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**Contract Management Process Maturity:**
**Empirical Analysis of Organizational Assessments**

**27 August 2009**

**by**

**Dr. Rene G. Rendon, Associate Professor**
Graduate School of Business & Public Policy
**Naval Postgraduate School**



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# Abstract

This research builds upon the emerging body of knowledge on contract management workforce competence and organizational process capability. In 2003, the Contract Management Maturity Model (CMMM) was first developed for the purpose of assessing an organization's contract management process capability. Specifically developed for the Department of Defense's (DoD) contracting agencies and defense industry partners, the CMMM has been applied at Air Force, Army, Navy, and defense industry organizations. During the period between 2007 and 2009, assessments were conducted at Army, Navy, Air Force, and joint DoD contracting organizations using the CMMM. These organizations included the Army Aviation and Missile Command, Naval Air Systems Command, Air Force Logistics Center, and the US Transportation Command. The primary purpose of this paper is to summarize the assessment ratings, analyze the assessment results in terms of contract management process maturity, discuss the implications of these assessment results for process improvement and knowledge management opportunities, and provide insight on consistencies and trends from these assessment results to DoD contract management. This paper also discusses these assessment results in an attempt to characterize the current state of contract management practice within the Department of Defense.



**Keywords:** Organizational process capability, assessment ratings, assessment results

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# About the Author

**Dr. Rene G. Rendon** is a nationally recognized authority in the areas of supply management, contract management, and project management. He is currently on the faculty of the United States Naval Postgraduate School where he teaches in the MBA and Master of Science programs. Prior to his appointment at the Naval Postgraduate School, he served for more than 22 years as an acquisition and contracting officer in the United States Air Force, retiring at the rank of lieutenant colonel. His Air Force career included assignments as a warranted contracting officer for the Peacekeeper ICBM, Maverick Missile, C-20 (Gulfstream IV), and the F-22 Raptor. He was also a contracting squadron commander for an Air Force pilot training base and the director of contracting for the Air Force's Space Based Infrared satellite system, and the Evolved Expendable Launch Vehicle rocket program.

Rendon has taught contract management courses for the UCLA Government Contracts program and was also a senior faculty member for the Keller Graduate School of Management, where he taught MBA courses in project management and contract management. He is a graduate of the US Air Force Squadron Officer School, Air Command and Staff College, Air War College, and the Department of Defense Systems Management College. Rendon is Level III certified in both Program Management and Contracting under the Defense Acquisition Workforce Improvement Act (DAWIA) program. He is also a Certified Professional Contracts Manager (CPCM) with the National Contract Management Association (NCMA), a Certified Purchasing Manager (CPM) with the Institute for Supply Management (ISM), and a certified Project Management Professional (PMP) with the Project Management Institute (PMI). He has received the prestigious Fellow Award from NCMA, and he was recognized with the United States Air Force Outstanding Officer in Contracting Award. He has also received the NCMA National Education Award and the NCMA Outstanding Fellow Award. Dr. Rendon is a member of the ISM

Certification Committee as well as on the Editorial Review Board for the ISM *Inside Supply Management* magazine. He is a member of the NCMA Board of Advisors as well as associate editor for its *Journal of Contract Management.* Dr. Rendon's publications include *Government Contracting Basics* (2007), *U.S. Military Program Management: Lessons Learned & Best Practices* (2007), and *Contract Management Organizational Assessment Tools* (2005). He has also published scholarly articles in the *Contract Management* magazine, the *Journal of Contract Management*, the *Program Manager* magazine, the *Project Management Journal*, and the *PM Network* magazine. He is a frequent speaker at universities and professional conferences and provides consulting to both government and industry.

Rene G. Rendon, D.B.A
Associate Professor
Graduate School of Business and Public Policy
Naval Postgraduate School
Monterey, CA 93945-5197
Tel: (831) 656-3464
E-mail: rgrendon@nps.edu

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# Table of Contents

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# I. Overview

Contract management has become increasingly important in the commercial industry as well as in the federal government. As organizations continue to focus on core competencies and outsource non-core yet critical functions, these organizations are relying on contract management processes as a key to achieving and maintaining a competitive advantage (Quinn, 2005; Patel, 2006).

In addition, the federal government continues to increase its level of public spending for goods and services. With a procurement budget of approximately $532 billion in FY 2008 and an increase from $200 billion in FY 2000, federal government acquisition professionals are responsible for managing contracts for the procurement of critical supplies and services, ranging from commercial-type supplies to professional and administrative services to highly complex information technology systems. Within the federal government, the Department of Defense (DoD) is the largest contracting agency, procuring approximately $388 billion in FY 2008 (GAO, 2009).

The extent and amount of federal procurement spending necessitates that these contract management processes be well managed (Thai, 2004). However, recent Government Accountability Office (GAO) reports reflect that this is not the case. The GAO has listed contract management as a “high-risk” area for the federal government since 1990 and continues to identify it as high risk (GAO, 2007b, January; 2009). Within the federal government, the procurement and contracting function has been elevated to an organizational core competency (Kelman, 2001) and is receiving extensive emphasis in the areas of education, training, and the development of workforce competence models (Newell, 2007; GAO, 2007a, January). In addition to a focus on increasing individual contract management competency, organizations are now focusing on increasing contract management process competence through the use of organizational process maturity models. Just as individual competence will lead to greater success in performing tasks,

organizational process capability will ensure consistent and superior results for the enterprise (Frame, 1999; Kerzner, 2001).

# II. Research Scope and Objectives

This paper analyzes the results of contract management process capability assessments conducted during the period 2007–2009 using the five-level Contract Management Maturity Model (CMMM). The CMMM is used to assess an organization's contract management process capability and to develop a roadmap for implementing contract management process improvement initiatives. Using the survey assessment tool, the CMMM was applied to Army, Navy, Air Force, and joint Navy DoD contracting agencies, as well as major defense contractors. The purpose of this research is to summarize the assessment ratings, analyze the assessment results in terms of contract management process maturity, and discuss the implications of these assessment results for process improvement and knowledge management opportunities. The assessment results and related recommendations for contract management process improvement and knowledge management opportunities will guide the contracting agencies in developing a roadmap for increasing contract management process capability. A thorough understanding of the current level of contract management process capability will help these organizations improve their procurement of defense-related supplies and services. This research will also discuss the assessment results by providing insight on consistencies and trends in an attempt to characterize the current state of contract management within the Department of Defense.

The background and context of contract management process maturity and, specifically, the Contract Management Maturity Model will first be presented. The assessed organizations will then be profiled, followed by the analysis of the assessment findings and implications for process improvement and knowledge management opportunities. Finally, a brief discussion on consistent trends in the practice of contract management throughout the DoD will be presented.

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# III. Conceptual Framework

A review of the procurement literature finds a body of knowledge focused on the transformation of the procurement function from a tactical to a strategic perspective. Beginning with Henderson's (1975) prediction of the purchasing revolution in 1964 and extending to Kraljic's (1983) work emphasizing the need for a strategic supply management perspective and Reck and Long's research on developing the purchasing function to be a competitive weapon (1988), research shows the use of various organizational models for the development of the procurement function. These development models reflect the transition of procurement from a tactical function to a strategic and then an integrative one.

## A. Procurement Development Models

Reck and Long's (1988) model describes a four-stage development of the procurement function from passive, to independent, to supportive, and, finally, to integrative. Leender and Blenkhorn's (1988) model describes the three degrees of the procurement function's contribution to organizational objectives. Bhote's (1989) model reflects four stages of procurement development, ranging from confrontation to arms length to goal congruence, and, finally, to full partnership. Freeman and Cavinato (1990) present a four-stage procurement development model described as buying, purchasing, procurement, and supply. Burt, Dobler, and Starling (2003) present a four-stage progression to world-class supply management. This progression includes clerical, mechanical, proactive, and, finally, world-class.

It should be noted that these procurement development models are based on the development of the procurement *function*, specifically the procurement function's orientation and support of organizational strategy and objectives. As noted by the literature works cited earlier, some organizations' procurement function reflects more of a tactical purchasing perspective while other organizations' procurement function reflects a more strategic perspective. The development models found in the literature reflect the stage of development of the organization's procurement

function. These development models are not focused on the capability of the procurement *processes* or the strength and maturity of the procurement *processes* within the organization. An organization's procurement function can be in the early stages of development from tactical to strategic, yet its procurement process may reflect a high level of maturity. On the other hand, an organization's procurement function may be at the later stages of development toward strategic procurement but may have weak or immature procurement processes. These procurement developmental models reflect the transformation of the organization's procurement function, whereas capability maturity models are used to assess an organization's processes to determine the degree of capability or maturity of those processes.

## B. Process Capability

A review of the literature on process capability begins with the quality management research of Deming (1986), Juran (1988), and Crosby (1979). From this research, a greater emphasis was placed on continuous process improvement and increasing the capability of organizational processes. Process capability, in this sense, is defined as "the inherent ability of a process to produce planned results" (Ahern, Clouse, & Turner, 2001, p 4). As the capability of a process increases, it becomes predictable and measurable (Ahern, Clouse, & Turner, 2001). Deming, Juran, and Crosby revealed that as process capability increases, the inherent ability of a process to produce planned results also increases, thus becoming more predictable and measurable. This increase in process capability results in the organization controlling or eliminating the most significant causes of poor quality and productivity. As organizations steadily improve their process capability, they increase their competence and thus become more mature (Ahern et al., 2001). Competence, in this case, is defined as "an underlying characteristic that is causally related to effective or superior performance, as determined by measurable, objective criteria, in a job or in a situation" (Curtis, Hefley, & Miller, 2001). Maturity can be defined as a measure of effectiveness in any specific process (Dinsmore, 1998).

It is important to note that process maturity is not related to the passage of time. Different organizations mature at different rates, depending on the nature of the business and the emphasis placed on process improvement. Process maturity is more reflective of how far an organization has progressed toward continuously improving its process capability in any specific area. An organization's process capability maturity level describes the level of organizational capability created by the transformation of one or more domains of an organization's process. It is an evolutionary plateau on an organization's improvement path from ad hoc practices to a state of continuous improvement (Curtis et al., 2001).

By the 1990s, it became clear that for organizations to remain competitive in this dynamic marketplace, they must operate competently and with capable, mature organizational processes. Organizational competence would lead to higher levels of maturity or learning capability (Yueng, Ulrich, Nason, & Von Glinow, 1999), thus enabling them to produce high-quality goods and services faster, cheaper, and better than their competitors. Even more important was the concept that the degree of organizational competence and level of maturity could be described and assessed objectively according to some generally accepted evaluation criteria.

Frame (1999) expands on this concept by describing the environment that supports organizational competence. Frame states that organizations demonstrate competence when they provide their employees with clearly defined and well-formulated procedures for performing work, access to information needed to perform work effectively, sufficient quantities of qualified human and material resources, and opportunities for training and education. Frame also identified a clearly defined organizational vision of where the organization is headed, a culture of openness, and the institutionalization and management support of organizational processes as elements needed for achieving competence.

Frame (1999) also discusses the common features for assessing organizational competence, including adopting performance standards, assessing what it will take to achieve these standards, developing an organizational plan to

achieve these standards, implementing the plan, assessing the organization to see whether it is meeting these standards, and documenting the findings. The use of maturity models as a method for describing, measuring, and assessing organizational capability maturity began to take hold along with the movement toward total quality management.

## C. Capability Maturity Models

Capability maturity models have been used by many organizations to assess the level of capability and maturity of their most critical processes. In these maturity models, process capability is defined as "the inherent ability of a process to produce planned results" (Ahern et al., 2001), and maturity is defined as "a measure of effectiveness in any specific process" (Dinsmore, 1998). Some of the better-known capability maturity models include the Software Engineering Institute (SEI) Capability Maturity Model (SEI CMM), People Capability Maturity Model (People CMM), and the Project Management Maturity Model (PMMM). Most maturity models are built on a series of maturity levels—with each maturity level reflective of the level of competence for that process. As the organization gains process competence, it moves up the maturity scale. As maturity increases, so does capability and predictability while risk decreases.

In 1986, the Software Engineering Institute (SEI), with assistance from the MITRE Corporation, began developing a process maturity framework intended to assist organizations in improving their software engineering process. The fully developed Capability Maturity Model (CMM) and associated questionnaire was released in 1993 (Ahern et al., 2001). The SEI CMM has become the most influential quality management system in the United States software industry (Persse, 2001). The CMM is based on five maturity levels: Level 1–Initial, Level 2–Repeatable, Level 3–Defined, Level 4–Managed, and Level 5–Optimizing (Persse, 2001; Ahern et al., 2001).

In 1995, the People Capability Maturity Model (People CMM) was first published as a continuous process improvement guide for developing the capability

of an organization's workforce. The model focuses on improving the process capability for attracting, developing, organizing, motivating, and retaining an organization's workforce. The People CMM has been successfully implemented in companies such as Boeing, Lockheed Martin, Ericsson, Novo Nordisk IT A/S, and Tata Consulting Services. The People CMM is structured similarly to the other capability maturity models currently in the software management and project management fields. The People CMM consists of five maturity levels and is focused on specific workforce management and development processes and sub-processes. The People CMM also uses a questionnaire-based maturity assessment as an optional method for conducting people capability maturity assessments.

The application of capability maturity models to the project management field has been the topic of recent field research within academia as well as project management training and consulting companies (Bolles, 2002; Crawford, 2001; Foti, 2002; Kerzner, 2001; Ibbs & Kwak, 2000; Jugdev & Thomas, 2002; Helms, 2002). This recent field research extends the theory of the Software Engineering Institute's CMM model and applies this framework to the project management discipline. There are several project management maturity models currently in use today. Kerzner's Project Management Maturity Model (PMMM), similar to the SEI CMM and other project management maturity models, is comprised of five levels, with each level representing a different degree of organizational maturity in project management. The PMMM is based on five maturity levels: Level 1–Common Language, Level 2–Common Processes, Level 3–Singular Methodology, Level 4–Benchmarking, and Level 5–Continuous Improvement (Kerzner, 2001).

The SEI CMM, People CMM, and Kerzner maturity models are excellent examples of how the concept of capability maturity models have been applied to the software management, workforce management, and project management processes. The purpose of this abbreviated literature review was to show that maturity models are effective methods for assessing and improving organizational competence and maturity. The next section will discuss the application of the maturity model concept to contract management.

## D. Contract Management Maturity Model

The maturity model concept was first applied to contract management by Rendon (2003). With the increase in importance of the procurement function and with the procurement function's transformation from a tactical to a strategic perspective, the Contract Management Maturity Model (CMMM) was developed to assess the capability and maturity of an organization's contract management processes (Rendon, 2003). "Contract management," as used in the model, is defined as the "art and science of managing a contractual agreement throughout the contracting process" (Garrett & Rendon, 2005, p. 270). "Maturity," as defined in the model, refers to organizational capabilities that can consistently produce successful business results for buyers and sellers of products, services, and integrated solutions (Garrett & Rendon, 2005). Thus, contract management refers to the buyer's (procurement) process as well as the seller's (business development and sales) process. The CMMM assessments analyzed in this research focused only on the buyer's procurement process. The structure of the CMMM is based on six contract management key process areas, five levels of contract management process capability maturity, and the CMMM assessment tool.

## E. Contract Management Key Process Areas

The CMMM provides the organization with a detailed roadmap for improving the capability of its contract management processes. The model reflects the six contract management key process areas as well as key practice activities within each process area. These contract management key process areas are described below.

### 1. Procurement Planning

The process of identifying which organizational needs can be best met by procuring products or services outside the organization. This process involves determining whether to procure, how to procure, what to procure, how much to procure, and when to procure. Procurement planning activities include conducting

stakeholder analyses, conducting outsourcing analyses, determining requirements and developing related documents, conducting market research, selecting the procurement method, and selecting the contract and incentive type.

### 2. Solicitation Planning

The process of preparing the documents needed to support the solicitation. This process involves documenting program requirements and identifying potential sources. Solicitation planning activities include developing solicitation documents such as RFPs (Request for Proposal) or IFBs (Invitation for Bid), developing contract terms and conditions, and developing proposal evaluation criteria.

### 3. Solicitation

The process of obtaining information (bids or proposals) from prospective sellers on how project needs can be met. Solicitation activities include advertising procurement opportunities, conducting industry and pre-proposal conferences, and amending solicitation documents as required.

### 4. Source Selection

The process of receiving bids or proposals and applying evaluation criteria to select a provider. Source selection activities include evaluating proposals, negotiating contract terms and conditions, and selecting the contractor.

### 5. Contract Administration

The process of ensuring that each party's performance meets contractual requirements. Contract administration activities include conducting a post-award conference, monitoring the contractor's performance, and managing contract changes.

### 6. Contract Closeout

The process of verifying that all administrative matters are concluded on a contract that is otherwise physically complete. This involves completing and settling the contract, including resolving any open items. Contract closeout activities consist of verifying and documenting contract completion and compliance with requirements, making final payment, disposing of buyer-furnished property and equipment, documenting lessons learned and best practices, and collecting contractor past performance information.

Each of these contract management key process areas includes various key practice activities that support the specific process. The current state of contract management practice includes various best practices in performing these key practice activities. These contract management key process area best practices are categorized by the following groups—Process Strength, Successful Outcomes, Management Support, Process Integration, and Process Measurement. Each of the items in the survey relates to one of these best-practice groups. How an organization performs the key process areas and the extent to which the key practices incorporate best practices determines the organization's contract management process capability maturity level.

## F. Contract Management Process Maturity

The CMMM consists of five levels of maturity applied to the six key process areas previously discussed. The five maturity levels reflected in the model allow an organization to assess their level of capability for each of the six key process areas of the procurement process. The six key process areas and related practice activities allow the organization to focus on specific areas and activities involved in procurement.

The five levels of maturity range from an "Ad Hoc" level (Level 1), to a "Basic," disciplined process capability (Level 2), to a fully "Structured," established, and institutionalized process capability (Level 3), to a level characterized by processes

"Integrated" with other organizational processes that result in synergistic enterprise-wide benefits (Level 4), and, finally, to a level in which "Optimized" processes are focused on continuous improvement and adoption of lessons learned and best practices (Level 5). The following is a brief description of each maturity level.

**Level 1–Ad Hoc**

The organization at this initial level of process maturity acknowledges that contract management processes exist and that these processes are accepted and practiced throughout various industries and within the public and private sectors. In addition, the organization's management understands the benefit and value of using contract management processes. Although there are no organization-wide, established, basic contract management processes, some established contract management processes do exist and are used within the organization, but these established processes are applied only on an ad hoc and sporadic basis to various contracts. There is no rhyme or reason to which contracts these processes are applied. Furthermore, there is informal documentation of contract management processes existing within the organization, but this documentation is used only on an ad hoc and sporadic basis on various contracts. Finally, organizational managers and contract management personnel are not held accountable for adhering to, or complying with, any basic contract management processes or standards.

**Level 2–Basic**

Organizations at this level of maturity have established some basic contract management processes and standards within the organization, but these processes are required only on selected complex, critical, or high-visibility contracts, such as contracts meeting certain dollar thresholds or contracts with certain customers. Some formal documentation has been developed for these established contract management processes and standards. Furthermore, the organization does not consider these contract management processes or standards established or institutionalized throughout the entire organization. Finally, at this maturity level,

there is no organizational policy requiring the consistent use of these contract management processes and standards other than on the required contracts.

**Level 3–Structured**

At this level of maturity, contract management processes and standards are fully established, institutionalized, and mandated throughout the entire organization. Formal documentation has been developed for these contract management processes and standards, and some processes may even be automated. Furthermore, since these contract management processes are mandated, the organization allows the tailoring of processes and documents in consideration for the unique aspects of each contract, such as contracting strategy, contract type, terms and conditions, dollar value, and type of requirement (product or service). Finally, senior organizational management is involved in providing guidance, direction, and even approval of key contracting strategy, decisions, related contract terms and conditions, and contract management documents.

**Level 4–Integrated**

Organizations at this level of maturity have contract management processes that are fully integrated with other organizational core processes such as financial management, schedule management, performance management, and systems engineering. In addition to representatives from other organizational functional offices, the contract's end-user customer is also an integral member of the buying or selling contracts team. Finally, the organization's management periodically uses metrics to measure various aspects of the contract management process and to make contract-related decisions.

**Level 5–Optimized**

The fifth and highest level of maturity reflects an organization whose management systematically uses performance metrics to measure the quality and evaluate the efficiency and effectiveness of the contract management processes. At

this level, continuous process improvement efforts are also implemented to improve the contract management processes. Furthermore, the organization has established lessons learned and best practices programs to improve contract management processes, standards, and documentation. Finally, initiatives for streamlining contract management processes are implemented by the organization as part of its continuous process improvement program.

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# IV. Method

## A. Survey and Sampling

The CMMM assessment tool is a web-based survey comprised of a total of 62 items related to each of the six contract management key process areas (approximately 10-11 items per key process area). The items use a Likert Scale option response with associated numerical value from 5 (Always) to 0 (I Don't Know). These options respond to the organization's use of specific contract management best practices as reflected in the literature. As previously discussed, these best practices relate to contract management process strength, successful outcomes, management support, process integration, and process measurement. The assessment tool was developed and validated in 2003 and previously applied to other defense contracting organizations (Rendon, 2003; Garrett & Rendon, 2005; Rendon, 2008).

The CMMM is limited as an assessment tool simply by the fact that it is based on qualitative survey data. Thus, it is only as effective as the responses to the survey questions. The CMMM should be used as an initial tool in assessing an organization's contract management process capability. The CMMM results should be validated with follow-up assessments, including personal interviews, procurement file audits, and reviews of procurement process documentation. Additionally, comparison of CMMM results with other procurement metrics such as procurement administrative lead-time, small business awards, and number of protested contract awards will also provide additional backup to the CMMM assessment.

The CMMM uses a purposeful sampling method designed to acquire data on organizational contract management processes. Purposeful sampling is to ensure samples are knowledgeable and informative about the phenomena being researched, thus increasing the utility of the information obtained from small samples (MacMillan & Schumacher, 2001; Creswell, 2003). Thus, the survey is only administered to warranted contracting officers and fully qualified contract specialists.

The sampling in this research consisted of agency employees either designated as warranted contracting officers or individuals that were considered fully qualified in the government contracting career field, in accordance with the Defense Acquisition Workforce Improvement Act (DAWIA). Warranted contracting officers are those individuals that have specific authority to enter into, administer, or terminate contracts and make related determinations and findings on behalf of the United States Government (FAR, 2009). Full qualification in the contracting career field is interpreted to mean achievement of Level 2 certification in contracting under DAWIA. Level 2 certification requires completion of a baccalaureate degree with at least 24 semester hours of coursework in accounting, law, business, finance, contracts, purchasing, economics, industrial management, marketing, quantitative methods, and organization and management; two years of contracting experience; and completion of the required contract training courses (DAWIA, 2009).

The survey website link was emailed to the directors of contracting for these specific agencies, which was then forwarded to the eligible personnel. Reminder emails were sent approximately two weeks into the survey period. (For TRANSCOM, the surveys were completed in hard-copy and returned by mail.) The survey instrument included the appropriate confidentiality and protection of human subject provisions. Of the 602 eligible survey participants, 257 completed the survey, generating a response rate of approximately 43%. Below are profiles of the contracting agencies that participated in the survey.

## B. Assessment Organizations

Contracting agencies representative of the Army, Navy, and Air Force as well as a joint Department of Defense agency were assessed using the Contract Management Maturity Model (CMMM). These organizations included the Army Aviation and Missile Command, Naval Air Systems Command, Air Force Logistics Center, and the US Transportation Command.

The Army Aviation and Missile Command (AMCOM) is responsible for lifecycle management of army missile, helicopter, unmanned ground vehicle and

unmanned aerial vehicle weapon systems. These weapon systems include the Patriot air defense missile system, Hellfire and Javelin missile system, and Apache, Black Hawk, and Chinook helicopters. The AMCOM Contracting Center provides acquisition and contracting support for these weapon systems. In FY08, the AMCOM Contracting Center processed approximately 23,600 contract actions and obligated approximately $20.6 billion (AMCOM, 2009).

The Naval Air Systems Command (NAVAIR), headquartered at Naval Air Station Patuxent River, Maryland, provides acquisition and contracting support for naval aircraft and airborne weapon systems such as the Joint Strike Fighter, V-22 Osprey, H-53 and H-60 Helicopters, and Advanced Anti-radiation Guided Missile as well as the support services, facilities, maintenance, and training for these aircraft and systems. In terms of contracting support for these aircraft missiles and support services, in FY 2007, NAVAIR's contracting directorate processed 22,103 contract actions valued at approximately $23.4 billion (Kovack, 2008).

The Air Force Logistics Center (ALC) at Hill Air Force Base provides contracting support for the logistics and sustainment of the A-10 attack aircraft, B-2 bomber, C-130 cargo aircraft, and the F-16 and F-22 fighter aircraft. OO-ALC also provides contracting support for the logistics and sustainment of the Air Force's intercontinental ballistic (ICBM) missile fleet. In terms of contracting support for the aircraft and intercontinental ballistic missile systems, the OO-ALC annually executes approximately 13,000 contacts valued at almost $3 billion (Sheehan, Moats, & VanAssche, 2007; US Air Force, 2007).

The US Transportation Command's (USTRANSCOM) mission is to provide air, land, and sea transportation for the Department of Defense, both in times of peace and times of war. In support of this mission, USTRANSCOM acquires distribution and transportation services for global movement in support of the warfighter. The directorate of acquisition provides acquisition support of USTRANSCOM's mission. The directorate typically processes approximately 6,000

contract actions with an annual spend of approximately $6 billion (USTRANSCOM, 2009).

Although these defense contracting agencies acquire and procure different types of supplies and services such as aircraft/missiles, transportation services, and information technology equipment, the contract management processes used are common to all organizations. Additionally, the contract management processes used at these contracting agencies are common to Army, Navy, Air Force, DoD, and other federal government agencies for the procurement of supplies and services. Thus, the conclusions based on the analysis of the results from these contract management process assessments may be applicable to other federal government agencies. The CMMM assessment results will be discussed next.

# V. Results

The Contract Management Maturity Model (CMMM) organizational assessments can be analyzed at different levels. The CMMM assessment tool allows for identification of the respondent's specific program office within the assessed organization. For example, the assessment of the Army Missile and Aviation Command (AMCOM) includes the organization's program offices such as the Tactical Missile Systems, Air Defense Systems, and Helicopter Systems. Thus, within the organization, such as AMCOM, CMMM assessment results can be analyzed to determine the contract management process maturity ratings for each program's contracting office, and comparisons of maturity ratings can be made among these contracting offices. This allows for the development of specific process improvement initiatives for these program's contracting offices.

In addition to assessments at the program office level, the CMMM assessment results can also be analyzed at the enterprise level. Using AMCOM as an example again, at this enterprise-level of analysis, the CMMM results can be compared to other contracting enterprises, such as Army Communications Electronics Command CECOM), or Army Tank-Automotive and Armament Command (TACOM). Process improvement initiatives can then be suggested for each contracting enterprise.

Finally, the results of enterprise-level assessments can be used to characterize the state of contract management process capability across DoD's agencies such as the Army, Navy, Air Force, and joint Department of Defense (DOD) agencies. For the purpose of this paper, the CMMM analysis is conducted at the agency level. Our purpose is to compare the CMMM assessment results among Army, Navy, Air Force, and joint DoD agencies. The results of the CMMM assessments at the Army Aviation and Missile Command (AMCOM), Naval Air Systems Command (NAVAIR), Air Force Logistics Center (ALC), and the US Transportation Command (TRANSCOM) will be discussed in an attempt to identify

consistencies in contract management processes capability and areas for contract management process improvement and to characterize the state of contract management process capability within the Department of Defense.

The results of the CMMM assessment at the four contracting enterprises are listed in Table 1 as well as the contract management key process areas, survey item number, and item description. Also listed are the mean response for each survey item, standard deviation, and number of responses for each contracting enterprise.

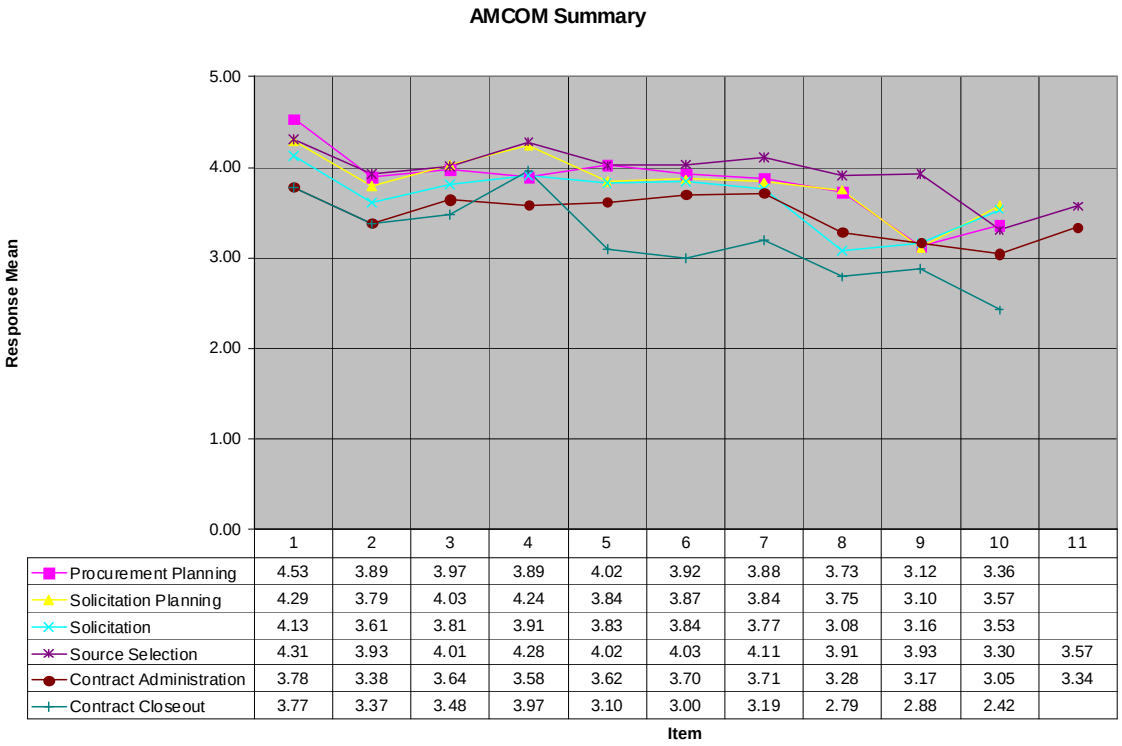
The mean responses—based on the Likert Scale numerical value range from 5 (Always) to 0 (I Don't Know) for each item in each key process area (Procurement Planning, Solicitation Planning, etc.)—are totaled and the resulting score is converted to its associated process capability maturity level, using the CMMM conversion table.

**Table 1. Results of the CMMM Assessment**

| Key Process/Item Number/ Description | AMCOM | NAVAIR | ALC | TRANSCOM | | |
|---|---|---|---|---|---|---|
| | Mean | Mean | Mean | Mean | SD | Total *n* |
| **Procurement Planning** | | | | | | |
| 1.1 Process Strength | 4.53 | 4.11 | 4.03 | 4.38 | 0.23 | 262 |
| 1.2 Process Strength | 3.89 | 3.61 | 3.80 | 4.04 | 0.18 | 262 |
| 1.3 Process Strength | 3.97 | 3.72 | 3.80 | 4.00 | 0.13 | 262 |
| 1.4 Successful Results | 3.89 | 3.39 | 3.68 | 4.08 | 0.30 | 262 |
| 1.5 Management Support | 4.02 | 4.17 | 3.83 | 4.17 | 0.16 | 262 |
| 1.6 Process Integration | 3.92 | 3.94 | 3.98 | 4.21 | 0.13 | 262 |
| 1.7 Process Integration | 3.88 | 3.78 | 3.73 | 3.63 | 0.11 | 262 |
| 1.8 Process Integration | 3.73 | 4.00 | 3.95 | 4.17 | 0.18 | 262 |
| 1.9 Process Measurement | 3.12 | 2.72 | 3.28 | 2.38 | 0.41 | 262 |
| 1.10 Process Measurement | 3.36 | 3.22 | 3.65 | 3.71 | 0.23 | 262 |
| **Total** | 38.33 | 36.67 | 37.70 | 38.75 | | |
| **Solicitation Planning** | | | | | | |
| 2.1 Process Strength | 4.29 | 4.00 | 4.05 | 4.46 | 0.21 | 258 |
| 2.2 Process Strength | 3.79 | 3.33 | 3.65 | 3.88 | 0.24 | 258 |
| 2.3 Process Strength | 4.03 | 3.56 | 4.05 | 4.25 | 0.29 | 258 |
| 2.4 Successful Results | 4.24 | 3.94 | 3.88 | 4.38 | 0.24 | 258 |
| 2.5 Management Support | 3.84 | 3.83 | 3.65 | 4.17 | 0.21 | 258 |
| 2.6 Process Integration | 3.87 | 3.94 | 3.63 | 3.75 | 0.14 | 258 |
| 2.7 Process Integration | 3.84 | 3.67 | 3.58 | 3.71 | 0.11 | 258 |
| 2.8 Management Support | 3.75 | 3.67 | 3.55 | 4.21 | 0.29 | 258 |
| 2.9 Process Measurement | 3.10 | 4.22 | 3.80 | 2.38 | 0.81 | 258 |

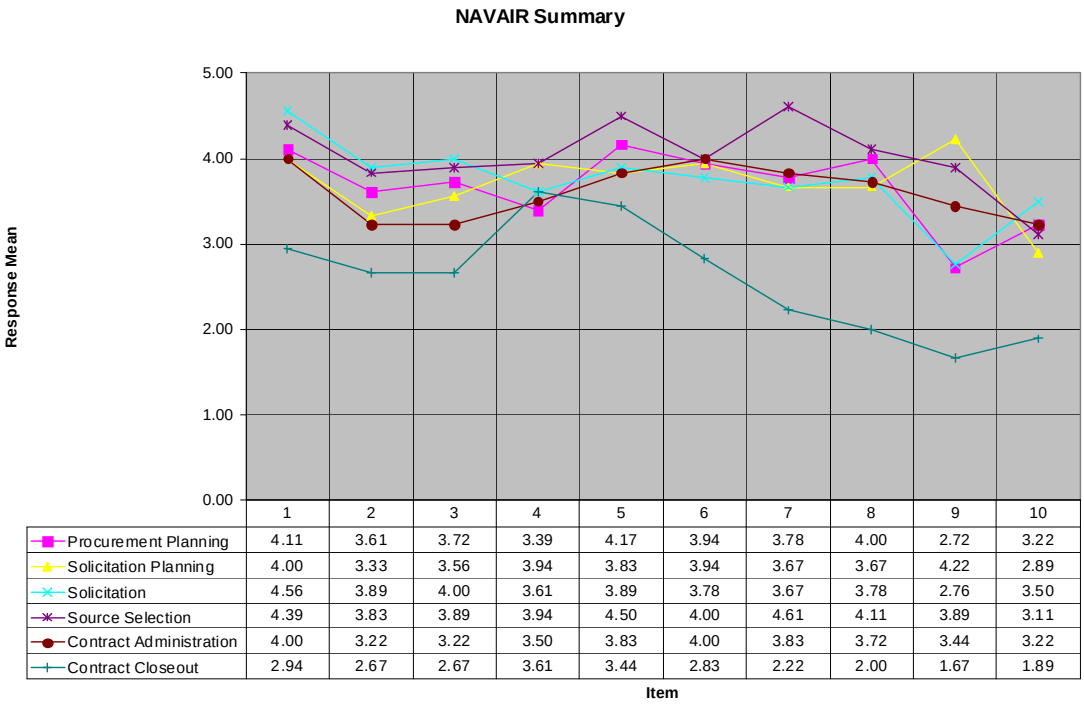
| | | | | | | |
|---|---|---|---|---|---|---|
| 2.10 Process Measurement | 3.57 | 2.89 | 3.43 | 3.79 | 0.38 | 258 |
| **Total** | 38.32 | 37.06 | 37.25 | 38.96 | | |
| **Solicitation** | | | | | | |
| 3.1 Process Strength | 4.13 | 4.56 | 4.30 | 4.04 | 0.23 | 258 |
| 3.2 Process Strength | 3.61 | 3.89 | 3.93 | 3.42 | 0.24 | 258 |
| 3.3 Process Strength | 3.81 | 4.00 | 4.20 | 3.88 | 0.17 | 258 |
| 3.4 Successful Results | 3.91 | 3.61 | 3.85 | 4.33 | 0.30 | 258 |
| 3.5 Management Support | 3.83 | 3.89 | 3.55 | 4.04 | 0.21 | 258 |
| 3.6 Process Integration | 3.84 | 3.78 | 3.53 | 3.71 | 0.14 | 258 |
| 3.7 Process Integration | 3.77 | 3.67 | 3.50 | 3.54 | 0.12 | 258 |
| 3.8 Process Integration | 3.08 | 3.78 | 3.20 | 4.25 | 0.54 | 258 |
| 3.9 Process Measurement | 3.16 | 2.76 | 3.35 | 2.38 | 0.43 | 258 |
| 3.10 Process Measurement | 3.53 | 3.50 | 3.60 | 3.92 | 0.19 | 258 |
| **Total** | 36.67 | 37.43 | 37.00 | 37.50 | | |
| **Source Selection** | | | | | | |
| 4.1 Process Strength | 4.31 | 4.39 | 4.08 | 4.42 | 0.16 | 257 |
| 4.2 Process Strength | 3.93 | 3.83 | 3.73 | 3.88 | 0.09 | 257 |
| 4.3 Process Strength | 4.01 | 3.89 | 4.13 | 4.00 | 0.10 | 257 |
| 4.4 Successful Results | 4.28 | 3.94 | 4.00 | 4.33 | 0.20 | 257 |
| 4.5 Management Support | 4.02 | 4.50 | 3.95 | 4.21 | 0.25 | 257 |
| 4.6 Successful Results | 4.03 | 4.00 | 3.73 | 3.67 | 0.19 | 257 |
| 4.7 Successful Results | 4.11 | 4.61 | 3.98 | 4.67 | 0.35 | 257 |
| 4.8 Process Integration | 3.91 | 4.11 | 3.88 | 4.21 | 0.16 | 257 |
| 4.9 Process Integration | 3.93 | 3.89 | 3.95 | 3.96 | 0.03 | 257 |
| 4.10 Process Measurement | 3.30 | 3.11 | 3.55 | 2.46 | 0.47 | 257 |
| 4.11 Process Measurement | 3.57 | * | * | 4.00 | 0.30 | 257 |
| **Total** | 43.39 | 40.28 | 38.95 | 43.79 | | |
| **Contract Administration** | | | | | | |
| 5.1 Process Strength | 3.78 | 4.00 | 3.93 | 4.25 | 0.20 | 257 |
| 5.2 Process Strength | 3.38 | 3.22 | 3.63 | 3.54 | 0.18 | 257 |
| 5.3 Process Strength | 3.64 | 3.22 | 3.70 | 3.83 | 0.26 | 257 |
| 5.4 Successful Results | 3.58 | 3.50 | 3.15 | 4.29 | 0.48 | 257 |
| 5.5 Management Support | 3.62 | 3.83 | 3.55 | 3.92 | 0.17 | 257 |
| 5.6 Process Integration | 3.70 | 4.00 | 3.88 | 4.17 | 0.20 | 257 |
| 5.7 Process Integration | 3.71 | 3.83 | 3.50 | 3.75 | 0.14 | 257 |
| 5.8 Process Integration | 3.28 | 3.72 | 3.45 | 3.46 | 0.18 | 257 |
| 5.9 Process Integration | 3.17 | 3.44 | 3.48 | 2.88 | 0.28 | 257 |
| 5.10 Process Measurement | 3.05 | 3.22 | 3.10 | 2.33 | 0.40 | 257 |
| 5.11 Process Measurement | 3.34 | * | * | 3.75 | 0.29 | 257 |
| **Total** | 38.25 | 36.00 | 35.35 | 40.17 | | |
| **Contract Closeout** | | | | | | |
| 6.1 Process Strength | 3.77 | 2.94 | 4.08 | 3.50 | 0.48 | 257 |
| 6.2 Process Strength | 3.37 | 2.67 | 3.73 | 2.88 | 0.48 | 257 |
| 6.3 Process Strength | 3.48 | 2.67 | 3.50 | 3.21 | 0.39 | 257 |
| 6.4 Successful Results | 3.97 | 3.61 | 3.88 | 4.08 | 0.20 | 257 |
| 6.5 Management Support | 3.10 | 3.44 | 3.30 | 2.58 | 0.38 | 257 |
| 6.6 Process Integration | 3.00 | 2.83 | 3.15 | 2.96 | 0.13 | 257 |
| 6.7 Process Integration | 3.19 | 2.22 | 3.13 | 2.83 | 0.44 | 257 |
| 6.8 Process Measurement | 2.79 | 2.00 | 2.80 | 1.96 | 0.47 | 257 |
| 6.9 Process Measurement | 2.88 | 1.67 | 2.90 | 2.96 | 0.62 | 257 |
| 6.10 Process Measurement | 2.42 | 1.89 | 2.80 | 2.54 | 0.38 | 257 |
| **Total** | 31.97 | 25.94 | 33.25 | 29.50 | | |

Figures 1 through 4 are line graphs that reflect item means for each survey item within each contract management key process area (Procurement Planning, Solicitation Planning, Solicitation, …), for each contracting organization (AMCOM, NAVAIR, ALC, TRANSCOM).



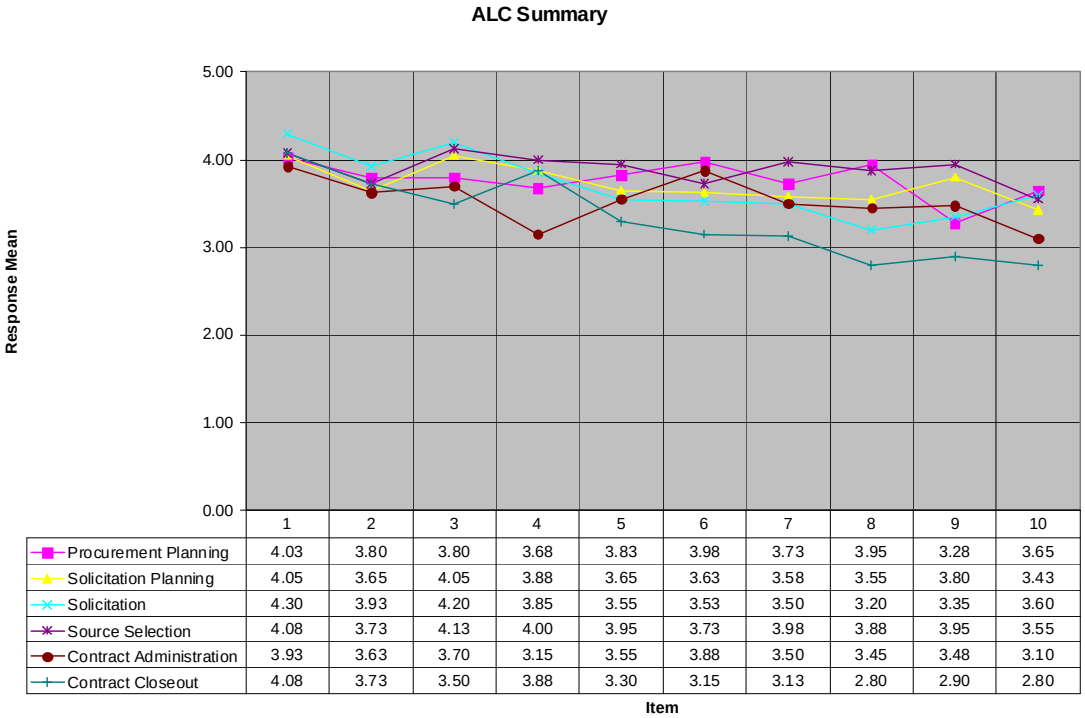

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Procurement Planning | 4.53 | 3.89 | 3.97 | 3.89 | 4.02 | 3.92 | 3.88 | 3.73 | 3.12 | 3.36 | |
| Solicitation Planning | 4.29 | 3.79 | 4.03 | 4.24 | 3.84 | 3.87 | 3.84 | 3.75 | 3.10 | 3.57 | |
| Solicitation | 4.13 | 3.61 | 3.81 | 3.91 | 3.83 | 3.84 | 3.77 | 3.08 | 3.16 | 3.53 | |
| Source Selection | 4.31 | 3.93 | 4.01 | 4.28 | 4.02 | 4.03 | 4.11 | 3.91 | 3.93 | 3.30 | 3.57 |
| Contract Administration | 3.78 | 3.38 | 3.64 | 3.58 | 3.62 | 3.70 | 3.71 | 3.28 | 3.17 | 3.05 | 3.34 |
| Contract Closeout | 3.77 | 3.37 | 3.48 | 3.97 | 3.10 | 3.00 | 3.19 | 2.79 | 2.88 | 2.42 | |

**Figure 1. AMCOM Summary**



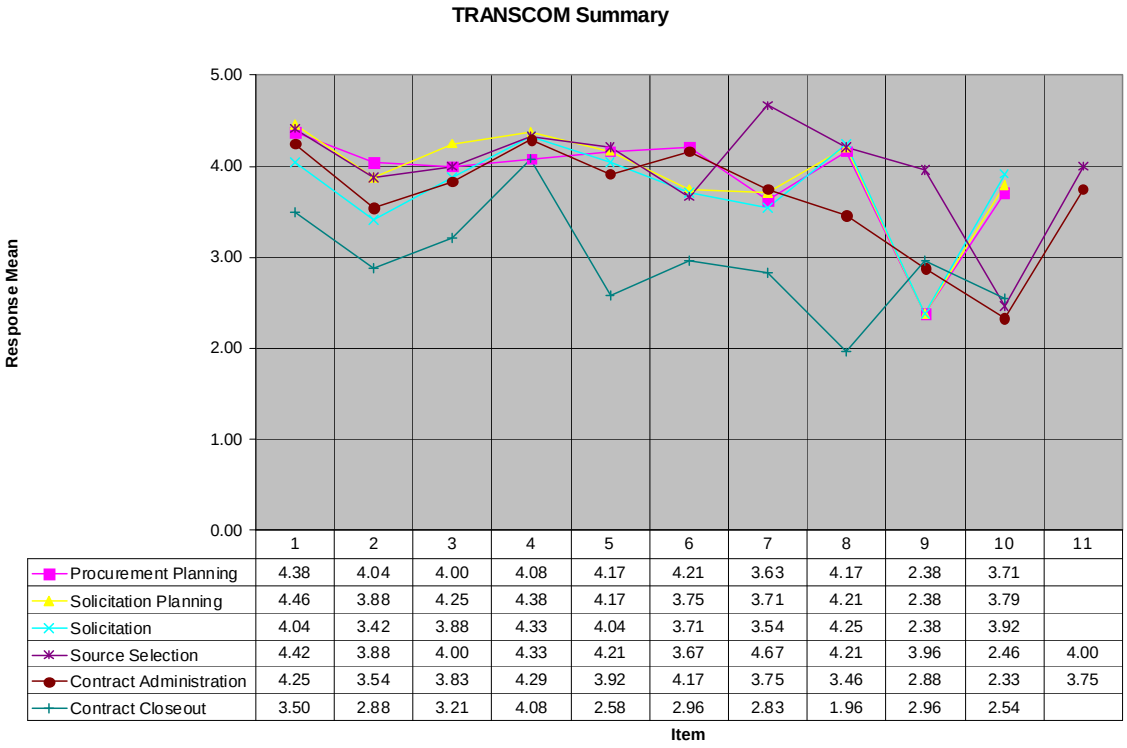

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Procurement Planning | 4.11 | 3.61 | 3.72 | 3.39 | 4.17 | 3.94 | 3.78 | 4.00 | 2.72 | 3.22 |
| Solicitation Planning | 4.00 | 3.33 | 3.56 | 3.94 | 3.83 | 3.94 | 3.67 | 3.67 | 4.22 | 2.89 |
| Solicitation | 4.56 | 3.89 | 4.00 | 3.61 | 3.89 | 3.78 | 3.67 | 3.78 | 2.76 | 3.50 |
| Source Selection | 4.39 | 3.83 | 3.89 | 3.94 | 4.50 | 4.00 | 4.61 | 4.11 | 3.89 | 3.11 |
| Contract Administration | 4.00 | 3.22 | 3.22 | 3.50 | 3.83 | 4.00 | 3.83 | 3.72 | 3.44 | 3.22 |
| Contract Closeout | 2.94 | 2.67 | 2.67 | 3.61 | 3.44 | 2.83 | 2.22 | 2.00 | 1.67 | 1.89 |

**Figure 2. NAVAIR Summary**




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Procurement Planning | 4.03 | 3.80 | 3.80 | 3.68 | 3.83 | 3.98 | 3.73 | 3.95 | 3.28 | 3.65 |
| Solicitation Planning | 4.05 | 3.65 | 4.05 | 3.88 | 3.65 | 3.63 | 3.58 | 3.55 | 3.80 | 3.43 |
| Solicitation | 4.30 | 3.93 | 4.20 | 3.85 | 3.55 | 3.53 | 3.50 | 3.20 | 3.35 | 3.60 |
| Source Selection | 4.08 | 3.73 | 4.13 | 4.00 | 3.95 | 3.73 | 3.98 | 3.88 | 3.95 | 3.55 |
| Contract Administration | 3.93 | 3.63 | 3.70 | 3.15 | 3.55 | 3.88 | 3.50 | 3.45 | 3.48 | 3.10 |
| Contract Closeout | 4.08 | 3.73 | 3.50 | 3.88 | 3.30 | 3.15 | 3.13 | 2.80 | 2.90 | 2.80 |

**Figure 3. ALC Summary**




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Procurement Planning | 4.38 | 4.04 | 4.00 | 4.08 | 4.17 | 4.21 | 3.63 | 4.17 | 2.38 | 3.71 | |
| Solicitation Planning | 4.46 | 3.88 | 4.25 | 4.38 | 4.17 | 3.75 | 3.71 | 4.21 | 2.38 | 3.79 | |
| Solicitation | 4.04 | 3.42 | 3.88 | 4.33 | 4.04 | 3.71 | 3.54 | 4.25 | 2.38 | 3.92 | |
| Source Selection | 4.42 | 3.88 | 4.00 | 4.33 | 4.21 | 3.67 | 4.67 | 4.21 | 3.96 | 2.46 | 4.00 |
| Contract Administration | 4.25 | 3.54 | 3.83 | 4.29 | 3.92 | 4.17 | 3.75 | 3.46 | 2.88 | 2.33 | 3.75 |
| Contract Closeout | 3.50 | 2.88 | 3.21 | 4.08 | 2.58 | 2.96 | 2.83 | 1.96 | 2.96 | 2.54 | |

**Figure 4. TRANSCOM Summary**

# VI. Discussion

## A. Agency-level Analysis: Process Capability Consistency

When the contract management process assessment results for the Army, Navy, Air Force, and TRANSCOM are compared, some consistencies can be identified in terms of process area item means as well as process capability maturity ratings. The purpose of this analysis is to discuss the implications that these consistencies have in terms of contract management process capability within the Army, Navy, Air Force, and joint DoD agencies. The implications of these assessment results will be discussed in the areas of contract management maturity levels, process improvement opportunities, knowledge management opportunities, and overall DoD contract management trends.

The data in Figures 1 through 4 provides some interesting observations. First, we see that some of the key process areas, as reflected in the item means, are more closely grouped for some agencies and are more widely dispersed for other agencies. For example, the Army AMCOM (Figure 1) and Air Force ALC (Figure 3) item means are more closely grouped together in all six contract management key process areas compared to the Navy NAVAIR (Figure 2) and TRANSCOM (Figure 4) item means. This may indicate that the use of contracting best practices related to process strength, process outcomes, management support, process integration, and process measurement is more consistent among the key process areas for these Army and Air Force contracting agencies and less so for the Navy and TRANSCOM contracting agencies.

Second, we see that the Contract Closeout process area, as reflected in the item means, is consistently the lowest scoring of all of the contract management key process areas for all contracting agencies. This is especially true for AMCOM and NAVAIR. This may indicate that, for these contracting agencies, the Contract Closeout process area and related activities are lacking in the use of contract

management best practices related to process strength, process outcomes, management support, process integration, and process measurement.

Additionally, the Contract Administration key process area, as reflected in the item means, is the next lowest scoring process area. We especially see this for AMCOM, TRANSCOM, and, to some extent, ALC. Once again, this may reflect the lack of contract management best practices related to process strength, process outcomes, management support, process integration, and process measurement in these specific contracting agencies.

Finally, we see that the Source Selection process area, as reflected in the item means, is the highest scoring of all of the contract management key process areas for all of the contracting agencies. This is especially true for AMCOM, NAVAIR, ALC, and, to some extent, TRANSCOM. This may reflect a greater use of best practices related to process strength, process outcomes, organizational management support, process integration, and process measurement for the Source Selection contract management key process area.

## B. Agency-level Analysis: Process Capability Maturity

Based on the data from Figures 1 through 4, the item means for each contract management key process area are used to determine the maturity level for that specific area. Figure 5 reflects the contract management process capability maturity levels for each key process area for each contracting agency.

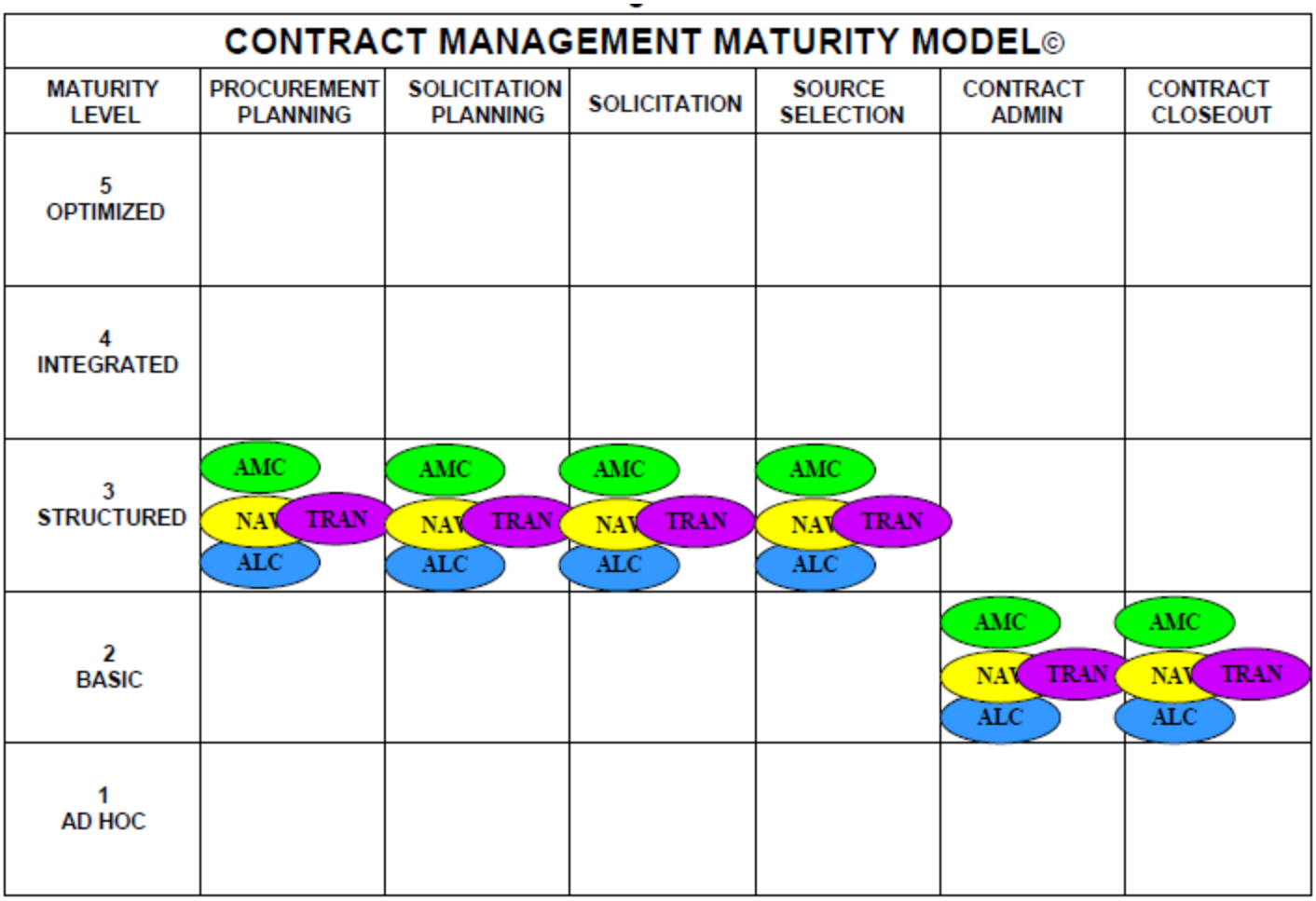



**Figure 5. Contract Management Maturity Model**

As can be seen in Figure 5, all of the contracting agencies are rated at Level 3 Structured for the pre-award and award phases of the contracting process. These are the contract management key process areas of Procurement Planning, Solicitation Planning, Solicitation, and Source Selection. The survey data results in Table 1 and Figure 5 indicate that these contracting agencies' key process areas are fully established, institutionalized, and mandated throughout the entire contracting agency. Additionally, these contracting agencies have developed formal documentation for these contract management processes and standards, and some processes may even be automated. Furthermore, these contracting agencies allow the tailoring of contract management processes and documents in consideration for

the unique aspects of each contract, such as contracting strategy, contract type, terms and conditions, dollar value, and type of requirement (product or service). This maturity level also reflects that the contracting agency's senior management are involved in providing guidance, direction, and even, when required, approval of key contracting strategy, decisions, related contract terms and conditions, and contract management documents.

However, Figure 5 also indicates that for these contracting agencies' specific key process areas, processes are not fully integrated with other agency core processes nor is the contract's end-user customer an integral member of the contracting team. Additionally, these contracting agencies do not systematically use performance metrics to measure the quality and evaluate the efficiency and effectiveness of the contract management processes, implement continuous process improvement efforts, or rely on lessons learned and best practice databases to improve the contract management processes.

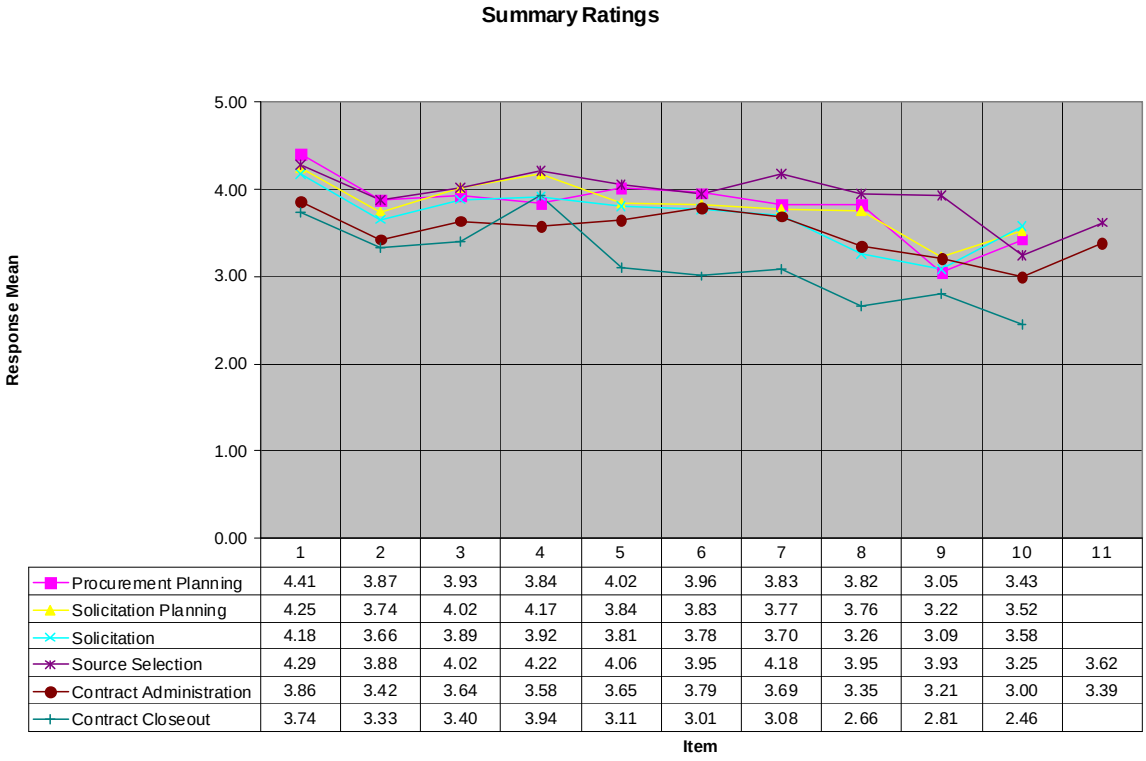
Figure 5 also reflects that for the post-award contracting phases, specifically the Contract Administration and Contract Closeout key process areas, the contracting agencies' process capability maturity is rated at Level 2 Basic, reflecting processes that are less mature and less capable than the pre-award processes. Specifically, according to the CMMM results, for Contract Administration and Contract Closeout, the contracting agencies have established some basic contract management processes, but these processes are required only on selected complex, critical, or high-visibility contracts, such as contracts meeting certain dollar thresholds or contracts with certain customers. Additionally, the Basic maturity level reflects that these agencies have developed some formal documentation for the Contract Administration and Contract Closeout contract management processes.

However, Figure 5 also reflects that there is no organizational policy requiring the consistent use of these basic Contract Administration and Contract Closeout processes on more than the required contracts. Finally, the agencies do not

consider these contract management processes well-established or institutionalized throughout the entire organization.

## C. DoD-level Analysis: Process Capability Consistency

The results of the CMMM assessment for these four defense contracting agencies can be consolidated to allow analysis of response means at a DoD level. Figure 6 illustrates the CMMM response means ratings for all 257 responses, representing a DoD-level analysis. In addition, Figures 7 through 12 provide CMMM response means broken out for each of the six contract management key process areas.




| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Procurement Planning | 4.41 | 3.87 | 3.93 | 3.84 | 4.02 | 3.96 | 3.83 | 3.82 | 3.05 | 3.43 | |
| Solicitation Planning | 4.25 | 3.74 | 4.02 | 4.17 | 3.84 | 3.83 | 3.77 | 3.76 | 3.22 | 3.52 | |
| Solicitation | 4.18 | 3.66 | 3.89 | 3.92 | 3.81 | 3.78 | 3.70 | 3.26 | 3.09 | 3.58 | |
| Source Selection | 4.29 | 3.88 | 4.02 | 4.22 | 4.06 | 3.95 | 4.18 | 3.95 | 3.93 | 3.25 | 3.62 |
| Contract Administration | 3.86 | 3.42 | 3.64 | 3.58 | 3.65 | 3.79 | 3.69 | 3.35 | 3.21 | 3.00 | 3.39 |
| Contract Closeout | 3.74 | 3.33 | 3.40 | 3.94 | 3.11 | 3.01 | 3.08 | 2.66 | 2.81 | 2.46 | |

**Figure 6. Summary Ratings**

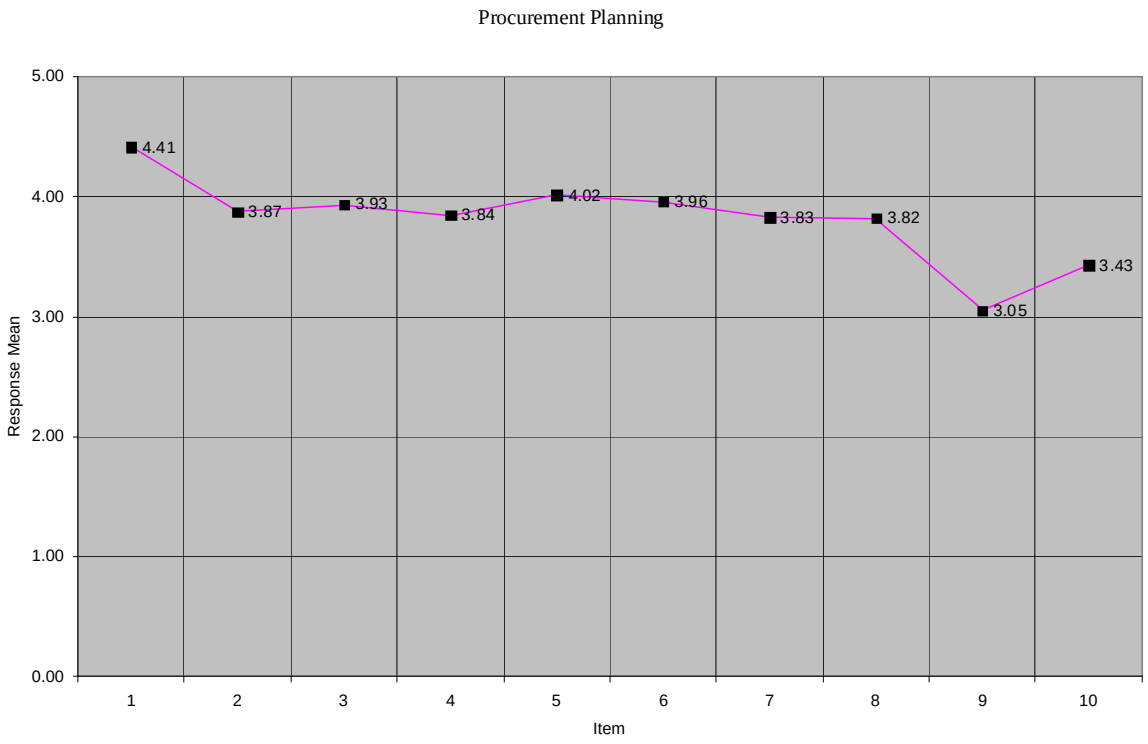



**Figure 7. Procurement Planning**

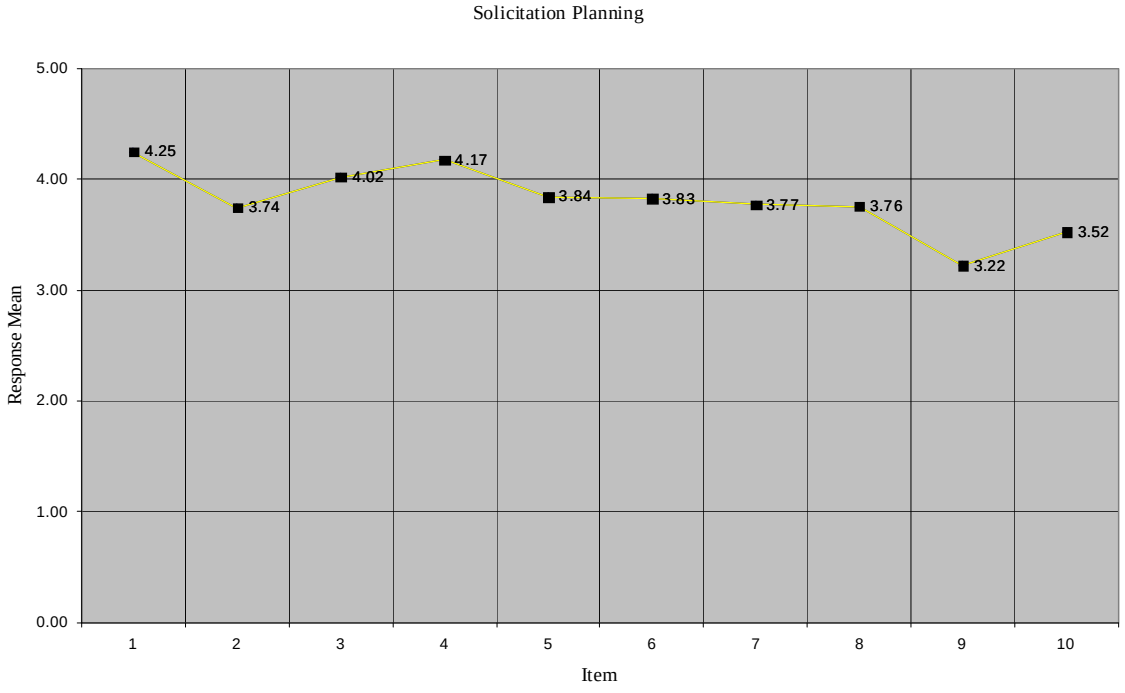



**Figure 8. Solicitation Planning**

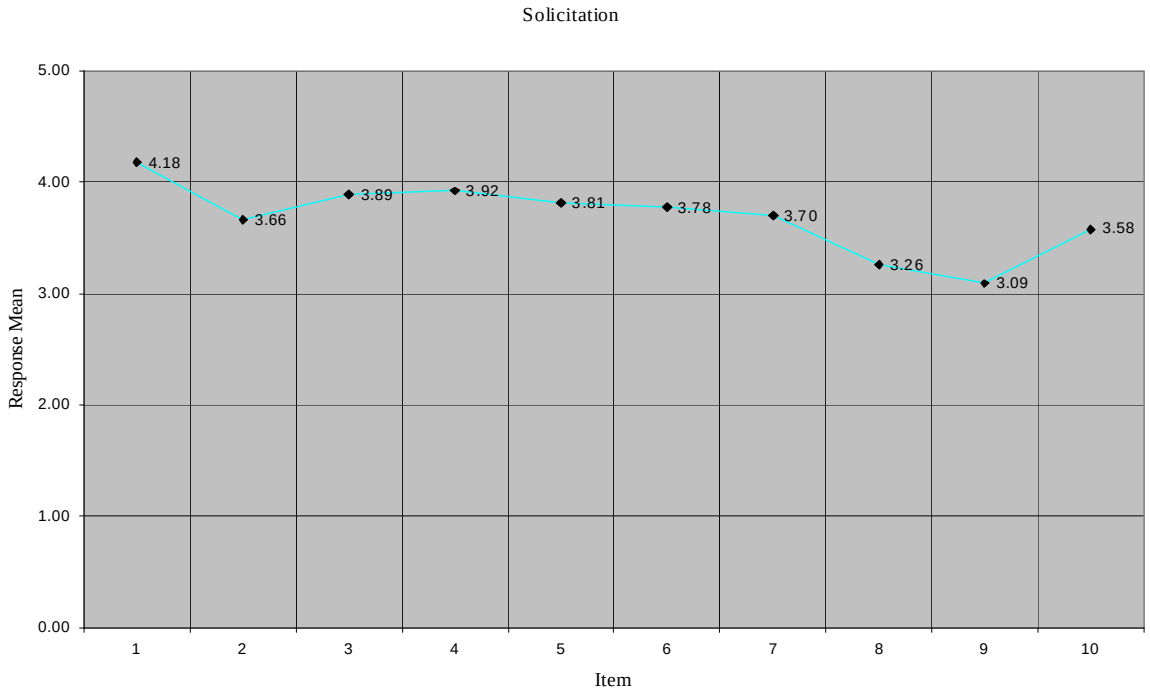



**Figure 9. Solicitation**

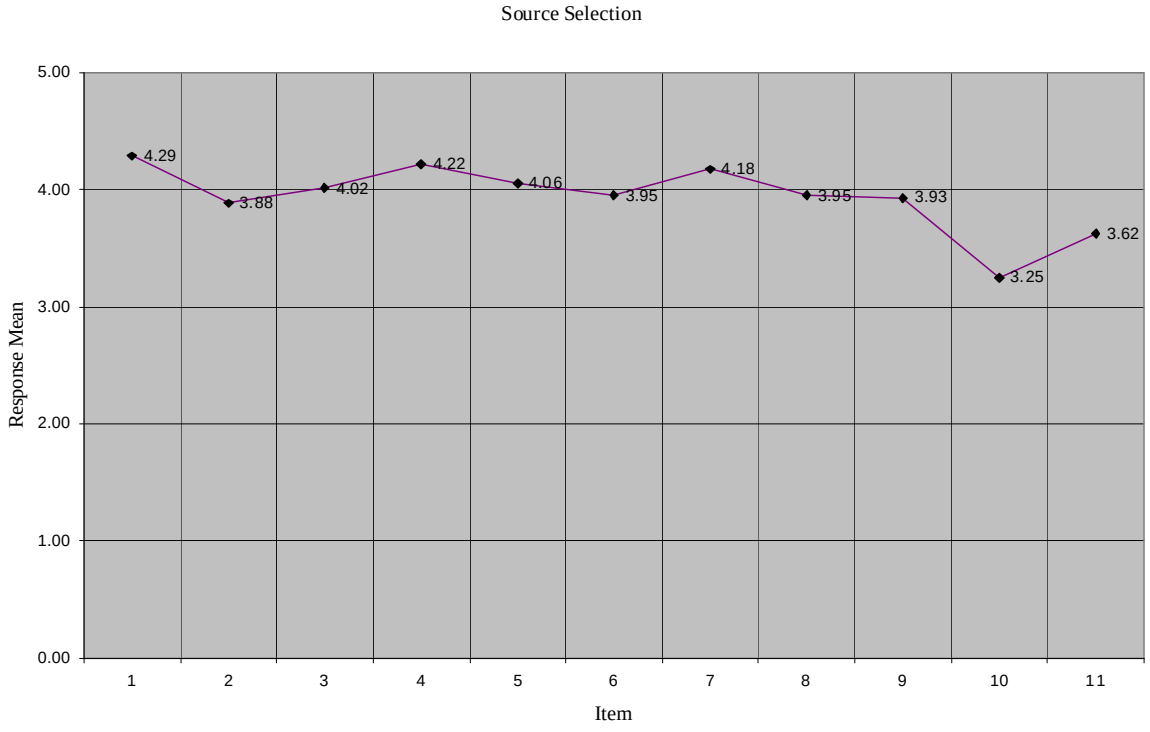



**Figure 10. Source Selection**

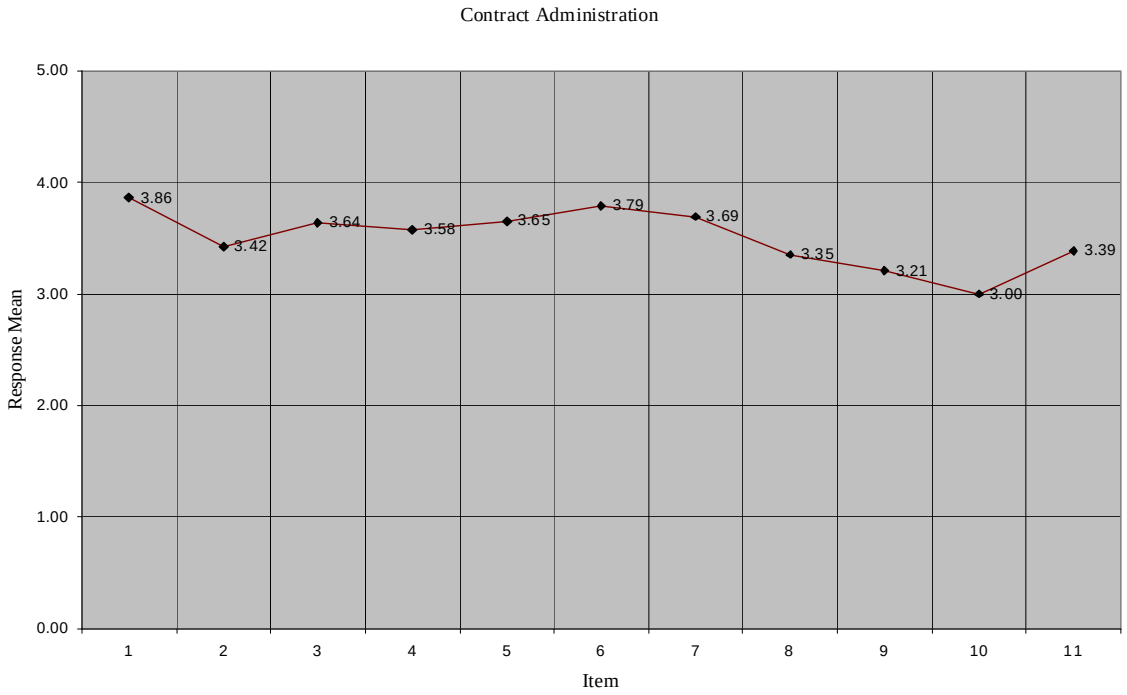



**Figure 11. Contract Administration**

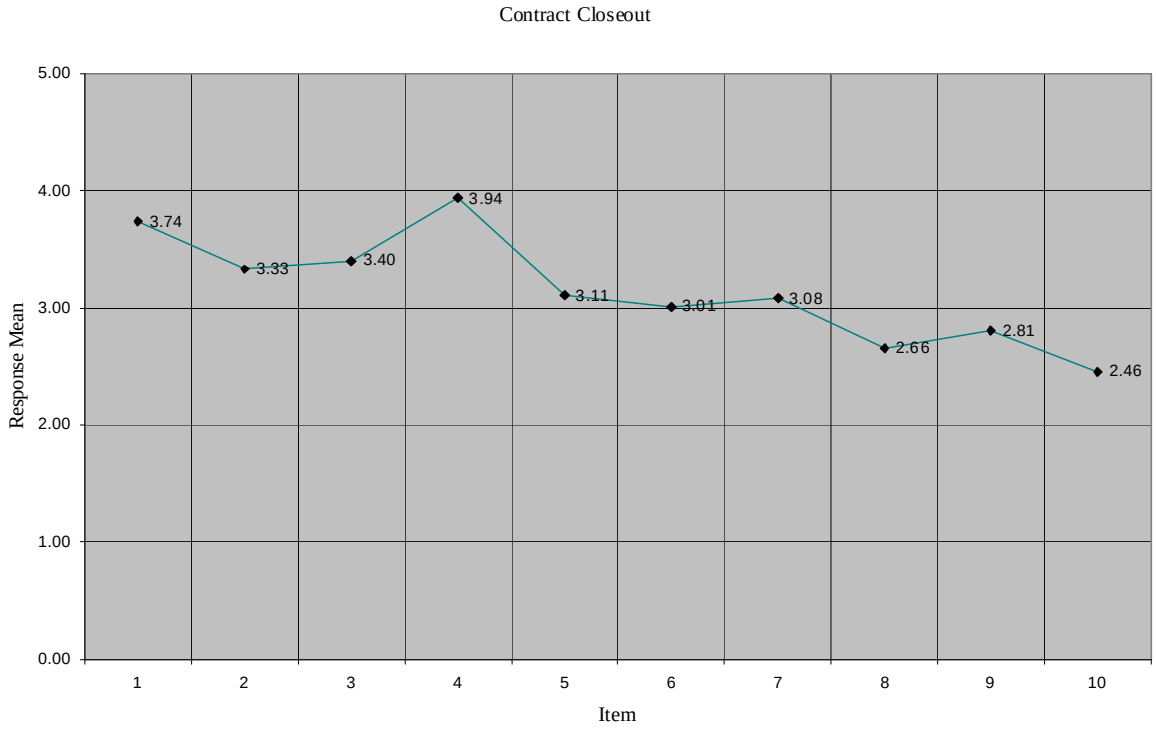



**Figure 12. Contract Closeout**

As reflected in Figure 6, the Source Selection key process area consistently received the highest survey response means (8 out of 11 items) while the Contract Closeout key process area consistently received the lowest survey response means (9 out of 10 items).

In addition, of all the items for each contract management key process area, the item related to "the organization having an established process" for each of the key process areas (Questions 1.1, 2.1, 3.1, 4.1, 5.1, and 6.1) consistently received the highest survey response means (5 out of 6 items).

Also, of all the items for each contract management key process area, the item related to "the organization uses efficiency and effectiveness metrics in systematic evaluations" (1.9, 2.9, 3.9, 4.10, 5.10, 6.8) consistently received the lowest survey response means (5 out of 6 items).

Furthermore, of all the items for each contract management key process area, the item related to "the organization adopts lessons learned and best practices as methods for continuously improving" (1.10, 2.10, 3.10, 4.11, 5.11, 6.9) consistently received the second-lowest survey response means (3 out of 6 items).

## D. DoD-level Analysis: Contract Management Best Practice Groups

A DoD-level analysis can also be conducted on the contract management key process best practice groups. As discussed previously in this paper, each of the contract management key process areas includes various key practice activities supporting the specific process. How an organization performs the key process areas and the extent to which the key practices incorporate best practices determines the organization's contract management process capability maturity level. These contract management key process area best practices are categorized by the following groups—Process Strength, Successful Outcomes, Management Support, Process Integration, and Process Measurement. Each of the items in the survey relates to one of these best practice groups, as reflected in Table 1. Figures

13 through 17 reflect the survey response means for the survey items related to each best practice group. A review of Figures 13 through 17 can identify the range of high- and low-scoring items, and related contract management process key areas, for each contract management process best practice group. This analysis provides some valuable insight in terms of contract management best practices within the six key process areas.

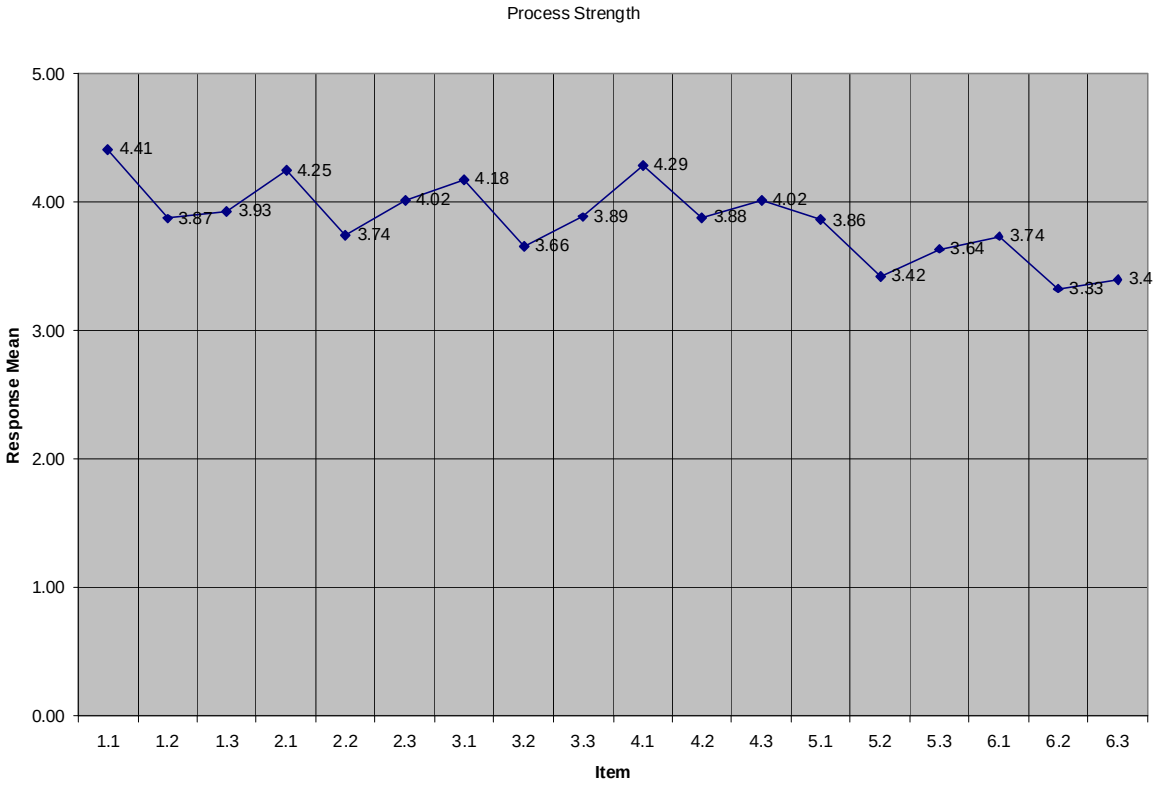



**Figure 13. Process Strength**

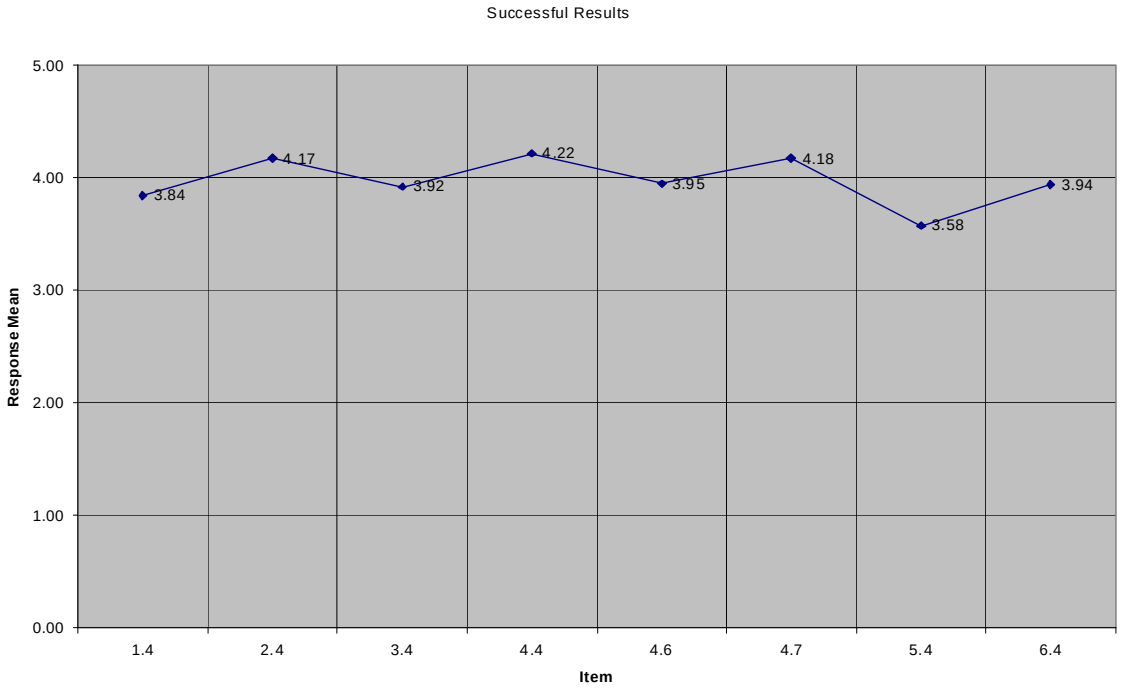



**Figure 14. Successful Results**

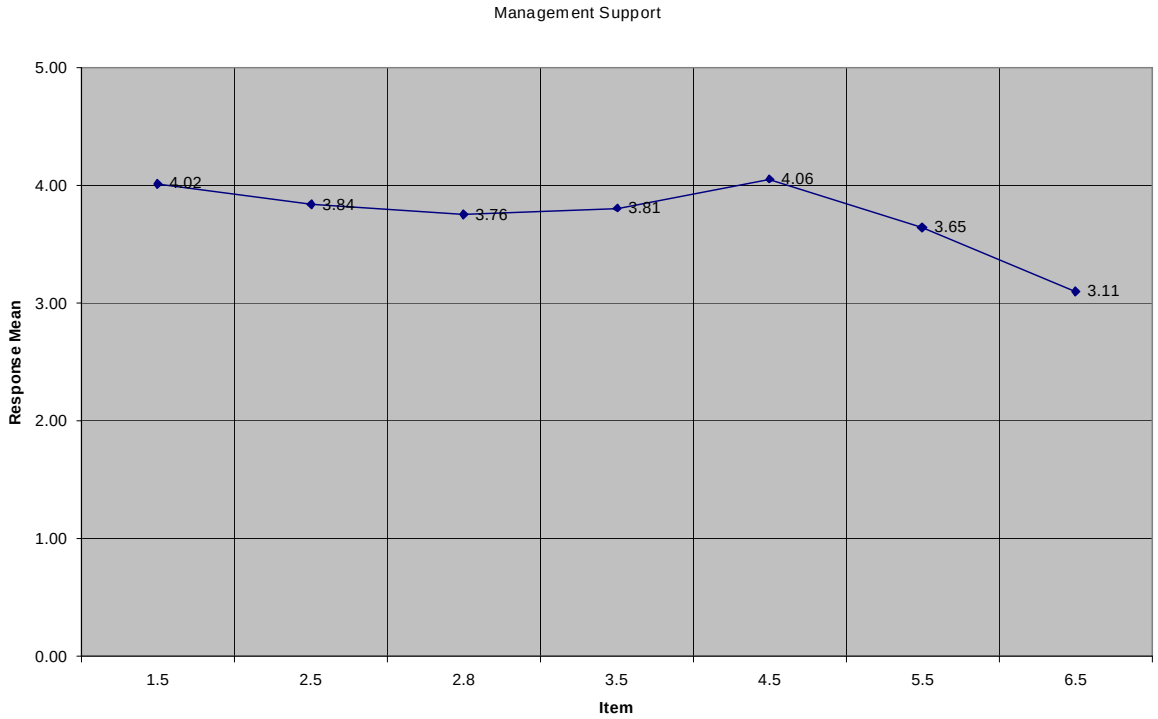



**Figure 15. Management Support**

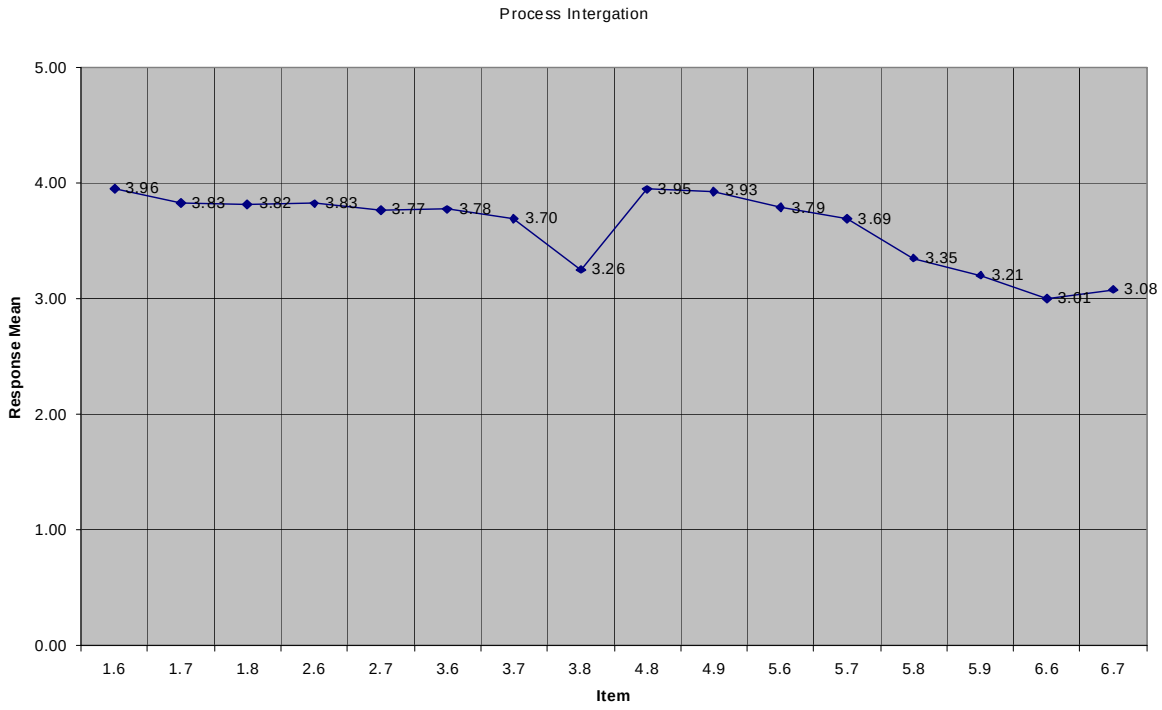



**Figure 16. Process Integration**

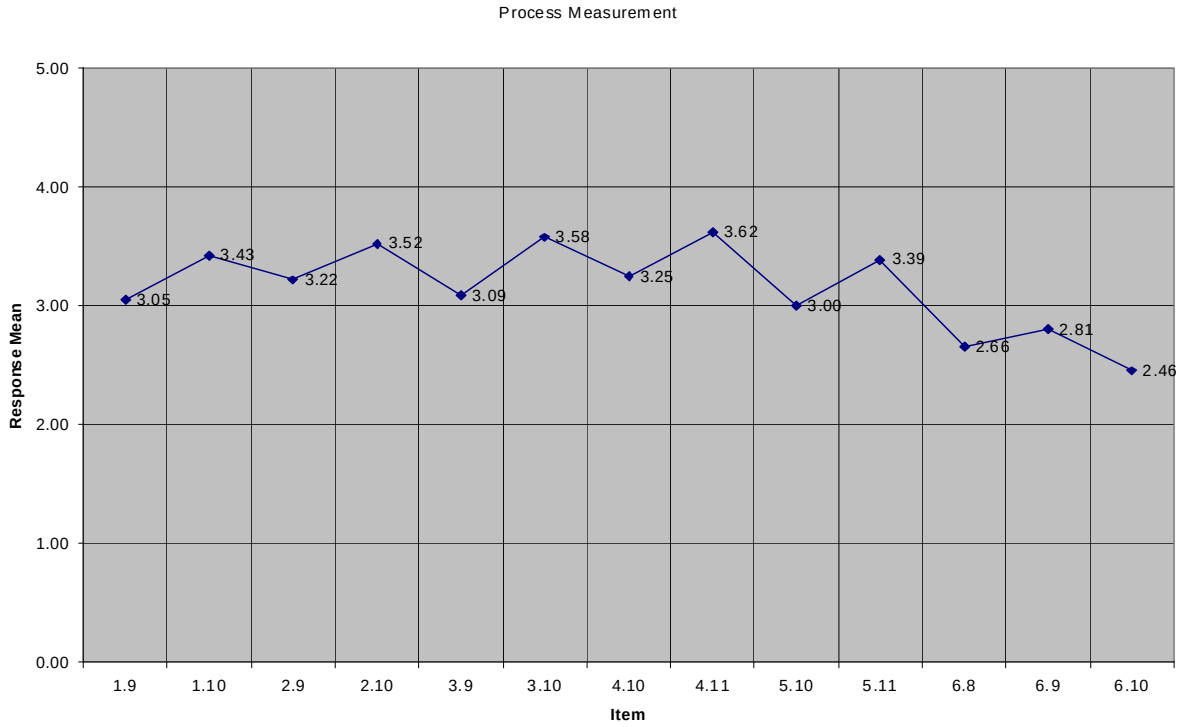



**Figure 17. Process Measurement**

In Figure 13, Process Strength, we see that the response means range from a high of 4.41 (item 1.1, Established Procurement Planning Processes) to a low of 3.33 (item 6.2, Standardized and Mandatory Contract Closeout Processes). This indicates a stronger use of Process Strength best practices in the earlier contract management phases, specifically Procurement Planning, Solicitation Planning, Solicitation, and Source Selection, and, to a lesser extent, during Contract Administration and Contract Closeout. The specific Process Strength best practice relates to having these contract management processes well-established and institutionalized throughout the organization.

In Figure 14, Successful Results, we see that the response means range from a high of 4.22 (item 4.4, Successful Source Selection Evaluation Criteria) to a low of 3.58 (item 5.4, Successful Contractor Performance, Accurate and Timely Contractor Payments, Controlled Contract Changes). In terms of best practices related to Successful Results, we see Solicitation Planning and Source Selection as the contract management phases that exhibit best practices relating to receiving accurate and complete proposals, integrity of evaluation criteria, and consideration of offerors' past performance, technical, managerial, and financial capability. The Contract Administration phase reflected the lowest response mean, specifically for the item concerning successful contractor performance, processing accurate/timely contractor payments, and controlling contract changes.

In Figure 15, Management Support, we see that the response means range from a high of 4.06 (item 4.5, Input and Approval of Source Selection Decisions and Documents) to a low of 3.11 (item 6.5, Input and Approval of Contract Closeout Decisions and Documents). A clear distinction can be made in the area of Management Support of contract management activities. The survey results reflect that the Procurement Planning and Source Selection phases exhibit stronger Management Support best practices, with senior management involved in providing input and approval of decisions and documents, while the Contract Closeout phase reflect the lowest level of senior management involvement.

In Figure 16, Process Integration, we see that the response means range from a high of 3.95 (item 4.8, Representation of Source Selection Project Team) to a low of 3.01 (item 6.6, Representation of Contract Closeout Project Team). Process Integration best practices were rated highest for the Source Selection phase and were rated lowest for the Contract Closeout phase. These best practices included the use of integrated teams and integrated processes. It should be noted that the best practice of incorporating industry input into the solicitation document stood out as a low-scoring item in the Solicitation process area.

In Figure 17, Process Measurement, we see that the response means range from a high of 3.62 (item 4.11, Use of Source Selection Lessons Learned and Best Practices) to a low of 2.46 (item 6.10, Use of Contract Closeout Lessons Learned and Best Practices). It is interesting to note that the highest and lowest items relate to use of lessons learned and best practices in their respective contract management key process areas. The highest Process Measurement items were in the Solicitation Planning, Solicitation, and Source Selection phases and the lowest scoring items were in Contract Closeout phase. Of the two Process Measurement items in all of the contract management key process areas, the items related to the use of efficiency and effectiveness metrics scored lower than the items related to the use of lessons learned and best practices. Based on the survey response means, as a best practice group, Process Measurement best practices were the lowest scoring of all of the survey items.

## E. Summary Analysis

In the final analysis, the CMMM results reflect that for the contracting agencies assessed, the pre-award phases of Procurement Planning, Solicitation Planning, Solicitation and Source Selection, rated at the Structured Level, are more mature and capable compared to the post-award phases of Contract Administration and Contract Closeout, rated at the Basic Level. This is also true at the DoD-level of analysis. In addition, at the DoD-level of analysis, the Source Selection process area seems to be the most mature and capable process. These levels of maturity

are due to the existence of contract management best practices. Best practices in the areas of Process Strength and Management Support are higher in the pre-award phases and lower in the post-award phases. Successful Results-related best practices seem to be more consistent across all contract management phases, while Process Integration-related best practices were lower in post-award phases, and Process Measurement-related best practices were consistently low in all contract management phases and the lowest in Contract Closeout.

It is interesting to note that recent reports by the Government Accountability Office (GAO) have identified the same areas identified by these CMMM assessment results as problematic throughout the DoD and the federal government. These reports have identified problems related to ensuring proper management, oversight, and surveillance of awarded contracts (GAO, 2005; GAO, 2006a; GAO, 2007a, July), as well as management of contractor performance information (GAO, 2007b, July). The DoD Inspector General (IG) has also identified that "organizations are deficient in contract administration, including the surveillance of contract performance, assignment of contracting officer representatives, preparation of quality assurance surveillance plans, and collection and recording of contractor past performance" (DOD IG, 2007, p. i).

Another interesting insight from the combined CMMM assessment results is the lack of organizations rated at the Integrated Level of process maturity. The key to achieving Level 4 Integrated is having contract management processes that are fully integrated with other organizational core processes such as financial management, schedule management, performance management, and systems engineering. In addition to representatives from other organizational functional offices and stakeholders, the contract's end-user customer is also an integral member of the procurement organization (Garrett & Rendon, 2005). Within the DoD, integration in defense procurement projects is implemented using cross-functional teams called Integrated Product Teams (IPTs). IPTs are used to maintain continuous and effective communication and collaboration among program management, procurement, financial management, and end-users (DoD, 2003).

Recent GAO reports have identified that IPTs were not operating effectively, and IPT decision-making processes were sequential and involved numerous external consultations for approval (GAO, 2001). The CMMM assessment results at these contracting agencies seem to reflect the ineffectiveness of the integrated project teams.

## F. Process Improvement and Knowledge Management Opportunities

The true value of the CMMM is continuous process improvement of the organization's contract management processes. The results of the assessment analysis can be used to develop a roadmap for implementing contract management process improvement (Garrett & Rendon, 2005). The following process improvement opportunities are provided for the pre-award phases and the post-award phases of contract management.

## G. Pre-award Phases

Based on the results of the CMMM assessment, the contracting agencies' process capability maturity level for the pre-award phases of Procurement Planning, Solicitation Planning, Solicitation, and Source Selection were determined to be at Level 3 Structured. To progress to the Integrated maturity level (Level 4), these contracting agencies should ensure these pre-award phase activities are integrated with other organizational core processes such as quality assurnace, financial management, schedule management, performance management and risk management. The Procurement Planning process activities that need to be integrated with other organizational core processes include requirements analysis, acquisition planning, and market research. For the Solicitation Planning process, the activities include determining procurement method, determining evaluation strategy, and developing solicitation documents. Solicitation process activities to be integrated with organizational core processes include advertising procurement opportunities, conducting solicitation and pre-proposal conferences, and amending solicitation documents as needed. Source Selection process activities include

evaluating proposals, applying evaluation criteria, negotiating contract terms, and selecting contractors.

In addition to integrating these pre-award phase activities with other organizational core processes, these agencies should also ensure that the procurement project's end-user and customer are included as integral members of the procurement team and are engaged in providing input and recommendation to key contract management decisions and documents.

These agencies should also revise their current efficiency and effectiveness metrics to ensure they are adequately measuring, tracking and incentivizing achievement of the fundamental pre-award phase process goals (Garrett & Rendon, 2005). The agencies should also implement a database of best practices and lessons learned to help achieve higher pre-award phase process maturity levels.

Finally, each contracting agency should emphasize pre-award phase topics into its current contracts training program. For Procurement Planning, this training would include, but is not limited to, FAR Part 7-Acquisition Planning, FAR Part 5-Publicizing Contract Actions, and FAR Part 10-Market Research. This training should focus on subjects such as determining funds availability, evaluating preliminary cost and schedule estimates, assessing and managing risk, determining manpower resources, conducting assessments of market conditions, selecting the appropriate contract type, developing contract incentive plans, and developing standard and unique contract terms and conditions (Garrett & Rendon, 2005).

For Solicitation Planning, this training should focus on subjects such as developing solicitations, assessing solicitation documents, and developing appropriate criteria for proposal evaluation (Garrett & Rendon, 2005). This training would include, but is not limited to, FAR Part 12-Acquisition of Commercial Items, FAR Part 13-Simplified Acquisition Procedures, FAR Part 14-Sealed Bidding, and FAR Part 15-Contracting By Negotiation regarding developing solicitation documents and evaluation strategy.

Solicitation process-related training would include subjects such as developing an integrated approach to establishing qualified bidders lists, conducting market research, advertising procurement opportunities, and conducting pre-proposal conferences (Garrett & Rendon, 2005). FAR training related to this topic would include FAR Part 5-Publicizing Contract Actions, FAR Part 12-Acquisition of Commercial Items, FAR Part 13-Simplified Acquisition Procedures, FAR Part 14-Sealed Bidding and FAR Part 15-Contracting By Negotiation on conducting pre-solicitation and pre-proposal conferences.

Source Selection process-related training would include subjects such as proposal evaluation and evaluation criteria, evaluation standards, estimating techniques and weighting systems, and negotiation techniques, planning, and actions (Garrett & Rendon, 2005). FAR training that would supplement this includes FAR Part 12-Acquisition of Commercial Items, FAR Part 13-Simplified Acquisition Procedures, FAR Part 14-Sealed Bidding and FAR Part 15-Contracting By Negotiation for evaluating proposals and for selecting contractors.

## H. Post-award Phases

Based on the results of the assessment, the contracting agencies' maturity level for the post-award phases of Contract Administration and Contract Closeout were determined to be Level 2 Basic. To progress to the Structured maturity level (Level 3), the agencies should ensure that Contract Administration and Contract Closeout processes are fully established, institutionalized, and mandated throughout the organization. Formal documentation should be developed for Contract Administration and Contract Closeout process activities. These contract administration activities include monitoring and measuring contractor performance, managing the contract change process, and managing the contractor payment process. The Contract Closeout activities include verifying contract completion, verifying contract compliance, and making final payment.

Senior management should be involved in providing guidance, direction, and even approval of key contract administration and contract closeout strategy,

decisions, related contract terms and conditions, and documents (Garrett & Rendon, 2005). Finally, the organization should allow the tailoring of processes and documents, allowing consideration for the unique aspects of each contract such as contracting strategy, contract type, terms and conditions, dollar value, and type of requirement.

The agencies should also incorporate Contract Administration- and Contract Closeout-specific topics into its training program. The Contract Administration training should focus on areas of conducting integrated assessments of contractor performance such as integrated cost, schedule, and performance evaluations. Specific topics should include managing contract changes, processing contractor invoices and payments, managing contractor incentives and award fees, and managing subcontractor performance (Garrett & Rendon, 2005). FAR training that would supplement this training would be FAR Part 42-Contract Administration and Audit Services, FAR Part 45-Government Property for complying with terms and conditions and FAR Part 46-Quality Assurance for monitoring and measuring contractor performance. The Contract Closeout training would focus on subjects such as contract termination, closeout planning and considerations, and closeout standards and documentation (Garrett & Rendon, 2005). Additional FAR training that would supplement this would be FAR Part 42-Contract Administration and Audit Services for verifying contract completion and contractor compliance and FAR Part 4-Administrative Matters for ensuring contract completion documentation.

The process improvement and knowledge management opportunities identified in these CMMM assessment results are similar to other CMMM assessments conducted at other major contracting agencies (Garrett & Rendon, 2005; Rendon, 2008). The opportunity for knowledge sharing and knowledge transferring has been identified as the number one goal for the Department of Defense Acquisition, Technology, and Logistics (AT&L) Human Capital Strategic Plan (HCSP). The overarching purpose of the goal is to promote DoD-wide sharing of workforce best practices by the military department (DoD, 2007). It is also interesting to note that recent GAO reports have identified the need for improved

training management of the contracting workforce and for creating a culture that promotes knowledge sharing in order to improve federal acquisition as an opportunity in federal contract management (GAO, 2002; GAO, 2006b). These opportunities for knowledge-management initiatives in contract management will only increase in importance as the government contracting workforce continues to retire and is replaced with more junior and less experienced contracting professionals.

# VII. Conclusion

This paper analyzed the results of contract management process capability assessments conducted in between 2007 and 2009 at Army, Navy, Air Force, and joint DoD contracting agencies using the Contract Management Maturity Model (CMMM). The results of the contract management process assessments revealed that all of the contracting agencies are rated at the Structured (Level 3) level of maturity for the Procurement Planning, Solicitation Planning, Solicitation, and Source Selection key process areas.

Additionally, all of the contracting agencies are rated at the Basic (Level 2) level of maturity for the Contract Administration and Contract Closeout key process areas. An analysis of these contract management assessment results identified opportunities for improving the contracting processes, increasing contract management process maturity, and implementing knowledge management initiatives.

An area for further research in these specific assessments would include identifying any relationships between the CMMM assessment results and other procurement capability or competence assessments as well as procurement performance metrics such as procurement administrative lead-time (PALT), number of letter contracts awarded, number of sole-source contracts awarded, number of contracts completed on time and on schedule, and number of sustained protests. Further analysis of these procurement assessments and performance metrics may provide additional validation of the CMMM assessment results and also identify additional procurement process improvement opportunities.

The analysis of the results of the contract management process assessments also identified trends and consistencies in the DoD and federal government contract management. These include problem areas within the contract administration and contract closeout process areas, procurement process integration and teaming issues, and contract management knowledge sharing and training issues. As the

body of knowledge on contract management workforce competence and organizational process capability continues to emerge, the use of maturity models will continue to gain wider acceptance in the contract management field as a tool for assessing organizational contract management process maturity and for providing a roadmap for implementing contract management process improvement initiatives.

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