

NORTHROP GRUMMAN

DEFINING THE FUTURE

Mission Assurance and CMMI

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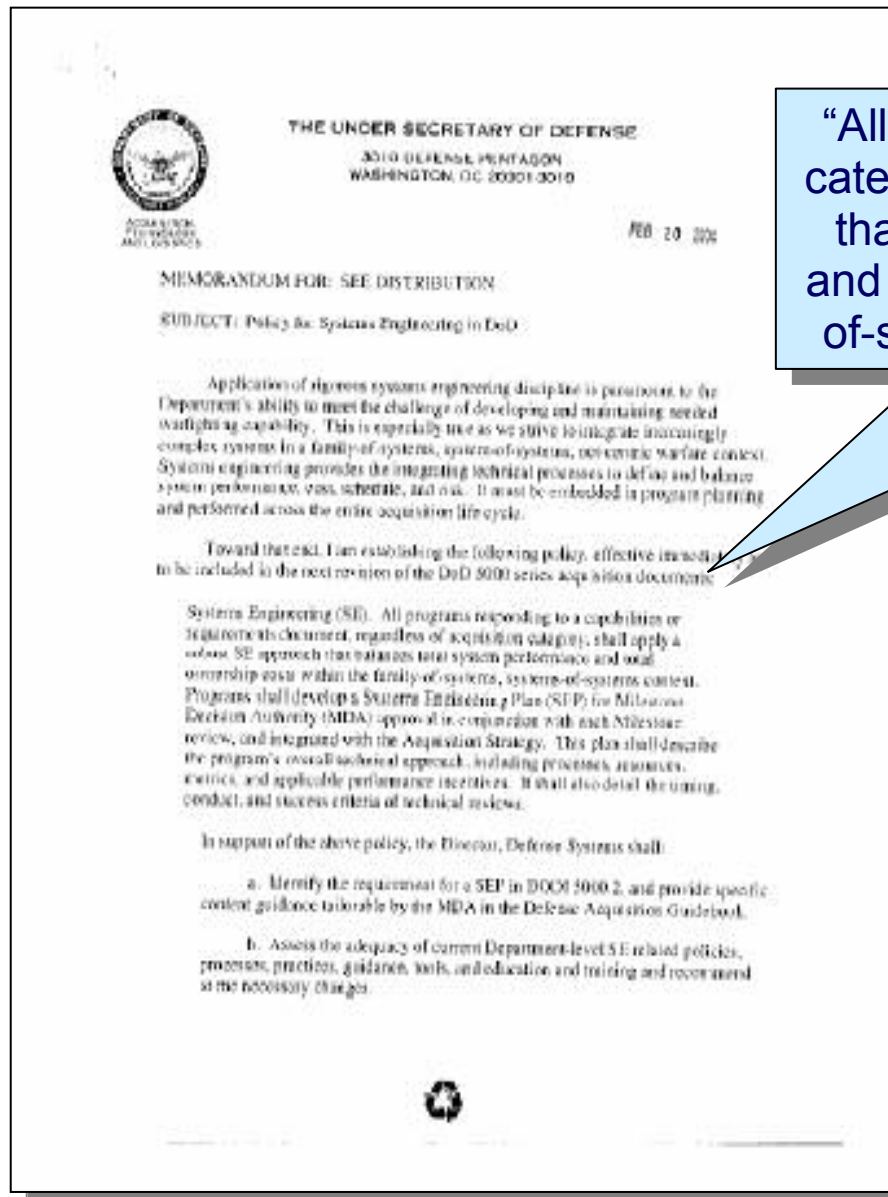
Introduction

- **Many government customers, including NASA, NRO, and the Missile Defense Agency, are expressing increasing interest in Mission Assurance (MA)**
- **The presentation will:**
 - Review customer MA requirements
 - Identify the critical MA activities
 - Explain how CMMI relates to MA
 - Present examples from Northrop Grumman Mission Systems

What is Mission Assurance?

- **An engineering level assurance process performed over the lifecycle of a program to identify and mitigate design, production and test deficiencies that could effect mission success**
 - The outcome is an effective, reliable, and safe capability
- **Includes the disciplined application of general system engineering, risk management, quality, and management principles to achieve mission success**
- **Mission and safety critical items are those items where failure would directly affect system or personnel safety, mission success, or operational readiness**

Our Customers Recognize the Need



“All programs..., regardless of acquisition category, shall apply a robust SE approach that balances total system performance and total ownership costs within the family-of-systems, systems-of systems context.”

- Directive issued in December 2003
- Charged the Director, Defense Systems, to identify requirements in DODI 5000.2 and provide guidance in the Defense Acquisition Guidebook
- Charged each Component Acquisition Executive and defense agency to provide its approach and recommendations

MDA Assurance Provisions

Almost 3000 separate process requirements for MDA programs

- Management
- Design & Development
- Software & Firmware
- Technical & Mission Assurance Reviews
- Reliability, Maintainability, & Availability
- Parts & Materials Control Program
- Configuration Management
- Control of Nonconforming Items & Materials
- Fabrication & Quality
- Supplier Management
- Safety
- Integrated Test & Evaluation Program
- Test, Measuring , & Diagnostic Equipment and Standards
- Interface Management

How Does This Relate to CMMI?

MDA requirements addressed by CMMI

- ✓ Management
- ✓ Design & Development
- ✓ Software & Firmware
- Technical & Mission Assurance Reviews
- Reliability, Maintainability, & Availability
- Parts & Materials Control Program
- ✓ Configuration Management
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- Test, Measuring , & Diagnostic Equipment and Standards
- ✓ Interface Management

	Process Areas
5	Causal Analysis and Resolution Organizational Innovation and Deployment
4	Quantitative Project Management Organizational Process Performance
3	Requirements Development Technical Solution Product Integration Verification Validation Organizational Process Focus Organizational Process Definition Organizational Training Risk Management Integrated Project Management (for IPPD) Integrated Teaming Integrated Supplier Management Decision Analysis and Resolution Organizational Environment for Integration
2	Requirements Management Project Planning Project Monitoring and Control Supplier Agreement Management Measurement and Analysis Process and Product Quality Assurance Configuration Management
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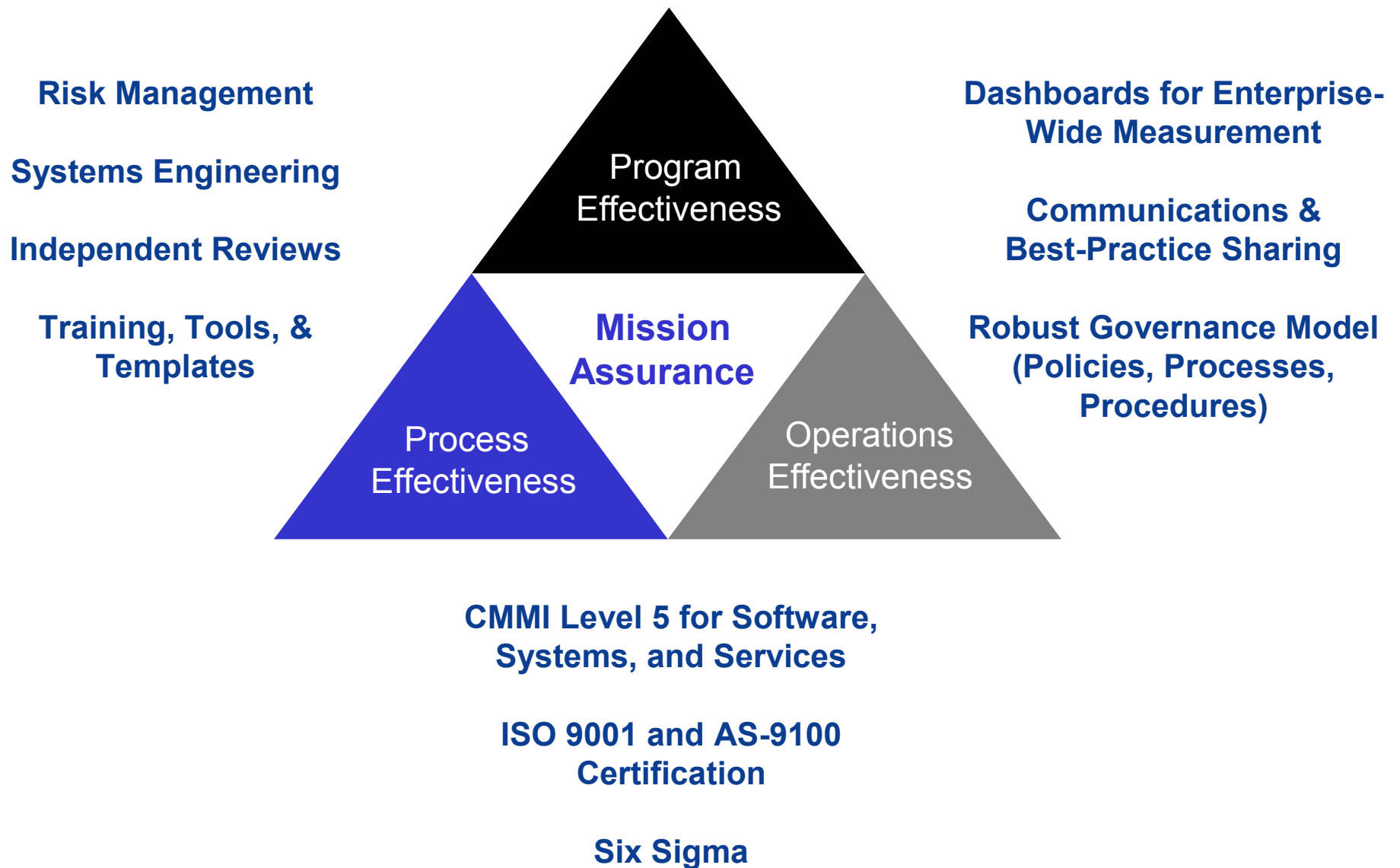
DEFINING THE FUTURE

Northrop Grumman Mission Systems Mission Assurance Approach

FROM UNDERSEA TO OUTER SPACE TO CYBERSPACE



Mission Success Requires Multiple Approaches



Process Effectiveness

Audits & Appraisals

12 Northrop Grumman sites externally appraised at CMMI Level 5

Staff Competence & Training

- CMMI & Six Sigma courses
- Policies & processes course
- Standard Training Modules for each job function: engineering, project management, QA, CM, etc.

Process Asset Library

Policy Sort

- 701 Quality Manager
- 702 Documents & Re
- 911 Org Process Def
- 912 Org Process Foc
- 913 Org Process Perf
- 914 Org Innovation &
- 915 Org Training
- 921 Project Planning
- 921 Project Plan
- 921 Project Plan
- 921 Project Aud
- Training: 921.0
- Training: 921.1
- Training: 921.2
- Checklists
- Integrated M
- Integrated M

Communications & Collaboration

CMMI/Process Mgmt

Home >> CMMI / Process Management

Home PI Summit

Welcome

This web site is designed to support the sharing of information and assets related to Northrop Grumman Mission Systems' Capability Maturity Model Integrated (CMMI) initiative.

Assuring mission success by making the people and processes more informed and effective

Program Effectiveness

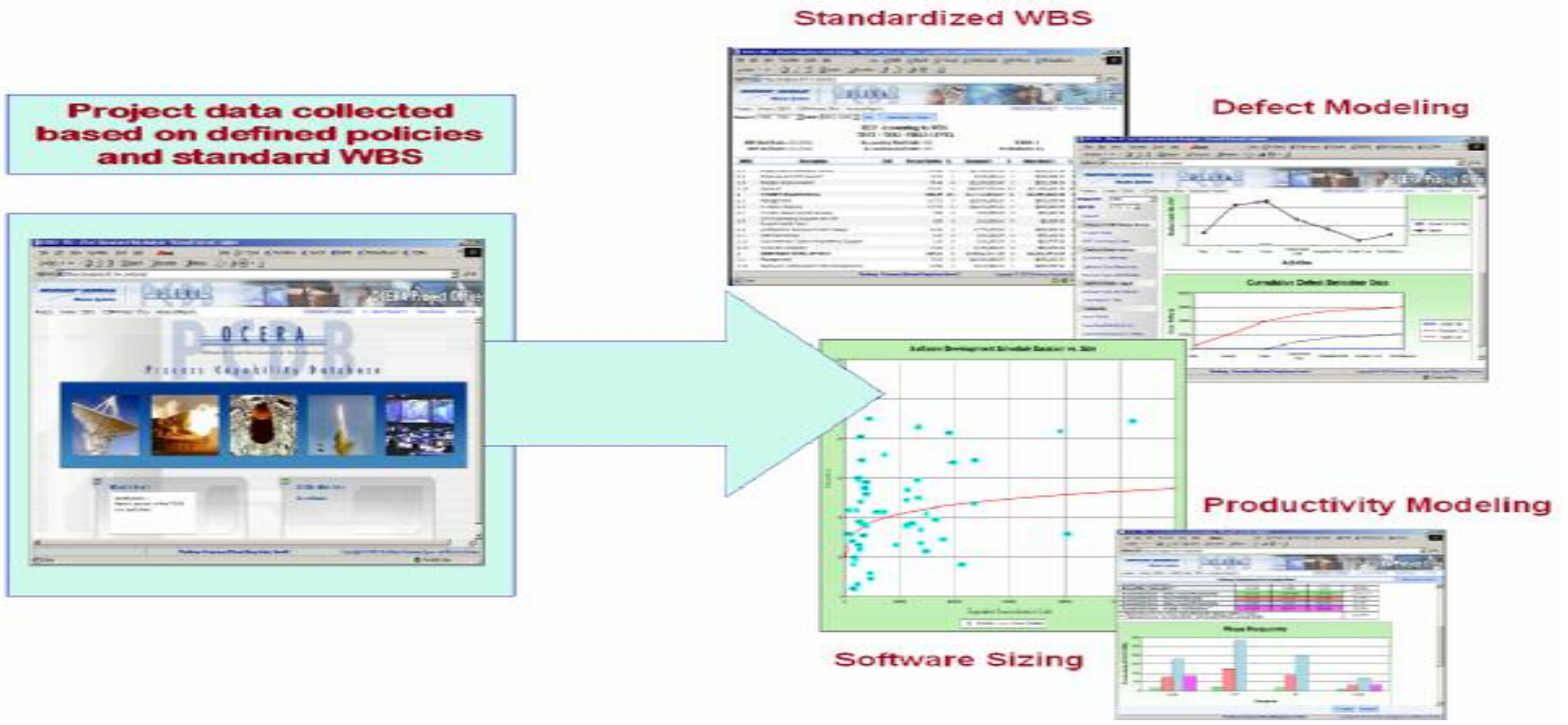
- **Six Sigma connects process improvement and business value**



- **Six Sigma projects can help focus and measure CMMI-driven process improvements**
 - Identify the customer's needs, maximize the value/cost
 - Tools for management by variation (CMMI Levels 4 and 5)
- **Results to date**
 - 3500 Green Belts, 170 Black Belts, 10 Master Black Belts
 - 400 completed Six Sigma projects, 270 in progress
 - Significant benefit to our customer – lower costs, better performance

Assuring mission success by identifying the customer's needs and reducing defects

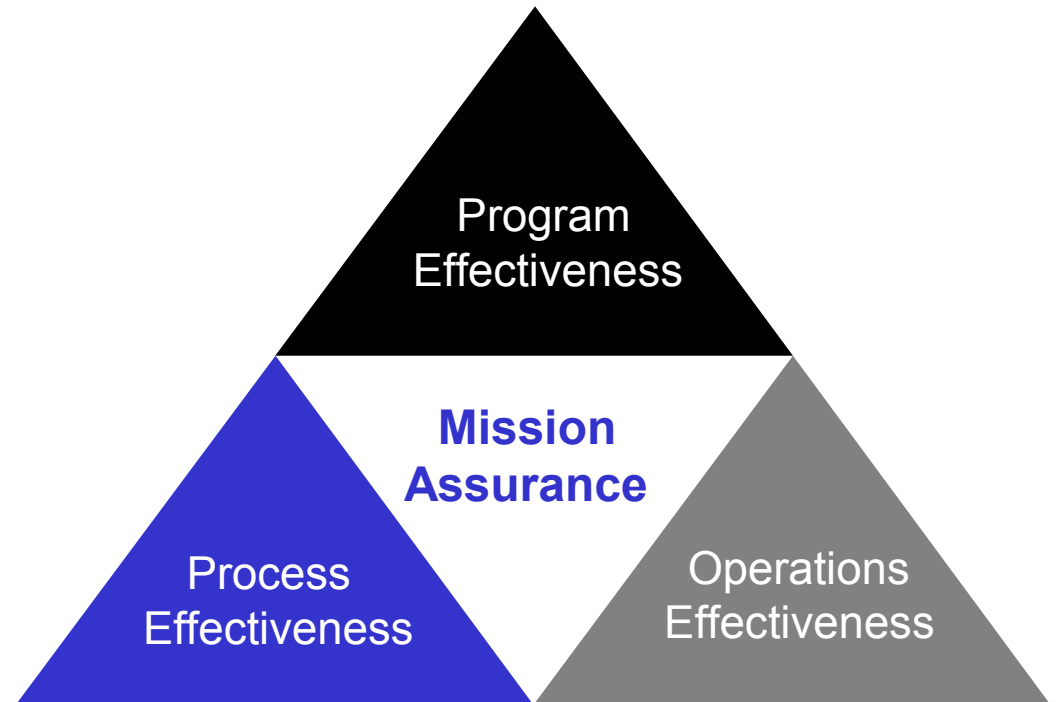
Operational Effectiveness



Assuring mission success by providing independent cost, schedule and risk realism

Lessons Learned

- **Mature processes are only a necessary condition for mission success**
 - Goal should be successful missions, not process for process sake
- **Mission success requires a holistic culture shift**
 - Focus improvements on program success in the larger mission context
 - Requires corporate leadership and vision, backed by experience, dedication and resources



Must reduce variation and risk, to ensure predictable program performance and maximize chances of mission success