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Customer Success Is Our Mission

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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Introduction

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- 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

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Network Centric Systems – Raytheon Engineering Process History

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1988
Raytheon ED SW Eng Std - Practices Manual "Blue Book"

1991
1991 PRISM, MLS SCEs SEI 3

1992
RES = MSD + ED + SubSig

1993
Blue Book becomes RES SW Standard

1994

1995
GP&P on SW Dev issued

1996

1997
RSC = RES + Esys + TI + HAC

1998
SOIs released

19
GP&P obsolete. "Blue Book becomes standard

2000
ATMS supported by SWEC, PDC,PE and SEC Engineering Center

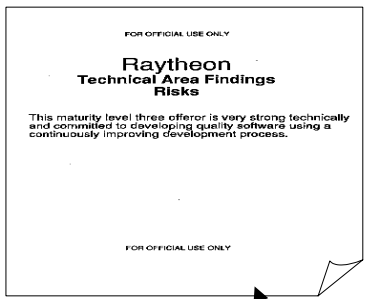
2001
CMM L3

2002
CMM L4&5

2003
CMMI L5 SW

CMMI L3 SE

1995 IEEE Award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Technical Area Findings
Risks

This maturity level three offeror is very strong technically and committed to developing quality software using a continuously improving development process.

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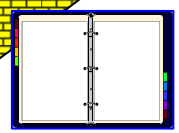
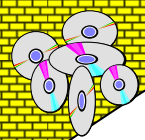
NASM SEI 3 SCE

1995 ISO9001 Certified SW Process





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Goal Evolution

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- 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!

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CMM Level 3 Approach

Minding Your Own Business

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Didn't Know It Was Coming

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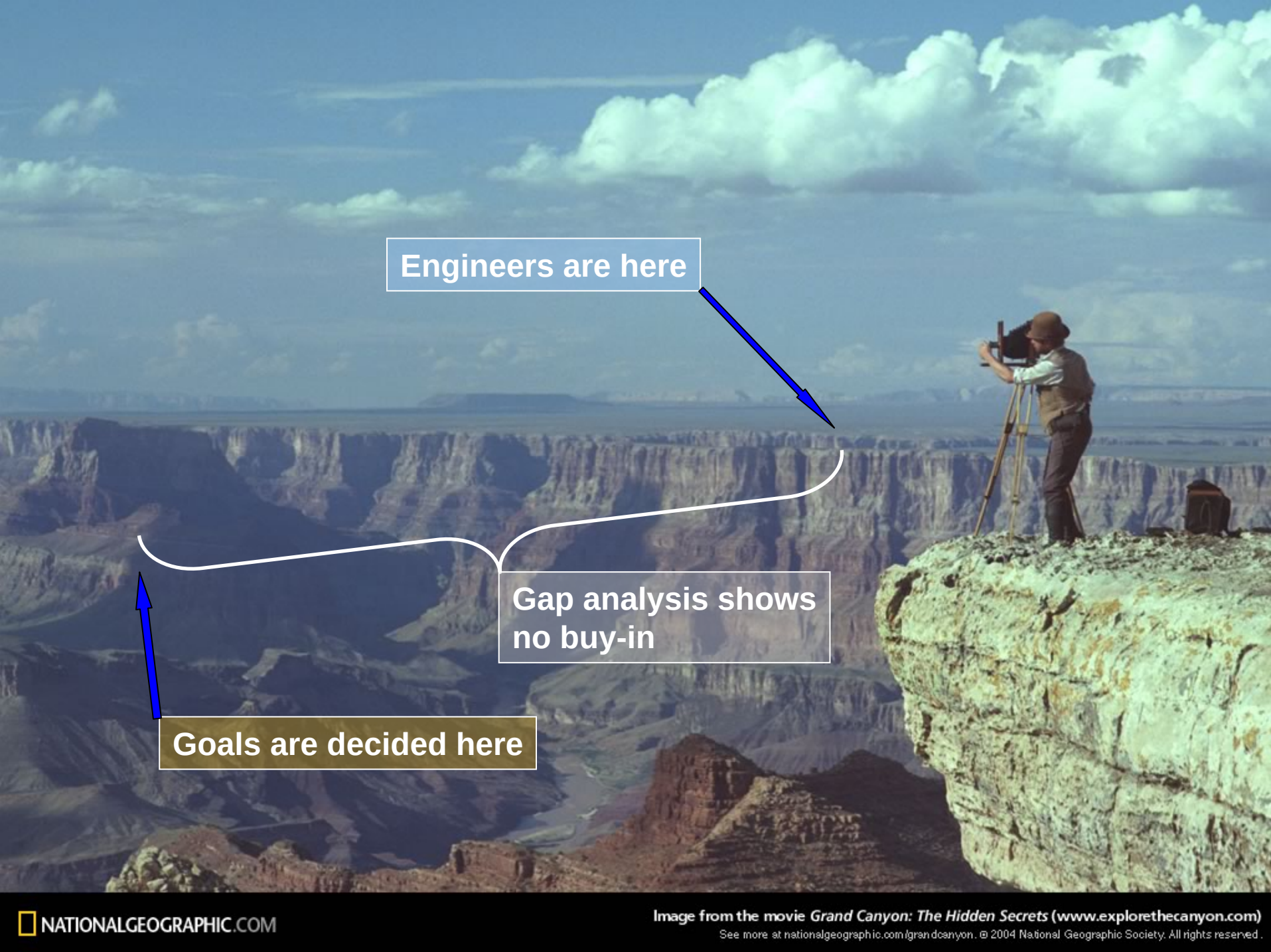

Results / Behaviors

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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

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CMM Level 5 Approach

No Longer Alone

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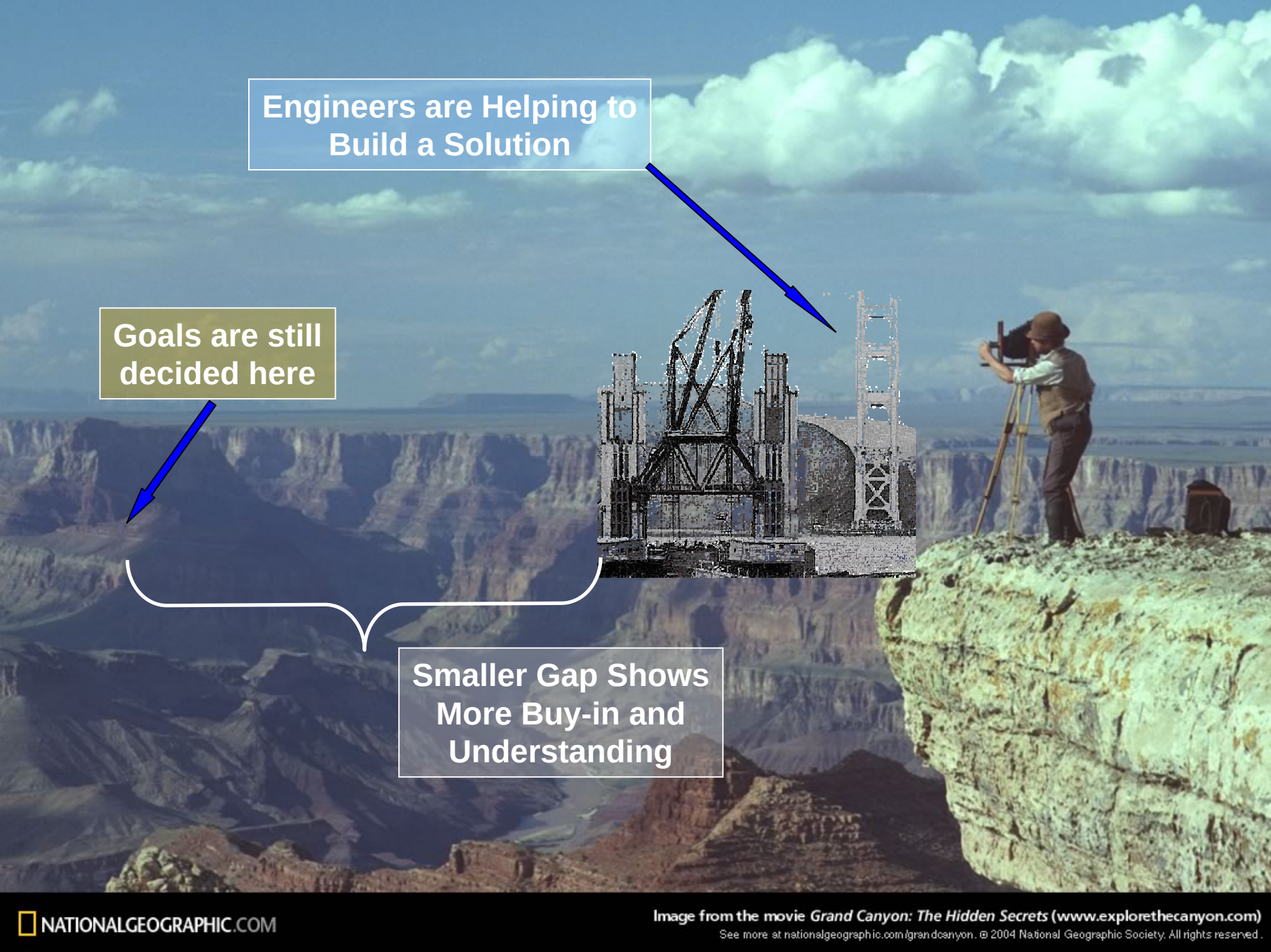

Results / Behaviors

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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 it they are not involved

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CMMI Level 5 Approach

Evolved Approach

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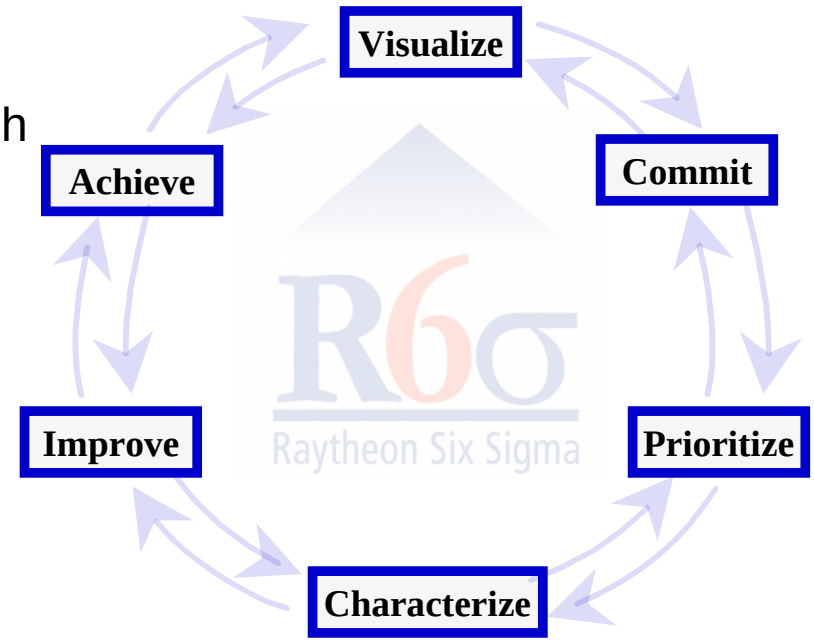
- Understand external goals
  - Understand company goals
  - Understand engineering goals
- Involve stakeholders in determining approach
- Set organizational goals
  - Define goal
  - Define behavior
  - Establish measures
  - Define activities to support the goals
  - Identify a champion for each activity
  - Establish roadmap for everyone
- Showed clear sponsorship



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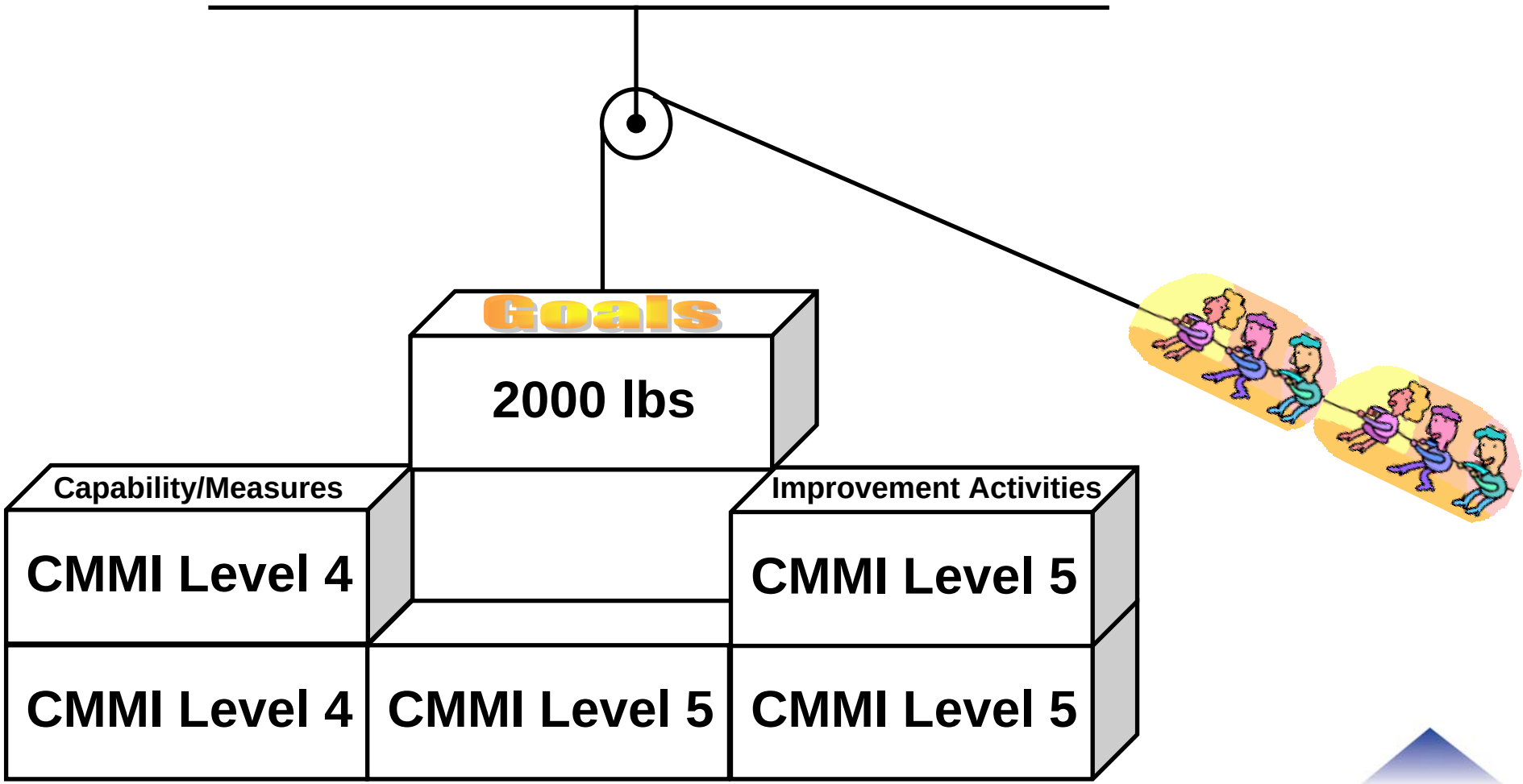

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Everyone Is On Board
No More Gaps – Everyone is Involved in the Process
High- level Goals are still decided here
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Results / Behaviors

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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

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2004 Goals – Examples

Raytheon High-level Goals

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2004 Organizational Goals

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- 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

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Alignment with Raytheon Goals

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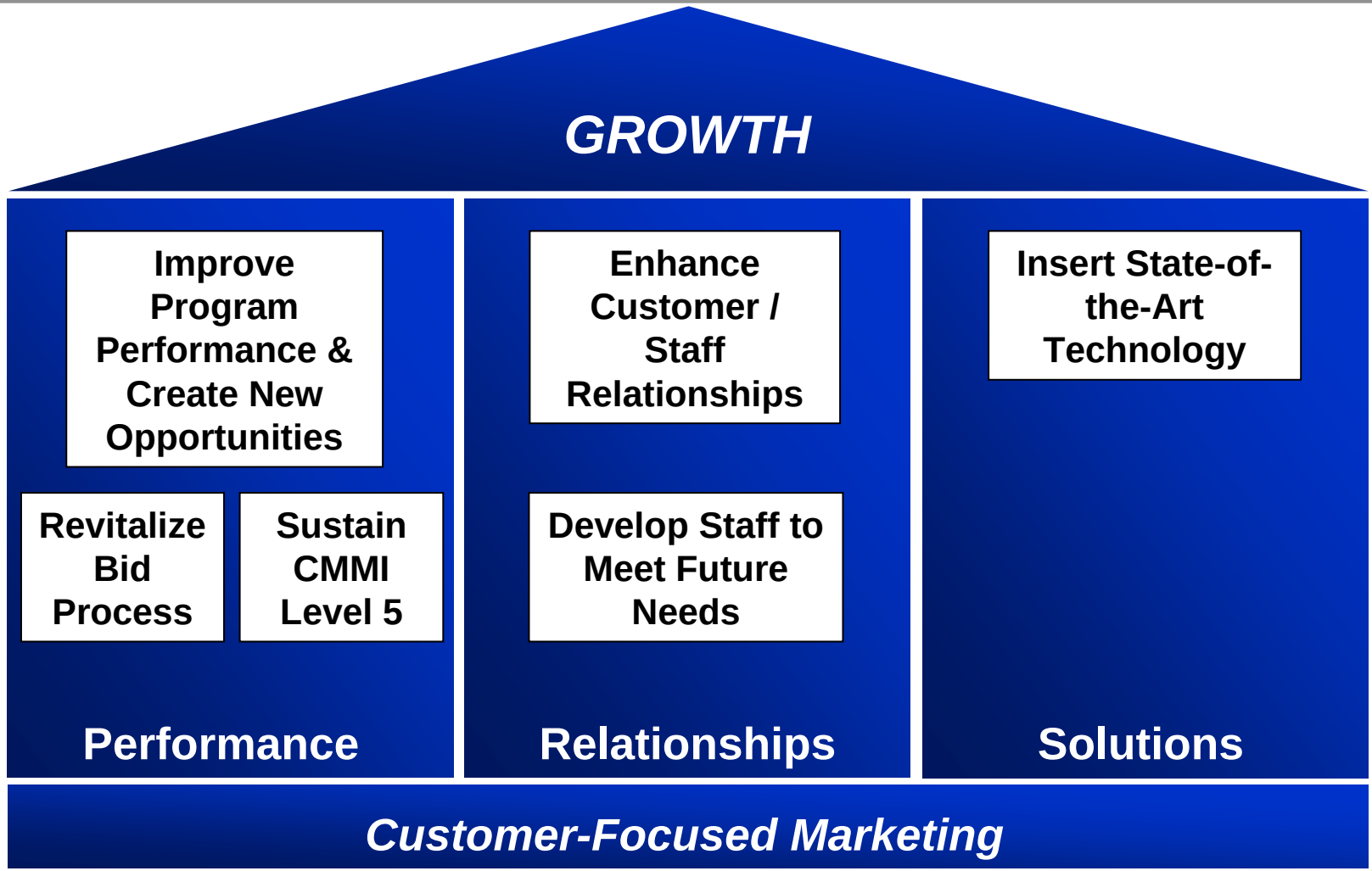

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Goal – Example 1
Continue Performance Improvements

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- 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

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Goal - Example 2
Evolve CMMI Level 5 Capabilities

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- 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

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2004 Overall Accomplishments

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- 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

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Summary

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- 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

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- 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

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Contact Information

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Biography

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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.

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