



# **16239 - Streamlining Systems Engineering ESOH Management & Documentation**

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# Purpose

- Highlight recent efforts by the Office of the Deputy Under Secretary of Defense (Installations and Environment) (ODUSD(I&E)) to streamline the acquisition Environment, Safety, and Occupational Health (ESOH) documentation by eliminating redundancy between
  - Systems Engineering Plan (SEP)
  - Programmatic Environment, Safety, and Occupational Health Evaluation (PESHE)
  - National Environmental Policy Act (NEPA)/Executive Order (EO) 12114 Compliance Schedule


***Place Program Office and program oversight focus on the data generated by implementing ESOH management planning***

# 2008 DoDI 5000.02 Enclosure 12, Systems Engineering, Section 12.6 Environment, Safety, and Occupational Health (ESOH) Requirements

- Integrate ESOH risk management into the overall systems engineering process for all developmental and sustaining engineering activities
- Eliminate hazards where possible, and manage ESOH risks where hazards cannot be eliminated
- Use methodology in MIL-STD-882E, “DoD Standard Practice System Safety”
- Report on the status of ESOH risks and acceptance decisions at technical reviews
- Address the status of all High and Serious ESOH risks at acquisition program reviews and fielding decisions
- Ensure appropriate management authority has accepted ESOH risks prior to exposing people, equipment, or the environment to known system-related hazards
- Include the user representative in the risk acceptance decision process
- Provide system-specific analyses and data to support other organizations’ NEPA/EO 12114 analyses
- Support system-related Class A and B mishap investigations
- Prepare and maintain a PESHE starting at Milestone (MS)-B
- Prepare and maintain NEPA/EO 12114 Compliance Schedule starting at MS-B

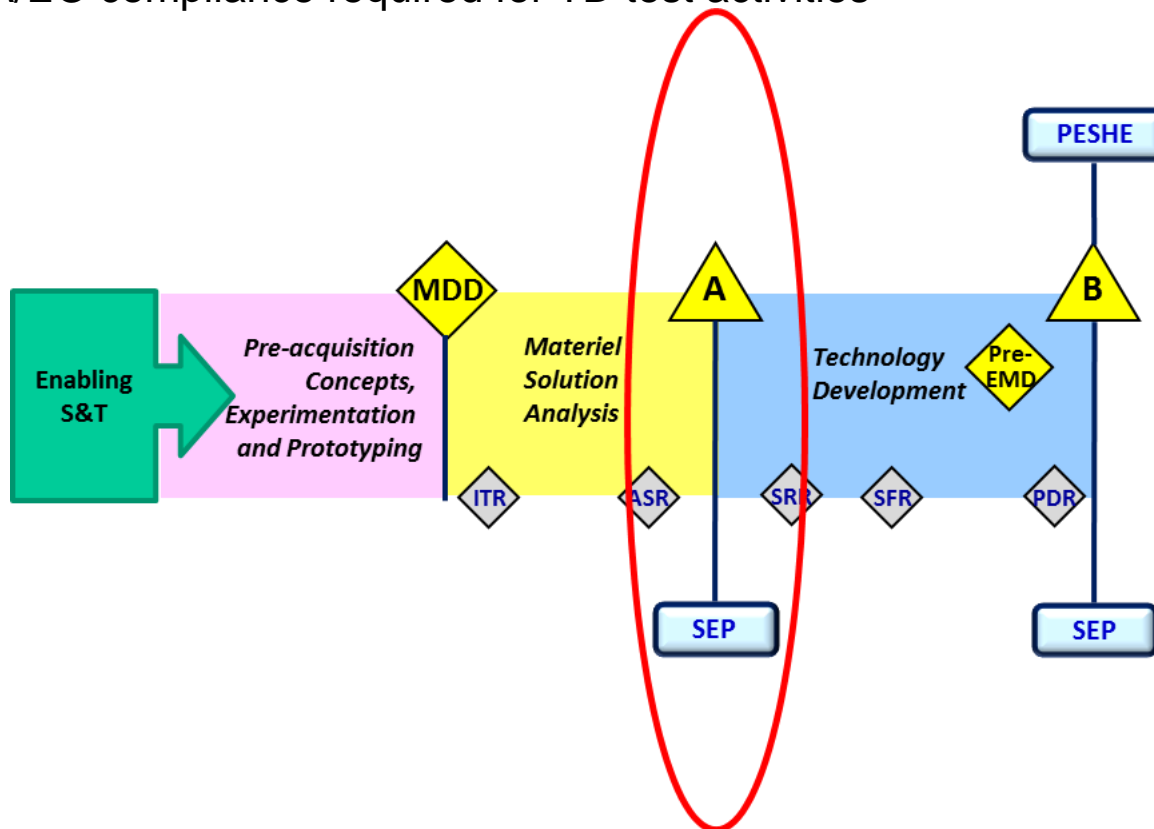
# 2009 Weapon Systems Acquisition Reform Act (WSARA) (DTM 09-027)

- Preliminary Design Reviews (PDRs) mandatory for all MDAPS prior to MS-B
  - A rule of thumb is that 10-25% of product drawings and associated instructions should be complete, and that 100 percent of all safety-critical component (Critical Safety Items and Critical Application Items) drawings are complete at PDR
- Technology Development Strategy (TDS) shall provide for prototypes of the system or, if a system prototype is not feasible, for prototypes of critical subsystems before MS-B approval.
  - Development and Test activities associated with these prototypes typically must comply with NEPA and EO 12114 requirements

 ACQUISITION TECHNOLOGY AND LOGISTICS	<p>THE UNDER SECRETARY OF DEFENSE 3010 DEFENSE PENTAGON WASHINGTON, DC 20301-3010</p> <p>DEC 04 2009</p> <p>MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS CHAIRMAN OF THE JOINT CHIEFS OF STAFF UNDER SECRETARIES OF DEFENSE DEPUTY CHIEF MANAGEMENT OFFICER ASSISTANT SECRETARIES OF DEFENSE GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE DIRECTOR, OPERATIONAL TEST AND EVALUATION DIRECTOR, COST ASSESSMENT AND PROGRAM EVALUATION INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE ASSISTANTS TO THE SECRETARY OF DEFENSE DIRECTOR, ADMINISTRATION AND MANAGEMENT DIRECTOR, NET ASSESSMENT DIRECTORS OF THE DEFENSE AGENCIES DIRECTORS OF THE DOD FIELD ACTIVITIES</p> <p>SUBJECT: Directive-Type Memorandum (DTM) 09-027 – Implementation of the Weapon Systems Acquisition Reform Act of 2009</p> <p>References: (a) Public Law 111-23, "Weapon Systems Acquisition Reform Act of 2009," May 22, 2009 (b) DoD Instruction 5000.02, "Operation of the Defense Acquisition System," December 8, 2008 (c) Defense Federal Acquisition Regulation Supplement, August 17, 1998 (d) Defense Acquisition Guidebook (e) Sections 2366a, 2366b, 2432, 2433a, and 2445c(f) of title 10, United States Code</p> <p><u>Purpose.</u> This DTM implements and institutionalizes selected requirements of the Weapon Systems Acquisition Reform Act of 2009 (Public Law 111-23) (Reference (a)). The law established a number of requirements that directly impact the operation of the Defense Acquisition System and the duties of key officials that support it.</p> <ul style="list-style-type: none"><li>• This DTM amends the Acquisition Policy in DoD Instruction 5000.02 (Reference (b)), the Defense Federal Acquisition Regulation Supplement (DFARS) (Reference (c)), and the associated business practices contained in the Defense Acquisition Guidebook (Reference (d)).</li></ul>
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# WSARA Impact

- With more systems engineering activities moved into Technology Development (TD), requirement for first PESHE at MS-B is late to need
- ESOH planning needs to be addressed at MS-A
  - ESOH risk management status reporting required at Pre MS-B PDR
  - NEPA/EO compliance required for TD test activities



## AT&L Memos impacting ESOH in Acquisition

- AT&L Memo “Better Buying Power 2.0: Greater Efficiency and Productivity in Defense Spending,” requires streamlining of acquisition documentation
- AT&L Memo “Document Streamlining – Program Strategies and SEP”
  - PESHE Summary and NEPA/EO 12114 Compliance Schedule no longer included in Acquisition Strategy
  - Provides mandatory outline for the SEP
    - Includes ESOH management planning in SEP Table 4.6-1, Design Considerations
    - Directs PESHE and NEPA/EO 12114 Compliance Schedule be included in SEP at MS-B and MS-C
  - NOTE: SEP is required at MS-A, MS-B, and MS-C

# SEP Design Considerations Table 4.6-1

Mapping Key Design Considerations into Contracts					
Name (Reference)	Cognizant PMO Org	Certification	Documentation (hot link)	Contractual Requirements (CDRL #)	Description/Comments
SE Tradeoff Analysis for Affordability			(MS B)		Provide the systems engineering trade-off analysis showing how cost varies as the major design parameters and time to complete are traded off against one another. The analysis will reflect attention to capability upgrades. The analysis will support MDA approval of an Affordability Requirement to be treated as a Key Performance Parameter (KPP) in the Acquisition Decision Memorandum. The analytical summary will include a graphic illustrating cost tradeoff curves or trade space around major affordability drivers (including KPPs when they are major cost drivers) to show how the program has established a cost-effective design point for those affordability drivers.
Corrosion Prevention and Control (ACAT I only)			CPCP (MS B & C)		Describe how design will minimize impact of corrosion and material deterioration on system throughout system life cycle.
Environmental Safety and Occupational Health (ESOH)			PESHE NEPA Compliance Schedule (MS B & C)		Describe how design will minimize ESOH by summarizing how program will integrate ESOH considerations into SE processes to include method for tracking hazards and ESOH risks and mitigation plans throughout the life cycle of system.
Human Systems Integration (HSI)					Summarize how HSI will be integrated within the SE processes, specifically addressing the human operator and maintainer requirement allocation approach that accounts for total system performance.
Item Unique Identification (IUID)			IUID Implementation Plan (MS B & C)		Describe how the program will implement IUID to identify and track applicable major end items, etc.
Manufacturing					Assess the manufacturing risk and readiness of all contributory processes and particularly those that are new or unproven in a full-rate production environment.

## SEP Design Considerations Table 4.6-1, Continued

- Identification of ESOH responsibilities, organizational structure, and User Representative
- Required ESOH certifications (e.g., approvals, endorsements, releases)
- Documentation (attach PESHE and NEPA/EO 12114 at MS-B and MS-C)
- Contract language and requirements (e.g., Data Item Descriptions, Contract Data Requirements Lists [CDRL])
- A description of the approach to minimize ESOH risks through design and other methods (e.g., logistics, training, hazard communication, compliance)
- A description of the method for tracking hazards throughout the life cycle of the system

***Include required ESOH management planning information either directly in the table or by attaching a document to each table cell (depending on amount of material)***



## SEP Design Considerations Table 4.6-1, Continued

- Alternative approach: use appropriate sections of SEP and cross-reference information in Design Considerations Table 4.6-1

SEP Outline Section	ESOH Contribution <sup>1</sup>
<p>Section 2.2: Technical Certifications</p> <p>Table 2.2-1: Certification Requirements</p>	<p>Identify any ESOH-related certifications, approvals, or releases required for the system prior to fielding such as:</p> <ul style="list-style-type: none"> <li>• Airworthiness.</li> <li>• Navy Weapon System Explosives Safety Review Board (WSESRB).</li> <li>• Insensitive Munitions/Hazard Classification (IM/HC).</li> </ul>
<p>Section 3.3: Engineering and Integration Risk Management</p>	<ul style="list-style-type: none"> <li>• Include the program's ESOH risk management approach, or reference the PESHE, which should document this information.</li> </ul>
<p>Section 3.4: Technical Organization</p> <p>Paragraph 3.4.1: Government Program Office Organization</p> <p>Figure 3.4.1-1: Program Office Organization</p>	<ul style="list-style-type: none"> <li>• Include ESOH representation in Integrated Product Teams (IPTs), and ESOH-related IPTs and Working Groups (WGs).</li> </ul>
<p>Section 3.4.2: Program Office Technical Staffing Levels</p>	<ul style="list-style-type: none"> <li>• Summarize the program office's ESOH technical staffing plan. Include process and tools used to determine required technical staffing, and potential risks if staffing levels are not met.</li> </ul>

## SEP Design Considerations Table 4.6-1, Continued

- Alternative approach: use appropriate sections of SEP and cross-reference information in Design Considerations Table 4.6-1, Continued

SEP Outline Section	ESOH Contribution <sup>1</sup>
Section 3.4.4: Engineering Team Organization and Staffing Figure 3.4.4-1: IPT/WG Team Hierarchy Table 3.4.4-2: IPT Team Details	<ul style="list-style-type: none"> <li>Identify all Government AND contractor (when available) ESOH specific IPTs and their associated WGs.</li> <li>Identify Government AND contractor (when available) ESOH specific IPTs and ESOH participation in other IPTs.</li> </ul>
Section 3.6: Technical Performance Measures (TPM) and Metrics Table 3.6-2: TPMs	<ul style="list-style-type: none"> <li>Identify ESOH-related Key Performance Parameters, Key System Attributes, Additional Performance Attributes, and Other System Attributes.</li> </ul>
Section 4.4: Technical Reviews Table 4.4-1: Technical Review Details	<ul style="list-style-type: none"> <li>Identify ESOH participation for each technical review, to include ESOH-related questions, as appropriate, and procedures for review of ESOH risks.</li> </ul>
Section 4.7: Engineering Tools	<ul style="list-style-type: none"> <li>Identify ESOH tools, e.g., HTS.</li> </ul>

## ODUSD(I&E) Responses

### ➤ Objectives:

- Streamline the acquisition ESOH documentation by eliminating redundancy between SEP, PESHE, and NEPA/EO 12114 Compliance Schedule
- Focus on the data generated by implementing ESOH management planning
- Ensure ESOH planning prior to MS-A for the TD Phase (now called Technology Maturation and Risk Reduction Phase in the final draft revision to DoDI 5000.02)

### ➤ Approach documented in Chapter 4, Systems Engineering, of the new 2013 Defense Acquisition Guidebook (DAG)

- Use the SEP to document ESOH management planning
  - Ensures ESOH planning documented in SEP at MS-A for TDS/TMRR
  - Enhances integration of ESOH into Systems Engineering planning and execution
- Use the PESHE and NEPA/EO 12114 Compliance Schedule to document ESOH data generated by implementing the management planning
  - DAG recommends MS-A SEP include hazard tracking data from Analysis of Alternatives and selection of Preferred Materiel Solution and NEPA/EO 12114 Compliance Schedule for the TDS/TMRR phase
  - Requires programs to provide hazard tracking data, hazardous material data, and Compliance Schedule for review and MS-B and MS-C

# Draft Revision to DoDI 5000.02 Includes New Concept for SEP, PESHE, and NEPA/EO 12114 Compliance Schedule

- Clearly defines the ESOH content requirements for all three documents to avoid duplication and reinforce that ESOH management is an integral part of the Systems Engineering process
  - Starting at MS-A, the SEP contains ESOH management planning
  - PESHE contains the data produced from implementing ESOH planning
    - Need to initiate ESOH hazard data tracking during Materiel Development Phase
    - Provide as part of SEP at MS-B and MS-C
  - NEPA/EO 12114 Compliance Schedule defined as a separate document from PESHE
    - Need to develop Compliance Schedule supporting TD Phase in MS-A SEP
    - Provide Compliance Schedule for life cycle in MS-B and MS-C SEPs
- This concept:
  - Supports the OSD Acquisition Documentation Streamlining efforts
  - Improves ESOH management during TDS/TMRR phase
  - Ensures Program Oversight offices can review actual hazard tracking data and Compliance Schedules to assess adequacy of ESOH management planning execution

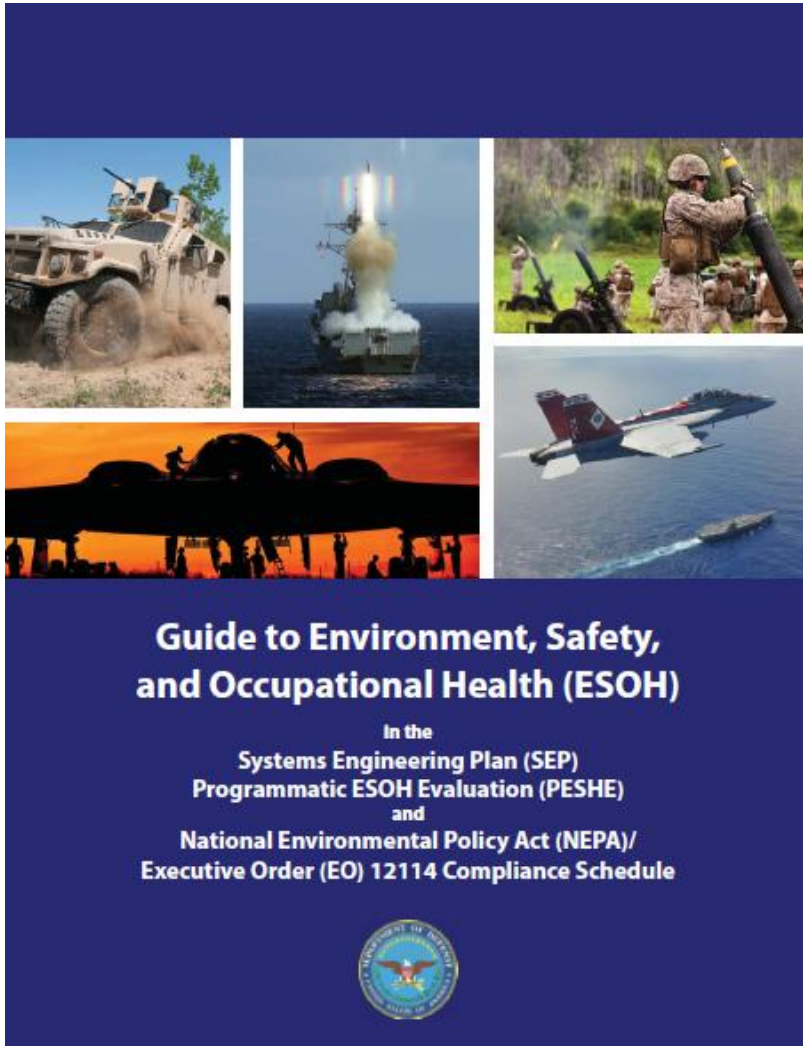
# PESHE Requirements

- Minimum Information required:
  - ESOH Risk Matrices (for hardware and software) used by the program with definitions for severity categories, probability levels, risk levels, risk acceptance authorities, and User Representative concurrence authorities
    - MIL-STD-882E defines the term User Representative
    - Each Service designates the appropriate User Representative for a given system
  - Government-owned Hazard Tracking System (HTS) data
    - Can provide electronic copy of the current HTS
    - Can include a copy of the data from the HTS if using contractor proprietary HTS
  - Hazardous materials management data including data on hazardous wastes and pollutants associated with the system, if not included in the HTS
  - Environmental impact information, not included in the HTS or hazardous materials management data, but needed to support installation and range analyses
- PESHE required for all Acquisition Categories
  - Software-only programs not exempt – need results of software system safety analysis
  - PESHEs for follow-on ACATs to new programs should incorporate the data from the original program and add the new data

# NEPA/EO 12114 Compliance Schedule Requirements

- Proposed actions (based on system-related activities such as, but not limited to, T&E and fielding/ basing activities) throughout the life cycle of the program that may require preparation of formal NEPA/EO 12114 documentation
- The anticipated start date for each proposed action
- Proponent responsible for preparing the NEPA/EO 12114 documentation for each proposed action
- The anticipated or actual type of NEPA/EO 12114 document which the proponent should complete prior to the proposed action start date
- The anticipated or actual start and completion dates for the final NEPA/EO 12114 document
- The specific signature approval authority for the documents per DoD Instruction 5000.02 and Component policy

# New Concept for SEP, PESHE, NEPA/EO 12114 Compliance Schedule



- First Introduced in Defense Acquisition Guidebook (May 15, 2013)  
<https://dag.dau.mil/>
- Detailed guidance included in newly developed "Guide to ESOH in the SEP, PESHE, and NEPA/EO 12114 Compliance Schedule (September 16, 2013)  
<https://acc.dau.mil/pesheguide>
- To be incorporated in revision to DoDI 5000.02

## Conclusion

- The new concept for ESOH in the SEP, PESHE, and NEPA/EO 12114 Compliance Schedule will streamline documentation development, eliminate redundancy of information, and focus efforts on generation and evaluation of ESOH data (vice the description of ESOH management efforts)



# Questions

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