CMMI Level 5 Lessons Learned

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Agenda

- Background
  - BAE Systems - Mission Solutions and Process Improvement Organization
  - Context
- Lessons Learned
- Summary
- Point of Contact

Mission Solutions–Intelligence Systems

Image Archive and
Retrieval Systems

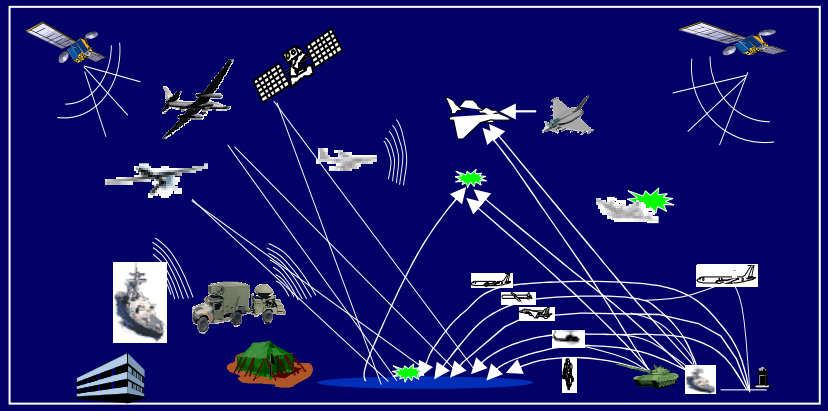
Information
Dissemination Systems

Imagery Exploitation and
Cartographic Systems

Image Management and Exploitation Systems for Cartographic and Intelligence Applications for its Mission Partners

Mission Solutions–Defense Systems

Battle Management Systems
Mission Planning, Time-Critical Targeting, Resource & Logistics Planning



Test & Space Systems
Avionics and test solutions for advanced electronic systems including aircraft, munitions, spacecraft, and telecommunications

International
Commercialization of Mission Solutions technologies for export to foreign customers

End-to-End Battle Management and Support Systems for the Warfighter

Mission Solutions – Geospatial Data Production & Homeland Security

Geospatial Production
Full range of geospatial products and services for highly accurate maps, fused geographic data and information, and real-time data presentation

Imagery Analysis and Modeling
Real-time image analysis and report generation augmenting national customers. 3D terrain model builds for demonstration

Homeland Security Applications
Geospatial databases combining positional and attribute information for emergency response, situational awareness, and scenario-based modeling and simulation

Full Range of Highly Accurate Geospatial Products and services

Mission Solutions–Geospatial eXploitation Products

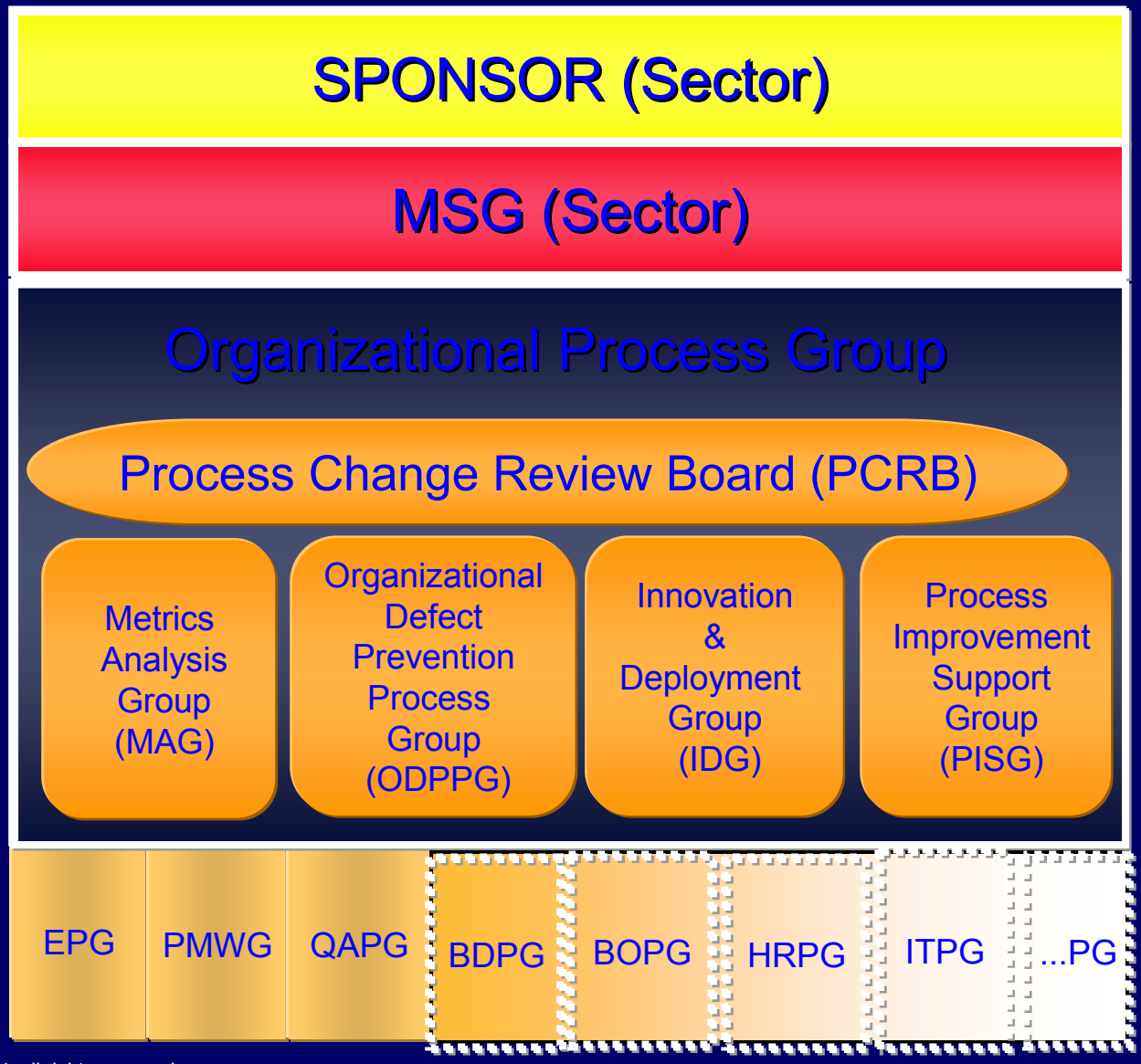
Geospatial Information

Imagery Analysis

3D Visualization

Commercial Software for Photogrammetry, Mapping & GIS, Imagery Exploitation, C4ISR, Targeting, Visualization & Simulation, Natural Resource Management, and Vertical Obstruction Identification

Organizational Process Improvement Organization - OPG Expansion



- Guidance & Direction.

- Oversight & Direction.
- Goal Setting & Tracking.

- Oversight & Direction for process definition and implementation. Report progress to MSG.
- Administer Process Changes
- Administer metrics database, analyze metrics, flag trends and statistical issues.
- Support analysis and actions on discrepancy data
- Support assorted data mining, piloting, and innovation
- Provide support for web, metrics and tool implementation.

- Oversee and implement their respective processes.
- Feedback & review of their processes.

Operating Context for Process Improvement Program

- Improve efficiency in institutionalizing mature practices
- Optimize Return On Investment to projects and the organization
- Reduce uncertainty of Appraisal Results
  - "Bullet Proof"

SCAMPI Lessons Learned

- General:
  - Visible sponsorship/commitment from the top down is key to the success of all activities leading up to an appraisal.
  - A well prepared artifact repository is central to a more timely and successful appraisal and sends a message to the appraisal team of the level of preparedness of the organization
  - Plan, master schedule, risk register, earned value, SPI/CPI, networked schedule were key to effectively controlling costs and managing the Process Improvement initiative as a program

SCAMPI Lessons Learned (Continued)

- Appraisal Selection:
  - Class C Appraisal not recommended for preparing for SCAMPI Class A:
    - Inaccurate findings and wasted time chasing non-existent problems
    - Interviews are needed to augment artifact review
  - Use health checks (CMMI Class B) to:
    - Build a harmonious appraisal team
    - Refine / establish understanding & agreements on the CMMI processes
    - Work out technical issues
    - Focus on getting processes and tools fixed
    - Support successful CMMI Class A appraisal

SCAMPI Lessons Learned (Continued)

- **Process Areas:**
  - Additional CMMI processes (beyond SW-CMM) required heavy focus and extra work to develop, deploy, and institutionalize.
    - Non-Deliverable documents, Supplier Agreement Management, Relevant Stakeholder Involvement, Plan to Plan, Plan to Monitor and Control Processes, Product Integration, Verification, Validation
    - Develop and Refine processes to ensure CMMI compliance
  - Implementing processes to address Relevant Stakeholder Involvement (RSI) was time consuming and requires much "hand holding"
    - Monitoring, tracking, and controlling RSI is the challenge
  - Significant effort to expand metrics to cover all Engineering PAs, Project Management PAs, Support PAs, and Organizational PAs
    - Having data that demonstrates institutionalization of selected process areas at Capability Levels 4 and 5 is a long pole in the tent

SCAMPI Lessons Learned (Continued)

- **Preparation:**
  - Establish standard interpretation of which artifacts will satisfy each PA
  - Significant time needed to collect and populate artifact repository
    - Substantial impact to projects
  - Internal appraisal team members review and validate the artifacts
    - Reviewers validate the PAs they will cover for the appraisal
  - Preparation/information sharing brown bag sessions with project representatives meeting together
  - Weekly status meetings with project leaders on issues and progress
  - Establish a way to handle appraisal team Requests For Information (RFI) electronically using email and project folders

SCAMPI Lessons Learned (Continued)

- Appraisal Team:
  - Establish agreement with the Lead Appraiser on the target goal, PA scoping profile, and CMMI process area's meaning
    - Develop understanding that helps avoid surprises during the appraisal
    - Focus on satisfying the lead appraiser's understanding of each PA
    - Don't get sidetracked by external personnel and consultants
  - Select appraisal team members that are knowledgeable and experienced in the PAs and Project disciplines
  - Be diligent in selecting the right mix of external appraisers to ensure harmonious appraisal team interaction
  - Maintain consistent appraisal team members from initial health check through final SCAMPI Class A
  - Use Health Checks as team building/training opportunities to build the pool of future Assessment Team Members

SCAMPI Lessons Learned (Continued)

- **Consultants:**
  - Use consultants to help maintain focus on key areas
    - Comments and actions assigned by external consultants tend to be visible and thus drive actions
  - Carefully consider and filter consultant's action items if they add unneeded work or distract you from satisfying the lead appraiser
    - Keep your eye on the target
    - Beware academic perfection
- **Interviews:**
  - Select interviewees that implement the processes for which they will be interviewed
  - Prepare interviewees for the interview process
    - Normalize understanding of how company meets CMMI practices
    - Put your best foot forward

SCAMPI Lessons Learned (Continued)

- **Technical Support During SCAMPI:**
  - Thoroughly test the electronic system and hyperlinks in the environment in which the appraisal will be conducted
  - Ensure that the same version of needed applications are consistent on all computers used during the appraisal
  - Have an Emergency Response Team to solve technical problems
- **Projects:**
  - Work with projects early to scope how the CMMI relates to their stage of the development lifecycle
  - Regularly inform middle and upper management about their project's preparation activities: progress and issues

SCAMPI Lessons Learned (Continued)

- **Artifact Repository:**
  - Practice Implementation Indicator Data Base (PIIDB) was very helpful
    - Software Productivity Consortium (SPC) tool
    - Better than hardcopy (often faster for appraisal team)
    - Game plan to establish and maintain links is critical
    - Standardized project directory names and structures
    - Maintain CM of each projects' PIIDB
    - Enables appraisers to cover CMMI methodically and organizes results for the appraisal team
  - Use both Subject Matter Experts (SME) with CMMI knowledgeable personnel to identify standard and unique project artifacts
  - Develop spreadsheet of artifact types for each GP (and SP)
    - Common understanding and agreement of the best artifacts to use

Summary

- It is possible to reduce uncertainty in appraisal results
- Pro-active, cooperative work is key:
  - Projects
  - Interviewees
  - Departments
  - Appraisal Team
- Artifact-based SCAMPI lends itself well to getting predictable results:
  - Organize and annotate evidence diligently
  - Help the Appraisal team find evidence they need
- Robust appraisal preparation will help drive mature practice institutionalization

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BACK UP

Core Competencies

- Managing large, complex, software-intensive production programs from development through operations and maintenance
- Accurate, three-dimensional mensuration and multi-sensor fusion
- Low observable (Stealth) modeling and autorouting for mission planning
- Phenomenology expertise for multi-spectral and hyper-spectral data
- Providing near-real-time information to the decision maker (from policy makers to shooters)
- System/software integration of Information Technology commercial off-the-shelf (COTS) based systems

EXECUTIVE SPONSOR

Marshall Banker

Management Steering Group

Chair – Vice President Mission Assurance

Enterprise Systems	Integrated Systems	Mission Solutions	Defense Systems	Intelligence Systems	Geospatial eXploitation Products	Homeland Security & Geospatial Data Production
President	President	President	VP	VP	VP	VP

Business Development	Business Operations	Contracts & Legal	Engineering	Human Resources	Information Technology	Mission Assurance
VP	VP	VP	VP	VP	Director	VP

Organizational Process Group

Chair – Director Process Improvement

Integrated Systems	Engineering	Human Resources	Information Technology	Process Improvement	Program Management	Quality Assurance

Business Development	Business Operations	Contracts & Legal	Enterprise Systems Liaison

Acronym List

ATM	Assessment Team Member
BDPG	Business Development Process Group
BOPG	Business Operations Process Group
CM	Configuration Management
CMMI	Capability Maturity Model Integration
DP	Defect Prevention
EPG	Engineering Process Group
GG	Generic Goal

Acronym List

HRPG	Human Relations Process Group
IDG	Innovation and Deployment Group
ITPG	Information Technology Process Group
MAG	Metrics Analysis Group
MSG	Management Steering Group
ODPPG	Organizational Defect Prevention Process Group
OPG	Organizational Process Group
PA	Process Area

Acronym List

PCRB	Process Change Request Board
PG	Process Group
PI	Process Improvement
PIIDB	Process Implementation Indicator Database
PISG	Process Improvement Support Group
PMWG	Program Management Working Group
QAPG	Quality Assurance Working Group
RFI	Requests for Information

Acronym List

RSI	Relevant Stakeholder Involvement
SCAMPI	Standard CMMI Appraisal Method for Process Improvement
SG	Specific Goal
SME	Subject Matter Expert
SPI/CPI	Schedule Performance Index/Cost Performance Index
TCM/PCM	Technology Change Management/Process Change Management