![Northrop Grumman — Defining the Future]

What Beyond CMMI is Needed to Help Assure Program/Mission Success?

CMMI Technology Conference & User Group

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Northrop Grumman Mission Systems

- **A leading integrator of complex, mission-enabling systems**

- **2003 Sales - ~$4.1B**

- **18,000 employees in 50 states and in 23 countries**

- **1500 active contracts**

- **Deep, legacy domain expertise in priority, high-growth segments**

- **Premier provider of mission critical end-to-end solutions**

Intercontinental Ballistic Missile Program

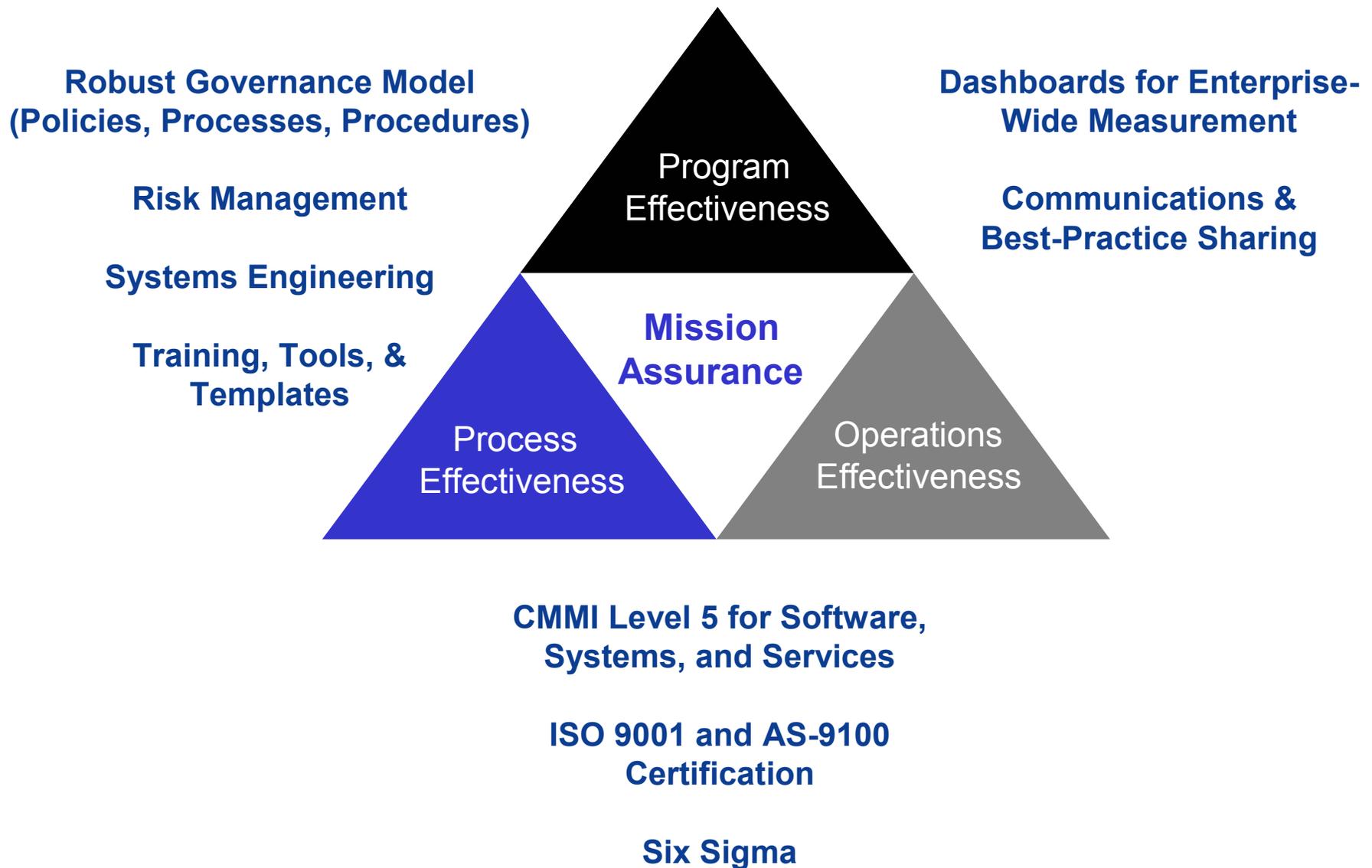**Joint National Integration Center**

Satellite Command & Control

Focused on program performance

Our Customer's Challenges

- **Robust Systems Engineering**
  - Design and process flexibility that rapidly and affordably accommodates change
  - Better definition of requirements, spiral acquisition strategies, flexible architectures, mature engineering processes, evolutionary acquisition strategy

- **Mission Assurance**
  - Safe, reliable, robust products and services that meet or exceed our customer expectations
  - Done right the first time, every time
  - Quality expectations from the top down

- **Supplier Quality Management**
  - Management of the entire supplier chain

CMMI Level 5 software and systems engineering processes are only a starting point…

Mission Success Requires Multiple Approaches

**Robust Governance Model
(Policies, Processes, Procedures)**

Risk Management

Systems Engineering

**Training, Tools, &
Templates**

Program
Effectiveness

**Mission
Assurance**

Process
Effectiveness

Operations
Effectiveness

**Dashboards for Enterprise-
Wide Measurement**

**Communications &
Best-Practice Sharing**

**CMMI Level 5 for Software,
Systems, and Services**

**ISO 9001 and AS-9100
Certification**

Six Sigma

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

Communications & Collaboration

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

Program Effectiveness

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

DEFINE	MEASURE	ANALYZE	IMPROVE	CONTROL
Charter team, map process & specify CTQs	Measure process performance	Identify & quantify root causes	Select, design & implement solution	Institutionalize improvement, ongoing control

- **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
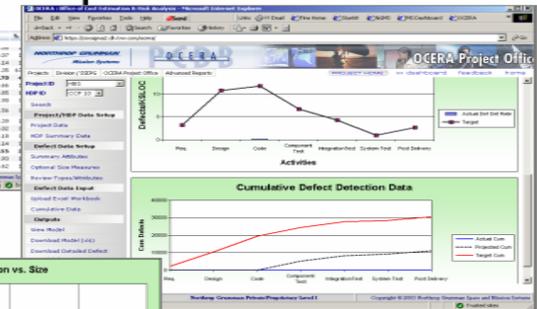
Operational Effectiveness

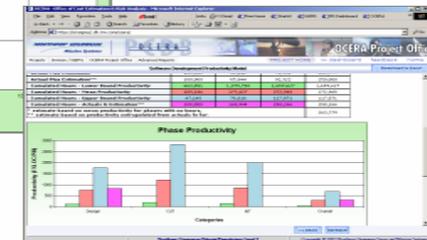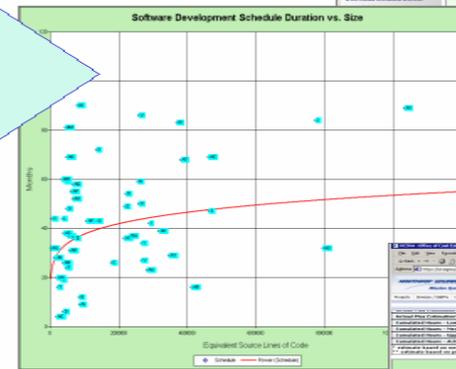**Project data collected based on defined policies and standard WBS**

Standardized WBS

Defect Modeling

Software Sizing

Productivity Modeling

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

Summary

- **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

Program Effectiveness

Mission Assurance

Process Effectiveness

Operations Effectiveness

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