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TurboTax® for Systems Engineering

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NDIA Systems Engineering Conference, October 26, 2005

A banner with a blue background. On the left, there is a large, stylized yellow arrow pointing to the right. In the center, the words "Net-Centric Enterprise" are written in a bold, white, sans-serif font. On the right, there is a faint image of a soldier in a combat uniform and helmet, looking forward.

**Net-Centric
Enterprise**

Presentation Outline

- Introduction to SPAWAR Systems Center Charleston
- CMMI® and Project Plans
- TurboTax® style of application design
- ePlan Builder
- Summary



**Net-Centric
Enterprise**



Introduction to SPAWAR Systems Center Charleston (SSC-Charleston)

- **Where we fit**
- **What we do**
- **What we are known for**
- **Who we are**
- **Vision**

A horizontal banner with a dark blue background. On the left, there is a large, stylized yellow arrow pointing to the right. In the center, the words "Net-Centric Enterprise" are written in a large, white, sans-serif font. On the right, there is a faint, semi-transparent image of a soldier in a combat uniform and helmet, looking forward. The background also features some abstract, glowing lines and shapes, suggesting a network or data environment.

**Net-Centric
Enterprise**

SPAWAR



Systems Center
Charleston

Where We Fit

President

non-DoD

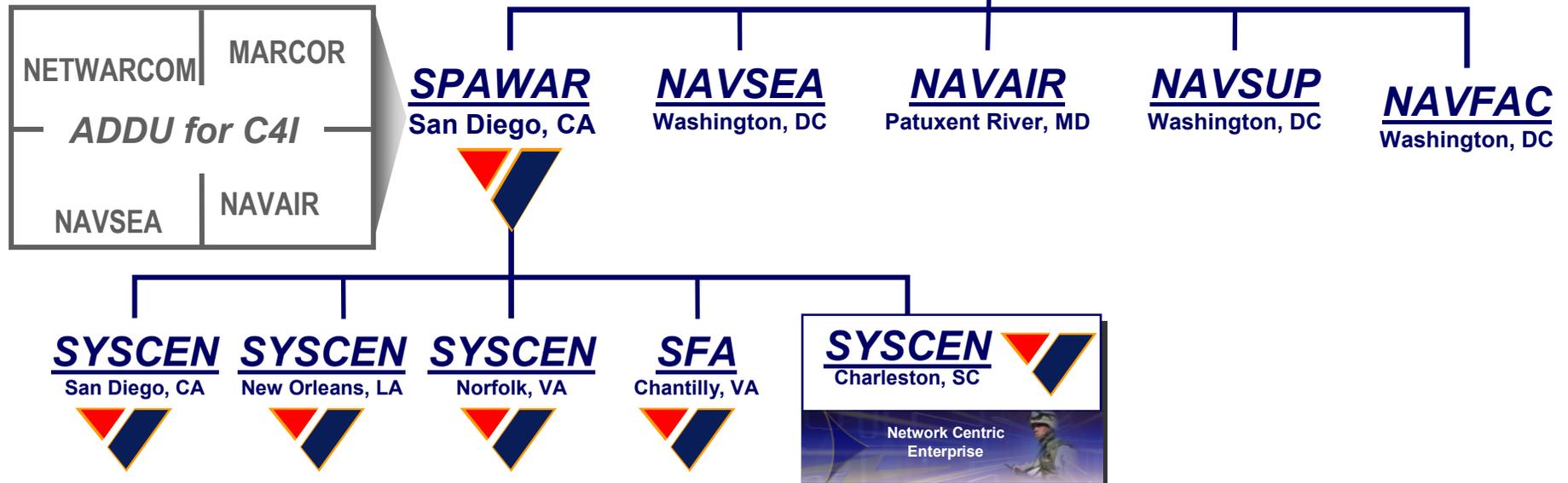
Secretary of Defense

Secretary of the Navy

Other DoD

CNO
Fleet Support

ASN (RDA)
Acquisition





C4ISR

Command
Control
Communications
Computers
Intelligence
Surveillance &
Reconnaissance

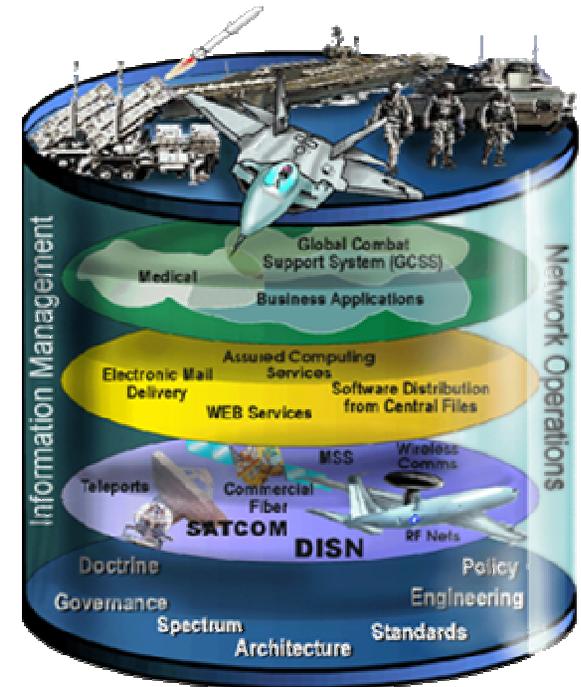
- *Modeling & Simulation*
- *Command & Control*
- *Navigation*
- *Physical & Computer Security*
- *Video Teleconferencing*
- *Information Assurance*
- *Sensors*
- *Communications*
- *Cryptologic & Intelligence*
- *Image Processing*
- *Meteorology*
- *Air Traffic Control*



Systems Center
Charleston

What We're Known For

- **Developer of FORCEnet joint collaborative assessment tools** that promote netCentric interoperability and reduce system redundancy
- **Principal SPAWAR provider for Joint and Homeland Security C4I solutions** in a responsive manner.
- **Navy's most efficient provider of critical engineering** and acquisition expertise for Navy/Joint commands and other federal agencies
- **Rapid integrator and deployer of interoperable technologies** to the Navy, Federal Government, and Joint Warfighter
- **Developer and employer of life-cycle logistic support solutions** in a web-enabled portal environment



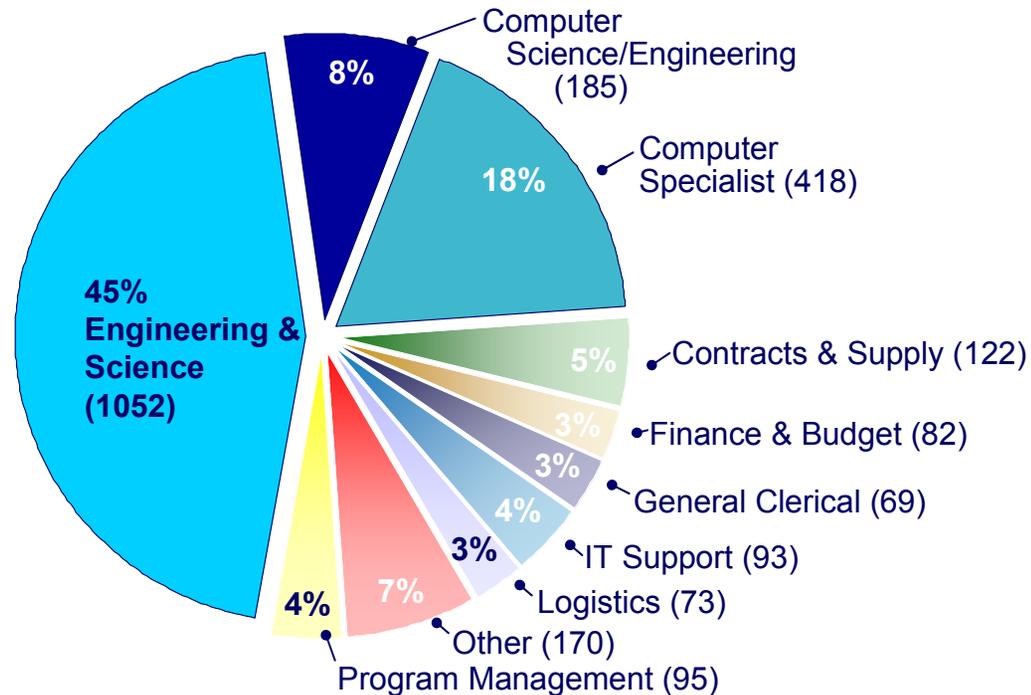


Systems Center
Charleston

Who We Are

A Large Systems & Software Engineering Organization

Over 70% of workforce is in an engineering or computer-related discipline



- The effective and efficient solutions to the global war on terror developed by SPAWAR result from good systems and software engineering.
- Systems engineering is our core competency.
- Total workforce of ~ 2300 employees.



- **Vision**

- Develop and maintain a World Class Systems Engineering Organization

- **Approach**

- Achieve Command-wide operational consistency
- Based on ISO 15288 – systems engineering
- Based on ISO 12207 – software engineering
- Measure using best practices of CMMI®

- **Benefits**

- Facilitates sharing of tools, documentation, templates, and other artifacts needed by project engineers
- Project Engineers will implement projects quicker; with improved monitoring, effectiveness, quality and efficiency

“Engineering is the key to our survival. Look to the future.”

James Ward, Executive Director, SSC Charleston

CMMI[®] and Project Plans

- CMMI[®] Planning of a Project
- Documentation Pitfalls



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- **Significant emphasis in CMMI® best practices on Planning**
 - Plan the Planning
 - Plan the Process
 - Integrate and Maintain the Plans
 - Manage the Project using the Plans
- **Projects have numerous plans**
 - Project Mgmt Plan, Systems Engineering Plan, Software Development Plan, CM, QA, Supplier Mgmt Plan, Test, Verification, Validation, Install, Support ...

“Let our advance worrying become advance thinking and planning.”

Winston Churchill



- **Generating from scratch**
 - Author specific
 - What did I forget?
 - Time – “Re-inventing the wheel”
- **Copy from “good” example**
 - Is it good?
 - Cut and Paste errors – old project data
 - What did they forget or intentionally leave out?
 - Is my project really the same?
- **Document Outlines/Templates**
 - May provide just placeholders; not provide explanation
 - Must contain all possible sections; don’t handle branching
 - No validation
- **General issues with all above alternatives**
 - Consistency from Plan to Plan
 - Formatting
 - What belongs in this section?

TurboTax[®] style of application design

- TurboTax[®] Usability
- Application as a Document Builder



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- **TurboTax[®] (and other income tax software)**
 - Simplifies the process for completing income tax returns
 - Uses an “interview” format with the user to collect information
 - Provides common defaults (that can be changed)
 - Branches to necessary sections based on input collected; skips unnecessary sections
 - Information entered once, but used in several places
 - Validates information for gaps and inconsistencies
 - Provides page/field specific help text
 - Automatically generates final forms



Apply Concept to Building Plans

- **Collect common project information once**
 - Ensures consistency from plan to plan
- **Acts as on-line template**
 - Ask questions, give choices, prompt for input
 - Application logic ensures full coverage of required sections (from standard process manuals)
 - Logic permits skipping / branching as appropriate
 - Provide on-line, section sensitive help
- **Standard content can be included in all plans**
- **Automatically generate initial draft of plan**

ePlan Builder

- **Functionality/Capabilities**
- **Application in Action**
- **Technical Specifications**

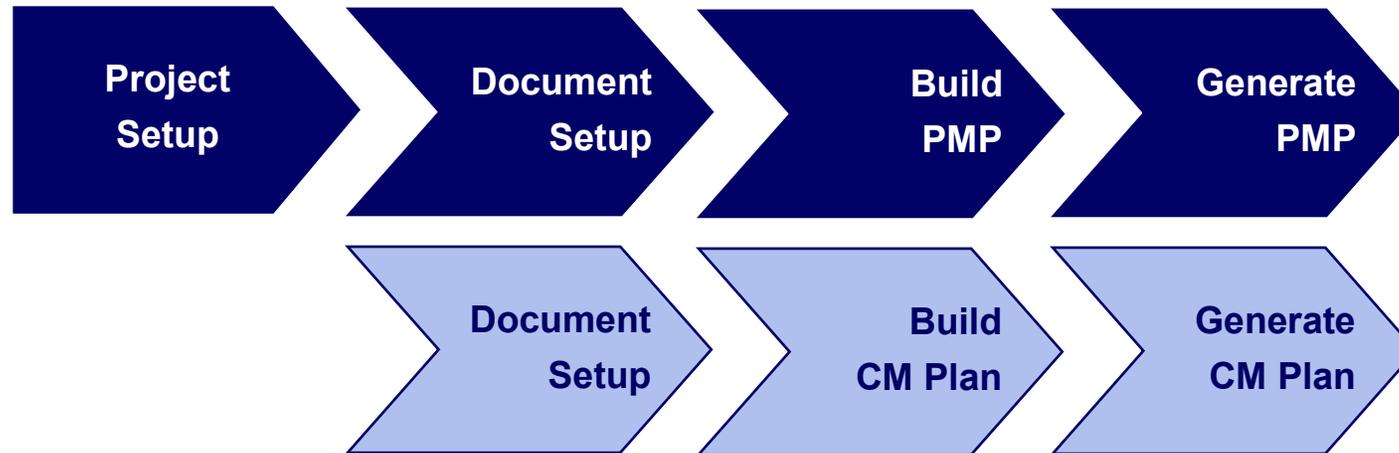


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Enterprise**



- **Currently builds CMMI[®]-compliant (Maturity Level 3)**
 - Project Management Plan
 - Configuration Management Plan
 - Product and Process Quality Assurance Plan
 - Requirements Management Plan
 - Measurement and Analysis Plan
- **Generates plan in Rich Text Format (rtf)**
 - For further editing and updating
- **Can generate plan-specific standard lists for:**
 - Definitions
 - Acronyms
 - References
 - Roles/Responsibilities

***Project-specific content
can also be added to
these sections***



- **Generally, the Project Management Plan (PMP) would be built first**
- **Subsequent plans can then be built, using the same project setup information**

The screenshot displays the ePlan Builder web application interface. At the top left is the SPAWAR logo and the text "Space and Naval Warfare Systems Center Charleston". The main header area contains the "ePlan Builder" title and "Electronic CMMI® Compliant Documentation Application". A navigation bar includes "Save", "Quit", and "Help" buttons, and a breadcrumb trail: "Home" → "Project Setup" → "Document Setup" → "Build" → "Generate".

The left sidebar is titled "SPiRiT Anti-Gravitational Conveyance" and contains a tree view with the following items:

- PROJECT SETUP
 - Project Setup
 - Organization Setup
 - Project Information (highlighted with a yellow box and an arrow)
 - Project Roles
 - Master Project References
- DOCUMENT SETUP

Below the sidebar is a "Contact" section for "DEMONSTRATION v2.0" by Clay Blackwelder, ePlan Builder Administrator, with links for "Technical Support", "Email Administrator", and "Back to CorpWeb".

The main content area is titled "Project Information" and contains the following text and form elements:

This section will allow you to enter project information. The information entered here, while not included within the generated documents does have a bearing on the text and options for a given document.

Please select the Project Type.

Product
 Service

Please select the Product Type.

Software
 Hardware

Please select the project effort.

Service

Please enter a project description.

the SPiRiT AGC is an anti-gravity, high-speed conveyance engine designed to be put into different types of conveyances to transport passengers over great distances in a very short

One of 5 sections for Project Setup

Space and
Naval Warfare
Systems Center
Charleston

ePlan Builder

Electronic CMMI[®] Compliant Documentation Application

Save Quit Help
Sponsored by the Director of Engineering Operations (O9K) - Michael Kutch

Home →
 Project Setup →
 Document Setup →
 Build →
 Generate ✓

SPIRIT Anti-Gravitational Conveyance

PROJECT SETUP
Project Setup
Organization Setup
Project Information
Project Roles
Master Project References

DOCUMENT SETUP

Contact

DEMONSTRATION v2.0
Clay Blackwelder
ePlan Builder Administrator

[Technical Support](#)

[Email Administrator](#)

[Back to CorpWeb](#)

Project Roles

The project has primary personnel that comprise the Management, Development and Testing team. Please enter the following roles for this project.

External Stakeholders:

Please enter the code and name of the Program Sponsor
Code: Name:

Please enter the code and name of the Program Manager
Code: Name:

Please enter the code and name of the Primary Requirements Provider
Code: Name:

Please enter the code and name of the CCB Chairman
Code: Name:

Please enter the code and name of the Senior Manager
Code: Name:

Required Project Roles

Please enter the code and name of the Project Leader
Code: Name:

Project data is common to all plans under that project

ePB – Select Tasks for each Role

ePlan Builder

Electronic CMMI® Compliant Documentation Application

Save Quit Help

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Home Project Setup Document Setup Build Generate

PMP

SPiRiT Anti-Gravitational Conveyance

PROJECT SETUP

DOCUMENT SETUP

DESCRIPTION

ORGANIZATION

Organization

Organization Chart

Program Manager Tasks

Project Leader Tasks

Systems Engineering Tasks

Security Engineering Tasks

Software Engineering Tasks

Test Engineering Tasks

Configuration Manager Tasks

Quality

Tailor each role from pre-defined list of tasks and/or add custom tasks

Project Leader Tasks

The Project Leader is responsible for establishing and maintaining the project plan.

Please identify the specific responsibilities of the Project Leader.

- Coordinates all activities of the prime contractor and subcontractors
- Assigns specific responsibilities to subcontractors [PP GP 2.4]
- Discusses technical issues from the Government with subcontractors
- Discusses technical issues from the subcontractors with the Government
- Manages the project cost and schedule [PMC 1.1]
- Resolves any inconsistencies in the requirements [PMC 2.2]
- Mitigates project risks [PMC 1.3]
- Manage and resolve corrective actions [PMC 2.2] [PMC 2.3]
- Provides prime contractor and subcontractor work products and deliverables to the Government

Note mapping to CMMI® generic and specific practices

Please enter any additional specific responsibilities of the Project Leader.

Task



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Work Breakdown Structure (WBS) in a Project Management Plan

SPAWAR Space and Naval Warfare Systems Center Charleston

ePlan Builder

Electronic CMMI[®] Compliant Documentation Application

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Save Quit Help

Home → Project Setup → Document Setup → Build → Generate

PMP

- SPIRIT Anti-Gravitational Conveyance
- PROJECT SETUP
- DOCUMENT SETUP
- DESCRIPTION
- ORGANIZATION
- WBS

WBS

[Click for more information about WBS](#)

This page allows you to select activities from the Work Breakdown Structure (WBS) at a high level, and enter estimated costs at the lowest levels selected. These estimates will constitute the budget for SPIRIT Support. The estimates are to be expressed in thousands of dollars (1000 = \$1,000 K = \$1,000,000).

Cost estimates entered using SPAWAR standard WBS

Activity	2006 (K)
1.0 DIRECT COSTS	<input type="text"/> K
2.0 INDIRECT COSTS	<input type="text"/> K
3.0 OPERATIONS AND MAINTENANCE SUPPORT	<input type="text"/> K
4.0 DEMILITARIZATION AND DISPOSAL	<input type="text"/> K
5.0 WITHHOLDS (EXTERNAL AND INTERNAL)	<input type="text"/> K

ePB accommodates multi-year projects

Contact: DEMONSTRATION v2.0, Clay Blackwelder, ePlan Builder Administrator

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Naval Warfare
Systems Center
Charleston

ePlan Builder

Electronic CMMI® Compliant Documentation Application

Save Quit Help Sponsored by the Director of Engineering Operations (O9K) - Michael Kutch

Home Project Setup Document Setup Build Generate

PMP

SPIRIT Anti-Gravitational Conveyance

- PROJECT SETUP
- DOCUMENT SETUP
- DESCRIPTION
- ORGANIZATION
- WBS
- ACTIVITIES
- SCHEDULE
- PROJECT FUNDING
- RISKS
- COMPLIANCE

WBS

[Click for more information about WBS](#)

This page allows you to select activities from the Work Breakdown Structure (WBS) at a high level, and enter estimated costs at the lowest levels selected. These estimates will constitute the budget for SPIRIT Support. The estimates are to be expressed in thousands of dollars (1000 = \$1,000 K = \$1,000,000).

Add Previous Fiscal Year Add Fiscal Year

1.0 DIRECT COSTS		2006	
1.1 PRIME MISSION PRODUCT (HARDWARE AND/OR SOFTWARE)		2006	2006
1.1.1 PRIME MISSION PRODUCT - HARDWARE	2006	<input type="text"/>	<input type="text"/>
1.1.2 PRIME MISSION PRODUCT - SOFTWARE	2006	<input type="text"/>	<input type="text"/>
1.1.3 PRIME MISSION PRODUCT - INTEGRATION, ASSEMBLY & TEST PRODUCT	2006	<input type="text"/>	<input type="text"/>
1.1.4 PRIME MISSION PRODUCT - PURCHASED SERVICES	2006	<input type="text"/>	<input type="text"/>
1.2 PLATFORM/SITE INTEGRATION	2006	<input type="text"/>	<input type="text"/>
1.3 PROGRAM MANAGEMENT	2006	<input type="text"/>	<input type="text"/>

Can drill down three levels deep in WBS structure. Costs sum up to higher level.



- **Project Schedules**

- Import from .csv file (or Excel, Project export)
- Embed graphic/image of project schedule
- Build manually

- **Include graphics, charts, tables**

- Import organization chart
- Process diagrams

- **Measurement and Analysis**

- Define reporting plans and reporting schedule

- **CMMI[®] Mapping as Appendix**

- Denotes section of plan that maps to CMMI[®] specific and generic practices



- **Architecture**

- Web-based application, with supporting database
 - MS SQL Server® 2000 Relational Database Management System (RDBMS)
- Web architecture: Active Server Page, MS .NET Framework® 1.1 (ASP.NET)
- Programming Language: MS Visual Basic® .NET (VB.NET)
- Scripting Language: HTML, Javascript
- Master Page engine that uses only one Active Server Page (ASP) that dynamically retrieves required information (questions, client answers, document template text, etc.)

- **Development - Incremental life cycle model**

Summary

- Results
- Going Forward



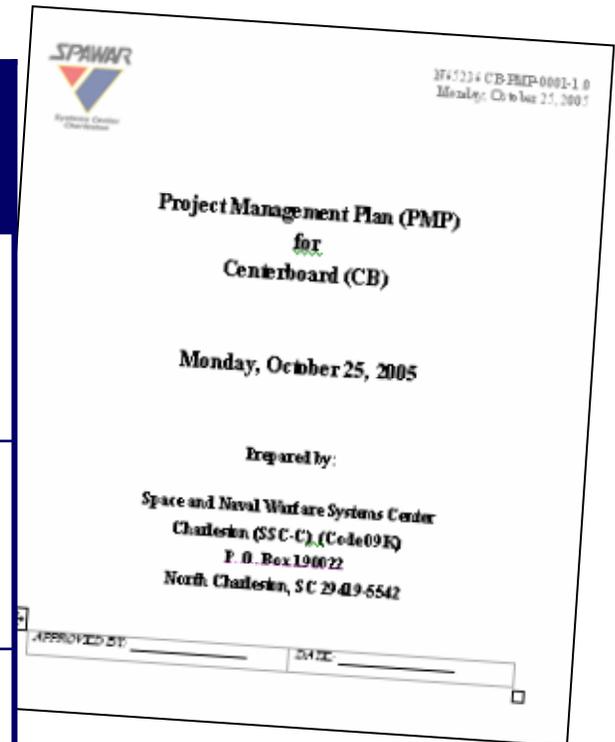
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Plans Generated By ePB

Plan Name	# Generated since May
Project Management Plan	40
Process & Product Quality Assurance Plan	11
Configuration Management Plan	9
Requirements Management Plan	5





- **Increase usage of tool across departments/projects**
- **Add additional plans to application**
 - Systems Engineering Plan (SEP)
 - Software Development Plan (SDP)
 - Supplier Agreement Management Plan (SAMP)
- **Apply lessons learned to modify existing plans**
 - As organization matures and processes improve
 - New plan templates can be created as regular word document that can be reviewed/approved before coding
- **Can be applied to other organizational documents**



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Summary – ePB is just one tool in our process improvement efforts

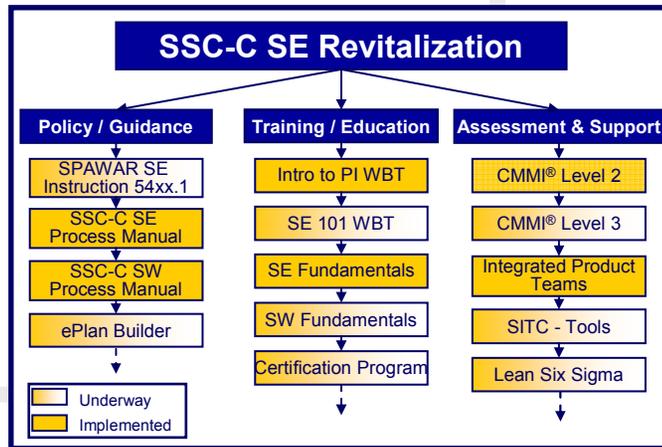
Aggressive SE Program

Industry Standards

- Systems Engineering (SE)
- Software Engineering (SW)

Best Practices

- CMMI®
- ISO 9001
- Lean Six Sigma

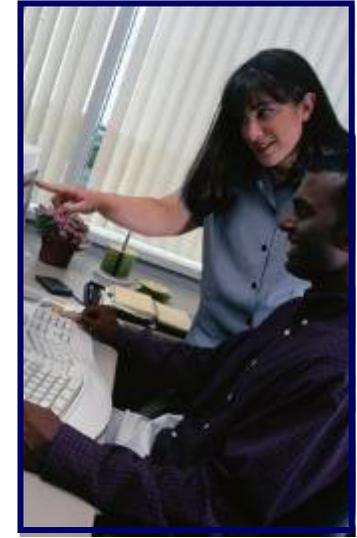


Training – 1,300 people*

Systems Engineering Fundamentals - 180

Intro to SSC-C PI

- CMMI® Level 2 Processes
- CMMI® Level 3 Processes
- SE/SW Engineering Workshops
- Web-Based Training (WBT) for Process Improvement



*includes industry partners

Successes

- Command Achieved CMMI® Maturity Level 2 in April 2005
- 1st SPAWAR Systems Center to Achieve CMMI® Maturity Level 2



Plans

- World Class Systems Engineering
- Support Command Balanced Scorecard
- April 2007 CMMI® Maturity Level 3





Thank you !

Any Questions ?

Contact Information:

Michael T. Kutch, Jr
SPAWAR Systems Center Charleston
michael.kutch@navy.mil
(843) 218-5706

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