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Systems Center
ATLANTIC

Sustainment and Continued Institutionalization of Best Practices and CMMI® at SPAWAR

Mike Knox
Technical Software Services, Inc. (TECHSOFT)
Director, Engineering Process Services

For

Michael T. Kutch, Jr
SPAWAR Systems Center Atlantic
Head, ISR/IO/IA & Cyber

NDIA CMMI Technology Conference – Nov 16-19, 2009

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Presentation Outline

- Intro to SPAWAR
- SPAWAR Systems Center Atlantic CMMI® History
- Post ML3 – Now What ?
- Sustainment & Institutionalization
- Multiple Methods
- 2010 and Beyond
- Lessons Learned

Space and Naval Warfare Systems Command
Intro to SPAWAR – Who We Are

- Navy's Technical Authority and acquisition command for C4ISR*, business IT, and space systems
- Provide quality full-service systems engineering and acquisition to rapidly deploy capabilities to the Warfighter
- More than 12,000 employees and contractors deployed globally and near the fleet
- $9.869B Organization

*Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance

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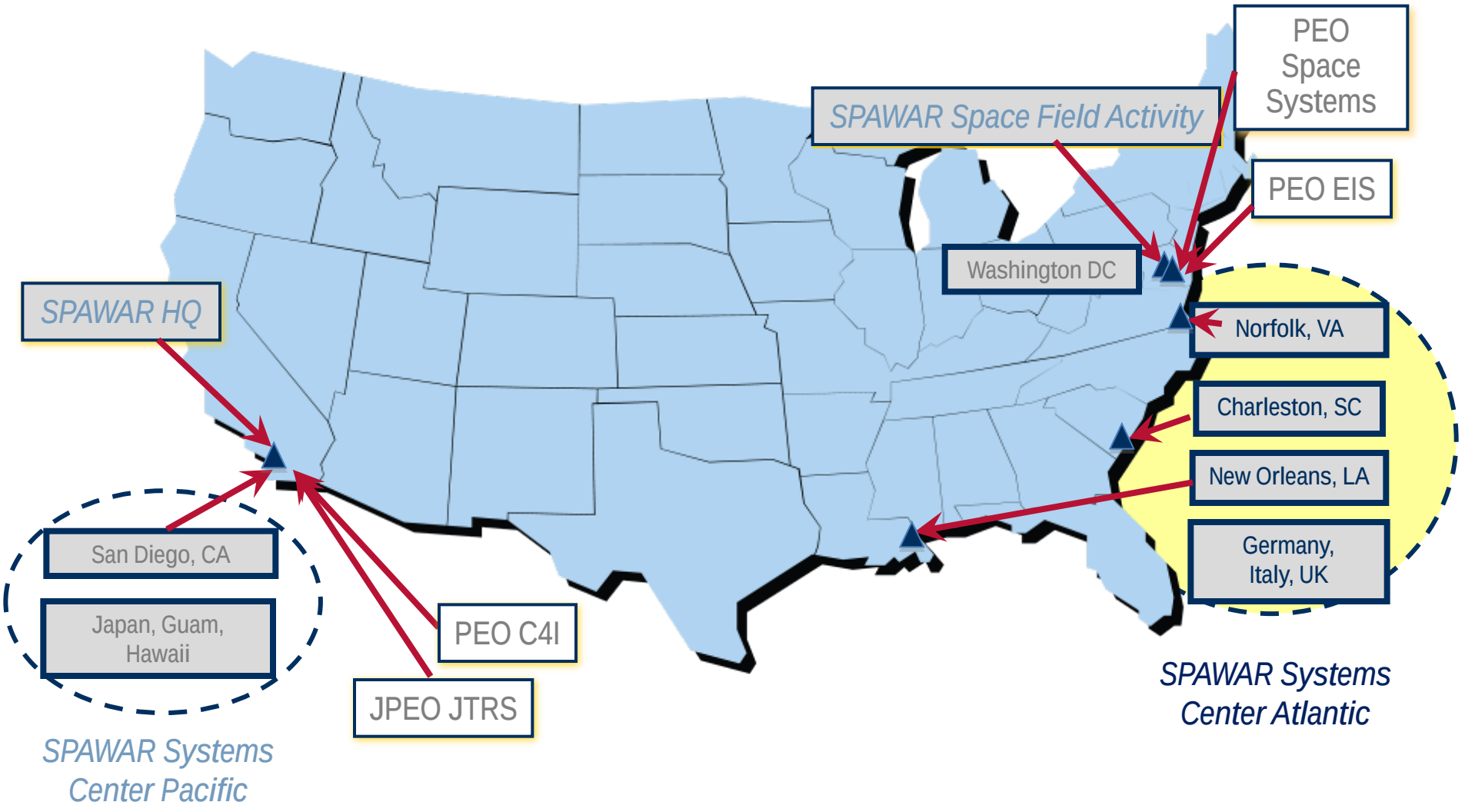
Intro to SPAWAR – Where We Are



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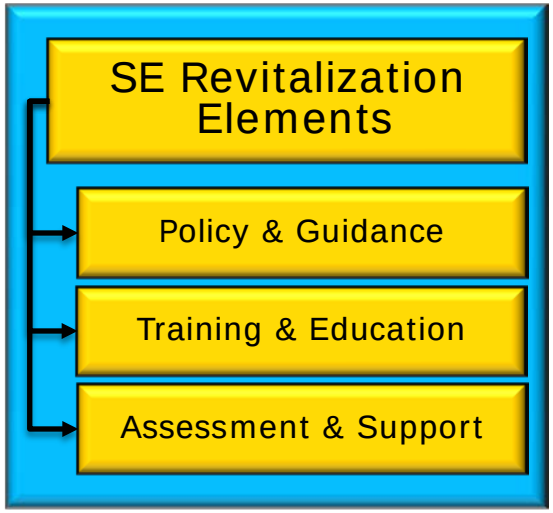
SPAWARSYSCEN Atlantic CMMI History: Process Improvement Approach

- Aligned with common issues/themes from DoD SE Issues Lists
  - Need for SE Revitalization, Engr & Proj Mgmt Guidance, & Training
- Selected CMMI as assessment model
- Selected broad variety of pilot projects
- Developed Organizational infrastructure, templates, and tools
  - Processes assigned/owned by Integrated Process Teams
- Conducted extensive Training – SE, Proj. Mgmt., CMMI, Risk Mgmt.
- Coaching & Mentoring
  - Organization and project level
- Frequent benchmarks – Class C, B, A appraisals
  - Publicized successes



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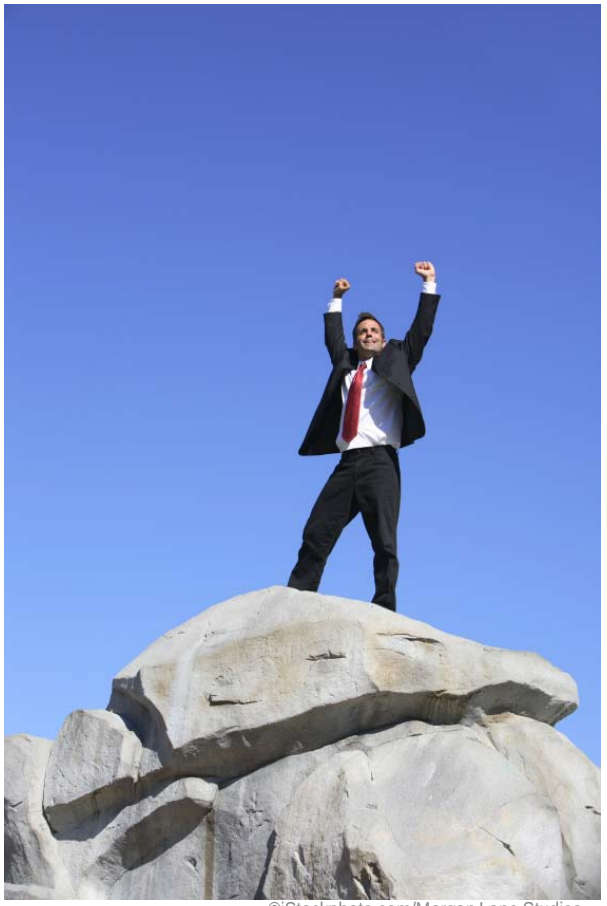
SPAWARSYSCEN Atlantic CMMI® History: Timeline of Success

Process Improvement Timeline

- 2001-2003 – Figuring it all out
  - Pilot projects; Initial CMMI® training
  - 20-30 projects working on Level 2 processes
  - Trained over 800 employees
- 2004/2005 – Shift to SE focus (not CMMI®)
  - Project level benchmark SCAMPI A appraisals
  - Heavy Training continued – SE, PM, CMMI®
  - Integrated Process Team (IPT) infrastructure established for process ownership and sharing
  - Successful ML2 SCAMPI A (Charleston)
- 2006/2007 – Similar 2-year approach for ML3
  - "Focus" and "non-focus" projects
  - Successful ML3 SCAMPI A (Charleston, Tidewater)
- 2008 – Command Consolidation (Charleston, Tidewater, New Orleans)
- 2009 – Successful ML3 SCAMPI A (New Orleans)



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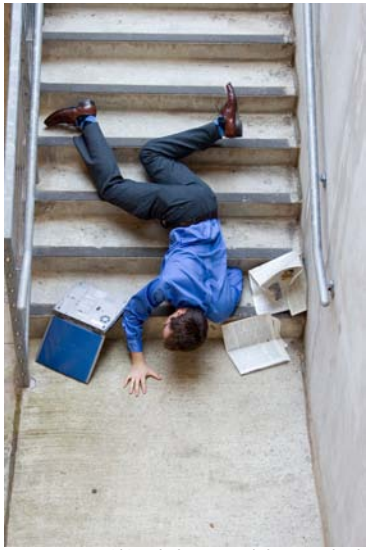
Post ML3 – Now What ?
Continuous Process Improvement !

- What did that mean?
  - High Maturity (ML4/5)? - Logical next step
    OR
  - Institutionalization and broader exposure?
- Pushed both agendas
  - Educated on high maturity processes & measures
    - Existing data not complete, clean or detailed
    - Lack of agreement on common measure
  - Developed internal assessment for new “CMMI® projects”
- End Result
  - Splintered message; overtaxed resources; loss of focus
  - Realization - Not Ready for High Maturity
  - Danger of slipping back!



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Post ML3 – Now What?
Continuous Process Improvement at ML3

Sustainment (Project Level)

- Like Diet Maintenance
  - Keep the Discipline
- Fix/Improve weaknesses
  - Peer Reviews
  - Measurement
- Regular Monitoring and Control
  - Active Quality Assurance
  - Contribute to Organization PAL
- Seamless shifts/changes
  - Project phases
  - Team members
- Internal improvements

Institutionalization (Org Level)

- Grow and spread usage
  - Convert the non-believers
  - Apply to more/all projects
- Refine and Improve processes
  - Address “global” issues
  - Add detail where necessary
  - Institute control points
  - Consolidate the common
  - Simplify
- Integration
  - Lean Six Sigma
- Update infrastructure

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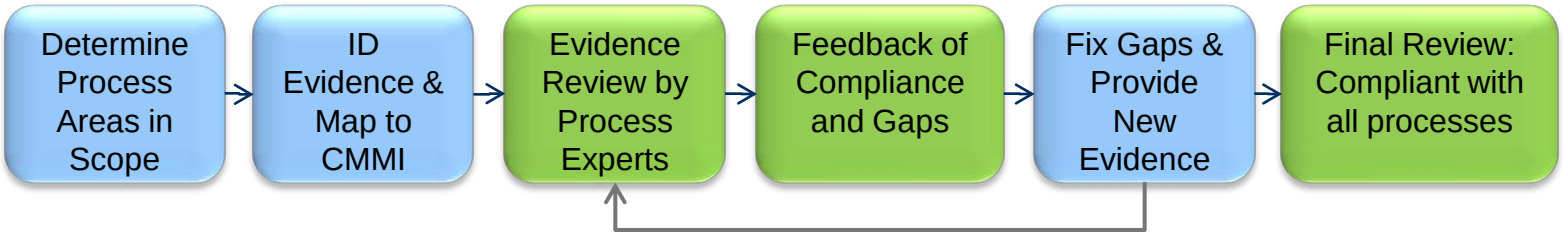
Methods for Sustainment & Institutionalization

- CMMI® Internal Assessments
  - Less costly than SCAMPI A
  - Project, Program, Area scope
- New Project Initiation and Startup process
  - Improve initial scoping/planning
- Enhanced Reviews Process
  - SOPs and Checklists
  - Management Oversight Reviews
- Integrate with other initiatives
  - Lean Six Sigma
  - Technical Authority
  - Navy ERP (SAP)
- Maintain infrastructure
  - Process Maintenance by IPTs
  - Adapt to changing organization
- Continue Training
  - CMMI
  - SE, Integrated Risk Mgmt
  - Project Initiation
  - Reviews
- Measure
  - Internally Assessed Projects
  - Reviews
  - Other Maturity Models
- Spread News of Success

Methods for Sustainment & Institutionalization- CMMI® Internal Assessment

- Typically, at Project or Program level
  - Full body of evidence and artifacts required
  - Not a single event, but an assessment over time with gap analysis and multiple feedback loops
  - By objective CMMI® -trained resources (1 or 2)
- May not assess all CMMI® ML3 process areas
  - Allows for focusing / scaling to most beneficial areas
  - Minimum core areas – Project Mgmt, Requirements, Risk, CM



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Methods for Sustainment & Institutionalization- CMMI® Internal Assessment

Outcome

- Validates that project/program is following CMMI® best practices
- Recognition – Process Excellence certificate
  - NOT a Maturity Level (or CL) rating, but high probability that project would achieve the corresponding rating if SCAMPI A assessed

Benefits

- Expansion of best practices
- Broadens participation
  - Suitable for all sizes
  - Tailorable for non-Development
- Projects experience improvement first hand
- Incremental approach

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CMMI® Process Excellence

In accordance with SPAWAR Atlantic standards, the
EKMS Project
has been assessed as successfully implementing
the best practices of CMMI®.

PROCESS AREAS IMPLEMENTED		
Project Planning	Measurement & Analysis	Requirements Management
Project Monitoring & Control	Process & Product Quality Assurance	Requirements Development
Configuration Management	Supplier Agreement Management	Risk Management

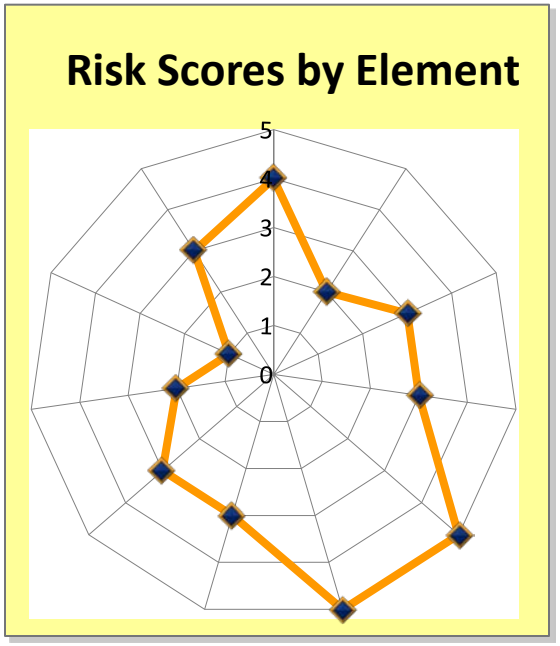
Brace Carter
Director, Engineering Operations

9/1/2009
Date Assessed

CMMI® is registered in the U.S. Patent and Trademark Office by Carnegie Mellon University

Methods for Sustainment & Institutionalization- Project Initiation Request

- How to get new projects to determine right amount of SE and Project Planning needed?
  - SPAWAR is too diverse for canned “tailoring scenarios”
- Objective method to assess potential risk was needed
  - Often, small projects with high visibility had big execution issues
- Project Initiation Request (PIR) process:
  - Profiling questions: Visibility, Teaming complexity, Impact of failure, Quality of requirements, Technology dependency, Project leader experience, Similarity to other projects, Funding issues, Schedule drivers, etc.



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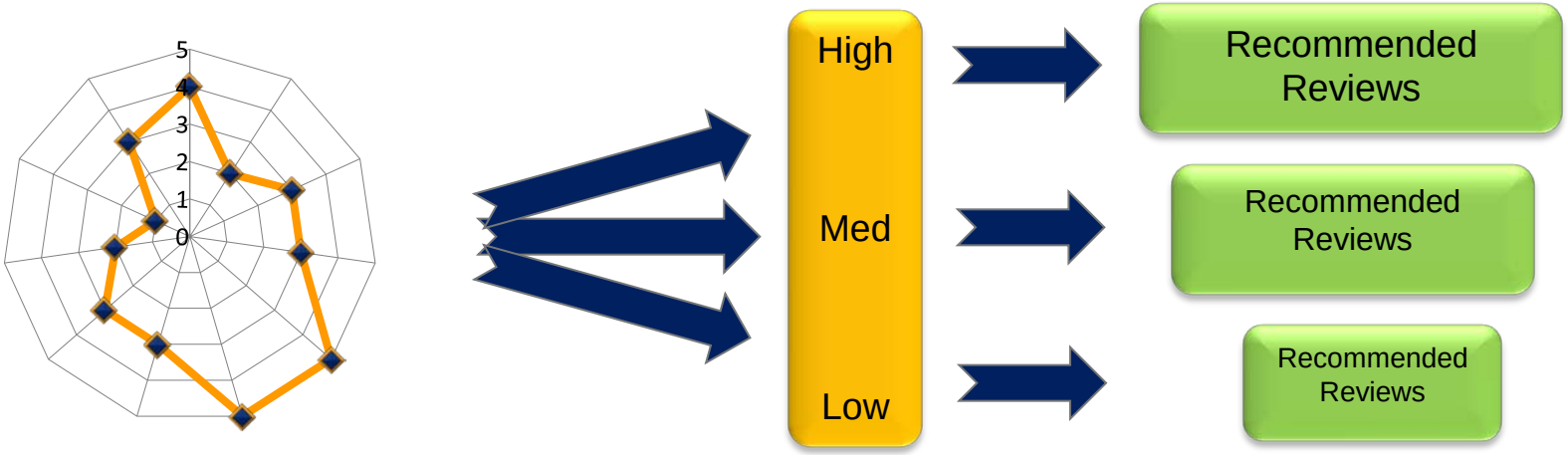
Methods for Sustainment & Institutionalization- Enhanced Reviews Process

Risk Profile Score … Drives Level of Rigor … and Recommended Reviews



- What we are doing:
  - Built a flexible reviews process scalable to managerial needs and/or project size
  - Emphasizing ACAT SETR type reviews for non-ACAT programs
    - Tailored Review Checklists
  - Improved Review tracking

- What we are gaining:
  - Well-defined triggers to spawn higher level reviews
  - Continuity in management and SE across the command
  - Identifying opportunities to increase net readiness of product

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Methods for Sustainment & Institutionalization- Integrate with Other Initiatives

- Lean Six Sigma
  - Enabler for Continuous Process Improvement
    - Tools and Structure (DMAIC)
- Technology Authority
  - Utilize “warranted” experts on technical reviews (SETRs)
  - Scaling down ACAT/POR SETR checklists for non-Program of Record projects
- Navy ERP
  - Linking completion of Project Initiation to release of funds in ERP
  - ERP to improve cost and schedule measurement/monitoring

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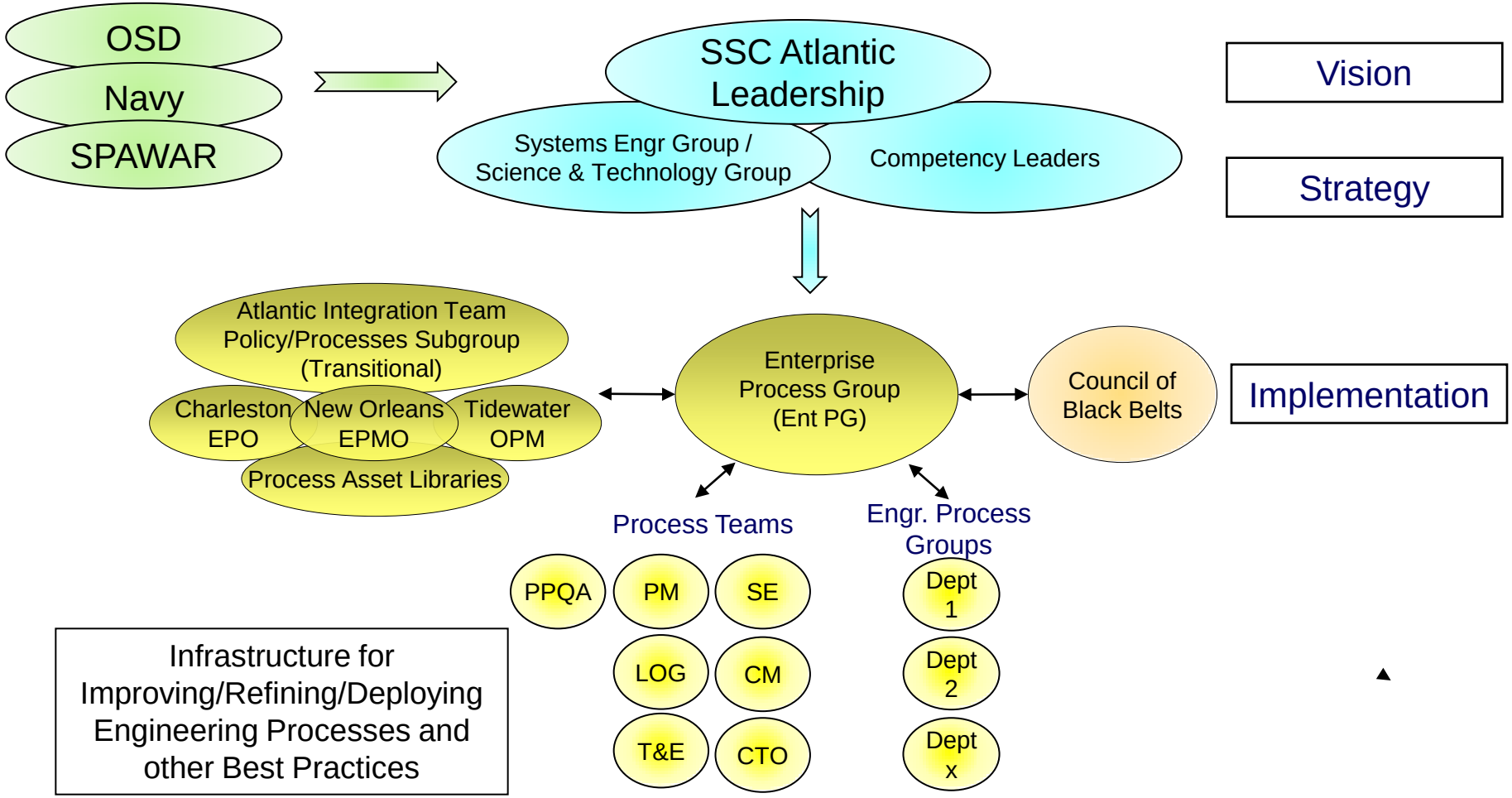
Methods for Sustainment & Institutionalization- Maintain Infrastructure



Methods for Sustainment & Institutionalization- Command Funded Training

- Introduction to CMMI®
  - 3-day Introduction to CMMI® course with SPAWAR flavor
  - Students learn how the best practices build and relate across process areas
- Systems Engineering Fundamentals, Integrated Risk Management
  - Multi-day, on-site, classroom courses
  - Based on SMU SE Masters courses
  - Customized to incorporate SSC Atlantic SE process
- Project Initiation, Self Assessment
  - 2-day Project Initiation, Review Process & CMMI Internal Assessment workshop
- Lean Six Sigma - # of Active Belts
  - 40 Black Belts, 217 Green Belts, 260 Yellow Belts
- Web-Based Engineering Modules

"Thought provoking, motivating, and challenging. Learning basic SE caused me to brainstorm many different applications of organized system processes. It motivated me to want to begin organizing its application. It also challenged me to apply GOOD SE practices in order to successfully be more efficient in the process.."

"It was extremely beneficial to have a professor with extensive knowledge of the subject matter and one who could apply it to the SPAWAR methods."

Student Feedback

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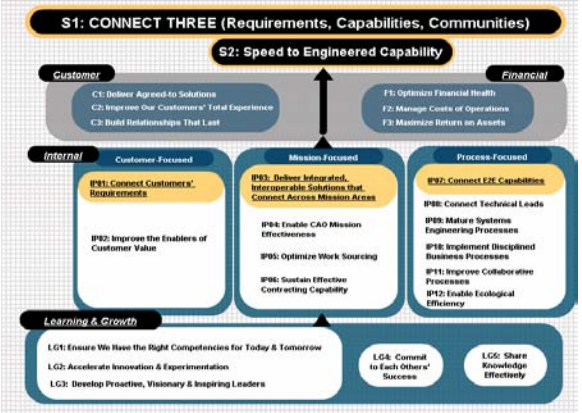
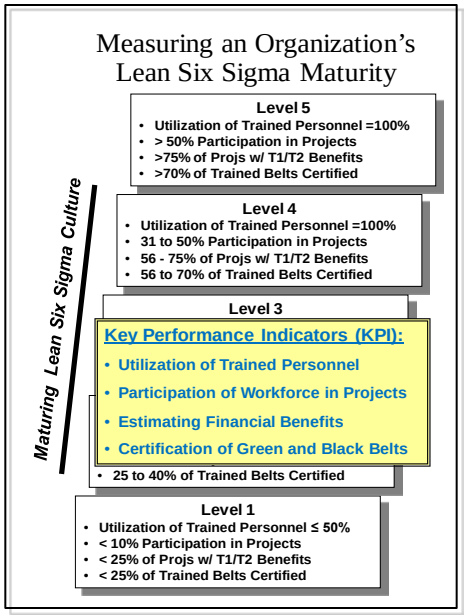
Methods for Sustainment & Institutionalization- Measure

- Balanced Scorecard – Quarterly/Annual targets
  - Number of CMMI® Assessed Projects
  - Project Initiation Usage
  - Reviews Tracking
  - ForceNet – Fully Netted Force (FnF) and Fully Netted Resource (FnR) assessments



- Lean Six Sigma Maturity Model
  - Maturity Model framework is easy to understand
  - Assesses levels of training, certification, participation, and utilization



- Documented Processes
  - # of processes and procedures documented using Oracle Tutor tool

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Methods for Sustainment & Institutionalization- Spread the Word

- Systems and Software Engineering Newsletter (S²E News)
  - Informs folks of latest improvements/initiatives
  - Spreads the word on upcoming training or events
  - Recognizes projects for their achievements

s²eNEWS
Systems and Software Engineering Newsletter
SPAWAR Systems Center Charleston

Volume 2, Issue 1 February 2006

The Benefits of CMMI®

SSC Charleston's Project Managers have pushed their teams to practice CMMI® and are reaping great benefits as a result. The Engineering Process Office sat down with them to discuss what they learned during their pursuit of Maturity Level 2. Article on Page 2.

KUTCH'S KORNER: CMMI® Makes SSC-C Work Smarter

In the past year, we've taken great steps toward making SPAWAR Systems Center Charleston a world-class engineering organization. We had six teams go to CMMI® Maturity Level 2, and their experience is the focus of this issue of the *s²eNEWS*. Granted, this effort required significant work, but SSC-C is seeing numerous benefits as a result of implementing CMMI. By jumping ahead, these teams have provided a roadmap we all can follow, allowing us to work smarter to achieve the same success. The tangible, quantifiable benefits we've reaped by implementing CMMI have boosted SSC Charleston's reputation – both in the Command and the civilian world – as a quality engineering institution, and that's something we can all be proud of. In their interviews for the article you're about to read, SSC-C's projects were very candid about the difficulties they encountered, the new processes and techniques they've implemented, and the resulting benefits. Some said they only made minor changes, while others experienced a dramatic

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New SE 101 Web-Based 7

s²eNEWS
Systems and Software Engineering Newsletter
SPAWAR Systems Center Charleston

Volume 4, Issue 2 September 2008

Stumped by CMMI®- Related Reviews?

EPO Website Features Review-Related Docs

A crucial part of the CMMI® model, reviews are an oft-perplexing subject for new and established projects alike.

In response to SSC-C projects' requests for more specific guidance, the Engineering Process Office (EPO) has developed new resources and an online repository of review-related documentation.

"The focus is now on treating the review process as its own organized process," said Bruce Carter, Director of Engineering Operations (Code 56E00). "Any existing project can take advantage of these new resources."

> "The focus is now on treating the review process as its own organized process."
> Bruce Carter, Director Engineering Operations

In July, two new pages were launched on the EPO website: a SSC-C Review Process page and an SOPs, Checklists & Forms page.

The SSC-C Review Process page is a clearinghouse of review-oriented documents, including over three dozen SOPs and nearly 70 checklists and forms. The new SOPs, Checklists & Forms page puts every SOP, checklist, and form used at SSC-C in one convenient location.

"Reviews have always been a part of the SE process, but this new approach consolidates all review information into one location," Carter said. "This makes planning easier."

In addition, the SSC-C Review Process Manual has undergone a major revision to make it more complete and to bring it in line with Systems Engineering Technical Review Process Instruction SPAWARINST 5400.3.

The Review Process Manual now covers product, project, and process reviews more thoroughly. Review types and definitions have been added, and there is more description of the standard steps and process flow.

FOR FAST ACCESS
New Review Process Page
https://esgwweb.spawar.navy.mil/emss/standardprocesses/reviewprocess.aspx
New SOPs, Checklists & Forms Page
https://esgwweb.spawar.navy.mil/emss/standardprocesses/docs.aspx

New PIR Is Your Guide

The new SSC-C Project Initiation Request (PIR) process is designed to help projects with upfront planning and analysis of project scope, size, and complexity through the use of a risk profiling worksheet. The process begins when a customer submits a request to initiate work.

To lead projects and supervisors through the process of developing and reviewing PIR data, SSC-C has developed several new PIR-related documents.

The newly-developed *PIR Data Development (PIR) SOP* guides a project step-by-step through the early stages of developing their PIR data. To assist them, SSC-C has developed the *PIR Profiling, Required Reviews EZ Template*, a fill-in-the-blank worksheet.

The completed project PIR data includes the *PIR Form* (or equivalent documentation), *Project Profiling Worksheet, Required Reviews Worksheet*, and *Project Tailoring Form*.

Continued on Page 2

KUTCH'S KORNER: CHANGES IN LATITUDES, CHANGES IN ATTITUDES

It's these changes in latitudes, changes in attitudes
Nothing remains quite the same
With all of our running and all of our running
If we couldn't laugh, we would all go insane
Jimmy Buffet - Changes in Latitudes, Changes in Attitude

Our Command has undergone significant change lately and FY2009 promises more change. We have new leadership in place, we are growing due to SSC Atlantic, and we

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1 New PIR is Your Guide
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2 2008 Innovation

s²eNEWS
Systems and Software Engineering Newsletter
SPAWAR Systems Center ATLANTIC

Volume 5, Issue 1 March 2009

SSC Atlantic Sets Sights on CMMI® Maturity Level 3

Formal Appraisal of Charleston, Tidewater, and New Orleans Projects in 2010

The merging of SPAWAR Systems Centers Charleston, Tidewater, and New Orleans into SSC Atlantic has spurred a push for the entire organization to reach Capability Maturity Model Integration (CMMI®) Maturity Level 3 in less than two years.

The target date for a formal "Class A" Standard CMMI® Appraisal Method for Process Improvement (SCAMPI℠) appraisal for SSC-Atlantic has been set for March 2010.

"Our vision is still world-class systems engineering, but our main focus is getting the entire organization to Maturity Level 3 (ML3)," said Bruce Carter, Director of Engineering Operations (Code 5OE00). "However, we are still encouraging individual projects to go further to CMMI® Maturity Levels 4 and 5. Those projects will continue to receive support from the organization and the EPO."

In April 2007, the former SSC Charleston became the first SPAWAR Systems Center to reach CMMI® ML3.

Five months later, in September 2007, the former SSC Norfolk achieved the same milestone. SSC Atlantic projects in New Orleans are slated to undergo a formal SCAMPI Class A appraisal in April 2009 to reach ML3.

An organization that achieves a Maturity Level rating must reachieve the rating every three years. That means the former SSC Charleston's ML3 rating will expire in April 2010 unless SSC Atlantic successfully reachieves ML3 in March 2010.

"It's important to understand that a Maturity Level rating is not a one-time-only thing – it's a continuous process. You can't just sit back and say 'OK, we made it to ML3 and now we can relax,'" Carter said. "All projects that have individually achieved ML3 should still be operating at ML3. We can't lose that momentum."

A cross-section of projects from Charleston, Tidewater, and New Orleans will be selected to participate in the SSC Atlantic SCAMPI, Carter said.

To prepare, the projects will undergo a series of internal self-assessments and Class C appraisals during 2009 to gauge their readiness and whether they have sustained their current Maturity Level processes.

In addition, the Engineering Process Office will continue its regular monthly coaching sessions with projects.

KUTCH'S KORNER: COMMIT TO CHANGE, FIND NEW OPPORTUNITIES

John F. Kennedy once said "change is the law of life," and that has been especially applicable in recent months as SPAWAR undergoes rapid changes on many fronts.

We are in the midst of a Competency Aligned Organization (CAO) with Competencies, new Business Units and Integrated Product Teams, the rollout of Navy ERP, and the consolidation of SPAWAR systems centers in Charleston, Norfolk, and New Orleans to create SPAWAR Atlantic.

The way we do business is changing, requiring us to leverage our knowledge in new ways, expand geographically, and integrate new people and projects.

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1 Kutch's Korner
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3 TIMPO LAN Project

SPAWAR Systems Center ATLANTIC

2010 and Beyond

- CMMI® Maturity Level 3 Appraisal/Re-appraisal
  - 1st for new SSC Atlantic organization
  - All sites comprising Atlantic achieved ML3 previously
  - Challenge to show integration and alignment to Atlantic standard organizational processes
- CMMI® for Services
  - Begin implementation of new Services constellation
  - Appropriate for many projects/programs in SPAWAR
    - Software Help Desks, Data Centers, Network Management
- Leverage Navy ERP
- Consolidation and Integration of process assets to single process asset library

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Lessons Learned

- No room for complacency
  - Must keep focus on continuous process improvement
  - Maintain high standards; don't dilute the effort

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- Sharing isn't "natural"
  - Successful projects are often focused on remaining successful and may ignore the "outside"
  - Need intermediaries to help push/pull, make sharing easier
- Continue to refine the "how do I …"
  - Models and high level processes say "what to do"
  - Workers want to know how to do it
    - Templates, Checklists, Examples, Options
- Even the Resistors can be converted
- Process Improvement is a marathon - Be the Tortoise

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Thank You !

Mike Knox
Technical Software Services, Inc. (TECHSOFT)
Director, Engineering Process Services
mjknox@techsoft.com

Michael T. Kutch, Jr
SPAWAR Systems Center Atlantic
Head, ISR/IO/IA & Cyber

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