CONTRACTOR MAINTENANCE OF TRAINING DEVICES - ANSWER OR ALTERNATIVE

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INTRODUCTION

Training Devices, in one form or another, have been with us ever since man first discovered that by conveying his experienced skills to those who were inexperienced, he could more readily house, feed, and defend himself. The requirement to maintain training devices has also always been with us.

Training devices took a giant step forward with Ed Link's invention of the famous Link Trainer. Since that time, each step in the development of training devices has been tied to growth during periods of war or peacetime crises. With each step, however, the problems associated with training devices became more severe. The cost of software has more than doubled; the cost of hardware has grown greatly; and personnel related costs have steadily risen, from 46% of the Defense budget in 1968 to 61% in 1976.[1] Dramatic increases in the cost of training, logistic support, retirement benefits, and administration of the military and Civil Service work force have plagued the Department of Defense.

Contract maintenance has been viewed by many as the logical answer to the dilemma of doing more with less dollars. This paper will discuss many of the pros and cons of contract maintenance to support the contention that although it might not be THE ANSWER in each situation, contract maintenance is indeed a viable alternative that should be carefully considered when weighing all maintenance factors.

BACKGROUND

The advent of the Link Trainer was followed by World War II and the expanded use and application of training devices. Although the cost of trainers was relatively inexpensive when compared to the cost of aircraft, there were many new problems to overcome. The resolution of these problems led to new concepts in training evaluation and measurement, procurement, maintenance, and logistic support, and new assessments as to the qualifications and training of trainer maintenance personnel.

Due in part to the chill of the Cold War, the communist scare of the late 1940s and early 1950s, the growing military might of Communist China, and the lessons of the Korean War, the need for a highly trained fighting force did not diminish. In those days, as many of you may recall, a nation's military might was measured by the number and sophistication of its various weapon systems. Material needs took precedence over humanistic needs as "people" took a backseat to the steady procurement and development of new weaponry.

As our weaponry became more complex, so did the skills necessary to maintain it. The military countered with a broad system of personnel screening and classification, technical training, on-the-job training, and improved management, control, reporting, procurement, maintenance, and logistic support. The name "synthetic trainers" was applied to virtually all training devices.

Synthetic trainers were basically simple electromechanical devices that tried to duplicate certain aircraft functions. Our flight crews were well into the Jet Age while synthetic trainers were still trying to improve the performance and capability of long outdated systems. Many decision makers, both in Congress and the military, questioned the validity of trainers as an effective aircrew training aid. In addition, large numbers of aircrews resented the mechanical monsters and saw them as a threat to actual flying.

Between 1950 and the early 1970s, there were budget, personnel, and program cuts. These cuts were influenced by the race for space and a shift of priorities, the Cuban and Lebanon Crises, the Arab-Israeli Wars, major changes in our defense posture, new concepts and philosophy, Vietnam, a wholesale shift in the world economy, and the rebirth and rise of the Arab States.

On the sidelines and virtually unnoticed, the synthetic trainers slowly matured and were replaced by the far more complex simulator, but the entire training devices field remained hidden in shadow. While the sophistication of aircraft systems and other weaponry created a high degree of specialization and a vast new array of military job skills, the training devices field remained relatively small and the technician was then, as now, a jack-of-all-trades. Personnel assignment and classification policies, technical training, and maintenance were basically the same in 1972 as they were in 1952. With the development of the versatile computer, a whole new technology was being applied to simulators.

Despite early warning signs, the Energy Crisis of 1973/74 caught the entire nation unprepared. Almost immediately there were new

national problems and a new set of values — and the dramatic theme was energy conservation.

The Federal Government swung into action. The GAO, OMB, the President's Scientific Advisory Board, as well as earlier McNeff Report keyed on the increased use of training devices to reduce flying training costs and to conserve energy. The military services were directed to institute a comprehensive analysis of their present and future simulator requirements. The Air Force alone requested more than 150 new simulators and major modifications to existing devices. The cost of this simulator modernization and research was tagged at three billion dollars.[2]

The use and technology of simulators advanced at an unprecedented pace — and simulators moved from the shadows into the stark reality of the Computer Age. Thus, in 1974, time and progress finally caught up with training devices and, within the military, the small, well hidden training devices field was totally unprepared for the technological invasion.

This invasion has resulted in rising costs in all areas, major problems in simulator maintenance, and problems in logistic support. Most of the major problems, however, have been personnel related.

Despite the extraordinary efforts since the inauguration of the all-volunteer armed forces, recruiting has barely achieved its objectives. In addition, the number of noncombatant support personnel has grown at an alarming rate and many personnel with high school diplomas simply lack the basic skills to master today's technological demands. These demands are also compounded by the exodus of experienced enlisted personnel who are highly trained in the skills that are most salable to industry. The long lead times, the lengthy and expensive training, the technological explosion, and the shrinking defense dollar have mandated that DOD examine alternatives for system support. These alternatives have included the increased use of Civil Service and contract maintenance for the traditional enlisted manpower, or a combination of these alternatives. Since they do not "go to war," simulators are particularly viable candidates for contract maintenance.

The simulator industry has numerous examples of ongoing contractor maintenance programs: Singer and American Airlines are supporting the Undergraduate Pilot Trainers (UPT); AAI maintains both the Undergraduate Navigator Trainer (T45 UNT) and the Simulator (for) Electronic Warfare Training (T5 SEWT); Singer supports advanced simulators at both Williams AFB and Luke AFB; and Northrup has the entire base support function at Vance.

While there are more and more considerations for contract maintenance by various DOD entities, the "bottom line" is the cost comparison between organic, or in-house, and contract maintenance. There are, however, pros and cons to contract maintenance.

PROS AND CONS

What are the advantages of contract maintenance and why?

First and foremost, personnel costs are lower for contract maintenance than organic and/or Civil Service support. This is a definite concern since personnel costs now account for approximately 65% of the DOD budget and the emphasis is on reduced manning of noncombatants (or, if you will, increasing the "teeth-to-tail" ratio).

One major cost of personnel is that of training. The cost of a 24- to 36-week technical school course ranges from $20,000 to $25,000.[3] This does not include advanced skill level training, Type I training, special training, and various OJT, management, social actions, NCO leadership, and advanced leadership courses. The cost of training Civil Service personnel is somewhat higher due to the higher rates in pay and per diem.

While in training, the individual is essentially nonproductive. Because of production delays or other unforeseen circumstances, the military technician or Civil Service employee could find himself trained and ready — but with no equipment to work on. Although the individual may be employed elsewhere, a loss of technical proficiency on the device for which the individual was initially trained will probably occur.

Inherent in many training devices is the requirement for an operator and, in some cases, an operator/instructor. With most training devices, an operator can be easily trained within a month. The instructor usually requires two to three months to reach the desired proficiency. Because of the classification system, ALL training devices personnel must attend the technical school. Of the 24- to 36-week school, only 2 weeks are directed toward operator duties and skills while the remaining 22 to 34 weeks are geared toward maintenance knowledge and skills. Despite the $20,000 to $25,000 technical school investment, many school graduates remain operators throughout their initial enlistment. Additionally, personnel find that they must prove themselves as operators before undergoing OJT to make them knowledgeable and productive maintenance personnel. In many cases, fully three years (of a four-year enlistment) have passed before the first term enlisted technician becomes an integral part of the on-equipment maintenance team. In effect, a near-$25,000 training investment is not commensurate with the maintenance output of one productive year!

Under contract maintenance programs, the contractor is responsible for and, more importantly, liable for providing fully trained, capable maintenance personnel at the point he accepts responsibility and for the life of his contract.

The contractor normally achieves lower costs by providing fewer people to perform equivalent jobs. Unimpeded by supervisory classifications, nonjob related training, meetings/briefings, manning, and other requirements, the wise contractor seeks to maximize personnel efficiency. With personnel that are normally more experienced and of higher skill levels than military personnel, the contractor has no manning constraints and can usually keep his supervisory staff at a minimum.

In most cases, the contractor can supply an experienced, stable work force. If training is required, the contractor sends fewer personnel and the training is tailored to exact needs. The contractor can also achieve economy by having his training school graduates train the remaining work force. Due to the experience levels of his people, contractor training can usually be compressed into much less time. Finally, because of his flexibility, the contractor does not require a long lead time for training. His training program can be readily geared to the production or modifications schedule of the device in question. As a result, the loss of technical proficiency is unlikely.

A significant advantage of contractor maintenance is assignment stability. The axiom that "maintenance is maintenance" is akin to exclaiming that if one can fly a Piper Cub, one should be equally proficient at flying a Boeing 747. Each simulator and each simulator system has its own peculiarities. The theory that separates pilot from navigator, ECM from gunnery, model board from dome visual, and a six-degree from a four-degree motion base plays a primary role in the maintenance of that equipment. There is no known substitute for experience. In many cases, about the time the enlisted technician feels at home on the device, he is reassigned. Although the personnel assignment system can withhold assignment under certain conditions, it rarely happens. The contractor does not have this problem.

An item of cost in personnel-related issues is that of administration. The administrative time and costs associated with the military are significant. The contractor is bound by contract to manage and control his employees; thus he essentially performs all the functions formerly accomplished by the various military supervisory and command levels. In some cases, contractor maintenance provides an appreciable reduction in the personnel administration areas.

Another major consideration is risk. We know of no system or procedure whereby the Government is relieved of all risk. Even if a contractor fails to perform and incurs a monetary liability for his failure, the Government is still left with an unfilled program or training requirement. We must also recognize that the contractor is in the business to show profit. He lays his reputation on the line with each contract and most contractors would rather pump in whatever is required than to admit failure. If good news travels fast, bad news travels even faster. Thus, we believe there is a degree of shared risk by both the contractor and the Government.

As the buyer, the Government sets conditions and establishes performance criteria for contractor maintenance. In essence, the contractor who bids on the proposal is stating that he can meet the requirements, is willing to assume the monetary risks, and can do the job at less cost than a Government work force. In a training device utilization program that is highly structured and tied to a rigid incoming and outgoing student pipeline, an efficient contractor can greatly reduce the risk and possible damage to the course and student pipeline.

A final factor for contract maintenance is a potentially lower development cost. This can occur when the contractor is permitted to develop only that data which he himself deems necessary. For example, a contractor could feasibly maintain a complex system using only schematics, wire lists, interconnecting diagrams, and engineering sketches. Obviously, this major cost reduction in development denies the Government the capability to solicit future competitive bids and/or assume the organic maintenance responsibility without incurring considerable cost.

While on the subject of simulator development, one cannot escape the enormous cost of a modern simulator system. Major modifications have also compounded simulator costs. This cost represents a "sunk" cost and the only sure method to recoup the investment is to maximize the use and capability of the simulator system throughout its life expectancy. This equates to optimum maintenance efficiency. Moreover, the new breed of state-of-the-art devices has taxed the military's ability to keep pace. Technical innovation not only affects personnel but logistics support as well. Here, too, contract maintenance can fill in the gap. Many of the factors cited above are not new. Military decision makers have been, and are, dealing with the perplexing problems associated with simulator maintenance. The natural alternative to a military work force is Civil Service; however, with even higher pay rates and administrative costs, Civil Service has many of the same constraints as the military.

The industry has cited numerous[4] cost effective contract maintenance operations. In one instance, nearly 75 military and Civil Service employees were replaced by 26 contractor personnel.

The prime disadvantage of contract maintenance is the untenable position of the Government if, for any reason, the contractor fails to perform. This situation can be especially acute if the Government, as mentioned earlier, has not procured the necessary engineering and technical data. It would be difficult, if not impossible, for another contractor to assume the risk. Should the Government elect to take over the maintenance responsibility, personnel would have to be located and trained and, in the interim, there would be limited productivity of the device and the people associated with it. In any case, the cost to the Government, in time, performance, and dollars, would be significant.

Another argument against contract maintenance deals with the sole source contractor. The contractor may have developed the technical data or be highly specialized to the point where there is no competition or he may have simply maintained the device for so long that no one else is interested in competing for the contract. In short, the contractor becomes the recognized expert and, as such, what is to prevent him from escalating the cost beyond reason? Along this same line, there is yet another argument against contract maintenance. Stated simply, the contractor is in business to make a buck; thus, he may take shortcuts, run a "body shop," and only perform just to get by.

These are certainly strong arguments; however, they are not absolute. Our industry is built on free enterprise and free competition. Just as the Government watches industry, we watch each other. We are indeed in business to make a profit and we can obtain that profit and continued profit, only by satisfying the customer or buyer. If we fail, we have not only tarnished our reputation throughout the industry, but have negated our chances for other Government contracts as well. Moreover, the Government is the buyer and it is the Government, not the contractor, who establishes the conditions and performance levels of the contract. The Government can and should minimize its risk by making the training of a replacement a provision of the contract. This would serve to protect both the Government and program continuity.

Some of the major pitfalls of contract maintenance were also discussed in an Air Force Air Command and Staff College research paper.[5] The author skillfully debated the issues, negative aspects, and remedies for the Government to avoid many of the problems related above.

Also considered disadvantages of contract maintenance are the real and perceived problems of contractor/Government interface and the attendant turmoil inherent in this situation. Frankly, there is usually some difficulty in integrating the contractor into a military environment. Despite a growing number of contract operations, there are a vast number of military personnel who neither know nor understand the meaning of a non-personal services contract. Conversely, many contractor personnel do not know military practices and procedures. The tendency of the military is to place <u>everyone</u> in the organizational chain and to exercise some degree of control. The tendency of the contractor is to resist this. The resultant situation strains relationships, affects morale, and hinders operations. The contractor "works for" and is responsible to his contracting officer. Legally, in most cases, all Government communications pass through the contracting officer to the contractor and vise versa. This procedure is sometimes misunderstood and often disagreed with by the military operations and maintenance hierarchies. In practice, however, both parties must recognize that rapid and direct communications are advantageous to both. The importance of amiable relationships and rapport cannot be overemphasized for mutual understanding is <u>the</u> primary basis for good contractor relations.

To minimize the dangers of strained relationships and misunderstandings, all parties should be made aware of the organizational structure, performance specifications, and the responsibilities - and nonresponsibilities - of the contract maintenance team. Where minor out of scope requirements are required and have a minor impact on the contractor, we're quite confident the customer would receive the requested service without added cost. In our business, too, the name of the game is to keep the customer satisfied.

Large out of scope requests that require a major expenditure in time or manhours will certainly result in contractor payment requests. Normally, the contractor does not expect remuneration for added effort of his own making; however, he will usually seek payment when the effort is not his fault. This brings up another aspect of contractor maintenance: weekend, holiday, special, or unforeseen training or work and the threat of contractor strikes or work slowdowns/stoppages. The most obvious solution is to build contingencies for these situations into the contract. As for the threat of union squabbles and contractor strikes, cursory investigation indicates that the Government has experienced far more difficulties with its own Government employees' unions than with simulator industry contract maintenance operations. (This, however, is not necessarily true with reference to simulator contractor production facilities.) In

addition, Government union agreements and regulations also restrict the flexibility of Civil Service employees to respond to shift changes, weekend/holiday work, and training schedule changes. It should be noted that all Civil Service overtime must be approved before it can be authorized. Most contractors do not have this constraint on their work force. By building performance measures (as opposed to time and material requirements) into the contract, the contractor must respond and the Government could care less how he schedules his employees to meet the requirement.

Another complaint regarding contractor maintenance is the question of manning in a national emergency, the manning of overseas sites or operations in combat zones. Various contractors have maintained successful overseas operations for years - and that also includes Korea and Vietnam during wartime. Of course, simulators do not go to war and for the most part, their high cost, fragile equipment, and need for air conditioning do not lend themselves to combat operations. As for the high cost associated with overseas contract operations, we know of no existing low-cost operation overseas or in a combat area. Where operating costs are high and the risk is great, the contract costs will be commensurate - and that's the way it is.

A final argument against contract maintenance is the determination of performance standards or measurements. As stated earlier, all participating parties should be aware of and fully understand the contract maintenance measures of acceptable performance. The question is "what should that performance be?" or "how do you evaluate the performance of a contractor?" The same rules that apply to the military or Civil Service do not necessarily apply to the contractor. As an example, most Government and military regulations and manuals are designed to control the output through a high degree of supervision and control over the work force. The legal ramifications of a nonpersonal services contract are such that the Government is expressly forbidden to supervise or control contractor employees. This does not mean the Government relinquishes total control over the output; it merely means the output should be contractually defined.

The usual performance criterion has been students in, or scheduled, versus students out, or completed. While this is one valid measure, it is by no means the only measure. Other tangibles such as logistic support cost, the extent of local repairs - or the lack thereof, top priority requisitions, and user comments can be effectively utilized to measure contractor performance more accurately.

There may not be an answer to the question of what contractor maintenance performance measures should be used, but this is an area for further investigation by both Government and industry.

CONCLUSIONS

We have discussed the history, the pros, and the cons of contractor maintenance. But what does it all mean? Is contractor maintenance the answer — or alternative?

We believe that the pros of contractor maintenance far outweigh the cons and while contractor maintenance may not be the answer for all simulators, it definitely should be considered as a viable support alternative.

To be objective, it is extremely difficult to avoid bias on any subject wherein one has a vested interest. To be sure, the major considerations for simulator contractor maintenance are less cost and a high-degree of flexibility. The arguments against were quickly dispatched, at least on paper. In practice, however, disagreements are not always easily resolved. In our business, it is virtually impossible to hide failure, incompetence, or unsound practices. The Government obtains some degree of protection by contracting with reputable, proven, and reliable firms, for they have the most to lose should something go awry. This success or failure of any contract is not dependent upon the actions of the home office but upon the individuals or teams in the field. With this in mind, a close rapport and a mutual understanding are two of the primary keys to successful contractor maintenance.

We believe all would agree that contractor versus organic support merits further investigation. Cost avoidance can be realized from the standpoints of labor savings and, if the Government desires, Engineering and Technical Data costs. The Government does run the risk of being in a sole source situation with a contractor, particularly if engineering technical data is not procured, and it is true that in the past, some major contractors have gone out of the training device business which could leave the Government in an untenable position.

Again, we believe the pros far outweigh the cons and recommend that the Government expand its consideration of candidates for contractor maintenance as well as investigate areas impacting contractor maintenance activities, such as contractual vehicles and methodologies for measurement of performance.

Why contractor maintenance? To sum up all the rhetoric in two words: less cost. President Carter summed it up neatly when he stated: "When the Government must perform a function, it should do it efficiently. Whenever free competition would do a better job of serving the public, the Government should stay out."[6]

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