Use of CMMI in an Acquisition Context

Using CMMI for Process Improvement at USAF Space and Missile Systems Center (SMC)

Dr. Jack R. Ferguson
jrf@sei.cmu.edu

 © 2003 Carnegie Mellon University

Outline

Purpose-Approach
Process
Adapting CMMI for acquisition
Notes on the experience

 © 2003 Carnegie Mellon University

Purpose

Revitalize world-class systems engineering and program management culture and practices within SMC to effectively acquire space systems that meet the needs of the nation and the DoD war fighter

 © 2003 Carnegie Mellon University

Approach

Implement a continuous engineering and acquisition process improvement program across SMC

- Improve safety, reliability, and quality of space systems through the integration of sound engineering principles and standards
- Improve engineering and acquisition knowledge and skills and attract and retain engineering resources

SMC selected the Capability Maturity Model Integration (CMMI^{SM}) framework to baseline SMC processes

- CMMI^{SM} is the Defense Industry-wide accepted method for process appraisal and improvement

 © 2003 Carnegie Mellon University

Process-1

Select and adapt CMMI processes for SMC

Perform pilot appraisal

Revise CMMI and appraisal processes

Perform appraisal in each program and staff agency

Brief leadership on overall results

Plan and implement improvement activities

© 2003 Carnegie Mellon University

Process-2

Briefing for leadership

- Composite results (per Process Area)
  - -Total # Practices Fully, Partially, Not Implemented and Not Applicable
  - -Total # Practices judged Best Practices

- Best Practices for use throughout SMC

 © 2003 Carnegie Mellon University

Process-3

Current Status

- Adapted CMMI and ARC-Class B appraisal method for acquisition
- Performed appraisals on five programs and two staff agencies

Next steps

- Continue appraisals
- Brief leadership and start improvement
  - -Establish improvement infrastructure
  - -Share Best Practices across programs
  - -Establish SMC generic practices, metrics and training
  - -Implement improved processes in programs

© 2003 Carnegie Mellon University

Adapting CMMI for Acquisition

Process Areas Selected for SMC

- Project Planning
- Project Monitoring and Control
- Integrated Supplier Management
- Risk Management
- Requirements Development
- Requirements Management
- Verification
- Validation
- Configuration Management
- Decision Analysis and Resolution
- Organizational Training

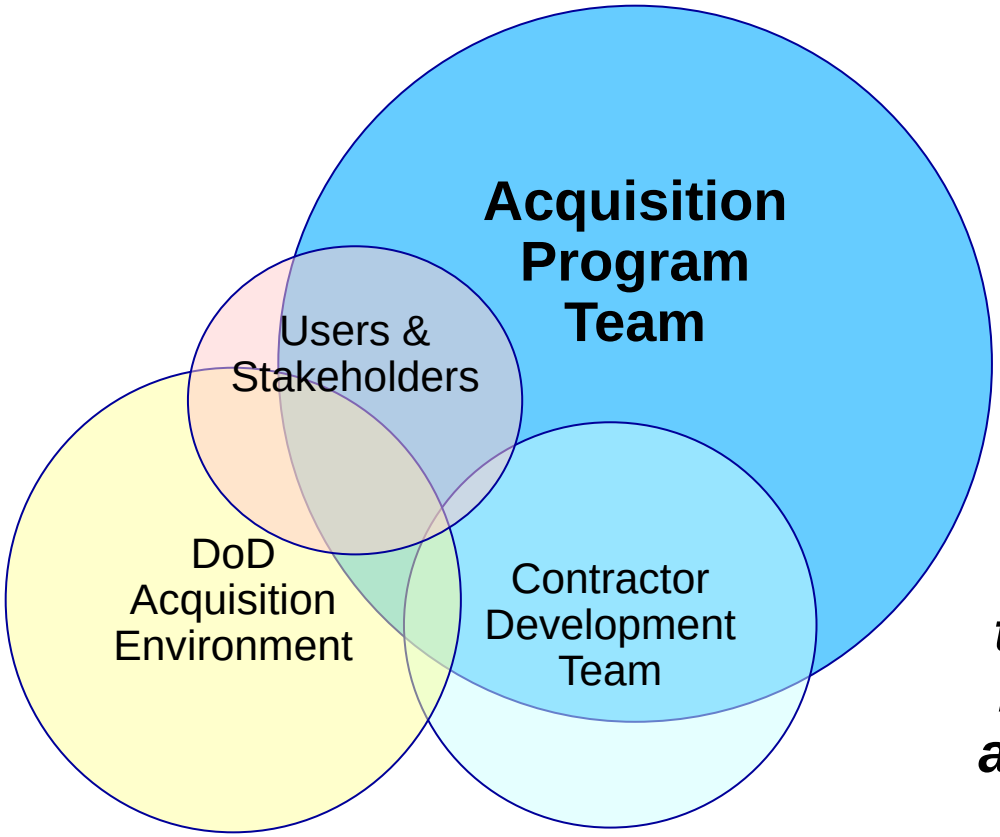
© 2003 Carnegie Mellon University

Augmentation to CMMI PAs

CMMI Process Area	SA-CMM KPA
Project Planning	**Software Acquisition Planning**
Project Monitoring And Control	**Project Management**
Integrated Supplier Management	**Solicitation**
Risk Management	**Contract Tracking and Oversight**
Requirements Development	**Requirements Development and Management**
Requirements Management	
Verification	
Validation	
Configuration Management	
Decision Analysis and Resolution	
Organizational Training	

© 2003 Carnegie Mellon University

Acquisition Organization Interfaces



Appraisal looks at the SPO processes both internally and across its interfaces

 © 2003 Carnegie Mellon University

Summary of additions from SA-CMM

Project Planning **Project Monitoring and Control**	**Addition of Acquisition Strategy and Operations/Sustainment Activities**
Integrated Supplier Management	**Addition of Solicitation and Contract Tracking and Oversight Activities**
Requirements Development	**Develop Verification Requirements**
Requirements Management	**Baseline Requirements and analyze changes for impacts**

© 2003 Carnegie Mellon University

Notes on applying CMMI to Acquisition Organizations

Technical Solution and Product Integration

- Overseen in Integrated Supplier Management

Verification and Validation

- Application to program office vs acquired products

Application to staff organizations

 © 2003 Carnegie Mellon University