Ogden Air Logistics Center

The Next Step in Process Evolution: CMMI and TSP/PSP

The Software Maintenance Group
Hill Air Force Base, Utah

Panel Member: David R. Webb
About the Software Group
At Hill Air Force Base

- Large Cadre of Talented People:
  - 820 + Personnel
  - Average over 10 years technical experience
  - Growing by ~50 PEs/Year

[Diagram showing the breakdown of personnel: 73% Engineers/Computer Scientists, 9% Configuration Management, 9% Technicians, 2% Administration, 7% Support Staff]
Hill & CMM / CMMI

O G D E N A I R

Began CMM Initiative

Assessed CMM Level 2

Assessed CMM Level 3

Assessed CMM Level 5

Began CMMI Initiative

CMM Level 4

First in DoD!

Also AS9100 Registered!


NDIA CMMI 2009

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OGDEN AIR

Assessed CMMI Level 5
TSP Projects at Hill – 1

■ TaskView (Since 1997)
  ■ Air Tasking Order Parser
  ■ Used TSP since inception
  ■ Was a focus project for the 1998 SW-CMM CBA-IPI

■ Ground Theater Air Control System (GTACS – 2001)
  ■ Air Force Control Reporting Center (CRC)
  ■ Began using TSP to address quality issues
  ■ Was a focus project for the 2006 SCAMPI A

■ Expeditionary Fighting Vehicle (EFV – 2006)
  ■ Amphibious “Tank” – Replaces AAV
  ■ Used TSP to “kick start” new team using High Maturity Practices
  ■ Planned as focus project for 2010 SCAMPI A
TSP Projects at Hill – 2

- Command and Control System – Consolidated (CCS-C 2009)
  - Developing documentation for the CCS-C program office
  - Preparing for IV&V and software sustainment roles
  - Used TSP to get team focused early
  - Did a non-software TSP launch with only team leader training
  - PSP training held later
  - Integrating SCRUM concepts with TSP:
    - Daily Stand-ups
    - Sprints (with launches/relaunches)
SEI’s TSP to CMMI Mapping – 1

TSP and CMMI Process Categories

Percentage of SPs

0% 25% 50% 75% 100%

Process Management Project Management Engineering Support

Process Category

Unrated Not Addressed Partially Addressed Supported Directly Addressed

Source: James McHale and Daniel S. Wall Mapping TSP to CMMI (CMU/SEI-2004-TR-014)
Hill TSP Tracking Tools

Hill Uses The Process Dashboard Tool to:

- support individuals and the team in using high-maturity processes for software development
- simplify the work involved in following a high-maturity process
- help individuals to follow a defined process and collect metrics data
- improve the accuracy of collected metrics
CMMI OPP and QMP Issues

- GTACS SCAMPI’s Discovered Weaknesses in OPP and QPM
  - GTACS data were not analyzed at the sub-process level
  - Data analyses did not address an understanding of process variability

- TSP Paradigm was Not Consistent with CMMI Expectations
  - TSP teams use data for three purposes:
   - project planning
   - project monitoring and oversight
   - process improvement
  - TSP fundamentally considers the software development process as a single entity
Hill Used TSP Data to Solve the Apparent Conflict

Run Chart - Forecast Task Completion with control limits

GTACS % Rework

Upper Control Limit (Historical)

Squadron % Rework Goal

Average (Historical)

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Other Level 4 TSP Implementations

- Expeditionary Fighting Vehicle
  - Used regression techniques on TSP-gathered data
  - Found a close correlation between SLOC and Task Hours, suitable for an estimating model
The Software Group at Hill Air Force Base Continues to Follow CMMI Level 5 Practices

TSP Has Been Used on Specific Projects Since 1998 with Great Success

Hill Has Found CMMI and TSP to be Strong Allies

Hill Has Used TSP to “Kick Start” CMMI High Maturity Teams

Additional TSP Scripts, Forms and Reports are Needed to Meet the Full Intent of the CMMI