

# NAVAIR

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## Software Acquisition Process Improvement

# Report Documentation Page

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# Topics

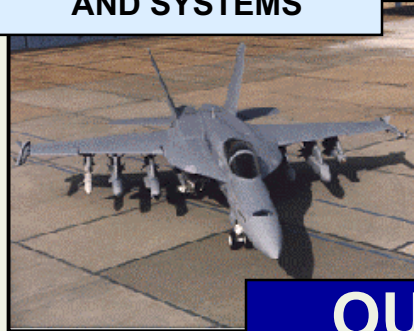
- Background
- Process Improvement Journey
- NAVAIR Acquisition Improvement Plan

# NAVAIR Products & Capabilities

AIR ASW / ASUW



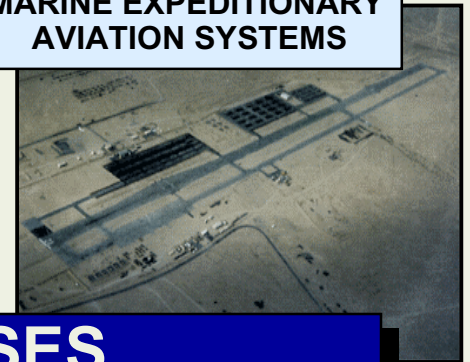
SEA BASED AIRCRAFT AND SYSTEMS



MARITIME WEAPONS



MARINE EXPEDITIONARY AVIATION SYSTEMS



AIRCREW / MAINTENANCE TRAINING SYSTEMS



## OUR CORE PROCESSES . . .

. . . WE EXECUTE (ON BEHALF OF THE USER)

ACQUISITION  
MANAGEMENT

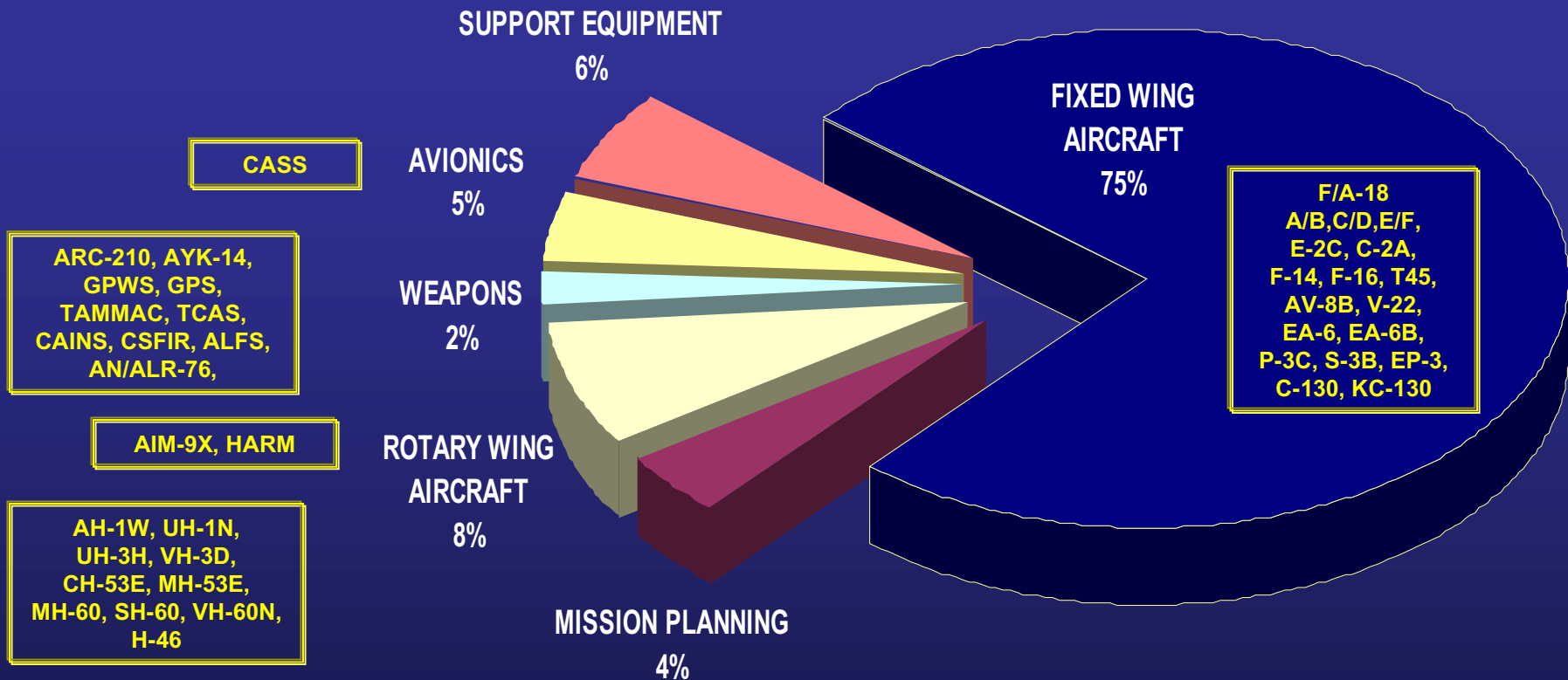
REPAIR /  
MODIFICATION

TEST AND  
EVALUATION

IN-SERVICE ENGINEERING  
AND LOGISTICS SUPPORT

TECHNOLOGY, RESEARCH & DEVELOPMENT,  
HARDWARE & SOFTWARE PRODUCTS

**. . . MORE THAN AIRCRAFT AND WEAPONS,  
TOTAL SYSTEM CAPABILITY AND SUSTAINMENT**

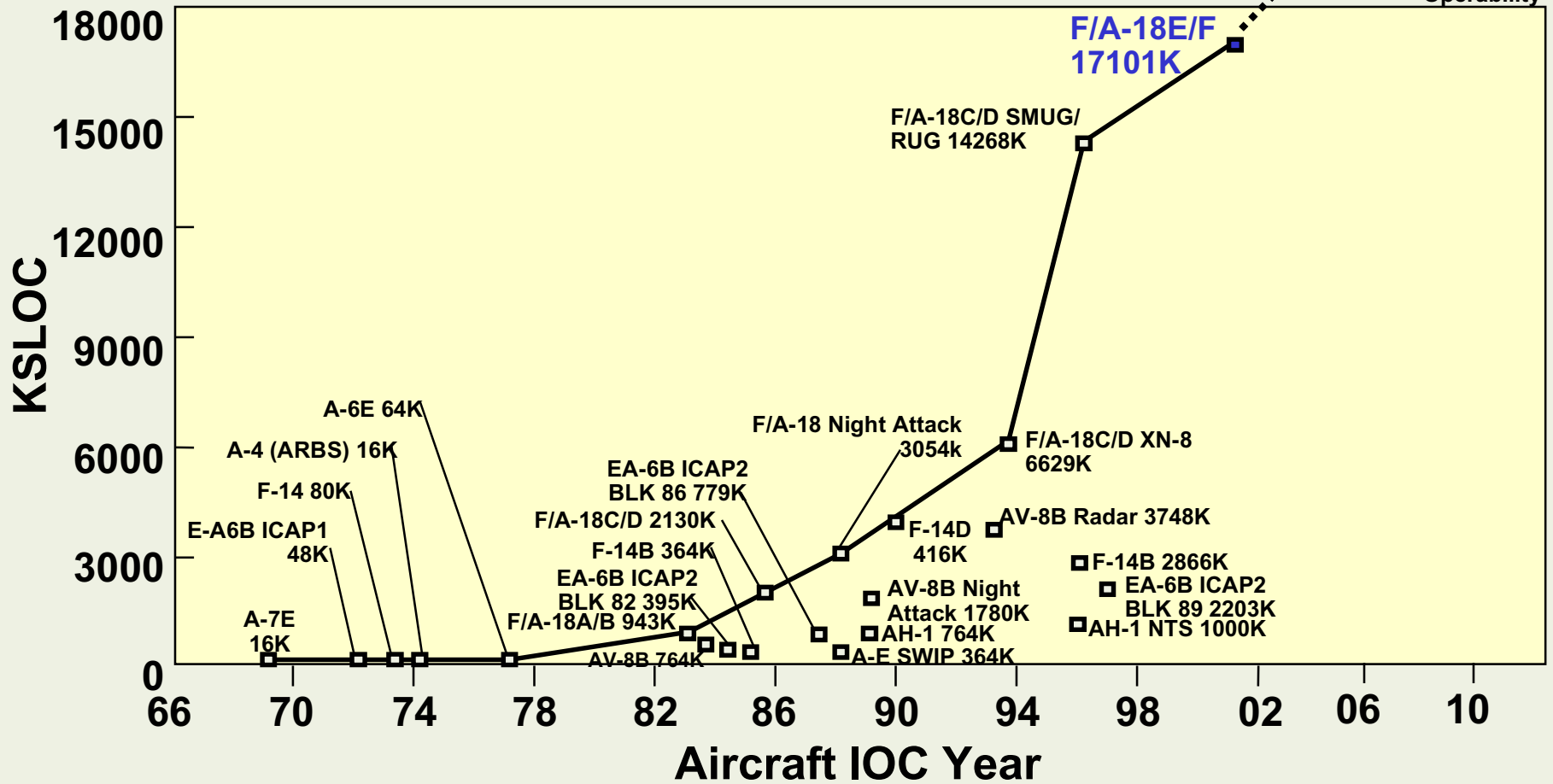


**Over \$2B on Software Development and Related Activities Per Fiscal Year**

**65M SLOC Operational Software**  
**31M SLOC Support Software**

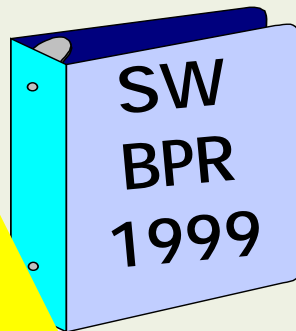
*Represents Approximately 50%  
 Of NAVAIR Software*

# System Environment



- JSF
- UAVs
- NCW
- Inter-System Operability

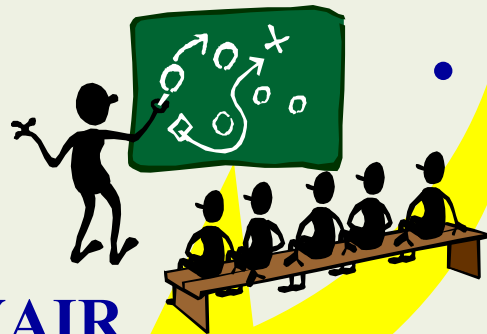
# Setting the Stage



- Software Business Process Engineering Study
  - The compelling reason to change



- System Leadership Council
  - The Enablers & Policy Makers



- Software Leadership Team
  - The Facilitators & Planners

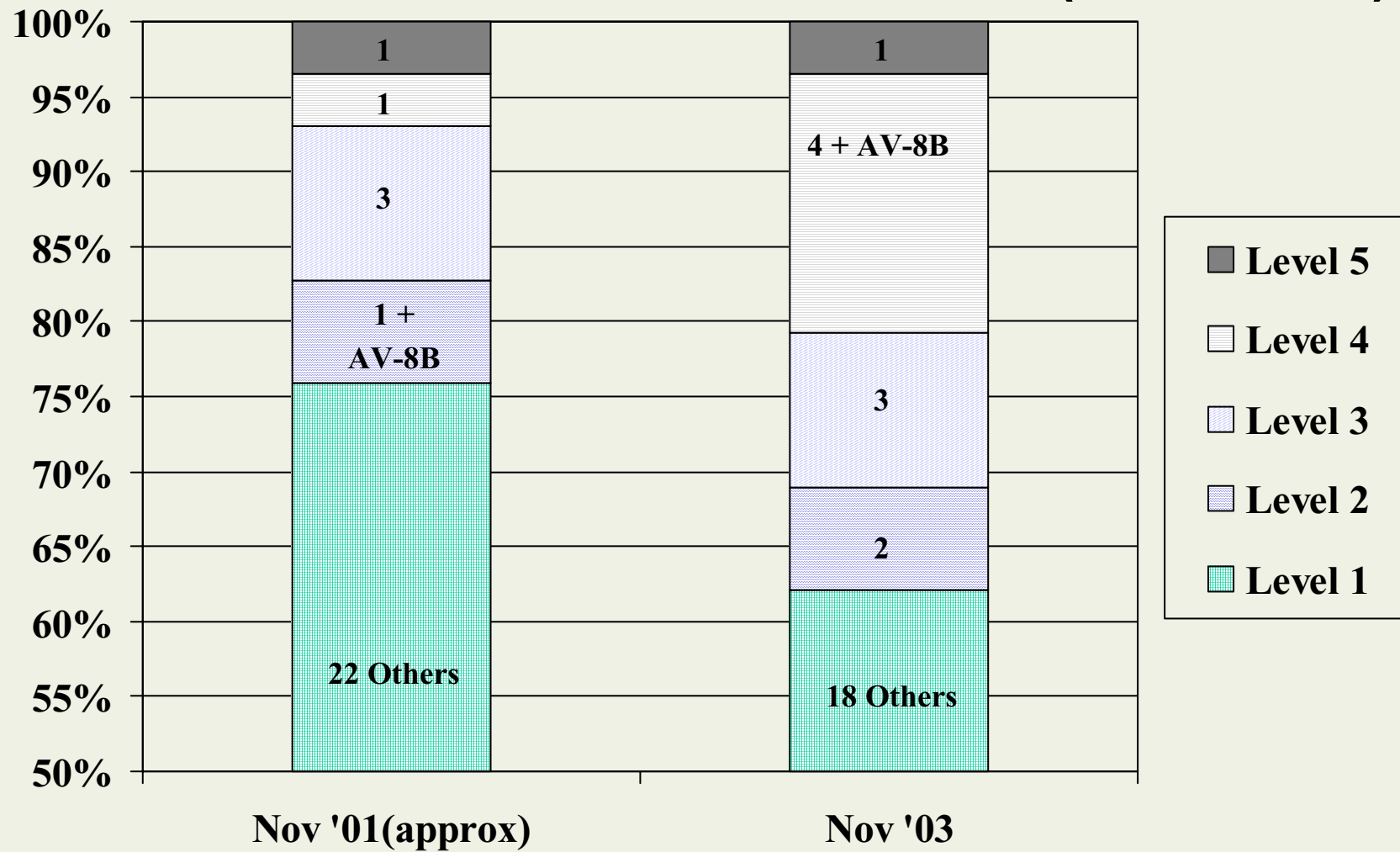
**NAVAIR  
Software  
Strategic  
Plan**



- Software Resource Center
  - The Coaches & Doers

# SW-CMM LEVEL RATINGS

## SOFTWARE SUPPORT ACTIVITIES (29 TOTAL)





# Team Software Process

Used by organic maintenance and developer programs

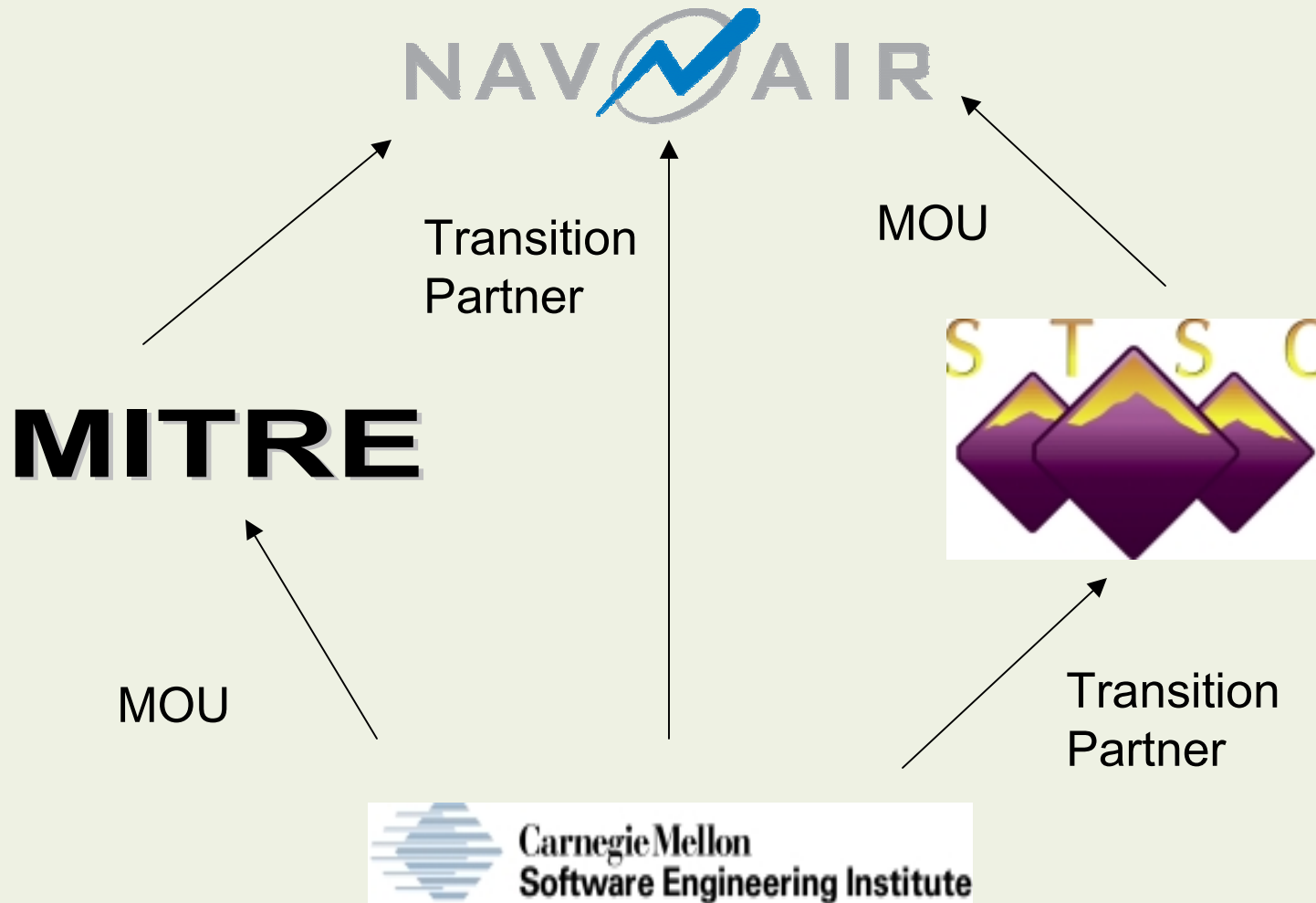
11 projects ongoing

7 projects planned

Resulted in improved predictability of cost, schedule and quality

Four NAVAIR personnel have been trained as PSP instructors and TSP coaches

# NAVAIR MITRE SEI STSC Collaboration Integration



# NMSS Collaboration Objectives

- Support NAVAIR activities with the implementation of disciplined and rigorous software and system engineering practices.
  - to the acquisition of software intensive systems
  - To meet the requirements of Public Law 107-314, Section 804
- Enhance and accelerate technology transition to NAVAIR organic resources
- Assist in the continued development of current organic acquisition process improvement capabilities and expertise
- Positively impact NAVAIR's ability to acquire near defect free software intensive systems on time, every time.

# The Software Engineering Institute

- DoD R&D laboratory FFRDC sponsored by the Undersecretary of Defense for Acquisition, Technology, and Logistics
- Situated as a college level unit at Carnegie Mellon University, Pittsburgh, PA
- Mission is to provide leadership in software engineering and to transition new software engineering technology
- Encouraged to support industry in pre-competitive technology R&D and in technology transition activities

# Best Practices Used

- Software Acquisition CMM
- Software Acquisition Planning
- Source Selection Technical Reviews
- Appraisals and Assessments (SCAMPI)
- Training
  - Executive Overviews
  - Model
  - Appraisal Methodology
- Measurement Programs

# Best Practices Used -2

- PSP/TSP
- CMMI
- S/W Architecture
- Pre-RFP Strategies (Documentation, Acquisition Strategy, Technical Advisors to Source Selection)

# The MITRE Corporation

- Operates three FFRDCs
  - Systems engineering and integration work for Department of Defense C3I.
  - Systems research and development work for the FAA and other civil aviation authorities.
  - Strategic, technical and program management advice to the IRS and Treasury Department.
- A not-for-profit corporation combining systems engineering and information technology to address issues of critical national importance.

# Multi Mission Maritime Aircraft (MMA)

- Program early in the life cycle
- RFP development – included systems & software engineering verbiage
- SCAMPI appraisals of contractor process capability
- Introduced process-based philosophy in the acquisition
- Prepared government integrated program team for appraisals
- Future architecture focus anticipated



# Software Technology Support Center (STSC)

- US Air Force at Ogden Air Logistics Center, Hill AFB
- Provides best software practice consulting services
  - CMMI
  - Software Acquisition
  - Assessments
  - Project Management
  - Test Engineering
  - Systems Engineering
  - Personal Software Process (PSP)
- An SEI Transition Partner

# STSC NAVAIR Partnership

- China Lake, CA
  - AV-8B
    - PSP I/II for Engineers
    - CMM Snapshot
  - F-18
    - CMM Snapshot
    - Intro to CMMI
- Jacksonville, FL
  - PSP I/II for Engineers
  - PSP/TSP for Executives/Managers

# STSC NAVAIR Partnership

- Orlando, FL
  - PSP/TSP for Executives/Managers
- Patuxent River, MD
  - P-3
    - Intro to PSP
    - PSP I/II for Engineers
    - PSP/TSP for Executives/Managers
    - TSP

# STSC NAVAIR Partnership

- Pt. Mugu, CA
  - F-14
    - Intro to PSP
    - PSP I/II for Engineers
    - PSP/TSP for Executives/Managers
    - CMM snapshot
- San Diego, CA
  - PSP I/II for Engineers
  - PSP/TSP for Executives/Managers

# Lessons Learned – Developer-focused SW Improvement Experiences

- **Senior management support & involvement**
  - Set policy, vision, strategies & goals
  - Identify measures & monitor performance
- **Dedicated resources to execute the strategies**
  - Educating project team leaders on benefits
  - Educating practitioners on methods
  - Seed funding for project team SW improvement initiatives
  - Improvement initiatives must be run like a projects

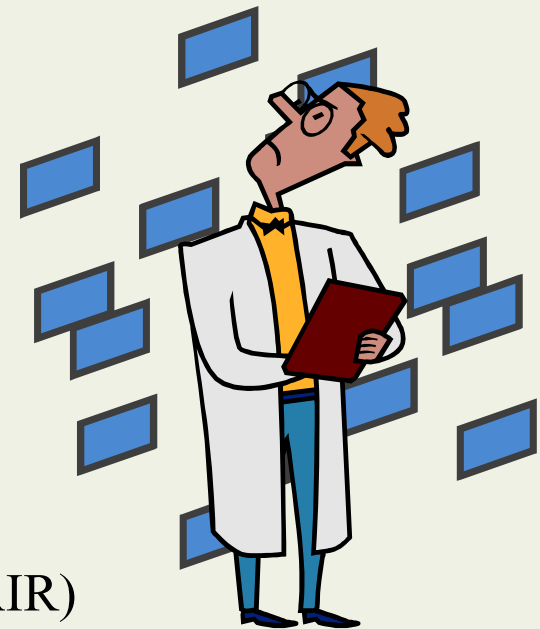


# Defense Authorization Act of Fiscal Year 2003, Section 804

- A new public law
  - Enacted by Congress December 2002
  - DoD guidance issued March 2003
    - Requires military departments and select defense agencies to establish software acquisition process improvement programs
- Focus is on improving how the DoD acquires software

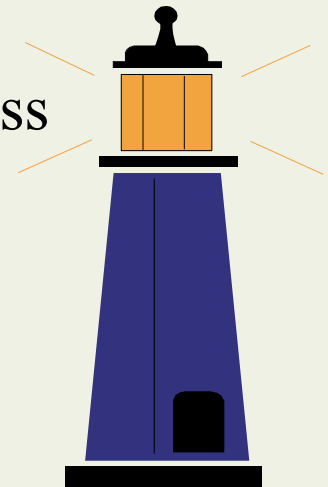
# Required Software Acquisition Improvement Process Areas

- DoD's initial minimum set
  - Acquisition planning
  - Requirements development & management
  - Configuration management
  - Risk management
  - Project management & oversight
  - Test & evaluation
  - Integrated team management
  - Solicitation & source selection
  - Performance measurement (added by NAVAIR)
- Processes must be documented, performed and continuously improved



# NAVAIR's 804 Implementation

- **Phase 1 – Requirements (done 12/03)**
  - A. Build an SW acquisition process improvement CoP
  - B. Identify NAVAIR Instructions that map to 804
  - C. Communicate 804 requirements
    - PEO(A) 11/17; PEO(W) 11/24; PEO 1.0 12/2; PEO(T) 12/5
- **Phase 2 – Gap Analysis & Planning (mostly by 4/04)**
  - A. Revise NAVAIR Instructions as necessary
  - B. Develop a NAVAIR Software Acquisition Process Improvement Program (SAPIP)
  - C. Build or identify a support infrastructure
- **Phase 3 – Implementation**
  - A. PMs execute to NAVAIR Instructions





# NAVAIR Plan

**(Software Acquisition Process Improvement Program – SAPIP)**

- Owned by the Program Mgmt Competency
- Approved by the SLC (target March '04)
- Implemented by Assistant PEOs
- Supported by the SRC & Competencies
- SAPIP status
  - Phase 1 of plan has been implemented
  - Outstanding tasks: Continue orientations, define compliance measurements, execute & track progress

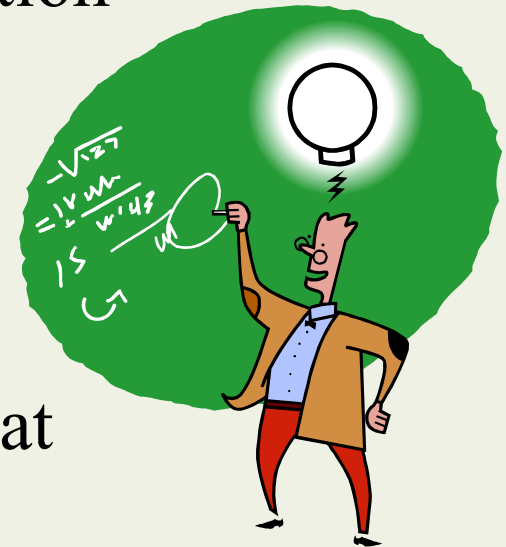
# Implementation Steps for NAVAIR PMs

- Gauge whether you comply with the updated NAVAIR Instructions
- Validate and document your acquisition processes
  - Processes include entry criteria, steps, exit criteria and measurements
  - Competencies are responsible for any additional how-to processes
- Develop and implement software acquisition process improvement plans and measurement programs

[per NAVAIRINST 5234.2 & 5234.5]

# Acquisition-focused SW Improvement Hypotheses

- Do what makes sense for your organization (Section 804 is not prescriptive)
  - No clear, singular improvement model for benchmarking; pick one that supports your business goals
- Need to emphasize and re-emphasize that Section 804 is about the acquirer
- Lessons learned from SW development improvement are directly applicable



# Support for Software Acquisition Process Improvement

- NAVAIR's Software Resource Center (SRC) will help acquisition programs to:
  - Identify their improvement goals and performance measures
  - Identify, document and baseline their current processes against best practices
  - Develop a measurement program and process improvement POA&M
  - Define their improvement program training and support needs
  - Find resources to help satisfy those needs



# Acquisition Improvement Is Underway Within NAVAIR

