RAH-66 Comanche

Comanche Process Improvement Vision and Initiatives

26 JAN 04

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Contents

• Purpose
  – To describe the Comanche Process Improvement (PI) vision, activities and status

• Outline
  – Comanche Program Overview
  – Process Improvement Approach & Schedule
  – Process Improvement Status and Path Ahead
  – Summary
## Comanche Software Source Lines of Code (SLOCs)

<table>
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<tr>
<th>Category</th>
<th>SLOC (K)</th>
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<td>Support</td>
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<tr>
<td>Integration</td>
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### AIR VEHICLE SLOC COMPARISON

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<td>2400</td>
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<td>F-22</td>
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<td>JSF</td>
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**1,451K SLOC reused from LBA, F-22 & Others**

Data current as JUN 02
Data from CARD

26 JAN 04
Comanche Software Growth
Cumulative Software

<table>
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<th>Month</th>
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<td>Apr 04</td>
<td>1,160,809</td>
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<tr>
<td>Aug 04</td>
<td>1,173,885</td>
</tr>
<tr>
<td>Jan 05</td>
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<td>Mar 05</td>
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<td>Jun 06</td>
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<td>Jun 07</td>
<td>3,506,330</td>
</tr>
<tr>
<td>Apr 08</td>
<td>4,249,334</td>
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</table>

TOTAL 1,088,840 1,160,809 1,173,885 1,361,728 1,860,962 2,820,917 3,506,330 3,593,380 4,249,334

Data current as JUN 02
Data from CARD

26 JAN 04
# Comanche Program Schedule

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<th>FY 04</th>
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</table>

## Block I Development
- A/C 3-6
- A/C 7
- A/C 8-11

## Block II Development

## Block III Development

#### Initial Process Improvement
- Level 3

#### Continuous Process Improvement
Process Improvement History

• 2002: In response to various independent program assessments, Comanche PM launches a process improvement initiative focusing on acquisition processes
  Independent Assessments
  – Identified lack of Systems Engineering as a program weakness
  – Identified acquisition process as a target for improvement
  – Recommended review of contractor processes by Software Engineering Institute (SEI)

• 2003: ASA (ALT) launches the Army Strategic Software Improvement Program

• 2003: OSD improvement initiatives mandated by the Bob Stump National Defense Authorization Act for Fiscal Year 2003, Sec. 804. for Improvement of Software Acquisition Processes

Our challenge:

*Find a way to improve acquisition processes, meet requirements and minimize impact to the Comanche PMs while answering the mail at Army, OSD and Comanche (internal) levels*
How Comanche PI Fits into the Process Improvement Environment

Comanche PI
- All Product Offices
- Focus on System
- Model Based Improvement
- Goal SA-CMM Level 3

ASSIP
- All Army Programs
- Focus on Software
- Benchmark for Improvement

Section 804
- All DoD Programs
- Focus on Software
- Policy

Comanche PI Complies with ASSIP
ASSIP Complies with Section 804

26 JAN 04
Why Are We Doing This?

Improving Comanche Acquisition Processes will:

• Instill Discipline Into Acquisition Processes
• Capture Comanche Best Practice Expertise Before It’s Gone
• Enhance Internal And External Communication
• Maximize Efficient Use Of Constrained Resources
• Expand The Scope Of Risk Management Efforts
• Achieve Predictable Project Cost And Schedules
• Reduce Project Cost And Schedule Variances
• Comply With Section 804

Bottom Line
Process Improvement Makes Good Business Sense
Comanche Removes Steps from the Traditional Strategy

Level 1

Each Project Develops from Scratch

PI Team Identifies

Gaps

Step 1
Organization Closes Gaps; Re-Analyzes Status

Step 2
Organization Validates Projects

Step 3
Deploy Across Organization; Each Project Tailors

Level 2 & 3

Organization Assessed

Best

Organization Process Asset Library

Organizational Process Assets are used as a Force Multiplier

PI Team Analyzes

Each Project Assessed

Existing Assets

Policies
Practices
Processes
Procedures

Project-Unique Assets are not Developed Up-Front

Existing Assets

Policies
Practices
Processes
Procedures

Standard Acquisition

Policies
Practices
Processes
Procedures

Organization Maintains
Comanche Process Improvement
Strategy Details

• The Systems Engineering Division owns process improvement
• SEI Capability Maturity Models (CMM) provide framework for Process Improvement
  – Software Acquisition CMM (SA-CMM) Level 2 & 3 key process areas provide organizational framework
  – Relevant Systems Engineering CMM (SE-CMM) practices and existing Comanche practices are mapped into SA-CMM framework key process areas
• Comanche Process Improvement is a “Do-It-Yourself” Effort
  – Comanche Personnel are involved in every step
  – Software Engineering Institute (SEI) and AMRDEC Software Engineering Directorate (SED) provide consulting services
  – ASSIP benchmark data/recommendations are integrated into the Comanche process improvement effort
The Comanche PMO will base their process improvement effort on the Capability Maturity Model Integration (CMMI - Systems Engineering) and the Software Acquisition (SA-CMM) process improvement frameworks ... we are going to shoot for a Level III assessment by December 2004.
Comanche Operational Approach to Acquisition Improvement

Establish sponsorship
- Communicate results

Establish vision and scope
- Communicate results

Develop a plan
- Communicate results

Perform gap Analysis
- Communicate results

Conduct process data gathering
- Communicate results

Build a model of the process
- Communicate results

Develop the new processes
- Communicate results

Pilot the new processes
- Communicate results

Rollout the new processes
- Communicate results

Conduct mini evaluation
- Communicate results

Shaded Tasks with a Check Mark are Complete, and without are In-Progress
Clear Tasks are not begun
Fact-Finding Methodology

• **Context Analysis (Quick Look)**
  – Interviewed selected managers
  – Identified Level 2 & 3 KPAs that are
    • Likely to rate as Satisfied
    • May rate as Satisfied
    • Likely to rate as Unsatisfied

• **Gap Analysis (Deeper Look)**
  – Each Level 2 and Level 3 KPA briefed to Acquisition Improvement Group (AIG) over 3 full days
  – Open Discussions of each KPA leading to a real-time rating by AIG for each commitment, ability, activity, and measurement
  – Data review to estimate rating that would be received during an assessment
    • **Satisfied (Green)** - effective implementation of one or more practices
    • **Partially Satisfied (Yellow)** - a partial implementation of one or more practices
    • **Not Satisfied (Red)** - an ineffective implementation of an applicable practice or failure to implement an acceptable alternative.
SA-CMM Gap Analysis Stop Light
as of 18 DEC 03

Documented Organizational Policies

Adherence to Documented PROJECT Plans

Measurement and Verification of PROJECT

Documentation and Artifacts are needed across the board

Measurement is an integral part of moving to Level 3

Gray boxes do not appear in model
Gap Analysis Summary
Recommendations/Next Steps

• Organizational Policy
  – Continue to maintain senior level commitment and sponsorship of process improvement down to project level (e.g., senior verification)
  – Develop and promulgate policies ASAP

• Project Planning and Documentation
  – Develop and Improve artifacts Directives, Process Descriptions, Procedures to be applicable to model
  – Develop and implement repository and start collecting data ASAP
  – Provide reviews of all projects for quality, consistency, adherence to procedures/templates (to include IPTs), and “can they be used to manage the project”

• Measurement & Verification
  – Measure PI progress and operational improvement
  – Measure and verify management of projects – critical to PI success

• Paradigm Shift
  – Improve the culture to one that understands the concepts of internal management for all projects as opposed to contractor management
Our goal is to reach CMM Level 3 by DEC ‘04

1QFY05

Level 3

Work the plan!

1QFY04

How do we get there? (develop a plan)

3QFY03

Where are we? (survey the facts; perform a benchmark)

Blue, Bold & Italic Font Indicates Completed Milestones

26 MAR 04: Policies, Processes & Procedures
26 MAR 04: Roles & Responsibilities
21 MAY 04: Assessment Plan
09 JUN 04: Pre-Assessment
23 JUN 04: Corrective Action Plan

23 FEB 03: Initial Schedule
18 JUN 03: Strategic Plan
30 JUN 03: Update Schedule
09 JUL 03: Process Improvement Plan
11 JUL 03: Stand Up MSG/AIG
14 NOV 03: SA/SE Tailored CMM Framework

23 MAR 03: Executive Kick-off
02 MAY 03: PEO Letter
06 MAY 03: Climate Survey
22 MAY 03: Executive Interviews
Late JUL 03: ASSIP Bench Mark
12 DEC 03: CMM Gap Analysis
Summary

Comanche is:

- Developing the most SW intensive Army Aviation System

The Comanche Process Improvement Effort is:

- Using proven SEI capability maturity models
- Ongoing according to plan and schedule
- Complying with Section 804 and ASSIP