



Incentivizing a New Defense Industrial Base

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September 2015

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EXECUTIVE SUMMARY

It is the contention of this study that private corporations are increasingly disincentivized to do business with the U.S. Department of Defense (DoD). Contracting with DoD has always been challenging for private companies compared with the commercial marketplace. The defense sector is not a free market; it consists of a monopsony buyer, the DoD, and a limited set of major prime contractors. The rates of return for defense work are substantially lower than for comparable work in the commercial economy. Defense contracts are subject to unique accounting, regulatory, reporting and oversight requirements and processes that inevitably increase the costs of doing business and stretch out timelines.

Over the past half-decade, this environment has deteriorated markedly. In part, this is the result of declining defense budgets and a sharp reduction in procurement programs. Simply put, without procurements, companies are unable to recover their costs and earn profits. As the head of a major profit and loss center for one of the largest U.S. defense companies made clear, “I cannot convince my senior management to invest any of our money without the clear prospect of a procurement program at the end of the day and incoming revenues.”¹

Unlike the size of the defense budget, which is largely out of the Pentagon’s hands, the acquisition process is mostly, albeit not entirely, under DoD’s control. For the period in question, DoD has instituted a series of policies, procedures and management schema which can be described as misincentives, at best, and truly negative incentives, at worst. Among these are: efforts to increase the pace (and hence the costs) of competitive contract awards while simultaneously shortening the terms of those contracts, pressuring companies to accept fixed-price development contracts and agree to “eat” any cost overruns, demanding access to commercial intellectual property, and new and increasingly burdensome requirements for cost and pricing data. In a growing number of instances, the government announced at the start of a competition its intention to allow later competition for upgrades and sustainment. This has the potential to deny a prospective bidder the likelihood of achieving a desirable rate of return on initial investments and any continuing research and development by servicing the aftermarket. This is a serious misincentive. As a result, even long-time defense-oriented companies are choosing not to bid on major new procurements.

As the defense department increasingly looks to non-traditional suppliers of goods and services to provide critical military capabilities, it must address the misalignment of its incentive structure with requirements for greater participation in defense production and sustainment by commercial companies. This is particularly important in view of the fact that for many of the commercial companies, government contracts, in general, and DoD contracts, in particular, constitute a very small fraction of their revenues. The costs are too high and the gain too small to incentivize large, successful commercial companies to put up with the Pentagon’s acquisition system.

¹ Daniel Goure, Interview with senior official of a major U.S. defense company, October 2, 2014.

INTRODUCTION

An incentive is a motivator to action or behavior on the part of an individual or organization. In order to be effective, an incentive must have a connection to some need or requirement. For example, at its simplest, the incentive to make money is directly related to the requirement to satisfy basic needs such as food, clothing and shelter. Money is generally viewed as one of the most powerful incentives for inducing a desired action or behavior because of its flexibility. Companies employ an array of tools related to money, including sales, coupons, discounts, rebates and rewards to encourage buyers to spend money. Government uses monetary incentives such as changes in tax codes or zoning laws to incentivize businesses to invest or change locations.

Money can be used to satisfy most needs and desires. It can also be employed to address less tangible needs such as admiration or psychological gratification. Charities rely on the need of individuals and organizations for social and spiritual/psychic gratification to create the incentive for those with money to make donations.

Incentives can be either positive or negative. Positive incentives are rewards for certain behaviors. In monetary terms, a positive incentive might be a cash prize for achieving a certain goal. Negative incentives, also termed disincentives, impose costs or pain for other behaviors. An example of a negative incentive would be a tax on certain items or behaviors that make them more costly to acquire or conduct. Consider the current tax rates on tobacco products and its impact on decreasing smoking rates.

There is also a third category of incentives, what might be termed misincentives. This category would include positive or negative incentives misapplied or incentives that produce outcomes contrary to the rationale that brought them about. This category generally results from an incorrect appreciation of individuals', organizations' and companies' true motivations or ways of calculating outcomes. For example, the repeated attempts across a wide range of cultures and societies to incentivize harmonious social behavior through the collective ownership and operation of the means of production – socialism – has almost, without fail, produced the perverse outcome of reducing individual well-being, and increasing indirect and even illegal approaches to acquiring personal wealth. Why? Because socialist schemes fail to appreciate the prospect of individual success and personal gain that is the most powerful incentive in any economy.

The right incentives can motivate individuals and organizations, increase productivity, produce more goods and services, and generally enhance personal and collective well-being. As economist Charles Wheelan explained: “Programs, organizations, and systems work better when they get the incentives right. It is like rowing downstream.”² To this one could add the stability of these incentives. Business leaders are quick to warn of the negative effects on their ability (and willingness) to make investment decisions in an environment marked by uncertainty.

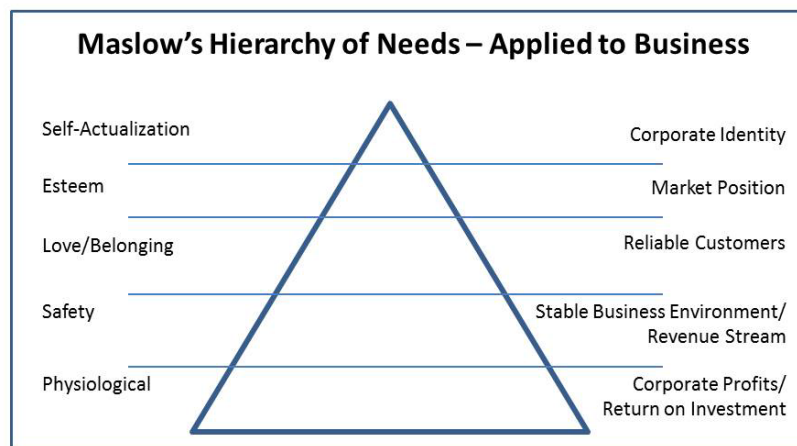
² Charles Wheelan, *Naked Economics: Undressing the Dismal Science (revised edition)*, W.W. Norton & Company, New York, 2010, p. 234.

MARKET INCENTIVES – WHAT MOTIVATES BUSINESS

There is no better known expression in economics than “The Invisible Hand.” This is economist Adam Smith’s metaphor for the way self-interested behavior, the operation of individual incentives in the marketplace, creates benefits for an entire society without any central direction. “It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest.”³ Each participant in the marketplace is incentivized to pursue his own self-interest. As a consequence of their acquisitive behaviors, individuals are in conflict with one another. Such behavior is natural, appropriate and even moral. Governments and states have the incentive to support such behavior so long as economic equilibrium is maintained and the process actually promotes the general welfare.⁴

Companies, like individuals, are motivated by self-interest and engaged in competition for resources, capital, labor and markets. The focus of these efforts certainly includes the generation of revenues and the creation of profits. Corporations have additional incentives, such as increasing market share, outpacing rivals and pursuing advances in technology that will support the creation of better products and production processes.

There are unique characteristics in different market sectors that can influence the incentive structure of participating companies. For example, the product cycles and appetite for innovation are distinctly different for industrial goods versus IT companies.



Academics, business consultants and pundits have sought to apply Abraham Maslow’s theory of the Hierarchy of Needs to the corporate world. In many ways the corporate hierarchy parallels that of individuals. At the most fundamental level, businesses have a set of basic, largely physiological needs. These include products or services to sell, a competent workforce, financial resources to acquire materials, hire workers, establish corporate infrastructure and, most important, a reasonable return on investments and adequate profits.

Second comes a stable, predictable business environment that involves the legal and tax systems in which a company operates, the supply chain that supports its operations and the money available to customers. The control of corporate intellectual property fits here. The next level in the corporate hierarchy focuses on solidifying the business base, specifically by creating a set of reliable

³ Adam Smith, *The Wealth of Nations*, Bantam Classics, 2003.

⁴ Hugo Sonnenschein, “The Economics of Incentives: An Introductory Account,” *Lecture Notes in Economics and Mathematical Systems*, Volume 210, 1983.

customers. The fourth level in the corporate hierarchy could be termed relative market position. Here a company would focus on brand recognition, market position and research and development (R&D) or innovation. The final level of corporate need has to do with its identity in the marketplace and the larger society. Companies will seek to maintain positions in sectors with which they are uniquely associated, helped create or believe they provide a unique set of products and services. They also will spend money and undertake other philanthropic activities in order to be viewed as good corporate citizens.

For companies, however, the circumstances that satisfy needs are determined in the context of the overall economy and, even more broadly, a political system. The business environment is highly competitive. Because capital and labor are mobile, they can choose where to go, which companies and economic sectors to invest in or work for, how much risk to accept and what level of profits or returns on investments to seek. A company must satisfy its bankers', investors' and workers' hierarchies of need in order to stay in business. In general, capital and labor will move where the returns are higher and/or the risks lower.

Private companies are in business to make money. That is their basic incentive. Money allows them to pay their workers, buy materials, continue to manufacture and sell products, invest in R&D on new or improved processes and products, pay back investors, provide dividends to shareholders and even pay taxes. It is that simple.

Figuring out how to make money, however, can be anything but simple. The decision to enter a line of business, expand or contract current activities and even exit the market are the function of a complex set of factors that either incentivize or disincentivize a company's decisions. One of the most obvious of these is the potential profit margin (the ratio of profits to total sales or revenues) for a given period of time. The higher the profit margin, the better the return to the company relative to its investments and the greater the incentive for a company to be in that particular line of business. Revenues and profit margins are extremely important to private companies that must rely on the commercial marketplace for investment funds and respond to shareholders.

Many incentives and disincentives are functions of the character of the market: how open and competitive it is, the costs of entry, the degree of competition from other companies, and the behavior of customers. Others are a function of government policies and regulations in everything from health and safety, labor, taxation, contracting and standards.

One of the most important incentives/disincentives is predictability. The more orderly or stable the market, the better able a company is to predict its sales and profit margin over time, thereby enabling it to make informed decisions regarding the deployment of human and financial resources, the wisdom of investments in infrastructure and the likelihood of realizing adequate returns for taking the risk to develop proprietary intellectual property.

Another incentive is mobility/agility. This can take many forms. There is the degree of mobility of corporate assets. How rapidly and at what cost can assets be redeployed in response to changes in government incentives, changing business conditions or opportunities to achieve greater rates of return? Agility is the ability of companies to respond to changes in market demands, consumer preferences or technological changes.

INCENTIVES IN THE DEFENSE MARKETPLACE

It is generally agreed that the defense sector is one of the most challenging for private companies. The defense marketplace is unlike the commercial world. There is one buyer, the Department of Defense (DoD), and often only a small number of sellers. The incentives are modest, at best, and the disincentives are high, particularly for new entrants from the commercial marketplace. According to U.S. government data, the average rate of return in this sector is substantially lower than for any other that involves high-end product development and manufacturing. Doing business with the Pentagon requires accepting a plethora of unique regulations, standards and specifications, and instituting a separate and unique set of accounting and reporting practices. The sanctity of privately generated intellectual property can be at risk, particularly for products that transition over time from primarily commercial sales to military sales.

The incentive structure in the defense marketplace is largely shaped by the defense procurement process. The government is not only the sole buyer, it defines the rules by which companies must operate.

In its relationship with defense firms, government is engaged in a form of cost based regulation such as occurs in the electric utility, healthcare and transportation sectors. However, government is not only the regulator of prices, but it is the buyer of products. Therefore, the nature of the incentives created by the way government organizes its own internal decisionmaking process also plays a key role in determining the outcome of the defense procurement process.⁵



Lack of competition for programs such as the Combat Search and Rescue Helicopter illustrate the lack of incentives for corporations to enter the defense marketplace.

In many respects, the defense procurement process is characterized by competing, even contradictory incentives. For example, the acquisition process incentivizes both efficient production in order to achieve affordability, but also the requirement to develop and produce advanced capabilities. Similarly, uncertainties with respect to budgets, threats to the advancement of technology and changes in tactics, operational concepts and organizations necessitate the maintenance of great flexibility in contracting. However, these uncertainties militate against commitments to long-term stable production and maintenance contracts. The DoD desires rapid and even

continual technological refresh but tends to have extremely long product cycles which limits the ability to produce revolutionary, vice evolutionary advances in capabilities. As a consequence, DoD tends to spend resources on R&D far in excess of what historic production rates would suggest. The need to preserve the technological advantages provided by superior weapons systems restricts the ability to create a broad market for such systems, virtually ensuring that production runs are relatively small and marginal costs relatively high. The combination of uncertainties, short-term contracts, excessive spending on R&D and small production runs make it virtually impossible for DoD to determine prices competitively.⁶

⁵ William P. Rogerson, "Economic Incentives and the Defense Procurement Process," Discussion Paper No. 1078, Northwestern University, December, 1993, p. 1.

⁶ *Ibid*, pps. 3-6.

During the 1990s, U.S. political leaders and defense industry analysts called for replacing a defense industry largely isolated from the commercial sectors of the U.S. economy with a single, integrated industrial base that would serve multiple customers. While some defense companies tried to follow this advice, most had little success. In hindsight, such advice seems to have overlooked the unique requirements and government-imposed constraints that pervade major weapons programs, and defense-industry leaders were probably right not to go very far down the road in trying to heed it.⁷

Defense companies are in an unusual position. As private businesses with shareholders, they have a hierarchy of needs very similar, if not identical to that of commercial companies. They must have customers and a revenue stream, generate profits and be able to compete with others in their sector. They are dependent on the same sources of financing as non-defense companies. But those sources have choices as to where they put their money. The stock price for all private companies is determined by the soundness of their business activities, and the relationship between risks and returns, not by the social good they provide in terms of support for national security.

At the same time, defense companies are in a part of the economy that has unique features, some of which are not conducive to meeting their hierarchy of needs. There is only one customer, the federal government. The business environment is highly cyclical, even unpredictable. Contracts can be cancelled at the convenience of the government. Corporate intellectual property may be subject to government taking. Corporate costs and prices are subject to the customer's review and profits controlled. The margins for defense companies are significantly below those for commercial companies in comparable sectors.⁸

There are marked differences in the incentive structure for commercial versus defense companies created by the regulatory requirements of DoD's acquisition system. Companies are forced to behave in ways that would be contrary to their self-interest in the commercial world and, on numerous occasions, even contrary to the best interests of the government. There are tremendous costs associated with meeting the accounting and reporting requirements of DoD contracts which most commercial firms are ill-prepared to address. As noted by Under Secretary for AT&L, Frank Kendall,

I have had companies, large companies who do a lot of commercial aerospace work, for example, say they will walk away from DoD business if they're forced to put certified cost and pricing data on all their commercial products. It's just too big a burden for them, and the business isn't worth it to them.⁹

So what incentives have there been for private companies to participate in the defense market? Obviously, DoD has lots of money. In addition, it is willing to shoulder much of the risk involved in the development of unique products and their sustainment over many decades. The widespread use of cost-plus contracts for many years has had the effect of insulating the companies from many potential downside risks.

So too did government programs such as Independent Research and Development (IR&D) that supported advanced science and technology as well as corporate R&D efforts with the limited

⁷ Barry Watts, *Strategy for the Long Haul: The U.S. Defense Industrial Base, Past, Present and Future*, Center for Strategic and Budgetary Assessments, Washington, DC, 2008, p. x.

⁸ Loren Thompson, "[Defense Industry Profits Are Not Impressive](#)," *Forbes.com*, July 24, 2013, at

⁹ Honorable Frank Kendall, AT&L, cited in Sandra I. Erwin, "Pentagon's Strained Relationship With Vendors Getting Worse," *National Defense Blog*, July 16, 2014.

expectation of a salable product at the end. Much of the advanced technology we now take for granted – from computers, to the Internet, satellites, nuclear power plants and jet engines – was the result of DoD-sponsored R&D efforts.

Ultimately, what kept industry going was the demand for products. While production runs for tanks, ships and planes were not on the order of what commercial automobile or aircraft companies experienced, they were still substantial. Moreover, after production runs ended, original equipment manufacturers (OEMs) could rely on a protracted aftermarket in which it could still make money. The value of the aftermarket was particularly significant for companies that provided products and services incorporating privately generated intellectual property.

It has become increasingly difficult for defense companies to satisfy their needs, particularly in a period of declining defense budgets. Not only does the customer have less to spend, but it is also more difficult for companies to make money, develop viable products and R&D strategies or acquire a greater share of a shrinking pie. Looking forward, defense companies see smaller budgets, fewer procurement programs and, hence, reduced revenues. In addition, DoD wants to open up the aftermarket to greater competition. While this strategy can reduce the cost of weapons system sustainment, it also impacts the OEM's long-term revenue stream.

In addition, the low risk environment in which defense companies once operated has changed. Acquisition policy is seeking to shift more of the burden of program risk from the government to the companies. Faced with the additional risk, companies would naturally raise their initial contract bid price or reduce the scope of proposed work. The potential unintended consequence for the Pentagon could be increased cost and reduced product performance.

The Pentagon also wants companies to spend more of their own money to develop next-generation products. But without a reasonable prospect of a production program that generates a revenue stream and profits, what incentive is there for a company to risk its own funds? Moreover, if a company were to use its own money to develop a new capability, the government might lay claim to the intellectual property, undercutting any incentives to make such investment. Or it could just walk away, leaving the company with a budget hole and no prospect for filling it.

Defense department acquisition officials like to say they respect the private sector and its inestimable contributions to national security. Such statements would have greater credibility if the Pentagon understood and responded to the defense companies' hierarchy of needs. A study by the Defense Acquisition University supports the assertion that despite decades of working closely together, the relationship between the Pentagon and private industry today in no way resembles a partnership. There is little respect for industry or understanding of its interests. A survey of government program managers revealed that many "see industry merely as uncommitted vendors, motivated only by profit; as a result, industry must be managed harshly." This is surprising since many of the program managers' industry counterparts are former DoD employees, most often retired military personnel. This study also suggests that government representatives lack understanding of money flows in the private economy or the importance of profits. In addition, the Pentagon does a poor job communicating its requirements, needs or interests to industry. Increasingly, DoD officials are seeking to avoid communicating with industry for fear of being accused of improprieties.¹⁰

By many standard measures, private companies have little in the way of incentives to do business with the DoD. As one respected defense analyst put it, "The margins are lousy."

¹⁰ Steve Mills, Scott Fouse and Allen Green, [*Creating and Sustaining An Effective Government-Defense Industry Partnership*](#), Defense Acquisition University, July 2011.

The most successful tech companies are accustomed to generating returns that match their innovative performance. Apple and Google last year produced operating margins in the 30% range, while Facebook and Intel were around 40%. In Washington, that kind of profitability would earn contractors an investigative hearing before the likes of Senator McCain. The biggest, most successful defense companies typically generate operating margins in the 14-16% range, and the Pentagon has policies for preventing them from making much more. For instance, Lockheed Martin's F-35 fighter is one of the greatest technological achievements of this generation, but after 14 years of work, the company's profit margin on the program has yet to break into the double digits.¹¹

It is important to recognize that the acquisition system has created incentives and disincentives for its own workforce. The layers of regulation, oversight, accounting, process assessment, and test and evaluation not only impose enormous costs on companies and government, but they also create a culture in which acquisition officials fear to use their own judgment and good sense when making contracting decisions.¹² An overzealous enforcement of acquisition policies and regulations can produce unintended and even negative consequences. The acquisition "culture" can have the effect of stifling the goals of reform efforts. According to a well-respected expert on the defense acquisition system:



Military aircraft, like the F-35 fighter seen above, are complex systems and integrating new capabilities requires a deep understanding of system and subsystem designs.

It would be my observation that many of the problems of the acquisition system are the result of unintended consequences of a very byzantine and, at times, outright contradictory set of laws and regulations, rather than problems of outright malice or malfeasance . . .¹³

DOD'S INCREASINGLY PERVERSE INCENTIVE STRUCTURE

It can be argued that, at one time, all the incentives for a successfully functioning defense industrial base were, like the planets, in alignment. There was money, programs, relatively minimal acquisition bureaucracy and a close relationship between government and industry. Investments in R&D produced multiple revolutions in military capabilities. The request for proposals for the U-2 reconnaissance aircraft was only two pages.

The end of the Cold War resulted in fundamental change to the environment for the defense industry. While the cost of defense goods and services continued to rise, defense budgets, particularly the resources available for procurement, stagnated. In addition, the challenges associated with operating in the defense marketplace increased. Repeated efforts to reform the defense enterprise actually

¹¹ Loren Thompson, "[Five Reasons Why Silicon Valley Won't Partner With The Pentagon](#)," Forbes.com, April 27, 2015.

¹² William C. Greenwalt, *Five Factors Plaguing Pentagon Procurement*, American Enterprise Institute, December 13, 2013.

¹³ Pierre A. Chao, [Twenty-five Years of Acquisition Reform: Where Do We Go From Here?](#) Statement before the Committee on Armed Services, House of Representatives, October 29, 2013.

added layers of bureaucracy, additional reporting requirements and costly procedures that acted as disincentives for long-time defense companies to remain in the sector as well as for commercial companies to enter it.

A 2012 study commissioned by the House Armed Services Committee identified a wide array of policies, practices, procedures and systems that acted as disincentives for private companies, particularly small and medium-size businesses seeking work from the defense department. These impediments included the lack of a comprehensive DoD strategy for managing and maintaining an industrial base, inconsistent communications between program offices and private industry, the fragmented nature of the industrial base, an inadequately trained and risk averse acquisition workforce and a proliferation of funding mechanisms. Most significantly, the report concluded that existing laws, regulations and procedures created substantial hurdles to private companies desirous of pursuing work with the Pentagon.

The plethora of regulations specific to government and defense contracting dissuades many companies from competing for government contracts. The acquisition process is often bureaucratic and rigid, with insufficient flexibility to allow appropriate application of management, oversight, and monitoring of small businesses. The defense business environment is also complicated, and some argue hindered, by current export control requirements.¹⁴

The cycle times between commercial and defense markets became increasingly disconnected. Today, that for commercial products is often measured in terms of months or, at most, a few years; those of defense items can extend for a decade or more. The commercial developer of an ultra-light combat vehicle now under consideration for acquisition by the U.S. Army put the difference this way: “We change models every year. Imagine the headache you’d have with that in a program of record; you’d just be buried by the change orders.”¹⁵

Even worse, the defense market can be extremely unpredictable. Contracts can be cancelled mid-stream at the convenience of the government. Budget trials and tribulations can result in previously well-funded programs losing resources or even being terminated. Requirements can change not only before a competition is initiated but even after a contract is awarded. Contract periods can be arbitrarily changed, often shortened in order to allow program managers to demonstrate that they are increasing the number of competitive contract awards. Unfortunately, a shorter contract period can be a disincentive in itself if a company believes it will not have sufficient time to recoup its upfront investments.

On top of these issues, defense companies have increasingly adopted management styles, market practices and financial metrics closely aligned with those that operate in the commercial world. In essence, the leadership of these companies operate on both sides of Alice’s Looking Glass, but their success or failure is judged largely according to standards of an entirely different one.

Since the 1970s, American defense firms have increasingly adopted management practices from the commercial sector. These practices have resulted in the strategic goals of many defense firms more closely resembling those of commercial firms. Top managers of many defense firms have found themselves concentrating more and

¹⁴ The Panel on Business Challenges in the Defense Industry, *Challenges to Doing Business with the Department of Defense*, House Armed Services Committee, March 19, 2012, pps. vi-vii.

¹⁵ Sydney J. Freedberg, Jr., “[Trucks From The Sky: Polaris Pitches DAGOR For ULCV](#),” *Breaking Defense*, May 8, 2015.

more on bottom-line financial returns for their shareholders, increasing their share of the market, and eliminating competition.¹⁶

As budgets shrink, the number of new programs decreases and the burden of oversight and regulation increases, the balance between incentives and disincentives in the defense sector are tilting substantially towards the latter. No wonder companies are increasingly choosing not to play, particularly if they are up against incumbents. The disincentives are becoming too high.

Programs and Profits: the Decline of Essential Incentives

At one and the same time the Pentagon both relies on corporate self-interest and despises it. It expects companies to succumb to the lure of doing business with an entity with virtually unlimited funds, but to temper its pursuit of profit in the name of national security or taxpayer rights. It likes hiring service companies because it doesn't have to deal with the long-term consequences of their employment and knows that the companies will terminate or transfer these individuals as soon as the contract ends. In other words, the Pentagon is relying on the incentive inherent in private business to manage costs in order to ensure profitability, while simultaneously resenting those companies for being profit oriented.

Two of the biggest shopping days of the Christmas season, Black Friday and Cyber Monday, are based on a simple economic proposition: with the right incentives both buyers and sellers can optimize their interests. For the seller it is revenues and profits and for the buyer it is lower prices and the ability to access a greater range of goods and services. Most often the mechanism for achieving both sets of interests is through increased volumes of sales. If a seller can achieve high sales volumes he can get a better deal from producers, who are able to reduce the costs of their materials and labor while increasing revenues and profits, and in turn offer a lower price to the buyer.

The same principles should drive defense acquisitions, but rarely do. One might think that the reason for this is because DoD buys in such small quantities, but this is not entirely true. Defense companies have the capability of optimizing their production lines and supply chains to reduce costs and improve prices for the government, even when the total buy is in the dozens or, at most, hundreds. When DoD keeps to a predictable and economically reasonable production rate, it also incentivizes the companies to invest their own resources in ways to reduce the costs of production.

No one who shops at Walmart, Target or Costco cares how much profit these retailers or their suppliers make so long as they are getting a bargain. The Pentagon needs to acquire the common sense of the average American shopper and create the incentives that will help industry reduce the price of defense goods and services.

1990s-era acquisition reform measures focused on harnessing the profit motive, improving government-industry communications, and developing public-private partnerships to better incentivize the private sector to deliver best-value solutions to the government at lower cost. However, in the last five years, DoD has seen the return of a culture of adversarial business relations with industry. The environment for anyone contracting with DoD is now more confrontational and risk averse. One former undersecretary of defense for acquisition, technology, and logistics summarized the current acquisition environment as a 'Global War on Contractors.'¹⁷

¹⁶ Watts, *op. cit.*, pp. 2-3.

¹⁷ William C. Greenwalt, Five factors plaguing Pentagon Procurement, *American Enterprise Institute*, December 13, 2013.

Even where there is no specific animus relative to the private sector, the acquisition “culture” is such as to make it difficult for private companies to pursue their most significant incentive, profits.

The economic/profit incentives culturally embedded in the system creates adverse results. Culturally we have evolved to a point where the system would rather pay \$1 billion and 5% profit for a defense good, than \$500 million and 20% profit. Even though in that example the taxpayer would save over \$400 million, the focus would be on why 20% of profit was paid.¹⁸

One of the clearest statements reflecting the fundamental clash of corporate incentives with DoD practices and a long-time defense-oriented company was by the well-respected CEO of General Dynamics, Phebe Novakovic. Clarifying her company’s decision to withdraw from competition for a new Pentagon jet trainer, she explained that changing Air Force requirements (called “creep” in the business) had increased the upfront costs of competing while reducing the magnitude of potential returns.

We are not going to compete for programs where we do not believe we can get a fair and sufficient return. Chasing revenues that don’t have good earnings doesn’t help us or shareholders one lick. This really has more to do with discipline of how we run our company, rather than response to any particular program. We’re just not going to compete in programs where we don’t think we can make a fair and good return.¹⁹

What Novakovic didn’t say was the requirements creep that was driving the competitors away from existing aircraft (called non-developmental items) and towards a clear sheet design also would likely raise the cost and increase the time it would take to deploy the new trainer.

A very recent example of the impact of growth and profitability on corporate decision making is the decision by Pratt & Whitney to sell its Sikorsky unit. According to industry analysts and company officials, while Sikorsky was making reasonable returns and had a significant backlog, its numbers were just not as positive as other portions of the business.²⁰

Competition as a Disincentive

Governments, like individuals, can suffer from the effects of too much of a good thing. This is the case when it comes to the degree and intensity of competition for Pentagon contracts. The current DoD leadership sees increased competition as a way of reducing costs. Unfortunately, too often, what the drive for more competition produces is too many companies chasing too few contracts. As a consequence, even if prices come down so too will quality, reliability and trust between the government and the private sector.

The DoD sits uncomfortably on the horns of an acquisition dilemma. It wants to reduce costs and timelines associated with acquisition of weapons systems, both new programs and upgrades, while simultaneously preserving the unparalleled quality of U.S. military capabilities. One of the primary ways DoD is seeking to achieve the former is by increasing opportunities for competition, if not in the production of major items then for the systems and subsystems they employ, as well as sustainment of existing platforms and weapons systems. To that end, the Pentagon has been pushing the idea of open architectures so that a wide range of components and systems can be plugged into a network deployed aboard a platform. This approach mirrors that of consumer electronics such as

¹⁸ Chao, *op. cit.*

¹⁹ Jill R. Aitoro, “[Why General Dynamics’ CEO decided to ‘politely bow out’ of the \\$11B Trainer-X program,](#)” Washington Business Journal, April 29, 2015.

²⁰ Aaron Mehta, “[Analysts: Sikorsky Decision May Signal Trend,](#)” *Defense News*, March 14, 2015.

smartphones and computers which can integrate new hardware and applications almost automatically.

The U.S. Air Force is the most aggressive of the services in looking for ways to open major platforms and weapons systems programs to greater competition. It is experimenting with the use of non-traditional acquisition authorities in order to speed up the process and reduce the burden of regulations and oversight, thereby saving both time and money. Most recently, the Air Force announced that it intends to allow companies other than the original primes to compete for block upgrades to the new Long-Range Bomber and possibly even the F-35 fighter.

Unfortunately, airplanes and missiles are not like smartphones and personal computers. They are remarkably complex systems. Integrating new capabilities is a challenging endeavor. This same depth of understanding, experience, data and technical skills is needed by private sector companies, not only the systems integrators, but the providers of subsystems and components. Acquiring such a deep understanding can take years. It can be quite costly, particularly if a company desires to develop the human capital and technical qualifications necessary to compete against an incumbent on a contract. This is one of the primary reasons why high-tech companies, particularly those in the aerospace and defense sector, focus so much attention on qualifying and training their subcontractors. The customer may pay more for subsystems and parts, but can make up for this in greater reliability, smoother operation of the supply chain, more rapid responsiveness to changing requirements and reduced error rates.

It is noteworthy that while the Air Force may be leading the charge on expanding competition for upgrade work on major platforms, it also has the worst record in the DoD when competing its current contracts on sustainment and upgrades. According to the Government Accountability Office, in Fiscal 2014 less than half of all Air Force contracts were awarded based on competitive procurement. The reason for this was the number of mature and aging systems. Across the entire DoD, there is a growing challenge to the goal of increasing competition because often “only one responsible source” able to meet the requirements exists. When it comes to commercial items, the incumbent may also have invested in proprietary intellectual property which no competitor can duplicate.

Simply put, there are few incentives today for private companies, including those that specialize in defense products, to invest in the required know-how, personnel, equipment and management systems to compete against incumbents for sustainment and upgrade work. If they win such a contract, the new incumbents must deal with learning curve issues, vetting and managing their supply chains and developing the necessary understanding of the platform or system they are supporting while simultaneously meeting its corporate interests in a satisfactory return on the initial investment. Even if all technical issues can be addressed rapidly and smoothly, the period of performance for the new contract may not be sufficient for the winner to recoup its costs. These are some of the reasons why certain defense companies also are foregoing competitions for major new start programs.

To attain cost reductions across successive competitive procurements, more solicitations were structured so that the winner was determined based on the standard of the Lowest Price, Technically Acceptable offer. Under LPTA, bidders had to meet a minimum threshold with respect to competence and proposed work programs. Factors traditionally employed in determining best value to the government (a bidder’s past performance, technical approach, management plan, ability to exceed minimum requirements, etc.) are not considered. Consequently, LPTA solicitations became “price shootouts” that allowed minimally qualified bidders to become credible candidates and produced a race to the bottom as bidders focused on cutting capabilities in excess of those needed to meet minimally acceptable performance standards.

A similar phenomenon is occurring as a result of the expanded use of indefinite delivery/indefinite quantity contracts (ID/IQ). This approach makes sense in cases where the Pentagon wants to purchase large quantities of different commoditized goods and services. Programs such as the Defense Logistics Agency's Tailored Logistics Support Program, Naval Sea Systems Command's SeaPort-Enhanced and the Army Sustainment Command's Enhanced Army Global Logistics Enterprise have demonstrated a remarkable ability to streamline the procurement and supply chain process while simultaneously improving responsiveness and reducing costs.

However, there is a darker side to ID/IQ contracts. In too many cases, winning such a contract does not mean a company actually gets any work. An ID/IQ is often just a gate pass with the real competition taking place for task orders. Companies often do more marketing after they win in order to get money for task orders. Some ID/IQ contracts require all winners bid on every task order, regardless of their competence in that specific area or the likelihood that they can recoup their costs, should they win. These requirements impose costs on both the government and companies.

Ironically, too much competition or the wrong kinds of competition can result in the loss of something the Pentagon values very much: innovation. In a perfect market, relentless competition drives down prices by forcing companies to reduce all nonessential costs, including investments in R&D to produce new products. As William Lazonick, Director of the University of Massachusetts' Center for Industrial Competitiveness, stated, "The basic problem with the theory of perfect competition is that, as consumers and workers, not to mention as taxpayers, we want some firms in an industry to transform technologies to generate higher quality, lower cost products than their competitors. We do not want firms to maximize profits subject to given technological conditions."²¹

Increasing Barriers to Commercial Companies Entering the Defense Market

The traditional way of financing innovation in the aerospace and defense (A&D) industry has been to rely on institutional customers such as the defense department and NASA in the United States, and national defense and space agencies in Europe. This worked as long as the technologies used for A&D applications were unique and ahead of those used in commercial fields. It created a kind of closed innovation ecosystem, with its own organization (e.g., prime contractors and system integrators), processes (such as technology readiness levels, concept and technology demonstration or developmental test and evaluation) and cycles (five, ten or more years). As with any closed system though, rigidity and bureaucracy have crept in and the whole system has become largely inefficient. That is how you end up with a price tag of \$200 million for a fighter aircraft, satellite or launcher.²² Senior DoD officials have made greater access to commercial technologies from non-defense companies a central feature of their plans for the promotion of defense innovation and the continuation of U.S. military-technological preeminence. According to these officials, the locus of innovation has shifted from the government, particularly DoD, to the private sector, generally, and to companies without significant defense business, in particular.

As anyone who follows defense acquisition policy knows, there is a yawning chasm between the Pentagon's vision of making commercial companies a major part of the defense technology and industrial base and the barriers the defense acquisition system creates for those companies' entry into the defense marketplace. Meeting the requirements of federal acquisition regulations, creating a unique, parallel accounting system, collecting certified cost and pricing data for an entire supply

²¹ William Lazonick, "[What's Perfect about Perfect Competition?. A Prosperous Economy Needs Innovators.](#)" *Huffington Post*, September 1, 2011.

²² Antoine Gelain, "Opinion: A&D Must Disrupt Its R&D Funding Routine," *Aviation Week & Space Technology* December 15, 2014.

chain, and potentially risking loss of commercial intellectual property are powerful disincentives for companies to do business with DoD. The Pentagon leaders want access to 21st century commercial technologies and production capabilities, but they want to do so using the acquisition policies and practices of the last century.

In one of its most recent reports, the Defense Business Board explored ways that DoD could incentivize the commercial sector to help with rapid product innovation. As many senior defense officials will admit, the military is no longer the engine of innovation it was during the Cold War. Increasingly, state-of-the-art products and services, everything from cold weather gear to electronics, jet engines and robots, are coming from the private sector and being adapted by the military for its purposes. The private sector can produce world-class products in a time frame and for a cost that are fractions of what can be achieved by the sclerotic defense acquisition system.

Defense companies have demonstrated what can be achieved with rapid and innovative product development when not under the system's thumb. The helicopter maker Sikorsky used its own resources to design and build a radically new type of helicopter with a wealth of innovative technologies, the S-97, in just four years. Similarly, Textron and AirLand Enterprises took just two years to build the Scorpion, a light attack, surveillance jet aircraft. Designed for ease of production and low cost, the Scorpion maximizes the use of components from existing aircraft.

In its latest study, the Defense Business Board has attempted to tell the Pentagon how to leverage the innovative energy of the private sector and, in particular, that of companies which don't typically do business with the DoD. The task force concluded that "DoD lacks sufficient understanding of business operating models and drivers of innovation."²³ The report calls on DoD to act more like a normal customer, buying commercial items without overlaying on the transaction all of its unique rules, reporting requirements and standards. Items developed and produced by private companies with their own money for the commercial marketplace should be treated as such by the Pentagon. It also means ending the war on profits; no profit means no incentive for the commercial industrial base to support DoD.

Another challenge for commercial companies entering the defense market is the impact of export control laws on their business plans. On more than one occasion, private companies have contracted with the Pentagon to produce a modified version of a commercial platform only to discover that even small changes to the basic design of the commercial vehicle rendered the entire platform subject to export controls. A recently published defense acquisition regulation would by default classify as a "defense article" any electronics developed with defense department funding, regardless of the degree of sensitivity or whether it also will be part of a civilian electronics system. Thus, commercial companies hoping to use DoD research funds to improve the value of their commercial products could find themselves locked out of the export market.²⁴

New Rules that Could Have Negatively Impacted IR&D

The defense department's office for Acquisition, Technology and Logistics (AT&L) has been trying to reform its policies for the \$4 billion spent annually on Independent Research and Development. IR&D is defense contractors' investment in basic and applied research and development for which DoD will provide reimbursement. Companies accumulate IR&D funds based on the work they do for

²³ Paul McLeary, "[Advisors to DoD: Help Private-Sector Innovators Help You](#)," *Defense News*, July 26, 2014.

²⁴ Sandra Erwin, "[New Export Rule for Defense-Funded Technology Raises Alarms](#)," *National Defense*, July 1, 2015.

DoD; funds are built into the cost structure of Pentagon contracts. Often the company will supplement the IR&D funds with its own corporate R&D resources. Until recently, companies had broad latitude regarding the use of IR&D funds. This allowed them to work on high risk ideas, creating the possibility for a significant improvement in the performance of an existing system or even a revolutionary breakthrough leading to the creation of a new and dominant military capability. Obviously, the company conducting the IR&D hopes that such success will lead to an advantage in competing for future contracts.

Recently, AT&L sought to establish greater insight and even influence control over the topics on which companies spend IR&D dollars. This is a reflection of the concern that the U.S. military is losing its technological edge and that it takes too long and costs too much to bring new capabilities into being.

The IR&D policy reforms carry with them a major risk of provoking negative unintended consequences. Companies must find a sponsoring organization for their IR&D efforts and justify their ideas before initiating work. This is wrong for many reasons. What about the absolutely brilliant, transformative idea that no DoD entity wants to sponsor? Conversely, the new requirement is likely to encourage “sponsor shopping” by companies. Because most potential sponsors are focused on acquiring current systems or supporting current operations, this will inevitably drag IR&D even more into the near-term, exactly the opposite result from what AT&L wants. Finally requiring “pre-reviews” of proposed projects will act like a tax on scarce IR&D resources.

Given the incentive structure for DoD program managers, the requirement to find a sponsor for IR&D could become even more deleterious to the process of innovation. A program manager may be willing to state needs or project future needs of his/her agency/office, but will they be willing to “endorse” an IR&D project and do so in writing? They may not want to take on this responsibility which is, in effect obligating government money. Will AT&L provide special procedures to permit program manager’s to do so? It is unlikely at best. And since the premise (false as it may be) is that IR&D is “reimbursed by the government” they won’t be able to endorse the project in writing unless special procedures for them are written into the regulations, which are unlikely.

But, say that AT&L provides for a procedure to “endorse” IR&D. Since they are now in a position to decide and endorse spending of government money, the program managers naturally will seek to protect themselves from accusations of bias or making an improper “endorsement.” They begin to require supporting data and papers before they take such a serious step. They will require forms, written proposals, competition and review by experts. In other words IR&D “endorsement” will devolve into a competitive procurement situation. The time associated with getting an IR&D project underway will increase, costs will go up and real spending on actual R&D by industry goes down even further.

In response to criticism from academia and industry, and upon reflection, AT&L wisely narrowed the focus of its revisions of IR&D policy. In an August 2015 white paper, Under Secretary for AT&L, Frank Kendall, described the desired interaction between government and industry thusly:

By law and DoD policy, contractor IR&D investments are not directed by the government - they are identified by individual companies and are intended to advance a particular company's ability to develop and deliver superior and more competitive products to the warfighter. These efforts can have the best payoff, both for the DoD and for individual performing companies, when the government is well informed of the investments that companies are making, and when companies are well informed about related investments being made elsewhere in the government’s Research and

Development portfolios and about government plans for potential future acquisitions where this IR&D may be relevant.²⁵

In essence, this is an example of DoD successfully avoiding the creation of a disincentive for industry, one that could have severely impeded the development of advanced capabilities that the department desperately desired. It can only be hoped that the encouragement for government and industry to engage in a dialogue will further the latter's ability to fulfill the former's requirements.

Management of Supply Chains

The Pentagon spends some \$200 billion annually on logistics and sustainment. By adding in support and training functions such as military communications and pilot training that countries like the United Kingdom have privatized, the number could be as high as \$300 billion or nearly three times the current procurement budget. If DoD wants real budget savings and improved warfighting outcomes, the Pentagon needs to adopt proven commercially-derived logistics and sustainment practices. Where it has done so, for example in the C-17 global sustainment program, DoD costs decrease and aircraft availability increases. Similarly, commercial logistics providers such as UPS have spent more than a decade providing affordable logistics support to U.S. forces in Iraq and Afghanistan. Privatizing non-core military functions could save tens of billions of dollars and free up hundreds of thousands of uniformed personnel and government civilians for more important tasks.

DoD is resistant to the widespread use of commercial best practices in logistics and sustainment because it means giving up some control over resources, people and equipment. What Pentagon officials, particularly program managers, have to realize is that the key to successful cost reduction is giving up control over much of the process, relying instead on the incentives of a free market-oriented approach with properly written contracts to drive the desired behavior by the private sector.

General Motors learned a lesson the hard way about placing competition ahead of long-term, stable relationships with its suppliers. Decades of pressuring suppliers to reduce prices and conducting revolving competitions created a hostile atmosphere across the supply chain and disincentivized collaboration. *The Wall Street Journal* reported that now GM is radically reversing course. It is looking at establishing long-term contracts, up to a decade in length, to reduce costs and improve access to innovative technologies. According to a GM official, "by locking suppliers into longer-term contracts and looping into vehicle designs earlier in the process, the auto maker can expect suppliers to share more innovations and better processes that help save money. We want them to double down on us." In other words, GM is taking into account in its contracting framework the sub-contractor's incentive structure.²⁶



²⁵ Honorable Frank Kendall, *Enhancing the Effectiveness of Independent Research and Development*, White Paper, Office of the Under Secretary of Defense Acquisition, Technology and Logistics, August 26, 2015, p. 2.

GM could teach DoD another lesson, one about the opportunity costs associated with trying to establish smothering controls over the private sector. According to a report in *Automotive News*, this new framework provoked a serious backlash. “Some suppliers and their attorneys interpreted the new terms and conditions as giving GM far broader authority to recover warranty and safety-recall costs, to take over suppliers’ intellectual property rights and to access their financial information.”²⁷ After a few months of discussions with its suppliers, GM rolled back its new framework. It realized it was a waste of effort to fight with suppliers over access to intellectual property and pricing information, when what it really wanted to focus on was collaboration on technology, quality and reducing waste to lower costs.

These are precisely the issues raised by companies doing business with the Pentagon over the department’s ongoing efforts to take corporate intellectual property, to acquire certified cost and pricing data on commercial items and to force companies to accept fixed-price contracts on new-start programs that greatly increase their vulnerability to cost overruns. What the Pentagon wants is exactly the same as GM’s desires – technology, quality and lower costs. But acquisition policies drive the conversations with industry in an entirely different direction, encouraging an adversarial relationship, increasing costs, slowing down innovation and disincentivizing participation in defense programs.

CONCLUSIONS

The U.S. government faces a very dangerous future if it does not provide greater incentives for private companies, particularly commercial enterprises, to do business with the Department of Defense. Private companies, even those heavily invested in defense work, have the ability to choose how they invest their resources and the contracts on which they will bid. This ability to choose has resulted in the lack of competition for such programs as the combat search and rescue helicopter and armored multipurpose vehicle. Non-defense companies can easily avoid the defense market entirely.



Multi-year procurements, like the Virginia-class submarine program, reduce the costs of production and increase efficiency.

The one thing that those in both the Executive and Legislative branches responsible for DoD acquisition could do to incentivize industry is to provide planning predictability and budget stability. Even if actual quantities of new items procured are limited, industry can adjust and scale their workforce and facilities to meet expected demand. What industry cannot do is hold on to capabilities and people when there are no revenues for them to generate.

If DoD wants companies to innovate it will have to buy goods and services. Companies, whether selling to DoD or the commercial market, live or die on the basis of sales. No sales means no revenues, no profits and no company. The Pentagon now buys so little that companies cannot see how spending scarce resources on innovation

²⁶ Jeff Bennett, “[GM Seeks Longer-Term Supplier Contracts in Bid to Cut Costs](#),” *The Wall Street Journal*, April 15, 2015.

²⁷ Mike Colias, “[GM rolls back contentious terms in purchasing contract](#),” *Automotive News*, February 11, 2014.

will help their bottom line. In fact, to the extent that introducing innovations adds to cost, schedule and risk, even if only at the beginning of a program, there is a positive disincentive to invest.

The Pentagon can provide predictability while also getting a good deal through the use of multi-year procurement contracts. Multi-year programs allow the manufacturers to acquire materials in greater bulk and move their workforce farther down the learning curve, thereby reducing the costs of production. The Virginia-class nuclear-powered attack submarine program has achieved significant reductions in material costs and labor inputs by using a contracting mechanism called block buys. This allows the builders to freeze the design, buy materials and major components (e.g., nuclear reactors) in economical quantities and improve labor productivity. Multi-year procurements and block buys also save DoD money indirectly by reducing the administrative costs associated with more frequent competitions.

A second way private companies can give the Pentagon a price break while making more money is through the use of modern logistics and transportation methods that optimize the use of physical assets and workers. This is what UPS and FedEx do every day. U.S. Transportation Command achieved major cost reductions and improvements in services through its Defense Transportation Coordination Initiative. A private contractor, Menlo Worldwide Government Services, LLC, provides shipment planning, optimization, the movement of materials and overall transportation resource management for defense material shipments moving into and among DoD facilities in the continental United States.

Manufacturers can both increase their profit and provide customers a better bargain by improving the quality and reliability of their products while holding prices relatively steady. Car manufacturers learned this lesson decades ago and now commonly offer ten year/100,000 mile warranties on power trains. Commercial aircraft engine manufacturers are moving in this direction as well.

DoD has even made it hard for companies to innovate in sustainment. Many companies have found success in innovating to support their products in the aftermarket. This is particularly true for companies such as auto makers and jet engine manufacturers that promise a specified level of reliability or performance for their products. It is worth investing in innovations that improve reliability or on-wing time because it reduces the costs of repairs, resulting in increased profit. This is known as Performance-Based Logistics and it is a win-win approach to innovation. Despite proven successes using this methodology, DoD has refused to make it a central part of its maintenance and sustainment strategy. The Pentagon would rather spend more than it needs to than allow its contractors to make additional profits.

Most private contractors work very hard to be a good partner to DoD. Despite the attitude of many in the acquisition bureaucracy, they are motivated by more than money. The Pentagon needs to reciprocate this commitment by becoming a good partner to industry. Under Secretary Kendall, has advocated for better training for acquisition professionals. A significant part of that training should be in microeconomics – that portion of the “dismal science” that deals with how companies operate.

This leads to the larger issue: the need to change DoD’s acquisition culture in order to incentivize both government and the private sector. Without a major change in DoD’s own culture, the effort to make the acquisition system more efficient is more likely than not to enhance inefficiency. In particular, it will almost certainly engender a more combative relationship between DoD and the private sector. The defense industry has repeatedly shown itself willing to adapt to meet changes in the way the Pentagon decides to conduct itself. Whether it is fixed price versus cost plus contracts, the use of commercial items, basic ordering agreements, small business and minority set aside, performance-based logistics, contractor logistics support arrangements or systems engineering and

technical assistance support, the private sector has responded to every invention and notion the bureaucrats have devised and continued to support the warfighters.

The major stumbling blocks facing the defense department are not the attitudes or behavior of the private sector but those historically exhibited by the government. DoD has shown no willingness to reduce its need for control, not only over all aspects of the acquisition process but also over requirements generation, budgeting, testing and evaluation. Unfortunately, there is no evidence from the Pentagon's efficiency initiatives or statements by senior officials that DoD is willing to reduce its desire for absolute control over the acquisition process or contracting activities. It still seems to want the degree of freedom it has always had to add requirements, move money around, change production rates, etc. But, at the same time, it now wants increases in efficiency, reduced costs, high productivity and adherence to schedules. The Department of Defense acquisition system will not be more efficient until the chief culprit, the government bureaucracy, is reined in. What is needed here is reform of the acquisition culture in DoD.

Glossary of Acronyms

A&D	Aerospace and Defense
AT&L	Acquisition, Technology and Logistics
CEO	Chief Executive Officer
DoD	U.S. Department of Defense
GM	General Motors
ID/IQ	Indefinite Delivery/Indefinite Quantity
IR&D	Independent Research and Development
IT	Information Technology
LPTA	Lowest Price Technically Acceptable
NASA	National Aeronautics and Space Administration
OEM	Original Equipment Manufacturer
R&D	Research and Development

