9097 - Acquisition ESOH Risk Management - How to Make It Work

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Purpose

- To describe how the DoD Acquisition Environment, Safety, and Occupational Health (ESOH) Risk Management (RM) process can work most effectively as part of the Systems Engineering process
- To highlight common elements of unsuccessful and successful ESOH RM processes

Background

- Many DoD Acquisition Program Offices have tried and not been very successful at implementing effective and efficient ESOH RM efforts, while some Program Offices have implemented programs have been successful
- Based on lessons learned from multiple program office experiences, there are some common elements of unsuccessful and successful ESOH RM efforts

How do you feel about your ESOH RM efforts?

Unsuccessful ESOH RM efforts

vs.

Successful ESOH RM efforts

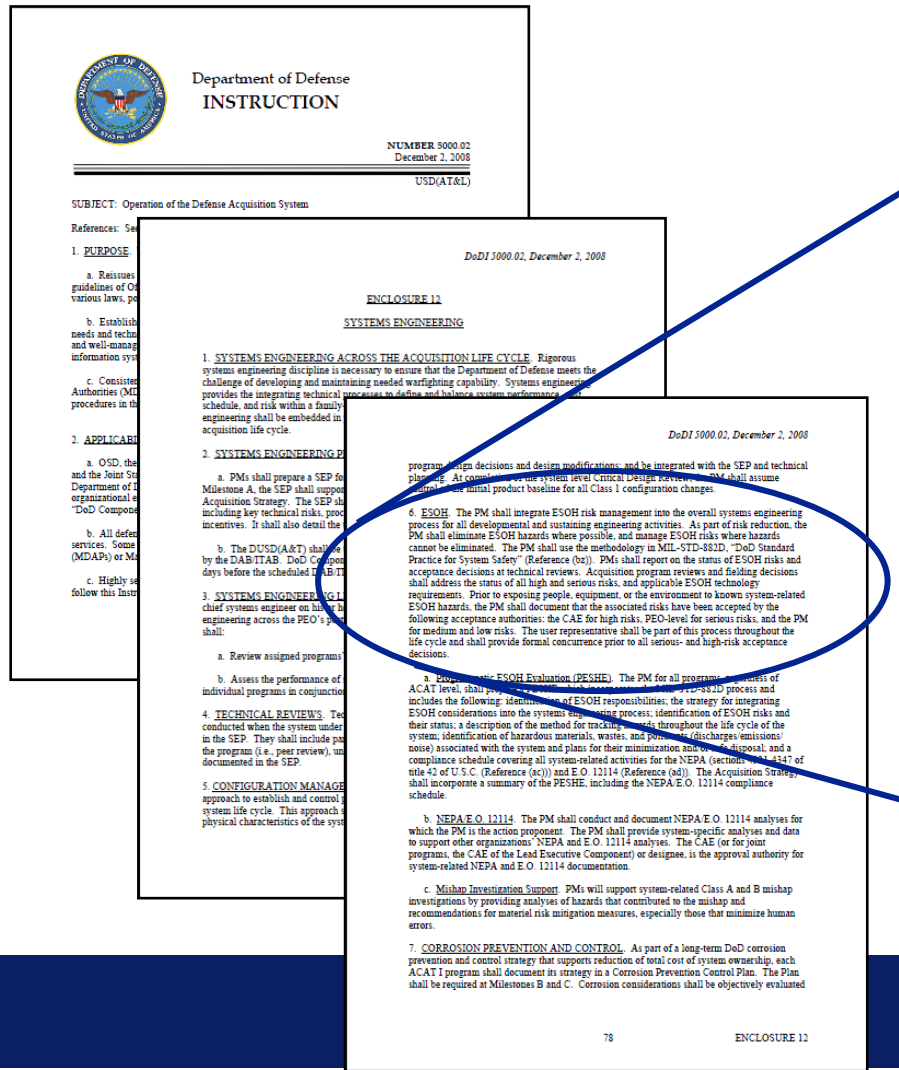
USD(AT&L) Policy Memorandums Related to ESOH

- Defense Acquisition System Safety, September 23, 2004
  - Use Standard Practice for System Safety, MIL-STD-882D to manage ESOH risk
  - Report ESOH risk status and acceptance decisions at technical and program reviews
- Reducing Preventable Accidents, November 21, 2006
  - Address status of each High and Serious ESOH risk and compliance with applicable safety technology requirements at all program reviews
- Defense Acquisition System Safety – ESOH Risk Acceptance, March 7, 2007
  - Formal acceptance of ESOH risks prior to exposing people, equipment, or the environment to a known system-related ESOH hazard
  - User Representative Formal Concurrence for High and Serious ESOH risks

These basic requirements have been in place for several years & incorporated into the new DoDI 5000.02

Requirements

- December 8, 2008 DoD Instruction (DoDI) 5000.02 defines the basic requirements for Acquisition Program Office ESOH RM to be part of the overall Systems Engineering process



Department of Defense
INSTRUCTION

NUMBER 5000.02
December 2, 2008
USD(AT&L)

SUBJECT: Operation of the Defense Acquisition System

DoDI 5000.02, December 2, 2008

ENCLOSURE 12

SYSTEMS ENGINEERING

1. SYSTEMS ENGINEERING ACROSS THE ACQUISITION LIFE CYCLE. Rigorous systems engineering discipline is necessary to ensure that the Department of Defense meets the challenge of developing and maintaining needed warfighting capability. Systems engineering provides the integrating technical processes to define and balance system performance, schedule, and risk within a family-of-systems, system-of-systems context. Systems engineering shall be embedded in acquisition life cycle.

2. SYSTEMS ENGINEERING P

a. PMs shall prepare a SEP fo Milestone A, the SEP shall suppo Acquisition Strategy. The SEP sh including key technical risks, proc incentives. It shall also detail the

b. The DUSD(A&T) shall by the DAB/TTAB. DoD Compon days before the scheduled DAB/TT

3. SYSTEMS ENGINEERING L chief systems engineer on his/her h engineering across the PEO's p shall:

a. Review assigned programs

b. Assess the performance of individual programs in conjunctio

4. TECHNICAL REVIEWS. Tec conducted when the system under in the SEP. They shall include pa the program (i.e., peer review), un documented in the SEP.

5. CONFIGURATION MANAGE approach to establish and control system life cycle. This approach physical characteristics of the sys

DoDI 5000.02, December 2, 2008

program design decisions and design modifications, and be integrated with the SEP and technical plans. At completion of the system level Critical Design Review, PM shall assume control of the initial product baseline for all Class 1 configuration changes.

6. ESOH. The PM shall integrate ESOH risk management into the overall systems engineering process for all developmental and sustaining engineering activities. As part of risk reduction, the PM shall eliminate ESOH hazards where possible, and manage ESOH risks where hazards cannot be eliminated. The PM shall use the methodology in MIL-STD-882D, "DoD Standard Practice for System Safety" (Reference (bz)). PMs shall report on the status of ESOH risks and acceptance decisions at technical reviews. Acquisition program reviews and fielding decisions shall address the status of all high and serious risks, and applicable ESOH technology requirements. Prior to exposing people, equipment, or the environment to known system-related ESOH hazards, the PM shall document that the associated risks have been accepted by the following acceptance authorities: the CAE for high risks, PEO-level for serious risks, and the PM for medium and low risks. The user representative shall be part of this process throughout the life cycle and shall provide formal concurrence prior to all serious- and high-risk acceptance decisions.

a. Programmatic ESOH Evaluation (PESHE). The PM for all programs [illegible] class of ACAT level, shall prepare a PESHE that documents the MIL-STD-882D process and includes the following: identification of ESOH responsibilities; the strategy for integrating ESOH considerations into the systems engineering process; identification of ESOH risks and their status; a description of the method for tracking hazards throughout the life cycle of the system; identification of hazardous materials, wastes, and [illegible] (discharges/emissions/noise) associated with the system and plans for their minimization and [illegible] disposal; and a compliance schedule covering all system-related activities for the NEPA (sections [illegible]4347 of title 42 of U.S.C. (Reference (ac))) and E.O. 12114 (Reference (ad)). The Acquisition Strategy shall incorporate a summary of the PESHE, including the NEPA/E.O. 12114 compliance schedule.

b. NEPA/E.O. 12114. The PM shall conduct and document NEPA/E.O. 12114 analyses for which the PM is the action proponent. The PM shall provide system-specific analyses and data to support other organizations' NEPA and E.O. 12114 analyses. The CAE (or for joint programs, the CAE of the Lead Executive Component) or designee, is the approval authority for system-related NEPA and E.O. 12114 documentation.

c. Mishap Investigation Support. PMs will support system-related Class A and B mishap investigations by providing analyses of hazards that contributed to the mishap and recommendations for materiel risk mitigation measures, especially those that minimize human errors.

7. CORROSION PREVENTION AND CONTROL. As part of a long-term DoD corrosion prevention and control strategy that supports reduction of total cost of system ownership, each ACAT I program shall document its strategy in a Corrosion Prevention Control Plan. The Plan shall be required at Milestones B and C. Corrosion considerations shall be objectively evaluated

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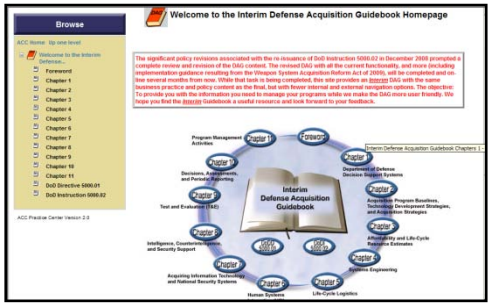
DoDI 5000.02, Enclosure 12

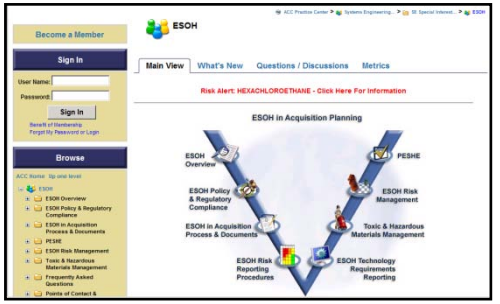
Guidance for ESOH / SE Integration

- DoD Defense Acquisition Guidebook (DAG)
  - Provides detailed guidance on how DoD expects Acquisition Program Offices to meet the ESOH RM requirements defined in DoDI 5000.02
  - **https://acc.dau.mil/dag**



- ESOH In Acquisition – Integrating ESOH into Systems Engineering
  - Depicts when ESOH activities should be performed to influence system design throughout SE process
  - Includes the ESOH Management Evaluation Criteria published by DDR&E and DUSD(I&E)

- Acquisition Community Connection (ACC)
  - Provides best practices on how to integrate ESOH considerations into the systems engineering and acquisition processes
  - **https://acc.dau.mil/esoh**



Common Elements of Unsuccessful ESOH RM Efforts

- Disconnect between ESOH Analysis and Design Activities
  - Difficult to implement ESOH recommendations for completed SE work products
  - ESOH recommendations will meet resistance and typically have limited success
  - Failure to follow through on recommendations and to work to viable mitigation solutions with Design Activities and the User Community
  - Failure of E, S, and OH Subject Matter Experts to work closely together with SE
    - » E, S, and OH provide conflicting program recommendations on same issues
    - » SSWG focused only on Safety; EWG focused only on Pollution Prevention
  - Failure to have E & OH Representatives as part of the ESOH effort
  - Trying to communicate a major design change to reduce ESOH risk at the wrong time could cost the program significant schedule and budget – obviously this will not be well-received

Common Elements of Unsuccessful ESOH RM Efforts (cont)

- ESOH Personnel are viewed by Management and Engineering as road blocks, not team members
- While the amount of resources applied to the ESOH RM efforts will have an impact on the quality of the outcomes, it is not the most critical factor
- Many large Acquisition Programs have allocated significant resources (funding and personnel) for ESOH RM
  - Can produce reduction of ESOH risks on the system despite organizational impediments
  - For example, large programs have been doing a good job at Hazardous Materials Management
  - However, utilizing substantial program funding for ESOH RM is not a sustainable approach

Common Elements of Successful ESOH RM Efforts

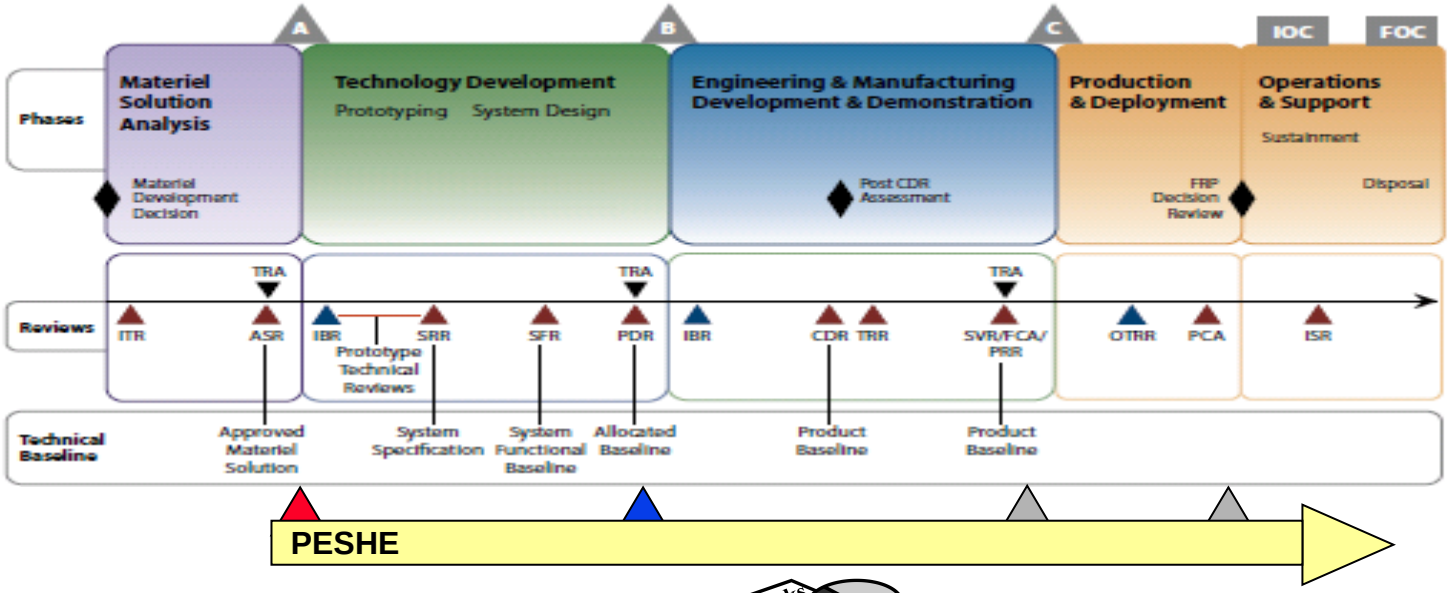
- An ESOH RM effort has to be part of and be able to influence the day-to-day decision making that occurs in the Systems Engineering process
  - Provide informative and timely ESOH inputs to Systems Engineering
    - » Direct line of communication to Systems Engineering, including Product/Engineering Integrated Product Team (IPTs)
    - » Daily ESOH communication via IPT meetings, phonecons, test logs
    - » Direct line of communication to test sites and/or end-users
  - E, S, and OH Subject Matter Experts work together to optimize recommendations across these functional areas
  - Implement closed-loop ESOH hazard tracking system, to include status of recommended mitigation measures
  - Integrate ESOH within Configuration Management Processes
    - » ECR/ECP reviews, technical document reviews, etc.
    - » Require ESOH review and approval for changes to be finalized
  - Participate in program and technical reviews (esp. PDR & CDR) to report risk and applicable ESOH technology status

Common Elements of Successful ESOH RM Efforts (cont)

- Program Manager and Chief Engineer are knowledgeable and understanding of ESOH efforts
  - PM and Chief Engineer views ESOH as team members and not as roadblocks
- The knowledge, skills, and abilities of the ESOH practitioners supporting a program can have a significant impact on the success of the Acquisition Program Office's ESOH RM efforts
  - ESOH practitioners need to be knowledgeable in their system, their system's operating environment, and also knowledgeable in applicable laws and regulations
- ESOH Professionals should have strong, in-depth knowledge of the ESOH risks AND potential mitigations
  - During IPT meetings and before/during design reviews, ESOH participation can provide expert feedback real-time to best influence design to reduce ESOH risk
  - During test site visits or end-user discussions, ESOH participation can receive real-time feedback on suggestions and/or concerns from those that work daily with the system to best influence design to reduce ESOH risk

Common Elements of Successful ESOH RM Efforts (cont)

- Programmatic ESOH Evaluation (PESHE): A living document that guides and documents identification and management of ESOH risks.
  - The ONLY DoD-required ESOH document!
  - Successful PESHEs document what the programs plans to do or is doing, is consistent with where the program is in the life cycle, and **does not** just restate policy



Starts as a planning document

Becomes an ESOH Risk Management Status Report

Conclusion

- If the ESOH team is removed from the Systems Engineering process, having a direct line to the Program Manager and/or having a large ESOH budget may not effectively influence design changes to mitigate ESOH risk
- If the ESOH RM efforts (resources and personnel) are a fully integrated part of the Systems Engineering team and efforts, then the likelihood of having a successful ESOH RM effort will be much higher than a better-resourced ESOH RM effort that is operating outside of the System Engineering process, even if it is reporting directly to the Program Manager
- Knowledgeable and experienced ESOH Professionals can effectively communicate ESOH risks and mitigations on a day-to-day basis within the Systems Engineering process to influence design changes and eliminate or reduce risk

Questions?

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