

# MIL-SPEC & MIL-STD Reform

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## ABSTRACT

The prudent allocation of funds is always an issue with any government agency. This is especially true in the Department of Defense (DoD) due to its magnitude and heightened level of public scrutiny. Acquisition reform is an ongoing federal/commercial effort designed to save both government and industry money by permanently altering the manner in which the DoD solicits civilian contracts and products. A necessary first step in this reform is to revise outdated and obsolete military specifications and standards. This paper will examine federal policy regarding government specification reform and explore the implications of the policy to date. It will also speculate on the future of reform and address the bigger issue behind standards reform, civil-military integration.

## INTRODUCTION

It is a well-known fact among soldiers that the lowest bidder manufactured their rifles. The DoD awards thousands of contracts annually to companies that provide the highest quality products at the lowest possible cost, whether that article be a garbage can or a nuclear submarine. Acquisition reform, in which military specification and military standard (MIL-SPEC & MIL-STD) conversion plays a major role, intends to change federal solicitation protocol, reevaluate federal specifications and standards, and consolidate industry and government manufacturing practices. In the process the DoD hopes to cut costs and take advantage of currently existing commercial business methods.

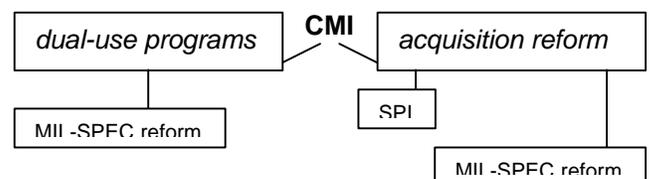
The former Secretary of Defense, William Perry, initiated the acquisition reform movement in 1994 with a series of memoranda that continue to serve as fundamental reform policy to this date. The original memorandum suggested a three-pronged strategy for reform.<sup>1</sup> The first step involves a commitment to performance-based specifications and standards in lieu of MIL-SPECS and MIL-STDs. Secretary Perry declared that agencies should avoid government-unique requirements except in those instances where it was absolutely necessary to

use military specifications for lack of commercial equivalence (i.e., armor plating). His second step was to improve the existing base of standardized requirement documents. Federal jurisdiction had previously extended to well over 30,000 specifications and standards, and although that base of documents was slated to undergo significant reductions, Secretary Perry wished to ensure that those remaining documents were technically correct. The final step in the reform package was to reduce the number of government imposed processes in commercial facilities. Many of these practices were redundant federal quality control standards that simply added to the red tape and costs of government contracts.

The anticipated results of reform were three-fold, the first and foremost of which was monetary savings. The DoD hoped to save enough in acquisition reform to fund major weapons upgrades for the next century, including a new class of submarines and aircraft. The second goal was to remove impediments to civil-military integration (CMI) by emulating commercial buying practices, thereby facilitating the inclusion of commercial technologies in military products. The final goal was to reduce the current weapons systems development time of 12-15 years in order to keep pace with dynamic technologies.

The language and jargon surrounding acquisition reform is extensive, making it difficult to distinguish where one program begins and another ends. The Single Process Initiative (SPI), dual-use technology programs, acquisition reform, and CMI are current DoD initiatives that relate to MIL-SPEC reform in one manner or another. The branch diagram below attempts to clarify this often-convoluted picture.

Figure 1: Branch Diagram of CMI



This figure is greatly simplified and is certainly not indicative of all DoD activities, but it illustrates the point that MIL-SPEC reform is the foundation for other projects relating to CMI. Standards reform promotes technologies that have both civilian and military application and contributes to acquisition reform by removing impediments involved with government contracts. MIL-SPEC reform is merely a means to reach an end; streamlined government processes and advanced civil-military integration.

This text will inevitably contain mention of government versus commercial processes and the integration of government and industry. It is the goal; however, that the aforementioned references will be limited to instances relating to MIL-SPEC reform. The goal, results, and future of MIL-SPEC reform and how this initiative relates to longer term DoD issues are the primary focus of this document.

## BACKGROUND

Specifications and standards are an integral part of engineering and are a necessary tool and invaluable asset to engineers in day-to-day communication. Among other functions, they define components and materials, dictate testing procedures, and mandate quality controls. Without standards and specifications, communication between engineers would be vague and garbled and practices would be ineffective and inefficient.

## HISTORY

The DoD, recognizing swift technological advances that occurred during WWII, began to establish an immense library of specifications and standards during the years of the Cold War. The military consistently emphasized quality over cost, citing national security as the driving factor in decision making. Wary of the quality of commercial products, the DoD applied strict military specifications and standards to defense contracts. Many of these standards and specifications, such as various descriptions of aircraft quality aluminum, were eagerly accepted by industry because the government was providing them with essential engineering information. However, many processing and quality specifications went above and beyond industry standards, forcing corporations to create special manufacturing techniques and testing procedures for defense articles, thus driving up the costs of federal contracts. One such example is the military's insistence that computer chips operate at extremely cold temperatures, whether their intended destination is the Arizona desert or the plains of North Dakota.

Times have changed, and, in many instances, military technology is no longer leaps and bounds ahead of

commercial technology. In fact, in arenas such as telecommunications and networking, industry practices have surpassed government achievements. The DoD is faced with budget constraints and downsizing and has been forced to adopt new and creative measures to save money. Acquisition reform has been proposed as the solution to the DoD's budget problems. It calls for increased integration of commercially manufactured components into military systems, allowing the government to take advantage of off-the-shelf technologies. It also aims to reduce the amount of red tape involved with government contracts now that the quality of industry products often exceeds government expectations. This saves money by giving corporations enhanced flexibility in their government contracts, disqualifying redundant practices, and eliminating unnecessary quality specifications. The government basically expects to save money by adopting better business practices.

Industry also stands to benefit from MIL-SPEC reform for many of the same reasons. The government often guards itself against fraud by *not* promoting the best business practice, but the free market is not so forgiving. Industry has long been the champion of repealing layers of acquisition burdens in the form of MIL-SPECS and MIL-STDS.<sup>2</sup> The government, without fail, has ignored these suggestions for the past three decades, and only recently has changed its policy regarding federal acquisition.

Acquisition reform is an ongoing process rooted in the 1994 memorandum published by then Secretary of Defense William Perry. It is part of a major effort by the DoD because not only does it promote cost-effective measures, but it has also received a lot of political attention. President Clinton and his staff have even gone so far as to create the position of Deputy Secretary for Acquisition Reform within the Office of the Secretary of Defense to oversee DoD's efforts relating to acquisition reform.<sup>3</sup> There is also now an 'Acquisition Reform Week' during which the DoD recognizes those firms that have taken major steps towards tearing down the barriers between industry and government.<sup>4</sup> Politics and economics have pushed acquisition reform into the Washington spotlight.

## PARTICIPANTS

MIL-SPEC reform basically involves three entities: government, industry, and non-governmental standards bodies (NGSBs). Government participation involves all federal agencies, but this paper will focus on the DoD and its subsidiary organizations. Twenty-six acquisition agencies within the DoD are responsible for the ownership and maintenance of federal standards and specifications and are therefore also responsible for reform.<sup>5</sup> Industry includes any corporation that does business with the military, but this paper will draw attention to three defense giants: Boeing, Lockheed-Martin, and Raytheon. These three corporations are

devoted to aviation and electronics and are prime recipients of defense contracts in terms of annual funds awarded them by the DoD.<sup>6</sup> NGSBs are simply the beneficiaries of the reform process in that industry assigns such organizations as the Aerospace Industries Association (AIA), the Society of Automotive Engineers (SAE), and the American Society for Testing and Materials (ASTM) the task of creating voluntary standards as the military deletes government-unique requirements.

## SEGREGATION

Segregation between defense industries and commercial industries is necessary to some degree. Six basic categories have been defined as major sources of segregation:<sup>7</sup>

1. Military specifications and standards
2. Acquisition laws, regulations, and culture
3. Militarily unique technologies or products
4. Commercially uneconomical orders
5. Emphasis on performance over costs
6. Classified technologies

Items three through six are inevitable sources that are inherent to maintaining effective fighting forces. However, the first two items on the list can and are currently undergoing drastic change. The first item is obviously germane to this research topic, but the second item is also affected in many ways by the reform of specifications and standards.

## CULTURE

Acquisition culture preceding reform initiatives is important to define because, like specifications and standards, it is something that the DoD affects without substantial legislative support. Acquisition culture has traditionally been very adversarial, where the government, upon awarding contracts, acts as a watchdog over industry.<sup>8</sup> The government oversight complex, by law, isolated itself from engineering, testing, and manufacturing and avoided direct involvement with a project. Rather than monitor industry efforts through observation and cooperation, the government instead required corporations to jump through many budget and quality control hoops during the development of a product. This added to the development time and cost of the product, but it was an effective means for the government to guarantee a quality product. Another potential danger with this adversarial culture was that contractors had legitimate reasons to avoid being completely forthright with oversight officials during the development process.<sup>9</sup> Rather than draw unwanted attention and pressure from the DoD, which would only increase costs, industry could simply mask a problem and fix it later.

By eliminating specification and standards barriers between industry and government, MIL-SPEC reform

has gone a long way toward altering the acquisition culture. This result, although not directly related to standards and specifications, will be examined later in this paper.

## POLICY AND PROCESS

This section will first outline the DoD policy for standards reform. The general federal policy that all government agencies abide by and the DoD's stance on international standards will follow.

### POLICY

Since Secretary Perry's 1994 memorandum there have been literally hundreds of government publications that outline the protocol of updating, canceling, and transferring ownership of government specifications and standards. It is difficult to assign a specific hierarchy of activities that the DoD has undertaken to define their policy because memoranda range in subject from contracts for government batteries to precision guided munitions. Perhaps a quote by Secretary Perry best sums up the effort across the board by all DoD personnel:<sup>9</sup>

*We're going to rely on performance standards instead of relying on MIL-SPECS to tell our contractors how to build something...there will still, of course, be situations where we will need to spell out how we want things built in detail. In those cases, we still will not rely on MIL-SPECS but rather on non-government standards...In those situations where there are no acceptable industrial specifications, or for some reason they are not effective, then the use of MIL-SPECS will be authorized as a last resort, but it will require a special waiver.*

In general, the DoD wants to practice what it has been preaching for years; don't tell a person *how* you want them to do something, but rather tell them *what* you want and you'll be amazed at the ingenuity of their work. The expected results of the reform, from most desirable to least desirable, are listed below:

- Cancellations of MIL-SPECS
- Development of Non-Government Standards (NGS)
- Development of Performance Specifications
- Consolidation of Standards and Specifications in Handbooks
- Updating of MIL-SPECS

### CANCELLATIONS

The first assignment of the Defense Standards Improvement Council (DSIC), with the assistance of Coopers & Lybrand consulting firm, was to identify the standards and specifications that were absolutely

unnecessary in government solicitations.<sup>10</sup> These documents were branded as the “Hot 105” because they were the primary cost-drivers in federal contracts. Many of the “Hot 105” were quality control standards and all were either unnecessary or obsolete. One example of a standard on the “Hot 105” list was MIL-STD-210C, a document dictating climactic test requirements for military systems and equipment.<sup>10</sup> It was unnecessary to use the standard in most applications and so it has been cancelled. All of these cost-drivers have since been cancelled, and it is the goal of the DoD to subject all similar MIL-SPECS and MIL-STDS to cancellation notices.

## NON-GOVERNMENT STANDARDS (NGS)

If any specification or standard exists in the commercial world that duplicates or is very similar to a MIL-SPEC or MIL-STD, then government officials are instructed to adopt the non-government standard.<sup>11</sup> If no such document exists outside the federal domain, then officials are instructed to work closely with their commercial counterparts to create a technically equivalent non-government standard. This is a point of contention in industry, especially the aviation industry, and will be addressed later in this paper. This process transfers responsibility and costs of maintaining specifications and standards to industry and lowers government overhead by reducing the amount of time, money, and resources devoted to the upkeep of federal documents. The creation of non-government standards involves entities like the AIA, SAE, and ASTM when they are chartered by industry to develop new standards where federal standards previously governed.

## PERFORMANCE SPECIFICATIONS

When it is absolutely impossible to use non-government standards the government promotes the use of performance specifications. The DoD’s definition of a performance specification follows:<sup>12</sup>

*A specification that states requirements in terms of the required results with criteria for verifying compliance, but without stating the methods for achieving the required results. A performance specification defines the functional requirements for the item, the environment in which it must operate, and interface and interchangeability characteristics.*

Performance specifications can be further broken down into three sub-categories: commercial item descriptions (CIDs), guide specifications, and program peculiar performance specifications.<sup>12</sup>

CIDs are used only to describe military requirements in terms of function, performance, and essential form and fit requirements. They are primarily applied to those items that are already purchased from a commercial vendor (i.e., canned ham).<sup>12</sup>

Guide Specifications standardize on functional or performance requirements that are common lot, such as systems, subsystems, equipment, and assemblies. They are also known as detail specifications and can generally be applied to many products and processes.<sup>12</sup>

Program Peculiar Performance Specifications, as the name suggests, can only be applied to one specific contract. They are developed during the negotiation of a contract and are only intended to extend through the life of that contract.<sup>12</sup>

## HANDBOOKS

Handbooks, rather than mandate certain practices and procedures, instead offer solutions that have worked in the past as guidance. Handbooks are not required documents like MIL-SPECS and MIL-STDS, and cannot be mandated in solicitations or contracts. They are for guidance only.<sup>13</sup>

## UPDATED MIL-SPECS

These are to be used as a last resort. Those documents that are updated must apply to military-unique items and program managers must obtain waivers to use these MIL-SPECS.<sup>14</sup> Waivers are granted on a case by case basis, but there are some interesting facts governing waivers.

Exemptions to waivers are granted for those documents that fall into one of the following categories:<sup>15</sup>

1. Documents required by Federal Acquisition Regulation
2. Uniform Federal Accessibility Standards (required by the Architectural Barriers Act)
3. Documents pertaining to nuclear ordnance

Waivers only apply within the Department granting the exemption (e.g., Army, Navy, and Air Force) and are only granted with expiration dates; the intent being that waivers are only a temporary fix and not a permanent solution. To date the Army and Navy have granted 41 and 14 exemptions to waivers, respectively.<sup>15</sup> This number is sure to decline as federal laws undergo revision and restrictive regulations are reduced.

The DoD’s goal was to evaluate all federal standards documents and take appropriate action based on the above options - an enormous task. The emphasis was placed on adopting non-government standards and performance specifications, as evidenced by the following policy statement:<sup>16</sup>

*The bottom line is that while adoption is not necessary for use, we strongly recommend adoption of any non-government standard being used...The emphasis on the development and use of performance specifications does not*

*eliminate the preference for non-government standards...We must keep in mind, however, that our goal is not to develop and use NGS for the sake of avoiding government specifications and standards. Our goal is to increase our access to commercial products and practices, and NGS are one way to achieve that goal.*

The furtherance of government reliance on the private sector for goods and services and the promotion of efficiency in government solicitations are always mentioned as driving factors in MIL-SPEC reform. Also, by adopting NGS, the government avoids the costs associated with developing and maintaining its own standards.

## FEDERAL POLICY

The DoD is not the only government agency subjected to acquisition reform, they are simply the focus of the initiative for two reasons: 1. they solicit the greatest number of commercial contracts at the greatest price, and 2. they have jurisdiction over the vast majority of federal standards and specifications. All federal agencies, meaning "any executive department, independent commission, board, bureau, office, agency, government-owned or controlled corporation or other establishment of the federal government," is required to adopt NGS or performance specifications in lieu of government-unique standards "except where inconsistent with law or otherwise impractical."<sup>17</sup> This policy is consistent with DoD policy, and will in large part depend upon DoD's progress with MIL-SPEC reform since many agencies already rely on military standards.

In addition, every federal agency, as defined above and to include the DoD, must annually report to the National Institute for Standards and Technology (NIST) on their progress in adopting NGS and performance specifications. The report is due at the end of each year and is to include the following:<sup>17</sup>

1. agency justification for the use of government-unique standards as opposed to NGS or performance standards
2. the number of NGSB's in which there is agency participation
3. the number of NGS the agency has adopted in that year
4. an evaluation of the effectiveness of this policy and recommendations for any changes

Of all federal agencies the DoD is most absorbed with standards reform activities, but NIST ultimately oversees all federal operations.

## INTERNATIONAL POLICY

Generic federal policy does not outline a preference for regional, national, or international standards. However,

it does state that "in the interests of promoting trade and implementing the provisions of international treaty agreements, agencies should consider international standards in procurement and regulatory applications."<sup>17</sup> The adoption of international standards is an issue that continues to face this nation and one in which the DoD is directly involved.

Most major defense contractors are multinational corporations and actually do more business with foreign countries than with the United States. There is an ongoing effort by NIST to promote international standards, though government involvement is limited.<sup>18</sup> ANSI, the American National Standards Institute, promotes ISO standards, and the Automotive Industrial Action Group (AIAG) advocates QS standards.<sup>18</sup> Regardless of the outcome of the debate, industries are adopting international standards, a trend to which the DoD must become accustomed.

When the DoD maintained its own quality control measures there was no concern for standard industrial practices. Many industries are now promoting international standards. The DoD must either accept or refute industry's proposal. So far the DoD has deemed international standards to be acceptable, but is dealing with them on a case by case basis. The most recent development with regard to this issue is the DoD's approval of Lockheed-Martin's use of ISO-9000 standards.<sup>19</sup> This move alone will affect in excess of three hundred government contracts. Texas Instruments was the first major contractor to suggest international standards. The DoD enthusiastically supports this initiative that affects over 700 government contracts.<sup>20</sup>

In addition to commercial conversions, there are also other ratified military international standardization treaties such as NATO STANAGs (Standardization Agreements).<sup>21</sup> These agreements push for further standardization among the U.S. and its allies concerning military forces. The DoD intends to abide by all defense international standardization agreements. The United States' commitment to its allies will continue, even if it means that military specifications must be maintained where they otherwise would not have been. These MIL-SPECS and MIL-STDS are another special category of documents that are exempted from the waiver process.

## LEGISLATION

In light of the negative exposure the military has received in the past for purchasing thousand dollar hammers and hundred dollar toilet seats, Congress was eager to promote acquisition reform. Language in annual Defense Authorization Acts dating back to 1990 contain references to streamlining government processes to match commercial practices and simplifying government contracts.<sup>7</sup> The issue was even apparent in the Competition in Contracting Act of 1984 where Congress required all federal agencies to "promote the use of commercial products wherever

practical.”<sup>7</sup> The topic has been discussed for years, but there was little incentive for the DoD to change its policy during the ‘80s because the military flourished under the Reagan administration. There were also certain benefits to the old system: it ensured quality equipment, guarded against waste and fraud, and preserved technological security.

It was not until the massive drawdowns and budget cutbacks following Desert Storm that the military was forced to change its acquisition structure. The most notable piece of legislation relating to this topic is the Federal Acquisition Streamlining Act of 1994 (FASA). Specifically, FASA provides a new definition of commercial items, raises the dollar threshold for simplified acquisition contracts to \$100,000, removes some cost and pricing restrictions for commercial products, and increases potential government purchases of commercial items.<sup>22</sup> The Federal Acquisition Reform Act (FARA) is another major piece of pertinent legislation that was passed in 1996. Like FASA, FARA aims to reduce the amount of inter-bureaucratic oversight in government solicitations and eliminate federal red tape.<sup>22</sup> The National Technology Transfer and Advancement Act of 1995 also outlines the general federal policy relating to standards reform.<sup>17</sup> Previously alluded to, this act required all government agencies to take action similar to that already undertaken by the DoD in the arena of standards reform.

There was little controversy surrounding these acts of Congress as they all passed with bipartisan support. However, recent legislation proposing other CMI initiatives, such as the implementation of dual-use technology programs, has met with mixed reviews and is still an issue facing the 105<sup>th</sup> Congress.

The DoD’s policies relating specifically to MIL-SPEC reform need no congressional support because the DoD has authority to implement those changes without legislation. MIL-SPEC reform, as it fits into acquisition reform, is generally supported by government and industry and fortunately involves no legislative debates. Other facets of acquisition reform, such as dual-use technology programs, are much more controversial, and the future of such programs is still uncertain.

## RESULTS

Overall, MIL-SPEC reform has been viewed as a positive practice and has generally achieved its stated objectives. Billions of dollars have been saved in single contracts alone. Commercial parts are regularly purchased as both complete products and components of larger systems. In addition, development and delivery times have been reduced, in some instances as much as half the expected time.

Standards’ reform greatly diminishes the DoD’s need for a large acquisition workforce and infrastructure. The DoD is currently reducing its acquisition workforce and

has projected a 25% reduction from 1995 through 2000.<sup>15</sup> The agency has already realized almost two-thirds of its expected cutbacks, but savings are difficult to document due to accounting practices. Savings may be significant, but there is also the possibility that they would be offset by the costs associated with contractors performing the duties of former government employees.<sup>15</sup>

Another benefit of MIL-SPEC reform has been the renaissance in acquisition culture. Rather than adversarial, the atmosphere is now one of cooperation. The government foresaw this as an eminent result of the elimination of numerous restrictions on industry.<sup>23</sup>

*Defense program managers and contract oversight personnel must now have even greater understanding of the underlying management or engineering processes at work, and the results required, so that they can evaluate and monitor contractor processes designed to achieve the same ends under this more flexible approach.*

Much more responsibility has been placed on the program managers as they have more flexibility in determining performance specifications and in the application of NGS. The military no longer simply awards contracts to corporations. There is now a feeling of joint ownership and interest in each individual contract.<sup>8</sup> Government employees are directly involved in the design, testing and manufacturing of products, whereas before they were distant observers.

Case studies documenting actual results of MIL-SPEC reform are numerous and varied. This paper will briefly recount the achievements of the Defense Personnel Support Center (DPSC), Lockheed’s Joint Air-Surface Standoff Missile (JASSM) and F-16 programs, Boeing’s Joint Direct Attack Munition (JDAM), and Raytheon’s Texas Instrument Systems (RTIS).

### DPSC

The DPSC, a subsidiary organization of the Defense Logistics Agency (DLA), supports the acquisition of weapons and other equipment such as fuel, food, clothing and medical supplies. Because the agency buys commercial products directly from a vendor, recent acquisition reform has prompted the DPSC to adopt CIDs rather than MIL-SPECS. Simply by changing the military requirements placed on syringes and medical examination tables the DPSC has been able to save \$1.85 million per year in its purchases.<sup>24</sup>

### JASSM

This program will provide the Air Force and Navy with the next-generation air launched cruise missile. Not only have government employees been directly involved in the engineering and testing of this article, but also the program manager is boasting that this contract “re-writes

the How-to-Book of Acquisition.” The results of the program to date are published on the following page:<sup>25</sup>

**Table 1: JASSM Reform Results**

	Old Way	New Way	Result
<b>Warranty</b>	Materials & Workmanship	15-20 yr “bumper – to – bumper”	More comprehensive
<b>Time</b>	12-15 yrs	< 10 yrs	Available in 2002
<b>Cost</b>	\$700K per unit	\$390K per unit	Save \$9 million per year

The reforms have cut production times, resulted in a better warranty, and decreased the overall cost of the product.

**F-16**

The F-16 is the world's most sought-after combat aircraft due to its versatility, lethality, and cost. More than 3,700 aircraft have been delivered to date in 19 countries. Lockheed-Martin has implemented commercial standards in lieu of MIL-STDS that reduce the manufacturing span from its previous 36-42 months to 22 months.<sup>26</sup> This is an example of how the reform process can be retro-applied to production lines already in operation. It is anticipated that the decrease in manufacturing time will result in an even greater demand for the aircraft as they can be delivered in a little less than two years.

**JDAM**

This is an initiative that plans to convert thousands of gravity bombs to precision guided bombs by adding a new navigation system. The project has flourished through the use of performance specifications and is expected to come online in half the originally anticipated time and at half the cost. This is primarily due to the integration of a commercially available computer processing chip rather than the previously required MIL-SPEC chip.<sup>27</sup>

**RTIS**

Texas Instruments is responsible for many defense electronics systems. The easing of stringent MIL-SPECS has afforded TI the flexibility to execute over 700 military contracts in a common process factory alongside other commercial products. Over 65 MIL-SPECS were replaced by eight performance specifications.<sup>28</sup> TI was also a pioneer in the institution of ISO-9000 quality standards and in the implementation of the SPI.

Another windfall of reform has been greater competition for government contracts. Criticism abounds targeting excessive layers of acquisition regulation and oversight as the reason for uneconomical government purchases. Smaller companies could not compete for pricey contracts in the old system, but by eliminating the aforementioned rules and regulations the government has increased competition for their contracts. Greater competition inevitably results in better quality and lower costs. MIL-SPEC reform has met with high praise for achieving its stated goals. However, there are still problems that need to be addressed, especially those that relate to the future of acquisition reform.

**ISSUES**

For simplification I will divide issues facing MIL-SPEC reform into two categories: short-term and long-term. Short-term issues are those that have already surfaced during the initial processes over the last four years. Generally speaking, these issues are minor when compared to the long-term issues. The long-term issues are deeper questions that have serious and long-lasting implications.

**SHORT-TERM**

The first complaint of the aerospace industry is that the DoD is not meeting its goal of working closely with industry to create new NGSBs when MIL-SPECS and MIL-STDS are on the table for cancellation. Industry has argued for years that many MIL-SPECS are overly restrictive, and standards reform was embraced by industry at its inception. The AIA, along with other trade associations, anticipated that the red tape would finally be removed and industry would enjoy much more flexibility in executing government contracts. However, what industry did not expect was outright cancellation of numerous military specifications that defined parts and materials used in aircraft manufacture worldwide. Many of these cancellations were not cost-drivers, but rather they constituted essential engineering information defining as much as one-third of the parts used in most commercial aircraft throughout the world.<sup>2</sup> The DoD, in its effort to perform a thorough reform, eliminated not only cost-drivers but also many MIL-SPECS that constituted best commercial practices.

In order to circumvent this communication vacuum the AIA created the Early Warning Project Group (EWPG) to keep tabs on DoD activities relating to MIL-SPEC reform. It is the responsibility of the EWPG to anticipate DoD cancellations and to find an appropriate, technically equivalent, NGS.<sup>2</sup> If an NGS is not readily available then the EWPG acts as a steering committee in the search for a NGSB to write a new specification, whether it be the AIA, SAE, ASTM, or others.

This lack of communication has added to the confusion of reform and could have very well been avoided. The solution, though effective, adds another organization to

the picture and is another sink for time, money, and resources.

The second issue involves NGSBs in this rapid reform process. When the government calls for the creation of hundreds of non-government standards, organizations like SAE find themselves overwhelmed with documents that they simply cannot process in a timely manner. The solution has been to adopt an accelerated process. Standards are normally subjected to committee review, but in the case of the accelerated process the new SAE standards are simply facsimiles of the recently cancelled MIL-SPECS.<sup>29</sup> The conversion includes all grammatical, typographical, and technical errors.

Again, the applied solution appears to be working, but hasty conversions are a waste of resources because eventually the documents must be subjected to standard acceptance procedures. NGSBs would rather conduct a thorough initial conversion, but government and industry often tie their hands with a flood of requests.

Other issues with which the DoD should be concerned relate to Qualified Products Lists (QPL) and Qualified Manufacturers Lists (QML). These documents are compiled through a joint industry/government effort and they outline those vendors and items that are acceptable for contracts and solicitations. The government sets the standards, and industry, by meeting those standards, is rewarded by inclusion on a QPL or QML. The DoD had maintained these lists in conjunction with MIL-SPECS and MIL-STDS in the past, but as the military relinquishes responsibility for standards to the commercial world it is unclear how QMLs and QPLs will be affected. The government still maintains the lists, but now industry sets the standards. Industry has a legitimate interest in relaxing standards simply so they can invest fewer resources to produce a product that qualifies for a QPL.<sup>30</sup> The former balance between government and industry no longer exists, but the government hopes that approved NGS and performance specifications will deter any potential QPL and/or QML issues.

Money is always a concern of both government and industry, and there are certain costs associated with the transfer of responsibility for specifications and standards. The government is investing manpower and money in the effort to update or cancel specifications. They are also holding the various service branches and other acquisition organizations responsible for instructing acquisition and oversight personnel how to operate in a cooperative acquisition environment.<sup>31</sup> Industry is also investing in the creation and maintenance of NGSBs. Both government and industry stand to eventually save money from MIL-SPEC reform, but it is costing money to reach that point in the evolution of government/industry relations.

## LONG-TERM

Again, major concerns in this arena relate to money. One of the driving factors behind MIL-SPEC reform was the potential savings, and although that has been accomplished, the magnitude of the savings is somewhat questionable. Organizations such as the now-defunct Office of Technology Assessment (OTA), the Congressional Research Service (CRS), and the General Accounting Office (GAO) do not necessarily agree on projected cost estimates. They do, however, agree that estimation is difficult due to the sheer magnitude of the DoD and the number of contracts it awards annually. The DoD, based on the limited number of programs it has studied, estimates that it saved roughly \$2 billion from fiscal year 1994 through 1996.<sup>32</sup> This number is in accordance with other agency predictions. Conservative estimates of the CRS projected that the DoD would be able to realize 2%-5% annual savings, a number that translates to savings of a few billion dollars per year.<sup>3</sup>

These savings undoubtedly justify the action taken thus far, but they are disappointingly lower than initial estimates. The DoD is planning a comprehensive force modernization initiative to take place at the beginning of the 21<sup>st</sup> century that will cost somewhere in the trillions of dollars. Annual savings of \$2 to \$4 billion will not result in a significant contribution toward these bills. Other action must be taken if the DoD seriously plans to fund the force modernization primarily through internal cost-cutting measures.

Perhaps the most significant implication of MIL-SPEC reform is the possibility that articles procured from industry that conform to industry standards will fail in military operations. The military has always emphasized quality over price because the United States prefers to measure its wars in terms of dollars spent rather than lives lost. This is a legitimate concern, and one that cannot yet be resolved as no weapons systems subjected to the new system of specifications and standards has been put into the warfighters' hands. The purpose behind a cooperative effort between government and industry was to create focused performance specifications designed to avoid this feasible consequence, but it will always remain a possibility and is an inherent risk associated with adopting a different set of standards. Critics fear the worst, but supporters look to nations such as Germany and Japan, both of whom rely heavily on industrial products to complement their defense forces.<sup>33</sup> Again, this issue is unresolved and one that future legislation and DoD policy may greatly affect.

Another concern is that the DoD will become too reliant on industry, especially foreign outsourcing for goods and services. This issue relates in part to industry, rather than government, retaining responsibility and control over specifications and standards. Industry will have more control over contracts, and the United States military could very well find itself purchasing foreign components through American contractors. Industry

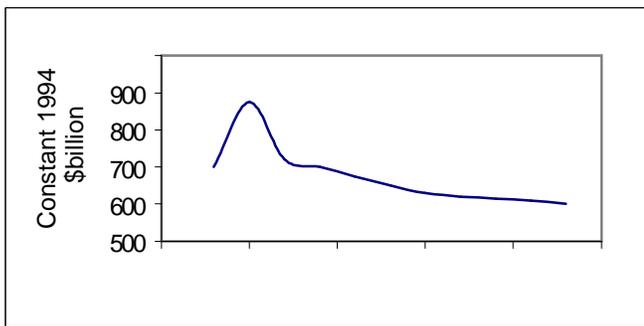
leverage is also linked to the issue over QPLs and QMLs. The adoption of international standards raises questions about national security, but it is highly unlikely that the military will be any more vulnerable to espionage or sabotage as a result of MIL-SPEC reform.<sup>7</sup> There is still significant segregation between the military and industry, and the safeguard of technological secrets is a grave concern; one that prompts military-unique specifications and standards.

One last issue facing the DoD is the increased potential for commercial fraud and abuse at the expense of the government. Federal acquisition and oversight organizations are evolving as a result of MIL-SPEC reform, and the atmosphere is no longer adversarial but rather cooperative. This relaxed environment may expose the government to dishonest practices. Careful accounting procedures and frequent audits appear to be the future of DoD oversight rather than expensive specifications and special manufacturing procedures.<sup>34</sup> It is hoped that these new practices will maintain the balance between industry and government.

**FUTURE ACTION**

Of course, no future action is certain, but there are a few initiatives whose occurrence is highly probable. Before the dissolution of the OTA, the investigative arm of Congress, the agency released a report in 1994 that explored the potential for CMI. This document makes several noteworthy points.

**Figure 2: DoD Budget Forecast**



First, assuming no new global threat, the DoD's budget is expected to continue to decrease annually until it reaches approximately two-thirds of what it was in 1985, as shown in Figure 2.<sup>35</sup> This should occur sometime in the first decade of the 21<sup>st</sup> century, so it is unlikely that drastic increased congressional funding will relieve any of the DoD's budget constraints.

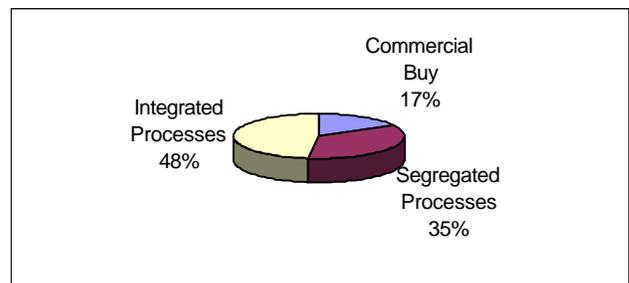
It is also unlikely that Congress will take any assertive action regarding further progression of acquisition reform. In light of the recent situation with satellite exports to China in which the United States may have

sold military technologies in commercial products, Congress will be hesitant to promote dual-use technologies and advanced commercial-military integration for fear of compromising our national security. Many of the benefits of MIL-SPEC reform have yet to be realized as products are still in the development stage, and Congress will probably wait for a report on MIL-SPEC progress and accomplishments before committing to any future initiatives.

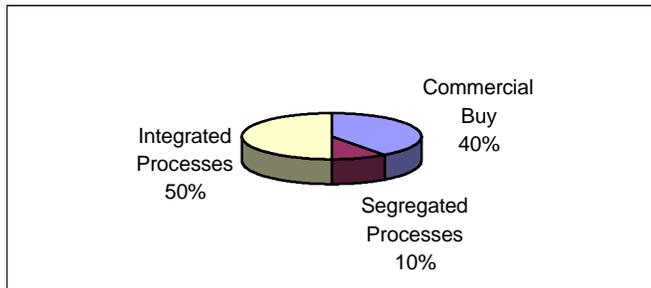
The DoD, without legislative support, will continue to restructure internally. The costly government accounting and oversight practices that are no longer required by law are obviously unnecessary and must also be reformed. It is estimated that personnel salaries alone run in excess of \$7 billion per year and that the entire oversight complex is said to cost over \$18 billion per year.<sup>7</sup> This is one area where the government can still make significant changes without affecting current contracts or business practices. The acquisition workforce has already experienced cutbacks, and it is anticipated that oversight personnel will be subjected to a similar fate.

However unlikely, it is interesting to speculate on the future organization of the DoD. MIL-SPEC reform, by breaking down numerous barriers between industry and government, has made possible some progressive options for future policy-makers. Recognizing that some segregation between defense and civilian industry is absolutely necessary for security reasons, the OTA has conducted a study to assess the potential savings were the United States to adopt a level of CMI similar to that of Japan, China, or Germany. Currently, the OTA estimates that approximately one-half of commercial and government processes are integrated and that one-sixth of government products are obtained through commercial buys. The remaining category is where the majority of the expenses lie, and that is with the segregated processes. It is estimated that about one-third of defense contracts are segregated, whether due to military-unique products or military-unique processes. Figure 3 on the following page represents the estimation of CMI in 1995.<sup>7</sup>

**Figure 3: 1995 CMI Division**



Liberal speculation by the OTA based on case studies of China and Japan indicates that the government could save from 20-60% annually in military expenditures if it is seriously committed to long term reform in the structure of the military. This would be realized by drastically increasing the number and type of products purchased from commercial vendors, increasing the number of integrated processes at industrial plants, and decreasing the number of segregated processes to pertain only to those items of the utmost security. This picture might look something like the following, significantly different from the previous figure:<sup>7</sup>



**Figure 4: Potential CMI Division**

This is highly unlikely to ever occur in the United States, but the point of the comparison is to prove that serious savings are realized only through serious measures.

## CONCLUSION

MIL-SPEC reform is a necessary policy that opens the door to controversial future policy discussions. It is difficult to conduct an accurate cost-benefit analysis of MIL-SPEC reform due to complicated accounting procedures and the wide breadth of affected parties. Despite this barrier, experts agree that the costs incurred thus far to facilitate standards conversion are justified because both industry and government will ultimately benefit from increased cooperation and streamlining. The DoD has realized its short-term goals of increased access to commercial technology, substantial savings, and decreased product development and manufacturing times. However, substantial savings will only be realized with more dual-use technology programs and enhanced CMI.

The United States must find a balance between the military and industry. Segregation cannot exist to the point where vital commercial technology is made unavailable to the DoD, but further streamlining of government with industry may result in an unacceptable level of military reliance on the commercial sector.

Proponents of future CMI claim that our military must adjust to the new global environment following the

collapse of the Soviet Union. Their stance is that large-scale future conflict is unlikely due to the fact that national economies now take a second seat to the global economy. Attacking another nation is like crippling yourself. They also cite military alliances as the future of warfare. It is for these reasons that they justify a full-scale revolution in U.S. military acquisition procedures. However, opponents look at rogue nations such as Iraq and Libya, claiming that well-equipped and well-trained troops are the only deterrent to frightening advances of technology. Their view is that economic reasons should not divert the DoD from its mission of training forces to defend democratic ideals.

Lawmakers will eventually dictate the outcome of this debate, but it is still unclear exactly where the best solution lies. It is clear, however, that MIL-SPEC reform has positively impacted both industry and the government, despite some minor drawbacks. Increased government awareness and involvement coupled with industry interests will hopefully lead to more efficient and more effective means of equipping the U.S. warfighter with the best equipment in the world.

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## ACRONYMS

AIA	Aerospace Industries Association
AIAG	Automotive Industry Action Group
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CID	Commercial Item Description
CMI	Civil-Military Integration
CRS	Congressional Research Service
DLA	Defense Logistics Agency
DoD	Department of Defense
DPSC	Defense Personnel Support Center
DSIC	Defense Standards Improvement Council
EWPG	Early Warning Project Group
FARA	Federal Acquisition Reform Act
FASA	Federal Acquisition Streamlining Act
GAO	General Accounting Office
JASSM	Joint Air-Surface Standoff Missile
JDAM	Joint Direct Attack Munition
MIL-SPEC	Military Specification
MIL-STD	Military Standard
NATO	North Atlantic Treaty Organization
NIST	National Institute for Standards and Technology
NGS	Non-Government Standards
NGSB	Non-Government Standards Bodies
OTA	Office of Technology Assessment
QML	Qualified Manufacturers List
QPL	Qualified Products List
RTIS	Raytheon's Texas Instrument Systems
SAE	Society of Automotive Engineers
SPI	Single Process Initiative
STANAG	Standardization Agreement
WISE	Washington Internships for Students of Engineering

