Litton Guidance and Control Systems
Issues and Initiatives in Software Engineering Knowledge Acquisition and Management

Wayne Sebera
sebera@littongcs.com

Vice-President Engineering
Litton Guidance and Control Systems

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Less than 3% of federal contractors are certified to Level 4.0

Awarded to
Litton Guidance & Control Systems
in recognition for achieving the Software Capability Maturity of Level 4

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Mark R. Aftaya
Authorized Lead Assessor -- SEI #9400778-A
Overview

• Software engineering is a critical discipline along with systems engineering, equipment engineering and engineering automation

• Knowledge is managed in Centers of Excellence (COEs) that represent the disciplines. They focus on personnel, processes, tools and technologies. They provide process and some technical training

• Domain expertise is also captured in Business Area Teams that focus on specific product lines, and are provided resources by the COEs
Existing Knowledge Dissemination Vehicles

- GCS uses extensive web-based technology for communication of software process and domain knowledge
  - engineering intranet that serves all disciplines
  - secure “tunnels” with other Litton divisions across internet

- Prime example is an advanced Software Process Asset Library (PAL) on the Division intranet
  - greatly accelerates spread of software process information
  - includes on-line training
  - accessible to 100% of software development personnel and rest of Division
  - the PAL is now a model for other engineering disciplines
  - the PAL was instrumental in our achieving SEI CMM Level 4
Existing Knowledge
Dissemination Vehicles (cont.)

• In-house software process and technical training
  – includes periodic Software Process Improvement Seminars, email bulletins and directed continuing education for SEPG and software managers

• Litton Software Technology Management Conference

• Sharing of process assets between Litton divisions

• GCS University Program
  – several venues for continuing education

• Litton Fellowship Program
  – recognized experts spend 25% time mentoring
Current Initiatives

• Major thrust to develop and implement integrated maturity model across engineering disciplines
  – includes GCS-unique process areas

• Developing domain taxonomy on WinWin pilot
  – WinWin currently being applied on IRAD project
  – plan to phase in WinWin on larger projects

• Risk management
  – intend to capture domain-specific risk patterns
  – using Expert COCOMO and looking at other assistants

• System dynamics modeling to capture shared visions of processes ("systems thinking in the learning organization")
  – address long-term strategies as well as local process improvement
Needs

- Mechanisms to capture and use domain-specific knowledge (e.g. sensor technology, inertial navigation, IFF, system architecture) in addition to software engineering knowledge
  - leverage unique expertise from individuals
  - propagate knowledge and automate design decisions
- Managing interface between process providers (COEs) and product lines (BATs)
- Flexible education programs
  - distance learning very attractive
- Brokering of stakeholders from different communities (e.g. WinWin participants)