehicle Puts Efficiency on Display — *Continued on Page 12*

FED Bravo, which has a combined mpg rating 90-percent higher than a comparable HMMWV, went on an urban "mission" before it debuted at the SAE World Congress and Exhibition. TARDEC's location in the heart of Detroit's auto industry enabled an extensive amount of collaboration to equip the vehicle with fuel-efficient technology.

Not Your Average Army Process

FED Bravo engineers shredded the Army's usual approach to vehicle design in two other ways to spark innovation. They adopted the "Monster Garage" method — so named to emulate the former cable television series that turned common vehicle models into something creative and extraordinary — and they went outside the Army to an academic partner to reshape the vehicle's styling and layout.

In the "Monster Garage" series, the hosts invited specialists to contribute ideas for each aspect of the vehicle. To design FED Bravo, TARDEC and Primus assembled a circle of subject-matter experts from government, industry and academia to filter through the most innovative and effective fuel-efficient technologies on the market that could be applied to a military platform. At TARDEC's Concepts Analysis System Simulation and Integration (CASSI) studios, engineers began M&S studies to examine vehicle tradeoffs using a top-down, systems-level approach with fuel efficiency and performance as primary requirements.

The team determined to equip FED Bravo with key features that include the following:

- Road-coupled parallel hybrid drive system. The front axle is powered by an electric motor, while the rear-wheel-drive is linked to a hybrid fuel-powered and electric system.
- Ford 4.4-liter twin turbocharged V8 diesel engine, capable of producing 268 horsepower.
- Integrated starter-generator shuts off the engine during idle time and restarts it when the driver touches the accelerator, which improves fuel economy and reduces emissions.
- Six-speed automatic transmission coupled with an advanced lithium-ion battery with high energy and power density.
- The full-power hydraulic brake system with antilock brakes is combined with the steering system to supply the hydraulic pressure demands for the steering, eliminating a second pump and improving efficiency.
- Carbon ceramic brake rotors with advanced coating for durability, plus low-drag aluminum brake calipers.
- Tubular space frame chassis for better rigidity-to-weight ratio. Combined with armored cab and V-shaped hull for protection from blasts.

In another aberration from standard practices, TARDEC engaged an automotive design class at the College for Creative Studies (CCS) in Detroit — the same pool of design talent that the Big Three draw from to design their passenger vehicles — to give the FED Bravo a bolder look on the outside and ergonomic upgrades on the inside. Military vehicles are normally designed around function and need, without much attention to industrial design or driver interface. TARDEC engineers invited 18 CCS design students in a class to provide their design ideas for an Army vehicle that would mimic the capabilities of a HMMWV M1114 vehicle but with a presence unlike anything else seen on a battlefield.

The team narrowed down the selections to three students' ideas and then chose the design by Joel Zastrow, who was a junior at the time, to move forward. Zastrow was subsequently hired by Primus to complete the FED vehicle's interior layout (which includes cup holders — Soldiers get thirsty in a desert). He unveiled his creation on a 1/5-scale model at the 2011 North American International Auto Show in Detroit.

"It doesn't look like any other military vehicle," Carl Johnson commented. "We're supposed to be looking forward with this vehicle, so it's supposed to be different."

What Have We Learned?

Two demonstrator vehicles can make a difference. FED Alpha and Bravo have already made their mark in the transfer of equipment and knowledge to benefit the engineering process.

"The drive cycles developed by CASSI to record performance data from the vehicle are going to be used again for other Army vehicles," Johnson related. "The Army didn't have its own drive cycles yet. This was a FED drive cycle designed just for this vehicle, but it can be adapted to other vehicles. Also, the data recorders we used in testing have worked so well, Aberdeen Proving Ground acquired them to continue using there."

Another gain for TARDEC could be called the "player to be named later." TARDEC hired CCS graduate James Scott, another automotive design student from the same CCS class as Zastrow, to work with the Advanced Concepts group where he now creates designs for Army vehicles.

The ultimate objective remains the same — transfer as many of these fuel-saving technologies and improved processes to other projects and platforms to make tactical vehicles as efficient, agile and safe as possible.

"The FED Bravo gets 90 percent better fuel economy and can go 80 mph — we would have definitely traded in our truck for something like that," Morrison added. "This vehicle has a little bit of both [efficiency and protection] when you factor in the V-shaped Hull and the adjustable height on the suspension which provides more blast protection. If some of these concepts are used in other vehicles, I think Soldiers will be impressed."

Johnson announced that the Bravo vehicle may make another public appearance at the Pentagon near Washington, D.C., on Sept. 17.

Beyond that, it's back to work for the vehicle — it undergoes testing and evaluation at the Chelsea Proving Ground in Michigan this summer and then heads over to the Army's Aberdeen Proving Ground in Maryland from August to December.

TARDEC Interim Director Jennifer Hitchcock checks out the FED Bravo vehicle's interior during the SAE World Congress and Exhibition April 24-26. FED Bravo demonstrates how commercially available fuel-saving automotive systems can help a military vehicle achieve a 90-percent improvement in fuel mileage.

Face of Defense - *Continued from Page 1*

experiencing significant culture shock when he arrived in Afghanistan.

"It's jarring just to see how a piece of candy changes kids' whole day," he said. "In America, that's something we take for granted."

Jackson said he plans to continue his education once he completes his enlistment. "I plan on going to the University of Southern California once I'm out and [taking] their physician assistant program," he said. "After that, I'll get a job in a hospital. Eventually though, I would like to move into the health care administration side of things. It won't be as much hands-on work. Instead, I'll be more focused on looking after the doctors and what they're doing."

While he misses his friends and family, Jackson said he misses his wife the most, and he focuses on his job to cope with being away.

His daily tasks include ensuring Marines and sailors are physically and mentally healthy, and he also helps Afghans, some of whom have been injured by IED blasts.

"He's one of the most motivated and dedicated corpsmen," said Navy Petty Officer 2nd Class Alexander Burkhart, the assistant leading petty officer at the battalion aid station. "He loves the Navy. He gets the job done. His Marines like him a lot. He's able to figure out what needs to be done and gets it done without any supervision. I have a lot of trust in him and his abilities."

Navy Petty Officer 3rd Class Lamar Jackson checks for a pulse on a simulated unconscious patient during a training exercise at Forward Operating Base Jackson, Afghanistan, June 8, 2012. U.S. Marine Corps photo by Lance Cpl. Mark Garcia

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