CMMI Based Risk Management

Presented By:

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Outline

- Role of DCMA
- Customer Expectations
- DCMA Use of CMMI
- Benefits of CMMI
- CMMI Pilot Efforts
- Conclusion
What We Do

Achieve Customer Outcomes!

Provide Customer Focused Acquisition Support Services
- Right Item = Quality
- Right Time = On-Time Delivery
- Right Price = Value for Money

Combat Support Agency
- Military Operations
- Readiness of Fielded Systems
- Modernization of Military Equipment
- Industrial Surge – During Conflict

Teaming with Military Services and Defense Contractors to ensure that tax dollars achieve mission requirements
Full Service Acquisition Impact

**Scope of work**
- All major weapons system programs
- $1,173B in Contract “Face Value”
- $129B Unliquidated Obligations
- 335,000 Contracts
- 16,000 Contractors
- Flight Operations (1200 Aircraft/yr)
- $86B Government Property
- $8B Progress Payments
- $12B Performance Based Payments
- $37B in Small Business subcont. plans

**Span of Control**
- 11,000 Professionals
- Over 800 Locations Worldwide
- 50 Major Field Commands
- $1.1B Budget Authority
- $81M Reimbursable/Foreign Military Sales
- Combat Support Agency
Readiness and Combat Support

The Apparent
Big Items - Big $ - High Attention

The Less Apparent
Small Items - Small $ - High Importance

DCMA covers...

The Full Spectrum

The Critical Few

Depot Maintenance
Timely Return to Mission
Capable Status

Combat Support Agency
78 personnel in 9 different countries including
Iraq and Afghanistan

DCMA
Defense Contract Management Agency
Influencing Program Success

Teaming & Real-Time Communication:
PM -- DCMA -- Suppliers

Cost Visibility & Reporting:
Direct & Indirect Rates

Schedule:
Proactive insight; Early delay notification

Risk Assessment/Risk Mitigation
plus
Right Staffing/Skills Mix

EVMS:
Predictive, Timely Analysis

Software:
Early engagement at Prime/Subs
What do our customers want?

- Interviews were conducted with our customers and the results were:
  - Require more insight into program, cost, schedule and technical risks to product outcomes
  - Desire more proactive involvement; predictive data analysis
  - Conduct risk assessment and take appropriate actions to mitigate the risks
  - Provide assurance that the products work right out of the box for as long as required
DCMA Use of CMMI

- DCMA is not the “typical” CMMI user
  - Not seeking a benchmark “Maturity Level”
  - Primary goal is a better understanding of program risks and Predictive Analysis
  - Provides a structured method for targeted process surveillance activities
  - Allows the identification and evaluation of suppliers’ most critical processes throughout the project life cycle

- Integrated surveillance for Systems Engineering and Software
  - Possible integration with other functional areas (program integration & integration & quality)
Benefits of CMMI

- Provides a structured method for targeted process surveillance activities
- Allows the identification and evaluation of suppliers’ suppliers’ most critical processes throughout the project life cycle
- Detailed analysis of process strengths and weaknesses weaknesses and their impact on product & program program performance
Method Description

CMMI-Based Risk Management Framework

Risk Planning & Prioritization

<table>
<thead>
<tr>
<th>Critical Processes</th>
<th>Priority</th>
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<tbody>
<tr>
<td>PA A</td>
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<td>PA B</td>
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<td>PA C...</td>
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Process Evaluation

Record Process Observations (Process Strengths & Weaknesses)

Determine Process Health

Step 1 - Identification & Prioritization

Past Performance

WBS, IMS, MOA

Critical Path

TRL, Etc.

Step 2 - Critical Process

Determine Process Health

Step 3 - Predictive Analysis & Recommendations (Actionable outcome)

Schedule

Cost

Process

Technical

Step 4 - Re-Plan

Step 5 - Program Element Mapping

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<tr>
<th>Critical Process</th>
<th>Priority</th>
<th>Program Element Mapping</th>
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<td>WBS # 2,4</td>
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<td>PA C</td>
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<td>WBS # 6, etc</td>
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Two Implementation Methods

- **Method 1**
  - Planning steps includes WBS elements mapped to Process Areas (PAs) (Step 1)
  - Used as one of the inputs to process prioritization
  - Surveillance is structured around a well understood WBS
  - Supplier has a well defined work scope
  - Surveillance scope includes a large part of the WBS structure

- **Method 2**
  - Mapping to the WBS elements delayed until process health is determined (Step 5)
  - Surveillance is structured around contract events
  - WBS lacks detail
  - Use of other products define detailed work scope (schedules, work packages)
**Example Output**

<table>
<thead>
<tr>
<th>WBS Ref</th>
<th>WBS Priority</th>
<th>CMMI PA’s</th>
<th>Process Measures</th>
<th>Other Measures</th>
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**Process Area Hits**
2 1 1 1 1 ...

**Weight PA Priority**
4 1 3 1 1 ...

**Incremental Process Evaluation Results**
Predictive Analysis (EV+)

- Earned Value Analysis
  - CAM Interviews
  - Root Cause Analysis

- Development Test
  - Data Evaluation

- CMMI Based Risk Management

- Technical Performance Analysis
  - Progress Against TPMs

- Schedule Analysis
  - Critical Path Analysis

- Other PST Technical/Business Inputs

- Blending

- Synthesis

- Predictive Reporting

- PMO
Pilot Site Experiences

Brian Weber
DCMA Lockheed Martin Dallas
Software Engineer
Good Experiences

- Pilot sites found that CMMI based Risk Management Method provided good direction
  - What process areas are involved
  - Which process areas have most impact on cost/schedule/performance
  - Which WBS elements are affected
  - Gave newer employees a place to start

- Predictive Analysis
  - Mapping of Process Areas to WBS helped determine what elements might be affected if problems aren’t fixed in the process.
Results

• Findings were made at each site based on method indicators.
  - Findings were easily traced to Process Areas
  - Findings were easily traced to WBS
  - Knowing what would be affected by the findings made arguing their importance simple.
Difficulties

• Up front planning was time consuming
  ➢ Multiple functionalities agreeing on what is important can take time
  ➢ Tools weren’t user friendly
  ➢ Tools lacked functionality
Revisions

• With the incorporations of lessons learned, the pilot sites found implementation was easier
  ➢ A new Database for recording observations made recording data easy
  ➢ Method became easily tailored to each site
Summary

• Methodology, training materials, and tools are available for agency-wide use
• More DCMA sites are willing to apply the method to their facilities
• Tools are improving and DCMA resources are applied more efficiently
• Pilots and early users are collecting lessons learned for knowledge management