Defense Standardization Program JOURNAL

For the Defense Standardization Program Community

May/June 2000 • Volume 1, Number 1

INAUGURAL ISSUE

The *Yin* and *Yang* of Standards

Airborne Lasers...has the future arrived?

USN Life Rafts: Reform in Action

and more...

Defense Standardization Council
Department of Defense
Chair Council to be appointed
Department of the Army
Renata F. Price
Department of the Navy
Eileen Roberson
Department of the Air Force
Dr. Don Daniel
Defense Logistics Agency
Thomas Ridgway
Defense Information Systems Agency
To be named
National Security Agency
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DEFENSE STANDARDIZATION PROGRAM JOURNAL

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Performance, Affordability, Readiness—Through Strategic Standardization

On the cover: Airborne Laser (ABL) publicity balloon landing during the Albuquerque Balloon Race.

Department of Defense policy is to: Promote standardization of materiel, facilities, and engineering cycle time.

DSP Mission: Identify, influence, develop, manage, and provide access to standardization processes, products, and services for warfighters, the acquisition community, and the logistics community to promote interoperability and sustain readiness.

The New Defense Standardization Program Journal

The Director's Forum

Gregory E. Saunders
Director, Defense Standardization Program Office

I am pleased to introduce you to our new magazine, the DEFENSE STANDARDIZATION PROGRAM JOURNAL. After 17 years of producing an excellent and informative Standardization Newsletter, we decided that we wanted to provide an enhanced forum for not only news, but for more in-depth articles examining various standardization topics, and for featuring success stories from the field of standardization.

Our plan is to publish two JOURNALS per year, with bi-monthly updates to keep you posted on news. The Defense Standardization Program Office staff will be writing some articles for the JOURNAL, but as you can see from our premier issue, we will also offer this forum to you for your ideas, case studies, opinions, and discussion of issues affecting standardization in the defense community. So I urge you to write comments on the articles you read here, articles of your own, or suggestions for subjects you would like to see addressed in an in-depth article. Please contact our editor, Mrs. Sharon Strickland at sharon_strickland@hq.dla.mil; (703) 767-6870 (telephone); (703) 767-6876 (facsimile); or write c/o Defense Standardization Program Office, 8725 John J. Kingman Road, Suite 4235, Fort Belvoir, Virginia 22060-6221. She will gladly receive your articles, ideas, and comments, and can also provide you with our editorial guidelines if you would like to write an article.

I urge you to write—send us your commentary, articles and suggestions.

I will also offer a column at the beginning of each JOURNAL that will be my "free for all" area. I will use my column to alert you to things that are going on in standardization, to offer opinion, as a bully pulpit, or to simply provide commentary from the perspective of the Defense Standardization Program Office on current events and issues that may affect our business. I'd like to begin by telling you a little of what is going on in the development of a National Standards Strategy...

National Standards Strategy

Why is the Department of Defense involved in something as esoteric as the development of a National Standards Strategy (NSS)? In the post MilSpec reform era, the Department of Defense still has more than 21,000 Military Specifications and Standards. We have also adopted (formally recognized for use within DoD) more than 8,000 private sector standards. Although our participation in development of voluntary standards has declined dramatically, we still have more than 400 people participating on standards development committees. As the largest single buyer in the Nation, we may well be the largest user of specifications and standards in the world. So, from a strictly standards point of view, we are a very large stakeholder in the national standards system, as a Standard Developing Organization, a participant in development of standards by other SDOs, and as a customer of both the standards and of the products and services they address.

But there are even more fundamental reasons why we care about a NSS. Recent years' reductions in defense procurement and the continual consolidation and restructuring of the defense industry mean that both we and our suppliers will struggle to meet demands for higher performance at lower cost, for competition and for innovation. We need to forge partnerships with industry to promote civil/military integration so that we can meet defense needs with products coming from commercial production lines and an expanded supplier base. There are many things we can do to break down barriers to civil/military integration, but having a single set of industry-wide standards for each major market sector is one of the keys.

Globalization is important to both industry and to the DoD. From a DoD perspective, we must promote creation of transatlantic and transpacific joint research and

continued on next page...

development, manufacturing, and acquisition ventures, whenever these ventures can be competitive and security enhancing. This requirement comes directly from the military necessity for equipment interoperability in the likely environment of coalition operations. It also recognizes the general industrial trend of globalization. Again, common standards used throughout an industrial sector are one of the keys for achieving success in this area. Within NATO, our ideal is to have common international standards that our allies and we agree to use. This can happen only if the industrial sectors come to agreement on common standards.

Another major area of common interest is the health of small, hi-tech, innovative firms. We must be able to attract these firms to defense business. Experience shows that working with new, agile, small firms fosters innovation and competition—results that are highly prized by both DoD and commercial industry. Much of what is being emphasized in the National Standards Strategy focuses on the efforts of larger companies and organizations. While I am not suggesting the strategy center around small companies, I think that both major corporations and government agencies would benefit from a strategy that involves small, innovative firms to participate on standards committees.

Lastly, while I know the National Standards Strategy is specifically looking at ways to improve the domestic standards development processes, I would like to underscore how important this is. Government and industry have both undergone major downsizing and restructuring in recent years. We simply do not have the financial or people resources to commit to standards development the way we did in the past. Somehow, the standards development process must be improved to collectively target limited resources in government and industry for those standards that are most needed and will likely have the biggest return on investment. We must also reduce costs associated with standards development by eliminating duplicative efforts, increasing on-line development and review of standards, and having more virtual meetings instead of face-to-face.

Standards development must be improved to target limited resources for the biggest return on investment.

I certainly do not think that development of a meaningful National Standards Strategy will be easy. Implementation will be even more difficult. I know that we will have to deal with people and organizations that are emotionally attached to the ways of the past, and suggesting new ideas that go against the consistency of the past and the existing culture will be enormously difficult.

I firmly believe we will have a National Standards Strategy. But what type of strategy? If it is to be a strategy that challenges the existing culture to yield larger results, then it must be one of powerful ideas capable of moving people to action.

Meet The Air Force Standardization Executive

We welcome **Dr. Donald C. Daniel**, Deputy Assistant Secretary of the Air Force for Science, Technology, and Engineering.

Dr. Donald C. Daniel

He is responsible for policy and guidance for science and technology; selected research, development, test and evaluation programs; systems engineering; weapons systems pollution prevention; and industrial practices. He also develops and provides program management direction for assigned research, development, test and evaluation activities, and industrial preparedness and standardization programs. He is also the Chairman, Air Force Scientist and Engineer Career Program Policy Council.

Dr. Daniel received his B.S., Master of Science, and Doctor of Philosophy in aerospace engineering from the University of Florida in Gainesville. Dr. Daniel was a research engineer with the Boeing Company prior to beginning his Air Force career. At Boeing, he conducted mission analyses and digital flight simulations for the Apollo and Saturn V manned lunar landing program. He held progressively more responsible positions in the Air Force and was also a member of the adjunct faculty of the University of Florida's Graduate Engineering Center, where he taught courses in aerodynamics. He also served as the Chief Scientist, Arnold Engineering Development Center, the world's largest aerospace ground-testing complex.

From 1994 to 1997, he was the Deputy Director of Science and Technology, HQ AFMC. From early 1997 until assuming his current position, he served as the Air Force Research Laboratory's first executive Director. He brings great talent to his position and we welcome the opportunities to work with him.

PAO Newsletters on the web at:

http://www.amc.army.mil/amc/pa/newsltrfs.html

Team C4IEWS Specification and Standards Acquisition Award

The Team C4IEWS Specification and Standards Acquisition Reform (SSAR) Team was named one of the 1998 Defense Standardization Program Army award winners. This annual award is given to defense organizations and individuals that have made significant accomplishments in implementing military specification and standard reform. Mr. David Oliver, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics, presented the award during a ceremony held at the Defense Logistics Agency Headquarters, Fort Belvoir, Virginia.

This team is credited with cost savings in FY98 of over $48 Million. The SSAR team was formed as an Army Acquisition Organization partnership to focus on the Army's specifications and standards acquisition reform initiatives, as part of the acquisition reforms directed by the Department of the Army. This team assists project Integrated Product Teams where application of acquisition reform initiatives can realize major life-cycle cost and system performance benefits. This assures the highest quality products are provided to the warfighter. The team is organized to include various acquisition reform tools under one banner to maximize the benefits of each of these unique, yet related, acquisition tools. These efforts were instrumental in implementing the use of performance based acquisitions, modernizing through spares, and the use of acquisition reform tools such as the value engineering methodology and operating and support cost reduction initiatives throughout the team's community. The team is committed to continuously training the workforce and to acquiring and sustaining high quality products and services for the soldier.

From left to right: David Oliver, Principal Deputy Under Secretary of Defense for Acquisition, Technology and Logistics; Jack Millett, AMC; Gerald Stoops, Associate Director of CECOM LRC; Roberto Flores and Mary Lynch, Team C4IEWS SSAR; Walter (Brad) Bergmann II, former Chairman, Defense Standardization Council; Victor Jiranek, Team C4IEWS SSAR; Gary Tull, former Army Standardization Executive; Jeff Carver and Steve Gunther, Team C4IEWS SSAR; and Gregory Saunders, Director, Defense Standardization Program. Other team members missing from the picture are Charles Cebula, Stephen Lascelles, Giuseppe Sgroi, Fred Domanich, Andrew Lee and Roland Chan.

PSMC Meeting in Orlando

Pictured with Gregory Saunders are officers of the Parts Standardization Management Committee (PSMC) at their recent April 3-7, 2000 general meeting in Orlando, Florida. Back row from left to right: Carl Muncy (DSCC), John Becker(Honeywell), Greg Saunders (DSPO) and Lee Gray (AMCOM). Front row, left to right: Cindy Morrison (UDLP) and Sam Merritt (DSCC). Mr. Saunders presented each of the officers with a plaque for their leadership and dedication in serving the committee. The PSMC is a joint Industry/Government working Group that provides a forum for promoting effective parts management and standardization through commonality of parts and processes. Their next scheduled meeting is tentatively scheduled for November 13-17, 2000 in Sandestin, Florida. More information about the committee can be found at www.dscc.dla.mil/psmc.

DoD Qualification Program Evaluating its Role In Today's Acquisition Environment

Carla Jenkins

The Department of Defense (DoD) Qualification Program has not had a critical reassessment of relevance, goals, and operation since 1984. With the profound changes that have taken place in the past five years under acquisition reform, the Director, Defense Standardization Program Office (DSPO), chartered a working group to examine the Qualification Program and to evaluate its role in today's acquisition environment.

Federal qualification requirements are defined in Federal Acquisition Regulation (FAR) Part 9—Contractor Qualifications, Subpart 9.2—Qualification Requirements. Subpart 9.2 implements 10 U.S.C. 2319, 41 U.S.C. 253c and prescribes policies and procedures regarding qualification requirements and the acquisitions that are subject to such requirements.

DoD qualification requirements are defined in (1) the Defense Federal Acquisition Regulation Supplement (DFARS), Subpart 209.2—Qualification Requirements, and (2) the DoD 4120.24-M, Defense Standardization Program (DSP) Policies and Procedures. DoD 4120.24-M implements 10 United States Code Section 2319 by providing procedures for the establishment and maintenance of the DoD qualification program and associated Qualified Products List (QPLs) and Qualified Manufacturers Lists (QMLs).

Section 2319 of the FY 1984 Authorization Act was enacted due to small business complaints that QPLs restricted competition and the qualification requirements were not being enforced. The resulting changes formed the framework for the current qualification program. This was the last significant reassessment of the DoD Qualification Program. The current program was created for a significantly different acquisition environment than that which exists today.

The working group is comprised of members from the Military Departments, Defense Agencies, and NASA. The program was evaluated to determine how qualification can be improved to better serve its customers throughout the acquisition community. The group has recommended changes to existing policies and procedures. That is expected to make the DoD's Qualification Program a valuable and responsive tool for defense acquisition.

The working group addressed the following:

- What is the purpose of qualification? Is that purpose still relevant in the new acquisition environment? Are there other purposes that can or should be served by qualification?
- Should the usage of qualification be changed from the tightly controlled qualification regime defined by DoD 4120.24-M to a more liberal usage?
- The QPL often plays an important role in logistics support. Is it time for this role to evolve? How would changes or improvements in the qualification program affect logistics support?
- DoD is increasing its usage of Contractor Logistics Support (CLS). How does qualification interact with CLS for existing systems? How does qualification interact with developing systems that will rely on CLS?
- State governments, commercial companies, and other bodies appear to be increasing their use of qualification. What lessons and best practices can be learned that might apply to improving the DoD Qualification Program?
- The qualification process, as currently practiced, is manpower and resource intensive. The use of qualification may decline as defense resources are further constrained. How can the qualification process be made more efficient and effective?
- Qualification requirements are currently incorporated into and made part of a defense specification. Can and should qualification requirements be removed from specifications and made separate but useful documents?
- The DoD is migrating toward greater use of non-Government standards (NGSs). How can third party qualification (e.g., Underwriters Laboratory) be put to good use within the DoD Qualification Program? And how can the government determine what constitutes a "suitable" third party laboratory for conducting qualification testing?
- What are the legal and liability implications of using third party qualification?
- How should the use of qualification requirements in NGSs be handled in dual-use (defense and commercial) situations?
- What should the DoD Qualification Program look like in the future to best meet the needs of the 21st century acquisition community?

A report is being prepared for submittal to the Director, DSPO, with recommended changes to policy, procedures, and any other changes necessary to accomplish the desired results. Also, DSPO is working on issues that resulted from recommendations made by the working group, such as use of Non-Government standards with commercial qualifications and better guidance on establishing qualification programs.

Carla Jenkins is a Program Analyst in the Defense Standardization Program Office. She can be contacted at (703) 767-6874; or by e-mail: carla_jenkins@hq.dla.mil.

1999 World Standards Day Paper Competition—First Place Winner

The *Yin* and *Yang* of Standards Development

Stephen C. Lowell

There is an ancient Chinese concept called *yin-yang* that holds that everything in the universe consists of opposite aspects (for example, hot-cold, dark-light, or life-death), which must be kept in balance for an entity to thrive. The *yin* and *yang* are opposing forces that constantly change, are in continual conflict, but are dependent on each other for survival. These opposites drive each other towards creativity and excellence, while at the same time, they restrain each other to ensure harmony. To the ancient Chinese, there was nothing in life that was exempt from the natural order of *yin-yang*, including standards.

In today's world, there are two opposing forces when it comes to standards development. On one side is the more traditional, formal standards development process, which is based on consensus, openness, and due process. The formal standards process is represented by the *yin*, which has the qualities of calmness and deliberateness. On the opposite side is the consortia standards process, which is more market driven, and the principles of consensus, openness, and due process may be limited or all together ignored. Consortia standards are developed jointly by companies or organizations that have similar strategic standardization goals, and are characterized by the need to develop standards quickly enough to meet market demands or to harmonize or differentiate requirements within a specific industry. In some cases, formally chartered groups develop consortia standards. In other cases, two or more companies may informally work together towards a common standard because it meets their business goals at that time. The consortia standards process is represented by the *yang*, which has the qualities of strength, action, and speed.

While formal and consortia standards have co-existed for a while, some have suggested that the importance and relevancy of formal standards is waning, and that it can no longer keep pace with the rapid changes in technology, particularly in the areas of telecommunications and information technology. The argument is that the formal consensus process inherently takes too long because it must respond to a wide variety of interests, including those who are considered "non-stakeholders" in the standard. There are criticisms that standards generated by the formal consensus process are technically inferior because in order to achieve consensus, they may have to accommodate the lowest common denominator. Somewhat contradictorily, there are also criticisms that these standards generate unrealistic requirements that focus on pedagogy and technological utopia rather than responding to "real world" market pressures.

Supporters of the formal consensus process, however, suggest that the pressure to bring products quickly to market can result in standards that may have safety, reliability, or environmental problems, which might be avoided with a wider review and more careful consideration. There is also the criticism that the consortia standards approach can result in sub-optimal standards that reflect the designs and processes of a select or influential group of producers or users rather than taking the time to evaluate what might be better solutions. And although some consortia standards have achieved the status of international *de facto* standards, there is concern that *ad hoc* approaches result in balkanized standardization rather than the single global standard desired by many producers and users.

Whether the formal standards process is superior to the consortia process or vice versa is not only a question without an answer, it is the wrong question. Either side can cite examples to illustrate why their process is best. Either side can cite examples of each other's shortcomings. What would be more productive is to identify those situations where business, technological, and public interests would be better served by one process or the other, and perhaps more importantly, to identify ways in which these different standards development processes might complement each other.

Stephen C. Lowell is a Program Analyst in the Defense Standardization Program. *His paper was the recipient of the first prize in the 1999 World Standards Day Paper Competition. The Defense Standardization Program Journal thanks the World Standards Day '99 Planning Committee and the Standards Engineering Society, co-sponsors of the WSD Paper Competition, for permission to reprint this paper here.*

Look Before You Leap

There are some situations that demand careful, widespread consideration where only formal consensus standards will do. For example, only formal standards would be considered for use in government regulations because they are developed following the principles of consensus, due process, and balance between producers, industrial users, and public consumers. The goal for regulatory standards is fairness and trying to represent the public interest rather than market considerations. While some consortia standards may have degrees of consensus and due process, they would rarely, if ever, satisfy the criteria for balance demanded by regulatory agencies. This is not to say that regulatory agencies are not concerned with the speed at which standards are developed. They are. Public safety, for instance, demands that standards be available as soon as possible. But regulatory agencies must also balance speed with costs to industry and the consumer, trade impact, social implications, and political backlash.

Steve Lowell is pictured beside Gregory Saunders, Director, Defense Standardization Program, and Dr. Belinda Collins, Director, National Institute of Standards and Technology Office of Standards Services, at the World Standards Day awards banquet.

While much press play is given to government regulations, the government actually prefers not to issue regulatory standards. Regulatory standards only become necessary in the absence of formal consensus standards that are voluntarily adhered to by industry. For example, the Consumer Product Safety Commission has issued fewer than 50 mandatory regulatory standards. But there have been over 300 product safety situations where industry preempted the need for a mandatory federal standard by working together to develop a formal consensus standard, and then, voluntarily enforcing the standard within the industry. Drawstrings on children's clothing, window pull cords, five-gallon plastic containers, hair dryers, and bicycles are just a few areas where this has happened. But once again, it needs to be emphasized that a consortia standard with limited participation and balance would not preempt a regulatory standard, since it would be viewed as reflecting only the self-serving interests of the producers of the standard.

Product liability is another area where only formal consensus standards will satisfy the need in industry. Directly or indirectly, the existence or absence of formal standards becomes an issue in every product liability case involving alleged design defects. Except for those cases where a manufacturer failed to comply with the formal standard, a defending manufacturer is better off when there is a formal standard than if there is no standard or only a consortia standard. Most design defect cases come down to whether a jury believes the experts of the defendant or the plaintiff. A formal standard provides judges and juries with an impartial yardstick against which to measure safe and adequate product design. Manufacturers argue that their compliance with a formal standard demonstrates that they acted reasonably and responsibly. An important aspect when citing standards in product liability cases is the process used to create the standards. Formal standards created under conditions of fairness, balance, consensus, and due process carry considerable positive weight for the defense. Consortia standards can actually create a negative impression if the plaintiff paints a picture of a company more interested in having a standard designed to capture market shares than a standard based on consumer safety and product quality. While formal standards do not guarantee victory in product liability cases, it is common for an industry to initiate formal standards development when they deem the liability risks unacceptably high. For example, earlier this year, liability lawsuits involving fires produced from glass candle holder breakage motivated candle manufacturers and glass companies to join with consumer groups on the ASTM Committee F-15 on Consumer Products to begin development of labeling and performance standards for glass candle holders.

Haste Makes Waste

Sometimes trying to develop a standard too quickly or prematurely can be costly and wasteful. There is certainly a high price to be paid for those companies that align themselves with the losing standard or for consumers who purchase products to short4ived standards. Any company or consumer who thought that Betamax would triumph over VHS as the *de facto* standard for videocassette recorders can attest to this.

Sometimes the effort to develop a consortia standard quickly, but without adequate input from prospective users, can have the unintended consequence of slowing down standardization. In May 1997, after two years of work, Visa and MasterCard issued Version 1.0 of their SET standard,

which was to create secure Internet transaction protocols to prevent credit card fraud. They predicted that SET would become the *de facto* standard for Interact transactions in the United States (U.S.) by mid-1998. As of today, SET has very little usage in the U.S. even though it has the support of the largest credit card companies. Everyone has a theory on why the SET standard failed to catch on. Some critics say it is too cumbersome and complicated for Internet customers. Some say there are too many other competing Internet security systems. Some say that Visa and MasterCard should have also involved the other major credit card companies. Some blame a lack of marketing. While it would seem that having common security protocols for Internet transactions would be a high priority for credit card companies, banks, Internet vendors, and Internet buyers, there is still no universal standard. The formal standards process is criticized for taking too long, but it does have the virtue of trying to bring all of the common stakeholders together to develop mutually satisfactory solutions. And given that at least four years have elapsed without the emergence of a dominant standard for secure Internet transactions, it is difficult to imagine that speed is really an issue here.

There is also the situation where a project is so large and the financial risks so high that manufacturers and users are unwilling to make major capital commitments until an accepted body of formal standards are in place. Such is the case with the Intelligent Transportation System (ITS) effort. ITS is an ambitious program that seeks to build a U.S.-wide intelligent information infrastructure to reduce traffic congestion, save energy, reduce transportation costs, and improve safety by integrating information on traffic signal control, freeway management, transit management, accident management, electronic toll collection, railroad crossings, emergency services, and traveler information. Standards will be the key to the future success of ITS since there must be a body of uniform standards that will:

- define the interoperability requirements among many different systems to allow for the transparent exchange of information across the U.S.;
- allow equipment from different manufacturers that perform the same function to be interchangeable;
- ensure equipment compatibility so devices from one system do not interfere with devices ofanother system;
- promote the rapid development of new technologies; and
- allow for systems to be upgraded easily and economically as new features and capabilities become available.

Because the stakes are so high and the tasks so complex in the ITS effort, the U.S. Department of Transportation is sponsoring the ITS National Architecture Project to identify where standards are needed. Nearly a dozen formal standards organizations will be involved in developing the standards. While timeliness is important, it is even more important that a deliberative, consensus process be used to ensure understanding, input, and acceptance from the many different stakeholders.

He Who Hesitates Is Lost

While rushing to develop or adopt the "wrong" standard can be disastrous for a business, taking the time to develop the "right" consensus standard can leave a company eating its competition's dust. Historically, formal standards developing organizations have excelled at rationalizing differences in materials, products, and technologies that changed slowly or in a predictable manner. Today, standards development processes must be more agile to respond to technologies that are in a state of flux. Standards must be able to guide the emergence of new technologies. This is especially true in the electronics area where most of the consortia standards groups can be found.

Rushing to develop or adopt the "wrong" standard can be disastrous for a business; taking the time to develop the "right" consensus standard can leave a company eating its competition's dust.

Even if a formal standards group manages to establish "the standard," individual companies or consortia may try to preempt the formal standard with their own standard. For example, the International Standards Organization issued the Open Systems Interconnection (OSI) reference model, which was to be the ultimate compatibility standard for computer systems. OSI, however, turned out to be a pedagogical standard that was too cumbersome and expensive to implement, and was generally supplanted by the market-generated Transmission Control Protocol/Internet Protocol (TCP/IP).

Another example of the marketplace showing it has a mind of its own when it comes to standards is in the selection of a digital standard for airwave transmissions for cellular phones. After many years of effort, the Electronic Industries Association appeared to have united U.S. industry behind one standard called time division multiple access (TDMA). But in the electronics arena especially, no standard is safe, and several major U.S. companies defected to an informal consortia standard called code division multiple access (CDMA). To add to the mix, the Europeans took advantage of the division in the U.S. and unified behind a *de facto* standard called global system for mobile (GSM)

communication. All of this competition between different standards and technologies resulted in incompatible mobile phone digital formats, which sometimes presented a problem to consumers who wanted to use their cellular phone while traveling. Ironically, standards created a lack of standardization. As the old joke goes, "Standards are everywhere, but not always the same ones." Happily, the cellular phone standards war may be coming to an end since earlier this year, the Universal Wireless Communication Consortium, which supports TDMA, signed an agreement with the North American GSM Alliance to make TDMA and GSM systems interoperable. But in the fast-changing world of electronics, another competing consortia standard could be looming just around the corner.

Too Many Cooks Spoil the Broth

Ironically, the strength of the formal standards process—that is, its diversity of participation—is also its weakness. If producers, users, and other stakeholders all share the same vision and need for a standard, then it is possible to issue a formal standard relatively quickly. There are plenty of examples of formal standards that have been developed and issued in less than a year, and such speed certainly rivals that of most consortia standards setting organizations. In addition, most formal standards setting organizations have provisions for quickly issuing interim standards when it can be demonstrated there is an urgent need and time is of the essence. Typically, these interim standards have a finite life span, but they do serve the purpose until a final formal standard can be approved.

The problem with the formal standards process occurs when there is no motivation to have a common standard, or worse yet, if major stakeholders have self-interest reasons to oppose any type of standard. There are at least three scenarios where self-interests make it difficult or impossible to have a formal standard. In these situations, consortia standards are better suited to fill the void.

The first scenario involves a situation where one group of stakeholders wants a standard, but a different group of stakeholders opposes any type of standards. For example, a group of users may strongly support the development of standards to establish a minimum baseline for quality, reliability, performance, and common test methods. But some producers may oppose the user standards, especially if their products do not meet the proposed standards or if the creation of formal standards would threaten their market shares. In such situations, producers use the consensus and due process procedures of formal standards setting organizations to ensure that standards are not approved. If enough users feel frustrated by producer objections to develop what the users perceive as "good" standards, and if there is sufficient common need on the part of users, they will come together to form their own consortium.

Ironically, standards created a lack of standardization.

The second scenario where consortia standards seem to be the only option is when a group of stakeholders have such widely divergent preferences that approval of a formal industry-wide standard would be unlikely. For example, the Open Group Consortia wants to develop standards to enable anyone to access any information to which they are entitled from anywhere at anytime. They want new software and hardware applications to be capable of being integrated as easily as connecting a telephone. The Open Group consists of Compaq, Fujitsu, Hewlett-Packard, Hitachi, IBM, NCR, Siemens, and Sun Microsystems. Notably absent from this group is Microsoft, and therein lies at least one major obstacle to formal standards in this area. The Open Group, as its name suggests, wants to promote open software standards. Microsoft considers itself to be the *de facto* global standard (as do many others), and that is a status it wants to protect. While it is only a hypothetical question, "Do you think that Microsoft and its supporters would oppose the development of open system standards under the formal standards development process?"

The problem with the formal standards process occurs when there is no motivation to have a common standard, or worse yet, if major stakeholders have self-interest reasons to oppose any type of standard.

The third scenario, which prompts the development of consortia standards rather than formal standards, is more of a nuisance than a showstopper, and that is the involvement of non-stakeholders as voting members in the formal standards process. Non-stakeholders are individuals who will not be materially affected by a standard, and represent themselves rather than a company or organization. While such individuals may offer a wealth of experience and knowledge, they sometimes assume a "purist" position that is out of step with the economic, technical, social, and legal realities that users, producers, and other stakeholders will face once a standard is approved. Some formal standards developing organizations already have procedures that limit

non-stakeholders participation in standards development by allowing them to contribute as advisors but not voting members. But many of the largest formal standards developing organizations have individual memberships rather than organizational memberships, and as long as you pay your membership dues, stakeholders and non-stakeholders all have equal voting privileges. While non-stakeholders rarely, if ever, stop a formal standard, they can delay it for a long time through negative voting and parliamentary appeals. In general, consortia groups do not face such frustrating delays because participation and voting is not by individuals but by companies or organizations.

Two Heads Are Better Than One

While most formal and consortia standards groups appear to either compete, coexist, or ignore each other, there are a few who have forged a symbiotic relationship that takes advantage of each other's strengths. The cooperation between the United States Council for Automotive Research

Pictured above are Mary McKiel (EPA), seated beside Steve Lowell, Defense Standardization Program, at the annual World Standards Day evening banquet.

(USCAR) and the Society for Automotive Engineers (SAE) is an example of such a successful relationship.

The USCAR consortia was formed in 1992 by Chrysler, Ford, and General Motors to work together to address common technological problems and opportunities. Shared standards were one of the outcomes from this joint effort. These standards were developed comparatively fast since consensus was only needed among the big three U.S. automotive manufacturers. The benefits from this pooling of resources was soon evident. USCAR's partnership on electrical wiring components reduced the number of cigarette lighter designs from 30 to 4, which improved the quality of the lighter and reduced the cost of design, testing, manufacturing, assembly, and supply. Similar efforts are underway to achieve the same types of results for tire jacks, fasteners, belts, fuel filters, light bulbs, gas caps, and any other common part that is not a market discriminator in influencing sales.

Given USCAR's early success and aggressive agenda, some pondered SAE's future role as the preeminent developer of automotive standards in the U.S. But what happened was not a fierce competition, but joint cooperation. USCAR recognized that while their consortia process could generate standards quickly, the standards did

While most formal and consortia standards groups appear to either compete, coexist, or ignore each other, there are a few who have forged a symbiotic relationship that takes advantage of each other's strengths.

not necessarily enjoy recognition and usage outside of the big three U.S. auto manufacturers. With the globalization of markets and suppliers, international recognition and use of the USCAR standards was important. SAE had both the reputation and experience needed to market the USCAR standards to a much wider audience.

A partnership was born when SAE's Cooperative Research Program agreed to provide USCAR's Strategic Standardization Board with document facilitation services, which included services to transform USCAR consortium standards into formal SAE standards. The result is that consortia standards, which initially had limited exposure, are now becoming the global standard. For example, SAE adoption of a battery abuse-testing standard originally developed by USCAR's Advanced Battery Consortium has generated overseas interest, and the Europeans and Japanese are using the SAE standard as guidelines for their own national standards, resulting in a harmonized *de facto* global standard. USCAR's horn connector standard is being considered for adoption as a SAE standard. The result is participation by five of the world's leading horn suppliers—FIAMM, Bosch, Denso, Hella, and FER- in the development of a standard that will have worldwide acceptance.

A few other formal standards developing organizations appear to be following the SAE lead. For example, the Institute of Electrical and Electronics Engineers (IEEE) established the IEEE Industry Standards and Technology Organization (ISTO) in January 1999 as an independent, not-for-profit corporation to help consortia and other special interest groups to develop IEEE standards rapidly. IEEE

offers consortia groups many benefits, including world-wide use and recognition of standards bearing the IEEE label, publication and document management, administrative support for meetings and conferences, on-line services, and marketing. In February 1999, the Medical Device Communication Industry Group (MDCIG) became the first program to operate under the IEEE ISTO. The MDCIG's goals are to accelerate the development process for the IEEE 1073 series of standards for medical device communications, and then foster the use of these standards in the health provider and medical device manufacturer communities.

We Need to Speed the Need

While the need to protect public interests is often more important than speed, this does not mean that the pace of the current formal standards development process is acceptable. In 1991, the National Institute of Standards and Technology (NIST) publication *Standards Activities of Organizations in the United States* only briefly acknowledged the existence of consortia standards organizations and did not provide any data about them. By 1996, this same NIST publication contained substantial information on consortia groups and their standards, noting that there were now 150 informal standards developers who had produced around 2000 standards. The number of consortia standards organizations has grown dramatically in recent years largely in response to a formal process that many companies perceive as being too slow. This is a trend that has caused some formal standards developing organizations to change their processes, but more needs to be done. As a minimum every formal standards developing organization should consider:

The number of consortia standards organizations has grown dramatically in recent years largely in response to a formal process that many companies perceive as being too slow.

- Better use of current information technology tools to conduct electronic document development, coordination, and resolution of comments, and hold virtual meetings. We are rapidly approaching a point where a computer and an email address will be considered as necessary as a telephone. While requiring all committee members to have a computer and email address may prevent some people from participating, such a requirement can hardly be considered a barrier to participation and is one of the keys to speeding up the document development process.
- Restructuring the voting process to ensure that only valid stakeholders are permitted to approve standards and developing a process to address quickly and fairly situations where participation by stakeholders appears to be for the purpose of blocking standards development. While formal standards developing organizations must take care to ensure balance, consensus, fairness, and due process, if they cannot solve the dilemma of negative or non-value added participation, the approval process will continue to be slow or impossible for certain committees.
- Providing professional draft development services. One of the most difficult and time-consuming tasks is developing the first draft for committee members to consider. While committee volunteers may have the interest in a standard, they may not have the time or the technical writing skills to develop it in a timely manner.
- Strategic planning to identify those standards that are most important to industry, the public, and government, and therefore, need to be placed on a faster track. NIST reports in their *Standards Activities of Organizations in the United States* that 80 percent of the orders for individual formal standards are for just 15-20 percent of the total number published. Many standards are no longer used because they are obsolete, but there are also many that have rarely been used because their development was driven more by individual desires than organizational needs.

The opposing standards processes complement each other in many ways and serve diverse purposes. They also challenge each other to do better.

Dynamic Balance

True to the principles of *yin* and *yang*, standards users and developers need both the more deliberative and balanced processes of the traditional standards developing organizations and the faster processes of consortia standards groups. The opposing processes complement each other in many ways and serve diverse purposes. They also challenge each other to do better. There are occasions when market demands require that a standard be developed more quickly than the traditional processes typically allow. At the same time, there are occasions when the public needs or high market risks associated with choosing the wrong standard require a more deliberative process that engages as many

stakeholders and experts as possible. The *yin* and *yang* symbolize the dynamic balance in the world, including the standards world. As stated in the ancient *Tao Te Ching:*

> "All life embodies the *yin*
> And embraces *yang*,
> Through their **union**
> Achieving harmony"

Despite the many changes that have occurred in recent years, there is still balance between the contemplative *yin* (the formal standards process) and the dynamic *yang* (the consortia standards development process). There is and will probably always be a need for the formal standards process. But unless more can be done to expedite the formal standards development process, the union and harmony between the standards *yin* and *yang* will likely not last.

World Standards Day Paper Competition

The Standards Engineering Society (SES), in conjunction with the World Standards Day (WSD) Planning Committee, has announced the theme, awards, and rules for participation in the 2000 WSD Paper Competition. "Standards for Change and Stability" is the general topic to be addressed with the winning entries to be awarded during the annual World Standards Day Dinner on October 18, 2000, in Washington, D.C.

The author(s) of the winning submission will receive $2,500 along with a plaque; second- and third-place winners will receive cash awards of $1,000 and $500 respectively. The winning papers will be published in the SES journal (*Standards Engineering*) and be available on the SES website. The first-place winner will also appear as a special article in the *ANSI Reporter*.

The paper competition, open only to U.S.-based organizations and individuals, is intended to focus on the overall theme of the general topic and specifically illustrate issues and concerns affecting the standards development community. Papers may address such topics as: facilitating change while maintaining stable processes; trends in standards funding, development, and distribution; global participation and convergence versus regional adoptions; the role of National Governments, regional bodies, and international institutions; and introducing radical new procedures into staid standards processes. Other arguments related to the topic are welcome.

A panel of independent judges selected by SES and approved by the WSD Planning Committee will review the papers. The SES Executive Director must receive all submissions and accompanying official entry forms by August 27, 2000. Entry forms, along with a complete set of rules and eligibility requirements, can be obtained from the SES Office, 13340 SW 96th Avenue, Miami, Florida 33176; (305) 971-4798; fax (305) 971-4799; email: hgziggy@worldnet.att.net; or through the SES Home Page: http://www.ses-standards.org

Established in 1947, the Standards Engineering Society is a not-for-profit professional membership society whose mission is to promote the use of standards and to enhance the knowledge of standardization. It is the member body for the United States and Canada in the International Federation of Standards Users (IFAN) and is accredited by the American National Standards Institute (ANSI). SES members are primarily involved in the application and use of company, government, national, regional, and international standards.

Continuous Technology Refreshment Implementation Process

Terry L. Mullins

A systematic process

The objective of this paper is to describe a Continuous Technology Refreshment (CTR) process that the Industrial Operation (IO) Division, Engineering Directorate (ED), Aviation and Missile Command has initiated during the past two years to achieve O&S cost reductions for program offices. Although stand alone cost reduction programs administered at the project office level can return significant cost reductions, these efforts can be leveraged to achieve even greater savings when integrated into a focused investment and cost reduction strategy Army wide.

Our approach to integrating CTR and resources

CTR has been going on for years through technology integration, Operating and Support Cost Reductions (OSCR), Reliability, Maintainability, and Supportability (RMS), Savings through Value Engineering (SAVE), Horizontal Technology Integration (HTI), product improvements, etc. The major difference now is that the CTR concept formalizes life cycle cost reduction initiatives into a strategy to ensure cost reductions are a consideration in all program and system management functions and decisions throughout the system life cycle. The CTR strategy compliments and enhances R&D, Test, Production, and supportability cost reduction initiatives by leveraging acquisition reform initiatives and practices to ensure weapon system technology is continuously upgraded. With each spares procurement, an opportunity exists to modernize the item being bought. Command processes must be implemented to ensure these opportunities are examined and not missed.

A key point to make here is that the approach does not look at CTR as a separate program, but as an umbrella concept under which multiple cost reduction initiatives will fall. The overall objective of the approach is to leverage sources of funding other than program office R&D dollars to achieve cost reductions to achieve modernization objectives.

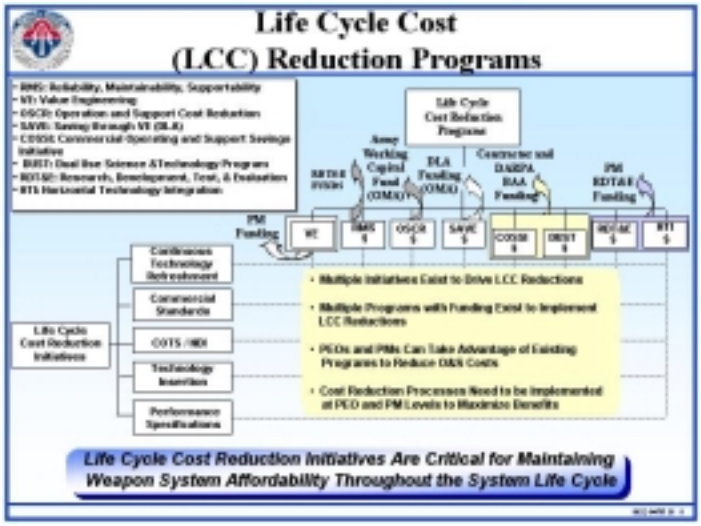

Figure 1: Life Cycle Cost Reduction Programs

Figure 1 identifies multiple funding sources and programs that can be used to accomplish the Life Cycle Cost Reduction Initiatives listed along the left-hand column of the chart. These initiatives derive from acquisition reform programs and efforts that the DoD has been implementing for the past four or five years.

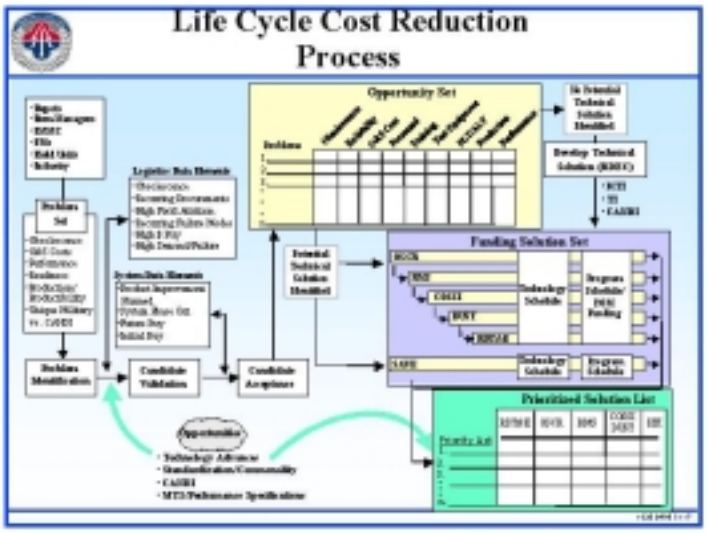

Figure 2: Life Cycle Cost Reduction Process

The process in Figure 2 integrates multiple functions and organizations into a candidate identification, candidate analysis, candidate selection and prioritization methodology to provide visibility of high benefit, high payoff investments. The operative term in this case is "visibility" of problems so decision-makers can decide on a course of action to implement to resolve the problems that exist or are developing.

Life cycle cost reduction process

IO/ED developed and defined a process that provides managers at all levels the visibility needed to make life cycle

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cost reduction investment decisions.

The process depends on leveraging existing data and information with little or no new identification work being required. The process provides decision-makers with a list of all problems that exists with an item so that multiple problems can be addressed and mitigated in one upgrade/ modernization effort. Another feature includes a prioritization and funding assessment to ensure that investments are being made in the most critical areas first. As problems are corrected, items will move up the list in priority so that a program has a continuous, updated investment list of improvements to make. Combining this list with the Acquisition Strategy, decision-makers have the basis for an investment strategy that supports a program's proactive cost reduction effort.

The process is organized in a series of logical steps to continuously identify opportunities to improve and modernize weapon systems. The methodology integrates consideration of other modernization opportunities such as technology insertion, horizontal technology integration, Commercial Off The Shelf/ Non-Developmental Items (COTS/NDI), and performance specification to leverage funding already invested by other programs to improve weapon systems.

Step 1: Problem Identification

Step 1 uses and leverages data and information from existing data sources and personnel to identify problem areas. Project Offices, Depots, Field Units, and Industry are the sources of this information. This is a continuous activity with each organization defining metrics to identify potential cost reduction candidates at the earliest possible point. This activity leverages work being done routinely in each organization to drive an CTR process.

A representative set of types of problems that will be identified are shown in the problem set box in Figure 2 above. It is not all-inclusive and can be tailored as necessary. The key to the problem set is that individuals and organizations are identified to focus on key areas that will indicate when problems are beginning to develop that will impact life cycle costs.

Step 2: Candidate Validation

In step two, data is collected on nominated candidates to ensure that the perceived problem is in fact a valid problem. Logistics data such as recurring procurements, obsolescence status, high demand items, high cost items, high overhaul requirements, etc. are assessed to determine the magnitude of the problem that has been identified. Once this assessment has been completed, the decision is made as to whether this is a potential candidate. The result is a list of feasible candidates that are supported by actual logistics data.

Step 3: Candidate Acceptance

Step 3 ensures only valid candidates are considered. Here project office information is collected for each feasible candidate. The objective is to eliminate any candidates inappropriate for expenditure of future funds. Items being phased out of the inventory, already being upgraded, no longer being procured, or that may have shown up in logistics demand data due to an initial buy are eliminated from consideration. A list of accepted candidates results from this step.

Step 4: Opportunity Set Development

The objective of this step is to capture all problems, which exist with a valid candidate, and define improvement or modernization opportunities that can be implemented in a single investment activity. The list of opportunity areas shown across the top of the chart is representative and not intended to be all-inclusive. Data from the logistics elements will be used in this step to complete the matrix for item opportunities. The opportunity set is very important to the process since information captured in this step will support development of a detailed Economic Analysis (EA). By considering all problems with an item, maximum savings that will produce a substantial Saving to Investment (SIR) ratio can be identified, increasing the chances for funding. There are two paths from Step 4 to Step 5. If a modernization technology has been identified that will correct the opportunities in the matrix, the project can proceed directly to Step 5. If no technology has been identified, a technology or solution search must be conducted. The RDECs and industry can be used in this role to identify potential technology solutions.

Step 5: Funding and Schedule Assessment

Once the opportunity set has been filled out, the candidates are screened against a number of funding programs to see if the candidate meets the criteria for submission. The programs listed in the process chart are funded on an annual basis to make O&S improvements to reduce life cycle costs. Each program has its own distinct set of criteria and submission schedules and each will require a validated EA. IO, ED has built a support capability to assist projects in deciding on the correct programs to pursue and developing a validated EA.

Step 6: Candidate Prioritization

The last step in the process focuses on prioritizing candidates and identifying the source of funding to be pursued. In this step the list becomes a project office's priority for investing funds to improve the weapon system and identifies high priority improvements. Matching candidates to other sources of funds enable the project office to leverage its RDT&E funding to

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The Future is Here

Airborne Laser (ABL) aircraft arrives in Wichita for modifications

Lieutenant Colonel Joel Owens

A wide-bodied airplane, which will soon be the world's first laser-armed aircraft of the new millennium, arrived in Wichita, Kansas, on January 22, 2000, from Seattle, Washington, for the start of major modifications. A brief ceremony was held in Seattle on Saturday morning before the first ABL flew to Wichita. Air Force officials from Washington, D.C., congressional representatives, and an estimated 1,000 attendees eagerly awaited the arrival of the first ABL aircraft. Designated the YAL-1A Attack Laser, the airplane rolled off the Boeing assembly line in mid-December 1999.

Work began almost immediately to transform this aircraft—a Boeing 747-400 freighter—into the world's first airborne Attack Laser. The aircraft was blocked on jacks, the cargo nose door removed, and the door cut to begin the transformation into the weapon system.

Work will continue over the next 15 months and this ABL aircraft will continue to undergo changes. The most visible difference will be the installation of a turret in the nose of the aircraft from which a beam of laser light will emanate to destroy Scud-like missiles hundreds of miles away. Additionally, the aircraft will be modified to accept a multi-megawatt-class chemical laser, specialized optics, and the computerized equipment that will allow it to spot a theater ballistic missile shortly after being launched, lock onto and destroy it. As the program is currently funded, testing in this phase culminates in 2003, with the destruction of several theater ballistic missiles and a seven-plane operational fleet could exist as early as 2009.

In addition to changing the way we fight wars–using directed energy to zap enemy missiles at the speed-of-light from hundreds of miles away while flying over friendly territory—the ABL program is also changing the way we do the business of developing new weapon systems. In fact, in the area of

defense standardization practices and reform, the ABL program has become a true trendsetter. The ABL program has managed to effect these reforms while still maintaining a flawless report card. A full three years into the program, ABL has essentially remained on cost and on schedule on a $1.3 billion dollar effort and has met or exceeded each and every technical and programmatic milestone to date.

Numerous innovative approaches have been implemented on the ABL

program in the area of defense standardization. By defining a unique blending of commercial and military acquisition practices, the Air Force was able to take advantage of significant efficiencies, saving both time and money. Rather than employ the more rigid government purchase procedures, the Air Force is buying its ABL aircraft in exactly the same manner as the airlines, Federal Express and United Parcel Service would using standard commercial practices. ABL also used a "hybrid" contract with a special provision allowing the government to buy these commercial aircraft with incremental funding—a first in the Department of Defense. The use of a commercial payment plan will likely change the way contractors are paid forever. ABL makes voucherless electronic payments for the 747 aircraft and cuts the timeline for payments from 45 days to the mere seconds it takes for an electronic funds transfer.

The ABL program also made extensive use of commercial off-the-shelf (COTS) components. By selecting a commercial 747-400 aircraft with the latest commercially available avionics in use by the airlines, the Air Force was able to make maximum use of commercial supply systems, was able to comply with the latest navigational standards, and can make maximum use of internationally controlled commercial airspace. Use of nationally recognized interface standards such as the Federal Aviation Administration Regulations and Standards puts the ABL Program on track for implementation of future

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technology improvements being developed for the airlines.

ABL's Battle Management Segment also includes many COTS and non developmental items (NDI) including ruggedized versions of commercially available computers, flat panel displays, network switches, Embedded Global Positioning System/Inertial Navigation Systems (EGIs), radios, etc. In addition, utilization of NDI already in use or being developed and qualified for other military platforms reduces ABL life cycle costs and provides for interoperability between the ABL and other components of the Theater Missile Defense Family of Systems Architecture.

The Air Force office responsible for producing the YAL-1A is the Airborne Laser System Program Office, formed in 1993 at Kirtland Air Force Base, New Mexico. This office is a major unit of the Air Force Space and Missile Systems Center, at Los Angeles Air Force Base, California. The Air Force Research Laboratory at Kirtland is also providing significant support to ABL, providing many of the technologies that made ABL possible. The labs work in lasers, adaptive optics, materials testing, and lethality and vulnerability studies have formed the foundation that helped move the program from the laboratory and into the acquisition mainstream.

Instrumental in producing the YAL-1A are several key contractors who are working under a $1.3 billion contract. The initial cost-plus contract was awarded by the Air Force in November of 1996 to Boeing Defense Group of Seattle. Boeing was to build the aircraft, manage systems integration, aircraft modifications, and the development of battle management systems (computers and software coupled to communications, intelligence and weapons-related instrumentation to detect, engage, and defeat the attacking missiles).

Working with Boeing are two other contractors: TRW Space and Electronics Group of Redondo Beach, California, is developing the laser; and Lockheed-Martin Missiles & Space of Sunnyvale, California, is in charge of beam and fire control development.

In actual battle, an airborne laser fleet could arrive on the scene within hours, ready to take defensive positions. Two ABL aircraft would be flying around the clock, orbiting at about 40,000 feet, providing defense against attacking missiles. If the enemy were to launch a theater ballistic missile, the attack laser would detect the booster while it is still powered as it emerges through the clouds. The

attack laser would then destroy the missile, with the resulting debris tending to fall back on enemy territory.

The start of aircraft modification was approved by Secretary of the Air Force, F. Whitten Peters, in December 1999, when he certified to the Congress it was time to start the transformation of the commercial 747 aircraft into the Air Force's deadly ABL weapon system. This certification was well received and congressional support for ABL is strong and growing. Numerous members of Congress have endorsed this program in writing to Secretary of Defense William Cohen over the past few months, lauding the program's many successes. Recent congressional testimony shows Congress appears committed to ensure full funding for the program next year in order to keep this vital program on track. Working together, the Air Force, the Department of Defense, Congress, and Team ABL will likely do just that.

Given the ever-present theater ballistic missile threat—with more than thirty nations possessing theater ballistic missiles—its rather reassuring the future has arrived—no more comic strip stories about lasers. We are living in the next millennium—the new frontier.

"Continuous Technology..."

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invest in other lower level priorities. The result is an investment strategy for modernizing components while reducing life cycle costs.

Conclusion

Reducing life cycle costs is not an easy task, but the process described above has proven that this objective is feasible. The process provides a methodical, disciplined approach to identifying problems, screening items, identifying all opportunities, and finally prioritizing candidates into an investment plan.

Postscript

The PATRIOT Air and Missile Defense and the Multiple Launch Rocket System Program Offices have developed in-house programs incorporating various aspects of the process for use in sustainment management. The Utility Helicopter Program Office has established a system improvement process for identifying opportunities. The SENTINEL product office has created a Total Ownership Cost Reduction IPT. The Industrial Operation Division is providing a support role to each office on different aspects of the program management, data collection, and funding of potential projects.

MIL-STD-810F Keeps Pace With Acquisition Reforms

Latest version of environmental standard nears release

Herbert W. Egbert

Thirty-seven years ago the U.S. Air Force assembled a 66-page document that provided a "cookbook" for environmental testing within the Department of Defense (DoD). This was the original MIL-STD-810, designed to ensure that all new military equipment would be subjected to a rigorous sequence of climatic and physical tests. The standards defined in the original document were tough and represented a challenge for both designers and testers. Over the years since 1962, the services learned more about conditions under which their new items (from supersonic aircraft to M-16 rifles) must perform. Many updates were made to the original standard. There have been five new releases, and the sixth was approved on January 1, 2000.

As a result of this evolutionary process, DoD has moved from what has been called "cookbook" procedures and "sacred cows," to a set of environmental guidelines and procedures which provide for tailoring to meet needs of a specific program.

The "framers" of 810F were very careful not to make it a set of test procedures for testers. It had to be relevant to several sectors of the acquisition community, including program managers, design engineers, and testers. Notwithstanding the fact that 810F has turned out to be a good and relevant document, it already faces major challenges. The MilSpec Reform effort curtails the use of specifications and standards in solicitations without a waiver, and encourages the use of commercial standards in lieu of government standards. Will industry take over the development of government environmental test documentation? Will the North Atlantic Treaty Organization's (NATO) documentation supersede MIL-STD-810F? The standard has withstood the test of time and is internationally recognized. It should not be discarded without careful review.

The development of MIL-STD-810F has been gradual. Seven years have passed since its inception, and much work has been devoted to its development application. Users of the new document will note a change in quality and format. Every figure has been redone. The two-part test methods of 810D and 810E are eliminated in favor of a more fluent structure, including elimination of the term "shall."

Desert testing of the M1 Abrams Tank.

More rationale has been added to help the user understand the concepts behind the stress level numbers so that more intelligent decisions can be made during test planning and development. Each test method has been reviewed and edited by one person, resulting in a more uniform text. The different test methods follow a relatively uniform structure. MIL-STD-810D (July 1983) introduced the concept of tailoring, and described the environmental engineering tasks. The information was directed primarily towards the environmental engineering specialists, those responsible for bridging the technical and communications gap between program management and the test laboratory. However, there was a flawed assumption in developing the guidance for this audience. It was assumed that these specialists were familiar with the complex interactions of severe environments on material and the minimum essential proof testing necessary. In reality, there were, and continue to be, many designated "specialists" who serve in this capacity as newcomers, or who have been assigned the responsibility as a collateral duty. As such, they are not necessarily well equipped to take on the environmental task. Even less guidance was provided for the first audience for the new 810D approach—the technical managers and program administrators. This was a definite weakness in the document, since all of the environmental engineering tasks, especially those involving tailoring, field data acquisition, and life cycle test correlation require up-front management planning. The understanding and use of the "standard" by managers were essential to allocation of proper funding, manpower, and schedule time for the environmental program. Better management guidance would have brought the administrator's view into more realistic perspective so that the complications, pitfalls, and limitations

of laboratory testing could be better appreciated.

Recognizing these shortfalls and that the "standard" was to be a part of the overall development program and not just a test procedure, the restructuring moved forward. MIL-STD-810F was structured and made comprehensive enough to support personnel working on a development program in several capacities. Three distinct audiences were defined: (1) Test, program, and procurement managers (those administrative personnel responsible for the definition, planning, and implementation of environmental test activities throughout all acquisition phases), (2) Environmental engineering specialists (technical personnel responsible for translating environmental operational criteria into specific designs and related test plans and requirements, especially those involving tailoring), and (3) Test engineers and facility operators (those persons who implement the test procedures, operating associated test equipment and instrumentation in test laboratories).

The new 810F is divided into two parts, each with a specific purpose. In part one, a significant overriding concept was that the document must be friendly to all users. This part now provides an expanded tutorial for management and environmental engineering audiences. It focuses on the process of tailoring materiel design and test criteria to the specific environmental conditions a materiel item is likely to encounter during its service life.

Part two is also improved. Specialists in each environment have continued to expand and refine the test descriptions and methodologies. It contains environmental laboratory test methods to be applied according to the general and specific test tailoring guidelines described in part one. It is important to emphasize that these methods are no longer called out in blanket fashion or applied as unalterable routines, but are to be selected and tailored to generate the most relevant test data possible. Part two contains 24 test methods, four of which are new:

Method 504 "Contamination by Fluids." Tests to determine if materiel is unacceptably affected by temporary exposure to contaminating fluids (liquids) such as may be encountered during its life cycle, either occasionally, intermittently, or over extended periods.

Method 517 "Pyroshock." Tests involving pyrotechnic (explosive or propellant-activated) devices that are performed to provide a degree of confidence that materiel can structurally and functionally withstand the infrequent shock effects caused by the detonation of a pyrotechnic device on a structural configuration to which the materiel is mounted.

Method 518 "Acidic Atmosphere." Tests to determine the resistance of materials and protective coatings to corrosive atmospheres (other than salt fog) when the requirements documents state that the materiel is likely to be stored or operated in areas where acidic atmospheres exist such as industrial areas or near the exhausts of any fuel-burning device.

Method 522 "Ballistic Shock." Ballistic shock tests generally involving momentum exchange between two or more bodies, or momentum exchange between a liquid or gas and a solid, performed to provide a degree of confidence that materiel can structurally and functionally withstand the infrequent shock effects caused by high levels of momentum exchange on a structural configuration to which the materiel is mounted.

MIL-STD-810F Supports:

1.Test, Program, and Procurement Managers
2.Technical Personnel Responsible for Environmental Design
3.Test Engineers and Facility Operators

When applied properly, the environmental management and engineering processes described in MIL-STD-810F can be of enormous value in generating confidence in the environmental worthiness and overall durability of materiel system design, as well as in helping to establish a baseline for service-life extension programs. However, it is important to recognize that there are limitations inherent in laboratory testing that make it imperative to use proper caution and engineering judgment when extrapolating laboratory results to results that may be obtained under actual service conditions. In most cases, real-world environmental stresses (singularly or in combination) cannot be duplicated practically or reliably in test laboratories. Laboratory tests focus more on producing the effects of the environment rather than the environment itself. Therefore, users should not assume that a system or component that passes the laboratory tests of this standard also would pass field/fleet verification trials, or vice versa.

The MilSPEC reform initiative has been misinterpreted as an effort to get rid of all specifications and standards. **In fact, it was really a wake-up call to get rid of documents for which there were commercial equivalents.** Rev 3 of MIL-STD-810E was published as an approved military STD. MIL-STD-810F was an immense undertaking, and is the best environmental testing guide currently in existence. It should serve developers and testers of military material well into the next century.

Further information on this subject can be obtained by contacting Herbert W. Egbert *at (410) 278-1476, U.S. Army Developmental Test Command, CSTE-DTC-TT-M, Aberdeen Proving Ground, Maryland 21005-5055. Email: egberth@dtc.army.mil.*

Combating the Electronic Component Obsolescence

by using common processes for defense and commercial aerospace electronics

Lloyd Condra

The Component Obsolescence Problem[1]

Aerospace electronics has grown steadily in importance since the beginning of the jet age. Although electronic components[2] and systems are not the largest cost elements in military or commercial aerospace vehicles, they are ubiquitous: electronic components are included in almost every system, including those that are primarily mechanical, hydraulic, and pneumatic.

The solid state electronics industry has grown in parallel with the jet airplane industry. Both were "invented" in the 1940's, saw their first significant applications in the 1950's and have grown to maturity since then. In the early days, military and commercial aerospace manufacturers depended on a well-developed military electronic components and specifications infrastructure to assure long-term availability of components that met their needs. This was possible because the military market sector comprised about 25% of the total market; it was responsible for a good deal of the device innovation, and therefore "owned" many device designs. As a result, military and commercial aerospace electronic design, manufacturing, procurement, operation, maintenance, and support decisions have been based on two assumptions:

1. The supply of electronic components specified to operate in aerospace environments is unlimited; and
2. Component designs will remain stable for long periods of time.

The assumptions are no longer true.

Table 1, and Figures 1 and 2, show that the entire aerospace industry (including both commercial and military) now consumes less than one per cent of the electronic components produced. The major component markets are computers, consumer electronics, and others[3], which do not have the demanding environmental or long production life cycle requirements of aerospace products; so the availability of components specified for aerospace applications is decreasing. Since 1992, at least 12 major manufacturers of electronic components, including Motorola, Intel, and Philips, have exited the military market[4]. For the first time in the history of solid state electronics, the aerospace industry has no broad-based access to a vertical supply chain for electronic components.

Figure 3 shows that the life cycles of all integrated circuit technologies are shrinking, almost to the point where the term *component technology life cycle* is meaningless[5]. Even "stable" component designs are modified constantly to reduce cost, improve yields, and enhance performance. The modifications are evaluated and characterized for high-volume applications, such as computers, but the applications of low volume users such as aerospace are rarely considered. The lifetime of a typical jet airplane will encompass many generations of electronic component design, as illustrated in Figure 4. Furthermore, while the military system assured that components with the same part number would have identical specifications regardless of who manufactured them, this is not true of non-military components.[6] This impacts both new equipment designs and component replacements in existing equipment.

The aerospace industry depends on electronic components, but can no longer count on sources of stable designs that are

Part Type	Part Numbers	Annual Volume, pcs.	Annual Volume, $M	Annual Volume, $/PN
Microprocessors	60	300,000	22	367,000
Other IC's	780	8,033,000	86	110,000
Discretes	300	13,500,000	20	66,000
Passives	650	77,000,000	26	40,000
Misc. (drives, displays, etc.	30	57,000	19	633,000
Aerospace total	1,820	99,000,000	173	95,000
Intel			25,000	

Table 1. *Annual commercial aerospace electronic component consumption, estimated from Boeing data. The volumes represent commercial aerospace, and can be doubled to obtain a rough estimate for all of aerospace, including defense. The total consumption of all of aerospace (including both commercial and military) is less than 0.5% of the total electronic component market.*

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[1] Much of the information in this section is obtained from references [1] and [2].

[2] In this report, the term electronic components refers to integrated circuits, resistors, diodes, transistors, and other electronic devices packaged individually, i.e., they are the same as piece parts. Higher assembly-level items, such as line-replaceable units, also are called components in some contexts, but that terminology is not used here.

specified for our specific applications. We must learn how to use components produced for other industries that are quite unlike ours.

The Aerospace Response

The aerospace industry has responded vigorously to the problem of component obsolescence. The topic has been widely discussed in almost every industry forum, industry-working groups have been formed, and conferences are being held to decide what can be done to minimize the impact of component obsolescence. The individual activities are too numerous to mention here, but their content seems to fall into one of three basic categories: (1) How to anticipate occurrences of component obsolescence; (2) How to react to occurrences of component obsolescence; and (3) How to reduce the risks of future component obsolescence. The bulk of activity has been in the first two categories listed above, and some gratifying results have been achieved. While their importance should not minimized, they are focused mainly on locating ever-diminishing sources of components that will meet the needs of aerospace users. As a matter of fact, a term commonly used in the defense electronics industry is "diminishing manufacturing sources and material shortages" (DSMS). These approaches will provide only short-term relief for the problem of component obsolescence, and should be viewed as methods to buy time while we pursue other approaches that produce long-term resolution.

Long-term resolution is not easy, but it begins with recognition of a basic fact:

> We will never again have access to electronic components designed and manufactured specifically to meet the needs of the aerospace industry.

The corollary is:

> We must learn how to use electronic components manufactured for other industries.

This report describes two activities currently underway in the aerospace industry that will help us work together to minimize the effects of component obsolescence.

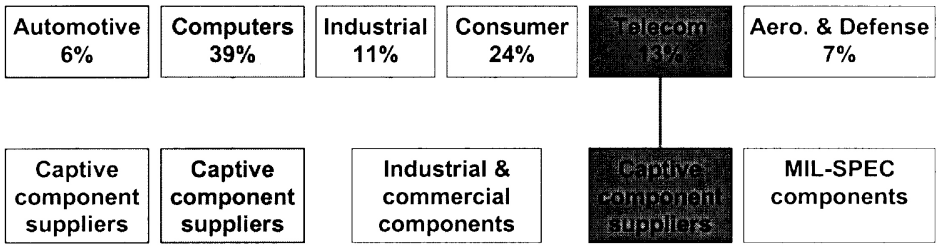

Figure 1. *Electronic Component Supply Chains, 1984 (percentages shown are percentages of the total component market).*

Industry Cooperation

Because the aerospace electronics industry is such a small segment of the market for electronic components, we must realize that the benefits of cooperation far outweigh the costs of competition. An example of such cooperation is the banding together of a number of aerospace equipment OEMs in an organization called STACK International. STACK is an organization of industrial users of electronic components based in St. Albans, U.K., and has been in existence since the 1970s. Its membership consists of representatives of two major industries: telecommunications and aerospace. Aerospace members include Smiths Industries, British Aerospace (U.K.), Boeing, Honeywell, Allied Signal Aerospace, Rockwell Collins, Eldec, Litton, and Lockheed Martin.

In addition to maintaining a component specification[7] STACK provides a forum for aerospace companies to discuss relevant component issues and exchange information in a non-competitive forum. Members also are finding that they can communicate and receive substantive information to component manufacturers, whereas paths to such communication would be unavailable to them on an individual basis.

Most of the current STACK activity is being conducted by the commercial avionics groups within the member companies. It is not; however, closed to the defense groups, and participation by both groups would enhance our ability to address the problem of component obsolescence.

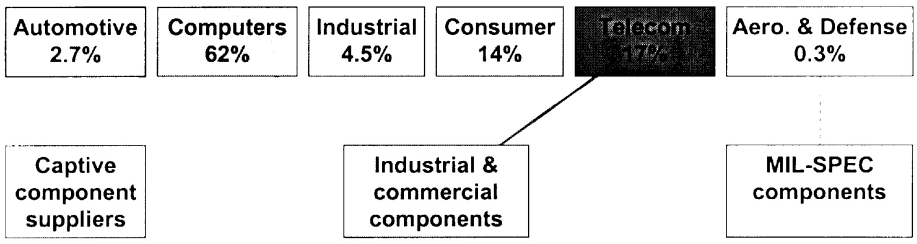

Figure 2. *Electronic Component Supply Chains, 2000.*

Electronic Component Management

The aerospace electronics industry has found that, while we cannot control our sources of electronic components, we can manage the processes we use to select and manage components to assure functionality, safety, reliability,

and cost-effectiveness, and minimize the effects of component obsolescence. To this end, the International Electrotechnical Commission Quality Assessment System for Electronic Components (IECQ) Certification Management Committee (CMC) has authorized an Avionics Working Group (AWG) to prepare guides for electronic component management[8] and using electronic components outside the manufacturers' specified temperature ranges.[9]

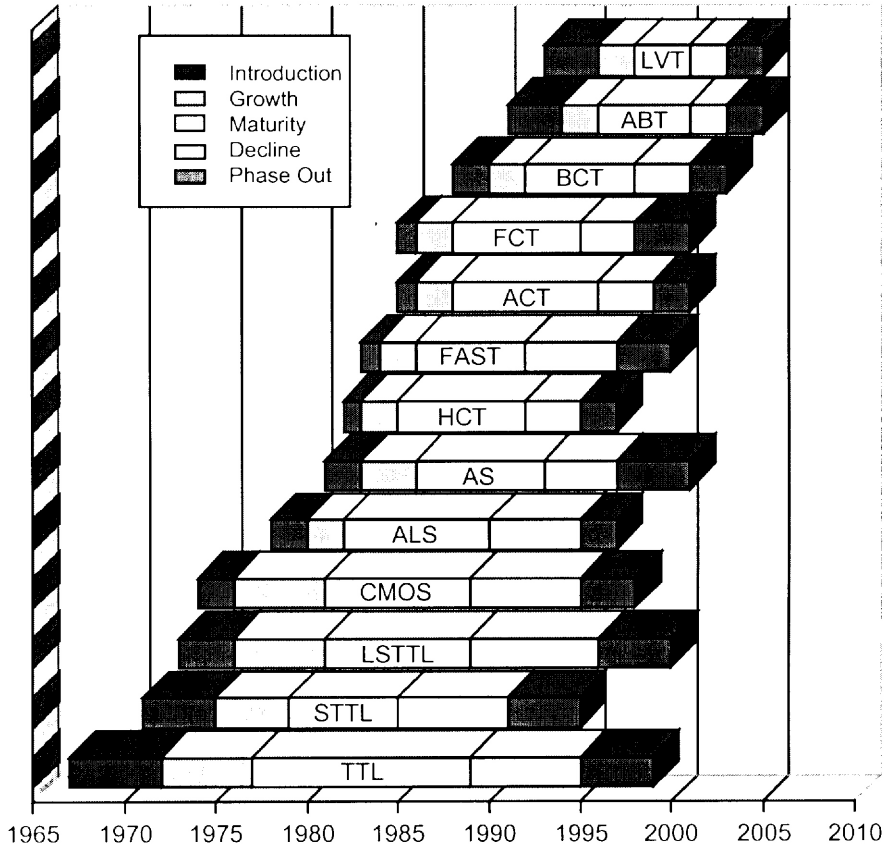

Figure 3. *Component technology life cycles are shrinking.*

About 40 organizations are participating in the AWG, including most of the airframe manufacturers and equipment suppliers in North America and Europe, the FAA, the U.K. MoD, some component suppliers, component test houses, and others. To date, the emphasis has been on commercial products, but since most of the participants also have significant presence in the defense industry, it is highly desirable for them to use the same practices for both military and commercial products.

Reference [8] is based on a process that has been under way in Boeing Commercial Airplanes and its electronic equipment OEMs since 1992, and described in reference [10]. To implement it, the equipment OEM prepares and implements an Electronic Component Management Plan (ECMP) that documents the processes the OEM uses to accomplish the following objectives:

1. *Component Application:* Components are applied properly in the design.
2. *Component Qualification:* Components are qualified for use.
3. *Component Quality Assurance:* The quality of every individual component is assured.
4. *Component Compatibility with the Equipment Manufacturing Process:* Component compatibility with, and integrity throughout, equipment manufacturing; equipment assembly; equipment shipping, handling, and storage; equipment test, repair, and rework; and component shipping, handling, and storage are assured.
5. *Component Data:* A process is in place to collect, store, retrieve, analyze, and act upon data concerning component problems, and to report relevant data from the component, equipment design, equipment manufacturing, and component use in service.
6. *Component Configuration Control:* Components are selected, substituted, and managed systematically to maintain traceability of components, and configuration control of equipment.
7. *Components for Use Outside Manufacturers' Specifications:* Component usage outside the component manufacturer's specification is minimized, and done only with documented, controlled processes that assure the integrity of the equipment.
8. *Component Obsolescence Management:* The impact of component obsolescence is minimized through documented processes that assure availability, functionality, integrity, and certification of equipment.

After the OEM's ECMP is approved by the customer, or by the IECQ, the ECMP becomes the controlling document for component decisions. Components selected and managed according to the processes documented in the ECMP will be approved for use in new designs, or for replacement into existing designs. The IECQ component management Guide encourages OEMs to develop a single ECMP that can be used for all programs, in contrast to some military practices,[11, 12] which require a separate plan for each program. It is cost-effective for OEMs to use common processes for all customers.

Because of the constant pressure to use components in temperatures wider than those specified by the component manufacturers, the AWG is preparing reference[9], to document and control the processes for using components outside component manufacturers' specified temperature ranges. To

minimize technical and legal risks, information is being collected from the AWG participants' experience with this practice, and from a research program being conducted by the CALCE Electronic Products and Services Center at the University of Maryland. The result is the most comprehensive process ever defined for using components outside manufacturers' specified temperature ranges.

Recent discussions with the FAA indicate that use of the IECQ Guides[8, 9] will allow the commercial aerospace industry to approve component substitutions by determining that they have gone through processes documented in conformance to the Guides. This will help streamline the process for certification of equipment that must be modified because of component obsolescence.

In recent discussions with companies that currently provide test services for components, the prospect of the test houses receiving certification from IECQ to conduct component qualification and quality assurance processes on component has arisen. In addition, it also might be possible for the third party test houses to conduct the processes to use components beyond the manufacturers' specification ranges. If this were to become a reality, then the test houses could become source facilities for components that require additional processes for use in rugged environments. A necessary condition for this to occur is that the ultimate users (the airframe manufacturers, prime contractors, and defense agencies) would have to agree on the processes, so that the market could be large enough to justify the required investment by the source facilities.

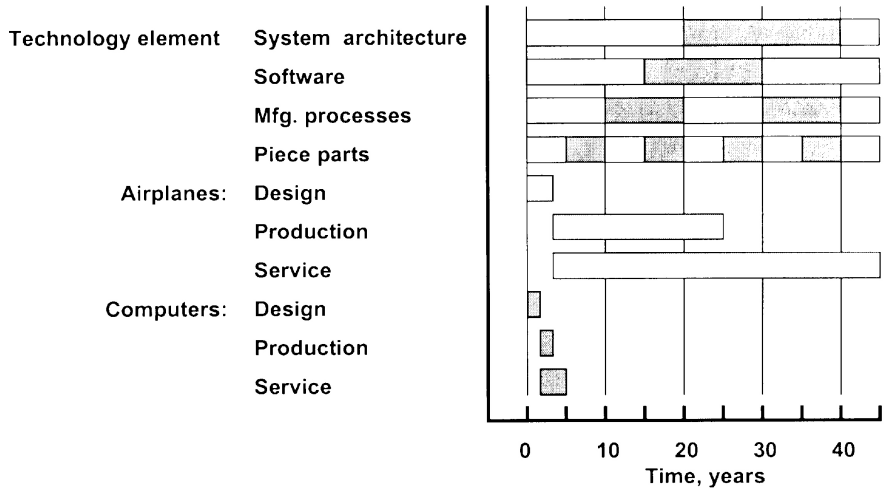

Figure 4. *Component technology, airplane, and computer lifetimes.*

Summary

The aerospace industry cannot control the sources of most of the electronic components it uses in avionics, and the short production lives of components produced for other markets has caused a severe component obsolescence problem. So far, the major response of the aerospace industry has been to locate sources of existing components that meet our needs. This response cannot be the long-term solution; instead, we must learn how to use components manufactured for other industries. Two approaches, described in this paper, have been the cooperative efforts of the commercial aerospace industry through STACK International, and participation in the IECQ-CMC Avionics Working Group to produce guides that will allow the commercial and military aerospace industry to document the processes necessary to use existing components. We must work together in these and other efforts to develop long-term solutions to the problem of component obsolescence.

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MIL-STD-882D, Standard Practice for System Safety, Published February 10

The system safety standard has been around for more than 40 years. It started with the ballistic missile business in the early 1960's, with the introduction of a US Air Force document, which later evolved into a Department of Defense standard. There was quite an evolution of system safety specifications and standards, as shown below:

- Old way: Analysis done after the fact
- BSD Exhibit 62-41, Ballistic missiles
- MIL-S-38130, Aircraft, Space and Electronics
- MIL-STD-882, Management emphasis and industry involvement
- MIL-STD-882A, Hazard probs and risk acceptance
- MIL-STD-882B, Individual tasks
- MIL-STD-882C, Integrated hardware and software tasks
- MIL-STD-882D, Standard Practice for System Safety

In 1994, then Secretary of Defense William Perry issued a memorandum on new ways of doing business, which created Acquisition and MilSpec Reform. All specifications and standards were reviewed and a panel determined that MIL-STD-882C was a "management standard" and not compliant with MilSpec Reform. Managers had originally scheduled MIL-STD-882C for cancellation but realized that a system safety standard was vital for the development of safe products. The newly formed Defense Standardization Improvement Council (DSIC) decided to keep a system safety standard, but to replace MIL-STD-882C with a nongovernment standard (NGS). The System Safety Panel of the Electronic Industries Alliance (EIA) developed a draft system safety NGS in late 1995, but industry product liability concerns led to a renewed push for a government standard. In 1996, the DSIC decided to drop the NGS effort and pursue development of an acquisition reform compliant MIL-STD-882D (MIL-STD-882C continued as a valid acquisition document, but its use generally required a waiver issued by upper level program management).

The system safety office of the US Air Force Materiel Command was tasked to develop MIL-STD-882D. Acquisition reform was not well understood in the beginning and mistakes were made. The first cut of MIL-STD-882D was disapproved by the Air Force Standardization Improvement Executive (SIE) for not being compliant. The SIE arranged for experienced contractor support and an integrated product team (IPT) to develop a compliant standard. This IPT had heavy industry involvement to ensure that mutual benefits would be realized. Final coordination with all affected services and industry occurred in 1999 and the standard was published on 10 Feb 2000.

How does the new document differ from MIL-STD-882C? It is now a performance based standard that dictates contractor performance to assure a safe product (with an Appendix for guidance use only). Section 4 of the new standard lists the core system safety steps, which are:

- Develop an approach for the system safety effort
- Identify hazards (does NOT specify which analyses or techniques—these are chosen by the contractor)
- Assess the risk of potential mishaps that could be caused by the hazard
- Identify risk mitigation measures. The preferred method is to redesign the product to eliminate hazards. A less desirable approach is to include safety devices and if that fails then include warning devices. The last ditch effort is to rely on specialized training or procedural controls.
- Reduce the mishap risk to an acceptable level.
- Verify (by analysis, testing, or inspection) the risk reduction.
- Have the appropriate authority accept the residual risk.
- Continue to track the hazards, closures, and residual risks.

Other key changes include the addition of environmental and health hazards management, and the use of "mishap risk" terminology instead of "hazard risk." MIL-STD-882D developers were concerned about the risk of a mishap that results from an uncontrolled hazard. The Appendix provides recommended methods for mishap risk measurement and management. The old MIL-STD-882C tasks are no longer in the standard and are now listed in the DoD Deskbook acquisition reference guide to be chosen by contractors as needed. (Note: MIL-STD-882D is called out in its entirety—bidders choose their methods to develop safe products.)

The Preparing Activity responsible manager is Mr. Chuck Dorney, *HQ AFMC/SES, Wright-Patterson AFB Ohio 45433, DSN 787-6007, (937)257-6007. The standard is available on the DOD ASSIST database.*

USN Multi-Place Life Rafts:
Acquisition Reform in Action

Dennis Shoemaker

One of the biggest challenges of today is to find ways to accomplish those extra projects that would provide improvements to the equipment already in use by our military forces. It seems the shrinking budgets are needed more and more to simply sustain the current tempo of operations with little left over. This is a report on one team's approach to improving one product line for the U.S. Navy and Marine Corps. It includes the pursuit of non-traditional funding sources and the application of Acquisition Reform training.

Female aircrew conducting boarding tests on the eight-person raft during Operational Testing at Naval Operational Medicine Institute, NAS Pensacola.

The product line included the seven-, twelve-, and twenty-man Multi-Place Life Rafts (MPLR) currently carried in many of the USN and USMC aircraft. These rafts were designed in the 1950's. They have been procured since that time using DoD detail specifications which require now obsolete materials, dated fabrication methods, and the use of Ozone Depleting Substances (ODS). These rafts require scheduled inspections, including inflation, be conducted every 224 days and which average six hours per inspection. These frequent inspections and the type of raft material significantly reduce the life of the rafts and require their replacement every 5-10 years.

A group from the Naval Air Warfare Center, Aircraft Division (NAWCAD) Patuxent River recognized this situation needed improvement and submitted a proposal to the Aircraft Equipment Reliability and Maintainability Improvement Program (AERMIP) in the Naval Air Systems Command. In FY 98, they received funding to identify new technologies and to determine if commercial products were available to replace these rafts. Another group later submitted another proposal to the NAVAIR Affordable Readiness program for funding to identify, qualify, produce procurement packages, and develop logistics support for new rafts. When this program also received funding, the two teams were combined with a net reduction in projected program costs.

Deployed eight-person life raft. The twelve- and twenty-person rafts have the same design.

The new team first developed a single Program Plan that would accomplish the goals of both of the original teams. The team was excited to try applying the lessons learned during recent Acquisition Reform training. They proceeded to draft a performance specification that was based upon the FAA Technical Standard Order TSO-C70a for life rafts. However, the specification also included additional requirements necessary to meet the special needs of military aviation. Each of these changes were made to meet those needs while remaining as compatible as possible with existing commercial products and technologies. Some of these additional requirements included:

- Provide rafts adequate to meet the needs of today's aircraft missions (replace the seven-man raft with an eight-man raft)
- Improved deploy-ability (size to fit through minimum 22-inch square aircraft escape hatches)
- Improved inflation system (zero-leak system)
- Provide a five-year cycle between scheduled raft inspections requiring inflation (reduced volume

Four aircrew conducting boarding tests on the 8-person raft during Operational Testing at Naval Operational Medicine Institute, NAS Pensacola.

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packaging)

- Provide access for more frequent inspections of limited life items such as water, flares, and radio batteries (separate packaging for accessory kit items)
- Increased space per person (4.5 vice 3.6 square feet per person).

Two aircrew conducting boarding tests on the 8-person raft during Operational Testing at Naval Operational Medicine Institute, NAS Pensacola.

The team increased the size requirement based upon the average age and size of military aircrew and passengers, each wearing standard military flight gear including boots, helmet, life preserver, and survival vest. The FAA specification assumes a mix of men, women, and children of different ages, each wearing commercial floatation gear.

Testing was a large issue with the team while writing the performance specification. We needed to ensure the USN would receive a quality product that would save lives in event of an aircraft mishap. However, we also wanted to keep the testing to a minimum to reduce costs in both time and money. The team decided to require the rafts either be FAA TSO certified or be capable of certification. As a result, the team only needed to test for the unique USN / USMC requirements. For example, if the material had already received TSO certification, then the team did not need to retest it for strength, flammability, etc.

The team was aware there were many commercial test facilities available. However, they decided to perform the laboratory, operational, and environmental tests using available government facilities and personnel.

The first tests were conducted by the team using the Aviation Life Support Systems laboratory facilities at NAS Patuxent River. They measured weight, size, and evaluated the packaging.

The Naval Operational Medicine Institute (NOMI) at NAS Pensacola agreed to conduct the operational tests. They provided both expertise and water survival instructors and students already equipped with the various flight equipment ensembles authorized for different aircraft platforms. They gave the rafts a realistic operational test by simulating what a downed aircrew or passenger would actually experience.

The environmental tests for altitude, dust, vibration, and both high and low temperatures, as defined by MIL-STD-810E, were required for the new rafts. The Electrical Power Engineering Environmental Evaluation Facility at NAS Patuxent River was elected to perform them. They were conducted where they could be easily observed by the team and at a fraction of what similar commercial testing would have cost.

Packed carrying case including vacuum-packed raft and accessory kit container.

A previous Commerce Business Daily (CBD) announcement (Request for Information) had already indicated there were commercial products available that could be modified and repackaged to meet the USN's needs. A new CBD announcement (Request for Sources) was issued to obtain sample rafts for testing. We met with two contractors to answer their questions and responded to phone calls and e-mails from eleven others. We eventually received sample rafts from two contractors.

Air Cruisers Company in Belmar, New Jersey, was one of the contractors who responded to the CBD Announcement with sample rafts. They took an existing commercial raft design and modified it to meet the requirements of the Performance Specification. Their sample rafts addressed all of the requirements of the specification. They designed, built, and delivered nine sample rafts for testing within 14 weeks. When testing revealed weaknesses in the initial rafts, they addressed those problems and built another raft incorporating improvements within six weeks. Their cooperative spirit, coupled with their rapid prototyping ability, enabled the team to both identify problems and to test the solutions while still staying on schedule to complete the project.

The team has now qualified new eight-, twelve-, and twenty-man rafts for fleet use. Operationally they surpass the rafts currently in the fleet today which means downed aircrew and passengers will have a much better chance of surviving a mishap. The three rafts are identical in everything but size, use modern technology, and will save the fleet significant man-hours. The five-year scheduled inspection cycle alone will save 77,500 fleet man-hours in the first seven years

Twenty-person life raft currently carried in USN and USMC aircraft.

even with the rafts being introduced on an attrition basis at a rate of 9% per year.

The US Air Force currently uses several rafts similar to those used by the USN. The new rafts were demonstrated to USAF representatives

Seven-person raft currently carried in USN and USMC aircraft. It is similar in design to the current twelve-person raft.

who also participated in some of the operational testing. The new rafts are being considered for use in some of the USAF aircraft.

As with any new program, the team has learned some valuable lessons. The three most significant include team commitment to Acquisition Reform,

Life raft with open canopy door.

pursuing non-traditional funding, and team composition.

First, the team had to stay committed to Acquisition Reform practices. We had to ignore one contractor who said "Just tell us what you really want and we will build it for you." We also had to respond to another contractor who complained we were favoring contractors with existing commercial products over contractors who were long-term suppliers of equipment to the government. The team took that as a compliment as it proved we were putting our lessons to work.

Second, it is sound business practice to pursue non-traditional funds. However, many of these special programs require results in a relatively short timeframe. The identification, qualification, and development of logistics support requirements of the new rafts have come very close to exceeding some of those limits. Only the commitment of the individual team members, the rapid prototyping capability of Air Cruisers, and the excellent cooperation received from other government individuals and offices have made it possible for the team to meet its goals.

And last, the primary team had the proper mix of personnel. We had two engineering technicians with more than 50 years combined Navy experience working with Aviation Life Support Systems, one experienced logistician, and one engineer. While the small size of the primary team increased everyone's workload considerably, it

Life raft with canopy half open.

also allowed decisions to be reached and implemented quickly. The primary team was supplemented with support from other areas such as contracts, testing, and specification development when required.

This program has been a challenge, a learning experience, and a lot of hard work to all of the team members. However, the fleet will soon have a better chance of surviving a mishap while saving time and money over the life cycle of its new life rafts. All told, it was well worth the effort involved.

"Computers in the future may weigh no more than 1.5 tons."
—*Popular Mechanics, forecasting the relentless march of science, 1949*

"I think there is a world market for maybe five computers."
—*Thomas Watson, Chairman of IBM, 1943*

"I have traveled the length and breadth of this country and talked with the best people, and I can assure you that data processing is a fad that won't last out the year."
—*Editor in charge of business books for Prentice Hall, 1957*

"But what is it good for?"
—*Engineer at the Advanced Computing Systems Division, IBM, 1968, commenting on the microchip*

"There is no reason anyone would want a computer in their home."
— *Ken Olson, President, Chairman and founder of Digital Equipment Corp., 1977*

"So we went to Atari and said, 'Hey, we've got this amazing thing, even built with some of your parts, and what do you think about funding us? Or we'll give it to you. We just want to do it. Pay our salary, we'll come work for you.' And they said, 'No'.... So then we went to Hewlett-Packard and they said, 'Hey, we don't need you. You haven't got through college yet."
— *Apple Computer, Inc. founder Steve Jobs*

Harold Machias—Farewell and Thank You for Years of Dedicated Service

Recently, the standardization community and officials from the Department of Agriculture (USDA) said "happy retirement" to **Mr. Harold Machias**, who worked diligently for more than 20 years in the Department of Agriculture (USDA) Standardization Program. USDA's standardization program stands as one of the top federal agencies for supplying current standards based on changing acquisition or business practices, inspection criteria, manufacturing and/or processing of perishable goods.

The Department of Defense (DoD) has and continues to use more than 400 USDA-Agricultural Marketing Services (AMS)-prepared standards for daily acquisitions of meat, poultry, fresh fruit and vegetables, and semi-perishable processed products. The Defense Support Center-Philadelphia Directorate of Subsistence has over 15,000 national stock numbers and local stock numbers linked to these USDA-AMS standards which account for over $300 million in military sales worldwide.

Mr. Machias observed that the DoD Index of Specifications and Standards (DoDISS) only cited USDA-AMS prepared Commercial Item Descriptions (CIDs). His questioning of the non-use of these heavily used acquisition standards in the DoDISS was a turning point in this USDA-DoD standardization partnership. Mr. Machias addressed his concerns directly to the Defense Standardization Program Office (DSPO), which forwarded the action out for review.

The Document Automation and Production Service (formerly called Defense Automated Printing Service) and the Defense Supply Center Philadelphia, Directorate of Subsistence, are leading the DoD review effort for incorporating the first segment, 155 digitized USDA-AMS standards (process standards), for incorporation in the DoDISS. A favorable response for incorporation in the DoDISS will result in the addition of another 245 USDA-AMS digitized standards (meat, poultry, fish, etc.)

The visibility that this improvement will provide in-house and to the DoD customers cannot go unrecognized. Mr. Machias leaves behind a vast improvement to the overall federal standardization program and to our military customers. The DSPO publicly sends thanks to Harold Machias for a job well done. Happy Retirement!

Farewell, Noel Bayfield

The Defense Standardization Program recently received a note from Noel Bayfield, our standardization contact in the Australian Ministry of Defence, announcing his retirement. Noel has been a good friend to the DSP and actively encouraged other members of the Australian Public Service to attend our courses at the Army Logistics Management College. Recently, we hosted one of his co-workers in a training program at Picatinny Arsenal. Noel had a total of 45 years in an outstanding career at the time of his retirement (27 years in the Royal Australian Air Force and 18 in Public Service). We will miss his enthusiasm and willingness to partner in our training programs. Good luck in all you do Noel, and have a wonderful retirement. Keep in touch. For all DSP community members who actively work with the Australian Ministry of Defence standardization program, Noel's co-workers, John Bladen and Errol Van Dort, will be doing Noel's work until a replacement is named. They can be reached at:

John.bladen@aea.sptcomd.defence.gov.au

Errol.vandort@aea.sptcomd.defence.gov.au

Anyone wishing to send a retirement note to Noel may reach him at: Noelrbayfield@bigpond.com

Why Daylight Savings Time?

We are now into Daylight Saving Time, and it sets the standard nationwide for how we conduct our lives after Summer has waned. Why?

First instituted by the British to save energy during World War I, Daylight Saving Time has become an institution for most of the United States. Daylight is not really saved, but energy is. More natural light in the evening during summer months translates into less use of electricity, as well as fewer traffic accidents and less crime—rewarding returns for such a slight adjustment of schedule.

A Flashback Into Aerospace Industry Association's 80-Year Historic Past...

Times have changed since 1910 when a Congressman was overhead remarking to Washington reporters: "Why all this fuss about airplanes for the Army—I thought we already had one."

(From a 1956 edition of Planes, *predecessor to the ALA newsletter.)*

Farewell, Brad!

The Defense Standardization Program community said farewell and happy retirement to **Walter B. "Brad" Bergmann, II**, on May 31. His many achievements were noted at his retirement party on May 25, and as his friends and co-workers gathered to say farewell to Brad, everyone echoed the same thoughts—Brad will be hard to replace and he will be missed. At the time of Brad's retirement, he was serving as the Executive Director for Logistics Management, Defense Logistics Support Command (DLSC), Defense Logistics Agency. In this job, he was responsible for oversight and direction of DLSC's Supply Management, Distribution Management, Technical Services, Disposal Management Groups, and the logistics management functions performed at the Defense Supply Centers, Defense Logistics Information Service, Defense Marketing and Reutilization Service, and other Defense Logistics Agency elements. And, **he was the Defense Standardization Executive and Chairman of the Defense Standardization Council.**

Brad had a wonderful career that was full of challenges, and along the way he made many, many friends. He was a distinguished military graduate from the Army ROTC and served a tour of duty in the Quartermaster Corps. Prior to entering active duty, he worked as an industrial engineer for Ralston Purina and IBM. Brad graduated from Purdue University and obtained his masters degree in Business Administration from the University of Kentucky.

Brad's federal career spanned three decades, including a quarter century as a civilian employee in OSD where he became a charter member of the Senior Executive Service. During this time he took on many and varied projects. Some were not successful, but most were very much so. A few of these dramatically changed the way DoD does business; most notably:

All Volunteer Force. Although a logistician with an operations research background, Brad participated in analyses of issues leading to significant changes in manpower utilization and quality of life programs.

Acquisition Reform. MilSpec reform was not a new idea when the Clinton Administration took office. However, the climate was right for change, and Brad was fortunate enough to be in the right job to "lead the charge."

Logistics Transformation. Customer focused supply chain management and readiness oriented product support are reality, not merely catch-phrases, at DLA; and Brad is pleased to have been a part of making it happen.

Brad's closing comment at his retirement ceremony was; "Remember; the difference between a click and a bang is something called logistics."

This article has two pictures—one of Brad and one of the character from the recent television show, *God, The Devil and Bob*. We had so many people tell us that Brad looked like the television character that we decided to send his photo to the Carsey-Werner Company, LLC, and ask permission to publish the character in our salute to Brad. Their management thought the resemblance was notable enough to grant us permission to use the photo. So, we thank Carsey-Werner and we say a fond farewell to one of the DSP's most lively and notable dignitaries. We will miss you, Brad.

Welcome

Welcome to the new Defense Standardization Program Journal magazine. The premier edition has been in production for several months now and we are very proud of the format.

As Greg Saunders stated in his column (page 3), it is our intent to publish articles of interest to our readers, case study results, and articles from you—the readers. I urge anyone interested in sending in an article to contact me and I will be glad to send out our editorial and publishing guidelines.

Issue two of the *Journal* (to be published in early Fall) will have articles on the top ten winners of the Defense Standardization Program Honorary Awards. These awards will be presented on July 7.

The Director, Defense Standardization Program, and I urge you to write. Call me for any questions and I will be glad to talk about your proposed articles. **Remember, it is DoD policy to "promote standardization of materiel, facilities, and engineering practices to improve military operational readiness, reduce total ownership costs, and reduce acquisition cycle time." The DSP mission is to "identify, influence, develop, manage, and provide access to standardization processes, products, and services for warfighters, the acquisition community, and the logistics community to promote interoperability and sustain readiness."**

The *Journal* is on the World Wide Web and can be downloaded in PDF format. If you no longer wish to receive a hard copy format, please contact the Editor. Single copies are still being sent free of charge to those who cannot access the Internet. Requests for paper copy, or address changes should be faxed to Sharon Strickland, Editor, at (703) 767-6876. Prior editions of *The Standardization Newsletter* are posted on our DSP Home Page where they can be downloaded or viewed. Visit our Home Page at: www.dsp.dla.mil.

Sharon Strickland

Editor's Corner

Sharon Strickland
Editor, Defense Standardization Program Journal

Mind Your Life

"Keep in mind that the true measure of an individual is how he treats a person who can do him absolutely no good."

—Ann Landers

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