# Running an SEPG – How SSC San Diego Operates its SEPG

**Brian Groarke**
**SPAWAR Systems Center, San Diego (SSC San Diego)**
**Systems Engineering Process Office (SEPO)**
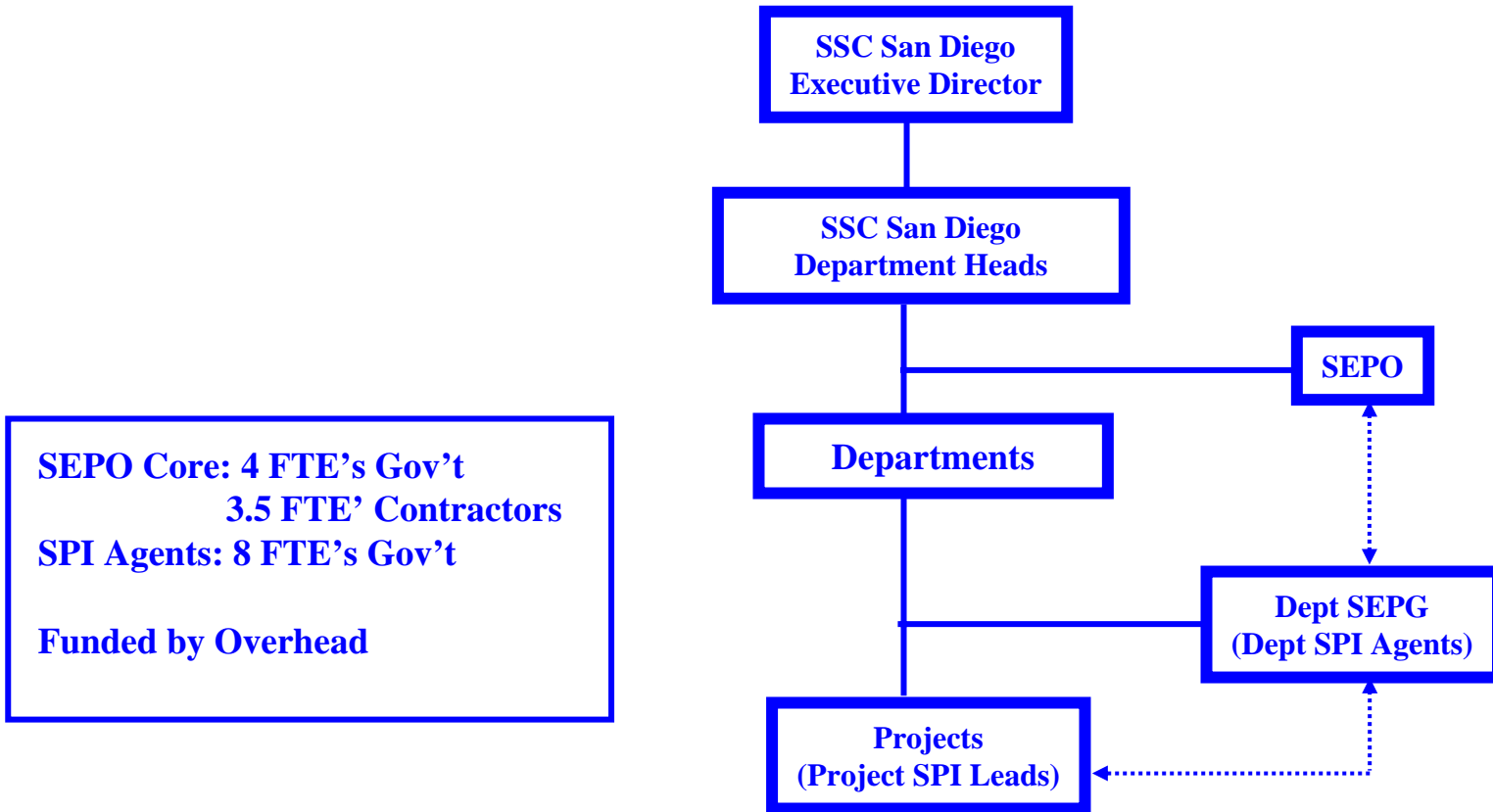**March 8, 2006**

# Objectives of the Briefing

- **Provide an overview of SSC San Diego and SEPO**

- **Provide an overview of how SSC San Diego operates its SEPG**

- **Discuss some specific practices and procedures used by SEPO**

- **Summarize lessons learned**

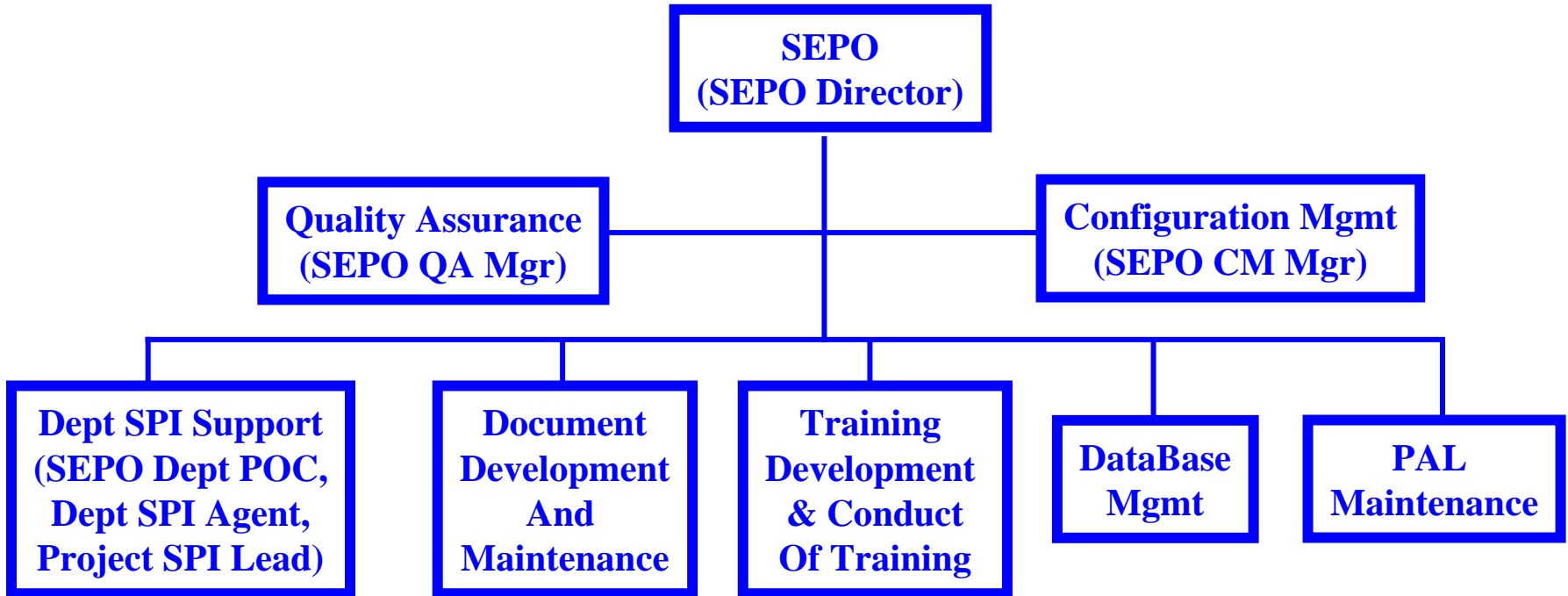# Space and Naval Warfare Systems Center San Diego (SSC San Diego)

- **Mission: to be the Navy's RDT&E, engineering and fleet support center for command and control, communications, ocean surveillance, and the integration of those systems which overarch multi-platforms**

- **Vision:   to be the nation's pre-eminent provider of integrated C4ISR solutions for warrior information dominance**

- **~3,500 civilians, 70 military, and several thousand contractors**

- **Actual funding for FY05 was  ~$1.4 billion**

- **Attained SW-CMM Level 3 in Oct 2000; re-assessed at Level 3 in Aug 2003; transitioning to CMMI; two projects have attained CMMI Level 2**

*Systems Engineering Process Office*

# SSC San Diego
# Process Improvement Organization

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                    ┌─────────────────────┐
                    │  SSC San Diego      │
                    │  Executive Director │
                    └──────────┬──────────┘
                               │
                    ┌──────────┴──────────┐
                    │  SSC San Diego      │
                    │  Department Heads   │
                    └──────────┬──────────┘
                               │              ┌─────────┐
                               ├──────────────│  SEPO   │
                    ┌──────────┴──────────┐   └─────────┘
                    │    Departments      │
                    └──────────┬──────────┘
                               │         ┌───────────────────┐
                               │         │   Dept SEPG       │
                               ├─────────│ (Dept SPI Agents) │
                    ┌──────────┴──────────┐└───────────────────┘
                    │     Projects        │
                    │ (Project SPI Leads) │
                    └─────────────────────┘
```

SEPO Core: 4 FTE's Gov't
           3.5 FTE' Contractors
SPI Agents: 8 FTE's Gov't

Funded by Overhead

# SEPO Organization and Work Distribution



- **SEPO** (SEPO Director)
  - **Quality Assurance** (SEPO QA Mgr)
  - **Configuration Mgmt** (SEPO CM Mgr)
    - **Dept SPI Support** (SEPO Dept POC, Dept SPI Agent, Project SPI Lead)
    - **Document Development And Maintenance**
    - **Training Development & Conduct Of Training**
    - **DataBase Mgmt**
    - **PAL Maintenance**

# SEPO Products and Services

- **Maintains SSC San Diego's Process Asset Library (PAL): Comprehensive web page of process improvement material: at http://sepo.spawar.navy.mil/**

- **Facilitates process improvement across all of SSC San Diego**

- **Conducts training courses**

- **Assists with internal appraisals on projects to determine best practices and areas for improvement**

- **Maintains Software Community Alias:  Email alias with over 800 members for announcements, requests for assistance**

- **Facilitates Systems/Software Process Improvement Working Group (SPIWG):  periodic meetings, seminars, lectures, debates, demos about systems engineering and process improvement issues**

- **Maintains SEPO Library: process improvement related books, guidelines, standards, products, processes, publications, proceedings, articles, videos**

- **Performs Community Liaison: Interface with the process improvement community outside of SSC San Diego, both government and commercial**

# SSC San Diego Organizational PAL:http://sepo.spawar.navy.mil/



Browser window showing SSC San Diego PAL and SEPO Home Page:

**SSC San Diego Process Asset Library**

(a repository of organizational standard process assets)

As the result of a recent reorganization, the Systems Engineering Process Office (SEPO) now appears on our organization chart as Corporate Process Re-Engineering, Code 20203. However, we will continue to be known as SEPO. Historically, SEPO started as the Software Engineering Process Group (SEPG) for SSC San Diego. Later, our role expanded to include systems engineering and then project management. Now our role expands again to include facilitation of business process re-engineering of corporate business processes at SSC San Diego.

"Process will always affect Project Performance!"
--- P. Lewis, Project Planning, Scheduling and Control

"The quality of a software system is governed by the quality of the process used to develop it."
--- Watts Humphrey, Managing the Software Process

This is an official U.S. Navy web site.
This US Government system is subject to monitoring.

The SSC San Diego Process Asset Library is a sub-web of the Space and Naval Warfare Systems Center San Diego public Web site, which can be accessed by clicking the SSC San Diego link above. To return here, click on About SSC San Diego and then

Navigation links: SSC San Diego SW-CMM Level 3, U.S. Navy, Navy Recruiting, Freedom of Information Act, SPAWAR Headquarters, SSC San Diego, SSC San Diego FOIA, Privacy Policy, Privacy Advisory, External Links Notice, Webmaster Contact Info, DoD Web Policies And Guidelines

*Systems Engineering Process Office*

- <u>**Project Planning Process**</u>
- <u>**Project Management Plan**</u>
- <u>**Tracking Procedure**</u>
  - **Weekly highlights and labor metrics (shared with all team members)**
- **Configuration Management Process**
- <u>**Meeting Procedure**</u>
- **Quality Assurance Plan**
- **Peer Review Process**
- **Risk Management Process**
- <u>**Training Process**</u>

# Project Planning at SEPO

- **A Project Management Plan (PMP) is used to plan and track tasking (PMP for the SSC San Diego PI Initiative )**
  - **Requirements are gathered using "Work Request" and Document Change Request (DCR) databases**
    - » **"Work Requests" are requests for tasking to be performed by SEPO (e.g new processes; new training courses)**
    - » **Requests can come from the Dept SEPGs, management, projects, and appraisal findings**
    - » **Document Change Requests (DCRs) are requests to fix defects in existing process assets**
  - **Plan is updated at least once a year and as part of re-planning efforts**
  - **MS Project file is created each year**
  - **Procedures are defined for accomplishing work**
  - **Tracking is done using weekly reports and earned value scheme**

- **Work Request and DCR DB are reviewed and priority items are added to plan**

- **Training needs analysis conducted**

- **Individuals are assigned tasking**

- **Team members estimate tasking for the year**

- **Estimates are reviewed**

- **Tasks are reprioritized based on resource availability, some tasks are deferred if resources are over-allocated**
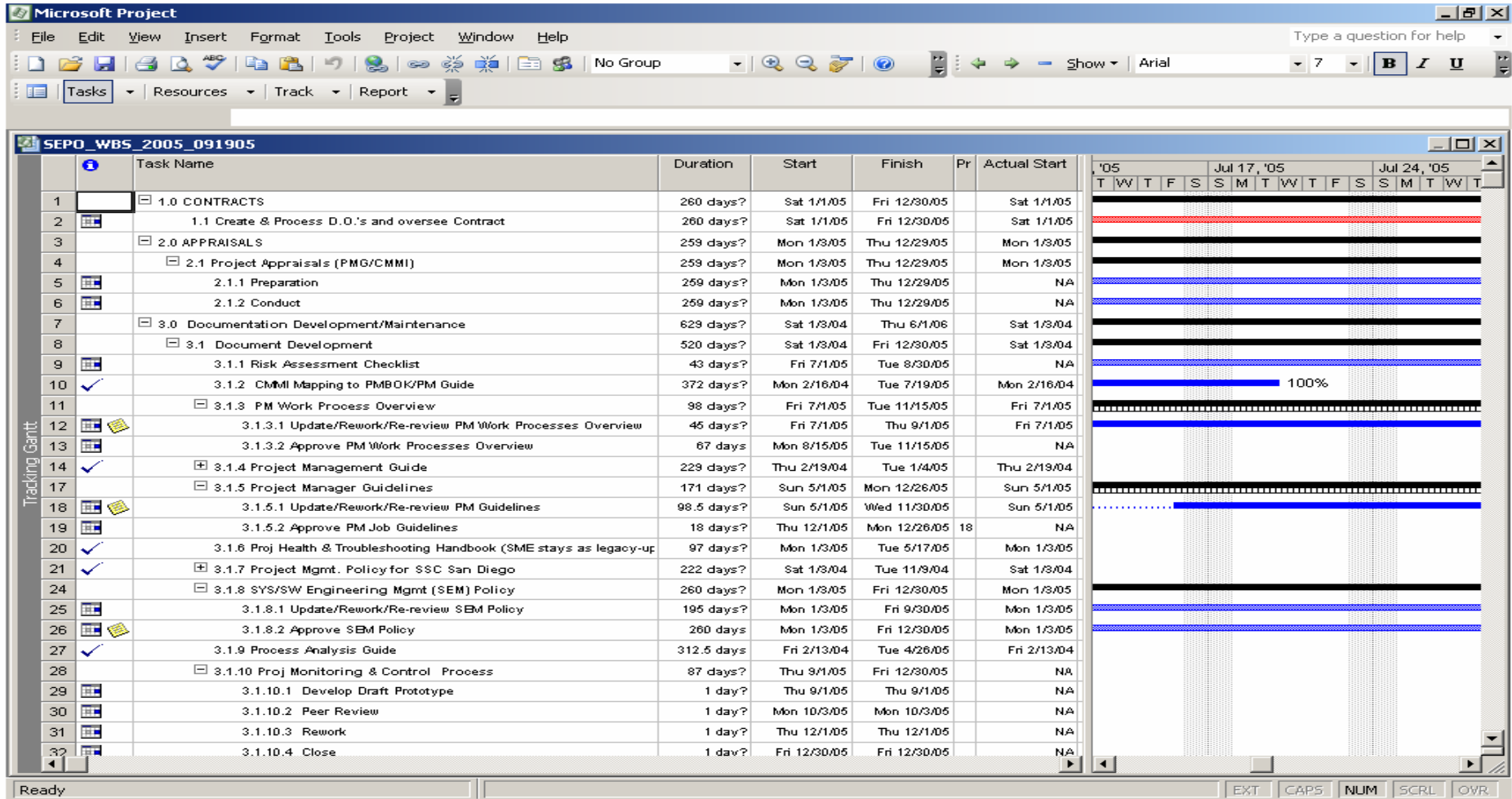
- **Mid-year re-planning conducted**

# SEPO Monitoring and Control

- **Use SEPO WBS to track actual effort**
- **Use a fourth level WBS to capture amount spent on products / services provided and rework**
- **Review data periodically:**
  - **Task completion**
  - **Identify scope creep**
  - **Manage risks**



| | A | B | C | D | R | S | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Name/Reporting Period: | | | | Stamnas Aug 29 – Sept 1, 2005 | | | | | | | |
| 2 | | Original Estimates | Actuals | 2005 Re-Estimates | 2005 Cuml | M | T | W | TH | F | Total | 2005 Cuml |
| 3 | SEPO WBS Hour Totals: | 2175.0 | 1302.0 | 896.0 | 1391.0 | 10.0 | 10.5 | 10.0 | 9.0 | 0.0 | 39.5 | 1430.5 |
| 10 | 3.0 DOCUMENTATION DEVELOPMENT/MAINTENANCE | 444.0 | 313.0 | 159.0 | 323.5 | 0.0 | 2.5 | 3.0 | 9.0 | 0.0 | 14.5 | 338.0 |
| 11 | 3.1 Document Development | 324.0 | 153.5 | 133.0 | 156.0 | 0.0 | 1.5 | 3.0 | 8.0 | 0.0 | 12.5 | 168.5 |
| 12 | 3.1.1 Risk Assessment Checklist | | 4.0 | 0.0 | 4.0 | | | | | | 0.0 | 4.0 |
| 13 | 3.1.2 CMMI Mapping to PM Guide (Completed) | 40.0 | 25.0 | 0.0 | 25.0 | | | | | | 0.0 | 25.0 |
| 14 | 3.1.3 PM Work Process Overview | 13.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 15 | 3.1.3.1 Update/Rework/Re-review PM Work Process Overview | 10.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 16 | 3.1.3.2 Approve PM Work Process Overview | 3.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 17 | 3.1.4 Project Mgmt Guide (Completed) | 35.0 | 12.5 | 0.0 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.5 |
| 18 | 3.1.4.1 Update/Rework/Re-review PM Guide | 30.0 | 12.5 | | 12.5 | | | | | | 0.0 | 12.5 |
| 19 | 3.1.4.2 Approve PM Guide | 5.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 20 | 3.1.5 Project Mgr Guidelines | 13.0 | 2.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 |
| 21 | 3.1.5.1 Update/Rework/Re-review PM Guidelines | 8.0 | 2.0 | | 2.0 | | | | | | 0.0 | 2.0 |
| 22 | 3.1.5.2 Approve PM Guidelines | 5.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 23 | 3.1.6 Project Health & Troubleshooting Handbook (Completed) (SME stays as legacy - update sections 1&2 as companion to PMG, etc) | 100.0 | 42.5 | | 42.5 | | | | | | 0.0 | 42.5 |
| 24 | 3.1.7 Project Mgmt Policy for SSC San Diego (Completed) | 9.0 | 1.5 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 |
| 25 | 3.1.7.1 Update/Rework/Re-review PM Policy | 4.0 | 1.5 | | 1.5 | | | | | | 0.0 | 1.5 |
| 26 | 3.1.7.2 Approve PM Policy | 5.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 27 | 3.1.8 SYS/SW Engineering Mgmt (SEM) Policy | 15.0 | 35.0 | 30.0 | 35.0 | 0.0 | 0.0 | 3.0 | 8.0 | 0.0 | 11.0 | 46.0 |
| 28 | 3.1.8.1 Update/Rework/Re-review SEM Policy | 10.0 | 35.0 | 20.0 | 35.0 | | | | | | 0.0 | 35.0 |
| 29 | 3.1.8.2 Approve SEM Policy | 5.0 | | 10.0 | 0.0 | | | 3.0 | 8.0 | | 11.0 | 11.0 |
| 30 | 3.1.9 Process Analysis Guide (Completed) | 3.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 31 | 3.1.10 Proj Monitoring & Control Process | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 32 | 3.1.10.1 Develop Draft Prototype | 5.0 | | | 0.0 | | | | | | 0.0 | 0.0 |
| 33 | 3.1.10.2 Peer Review | | | | 0.0 | | | | | | 0.0 | 0.0 |
| 34 | 3.1.10.3 Rework | | | | 0.0 | | | | | | 0.0 | 0.0 |
| 35 | 3.1.10.4 Close | | | | 0.0 | | | | | | 0.0 | 0.0 |
| 36 | 3.1.11 MS Proj Template for PMG | 3.0 | 2.0 | 0.0 | 2.0 | | | | | | 0.0 | 2.0 |
| 37 | 3.1.12 MS Proj Template for RBC | 3.0 | 2.0 | 0.0 | 2.0 | | | | | | 0.0 | 2.0 |
| 38 | 3.1.13 CMMI PI03 Matrices | 20.0 | 2.0 | 0.0 | 0.0 | | | | | | 0.0 | 0.0 |

SEPO WBS Hrs 15 Aug-31 Dec 05 / 2005 Orig Estimates / 2005 Act

# SEPO MS Project File

Microsoft Project — SEPO_WBS_2005_091905

| | ⓘ | Task Name | Duration | Start | Finish | Pr | Actual Start |
|---|---|---|---|---|---|---|---|
| 1 | | ⊟ 1.0 CONTRACTS | 260 days? | Sat 1/1/05 | Fri 12/30/05 | | Sat 1/1/05 |
| 2 | | 1.1 Create & Process D.O.'s and oversee Contract | 260 days? | Sat 1/1/05 | Fri 12/30/05 | | Sat 1/1/05 |
| 3 | | ⊟ 2.0 APPRAISALS | 259 days? | Mon 1/3/05 | Thu 12/29/05 | | Mon 1/3/05 |
| 4 | | ⊟ 2.1 Project Appraisals (PMG/CMMI) | 259 days? | Mon 1/3/05 | Thu 12/29/05 | | Mon 1/3/05 |
| 5 | | 2.1.1 Preparation | 259 days? | Mon 1/3/05 | Thu 12/29/05 | | NA |
| 6 | | 2.1.2 Conduct | 259 days? | Mon 1/3/05 | Thu 12/29/05 | | NA |
| 7 | | ⊟ 3.0 Documentation Development/Maintenance | 629 days? | Sat 1/3/04 | Thu 6/1/06 | | Sat 1/3/04 |
| 8 | | ⊟ 3.1 Document Development | 520 days? | Sat 1/3/04 | Fri 12/30/05 | | Sat 1/3/04 |
| 9 | | 3.1.1 Risk Assessment Checklist | 43 days? | Fri 7/1/05 | Tue 8/30/05 | | NA |
| 10 | ✓ | 3.1.2 CMMI Mapping to PMBOK/PM Guide | 372 days? | Mon 2/16/04 | Tue 7/19/05 | | Mon 2/16/04 |
| 11 | | ⊟ 3.1.3 PM Work Process Overview | 98 days? | Fri 7/1/05 | Tue 11/15/05 | | Fri 7/1/05 |
| 12 | | 3.1.3.1 Update/Rework/Re-review PM Work Processes Overview | 45 days? | Fri 7/1/05 | Thu 9/1/05 | | Fri 7/1/05 |
| 13 | | 3.1.3.2 Approve PM Work Processes Overview | 67 days | Mon 8/15/05 | Tue 11/15/05 | | NA |
| 14 | ✓ | ⊞ 3.1.4 Project Management Guide | 229 days? | Thu 2/19/04 | Tue 1/4/05 | | Thu 2/19/04 |
| 17 | | ⊟ 3.1.5 Project Manager Guidelines | 171 days? | Sun 5/1/05 | Mon 12/26/05 | | Sun 5/1/05 |
| 18 | | 3.1.5.1 Update/Rework/Re-review PM Guidelines | 98.5 days? | Sun 5/1/05 | Wed 11/30/05 | | Sun 5/1/05 |
| 19 | | 3.1.5.2 Approve PM Job Guidelines | 18 days? | Thu 12/1/05 | Mon 12/26/05 | 18 | NA |
| 20 | ✓ | 3.1.6 Proj Health & Troubleshooting Handbook (SME stays as legacy-up | 97 days? | Mon 1/3/05 | Tue 5/17/05 | | Mon 1/3/05 |
| 21 | ✓ | ⊞ 3.1.7 Project Mgmt. Policy for SSC San Diego | 222 days? | Sat 1/3/04 | Tue 11/9/04 | | Sat 1/3/04 |
| 24 | | ⊟ 3.1.8 SYS/SW Engineering Mgmt (SEM) Policy | 260 days? | Mon 1/3/05 | Fri 12/30/05 | | Mon 1/3/05 |
| 25 | | 3.1.8.1 Update/Rework/Re-review SEM Policy | 195 days? | Mon 1/3/05 | Fri 9/30/05 | | Mon 1/3/05 |
| 26 | | 3.1.8.2 Approve SEM Policy | 260 days | Mon 1/3/05 | Fri 12/30/05 | | Mon 1/3/05 |
| 27 | ✓ | 3.1.9 Process Analysis Guide | 312.5 days | Fri 2/13/04 | Tue 4/26/05 | | Fri 2/13/04 |
| 28 | | ⊟ 3.1.10 Proj Monitoring & Control Process | 87 days? | Thu 9/1/05 | Fri 12/30/05 | | NA |
| 29 | | 3.1.10.1 Develop Draft Prototype | 1 day? | Thu 9/1/05 | Thu 9/1/05 | | NA |
| 30 | | 3.1.10.2 Peer Review | 1 day? | Mon 10/3/05 | Mon 10/3/05 | | NA |
| 31 | | 3.1.10.3 Rework | 1 day? | Thu 12/1/05 | Thu 12/1/05 | | NA |
| 32 | | 3.1.10.4 Close | 1 day? | Fri 12/30/05 | Fri 12/30/05 | | NA |

Ready

# Earned Value Tracking Scheme

**Earned Value for SEPO Documentation**

| | |
|---|---|
| **Rough Draft** | **50% Earned Value** |
| **Ready for Peer Review** | **25% Earned Value** |
| **Baselined** | **25% Earned Value** |

**Earned Value for SEPO Training Course Development (See Appendix C of the SEPO Training Process)**

| | |
|---|---|
| **Determine Course Rqmts** | **20% Earned Value** |
| **Create Course Design** | **20% Earned Value** |
| **Develop Course** | **20% Earned Value** |
| **Pilot Presentations** | **20% Earned Value** |
| **Revise Course** | **20% Earned Value** |

**Earned Value for Development Efforts**

| | |
|---|---|
| **Requirements Defined** | **15% Earned Value** |
| **Design** | **20% Earned Value** |
| **Implementation** | **25% Earned Value** |
| **Test** | **15% Earned Value** |
| **Ready for Peer Review** | **10% Earned Value** |
| **Baselined** | **15% Earned Value** |

**Other (Non-LOE) Tasks**

| | |
|---|---|
| **Started** | **50% Earned Value** |
| **Completed** | **50% Earned Value** |

# Meetings

- **SPI Agent Meetings (twice a month) (SEPO Team Members and SPI Agents)**
  - **Share lessons learned, best practices, review plans and status**
- **SEPO Team Meetings (weekly)**
  - **Task status**
  - **Planning**
  - **Configuration Control Board (CCB)**
- **SEPO Parallel Organization Meetings (monthly)**
  - **Strategic planning**
  - **Risk management**
  - **Objective view of SEPO**
    - » **Are we doing the right things, the right way?**
    - » **Can we be doing things better?**
- **One-on-one meetings with individual SEPO members and SPI Agents**
  - **Review tasking**
  - **Give and receive feedback**

*\* All meetings have written format, agendas, minutes, and action items*

*Systems Engineering Process Office*

# SEPO Team Meeting Format

**PURPOSE - The purpose of the SEPO team meetings is to plan and review SEPO tasking**

**GOALS - The goals of the SEPO team meetings are listed below:**

- **Share information and lessons learned on process improvement**
- **Review the status of current tasking**
- **Discuss special topics of interest**
- **Plan future SEPO tasking**
- **Discuss/resolve issues related to SEPO/process improvement**
- **Conduct SEPO Configuration Control Board (CCB) meeting, if scheduled**

**SCHEDULE – SEPO team meetings will be held every Tuesday from 1000-1200 at SEPO**

**STANDARD AGENDA:**

- **Assign recorder (in alphabetical order by last name) and facilitator**
- **Go-Arounds (include announcements, issues, and current tasks as well as any new tasks that are about to begin; 20 min max)**
- **Code 202 Staff meeting report**
- **Conduct CCB, if scheduled**
- **Main Topic**
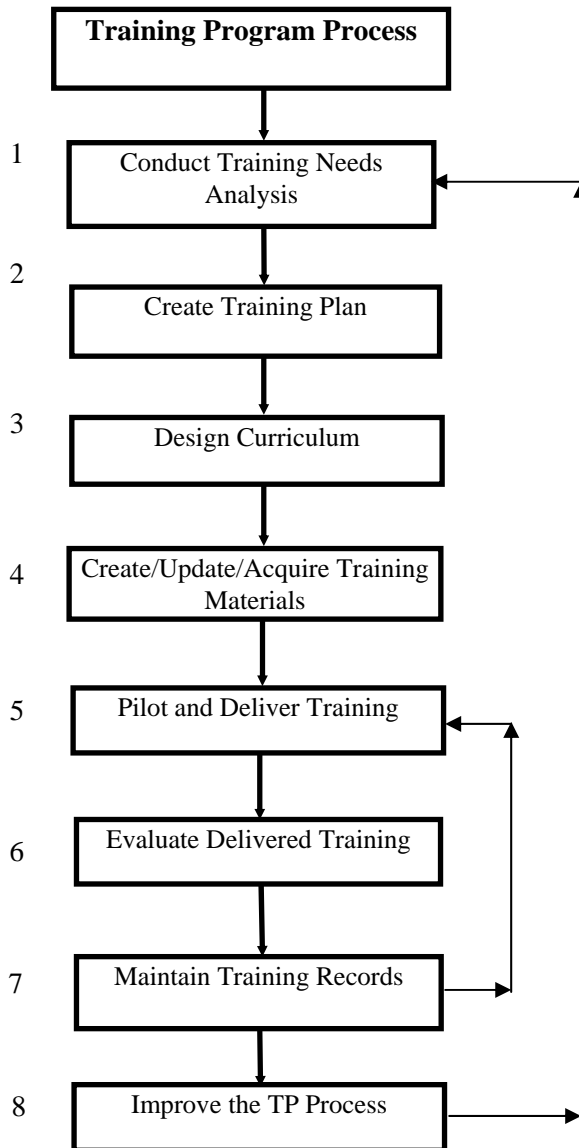- **Review SEPO WBS Tracking Report (periodically)**
- **Determine next meeting topic**
- **Review Action Items and meeting minutes from previous meeting; review new action items**
- **Schedule next one-on-one meeting (in alphabetical order by last name)**
- **Meeting evaluation**

# SEPO Training Process

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                    ┌─────────────────────────────┐
                    │  Training Program Process   │
                    └─────────────────────────────┘
                                  │
                                  ▼
   1            ┌─────────────────────────────┐
                │   Conduct Training Needs    │◄──────────┐
                │         Analysis            │           │
                └─────────────────────────────┘           │
                                  │                        │
                                  ▼                        │
   2            ┌─────────────────────────────┐           │
                │     Create Training Plan    │           │
                └─────────────────────────────┘           │
                                  │                        │
                                  ▼                        │
   3            ┌─────────────────────────────┐           │
                │      Design Curriculum      │           │
                └─────────────────────────────┘           │
                                  │                        │
                                  ▼                        │
   4            ┌─────────────────────────────┐           │
                │ Create/Update/Acquire Training │        │
                │          Materials          │           │
                └─────────────────────────────┘           │
                                  │                        │
                                  ▼                        │
   5            ┌─────────────────────────────┐           │
                │    Pilot and Deliver Training │◄──────┐ │
                └─────────────────────────────┘         │ │
                                  │                      │ │
                                  ▼                      │ │
   6            ┌─────────────────────────────┐         │ │
                │  Evaluate Delivered Training │         │ │
                └─────────────────────────────┘         │ │
                                  │                      │ │
                                  ▼                      │ │
   7            ┌─────────────────────────────┐         │ │
                │   Maintain Training Records │─────────┘ │
                └─────────────────────────────┘           │
                                  │                        │
                                  ▼                        │
   8            ┌─────────────────────────────┐           │
                │     Improve the TP Process  │───────────┘
                └─────────────────────────────┘
```

*Systems Engineering Process Office*

# SEPO Training Process (2)

- **Training needs analysis**
- **Training course standards**
- **Configuration Management of training course material**
- **Training database**
- **Course checklists**
- **Train-the-Trainer instructor workshop; instructor evaluation forms**

# Lessons Learned

- **Run the SEPG like a project team (you've heard that before!)**

- **Use the best practices from the CMMI to plan and manage the SEPG's work efforts**
  - **Using CMMI best practices helps the SEPG members to understand the model better and become better consultants to projects in the organization**
  - **SEPG's need to demonstrate that they can follow the same processes they are advocating that others follow (we need to eat our own dog food, so to speak)**

- **Encourage teamwork and collaboration within the SEPG**
  - **Teamwork is critical to success**

- **Running an SEPG is just like running a project**
  - **Plans need to be documented and tracked**
  - **Estimates need to be made**
  - **Risks are documented and tracked**
  - **SEPG members are managed**

- **Using best practices can help ensure the success of the SEPG**

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- **C4ISR: Command, Control, Communication, and Computers, Intelligence, Surveillance, and Reconnaissance**
- **CMMI: Capability Maturity Model Integration**
- **DCR: Document Change Request**
- **FTE: Full Time Equivalent**
- **PAL: Process Asset Library**
- **PMP: Project Management Plan**
- **RDT&E: Research, Development, Test, and Evaluation**
- **ROI: Return on Investment**
- **SEPG: Software Engineering Process Group**
- **SPI: Systems/Software Process Improvement**
- **SEPO: Systems Engineering Process Office**
- **SPIWG: Systems Process Improvement Working Group**
- **SSC San Diego: Space and Naval Warfare Systems Center, San Diego**
- **SW-CMM: Capability Maturity Model for Software**