Using CMMI To Improve Contract Management Within DCMA

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Outline

• DCMA Overview
• Transformation Within DCMA
• How DCMA Plans on Using CMMI
• Conceptual CMMI-Based Contract Management Framework
• Pilot Program
• Next Steps
• Questions
DCMA Overview
DCMA Overview

• DCMA: Independent combat support agency within DoD

• We are DoD’s contract’s manager. Responsible for ensuring Federal acquisition programs, supplies, and services are delivered on time, within cost and meets performance requirements

• Provides direct service on DoD contracts at Contract Management Offices (CMOs) throughout CONUS and Overseas
Transformation Within DCMA
How did Transformation Get Started?

- Defense Industry
  - Underway since 1980’s
    - Congress: Reduced Spending
    - Exec: Government Reinvention
    - OSD: Acquisition Reform Initiatives

- OSD Perspective
  - Transformation being pushed hard in every arena – all the Services, financial management, acquisition payments, etc
  - Performance-Based Management is major focus
Transformation Within DCMA

• DCMA
  – Embrace and Adapted to these sweeping changes
  – Initiated a Strategic Health Check (360° Assessment) to better understand the issues and challenges
  – Customer feedback mixed
    • Generally satisfied with past & current performance
    • Concerned with DCMA’s ability to meet future needs – both capacity & capability issue
      • You are too internally focused!
  – DCMA is changing its focus to a more Customer-Centered thinking utilizing Transformation & The Pillars
Transformation & The Pillars

Customer Alignment
Human Capital
Strategic Plan
Policy & Measures
Resource Reallocation

Multiple Products
Pillar Action Items (G, R, B)

Strategic (HQ)
Operational (D)
Tactical (CMO)

END-USERS
Customers & Workforce

BROKERS
DoD, Taxpayer, Congress
Customers & Workforce

FIXERS
DCMA Leadership

Successful Transformation

CMMI & Transformation

• What does the Customer want?
• CMMI methodology supports DCMA’s Transformation efforts
• Liaison interviews were conducted with our customers, and the results are:
  – Have more insight into program cost, schedule, and technical risks
  – More proactive involvement; predictive data analysis
  – Performance of risk assessment and mitigation
  – More insight into contractor systems and processes
Drivers

- Address customer needs
  - Driven by customer concerns and priorities
- Integrate functional surveillance activities
- Mechanism for targeted surveillance
  - Risk identification, handling and monitoring
- Provide input for Predictive Analysis
  - Leading indicator of potential problems
How DCMA Plans on Using CMMI
How DCMA Plans on Using CMMI

• First, let’s look at some history on using CMM’s within DCMA

• DCMA has developed CMM-Based Insight (CBI)
  – Continuous process appraisals, based on SW-CMM
  – Data collection tool developed
  – Limited implementation to date
    • Some success, usually based on heroics
    • Not fully integrated with DCMA “standard” business
    • Low “perceived” value / Return on Investment (ROI)
    • Seems cumbersome and resource intensive
    • High training overhead (relative to ROI)
• Now let’s see how we’re going to use CMMI with DCMA

• CMMI “Core Team” established:
  – Use lessons learned from CMM Based Insight
  – Develop Method Description Document (MDD) that clearly describes the usage of the CMMI within DCMA
  – Develop education strategy & materials
  – Pilot program to validate MDD and training
  – Provide status to DCMA HQ Management on results
How DCMA Plans on Using CMMI

• DCMA is not the “typical” CMMI user
  – Not seeking a benchmark “Maturity Level”
  – Responsible for oversight NOT development
  – **Primary** goal is risk management and Predictive Analysis. Process improvement is a secondary goal.

• Need to ensure CMMI is integrated as part of DCMA business - **NOT additional work**

• Need right balance of “process” and “product”

• DCMA will utilize the Quantitative Management Disciplines in PSM as part of the CMMI Process
Why should DCMA use CMMI as a tool to assist in performing Contract Administration activities?

- Systems engineering and software disciplines integrated into one reference process model.
- Provides a framework for introducing new disciplines as needs arise.
- Covers most of the disciplines used by our contractors
- Builds on (and improves!) the SW-CMM, SE-CMM and EIA 731
• To facilitate a **risk-based** contract management approach:
  – Map CMMI Process Areas to WBS Elements
  – Prioritize and evaluate suppliers’ processes
  – Identify and assess suppliers’ process-related risks
  – Predict future program performance (Predictive Analysis) based on the suppliers’ process capability and process-related risks
  – Select, plan and conduct targeted risk management and surveillance activities to address high priority risks
  – Collect, analyze and report process-related risk information
  – Continuously monitor & evaluate suppliers’ processes
How DCMA Plans on Using CMMI

Plans for CMMI Usage

• Address customer needs!
• Integrate into DCMA standard business
  – Support One Book (SRM, SPRDE & SAM)
  – Basis of structured surveillance approach
  – Provide input for Predictive Analysis
  – Integrated with other activities (e.g. TPM, EVM etc)
• Fully tailorable / maximum flexibility, e.g.:
  – Selecting only high priority Process Areas for specific program requirements
• Tool of choice
How DCMA Plans on Using CMMI

Plans for CMMI Usage

• Tool to aid contract surveillance
  – Primary purpose:
    • Risk identification, handling and monitoring
    • Aid Variance Analysis
    • Support Predictive Analysis

• Independent of supplier’s Process Improvement efforts (e.g. CMM, CMMI, etc)
  – Supplier attaining “Maturity Level” rating is not a factor
  – Supplier process improvement is secondary benefit
Integration with Risk Management

- CMMI helps identify risks:
  - Analysis of CMMI mapping helps identify relative consequence of project process areas
  - Determinants of likelihood:
    - CMMI based evaluation
    - DCMA specific knowledge
    - Measurement analysis
    - Past performance
    - Others
Potential Benefits

- Improve insight into high impact project processes
  - Efficient use of resources by targeting effort on the higher priority processes
  - Objective evaluation of process effectiveness (e.g. Cost Estimation)
  - Detailed analysis of process strengths and weaknesses and their impact on future program performance
  - Promote constructive teaming to improve program performance (PMO, DCMA and Supplier)
Conceptual CMMI-Based Contract Management Framework
**Conceptual CMMI-Based Contract MGT Framework**

### Key Process Mapping

<table>
<thead>
<tr>
<th>Key Process</th>
<th>Program Element Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA 1</td>
<td>CM plan, WBS Item 1</td>
</tr>
<tr>
<td>PA 3</td>
<td>QA Plan, System Spec</td>
</tr>
<tr>
<td>PA 6</td>
<td>WBS Item x, etc</td>
</tr>
</tbody>
</table>

### Risk Identification

- **CMML Evaluation**
- **TPMs**
- **Predictive Analysis**
Conceptual CMMI-Based Contract MGT Framework

STEP 1
Planning
Map WBS to CMMI
Identify Process Areas
Prioritize Process Areas

STEP 2
Risk Assessment
Identify risks
Consequence/Likelihood
Risk Rating

STEP 3
Risk Handling
Supplier Risk Management Strategy
DCMA Risk Monitoring Strategy

STEP 4
Risk Monitoring (Tracking)

DCMA Risk Monitoring Strategy: Execute Risk Monitoring/Management Plan
Periodical re-evaluation of risks
Pilot Program
Pilot Program

• Phased pilot program
  – Test high risk concepts first
  – Full stakeholder visibility and involvement
    • Customer, HQ, Districts & CMO
    • Part of pilot evaluation process

• Phase 1
  – Determine feasibility of “Planning” step
  – 2 sites (East & West)
  – Attributes of pilot site identified at Workshop
  – Phase 1 Pilot Sites:
    • DCMA Raytheon (June 2-3, 2003)
    • DCMA Northrop Grumman (June 16-20, 2003)
Pilot Program - Process Flow

Step 1: Planning

Select Major WBS Elements

Prioritize Lower Level WBS Elements

Dissect WBS Description

Map CMMI PA’s to WBS Elements

Identify and Prioritize PA’s

STEP 2: Identify and Assess Process Risk
<table>
<thead>
<tr>
<th>WBS Number</th>
<th>CMMI Process Areas</th>
<th>Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maturity</td>
<td>OPF</td>
</tr>
<tr>
<td>100000</td>
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<td></td>
</tr>
<tr>
<td>120000</td>
<td>Y</td>
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<td></td>
</tr>
<tr>
<td>122190</td>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

| Process Area Hits | 1 | 1 | 1 | 1 | 0 | 0 | 4 | 5 | 1 | 2 | 0 | 1 | 1 | 0 | 2 | 2 | 2 | 0 | 1 | 0 | 0 | 3 | 1 | 2 | 1 |
| Weighted PA Priority | 2 | 2 | 1 | 2 | 0 | 0 | 7 | 10 | 1 | 3 | 0 | 2 | 2 | 0 | 4 | 4 | 3 | 0 | 3 | 0 | 0 | 5 | 1 | 3 | 2 |
| CMMI Appraisal Results | Green | Red | Green | Yellow | Red | Red | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow |
Weighted Process Area Priorities

Focus on the Critical Few Vs the Meaningless Many!

Natural Breakpoints

Proposed Surveillance Priorities

Process Areas
# Example of Surveillance Strategy

<table>
<thead>
<tr>
<th>PA</th>
<th>PA Name</th>
<th>Schedule</th>
<th>RAM</th>
<th>Means of Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP</td>
<td>Project Planning</td>
<td>Wk1</td>
<td>PI SW</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>CMMI Ref</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>SG 1 Establish Estimates</td>
<td></td>
</tr>
<tr>
<td>SP 1.1-1 Estimate the Scope of the Project</td>
<td>1. How is the scope of work documented? 2. How do you ensure that the planned scope of work has been decomposed to a sufficient level of detail to enable accurate estimates?</td>
</tr>
<tr>
<td>SP 1.2-1 Establish Estimates of Work Product and Task Attributes</td>
<td>1. How was the size of work products and tasks performed estimated?</td>
</tr>
<tr>
<td>SP 1.3-1 Define Project Life Cycle</td>
<td>1. Where and how is the project lifecycle considered, and how does the lifecycle impact project planning activities?</td>
</tr>
<tr>
<td>SP 1.4-1 Determine Estimates of Effort and Cost</td>
<td>1. How was effort and cost derived from the estimated planning parameters?</td>
</tr>
</tbody>
</table>
Preliminary Pilot Conclusions

• Feasible to Map CMMI to WBS
  – Easier than expected
  – Knowledge of CMMI beneficial

• Systematic WBS Dissection Beneficial
  – Provided Common Understanding
  – Facilitated Team Communication

• Value of Mapping is proportional to the planning detail

• Recommend to Proceed to Next Phase
Next Steps

• Present Pilot Results to Core Team
  – Evaluate Pilot Results
  – Review and Update Process (MDD)
  – Plan Next Steps

• Out Brief Executive Management
  – Approve Future Planned Effort
Questions
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