Procurement in 2025:
Smarter Ways to Modernize

A Research Paper
Presented To

Air Force ***2025***

by

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Disclaimer

2025 is a study designed to comply with a directive from the chief of staff of the Air Force to examine the concepts, capabilities, and technologies the United States will require to remain the dominant air and space force in the future. Presented on 17 June 1996, this report was produced in the Department of Defense school environment of academic freedom and in the interest of advancing concepts related to national defense. The views expressed in this report are those of the authors and do not reflect the official policy or position of the United States Air Force, Department of Defense, or the United States government.

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Preface

The changes suggested in this paper reflect personal experience in military requirements while serving in the Air Force and personal experience in manufacturing after retirement from the Air Force. My civilian experience includes two years as general manager of an aircraft plant that had over 8,000 employees and both military and civilian contracts. Presently I am a parts manufacturer for several well-known companies. Whatever biases appear in this paper stem from 45 years spent in these occupations.

Executive Summary

Defense spending, lacking the threat of general war, is unlikely to grow between now and 2025. The onrushing balanced budget era spells even more trouble for defense. Annual debates over personnel costs, readiness, operation and maintenance (O&M), and procurement will increase heat but offer little light. In an austere environment, our current procurement practices will either saddle the Air Force with outmoded systems or cause us to swap force structure for increasingly expensive new systems. Neither outcome serves our nation well.

The defense industry has changed since the Cold War ended. Large firms have absorbed smaller ones. Other large firms have merged with former competitors. More consolidation seems inevitable. This shrinkage reflects economic reality—there are too few procurement dollars to support the cold war defense industry. Presumably, surviving firms are the fittest; and national security demands a healthy defense industry to protect vital industrial capabilities.

The Air Force expects the aerospace industry to produce weapon systems that touch the outer limits of technology, that are sustainable within the Air Force logistics system, and that have reasonable prices. Given that the aerospace industry had to downsize, it is not clear what effect downsizing will have on procurement policy. Nor is it clear how downsizing will influence weapon system performance, sustainability, and pricing. One thing is clear unless procurement policies change, dissatisfaction will continue to exist.

Present procurement practices are *too costly, too highly supervised, too cumbersome, too slow, and too secretive*—and these five dissatisfactions interact. For example, the last four drive the first upward. DOD must radically change procurement practices to reduce these dissatisfactions.

The following pages discuss changes that should occur. The way major contracts are awarded tops the list. DOD should award only design, engineering, and final assembly contracts to aerospace firms. The remaining contracts for most parts, subassemblies, and systems should be awarded directly to firms in the cost-effective, commercial sector. Computer aided design/computer aided manufacture (CAD/CAM) technology makes outsourcing a practical, low-cost method for manufacturing. DOD needs fresh faces from nondefense industries—and a better comprehension of modern industrial practices—in order to institute these changes.

The cost burdens associated with oversupervision, overinspection, excessive paperwork, and unreasonable security are correctable. DOD imposed some of these burdens; others resulted from congressional overview and intervention. In every case, solutions are possible—and the future Air Force will suffer if present procedures continue without change.

Setting the Stage

In order to look ahead 30 years, one makes assumptions that seem plausible—at least to this author. These assumptions provide a venue for examining tomorrow's policies. Lacking credentials as a soothsayer, the author recognizes that his specific assumptions may fail the test of time. Nevertheless, most of the changes recommended should benefit future procurement policies.

A balanced budget era will occur, sooner or later, and its impact will increase the tension between social entitlements and military requirements. Defense spending in constant dollars will not exceed present levels unless there is general war. Regional wars and excursions may briefly raise the budget threshold, but the additional money will be largely spent on operating costs. The Air Force budget will be tight(er), and internal debate over personnel costs, readiness, operation and maintenance (O&M), and procurement will increase. One positive affect of internal debate will be the realization that *radical* change is necessary in order to accomplish current and future missions. Organizations that don't change, die!

Air Force procurement for weapon systems between now and 2025 will struggle with conflicting factors. New technology will appear, and it will be attractive. However, tradeoffs between force structure and weapon effectiveness could push the Air Force into becoming too small for the worldwide mission or too obsolete to meet then-current requirements. Naval Air Force experience in the Gulf War is a recent example of the latter outcome. Nevertheless, Office of the Secretary of Defense (OSD) inclination will be to protect force structure from further drawdown. Making do with old systems will be the name of the game unless lower-cost procurement becomes possible.

Economies of scale that were possible in the past will virtually disappear from the weapon system procurement process. The F-16 may be the last Air Force weapon system to enjoy a large production run. The C-17 may be the last transport between now and 2025. The B-2 may be the first weapon system that dies because, among other reasons, Congress and the public do not understand economies of scale. Before this thought is rejected by advocates who see thousands of F-22s and joint advanced strike technologies in their procurement gunsights, let me suggest that their optimism will quickly die unless ways are found to dramatically reduce procurement costs.

The "defense industry" we have known will disappear except for a few corporations. The transformation of several firms into what is now Lockheed Martin serves as a classic example The nuptial arrangements between Boeing and McDonnell Douglas were recently disrupted by the timely arrival of a new suitor (Uncle Sam) with a large C-17 contract. But the shrinking process is well underway and the end is not in sight.

Remaining defense firms will be scaled back, will lack the flexibility offered in the past, and will have conflicting interests because of financial opportunities in the much larger civilian market. Corporate mergers and fewer military orders will cause skilled engineers and machinists to migrate to civilian industry where their long-term interests are better served. A worrisome analogy is the dominant position the US once held in nuclear power. When nuclear power became politically incorrect and career opportunities shrunk, bright young college students avoided nuclear physics and nuclear engineering. Today, world leadership in nuclear power lies elsewhere. Are potential Kelly Johnson's of the future turning away from aeronautical engineering as a career?

The international market will keep the US aerospace industry alive. Boeing remains the dominant commercial aircraft manufacturer in the world because of orders from foreign airlines and resurgent US airlines. McDonnell Douglas stays in the fight for second place despite subsidized Aerospatiale's best efforts. Many nations, particularly third world, still prefer American military aircraft and associated weapons for a variety of good reasons: proven performance, excellent parts support, competitive price, available training, political pressure, and so forth. Will this benign relationship with foreign purchasers help the future United States Air Force (USAF)?

The answer is a complex one. Regional alliances are strengthened when allies use common weapon systems that minimize logistical, training, armament, communication, and planning problems. When production lines in the US can stay open by building aircraft for other nations, the manufacturer is able to maintain facility, production lines, work force, and profitability. This ongoing production offers a relatively inexpensive source for US replacement aircraft and spare parts.

Serious limitations remain, however. Political and economic pressures make it extremely difficult to discontinue production, even though the aircraft being produced has long since been overtaken by newer developments. Meanwhile, inside the facility, machines grow old and outmoded. Engineers are unchallenged while marketing creates briefings to convince Congress and the Pentagon that their sow's ear really is a silk purse.

Without significant new development and production programs, the outlook will not be bright for the military side of US aerospace. Cold war money provided the impetus for developing and building the best military aircraft in the world. But the military side of US aerospace, now leading the world, may lose its dominance as programs dwindle, talent disappears, and technology drifts overseas.

A rough analogy may be the pre-World War II (WWII) era, circa 1941: excellent technology in US commercial aircraft, mediocre technology in US bombers, and mediocre-to-poor technology in US fighters. In regard to technology drifting overseas, we are "whistling in the dark" if we do not recognize that business and government policies which send our technology overseas in exchange for current business will eventually hurt the weakest members of the aerospace industry. If military contractors become the weakest members of our aerospace industry, then we should expect Europe, Japan, China, Israel, and Russia—using proven American technology—to overtake our lead in military aircraft.

The recent skirmish over maintaining air logistic centers (ALC) or privatizing repair was only a partial victory for the ALCs. Political factors obviously weighed heavily in the final decision process, with ALCs being closed in California and Texas. However, the argument that manufacturing skills and expertise could be retained in the aerospace industry through privatization of aircraft repair was exaggerated. *There is little commonality between repairing an old aircraft and manufacturing a new one.* Manufacturing skills are minimized in a repair facility. To illustrate, imagine the different process used to manufacture and assemble an aileron for an aircraft in serial production and the process used to repair the aluminum skin on one aileron. Yet, despite the obvious distinctions between these capabilities, future battles over privatization of the Logistic Centers will favor private industry because of costs and political pressures. Once this conversion has run its course, the Air Force should not assume that Aerospace Company X's repair facility can quickly become a production facility—and vice versa.

Air Force Materiel Command (AFMC) will continue to consolidate and shrink as the Air Force realizes the huge burden it places on the procurement process. The first sign of this shrinkage will occur when AFMC decentralizes control by moving system program officers to the centers. (Air Training Command [ATC] successfully decentralized years ago.) The Air Force will finally pay more than lip service to the term "empowerment" and follow industry's example. Communications and computers have eliminated the need for many administrative positions—politely called

"middle management" in civilian industry. The ax will also fall on the remnants of systems command because most technical work will be privatized. Once privatized, the oversight function should be performed by a smaller staff.

What's Wrong With Procurement Today?

Criticisms abound, and many solutions have been offered by Congress, Pentagon officials, the media, whistle-blowers, and so forth. In my opinion, many criticisms have been shallow and ill-founded. Many solutions were therefore inadequate. But the five basic criticisms persist and are probably correct. They are repeated here: *high cost; too highly supervised; too cumbersome; too slow, and too secretive.*

The number one deterrent to modernization is *high cost*. In the McNamara era, the services accused OSD of using the following rationale for killing most weapons system proposals: "One, we don't need it. Two, even if we need it, it won't work. Three, even if we need it and it works, it costs too much." Except for a brief period in the '80s, the third reason still dominates the decision process. Measuring school lunch programs against new bombers may not be logical but it rings a sympathetic bell with John Q. Public. The net affect of constantly escalating procurement costs has been a steady decline in force structure. All of the assumptions listed earlier suggest the upward spiral will continue unless radical change occurs.

Defense procurement is *oversupervised* from top to bottom. Congress, reacting to "$600 toilet seats" and similar minutiae, has imposed a bureaucratic nightmare of reviews, regulations, and policies. OSD, not to be outdone, layers programs with excessive review and more regulations. In turn, the secretaries of the Air Force impose themselves and their staffs into the supervisory role. The air staff and major commands expend increasing resources and time on program management, answering/asking questions, and telling Air Mobility Command (AMC) personnel how to do their job. AMC links the entire supervision chain with industry and is a sinkhole for even more money spent on supervision. And finally, at plant level, military inspectors inspect the already inspected. The defense industry maxim, "Give 'em the parts, charge 'em for the paperwork!" reflects industry's attitude toward this bureaucratic nightmare.

Procurement costs in the defense budget do not include the costs of government supervision for specific programs. If government supervisory costs were allocated as program overhead, individual program costs would be

significantly higher. It would be a real eye opener to include a rough estimate of all these hidden, supervisory costs in any big program. Start with the average hourly wage of the government workers (blue suit, civilian, congressional OSD, administrative), add fringes and overhead, multiply by man-years, then add the total to program overhead. This number would show Congress and senior defense officials the unhealthy contrast between the extremes of "Sam Walton"-type management and military pyramid management. A healthy, cost-conscious system would eliminate most intermediate supervision..

The entire procurement process is *too cumbersome* and complex. Businesses hesitate to seek government contracts, even when production levels are reasonably high. Philip Odeen, President and Chief Executive Officer of BDM International, Inc., and Chairman of the Defense Science Board's task force on privatization, makes this same point. When production levels are low—the norm in future years—more businesses will avoid government contracting. The reason for avoidance is simple: commercial business is more profitable and has fewer headaches, often leaving "bottom fishers" competing for the few government contracts available.[1]

Military procurement is *too slow* by any reasonable standard. Weapon systems take too long to get approval; too long to build; too long to test; and too long for any company, except within the subsidized defense industry, to accept the risk involved in making a profit. The advanced manned strategic aircraft, "AMSA", a.k.a. B-1, is the classic example. First postulated as a requirement in 1962, it was studied throughout the '60s, prototyped in the '70s, killed by President Carter in 1977, resurrected by President Reagan in 1981, produced in the '80s, and finally reached limited combat utility in the late '90s! Meanwhile, Air Force determination to "hang in there" with the B-1 has caused alternative proposals based on better technology to be placed on the back burner.

The procurement of new weapons is *too secretive.* Secrecy costs big money and big time. Secrecy denies the American public the opportunity to become aware of the merits of an expensive project during development when political support is badly needed. Secrecy prevents the military from defending projects which are attacked by media know-nothings.

On the other hand, publicity about big projects can produce salutary affects. When President Lyndon Johnson disclosed the SR-71, the public response was enthusiastic and supportive. When President Carter disclosed (to the dismay of the military) the stealth fighter, public response was once again positive. The Strategic Defense Initiative, labeled "Star Wars" by the media, may or may not have been an effective weapon system but the *economic*

consequences of competing with SDI overwhelmed Soviet leaders. The sad news about our efforts to maintain secrecy during procurement is that leaks and compromises usually result in premature disclosure anyway.

The notion that every production worker on a major weapon system has to have a secret or higher clearance should be critically examined, then discarded as nonsense. As a starting point, workers on parts and subassemblies are unable to determine performance or system characteristics because of their limited exposure to the entire project. Once a weapon system begins production, enough lead time has been established over copy-cat foreign systems so that the cloak of secrecy could be removed, costs reduced, and production simplified. Let the manufacturer worry about disclosures to competitive US firms.

Changes That Are Occurring: "Use Commercial Practices"

Manufacturers that depend upon government contracts do not compare in efficiency with commercial manufacturers in the same industry. Defense contractors blame their inefficiencies on a blizzard of government regulations and policies—an excuse that is not without merit. "Red tape" costs both time and money; it partially explains why overhead can be two or three times higher than overhead in comparable commercial companies. Large corporate staffs, low worker-productivity, excessive salaries, generous retirement benefits and other fringes, and restrictive union work rules all add to the problem. These systemic inefficiencies accelerate costs and can jeopardize major programs. Early Air Force audits of C-17 production nearly caused program termination; a bad situation corrected only after McDonnell-Douglas made major management changes.

Arcane language and excessive detail make government contract proposals a real challenge to the uninitiated contractor. Too often, contractors shy away from bidding because of their unfamiliarity with complex government regulations and policies. And those who do bid often feel compelled to hire consultant teams to translate requests for proposals and to prepare bids.

Simplifying the process should begin with defining the military requirement. The Air Force should clearly state overall objectives, but avoid describing detailed specifications. Commercial engineers contend daily with the state of the art; military planners do not. Therefore, commercial engineers can optimize the requirement if given some latitude. This is particularly true with fast-changing electronics and information systems.

The regulation and policy problem is perpetuated by high-ranking DOD civilians who are appointed to public office from defense industries. They are appointed because they "know the ropes" of defense contracting. Without accusing these officials of intentional wrongdoing, it seems obvious that the culture which provided their experience is the same culture that needs to be replaced. DOD needs fresh faces from nondefense industries.

If procurement costs are too high under the present procurement process, then change the process. Various efforts are already underway to improve contracting with private industry. Among the first is a directive to adopt "common processes by contractors in lieu of multiple, unique DOD standards and specifications."[2]

Secretary William Perry, on 6 December 1995, recognized that while, "it is generally not efficient to operate multiple, government-unique management and manufacturing systems within a given facility, there is an urgent need to shift to facility-wide common systems on existing contracts as well."[3] Secretary Perry directed Under Secretary Kaminski to promulgate guidance to the Directors of Defense Agencies to carry out his instructions.[4]

Give DLA credit for good intentions. However, "the devil is in the details." The memorandum requires the contractor to convince the government that implementing the common process in lieu of milspecs and standards on existing contracts will be advantageous to the government, will encourage the use of advanced practices, will eliminate non-value added requirements, and so forth.[5] The "common processes" initiative will become as objectionable as existing Mil standards if the government sits as judge and jury on how to make a product. The government must learn and practice the leadership maxim: "Tell them what to do, but not how to do it." Nevertheless, the SecDef directive is a sign of progress.

Today's American manufacturers compete worldwide for contracts. This highly competitive marketplace forces survivors to control costs while constantly improving quality. Successful manufacturers have newer machine technology, better engineers, experienced machinists, efficient factories, lean-and-mean staffs, motivated managers, and low general and administrative (G&A) costs. Absorbing more production is relatively inexpensive in such a company and results in manufacturing *economies of scale*. Companies fitting this description want government contracts only if government "experts" do not tell them how to run their business. If the government insists on telling such companies how to operate, thus continuing the bureaucratic nightmare, potential cost savings will disappear.

Changes That Should Occur: "Flatten the Procurement Chain"

Weapon system contracts are normally awarded to a prime contractor who typically includes other major defense contractors as part of the team. The prime and majors then turn to subcontractors for major components. The subcontractors then outsource part of their responsibility, and so on down the food chain. At each layer, the process includes oversight, inspections, paperwork, and *profit*. Figure 1 illustrates this multi-layered arrangement.

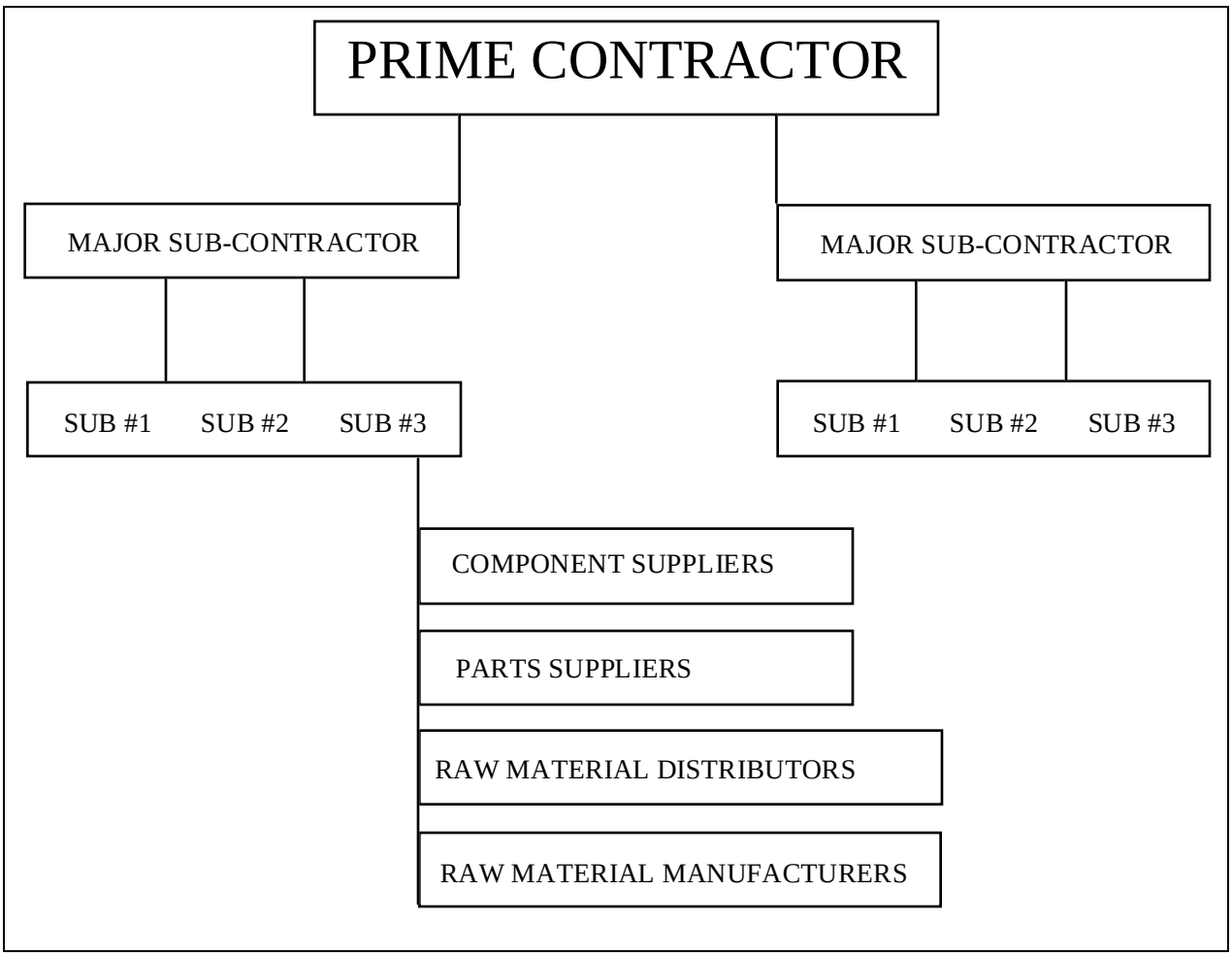

Figure 1. A Typical Production Arrangement

The compounding effect that multilayered procurement has on costs is very significant. Consider an example where the gross profit at each stage of production is 20 percent and there are only five stages of production. Assume

the part is an ejector that costs $640 for the parts supplier to make. Component supplier buys the ejector for $800, assembles the part in a thruster assembly, then sells to sub #1 for $1,000. Sub #1 builds and sells the engine chamber to a major subcontractor, the ejector representing $1,250 of the price. Major subcontractor attaches the engine chamber to the complete engine assembly and sells the entire propulsion system to the prime contractor for $1,562. Prime then sells the weapon system to the Air Force, the ejector representing $1,952 of the total price.

Now imagine a streamlined, alternative procurement system as depicted in figure 2. In this system, the prime is paid for engineering design and contract management. "Design" includes the selection of all major components and subsystems. Computer aided design/computer aided manufacturing (CAD/CAM) is the common denominator used in all these production arrangements. It allows the prime contractor to work directly with major and secondary subcontractors, thus eliminating at least one markup. Subcontractors can work directly with component suppliers, and parts suppliers using CAD/CAM and eliminating, at least one more markup. Final assembly should be outsourced as a specialized function. Selection criteria would emphasize the requirement for an existing plant, machinery, and work force.

This flattened procurement system would work because CAD/CAM works. It eliminates the error-ridden dependence on blueprints. When fed directly to three-, four- and five-axis computer numerically controlled (CNC) machines, precision parts are the result. Quality is improved and inspection costs are reduced. When the major components are ready for assembly, they fit and meet all specifications.

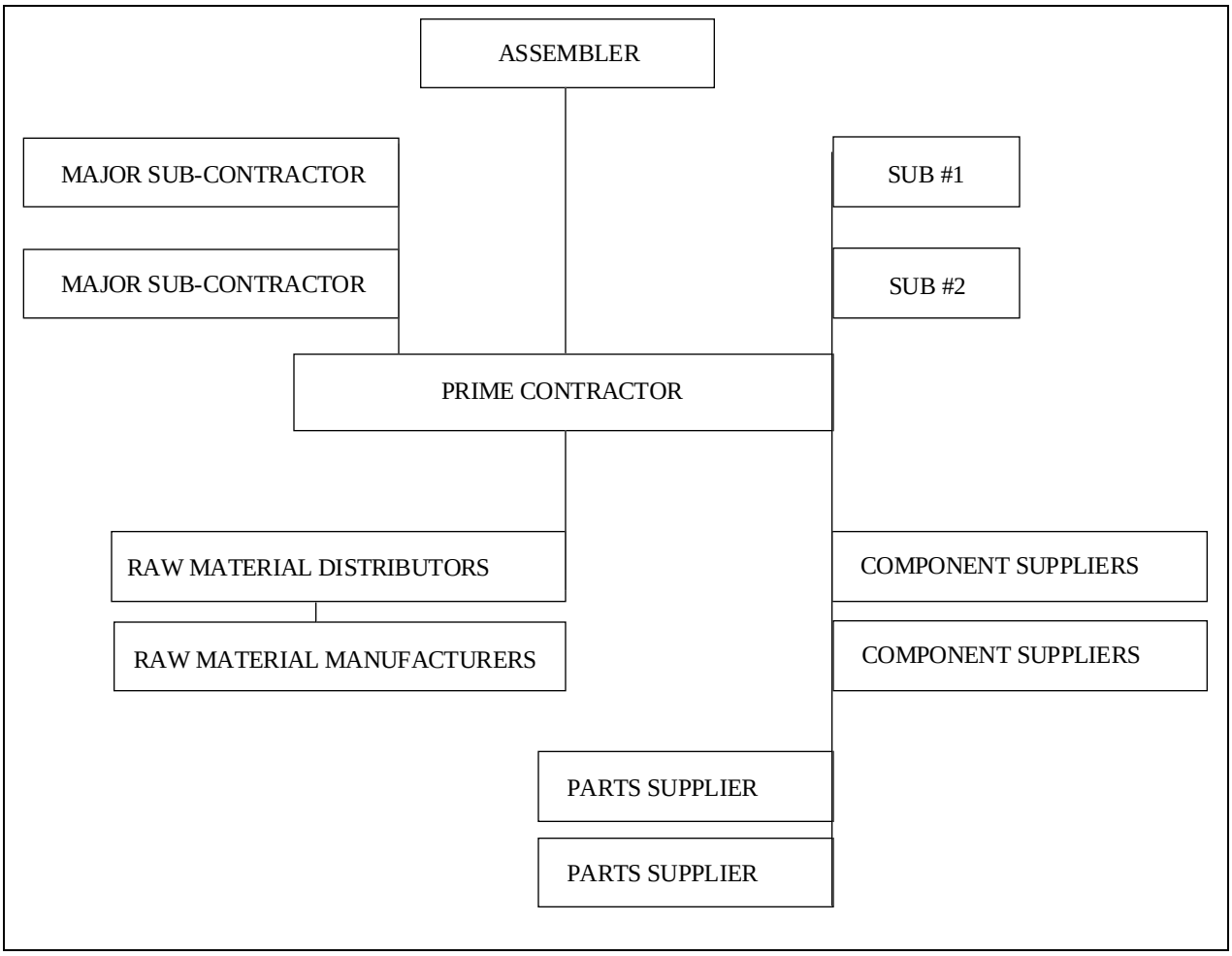

Figure 2. Contract Management by Prime Contractor

Another way to reduce the effect of progressive markups is to limit the amount that contractors can markup their purchases from subcontractors. Take the ejector example. A cap of five percent at each stage after the initial sale price of $800 would reduce the cost of the ejector to the Air Force from $1,952 to $1,033. Some companies are already following this procedure voluntarily.

Changes That Should Occur: "Minimize Investment In Plant and Equipment"

DOD wastes procurement dollars by including the costs for new plants and machines in a major program. Building and equipping plants at Palmdale and Pico Rivera were major cost factors in the B-2 program. Rockwell

had to rebuild for the B-1 program. Now that downsizing has hit defense procurement, scarcely a week goes by without some defense manufacturer auctioning machines and other equipment at fire sale prices. Most items are vintage 1980s or older, purchased for procurement in the cold war and outmoded in modern factories.

Bureaucrats may find comfort in clichés that dismiss this waste: "sunk costs"—"before my watch"—"water over the dam"—"spilt milk." But, there is little excuse for building a defense plant, buying new machines, hiring and training new workers, and so forth, when existing manufacturers can produce the same article by using or augmenting existing facilities. Separating design and contract management (prime contractor) from assembly (major contractor) will minimize this waste.

In most cases, contractors should use their own facilities. In other cases, Air Force assembly plants could be leased at minimum cost to contractors for aircraft assembly; for example, the contractor pays only utilities, insurance, and leasehold improvements. The assembly contract award should be heavily influenced by comparisons regarding depreciation, utility costs, availability of production workers, adequacy of machinery, jigs, and so forth. Separating assembly contracts from design and program management contracts would avoid situations where there is a mismatch between performance requirements (design) and production capabilities (plant and machinery). The Air Force should also avoid the notion that sharing a facility with commercial production is a no-no. Sharing facilities can create major savings.

Changes That Should Occur: "Attack Oversupervision"

Mentioned earlier are descriptions of procurement oversupervision by Congress, Secretary of the Air Force, OSD, the Air Staff, AMC and other MAJCOMS, DLA, the SPOs and plant representatives. All this staffing means time and money, as well as delayed decisions and immense overhead for contractors.

What to do? Change Congress . . . too tough. Change OSD . . . not unless you believe the tail can wag the dog. Change DLA . . . some progress might be possible if SecDef approved. Change Air Force—real change is possible.

The 1997 proposed defense budget allows the Air Force about $9 billion for procurement and $9.7 billion for research and development. Together they comprise 31.7% of the $58.9 total Air Force budget. *Defense News* stated, on 4 March 1996, "defense officials point to expenditures planned for 1998 through 2001, when procurement funding

is slated to increase by 40 percent."[6] (Reminiscent of "the check is in the mail!") Nevertheless, the dollars available for procurement, and research and development (R&D) have been drastically reduced from the recent past. Air Force needs to stretch the remaining dollars to cover essentials. Oversupervision is expensive and unnecessary. It wastes dollars that could be better spent on essentials.

The Air Force recently combined responsibilities for procurement and research and development within one command. The next steps should restructure this command by separating "line" and "staff and oversight" responsibilities. Start with R&D. How many civilian and military persons are actually involved in research? Would consolidation of Air Force labs reduce overhead? Would substituting civilian contracts for Air Force labs reduce "tail" and allow more "tooth"? How many "staff and oversight" people are required to manage R&D?

Imagine for a moment that one-half ($4.8 billion) of the R&D budget is spent in Air Force labs or working on projects that require "blue suit" scientific and engineering skills. The Air Force should compare costs with a $5 billion civilian company engaged in high-tech research and development. Does Air Force R&D require more people than the commercial R&D company? If so, why?

Switch to the other half of the R&D budget—the oversight responsibility for contracting, programming, and project monitoring. Is it reasonable to spend this much (pick your favorite number) on staff activities? Once again, the commercial model with similar sales is worth examining.

Procurement is proposed at $4.5 billion for 1997. Since most of the money goes to contracts, the problem boils down to reducing costs by reducing contractor overhead. This means fewer reports to the government, fewer meetings between company staff and government officials, fewer audits and inspections, and fewer government directives. Insistence on sensible warrants and guarantees would offset the reduction in government supervision.

Overinspecting has been another irritating, time-consuming and costly aspect of government procurement. There was a time, circa 1950-75, when most US factories were oblivious to modern quality techniques. To protect itself, the government subjected major purchases to an elaborate inspection system involving both commercial and government inspectors. Quality management has changed dramatically in the past twenty years. The Deming revolution, first felt in the Japanese auto industry, has now migrated to the United States and Europe. The notion that one could "inspect-in" quality is dead. Instead, today's emphasis is "build it right the first time."

The problems with overinspecting are at least threefold: (1) costs too much; (2) shifts responsibility from the worker to the inspector; and (3) doesn't solve systemic problems. Successful quality now depends upon statistical process control, worker empowerment, CAD/CAM, CNC machines, worker training, raw material verification and traceability, vendor qualification, modern calibration equipment, reliability testing, and so forth.

A universal quality standard called "ISO 9000" has been created. Companies qualified under ISO 9000 must meet certain quality standards that are respected worldwide. The drawback to ISO 9000 is that it emphasizes bureaucratic procedures and documentation over product quality. To oversimplify, ISO 9000 qualification means that a company is actually doing what it says it is doing and can prove it with paperwork. In most cases, companies that adhere to their ISO 9000 procedures will have quality products. But the Air Force should proceed with caution before Mil standards are discarded in favor of ISO qualification certificates.

Changes That Should Occur: "Outsource Depot Repair"

Using DOD employees, USAF depots in 1994 accomplished approximately $2.6 billion in repair and maintenance work. Commercial companies accomplished another $1.3 billion. About 85,000 DOD workers were employed for repair and maintenance work in 1995. The number will shrink to about 80,000 DOD employees in 1999. John White, Deputy Secretary of Defense, stated on 16 October 1995, that outsourcing to defense contractors should shrink the expenditures on overhaul and maintenance by 15-20 percent.

Several factors support White's opinion. Defense contractors would probably be more efficient than government facilities, so the estimate is not unreasonable. Start with Air Force Logistic Center (AFLC) management. The Air Force selects excellent major generals to run these large facilities. Sometimes they are experienced logisticians who have spent years in supply and maintenance. Others come with a background in operations and operations staff work. To the best of my knowledge, neither the logisticians nor the operators have managed a production facility with thousands of employees before commanding an AFLC. Usually they serve two or three years in this job and then move. These excellent officers are "a mile wide and an inch deep" in technical know-how. They are assisted by other officers with similar credentials. Intermixed are career civilians who honed their skills in the civil service and provide institutional memory that keep the AFLCs on even keel.

The contrast at the top between AFLCs and commercial factories is apparent. Chances are that top managers in a commercial factory have spent years learning their business. They tend to be "an inch wide and a mile deep" in technical know-how. They are comfortable in a corporate culture where the emphasis lies on the bottom line. Survivors of their selection process know how to cut production costs, know when a project is in trouble, understand balance sheets and income statements, and know that plant performance will determine their future livelihood. Would you pick an excellent general or an excellent plant manager to run your factory?

We need not dwell on comparisons of direct laborers to recognize that job stability in the commercial world suffers in comparison to government employment. The downside of instability is that commercial workers are less loyal to their employer. The upside is that productivity standards can be set higher for commercial workers. (Don't produce, get fired.)

Granted, the above comments are largely subjective. One additional comment is not subjective, however: the profit motive. Air Force Logistic Centers operate on a budget. Success is staying within the budget while meeting maintenance and repair objectives. The commercial facility also operates on a budget and must meet maintenance and repair objectives. Failure means the commercial contract is canceled or not renewed. The final measure of success in the corporate world is profitability. Contract termination hurts profitability. This emphasis on profitability stands behind most commercial decisions and is an economic discipline not evident in government. White is right; the Air Force should expend its talent and resources on the "tooth and not the tail" except when operational necessity dictates.

Changes That Should Occur: "Speed and Simplify"

The American judicial branch of government recognizes and respects the importance of precedence. However, the American legislative and executive branches ignore precedence when it comes to defense issues. With little regard to past program authorizations and appropriations, next year's authorizations and appropriations are stretched, altered, changed or deleted by Congress and/or the Executive branch. Previously mentioned was the 35-year saga of the B-1 from inception to almost combat-ready. The inevitable results are higher costs and a weapon system old before its time. Multiyear authorizations make good business sense and would partially correct the problem. However, persuading Congress or OSD to keep hands off previously approved programs is not for the faint of heart.

Changes That Should Occur: "Reduce Classification Costs"

Classification costs *can* be reduced. Whether they *will* be reduced depends upon the Pentagon. Most future procurement for the Air Force begins its life cycle in the Pentagon. There is very little reason for Air Staff action officers to minimize classification. Top secret and secret papers seem more important than confidential or unclassified papers. When in doubt, the staff overclassifies. Once anointed, the overclassification usually sticks.

Classification costs a lot of money over the life of a program. The most effective control mechanism in the Air Force is the budget. The air staff should establish a hard-nosed colonel with a small staff who computes the lifetime costs for security of classified programs. These costs should be clearly identified and only then approved as budget items. Enhancing visibility will force logical tradeoffs.

Many years ago, the Air Force realized that it was impractical to impose maximum security on all aspects of a military base. Instead, we relaxed security measures in areas where the risk of compromise or sabotage was low and tightened security in areas where valuable assets were stored or where war plans could be compromised. The same attitude should prevail when we are dealing with security at defense plants. Most industrial facilities are careful about security (badges, fences, inventory audits, proprietary disclosure statements, safes, passwords for computers, etc.). These self-imposed security measures are adequate for nearly all plants that could manufacture military systems. As mentioned previously, piling government security measures on top of these existing measure costs too much and severely restricts manufacturing operations.

Conclusion

The twentieth century began with the invention of flight. It ends with aircraft and space vehicles being the dominant military force. As sure as grass is green, the revolution in warfare will continue. The Air Force must grasp the future with one hand while reaching for its wallet with the other. It must convince an unsure nation that it is able and willing to pay the modernization bill that accompanies the twenty-first century. Modernization by 2025 begins by changing procurement policies now.

Notes

[1] Interview with Philip Odeen as reported in *Defense News* (4-10 December 1995): 45.

[2] "Adoption of Common Processes at Defense Contractor Facilities" memorandum from Major General Robert W. Drewes to Defense Contract Management Commanders and the Commander, Defense Contract Management Command International (11 December 1995): 1.

[3] "Common Systems/ISO-9000/Expedited Block Changes" memorandum from Secretary William J. Perry to the Military Department Secretaries, the Chairman of the Joint Chiefs of Staff, the Under Secretary of Defense for Acquisition and Technology and other addressees (6 December 1995): 1.

[4] "Single Process Initiative" memorandum from Paul G. Kaminaid to the Military Department Secretaries, the Chairman of the Joint Chiefs of Staff, the Under Secretary of Defense (Comptroller) and other addressees (8 December 1995): 1.

[5] "Adoption of Common Processes at Defense Contractor Facilities" memorandum from Major General Robert W. Drewes to Defense Contract Management Commanders and the Commander, Defense Contract Management Command International (11 December 1995): attachment 2, page 2.

[6] "Critics Question Adequacy of DoD Weapon Funding." *Defense News* (4 March 1996): 37.

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