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CRITICAL SUCCESS FACTORS FOR DOD PROGRAM  
MANAGERS

by

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## ***Preface***

In the last few years, interest in improving DOD acquisition management has progressed from the study phase to implementation of some reforms. This paper reflects development of one methodology program managers can use to contribute to this effort. To the military operator, the term “program manager” is perhaps pejorative. To be successful, program managers should be proactive “program leaders.” In my opinion, program managers and other members of the acquisition team have more flexibility than the military operator; this translates into more opportunities to exercise leadership. My aim in conducting this research was to examine factors that contribute to program and program manager success. Just as leadership is a combination of wisdom and practice, so is program management. I hope my efforts have contributed to the field of knowledge that future leaders in acquisition can draw upon. Special thanks to my faculty advisor, Lt. Col. Douglas Drake, for his guidance in helping me structure and prepare this paper.

## ***Abstract***

Department of Defense (DOD) acquisition programs and projects frequently experience cost overruns, performance deficiencies, schedule delays or cancellation. Often, a good program manager using effective leadership and program management practices is the main reason for a program's success. By examining successful programs and relevant literature on program management and defense acquisition, critical success factors can be identified and explained.

Critical success factors for DOD program managers were identified through factor analysis of the body of acquisition literature. The factor analysis technique developed by MacFarland<sup>1</sup> was used. Factor analysis measures the occurrence of key factors in a survey of relevant literature. The occurrence of a key factor in each article is noted. In a representative sample of literature, a determination can be made as to the relative importance of each key factor to the subject by noting and comparing the number of occurrences. The best practices identified were:

### **Acquisition Factors**

- well defined requirements
- acquisition strategy
- works well when fielded
- stability

### **Resource Factors**

- program manager skills
- quality people
- program manager responsibility and authority
- total team concept

These factors are critical success factors and should be examined by program managers for adoption and inclusion in their programs.

### **Notes**

<sup>1</sup> David MacFarland, “Development and Implementation of the Automated nautical Chart System II” (master’s thesis, University of Maryland, November 1992)

## **Chapter 1**

### **Introduction**

Department of Defense (DOD) acquisition programs and projects frequently experience cost overruns, performance deficiencies, schedule delays or cancellation. U.S. defense acquisition is the largest “business” in the world. Annual purchases by DOD of approximately \$178 billion exceed the combined purchases of General Motors, Exxon and International Business Machines (IBM). Defense acquisition involves almost 15 million contract actions annually and employs more than 165,000 civilian and military workers who manage research & development, procurement, test and evaluation, logistics and support activities.<sup>1</sup>

With such a large defense acquisition system, errors and inefficiencies are bound to occur. Acquisition “horror stories” are frequently cited in newspapers and magazines and further fuel the public perception of the poor state of the DOD acquisition system. Besides the negative publicity, the real impact is on defense readiness, performance and cost effectiveness. Since World War II, six blue-ribbon commissions have studied DOD acquisition and recommended remedies. Adoption of some of these recommendations, new regulations and laws have all failed to alter the public perception that the DOD acquisition system produces more failures than successes.<sup>2</sup>

## **Statement of the Research Question**

Critical success factors (CSF) are those factors (management, leadership, process) critical to an organization's mission success. The purpose of this research project is to identify critical success factors DOD program managers (PMs) can effectively apply to enhance the success of their acquisition programs. The success factors identified will provide a foundation on which to improve the defense acquisition system. The critical success factors to be identified are those program managers can implement within the framework of the current acquisition and procurement system, vice the multiple attempts to reform the system itself.

## **Background and Significance of the Problem**

An important distinction in the defense procurement system is recognizing that there are two major categories of items purchased: major "weapon" systems and commercial-type "standard" items. While the majority of contract actions involve standard items, the majority of procurement funds go towards the major weapon systems.<sup>3</sup> Acquisition of major weapon systems is also where the greatest challenges to success and opportunities for improvement lie.

Dr. Jacques Gansler, Undersecretary of Defense for Acquisition and Technology notes that there is a public perception of mismanagement, waste and fraud in defense budgeting and procurement. He argues that despite headlines describing \$5000 hammers and \$2000 plastic caps for stool legs, DOD is one of the best-managed federal agencies. However, with the average cost overrun on a weapon system of 40%, he also believes there is much room for improvement.<sup>4</sup> He suggests ways to improve the system: a better

understanding of the procurement process from theory through implementation; consideration of the performance, costs and quality of weapons procured; competence and experience of the people who are involved in the acquisition process; and careful study of the unique defense environment and ways to improve it. He expects big changes as DOD moves into the 21<sup>st</sup> century. He states, “Hopefully, we won’t recognize acquisition in five years. To get there, we need to focus on training and education. Otherwise, we won’t meet the demands placed before us.”<sup>5</sup>

In an attempt to solve acquisition management problems, DOD and Congress have assumed strong oversight roles. Reforms imposed by them have resulted in over-management and longer development and production phases. Micro-management, over-regulation, over-specification, unstable funding and adversarial relationships with contractors have been mentioned as primary causes of procurement failures.<sup>6</sup>

Many organizations within DOD acquire major weapon systems. They can all benefit from an examination of “lessons learned” and an analysis of critical success factors in acquisition management. By appropriately applying critical success factors, DOD program managers can become more successful in meeting their cost, schedule and performance requirements and avoid the pitfalls that often result in program restructuring or cancellation.

### **Limitations of the Study**

This study concentrates on critical success factors for defense acquisition management. As such, it concentrates on leadership, program management, and program managers. This focus is necessary in order to allow a thorough analysis of one important aspect of acquisition within the scope of this research project: program management. The

study results should be interpreted with this in mind. There are many aspects of defense acquisition, including ongoing acquisition reform initiatives. This study assumes the program manager and his organization are already using appropriate management information systems, processes and tools. Rather than focus on the science of acquisition management, this study focuses more on the art: the variables that may mean the difference between success, mediocrity, or failure. Before adopting any critical success factor, program managers and or acquisition organizations should carefully analyze the factor to determine suitability and method of implementation.

#### Notes

<sup>1</sup> George Sammet Jr. and David E. Green, *Defense Acquisition Management* (Boca Raton, FL.: Florida Atlantic University Press, 1990), 29.

<sup>2</sup> “Rx for Ailing Procurement System,” *Washington Times*, 30 July 1990, F2.

<sup>3</sup> Jacques S. Gansler, *Affording Defense* (Cambridge, MA.: The MIT Press, 1989), 143.

<sup>4</sup> *Ibid.*, 171.

<sup>5</sup> Kari Pugh, “Eighth Semiannual PEO/SYSCOM Commanders Conference; The Future is Today”, *Program Manager* 27, no. 6 (November-December 1998): 66.

<sup>6</sup> William H. Gregory, *The Defense Procurement Mess* (Lexington, MA.: Lexington Books, 1989), 56-57.

## **Chapter 2**

### **Description of Critical Success Factors and Research Methodology**

The defense acquisition environment is rapidly changing. The United States once had a dedicated defense industrial base, what President Franklin D. Roosevelt referred to as “the arsenal of democracy” and President Dwight D. Eisenhower derisively called the “military-industrial complex.” This dedicated web of companies catering exclusively to DOD defense needs has all but disappeared; it has been merged into a national industrial base. The national industrial base has many customers, among which is the DOD. To meet the needs of these customers and remain competitive in global markets, these companies have become more innovative, rapidly evolving products, and less inclined to produce the specialized products DOD has traditionally purchased.

The rapidly changing environment in which these companies operate has necessitated a move away from process oriented management towards a more flexible focus on areas that have the greatest impact: critical success factors. An early indicator of this trend was the emergence of Total Quality Management (TQM). TQM, while still process oriented, was used to identify and optimize processes *critical* to the success of the operation. DOD acquisition has mirrored this approach, embracing TQM and process improvement, only to find that the rapid changes in technology and the absorption of the defense industrial base into the more consumer driven national industrial base requires a

more flexible approach. This is currently reflected in the move towards acquisition reform, with the reduction of process directives and emphasis on flexibility, teamwork and problem solving. Applying the critical success factor approach to acquisition management gives the program manager two benefits. First, it reflects the reality of managing in a fast-paced, evolving environment. Second, it helps program managers focus their attention on those factors that will have the greatest impact toward program success.

### **Critical Success Factors**

Boynton and Zmud<sup>1</sup> define critical success factors (CSF) as “those few things that must go well to ensure success for a manager or an organization, and therefore, they represent those managerial or enterprise areas that must be given *special* and *continual* attention to bring about high performance” (emphasis in original). CSFs can be used by program managers to help achieve high performance and program success.

Generally, for any leader or manager there are only a few truly critical success factors. Most program managers have given some thought (perhaps subconsciously) to what the critical success factors are for their program and situation. Perhaps they think of them in terms other than “critical success factors,” but whatever they are called, these are important items that receive the program manager’s attention.<sup>2</sup>

Critical success factors have three major uses. The first is to help the manager determine his or her information needs. CSFs can help the PM implement strategies, objectives and goals for his program. The second use of CSFs is as a strategic planning aid. CSFs can help guide strategic planning in the right direction by highlighting key areas for management focus. The third use of CSFs is in information systems planing.

This is analogous to the development of “metrics” and key areas for management tracking and attention.<sup>3</sup> Critical success factors can be divided into three areas: strategic planning/strategies, human resources and business practices.<sup>4</sup>

### **Strategic Planning/Strategies**

The importance of strategic planning in all organizations is well known and documented. Program managers must be adept at capturing the needs (requirements) of their customers, and must be able to meet those needs better than any competing system or program. The decision to procure more C-17s or buy an off-the-shelf, non-developmental airlift aircraft (NDAA) is an example of the competition program managers’ face. The C-17 program had to demonstrate marked cost and performance improvements in order to continue production beyond the first 40 aircraft, or face replacement by the NDAA.<sup>5</sup> At the broadest level, strategic planning and strategies can be called acquisition factors; those factors that can most influence the success or failure of the acquisition. For the purposes of this paper, the latter term will be used. Potential acquisition critical success factors include:

1. Well defined requirements
2. Acquisition strategy
3. Good relationship with the contractor
4. Existence of a total quality management program
5. Program stability
6. Meeting performance objectives
7. Meeting cost objectives
8. Meeting initial operational capability date
9. Working well when fielded

These potential success factors were chosen because they represent the most common program manager complaints and upper management attention areas. While seemingly difficult to quantify, most can be traced back to commonly accepted measures.

For example, “well defined requirements” are those that define a desired capability (not a solution) and are codified in a validated Mission Need Statement (MNS) and Operational Requirements Document (ORD). A program that does not have a validated MNS or ORD or has one in constant flux can be said to lack well-defined requirements.

## **Human Resources**

While program offices can be considered to be collections of facilities, tools, people and processes, the human element is the most important. Effective motivation and use of those people is paramount to program success. Program managers must select capable people, train them and provide them with opportunities to develop personally and professionally. The move within the acquisition community towards integrated product teams reflects the importance of the human element in acquisition and makes it easier for program managers to motivate, delegate, communicate and inspire trust among program office personnel.<sup>6</sup> At a broader level, human resources can be called resource factors and include the following:

1. Quality people
2. Total team concept (also known as integrated product teams)
3. Program manager skills
4. Program manager’s responsibility and authority
5. Program manager’s technical ability
6. User involvement
7. Adequate resources
8. Adequate staffing
9. Support agency involvement
10. Higher command involvement
11. Congressional involvement

As stated above, these potential success factors were chosen because they represent the most common program manager complaints and upper management attention areas. Again, some of these potential success factors are seemingly difficult to quantify; most

depend on a subjective determination of how much is enough (or too much). In general, when an extreme exists, many will recognize it and agree. Such is usually the case with program successes or failures caused by resource factors.

### **Business Practices**

Business practices are the methods and tools a program manager uses to transform organizational resources (money, people, and requirements) into defense systems (the product) as efficiently as possible. This area focuses on use of management information systems, management processes and other tools to effectively establish, monitor and control the acquisition process. This area is a key focus of regulations and ongoing acquisition reform efforts. While critical success factors can also be applied to this area, business practices, for the most part, are more science than art. As mentioned earlier, this study focuses on the art rather than the science of acquisition management, and assumes the program manager and his organization are already using appropriate management information systems, processes and tools. In addition, business practices tend to be promulgated at a higher management level and hence the program manager has little control over them. Because they are more science than art and mostly fall outside the program manager's normal span of control, business practices will not be addressed in this study.

### **Research Methodology**

A technique developed by MacFarland<sup>7</sup> will be used as part of the approach. Factor analysis can best be characterized as a survey of literature, instead of a survey of subjects

(people). Instead of a list of survey questions, a list of factors is used. Results are measured in much the same way as they are for conventional surveys.

The factor analysis technique measures the occurrence of key factors in a survey of literature. Literature related to the problem or research topic is selected and organized by subject area. Factors are divided into those relevant and applicable to each subject area. The occurrence of a key factor in each article is noted. In a representative literature sample, a numerical consensus can be determined as to the relative importance of each key factor to the overall subject area.

By comparing the occurrences of a key factor in a number of articles against occurrences of other key factors in the same articles, factors can be rank ordered. For example, if a key factor is mentioned in five out of ten articles surveyed, it has a figure of 50% for comparison purposes. A factor mentioned in three of the same ten articles would have a value of 30% and would thus be less important in the survey of literature than the higher-ranking factor. In this way, factors can be compared and ranked. Conclusions can then be drawn as to the importance or emphasis the literature places on each factor.

### **How Factor Analysis will be Used**

The factor analysis technique will be applied to the two CSF areas this study addresses: strategic planning/strategies and human resources. Articles relating to program management, program successes and program failures will be evaluated against a list of candidate critical success factors within the two CSF areas this study addresses. Within each area, critical success factors will be selected from the list of key factors. The critical success factors will be those within each area with the highest percent correlation in the literature surveyed.

## Notes

<sup>1</sup> Andrew C. Boynton and Robert W. Zmud, “An Assessment of Critical Success Factors”, *Sloan Management Review*, Summer 1984, 17.

<sup>2</sup> Christine V. Bullen and John F. Rockart, *A Primer on Critical Success Factors* (Boston, MA: Center for Information Systems Research Sloan School of Management, MIT, 1981), 12-13.

<sup>3</sup> *Ibid.*, 35-39.

<sup>4</sup> Kae H. Chung, *Management: Critical Success Factors* (Newton, MA: Allyn and Bacon, 1987), 23-25.

<sup>5</sup> Col. Randy Davis, LTC Bill Phillips and Lt. Col. Bud Vazquez, “The Phoenix Rises”, *Acquisition Review Quarterly* 4, no. 4 (Fall 1997): 415.

<sup>6</sup> Capt. Joseph A. Veneziano, “Getting Back to Basics in the Acquisition Workforce”, *Program Manager* 25, no. 5 (September-October 1996): 15.

<sup>7</sup> David MacFarland, “Development and Implementation of the Automated nautical Chart System II” (master’s thesis, University of Maryland, November 1992)

## **Chapter 3**

### **Presentation, Analysis and Discussion of Relevant Data**

#### **Analysis**

Literature was surveyed for references to or statements about the nine key acquisition and eleven resource factors listed in chapter 2. The results are presented in tables 1 and 2 with each source denoted by a letter. The correspondence to the actual source in the bibliography is listed in table 3.

The literature factor analysis reveals that there is a broad range of subject matter within the general topic of acquisition and program management. The highest correlation between a factor and the literature reviewed was 59%. There is a wide gap between the top four factors and the other factors in each CSF category. This reflects the fact that literature articles frequently focus on what the authors' feel are the most important aspects of acquisition and program management. This emphasis reflects the natural emergence of consensus critical success factors for the acquisition community.

Because the highest correlation was 59%, the degree of significance was calculated by using 59% as the maximum. Factors with correlation between 32% and 59% were considered to be the most significant. Factors with correlation between 14% and 31% were judged moderately significant. Factors with less than 14% correlation were considered to be least significant.

**Table 1 Acquisition Factor Analysis**

| FACTOR                            | SOURCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | TOTAL | PERCENT |
|-----------------------------------|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------|---------|
|                                   |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |         |
| WELL DEFINED REQUIREMENTS         |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 13    | 59%     |
| ACQUISITION STRATEGY              |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 10    | 45%     |
| WORKS WELL WHEN FIELDDED          |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 7     | 32%     |
| STABILITY                         |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 7     | 32%     |
| GOOD RELATIONSHIP WITH CONTRACTOR |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 6     | 27%     |

|                                                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |     |
|-------------------------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|-----|
| TOTAL QUALITY<br>MANAGEMENT<br>PROGRAM          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 3 | 14% |
| MEETS<br>PERFORMANCE<br>OBJECTIVES              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 9%  |
| MEETS COST<br>OBJECTIVES                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 9%  |
| MEETS INITIAL<br>OPERATIONAL<br>CAPABILITY DATE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 0 | 0%  |

**Table 2 Resource Factor Analysis**

| FACTOR                          | SOURCE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | TOTAL | PERCENT |
|---------------------------------|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------|---------|
|                                 |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |         |
| PROGRAM MANAGER SKILLS          |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 11    | 50%     |
| QUALITY PEOPLE                  |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 10    | 45%     |
| PM RESPONSIBILITY AND AUTHORITY |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 10    | 45%     |
| TOTAL TEAM CONCEPT              |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 10    | 45%     |
| USER INVOLVEMENT                |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 5     | 23%     |
| CONGRESSIONAL INVOLVEMENT       |        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 3     | 14%     |

|                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |    |
|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|----|
| ADEQUATE<br>RESOURCES         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 2 | 9% |
| ADEQUATE<br>STAFFING          |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 5% |
| SUPPORT AGENCY<br>INVOLVEMENT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 5% |
| HIGHER COMMAND<br>INVOLVEMENT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 5% |
| PM's TECHNICAL<br>ABILITY     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 1 | 5% |

**Table 3. Correspondence between Codes and Sources**

A: Baumgartner, Brown and Kelley  
B: Beltramo  
C: Chew  
D: Clay  
E: Davis, Phillips and Vazquez  
F: Gansler  
G: Gregory  
H: Hicks, Rich, Wertheim and Meyer  
I: Hirsch and Waelchli  
J: Johnson  
K: Kish  
L: Lesser  
M: Long  
N: Nelson  
O: Price and Valentine  
P: Rx for Ailing Procurement System  
Q: Sammet and Green  
R: Settlemyer  
S: Snoderly and Acker  
T: Total Quality Management Master Plan  
U: Veneziano  
V: Weiss

Please consult Bibliography for complete citation.

## **Findings**

The results correlated well with a similar study that used the conventional survey method. All the critical success factors identified below fell in the top category of those identified by the study using conventional surveys. Most striking was the similarity in the sample size. While this study surveyed 22 literature articles, the conventional study received 21 valid responses.<sup>1</sup> The most significant factors as identified in the factor analysis of the literature are:

### **Acquisition Factors**

- well defined requirements
- acquisition strategy
- works well when fielded
- stability

### **Resource Factors**

- program manager skills
- quality people
- program manager responsibility and authority
- total team concept

These results form a core listing of critical success factors for DOD program managers. A detailed description of each follows.

### **Well Defined Requirements**

A requirement is a formal description of a user's desired operational capability. This is normally transmitted to the program manager in the form of a Mission Need Statement and an Operational Requirement Document. Program stability depends on realistic requirements and minimal changes. Systems that have problems are usually those that have many changes during design and production, especially changes driven by the user.

The Bradley Fighting Vehicle is one such example. Originally specified as a lightly armored, lightly armed, highly mobile scout vehicle or personnel carrier, requirements were continually changed (this practice is also known as “requirements creep”) until the final product emerged as a relatively heavily armored, heavily armed scout vehicle, or more accurately, a light tank. Detractors contend the Bradley does neither mission well, and is vulnerable on the battlefield because to an enemy, it looks and acts like a tank but does not have the defenses or firepower of a tank.

Program managers should guard against overstated requirements that delay production and lead to higher costs.<sup>2</sup> Careful coordination and dialog with the operational user, who specifies the requirements, is necessary to ensure that the requirements and their ramifications are understood and well defined. Design of complex systems is a combination of trade-offs between cost, performance and schedule constraints. Program managers should make the user a member of their team early in the acquisition process. This fosters a dialog that helps the PM understand the user’s true needs and helps the user understand the ramifications and constraints that excessive or changing requirements place on the acquisition program.

Not enough time and attention are paid to successful programs that could serve as possible models for the future. The General Accounting Office (GAO), which seldom compliments the defense acquisition process, identified the Navy’s Fleet Ballistic Missile program as one such highly successful program spanning 15 years. The GAO identified open dialogue between the program manager and the prime contractor and *continuous communications with the ultimate users* as reasons for this success.<sup>3</sup>

## **Acquisition Strategy**

Like any business strategy or strategic plan, the acquisition strategy is situation and resource dependent. The program manager should examine the internal and external environment to gauge resources and support available. The acquisition strategy should be crafted to help further the program objectives, while meeting constraints placed upon the program by external regulators and regulations.

Snoderly and Acker<sup>4</sup> cite one strategy used to reduce acquisition time and costs. The Defense Support Program, which produces ballistic missile early warning satellites, had a requirement to purchase four satellites from their sole-source contractor, TRW, over a five-year period. Normally, the four satellites would be separately funded, purchased individually, and programmed for delivery in succeeding years. Parts and material purchases for each satellite would be made separately. Administrative costs and potential part obsolescence costs would also be high. Assembly and test production gaps would be created due to uneven production and funding.

The acquisition strategy actually pursued offered cost savings of \$134 million for the procurement. The strategy involved acquisition of parts for all four satellites at one time, in more economic quantities. A single qualification test for all four satellites, due to continuity of design and production also contributed to efficiency. Finally, the above efforts would result in delivery of the last satellite one year early, saving program administration costs. The acquisition strategy was approved because the program was well established with validated requirements and little chance of change or cancellation.

Another well-known acquisition strategy is the practice of splitting purchases of items. Most notably, this has been done with great success with air to air missiles and fighter engines. When quantities to be procured are sufficiently large, designs are stable,

and multiple annual buys are planned, leader/follower procurements work well. The field of competitors for production is narrowed to two who then compete annually based on criteria such as cost, performance enhancements and reliability for production buys. While both are awarded production contracts, the contractor that better meets the specified criteria is awarded a higher share of the production.

Since each acquisition is different, it is incumbent upon the program manager to establish his team early, define important goals, and with the assistance of his team, craft an acquisition strategy that will best meet those goals.

### **Works Well When Fielded**

The ultimate test and determinant of the success of a program is if the item procured works well in the environments and missions it was developed to meet. Delays in procurement or cost overruns are temporary (sometimes program threatening) problems that must be managed in order to keep the program alive. Those problems are often forgotten once the system is fielded and has a chance to mature. Examples of poor systems that eventually became operational successes abound. The AH-64 Apache helicopter, M-1 tank and C-17 can be included in this category. At one point or another during their development testing or production, these programs all suffered failures and setbacks. These failures were instructive and ultimately served as stepping-stones to the programs' success.

Program managers and their teams need to recognize that success is not a given. Setbacks will occur. The true test of the program manager and his team is not how they handle successes but how they prepare for and handle failure. Key to this is development and use of risk management tools by the program manager to identify potential risks and

mitigation strategies. While schedules slip and costs grow, the main concern of the ultimate user is if the system works well when fielded.<sup>5</sup>

## **Stability**

Stability is important to program success. Just as it is difficult to hit a moving target, is it also difficult to manage a program that lacks stability. Changes in requirements, budgets, and resources make program planning and execution difficult. The program manager must act to maintain stability where possible and manage change where stability is not possible. The program manager, as the prime program advocate, must act to lay the groundwork for external support that will help maintain stability.

Instability is the common factor in most defense acquisition problems. Clay<sup>6</sup> suggests five conditions for creating stability:

- A few key system objectives, consistent with strategies and user needs that are correctly identified and held constant.
- Cost, schedule, and performance estimates that are realistic. He defines realistic as the probability of over-performing being equal to the probability of under-performing.
- Trained and experienced personnel assigned to the program and work to achieve the program objectives.
- Resources approved and promised during the planning phase are provided unless the program fails to achieve its objectives.
- Commitments to complete acquisition tasks are fulfilled.

Program stability can be equated with quality expert W. Edwards Demming's constancy of purpose and has long been recognized as perhaps the single most important contributor to efficiency and effectiveness in acquisition.<sup>7</sup> Unfortunately stability is often a rare occurrence in acquisition programs. Political, budgetary and operational factors will act against the program manager's best efforts to maintain stability. Program managers need to be vocal advocates for their programs, planning for stability, but

accommodating changes that will inevitably occur. Where possible, establishment of a modest management reserve (both budget and schedule) and risk management efforts aimed at sources of program instability can help the program manager be better prepared for program changes.

### **Program Manager Skills**

The ability and skills of the program manager can make or break a program. A combination of leadership ability, communication skills, team building skills, experience and education is important. The program manager must be able to garner support for the program at higher levels, motivate the team, and navigate the program towards successful completion of its goals. The program manager is the program's leader and manager – he or she is in charge.

In all cases, the program manager's first and most important function is to have a "vision" of where the program is going and clearly communicate that vision to his or her team. Results-oriented program management as an effective way for program managers to mold organizational culture, emphasize their vision in terms of long-term goals and quality, and focus on the big picture. Results-oriented program managers have a sense of ownership in the program, believe in the mission, and communicate this to the program team. They create an environment focused on excellence and successful program completion.<sup>8</sup>

The ability and experience of the program manager is a vital element in the success of a program. Successful programs have managers who have the ability to communicate well with all types of audiences, are clearly in charge, take authority needed to perform the job, and hire quality people. Communicating effectively includes both speaking and

listening skills. The program manager must be adept at identifying the audience and adapting communication styles to effectively transmit his or her message. Program managers who are well-versed in gender based communication differences or Myers-Briggs personality type indicators are more apt to recognize non-verbal signals and adjust their communication and listening styles.

At one time or another, the program manager must be counselor, engineer, designer, historian, accountant, logistician, administrator, strategist, planner, leader coach and commander. The PM will have to develop and use expert judgement relative to all these functions and more, including congressional and public relations. The PM must also be a student, because many in the acquisition world have invaluable lessons to pass on. Without these skills, experience and lessons, the PM may find it difficult to optimize cost, schedule and system performance. First and foremost, the program manager must realize that success lies in how effectively he or she leads, motivates and supports the people assigned to the program office.<sup>9</sup>

### **Quality People**

Well-educated and trained people are essential to the success of a program. A reasonable amount of personnel stability and continuity as well as experience is desirable. Retaining a body of corporate knowledge within a program is important for continuity and success. At the same time, it is important to have a periodic infusion of new people with new ideas and experiences. One way this can be achieved is through a mix of civilian and military members on the program manager's team. Civilians tend to remain on programs longer, supplying a stable base of processes and history for the program, while military personnel bring varied experiences and ideas from many different sources.

Successful program managers hire or develop a talented workforce, mold them into a cohesive team and motivate them to help further program objectives. As Brigadier General James Feigley, the current program manager of the Marine's Advanced Amphibious Assault Vehicle states: "...Defense acquisition has always been, is now and I believe will remain in the future, principally a human endeavor. And while we can create a lot of processes, use a lot of tools by which to improve and speed up our work, all the important things sooner or later come down to people, their intellectual abilities, and their capability to work with other people. Those out there who think that it's otherwise have something to learn."<sup>10</sup>

One new policy that will contribute to the quality of the DOD acquisition force was recently announced by Under Secretary of Defense for Acquisition and Technology (USD (A&T)), Dr Jacques S. Gansler. Titled "Reform Through Learning: USD (A&T) Policy on Continuous Learning for the Defense Acquisition Workforce," the policy provides a framework for acquisition workforce development and continuing education. The policy applies to all members of the DOD acquisition workforce and requires members to engage in continuous learning activities, earning a specified minimum of "learning points" every two years. Employees may earn points through a variety of formal and informal and experiential and professional activities.<sup>11</sup>

### **Program Manager Responsibility and Authority**

The program manager is responsible for the success or failure of the program, yet there are many factors outside the span of his or her control. The program manager must assume the authority commensurate with the responsibility for insuring program success.

In the words of one program manager, “Any program manager has as much authority as he is willing to step up and take.”<sup>12</sup>

The program manager is ultimately responsible for the success of his or her program. Success is often measured in how well the program meets cost, schedule and performance targets. To be successful, the program manager must be able to balance these three objectives and work within the framework of change and uncertainty. The program manager must guard against challenges to his authority, or actions that undermine his position of responsibility. These challenges often come from outside the program. Baumgartner, Brown and Kelly recount how when one program manager was required to do something he disagreed with, he would explain what the repercussions of that action would be. If the person persisted, the program manager explained that he would tie that person’s name to the required change and its related cost and schedule impacts so that everyone in the program’s chain of command would know who was behind that change. The person usually acquiesced. As one program manager observed, many people in the Pentagon can say no, creating problems for your program, but do not have the authority to say yes.<sup>13</sup>

Retired Lt. General James Abrahamson notes that every program manager must view himself or herself as part of the combat team first and as a manager, engineer or scientist second. He notes that ultimately, as the leader, the program manager is responsible for the success or failure of the program. Two common practices serve to undermine the program manager’s authority. The first is the common practice of employing matrixed personnel over whom the program manager has little or no control and who may be negatively influenced by external factors. One way to overcome this obstacle is for the

program manager to have performance rating authority or input into the performance rating matrixed personnel receive. The second occurs when the program manager's prerogatives are usurped or negated by decisions or actions taken by Congress, the Office of Management and Budget or higher headquarters. In these situations, persuasion and documented rebuttals are often the program manager's only recourse. In both cases, if the program manager is to succeed, he or she must be resilient and work diligently to overcome organizational and bureaucratic obstacles.<sup>14</sup>

### **Total Team Concept**

The program manager should strive to create a program office team atmosphere where everyone can work towards program goals and aggressively manage the program. This team spirit promotes unity of purpose and creates a culture that unifies the program office. Formation of Integrated Product Teams that include the user and contractor serve to foster communication and a joint approach to identifying and solving problems. Although total quality management did not rank as a best practice, the total team concept is one element of a total quality management program that has been identified as contributing to the success of a program.

The program manager must work effectively within the acquisition trinity: the customer, the program office and the contractor. The program manager and his organization function as the center of this trinity: the link between the customer's requirements and their realization by the contractor. The program manager must work with the ultimate user (the customer) to define requirements and prevent requirements creep. At the same time, he must work to form an effective and efficient working

relationship with the contractor staying focused on important program goals and ideals while treating all parties with respect.<sup>15</sup>

Key to a program's success is the development of a program team composed of program office personnel, support personnel from other agencies, the user or customer, and the contractor. Three things the program manager can do to build an effective team are to create a team environment, communicate a vision, and work to resolve conflicts.

Creating a team environment is very important. Members of the program team are frequently geographically separated and report to different organizations. The PM must establish an atmosphere where team members are encouraged to participate, share opinions, and work together. The PM needs to help the team understand that building an effective team is a process that may take time.

As stated earlier, the program manager needs to communicate a vision. A vision gives people on the team a clear understanding of the direction in which the program is heading. It is inspirational and describes the ultimate success of the team's efforts. By establishing and communicating a vision, the program manager can more productively influence the success of the program than he or she could by trying to be everywhere and making all the decisions.

Conflicts are inevitable. The different personalities, loyalties and functional backgrounds of the team members frequently become contributors to conflict. The PM can help resolve conflict by being sensitive to the potential causes of conflict, recognizing conflicts that need PM intervention and using compromise and encouragement to resolve them.<sup>16</sup>

## Notes

<sup>1</sup> James H. Dobbins, “Critical Success Factors in DoD Program Management,” in *Military Project Management Handbook*, ed. David I. Cleland et al. (New York, NY.: McGraw Hill Inc., 1993), 17.1-17.18.

<sup>2</sup> J. Stanley Baumgartner, Calvin Brown and Patricia A. Kelly, “Successful Programs: Can We Learn from Their Experience?”, *Program Manager* 13, no. 1 (January-February 1984): 32.

<sup>3</sup> Donald A. Hicks, Ben R. Rich, Robert H. Wertheim and Wayne E. Meyer, “Improving Communications, Relaxing Specifications Would Aid Acquisition”, *Aviation Week & Space Technology* 134, no. 8 (February 25, 1991): 65.

<sup>4</sup> John R. Snoderly and David D. Acker, “Another Look at Shortening Acquisition Time”, *Program Manager* 10, no. 6 (November-December 1981): 7-8.

<sup>5</sup> Baumgartner, Brown and Kelly, 32.

<sup>6</sup> Lt. Col. John L. Clay, “What’s Wrong With Acquisition”, *Program Manager* 19, no. 5 (September-October 1990): 7-11.

<sup>7</sup> Edward Hirsch and F. Waelchli, “Toward a Set of Guiding Principles for Defense Acquisition”, *Defense* 20, no. 4 (April 1989): 8.

<sup>8</sup> James E. Price and Mary B. Valentine, “Results-Oriented Program Management as a Leadership Management Model”, *Program Manager* 21, no. 6 (November-December 1992): 12.

<sup>9</sup> James A. Abrahamson, “Military Program Management: A Personal Perspective,” in *Military Project Management Handbook*, ed. David I. Cleland et al. (New York, NY.: McGraw-Hill Inc., 1993), 11.2

<sup>10</sup> Collie J. Johnson, “AAAV—At the Brink of Prototype”, *Program Manager* 27, no. 6 (November–December 1998): 2.

<sup>11</sup> “New Learning Policy”, *Acquisition Reform Today* 4, no.1 (January-February 1999): 1.

<sup>12</sup> Baumgartner, Brown and Kelly, 37.

<sup>13</sup> Ibid., 35-36.

<sup>14</sup> Abrahamson, 11.2-11.6.

<sup>15</sup> Lt. Col. Wayne M. Johnson, “Simple Rules a Program Manager Can Live By”, *Program Manager* 26, no. 6 (November-December 1997): 46.

<sup>16</sup> Kevin P. Grant, “Team Building and the Project Manager,” in *Military Project Management Handbook*, ed. David I. Cleland et al. (New York, NY.: McGraw-Hill Inc., 1993), 22.5-22.14.

## **Chapter 4**

### **Conclusions and Recommendations**

#### **Conclusions**

By identifying elements of DOD acquisition program success, it is possible to define a set of critical success factors for DOD acquisition programs. Candidate elements of program success (factors) were used. A factor analysis was performed using relevant literature. Those factors with the highest correlation in the survey of literature were identified as critical success factors. The results using the factor analysis technique compare favorably with research using conventional surveys. Factor analysis provides a new method for identifying critical success factors that can help program managers achieve program success.

Critical success factors for DOD program managers are identifiable and their use would assist program managers in maintaining management focus on those factors most important to program success. The critical success factors as identified in the factor analysis of literature are:

#### **Acquisition Factors**

- well defined requirements
- acquisition strategy
- works well when fielded
- stability

**Resource Factors**

- program manager skills
- quality people
- program manager responsibility and authority
- total team concept

These results form a core list of critical success factors for DOD program managers.

**Recommendations**

Identifying and applying critical success factors can help program managers better manage their programs and achieve success. Program managers and their staffs should be educated on CSFs and how to identify specific CSFs for their situation and program. In addition, program managers should be shown how CSFs can translate into management indicators and be incorporated into information networks and program management tools/systems.

The critical success factors identified in this paper should be examined by program managers for adoption and inclusion in their programs. These critical success factors are widely recognized as contributing factors in program success by program managers and the current literature on acquisition. The entire set of CSFs will not apply to each program. The program manager should examine each practice carefully for inclusion in his program and monitor implementation for positive or negative results.

It is difficult to come up with a standard set of critical success factors that can be applied to all programs and situations. Different CSFs may be important to different program managers at differing points in time. It is important for the program manager to examine his or her circumstances and apply those CSFs that can be useful. Each program manager should determine how and when to implement each practice. The program manager should look at these CSFs in relation to his or her leadership style and

personality. Selection and use of CSFs can enhance or supplement the program manager's strengths and help overcome his or her weaknesses. Careful consideration should be given to the method of implementation in order to insure success.

Research on identification and use of CSFs is still relatively immature. Continued research into identifying and applying CSFs, particularly in the area of defense acquisition is necessary to fully develop the techniques. Pilot applications of CSFs in specific defense acquisition programs would provide a baseline for application and additional results for analysis.

## ***Glossary***

### **ACRONYMS**

|      |                                    |
|------|------------------------------------|
| CSF  | Critical Success Factor            |
| DOD  | Department of Defense              |
| MNS  | Mission Need Statement             |
| NDAA | Non–Developmental Airlift Aircraft |
| ORD  | Operational Requirements Document  |
| PM   | Program Manager                    |
| TQM  | Total Quality Management           |
| US   | United States                      |
| USAF | United States Air Force            |

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