

Pilot for CMMI-DEV V1.3 High Maturity Process Areas

Lockheed Martin IS&GS-Defense

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**Scott Foster
Dorna Witkowski**

Agenda



- **Background**
- **Purpose of Pilot**
- **Streamlined Structure of Pilot**
- **Summary of Results**

Background – IS&GS-Defense



- ***Lockheed Martin IS&GS–Defense***
 - Employs over 12,000 people at more than 200 sites encompassing over 400 programs worldwide
 - Is principally engaged in the design, development, operation and sustainment of systems and solutions that help our defense customers achieve their missions
 - *Headquarters:* Valley Forge, PA
 - *Customer Base:* The majority of IS&GS–Defense’s business is with the U.S. Department of Defense, other U.S. government customers and the military services of international governments.

Background – IS&GS-Defense



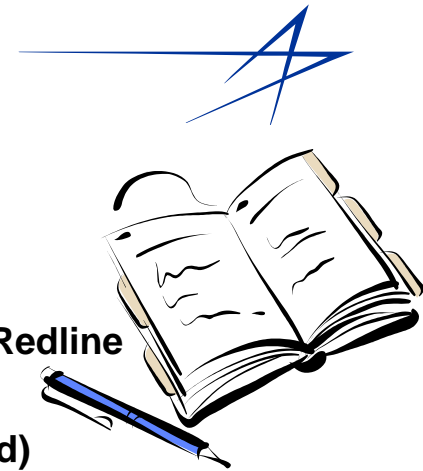
- In January 2009 IS&GS-Defense achieved a CMMI Maturity Level 5 based on the Staged CMMI Dev V1.2 + IPPD

- Organization and 3 large programs assessed:

- *** Advanced Extremely High Frequency (AEHF) Mission Control Segment (MCS) - develops and deploys the MCS which will consist of upgrades and replacement of the existing fielded MILSTAR equipment and software to support the combined MILSTAR and AEHF constellation of satellites.**
 - Size: 348 People, Development
 - Locations: King of Prussia, PA; Denver, CO; San Jose, CA; Rockville, MD
- *** Space Based Infrared System (SBIRS) High, Ground Segment – develops software to replace the ground segments of the US satellite Early Warning System.**
 - Size: 368 People, Development
 - Location: Boulder, CO; Sunnyvale, CA
- **Integrated Space Command and Control (ISC2) program - provides a powerful, yet flexible platform for current and emerging space, air, and missile defense missions.**
 - Size: 388 People, Development
 - Location: Colorado Springs, CO

*** Also participated in V1.3 Pilot**

Background – High Maturity Process Areas of V1.3



- Planning for the pilot was initiated on the March 2010 GLOP High Maturity Redline
 - Causal Analysis & Resolution (CAR) updated
 - Change from “Defects and Problems” to “Outcomes” (good or bad)
 - Organizational Innovation & Deployment (OID) updated
 - Differentiation between incremental and innovative improvements
 - Organizational Performance Management (OPM) was added
 - New process area to manage the process performance of the organization
 - Organizational Process Performance (OPP) updated
 - Change to order of specific practices to help understanding of intent
 - Rewrite of selection of processes and sub-processes
 - Quantitative Project Management (QPM)
 - Modification of order of specific practices to help understanding of intent
 - Clarification of analysis of project performance
- Used this version as the baseline for the pilot
 - Did not change direction even when OPM was combined with OID to form a combined OPM

The assumption was that V1.3 updates did not levy new requirements, only reinforced the *intent* of the high maturity concepts

Purpose of Pilot



- **Provide feedback to the Software Engineering Institute (SEI) on the updated language within the model**
- **Ensure the company and its programs were consistently performing at a Maturity Level 5**
- **Identify any potential disconnects between the company's plans and processes and the updated model**
 - **Ensure that the organization understood and was consistent with the new wording**
 - **Help new leaders in process positions feel more comfortable with the plans for a re-appraisal**
- **Piloted new PIID tool developed by the organization**



Streamlined Structure of Pilot



- **Chose a Class B method**
- **Only assessed High Maturity Process Areas**
- **Used discovery mode for QPM and CAR**
 - Programs provided easily available evidence for review (standard business rhythm work products)
 - No program preparation time required
 - Used artifacts from programs that were focus programs in the 2009 SCAMPI A
- **Required PIIDS for specific practices of organizational process areas only**
 - OPP, OID, OPM
 - No objective evidence for generic practices
- **Used an experienced appraisal team**
 - Both previously on SCAMPI A for the organization
- **Conducted interviews virtually**



Summary of Results – Feedback to the SEI



- Full agreement with eliminating GG4 and GG5
- Full agreement on greater emphasis on Process Performance Baselines and Models
 - Recommended greater emphasis in the informative material for ML5 PAs
- Partial agreement on adding a new OPM process area
 - 1/2 of team felt it wasn't needed and didn't add real value
 - 1/2 of team felt it helped tie the relationship between OID and OPP
- Full agreement with including positive as well as negative outcomes for CAR
- Mild agreement with de-emphasizing “common cause” as a differentiator between ML4 and ML5
 - Most people did not have an opinion
- Agreement on broadening “statistical management”
- Agreement on restructuring QPM



Summary of Results – Performance of Organization against the V1.3 PAs (1)



- Results were provided as risks:
 - **Low risk** of meeting CMMI goals – on the right track, but still work to do
 - **Medium risk** of meeting CMMI goals – actions need to be taken to stay on track
 - **High risk** of meeting CMMI goals – off track; need to re-assess program or organizational activity
- Additional meetings held after the Final Briefing to explain results in detail



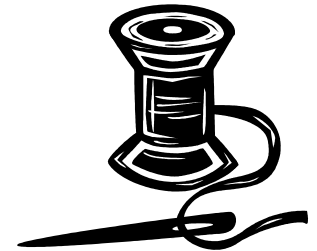
Summary of Results – Performance of Organization against the V1.3 PAs (2)



- **General Strengths:**
 - **Management support of the pilot**
 - **Both in concept, time of participants and follow-up after the results**
 - **Organization and Programs have Goal-to-Measure Mappings that show the threads from high level business goals to actual measurements used**
- **General Weaknesses:**
 - **Difficulty in articulating how the term “Quality and Process Performance Objectives” related to standard activities**
 - **Participants were not in “appraisal” mode**
 - **Even though most had been in appraisals before**
 - **Had to be reminded not to assume the appraisers knew how they operated**

Summary of Results – Performance of Organization against the V1.3 PAs (3)

- Program Process Areas were **low risk**
 - Evidence easily available to show compliance with QPM and CAR
 - Programs were being managed quantitatively and improvements were tied to program goals
 - But program personnel needed to be able to better verbalize threads and quantitative results
- OPM was **low risk**
 - Business needs and goals were established
 - Improvements were based on goals
 - Needed to articulate the “Quality and Process Performance Objectives”



Updates to QPM and CAR had no impact on programs
OPM turned out to be a “no brainer”

Summary of Results – Performance of Organization against the V1.3 PAs (4)

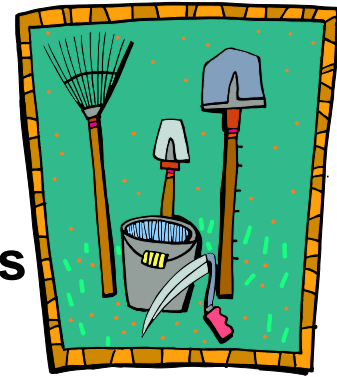


- OPP was **medium risk**
 - New organizational participants needed to learn to “tell the story”
 - To tie together the various aspects of high maturity
 - This observation was driven by the model’s emphasis on traceability to business objectives
 - New order of OPP did not affect results
- OID was **medium risk**
 - Business needs and goals were established
 - More emphasis on quantitative results in model will drive more emphasis on quantitative results in the evidence



Updates to OPP and OID helped focus organization on future actions

Summary of Results – PIID Tool



- **PIID tool used to review evidence for Organizational PAs**
- **Evidence *Review* Feedback**
 - Allow review comments in the tool
 - Allow partial satisfaction without failing the record/practice
 - Allow information requests without failing record/practice
 - Show all evidence for a PA at a glance
- **Evidence *Entry* Feedback**
 - Allow easy transfer between Direct and Indirect
 - Show what evidence has been submitted for entire Practice

All of the feedback has been addressed in the latest version

Summary of Results – PIID Tool



PIID Owner Interface

Retrieve PIIDs Select **Project** ISC2 Evidence

PA CAR - Causal Analysis and Resolution Show all PIIDs with pending actions (All program PAs)

PA	Practice	Status	Select
CAR	SP 1.1	Unsubmitted	<input type="checkbox"/>
CAR	SP 1.2	Reviewed	<input checked="" type="checkbox"/>
CAR	SP 2.1	Submitted	<input checked="" type="checkbox"/>
CAR	SP 2.2	Submitted	<input checked="" type="checkbox"/>
CAR	SP 2.3	Audited	<input checked="" type="checkbox"/>
CAR	GP 2.1	Reviewed	<input type="checkbox"/>
CAR	GP 2.2	Reviewed	<input type="checkbox"/>
CAR	GP 2.3	Submitted	<input type="checkbox"/>
CAR	GP 2.4	Reviewed	<input type="checkbox"/>
CAR	GP 2.5	Reviewed	<input type="checkbox"/>
CAR	GP 2.6	Audited	<input type="checkbox"/>
CAR	GP 2.7	Reviewed	<input type="checkbox"/>
CAR	GP 2.8	Submitted	<input type="checkbox"/>

Evidence

ISC2 CAR SP 1.2 [Practice Help](#)
[History and Corrections](#)

Perform causal analysis of selected defects and other problems and propose actions to address them.

Rationale: Discusses doing a Causal Analysis following an inspection.

Title	Description	Hyperlink
PCB Minutes from 06/26/2008	PCB minutes submitted to demonstrate the actions taken by the PCB as they relate to the CA presented to them. This new record submitted at the request of the auditors	..CB_Minutes.doc#

Status: Reviewed

ISC2 CAR SP 2.1 [Practice Help](#)
[History and Corrections](#)

Implement the selected action proposals that were developed in causal analysis.

Rationale: The just do it section assigns actions to be taken for the quick fixes

Title	Description	Hyperlink
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Summary of Results – PIID Tool



The screenshot shows the PIID Owner Interface in the background and an 'Action Entry' dialog box in the foreground. The dialog box is titled 'Action Entry' and contains the following elements:

- Buttons: Save, Cancel
- Text: 24761
- Text input field: Please rprovide Root Cuase Analysis based on exceeding control limits.
- Section: Issue and Recommendation
- Table with columns: Title, Description, Hyperlink
- Status: New
- Button: Open

The background interface shows a table of PIID results:

PA	Practice	Status	Se
CAR	SP 1.1	Reviewed	✓
CAR	SP 1.2	New	✓
CAR	SP 2.1	New	✓
CAR	SP 2.2	New	✓
CAR	SP 2.3	New	✓
CAR	GP 2.1	New	☐
CAR	GP 2.2	New	☐
CAR	GP 2.3	New	☐
CAR	GP 2.4	New	☐
CAR	GP 2.5	New	☐
CAR	GP 2.6	New	☐
CAR	GP 2.7	New	☐
CAR	GP 2.8	New	☐
CAR	GP 2.9	New	☐
CAR	GP 2.10	New	☐

Summary



- **Pilot helped organization do a “mid-course” correction**
 - Helped to understand emphasis in the next version of the model
 - Generated actions to ensure high maturity activities remain focused
- **Pilot helped establish a usable and flexible PIID tool for future appraisals**
- **SCAMPI B on all organizational process areas scheduled for January 2011 with V1.3**



