Leaner SCAMPI™ Preparation

Gary Natwick
Harris Corporation
16 November 2010
Providing Value To Our Customers

Aviation electronics

Intelligence, surveillance, and reconnaissance

Space and ground satellite communications systems

Communications and information networks

Operations and support services

People – Innovation – Process

Leaner SCAMP® Preparation
Agenda

• Background
• Challenge
• Approach
• Results
• Conclusion
Process Improvement Timeline

Government Communications Systems Division (GCSD)

ISO 9001 Compliance
SW-CMM Level 3
SW-CMM Level 2

1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011

Process Focus
Process Enhancement
Process Advancement

Lean Program
Project Engineering Metrics (PEM)
Division Process Group (DPG)
Integrated Process Manual (IPM)
Process Compliance Monitor (PCM)
Division Measurement Handbook (DMH)
CMMI-DEV+IPPD Level 3
AS9100 Certification
CMMI-SE/SW Level 3

7/91
7/94
9/94
1/93
1993
1994
7/95
1995
1996
1997
1998
1/01
4/01
7/00
2000
11/02
4/04
2003
1/04
2001
2002
11/05
2005
6/07
2007
6/08
2008
7/08
2009
7/11
2011
Background

• Process Improvement is a learned skill
• To increase awareness and capabilities Harris is using a Lean Six Sigma approach
  – Encourage team members to look for ways to improve processes by
    • Quantifying the process
    • Recommending a change
    • Measuring the improvement
  – Teach skills to assist in the efforts
    • Lean Fundamentals – eliminate waste
    • Simulation – understand system performance
    • Change behavior – people skills
    • Six Sigma tools – mathematical skills
Organizational Process Context

Integrated Process Manual (IPM)

Processes ▼

Statements

Expected

Actual

Work

Products

Practices ▲

Process Areas

Capability Maturity Model® Integration (CMMI®)

QA

Integrated Process (IP) Audits for IPM

Internal Compliance

External Compliance

Standard CMMI® Appraisal Method for Process Improvement (SCAMPI SM)
Challenge

• Problem
  – Total cost of SCAMPI\textsuperscript{SM} for division is significant and increases every SCAMPI\textsuperscript{SM} cycle (3-years)

• Goals
  – Reduce SCAMPI\textsuperscript{SM} preparation effort using Lean method

• Measurement
  – SCAMPI\textsuperscript{SM} preparation effort

• Benefits
  – More efficient SCAMPI\textsuperscript{SM} preparation process with earlier feedback for corrective actions
Approach

- **Objective**
  - Reduce effort in conversion for work products from internal organizational requirements to CMMI® Practices
  - Establish a work product priority to focus on the number of CMMI® practices affected by each work product
  - Reduce the rework in discovering the correct work product

- **Implementation**
  - Automate the conversion process
  - Prioritized work product review
  - Utilize process experts to data mine for work products
  - Complete improvements prior to next SCAMPISM
  - Establish more detailed measurements of SCAMPISM activities for future improvements

- **Validation**
  - SCAMPISM
Lean Six Sigma

• A set of principles, concepts, and techniques designed to enable key processes to produce an optimum system that we’ll deliver to our customers:
  – Exactly what they need
  – When they need it
  – In the quantity they need
  – In the right sequence
  – Without defects
  – And at the lowest possible cost
**Six Sigma DMAIC Process**

1. **Problem Definition**
2. **Data Measurement**
3. **Data Analysis**
4. **Improve**
5. **Control**

---

- **Practical Problem**
- **Mathematical Problem**
- **Mathematical Solution**
- **Practical Solution**

**Mathematical Approach with Practical Application**
Leaner SCAMPI\textsuperscript{SM} Preparation

### Supplier
- SCAMPI Projects
- Organizational (HR, DPG)

### Input
- SCAMPI Projects
- Program Work Products
- Organizational Work Products

### Process
- Characterize and reduce the frequency to review each work product
- Work products into PCM
- Export from PCM into Excel
- Compare deltas from last PCM export
- CMMI\textsuperscript{®} conversion mapping macro
- Review & identify corrective actions
- Map corrective actions back to PCM

### Output
- Corrective Actions
- CMMI\textsuperscript{®} Progress Report

### Customer
- Program Team
- Management
- Independent Appraiser

Export, conversion and mapping of work products is Non-Productive

Rework in discovering the correct work products is Non-Productive
Brainstorming

- Facilitated session with team resulting in 42 items
  - Identified 3 possible Lean applications
    - Reduce effort in PCM to CMMI® conversion for projects work products
    - Establish a work product priority to focus on the items that typically have issues and minimize the amount of effort appraising
    - Reduce the frequency of discovering correct work products
  - No detailed measurement breakdown available from previous SCAMPI SM components or subparts
    - Planning
      - Preparation
        - PCM to CMMI® conversion
        - Discovery of work products
        - Review work products for corrective action
        - CMMI® to PCM conversion
    - Conduct
    - Closeout

Limited Historical Data to Demonstrate Measureable Improvement
**PCM to CMMI Conversion**

- Sampled 4 months of SCAMPI\textsuperscript{SM} effort for 2 individuals involved in conversion and applied 50% to represent best estimate of time spent
  - Averaged 115 hours/month

**Work Product Priority**

- Analyzed the number of CMMI\textsuperscript{®} practices affected by PCM default work products to prioritize

---

**Work Products vs. CMMI Practices**

---

**Sample to Establish Measureable Improvement**
**Improvement Approach**

- PCM to CMMI® conversion for projects work products
  - Reduced to a one time event
  - Alternative communication used for corrective actions
- Establish a work product priority
  - Focus on the items that typically have issues and minimize the amount of effort appraising
- Find the correct work products the first time
  - Utilized process experts to data mining based upon standard organizational tools and standard program directory structure
  - Eliminated “bring me a rock”

Piloted on Next SCAMPI℠ Event
Implement Process Controls

- Let’s Not Do This Again
  - One time event for PCM to CMMI® conversion of projects work products
  - Establish a work product priority
  - Utilized process experts to data mining
- Setup work codes to measure SCAMPI\textsuperscript{SM} activities for future improvements:
  - Planning
  - Preparation
  - Program Support
  - Reviews (Readiness & On-Site)
  - Closeout
Results

• Results through 1\textsuperscript{st} SCAMPISM\textsuperscript{SM} Readiness Review compared to previous 2008 SCAMPISM\textsuperscript{SM} event
  – Preparation hours reduced by 59%
  – Cost reduced by 51%
  – Readiness of work products was improved

• Additional benefits
  – Reduced rework in discovering work products
  – Improved consistency in work products discovered across programs
Conclusions

- Lean Six Sigma provides
  - Ability to look at things differently and question habits
  - Ability to look for ways to improve how we do business
  - Tools to enable facilitating change
    - People skills
    - Mathematical skills
    - Modeling skills
    - Increased awareness of available resources
  - Data to show it pays for itself!
Harris Corporation
P.O. Box 37
Melbourne, Florida 32902-0037

Gary Natwick
gnatwick@harris.com
• SEI-Certified Introduction to CMMI® Instructor
• Harris SEI Partner Business & Technical Point of Contact

http://www.harris.com/
SEI Partner

© CMMI is registered with the U.S. Patent and Trademark Office by Carnegie Mellon University.
SM SCAMPI is a service mark of Carnegie Mellon University.