CMMI Level 5 Processes Make it Easy to Define and Deploy Measurable, Achievable Goals to Your Organization

SEPG 2005 Conference
Raytheon Company
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March 2005
Introduction

- Introduction
- NCS - Raytheon Process History
- Goal Evolution
- Pre-Level 5 Approach
- CMM Level 5 Approach
- CMMI Level 5 Approach
- 2004 Goals Deployment Examples
- Summary
- Biography
Network Centric Systems – Raytheon Engineering Process History

1991
Raytheon ED SW Eng Std - Practices Manual “Blue Book”

1992
1991 PRISM, MLS SCEs SEI 3

1993

1994

1995
IEEE Award

1995
SOIs released

1996

1997
RSC = RES + Esys + TI + HAC

1998
GP&P obsolete. “Blue Book becomes standard

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2001
NASM SEI 3 SCE

2002
CMM L4&5

2003
CMMI L5 SW

CMMI L3 SE

ATMS supported by SWEC, PDC, PE and SEC Engineering Center

1991
RES = MSD + ED + SubSig

1995
ISO9001 Certified SW Process

2001

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2002
CMMI L4&5

CMMI L3 SW

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Goal Evolution

- CMM Level 3 Approach
  - Goals are thrown at people
  - No easy way to measure success
  - No connection to most of the organization

- CMM Level 5 Approach
  - Capability being defined
  - Measures worked at the same time the goal is developed
  - Front line managers involved

- CMMI Level 5 approach
  - Desired behavior is identified
  - Goal is built to support that behavior
  - Measures defined and visible to all
  - Activities identified and sponsored
  - Goals and measures drive behavior!
CMM Level 3 Approach
Minding Your Own Business
Didn’t Know It Was Coming

Goals

2000 lbs
Goals are decided here

Engineers are here

Gap analysis shows no buy-in
Results / Behaviors

Results
- No way to plan approach to achieving goals
- No systematic way to evaluate performance
- No buy-in through most of the organization
- Erratic results

Behaviors
- “Pet Peeves” are selected for improvement projects
- Hand waves at measurement – “soft” money claims
- Panic mode to record/report “How we did against last year’s goals”
- Duck and cover - wait for new management/goals

Bottom Line
- No fundamental change - Engineers keep doing what they were doing
CMM Level 5 Approach
No Longer Alone

2000 lbs

Raytheon
Customer Success Is Our Mission
Goals are still decided here

Engineers are Helping to Build a Solution

Smaller Gap Shows More Buy-in and Understanding
Results / Behaviors

Results

- CMM Level 5 TCM/PCM allow the org to plan approach to achieving goals
- CMM Level 4 core measures provide a systematic way to evaluate performance
- Buy-in through most of the organization is still weak
- Erratic results but now efforts are focused

Behaviors

- “Pet Peeves” are not selected for improvement projects – chosen based on objective of organization
- Measurements are still weak in that they are not driving behavior
- Recording/reporting performance is now a regular event

Bottom Line

- Fundamental change to process surrounding Level 5 activities to orient them to satisfying goals
- Engineers keep doing what they were doing but are now very aware of the activities going on even if they are not involved
CMMI Level 5 Approach
Evolved Approach

- Understand external goals
  - Understand company goals
  - Understand engineering goals
- Involve stakeholders in determining approach
- Set organizational goals
  - Define goal
  - Define behavior
  - Establish measures
  - Define activities to support the goals
  - Identify a champion for each activity
  - Establish roadmap for everyone
- Showed clear sponsorship
No Longer Alone

2000 lbs

Capability/Measures

CMMI Level 4
CMMI Level 4

CMMI Level 5
CMMI Level 5

Improvement Activities

CMMI Level 5
CMMI Level 5
High-level Goals are still decided here

Everyone Is On Board

No More Gaps – Everyone is Involved in the Process
Results / Behaviors

Results

- CMMI Level 4/5 OPP/OID allow the org to plan approach to achieving goals
- CMMI Level 4 core measures provide a systematic way to evaluate performance
- Buy-in through most of the organization is strong
- Results on target and efforts are focused

Behaviors

- Activities chosen based on ability to achieve goals
- Measurements drive behavior
- Recording/reporting performance is part of the culture

Bottom Line

- Fundamental CMMI changes institutionalize treatment of goals
- Engineers are now both aware and involved in achieving the goals
2004 Goals – Examples
Raytheon High-level Goals

GROWTH

Performance
Relationships
Solutions

Customer-Focused Marketing

Vision
Strategy
Values
Goals
2004 Organizational Goals

- Improve cost, schedule, and quality performance
- Evolve CMMI Level 5 capabilities
- Develop and market Process / Product Technology Insertion as an internal and external SWEC discriminator
- Develop the technical skills required to meet our future program needs
- Revitalize the bidding process to be able to:
  - Increase accuracy and repeatability
  - Streamline the process
- Improve our relationships within the SWEC, with the PMOs, with our customers, and with other Raytheon organizations
Alignment with Raytheon Goals

GROWTH

- Improve Program Performance & Create New Opportunities
- Revitalize Bid Process

- Enhance Customer / Staff Relationships
- Sustain CMMI Level 5

- Insert State-of-the-Art Technology
- Develop Staff to Meet Future Needs

Performance
Relationships
Solutions

Customer-Focused Marketing
Goal – Example 1
Continue Performance Improvements

- Goal statement
  - Improve cost, schedule, and quality performance

- Measurement approach
  - Improve cost performance by 10% over 2003 performance
  - Reduce post PQT Defect Density by 15% over 2003 performance
  - Increase In-phase Defect Containment percentage by 10% over 2003

- Funded activities
  - PTIC (PSP/TSP, Agile, ATAM, MDA)
  - Improve the inspection process
  - Simplify the process for Small Project/IRAD/DARPA process tailoring
  - Process Engineers

- What you can do
  - Employees:
    - Baseline your own performance
    - Volunteer for PTIC initiative
    - Actively share lessons learned and best practices across projects
  - DMs: Baseline performance and set goals for their department
  - SMs / STMs: Understand cost, schedule, and quality goals for your project
  - PEs: React to measurement triggers
  - Think
Goal - Example 2
Evolve CMMI Level 5 Capabilities

- Goal statement
  - Evolve CMMI Level 5 capabilities

- Measurement approach:
  - 3 FDM postings per project in any phase up through SWIT
  - Sub-process and capability approach established by September
  - Reduce SEPG STR backlog by 50%
  - 100% Six-Sigma Qualified
  - Everyone participates in 4 Six Sigma projects

- Funded activities
  - Address Implementation Gaps identified by the 2003 SCAMPI
  - P3I SCAMPI Pre-looks
  - Address organizational Risk and Opportunity approach
  - Refine the common defect definition
  - Streamline tracking book, PST Checklists, Compliance Checklists

- What you can do
  - Employees: Contact an SEPG person and get involved
  - DMs: Bring steering committee results back to staff meetings
  - SMs / STMs / PEs: Attend OPI and bring results back to projects and sections
  - Think
2004 Overall Accomplishments

- Established a repeatable roadmap for establishing goals for our organization
- Goals were clearly focused for the organization and aligned with company goals
- Center director deployed goals presentation to all 600 people in the organization
- Created, funded, staffed, and completed 15 projects in support of the goals
- Involved 20% of the organization in those projects
Summary

- Tie Goals to every day projects
  - Make it one of the goals on people’s annual performance appraisal
  - Get the front line people involved
  - Show them how it fits into the big picture
- Make it easy for people
  - Supporting the goals should be part of their job’s
- Understand the behavior you want
  - Write goal at a high level
  - Establish measures to help drive the behaviors you want
- Make sure you have believable measurements
Summary

- Sponsorship in the form of funding and resources needs to be rock solid, focus erodes when:
  - Funding gets pulled
  - People want to work on “real” jobs
  - The available people aren’t the right people
- Make sure you have a champion for the activity
  - Increases likelihood of success
  - Activities with no champion tend to wither
Contact Information

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Biography

Jim Stubbe is a Senior Principal Software Engineer and is serving as the SEPG Chairperson for Raytheon Network Centric Systems in Marlborough, MA. Jim is currently leading a both a cross-NCS and a cross-Raytheon Measurement team.

Jim has been with Raytheon since 1989 and has served in a variety of line and technical management positions over that time.

Jim, working as the Metrics Working Group lead, was responsible for crafting and deploying the metrics infrastructure to support the Raytheon NCS Northeast Software Center’s successful 12/01 CMM Level 3 SCE, 12/02 CMM Level 5 SCE, and 12/03 CMMI Level 5 SCAMPI assessments.