Sustainment Engineering Versus Systems Engineering Is There A Difference?

Karen B. Bausman
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USAF Center for Systems Engineering
937-255-3355 ext 3331
Karen.bausman@afit.edu

Overview

- Background
- What Is Sustainment Engineering?
- How Does Systems Engineering Compare?
- Are The Differences Substantial?
- Recommendations

Background

- Inconsistent Application of Systems Engineering (SE)
  - AFMC SE Focus Forum
  - NDIA Top SE Issues for OSD in 2004 and 2007
- Not Enough Experienced/Qualified SE Practitioners
- Sustainment Engineering Not Classified as Acquisition Professional
  - Can't Get DAU Classes
  - Perception that Systems Engineering Overly Focuses on Acquisition Phases
- Sustainment Engineering Being Defined As Something "Different"

What Is Sustainment Engineering?

- Establishment, Maintaining and Execution of Strategy and Planning for Transition to and for Operations and Support Phase
- Establishment, Maintaining and Execution of Strategy and Planning for Disposal Phase
- Establish and Maintain the Required Facilities, Manpower, Tooling and Test Equipment
- Establishment, Documentation, Training, Execution, Assessment and Improvement of Engineering Processes/Procedures Including Depot Functions
- Conduct of Technical Reviews – Transition/Technology Readiness, In-Service
- Establish and Maintain Baselines, Data, Inventory & Supplier Mgmt/Control

What Is Sustainment Engineering?

- Identification and Monitoring of Hazards, Critical Safety Items, Operations/Maintenance Product Health, Operational Suitability, Safety and Effectiveness (OSS&E)
- Analysis of Trend Data, Alternative Solutions to Support Decision Analysis
- Transition of Operational/Interface Requirements into Improvements in Performance through Modification /Technology Insertion Requirements
- Support of SPO Contracts including Failure/Discrepancy, Latent Errors, & DMS
- Re-engineering of Legacy System Performance Requirements & Design Data

How Does Systems Engineering Compare?

- Decision Analysis – Analysis of Product Health Data, Reliability, OSSE
- Technical Planning – Strategy and Plans for Transition to O&S, O&S and Disposal Phases
- Technical Assessment – Identification & Monitoring of Hazards, Risks, Critical Safety Items
- Requirements Management – Establishment of Modification Requirements, Technology Insertion Requirements
- Configuration Management – Maintain Inventory, Documentation, Supplier Management/Control
- Data Management – Management/Control/Update of Technical Orders, User Manuals
- Interface Management – Tracking of External Interfaces

How Does Systems Engr Compare?

- Stakeholders Requirements Definition - Transition of Operational/Interface Requirements
- Requirements Analysis – Support of SPO Contracts, DMS
- Architectural Design – Maintenance of Inventory, Technology Insertion, Support of SPO Contracts
- Implementation – DMS
- Integration – Modification Kits, Technology Insertions, DMS, Legacy System Improvements
- Verification – Kit Proofing, Failure/Discrepancy Reports, Latent Errors
- Validation – TO Validation, OT&E Support
- Transition – Planning & Execution of Transition Plans to O&S

How Do They Compare?

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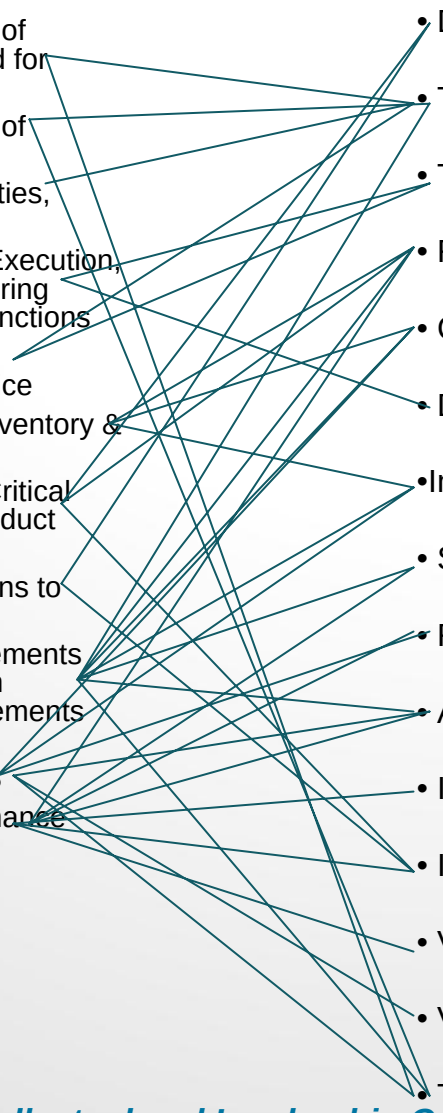

- Decision Analysis
- Technical Planning
- Technical Assessment
- Requirements Management
- Configuration Management
- Data Management
- Interface Management
- Stakeholders Requirements Definition*
- Requirements Analysis*
- Architectural Design*
- Implementation
- Integration
- Verification
- Validation
- Transition

* New DAG Names

Are the Differences Substantial?

- The Differences Can Be Compared to a New “View” of Systems Engineering – They are a Matter of Perspective and Understanding
  - Like the DoDAF “Views”
    - System, Technical or Operational
    - Need to Define a “Sustainment or Support” View
- Many Do Not Apply Systems Engineering in the Conduct of Sustainment Engineering
- Need Description or Picture of all Systems Engineering tasks Completed for or during Operations & Support
- This is not Substantial – It is a Knowledge Based Issue

Recommendations

- Need to Expand Defense Acquisition Guide to Include this new "Sustainment" View.
  - Add verbiage in each Technical and Technical Management Process description
  - Add tasks to be done in each phase of life cycle
  - Coordinate Design Considerations Applicable to Sustainment
- Incorporate Sustainment View in Training
- Produce Systems Engineering Guidance for Support Phase
  - Guidance for Re-engineering Legacy Systems
  - Added Emphasis on Interface Management