



# **DoD Systems Engineering and CMMI**

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# USD(AT&L) Imperatives

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- “Provide a context within which I can make decisions about individual programs.”
- “Achieve credibility and effectiveness in the acquisition and logistics support processes.”
- “Help drive good systems engineering practice back into the way we do business.”



# How Defense Systems is Responding

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- Instituted a new Systems and Mission Integration organization
  - Engaging OSD, Joint Staff, Services, and COCOM staffs to define joint integrated architectures
  - Synchronizing the requirements, acquisition, and budget processes
- Warfare offices tailoring the application of DoD 5000
  - Leading IPT process for program oversight and review
  - Role is to help programs succeed
- Formed a new Systems Engineering organization
  - Institutionalizing Systems Engineering across DoD
  - Setting policy for implementation, capturing best practices, setting standards for training and education
  - Enhancing emphasis on system assessment and support



# What We Have Done To Promote Systems Engineering

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- Issued Department-wide SE policy and provided implementation guidance
- Established SE Forum to ensure senior-level focus
- Instituted “context” briefings as part of Milestone Reviews
- Instituted system-level assessments as an aid to Program Managers
- Working with Defense Acquisition University to revise curricula
- Re-focused Warfare offices to help guide programs through the Milestone Review process



# What We Have Done To Promote Systems Engineering (Cont'd)

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- Emphasizing need for earlier test and evaluation involvement in the acquisition process
- Initiated needed improvements in modeling and simulation to account for family- and system-of-systems acquisition
- Leading the Defense Safety Oversight Council's acquisition panel; ensuring systems safety is integrated in design
- Leveraged close working relationships with industry (e.g., NDIA, GEIA, INCOSE, AIA, LAI) and academia (e.g., Stevens Institute of Technology, AFIT, NPGS, West Point, SMU)



# CMMI Vision

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***The initial vision for CMMI was to integrate the competing maturity models and provide more consistent process improvement***

- Cause integration of the *functional disciplines* within organizations and across programs
- Increase *systems engineering* process maturity as organizations migrate from the sun-setting CMMs to CMMI

**Build on and improve the significant work done on CMM-like Models**



# Have we lost sight of the goal?

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The end goal of CMMI is to provide a model for continuous process improvement, to achieve:

- Reduced cycle times
- Meeting cost & schedule targets
- Improve quality

**When achieving a level replaces the focus on continuous improvement, we've lost sight of the goal**



# How we got where we are

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- CMMI Sponsors opted to pursue staged and continuous models to preserve legacy
  - SW-CMM, staged
  - SECM, continuous

**We created “level-mania” instead of continuous improvement**





## Negative effects of “Levels”

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- Organizations often focus on maturity levels vice continuous improvement
- Organizations are tempted to view CMMI Level X as an “end” rather than a “means to the end”
- Some organizations may stop at Level “X” because that is all that is required or expected



## Negative effects of “Levels” <sup>2</sup>

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- Level “X” companies often do not perform at that level on all programs
  - Not all programs are appraised
- Once an organization achieves a desired level, the tendency is to let the baseline erode
  - Can result in reduced ROI

**DoD expects that if you have achieved high maturity, the next program will perform at that maturity**



# Level-mania The Solution

- DoD desires to shift focus from maturity levels to capability profiles
  - Remove the enticement of maturity levels and “one size fits all” syndrome
- Discourage use of maturity levels as selection criteria and replace with targeted CMMI-based risk and capability assessments & profiles
- Develop meaningful measures of process capability based not on a maturity level, e.g. Level 3, but on process performance

**Goal is to improve the impact of CMMI on program performance**



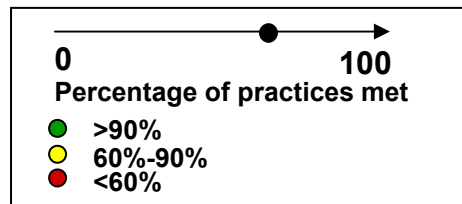
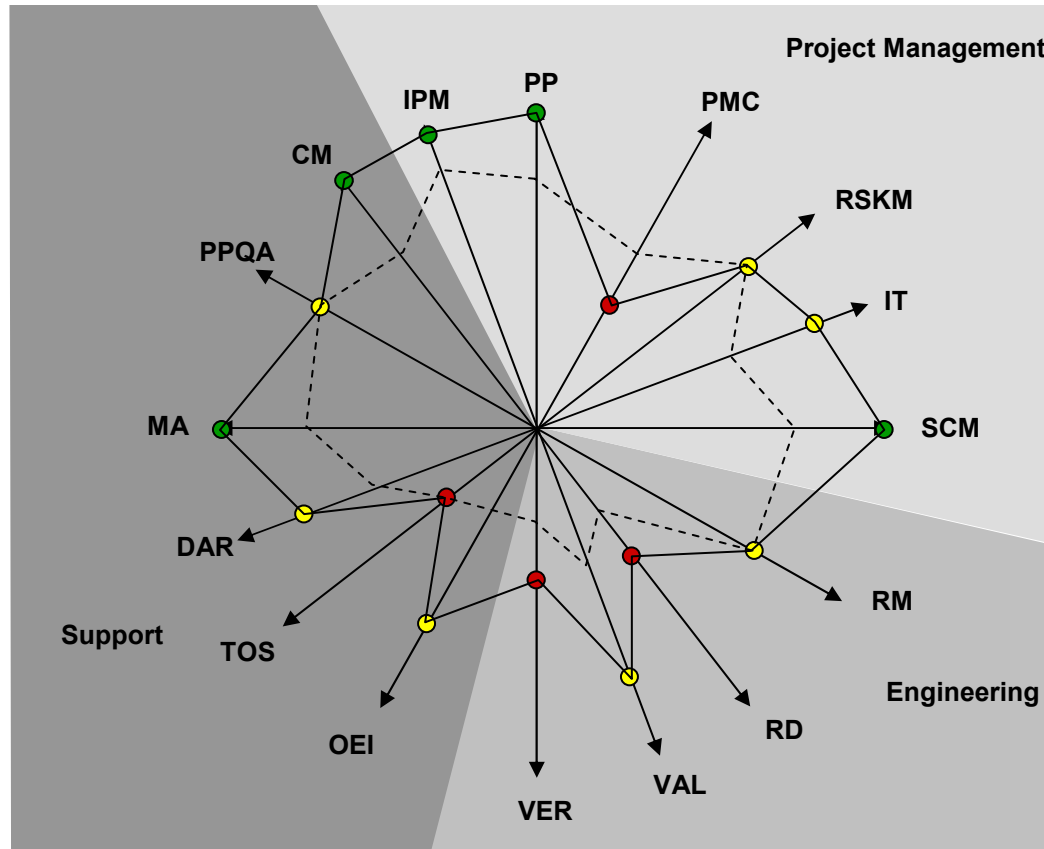
# CMMI Acquisition Module

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- New CMMI Acquisition Module (CMMI-AM) should prove valuable in assisting program offices in improving acquisition process
  - Recent pilot efforts indicate positive effect
- Results not expressed as “Levels” but as Capability Profile
- Self-initiated, for internal use
- Will help put program offices on path to acquisition process improvement



# Sample Assessment Results





# Reinforce the Basics

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- Continue focus on refining what CMMI was intended to achieve
  - Do the current process areas and practices allow us to achieve those objectives?
- Make sure that v1.2 changes bring value added to the user
  - assess the value of each change
- Ensure changes facilitate achievement of the CMMI objectives



# What we need from you

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- Support the effort to improve CMMI in v1.2
- Bring to bear a plethora of knowledge and lessons learned – gained from the implementation of CMMI

## **DoD needs even more focus on improvement**

- Help to identify systemic issues that plague poor program execution performance, despite high maturity levels



# Summary

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- CMMI has the potential to do even greater things for development of Systems
- “Continuous Improvement” is just as important for the CMMI product suite as it is for organizations

**The Department would like to increase focus on understanding the capabilities of both our organizations and our industry partners, instead of merely achieving maturity levels**