

Headquarters U.S. Air Force

Integrity - Service - Excellence



Systems Engineering -The Defense Acquisition System's Environmental Management System (EMS)

**Mr. Sherman Forbes
Office of the Deputy Assistant Secretary
(Science, Technology and Engineering)**



Overview

- **Environmental Management Systems (EMS)**
- **DoD Acquisition Systems Engineering (SE)**
- **SE – EMS Equivalency**



EMS -- Requirements

- **Executive Order (EO) 13148, *Greening the Government Through Leadership in Environmental Management*, 21 Apr 00**
 - Mandated EMS for all federal agencies
 - Required implementation by 31 Dec 05
 - **USD (AT&L) Memo, *DoD Environmental Management System*, 5 Apr 02**
 - Implemented EO 13148
 - Encouraged incorporating Safety and Health
-



EMS -- Requirements *cont'd*

- **DoD Directive 4715.1, *Environment, Safety, and Occupational Health (ESOH)*, 19 Mar 05**
 - **Requires ESOH management systems**
 - **Makes requirement applicable to acquisition, procurement, and logistics**
- **ISO 14001: 2004, *Environmental Management Systems -- Requirements with Guidance for Use*, 15 Nov 05**



EMS Elements

- **Document EMS approach**
 - **Identify activities for analysis**
 - **Identify their environmental aspects**
 - **Identify their environmental impacts**
 - **Evaluate significance in order to focus resources**
 - **“Control, manage, and improve” significant aspects**
 - **Management Reviews**
-



EMS - Issue for DoD Acquisition

- **Initial DoD Environmental perspective that each Acquisition Program Office had to have separate EMS**
 - **Concern -- separate, stand alone, duplicative management system within Program Offices focused on only one aspect of a system**
 - **DoD Acquisition ESOH IPT has countered that assertion with rationale for how DoD Acquisition SE satisfies EMS**
-



DoD Acquisition SE

■ Governing Documents

- **DoDD 5000.1, 12 May 03, *The Defense Acquisition System***
- **DoDI 5000.2, 12 May 03, *Operation of the Defense Acquisition System***
- **Defense Acquisition Guidebook, Oct 04**
- **DoD Policy Memo, 23 Sep 04, *Defense Acquisition System Safety***



DoD Acquisition SE

- **Translates capabilities into technical specifications**
 - **Optimizes total system performance**
 - **Minimizes total ownership cost**
 - **Employs interdisciplinary approach throughout life-cycle**
 - **Utilizes Risk Management to balance**
 - **External limitations**
 - **Design considerations**
-



SE - EMS Equivalency

- **Document EMS approach**
- **Identify activities for analysis**
- **Identify their environmental aspects**
- **Identify their environmental impacts**
- **Evaluate significance in order to focus resources**
- **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

- **Document EMS approach**
- Identify activities for analysis
- Identify their environmental aspects
- Identify their environmental impacts
- Evaluate significance in order to focus resources
- “Control, manage, and improve” significant aspects
- Management Reviews



SE - EMS Equivalency

- **Document EMS approach**
 - **Systems Engineering Plan (SEP)**
 - Reviewed & approved at MS A, B, C
 - Includes ESOH Integration Strategy
 - **Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE)**
 - Reviewed at MS B, C, FRP DR
 - Contains strategy, responsibilities, status of ESOH risk management, and measures for tracking progress



SE - EMS Equivalency

- ✓ **Document EMS approach**
- **Identify activities for analysis**
- Identify their environmental aspects
- Identify their environmental impacts
- Evaluate significance in order to focus resources
- “Control, manage, and improve” significant aspects
- Management Reviews



SE - EMS Equivalency

- **Identify activities for analysis – SE**
 - **DoD SE V-Model of SE steps in each phase of program's life cycle**
 - **Phase inputs**
 - **Analytical steps**
 - **Validations & verification testing**
 - **Technical Reviews**
 - **Phase outputs**
 - **Life cycle map for identifying activities for analysis for ESOH concerns**



SE - EMS Equivalency

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- **Identify their environmental aspects**
- **Identify their environmental impacts**
- **Evaluate significance in order to focus resources**
- **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

- **Identify their environmental aspects**
 - **SE uses MIL-STD-882D, *DoD Standard Practice for System Safety***
 - **Aspects = Hazards**
 - **Hazard identification is first step in ESOH hazard analysis -- PHL**
 - **Track and report hazard throughout system life cycle**



SE - EMS Equivalency

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- ✓ **Identify their environmental aspects**
- **Identify their environmental impacts**
- **Evaluate significance in order to focus resources**
- **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

- **Identify their environmental impacts**
 - **MIL-STD-882D**
 - **Impact = Mishap or undesired effect**
 - **Identify potential E, S, or OH mishaps resulting from hazards -- PHA**
 - **Document in hazard tracking system**
 - **Report on status in technical and program reviews**



SE - EMS Equivalency

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- ✓ **Identify their environmental aspects**
- ✓ **Identify their environmental impacts**
- **Evaluate significance in order to focus resources**
- **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

- **Evaluate significance in order to focus resources**
 - **MIL-STD-882D**
 - **Significance = Risk**
 - **Assess probability & severity that hazard will result in mishap -- PHA**
 - **Document in hazard tracking system**
 - **Report on status in technical and program reviews**



SE - EMS Equivalency

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- ✓ **Identify their environmental aspects**
- ✓ **Identify their environmental impacts**
- ✓ **Evaluate significance in order to focus resources**
- **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

- **“Control, manage, and improve” significant aspects**
 - **MIL-STD-882D**
 - Identify mitigation measures
 - Reduce risk to acceptable levels
 - Verify mishap risk reduction
 - **Integral part of design development trade studies/trade offs**
 - **Tracked and reported at technical and program reviews**



SE - EMS Equivalency

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- ✓ **Identify their environmental aspects**
- ✓ **Identify their environmental impacts**
- ✓ **Evaluate significance in order to focus resources**
- ✓ **“Control, manage, and improve” significant aspects**
- **Management Reviews**



SE - EMS Equivalency

■ Management Reviews

■ Report status at technical and program reviews and in PESHE

- 23 Sep 04 AT&L memo

- New memo in final coordination

■ Formal risk acceptance process

- High risk -- Component Acquisition Executive (CAE)

- Serious risks -- Program Executive Officer (PEO) level

- Medium & Low risks -- Program Manager (PM)



Summary

SE = Defense Acquisition's EMS

- ✓ **Document EMS approach**
- ✓ **Identify activities for analysis**
- ✓ **Identify their environmental aspects**
- ✓ **Identify their environmental impacts**
- ✓ **Evaluate significance in order to focus resources**
- ✓ **“Control, manage, and improve” significant aspects**
- ✓ **Management Reviews**



Questions?

