



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY
ACQUISITION LOGISTICS AND TECHNOLOGY
103 ARMY PENTAGON
WASHINGTON D.C. 20310-0103

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MEMORANDUM FOR PROGRAM EXECUTIVE OFFICERS
DIRECT REPORTING PROJECT MANAGERS

SUBJECT: Army Systems Engineering Policy

The Under Secretary of Defense for Acquisition, Technology and Logistics issued policy to reinvigorate systems engineering within the Department of Defense. Guidance for implementing systems engineering across Army Acquisition, Logistics and Technology is enclosed.

The Assistant Deputy for Acquisition and Systems Management, Office of the Assistant Secretary of the Army for Acquisition, Logistics and Technology, will chair an Army Systems Engineering Forum (ASEF) that is chartered to institutionalize effective systems engineering practices across our workforce and programs, and to promote collaboration across our requirements, acquisition, logistics, and testing communities. Each Program Executive Officer and Direct Reporting Program Manager is to designate a Chief System Engineer to participate on the ASEF. I expect the ASEF to plan, coordinate, manage, and execute initiatives for the resurgence of effective systems engineering, balancing programmatic cost, schedule, and supportability with technical reality. Within two weeks, please provide the name of your Chief System Engineer to Dr. James Linnehan, SAAL-SSI, (703) 604-7430, or e-mail: james.linnehan@saalt.army.mil.

Systems engineering excellence can integrate all elements of our U.S. Army community into a process driven disciplined team, producing timely, affordable, high quality products meeting the needs of our warfighters. I look forward to working with you to make this vision a reality and compelling success.


Claude M. Bolton, Jr.

Assistant Secretary of the Army
(Acquisition, Logistics and Technology)

Enclosure

CF:
USD(AT&L)
CG, AMC
CG, TRADOC

Systems Engineering Practice and Implementation

The Assistant Secretary of the Army (Acquisition, Logistics, and Technology)

Each defense acquisition program must, as a minimum, comply with DoDI 5000.2, USD(AT&L) memo, Policy for Systems Engineering in DoD, dated 20 Feb 04, and USD(AT&L) memo, Policy Addendum for Systems Engineering, dated 22 Oct 04.

Regardless of acquisition category, all programs shall develop and follow a Systems Engineering Plan (SEP) to execute and manage a disciplined system engineering process supporting the acquisition strategy adopted by the program. An evolutionary acquisition strategy is preferred. Systems engineering (SE) shall be the technical basis shaping the cost, schedule, supportability, and performance objectives for the acquisition program, and SE processes shall be integrated into the practices and processes followed by the acquisition program management office (PMO) and contractors. Recognizing the criticality of software to all acquisition programs and operational capabilities, software acquisition risks, processes and products shall be highlighted and addressed as a distinct entity within systems engineering.

Effective SE practices must be integrated into and support, as a minimum, the following PMO key process areas:

- Requirements Development and Management
- Project Technical Planning
- Project Technical Monitoring and Control
- Integrated Project and Team Management
- Measurement and Analysis
- Process and Product Quality Assurance
- Configuration Management
- Risk Management
- Solicitation and Contract Monitoring
- Transition to Operations and Support
- Product Validation (Test and Evaluation)
- Product Verification (Track to Requirements)
- Product Integration
- Supportability, planning, analysis, and tradeoffs

Responsibilities

- Approval authority for the SEP is delegated to the Program Executive Officer. The PEO can delegate SEP approval for programs for which the PEO is also the Milestone Decision Authority. The SEP is required to support Milestone A, B, and C, and whenever a significant program restructure or breach to the Acquisition Program Baseline (APB) occurs.
- Program Executive Officers (PEOs) are responsible for oversight of SE practices and processes. PEOs shall appoint a Chief System Engineer for oversight and evaluation of SE practices and products, including software engineering practices and products, across the PEO's areas of responsibility. The Chief System Engineer shall review and recommend approval of SEPs and shall provide technical oversight and guidance to system and software engineers on all programs. At the discretion of the PEO, a Chief Software Architect, subordinate to the Chief System Engineer, will be designated for programs where software size, complexity, and/or cost are major risks.
- PEOs are responsible for reconciliation of interoperability requirements to include Family of System (FoS)/System of System (SoS) and joint requirements across subordinate programs and external programs and organizations. PEO's that are responsible for highly interdependent systems shall develop an overarching FoS/SoS SEP to guide and manage requisite integrated SE activities.
- Program Managers (PMs) are responsible for developing and implementing the SEP for their program. The PM shall appoint a Chief System Engineer, and a subordinate Chief Software Architect, if warranted, to guide and implement SE for the program.

Systems Engineering Plan (SEP)

As guidance in preparing the SEP, reference the current versions of the DoD Acquisition Guidebook and the USD(AT&L) SEP Preparation Guide at <http://www.acq.osd.mil/ds/se/publications.htm>.

Technical Approach

- **Process:** A disciplined systems engineering process shall be followed for all programs, regardless of acquisition phase, including pre-Milestone A programs. SE shall identify what must be accomplished at major events, and shall establish and maintain a technical baseline, to include a schedule of technical reviews and a list of corresponding systems engineering products. The technical baseline for the development phase of a program, for example, shall address – requirements, architecture, design, interfaces, fabrication, integration, supportability, test, and verification. As the system moves through production and deployment, SE is responsible for assuring that all production and field installation activities are properly authorized, recorded and consistent with system requirements. Software processes and products shall be integrated into the technical baseline. The SE process must provide control and management of requirements, including FoS/SoS requirements, and must leverage simulation based acquisition approaches to balance requirements across programs. Early in the program life cycle, SE shall implement effective cost-schedule-performance-supportability-risk tradeoff analyses to establish initial cost, supportability and performance targets. Systems engineering shall ensure that cost, support, and performance targets are tracked and updated as the program matures through the life cycle.
- **Resources:** Identify the Chief System Engineer, Chief Software Architect, and systems engineering staff requirements. Identify automated tools that support the SE process: track requirements, support configuration and risk management, testing, and verification. Identify test facilities and test resources that will support product development and acceptance. Ensure SE is integrated into the PEO, PMO and contractor Integrated Process Teams (IPTs) and hierarchy.
- **Metrics:** Describe the approach for implementing an effective measurement plan to include requirements, cost, schedule, complexity, supportability, reliability, test, and quality. Identify a Technical Performance Measurement System to provide integrated cost, schedule, supportability, and technical performance reporting for early warning indication. Identify measures targeted to FoS/SoS requirements, technology readiness and software. Relate metrics to the Army Program Probably of Success Metric. When appropriate, address SE process metrics to provide monitoring or appraisal of the developer's processes.
- **Incentives:** Identify cost, schedule, supportability, and performance incentives at the developer/supplier and PMO levels. Address incentives tied to life cycle phases – development, production, and operations/support.

Technical Reviews

- **Timing:** Technical reviews shall be event not schedule driven. Technical reviews are required in preparation for Milestone A, B and C and at key maturity points within the current acquisition phase. Technical reviews are used to ensure readiness to proceed into the next phase of development and ensure stakeholders' requirements are being met. Specific examples of key technical reviews include: system requirement reviews, preliminary and critical design reviews, software architecture assessments and reviews, test readiness reviews, ILS assessments/reviews, product acceptance reviews, and flight design reviews (when appropriate).
- **Conduct:** The PEO Chief System Engineer, PMO Chief System Engineer or a designee approved by the PM shall chair technical reviews. The chairperson shall determine the degree of participation in the technical reviews by subject matter experts independent of the program. System, specialty, and software engineers, as appropriate, shall participate. Findings of technical reviews are under the purview of the PM and PEO.
- **Success Criteria:** List entrance and exit criteria, and weighting factors for all technical reviews. Criteria shall include the quality and acceptance of systems engineering products tied to key maturity points.

Schedule and Update Requirements

- The PEO shall approve the SEP to support Milestone A, B and C. As approved by the PEO, the PM can tailor the contents of the SEP to the needs and complexity of the program, for example, ACAT III, legacy programs (update existing System Engineering Management Plan (SEMP), COTS-based programs, and for programs post Milestone C.
- The PM shall maintain currency of the SEP as the program matures. Results of technical reviews shall be documented and used to update the SEP as required.
- The SEP shall be revised whenever a breach to the Acquisition Program Baseline (APB) occurs or as a result of a program restructure affecting the acquisition or test strategies.