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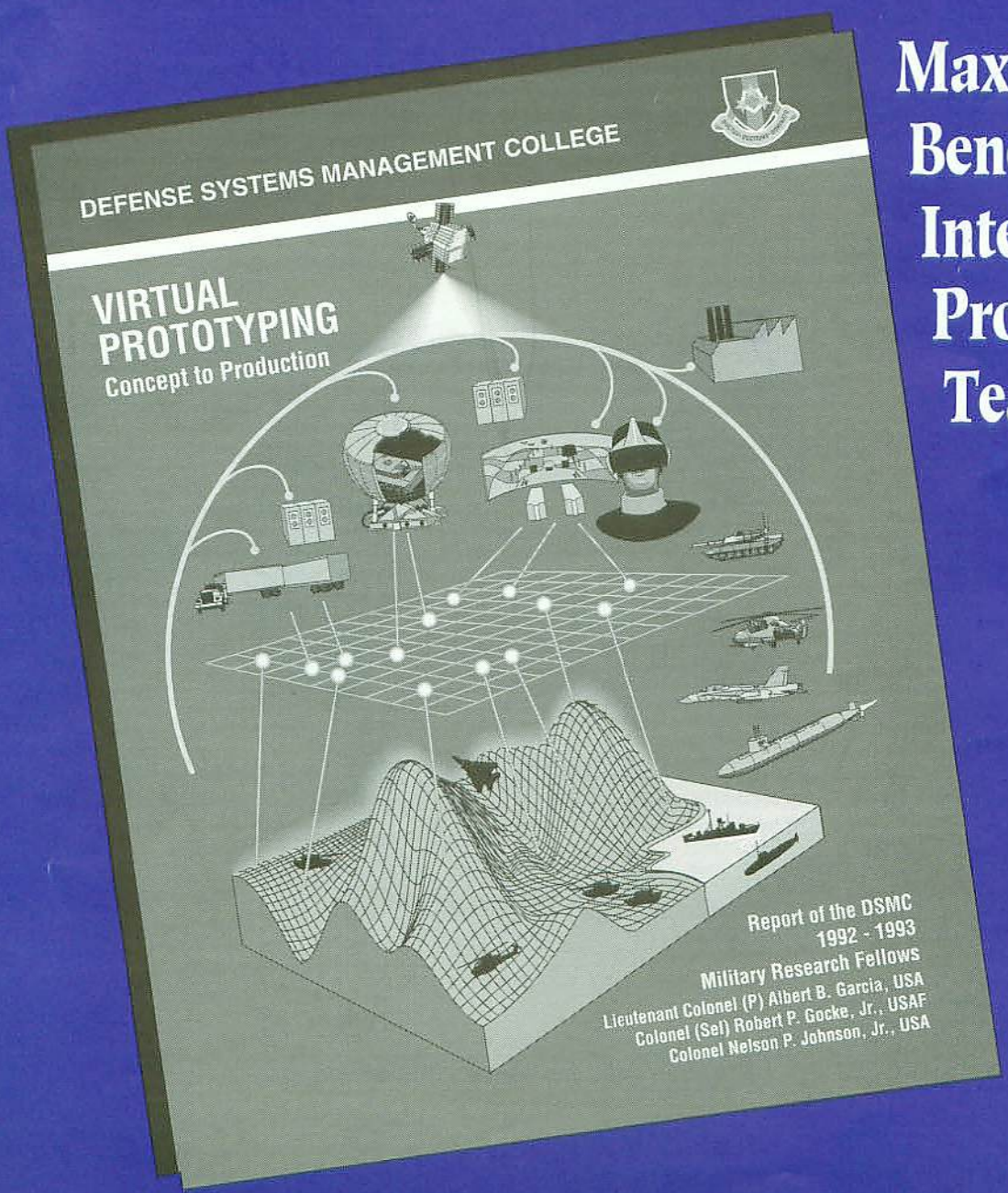
Contract for Change

Keeping Pace with Change

Cultural Implications of Change



Maximizing Benefits of Integrated Product Teams

WHY DoD SHOULD MOVE TOWARD COMMERCIAL PRACTICES

A Disparate View

Dr. Walter B. LaBerge

Most people miss the central point of why Department of Defense (DoD) acquisition must move toward a more commercial-like environment. Our present focus is to achieve those one-time, 10-15 percent savings which might accrue if we can achieve legislative reform (the 800 Panel Recommendations) allowing DoD to design and build hardware to commercial standards. However, this is not the best of reasons to move toward commercial standards. What we really should focus on is buying into the commercial competitive process where continuous aggressive competition drives down initial product sales prices and provides stimulus for continued product improvement and cost-performance benefit.

The DoD has an opportunity to get in on the same environment that brought the prices of cellular phones down and their performance up. We in DoD need to benefit from the way of conducting business that has improved CAMCORDER performance while halving their price. We need to use the system that in just a few years has made home computers affordable and indispensable.

Photo, and permission for use, from Maytag Company, Division of Maytag Corporation.

The new constrained fiscal environment in which DoD finds itself will require new ways of acquiring equipment. Most will delay or defer capabilities the Services would prefer to acquire more quickly. Decisions will have to be made as to whether a number of different capabilities should be simultaneously introduced into only portions of the force as opposed to our current intent to fully outfit all combat elements. This direction, plus an added emphasis on broad retrofit of forces vice new platform procurement, will completely change the nature of DoD procurement.

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The ISO 9000 is being recognized globally at a time when the world is attuned to the competitive value of product quality and services. This fact, along with the TQM focus by DoD for the last five years, will result in a truer, more complete interpretation of the ISO Quality Standards. This interpretation, therefore, will foster contractor implementation of all elements of a quality system with mandated internal audits and second-party audit by the customer (the government).

The DoD now has an opportunity to streamline further the quality-assurance activities with their contractors. With Defense Contracting Management Command's (DCMC's) emphasis on cooperation, process management, and utilization of contractor quality data, ISO 9000 will be a powerful tool for furtherance of these concepts. If DCMC continues to transition to this mode, the following actions must be taken at all levels:

— Training on ISO International Quality Standards and associated documents

— Training in conducting quality assurance (QA) system audits

— Recognizing that a contractor with a compliant ISO Quality System goes a long way toward ensuring product quality and service

— Future recognition of a supplier's third-party registration, if conducted by an accredited body.

This is not to say that a compliant quality systems guarantees a good product, only that this is a minimum requirement for ensuring product quality. We know the other elements of quality in design and manufacturing must be practiced to achieve world-class quality.

If the steps above are implemented, DCMC will become primarily a QA system assessment agency not an inspection agency.

Using commercial and international standards and specifications to procure some elements of our weapon systems is the direction of the future.

In January 1994, a set of guidelines for implementing ISO 9000, "Guidance on the Application of ISO9000/ ASQC Q90 Series Quality Systems Standards." was published in MIL-HDBK-9000, NASA-HDBK-9000. Without proper education and training on the concepts and philosophies of the elements and responsibilities indicated in ISO 9000 quality system, it is possible that many program managers and contract administrators will utilize all the supplements afforded in this guidance document and we will revert to "the government must inspect" mentality practiced with MIL-Q-9858A.

Certainly, some products and programs may require military specification supplements; but, there are many more programs where a compliant QA system will ensure product quality.

The real challenge is to distinguish between programs that can be managed by assessment of the ISO 9000 quality system and those that require additional military specifications and oversight. The Dod must be able to know the difference.

DoD Goes Commercial and International

The other DoD challenge is the major thrust to use Non-Developmental Items (NDIs) for our weapon systems. In his remarks to the National Contract Management Association, November 18, 1993, Dr. William J. Perry, now Secretary of Defense, mentioned the United States cannot afford two industrial bases — one for defense and the other for commercial. He also pointed out that advances in technology and productivity in the past 20 years in the commercial sector are too important to ignore.

Dr. Perry has been "beating the drum" for months, recommending DoD use of commercial specifications wherever possible. The ISO 9000 international quality standard used for DoD acquisition is a major step in this direction.

Recently, I have seen three RFPs for electronic equipment where military standards and specifications were listed along with a statement allowing for the use of commercial off-the-shelf components, as long as performance requirements are met. The electronics industry is one where commercial technology and reliability are conducive for many military applications. Some commercial plastic encapsulated circuits exhibit reliability measures equal to some military hermetically-sealed circuits.

Using commercial and international standards and specifications to procure some elements of our weapon systems is the direction of the future. Again, this must be done with knowledge and with the user in mind. Doing away with the 16-page specification for a ballpoint pen is long overdue. But, let us not move so quickly that we eliminate some military specifications and standards that have become industry standards. Let us continue to deal more with quality systems and cost-effective commercial products whenever performance and reliability is not compromised.

Though it offers difficult challenges, this new environment also may offer new opportunities. In changing from a needed rapid response to Soviet capabilities not influenced by budget constraints to a long-term, budget-constrained modernization program, we may be mimicking the business world of U.S. high-technology industry more closely than ever. The latent advantage in adopting a strategy more closely to the commercial world is being better able to adopt the business methods which have so strikingly reduced their product cost and increased their product capability.

...we wish to force ourselves and our suppliers into the equivalent of Maytag's environment. Maytag convinces the public it has a competitively priced product; its competitive performance improves constantly; and its products never need repair because reliability is their greatest concern.

It is not the 10-15 percent cost-performance improvement from specification changes that we should seek. Rather, our objective should be to get the larger incremental cost-performance improvements typical of the competitive, high-technology, commercial world. We should strive to achieve a stranglehold on our military marketplace with low-cost, high-performance products — like the Japanese did to us in the consumer electronics field and we have done recently to strike back in the semiconductor microprocessor arena.

These consumer product advances have come not at the expense of the supplier industries; rather, they have expanded and strengthened them. Continuing competition in the marketplace is what has made it happen, not bending the rules on how to build things. If we want to build a strong DoD industrial base, we should emulate competitive industry practice.

The real DoD issue, in my opinion, should be where procurements are required to be more like the forms of competition seen in the commercial marketplace, rather than limited to promoting a DoD "specification-free environment" to what will be, in an era of reduced new systems, a less-and-less competitive industry.

This different type of focus has not been discussed greatly. Perhaps this is because such a marketplace may not be to the advantage of those who give advice on the defense industrial base — namely, those who are in it now and might benefit from a change. The industry now possessed by DoD admittedly has performed well in the past as seen by the results of Desert Storm. However, it has been good at what we have asked it to do during the past decades — because of Soviet pressure, to emphasize performance and not necessarily economy. As a result, being scrupulously cost conscious is not something we would, in our wildest dreams, attribute to our current defense industry.

In the following, I hope to develop the rationale that there should be a substantial shift in emphasis in what we are trying to accomplish by acquisition reform, one skewed more heavily toward increased competition at all levels.

Key Issue

In my view, the real reason DoD should move to commercial standards is to be better able to permit continuing commercial-like production competition throughout the lifetime of its military products. The threat of continuing commercial price competition is what drives commercial suppliers to use their best people on design for low cost in the first place, and then to continue putting as first priority further reduction of cost and increased performance downstream. The same should be a DoD objective.

Suppliers in commercial industry know they cannot sit on their hands once they introduce a product. They know if they are successful in introducing a new, "hot" sales item, it will be reengineered quickly by their competition, which is anxious to take over that market. We should facilitate that continuous commercial-like competition.

However, as things stand, that is not how we motivate our contractors. The best of our contractor designers — the ones responsible for cost/performance optimization — having once helped their companies win a contract, now shift immediately to new competitions yet to be won. One can hardly blame these contractors; that is where their greatest rewards lie.

Conversely, government efforts to support commercial practice should not be oriented principally toward helping selected contractors shave small percentages of cost from products no longer subject to continuing competition. That is not where the biggest savings are to be found.

If we are to break our pick on a tough rock, it ought to be a rock that has real gold in it.

Raison d'Etre

Numbers taken from an Office of Technology Assessment report in process of publication show the differ-

ences. With their permission, I include them in Figure 1.

Today, almost everyone quibbles over whether savings by specification and other relief can be as high as 10 or 15 percent. However, the bombshell of momentous proportions contained in the referenced chart is that the differences in costs for equivalent military and commercial items actually purchased in the marketplace can range from 500-900 percent. Unusual about all this is that it isn't very surprising to anyone who sees the numbers.

Clearly, not all cost differences are due to competition. Some differences are connected with different volumes; some, perhaps, to lesser environmental requirements, although there is a bulk of Navy experience that shows commercial equipment can be repackaged easily to work in the military environment of ships and aircraft.

Further, I believe this concept of continuing competition in military goods can be achieved straightforwardly and, in fact, is aided by our current budget woes. Also, I suspect these ideas will experience far less difficulty than will an assault on the eaches of 800 Panel Acquisition Reform. Subsequent paragraphs illustrate how to accomplish the proposed continuing competition. Lastly, along with the cost reduction continued competition brings, can come a level of reliability and performance betterment not otherwise achievable.

The Environment We Wish to Create

In my mind, this proposal is the "Maytag repairman" argument in military clothing. In its simplest form, we wish to force ourselves and our suppliers into the equivalent of the Maytag environment. Maytag sells its products by convincing the public that they have a competitively priced product; its competitive performance improves constantly; and its products never need repair because reliability is their greatest concern. To make that claim "stick" through the years with department store customers, Maytag has tremendous incentive to invest its profits and use its best people to improve its product continuously. There is no equivalent "life-or-death" reason for DoD program managers or their military contractors to make the same consequential effort. Neither is the gain to do so high, nor is the peril of not doing it consequential. That being the case, any contractor, military or commercial, can be expected to put his best product design talent into completely different product development because that is where their money would lie.

Why Address this Issue?

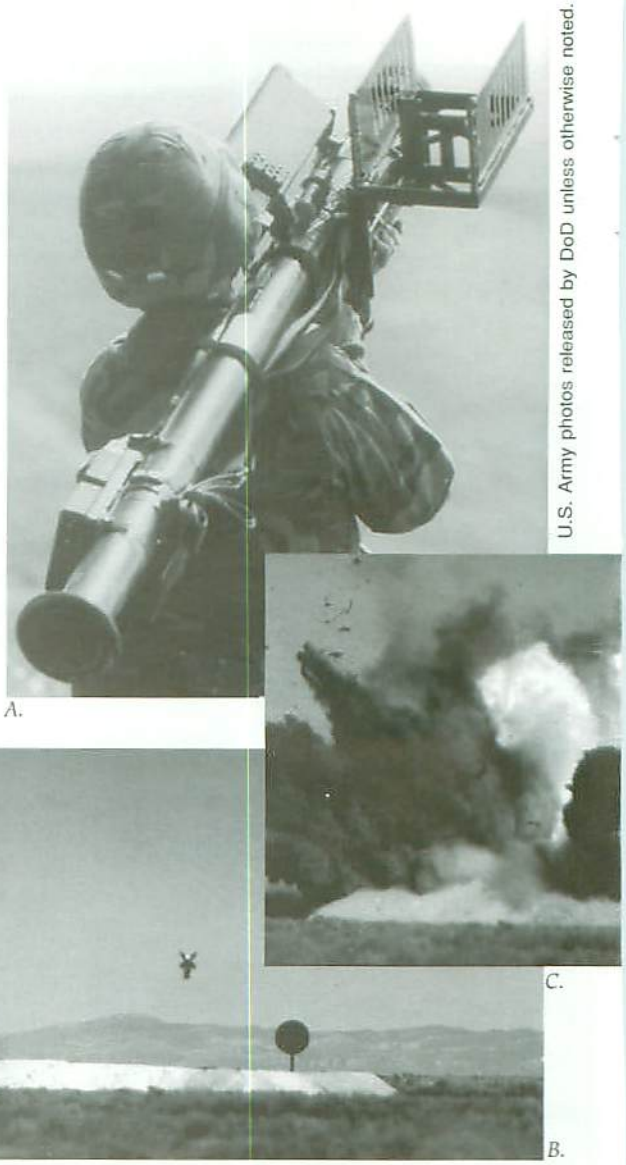
The issue of affordable military products is more important today than ever before. Surprisingly, it may be easier to implement now than earlier. These conditions are true because:

— Force structure demands, driven by multiple war scenarios and smaller budgets, inevitably are going to make acquisition accounts smaller and smaller, thus emphasizing even more the need for reduced product costs.

— Products introduced in the next decade will be used far longer than previously. Product improvement in the long term will be the order of the decade rather than new platform introduction. It is plausible to believe building factory improvements is more economical (even without arguments based on competition) than having them installed in the field by retrofit.

— Mobilization potential becomes more important, because we will not maintain, for budget reasons, a force that can ride out all foreseeable crises. Therefore, we will be obliged to design for rapid increase equipage of our force, not knowing when it will be needed. To meet that need, our only option appears to be an active warm base from which to accelerate.

— That, in turn, will drive us inevitably to build our new products at a low rate so we can keep our lines hot. We cannot allow the kinds of problems we have now (Abrams tank line, which will soon be dead) where many of our material items now out of



U.S. Army photos released by DoD unless otherwise noted.

A.

C.

B.

production have start-up times not within the envelope of anticipated crisis warning times. These longer build-out times will be permitted by the threat of the next decade; whereas, the threat we had formerly would not. Critical to remember is that times have changed. In the old days of Soviet confrontation when they introduced a new capability, we needed immediate, full response. Now, the threats are of lesser numbers and probably can be satisfied by a more drawn-out modernization program.

— Through this more drawn-out procurement cycle we need to maintain technological superiority, not allowing a protracted period of constant capability product. In DoD, we need the same incremental improvement that is typically going on in the commercial marketplace every day. With that improved performance, we also would need the decreased costs seen in any evolving commercial marketplace. The best examples of what we wish for the military is what is going on today in the high-technology commercial electronics businesses. Television, CD, computer, long-haul communications and cellular car phone businesses all give spectacularly better value as each year goes by. To give added hope that we can gain for the military what the civilian buyer already has, those products just discussed are almost exact overlays of what the military will buy in the next decade.

Furthermore, I see no reason why we cannot give the military buyer the same bargains we have available in our home electronics products, as long as we can achieve continuing production competition throughout the lifetime of military production runs.

FIGURE 1. MIL-SPEC vs. Commercial Comparisons (for similar quantities)

MIL-SPEC to Commerical Ratio

Item	Cost	Acq Time	Reliability	Size
Sony Color Monitor	8X	—	Similar	Same
Data Processor (classified)	9X	3X	Worse	1/6
Guardrail V/IV	2X	2X	Similar	Same
Secure Phone STU II / STU III	5X	4.5X	—	6X
STU III	4X	1.5X	Similar	Larger
Computer PDP 11/44	8X	—	Worse(11X)	1/8
Remote Sensor	4.5X	—	Similar	1/4
Inertial Navigator Carousel/ASN 132	1.7X	—	Worse(5X)	

Source: U.S. Department of Defense, 1987.

Contractor photo released by DoD

D.

Photo courtesy of McDonnell Douglas

E.

A. Soldier holding a Stinger scans the horizon.
B&C. A sequence of photographs showing a GBU-15 bomb on target and on impact during a weapons demonstration, December 12, 1978, at White Sands Missile Range, New Mexico.
D. A pair of U.S. Marines accurately determine their location during desert training exercises using the Position Location Reporting System (PLRS). The Hughes system allows Marines in the field to communicate with commanders by using a digital manpack radio that provides location, navigation and short messages through a hand-held readout device.
E. Air-to-air view of an F/A-18 Hornet strike fighter aircraft from Marine Fighter/Attack Squadron 314 (VMFA-314) firing an AIM-9 Sidewinder air-to-air missile during an operational test.

Technique for Achieving Continuous (Commercial-like) Competition

To achieve the continuous competition typical of the commercial marketplace, several characteristics of that marketplace must be satisfied.

1. Reasonably long procurement cycles for our products, in order to make plausible competitor investment in reengineering and tooling for late market entry. (Predicted by this article to be the way the military procurement will have to respond, for reasons other than cost, to the new budget environment.)

2. Freedom to change detailed design and to change any parts as long as the completed product can demonstrate form-fit and function compliance with the initial design, and pass companion environmental and lot sample tests. (An existence theorem has proved that such a process can work. We already allow in-production changes for the advantage of the government, subject to similar qualifying tests. Also, on a complete product basis, it was already tested successfully by the Army in its Gulf War GPS receiver procurement.)

3. Willingness to accept vendors accounting systems and plant procedures. (Again, already successfully tested by the GPS experiment. Also probably easily accepted as long as these competitions include several commercial contestants and recompetitions are frequent.)

4. Willingness to no longer depend on military maintenance for these kinds of procurements. Rather, there must be agreement to follow today's commercial pattern of return to vendor for replacement or repair (albeit the commercial vendor may also be in the field, if necessary). (Partially being done now for many products we buy. Clearly acceptable for most consumables ordnance like Stinger, Sidewinder, GBU bomb kits and the like, for training systems, for logistic support equipment, and for most complicated electronics not normally in immediate contact with the enemy.)

5. Agreement through contractual instruments that the designs paid for by the government, when produced, belong to the government and that these designs can be revealed to prospective bidders at the time of recompetition. (The way many commercial subcontractors now work. Equivalent to the common commercial practice of buying buying a competitors product and seeing what's in it and how it works.) Now practiced by the government in second-source procurements.

6. Further, agreement that nothing unspecified as company proprietary at the time of original contract award can be claimed later as company proprietary without agreement by the government. (A requirement not dissimilar from standard, long-accepted military second-sourcing procedures, and now frequently used in second- and third-tier contracts by primes.)

7. Products intended for long production runs (e.g., at least six years or more) during the competitive production period subsequent to initial production, will be considered to meet the statute requirements of Non-Developmental Item (NDI) legislation. (What isproposed already may be an allowable interpretation of current statutes, though probably this application will need congressional affirmation. Such affirmation may be agreeable to the special interests supporting existing regulations because of its comparatively limited application compared to blanket 800 Panel approvals.)

Summary

The DoD should try to emulate commercial characteristics which foster continuous commercial-like competition over the lifetime of its future procurements. Threat of such continuous procurement competition, when occasionally exercised, can force intense supplier effort on cost-performance in their initial designs, in order to make more difficult later market entry by a competitor. Continued vigorous cost/performance emphasis also can be expected for the same reason — the desire to prevent competitor market entry at anytime in the extended product production cycle. The whole idea is for the government to prevent noncompetitive equipment being built anytime during the production span of its programs. From examining commercial high-technology parallels, I believe that is where the biggest potential for savings exists for the buyer.

A program to easily achieve these incentives is proposed in this article. Work to relieve government procurement restrictions as proposed by the 800 Panel should also be pressed with vigor, since not all DoD products can meet the criteria for continuing competition as outlined above. However, our acquisition community must understand it is continuing commercial-like competition, not specification change, that holds the greatest opportunity for significant DoD savings.

In sum, as a way to look at things, it is our Maytag problem we wish to solve. Would we rather have the repairman come out (at $XX per hour and charge retail parts costs) or would we rather have the improvements built in at the factory at a fraction of the cost and, when we can buy a new one, give the old one to the kids (in the DoD case, to war reserves)? If you don't like the Maytag equivalence, try the comparable Motorola large-screen television parallel. In this instance, you probably do not want a planned product improvement program involving your local repairman implementing it in your living room, but may prefer to buy a new version when the price comes down a bit and new performance becomes irresistible, at which time you put the old one in the guest house (training base).

The issues in this article are potentially extremely important. They are sufficiently different from popular thought to merit major vetting and consideration. I hope the article stimulates investigation and concern.