

DEPARTMENT OF DEFENSE JOINT SYSTEM SAFETY STANDARDS WORKING GROUP STATUS

CIVILIAN HARM MITIGATION RESPONSE ACTION PLAN & MILITARY-STANDARD-882E, DEPARTMENT OF DEFENSE STANDARD PRACTICE SYSTEM SAFETY

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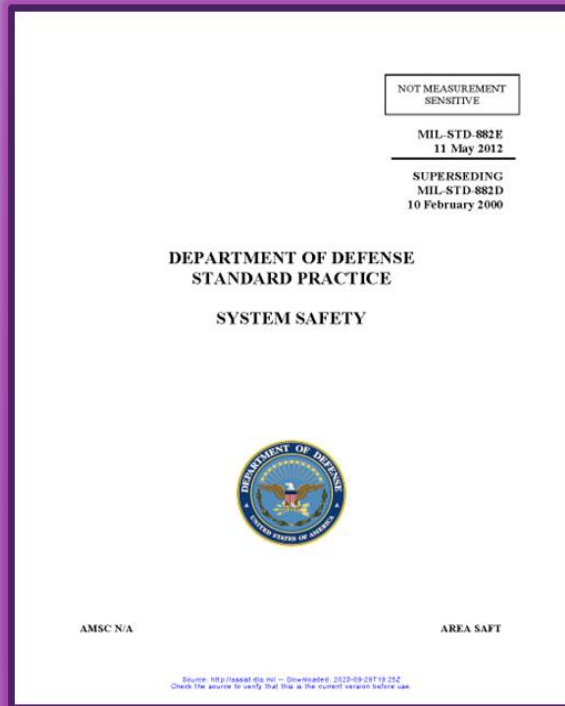
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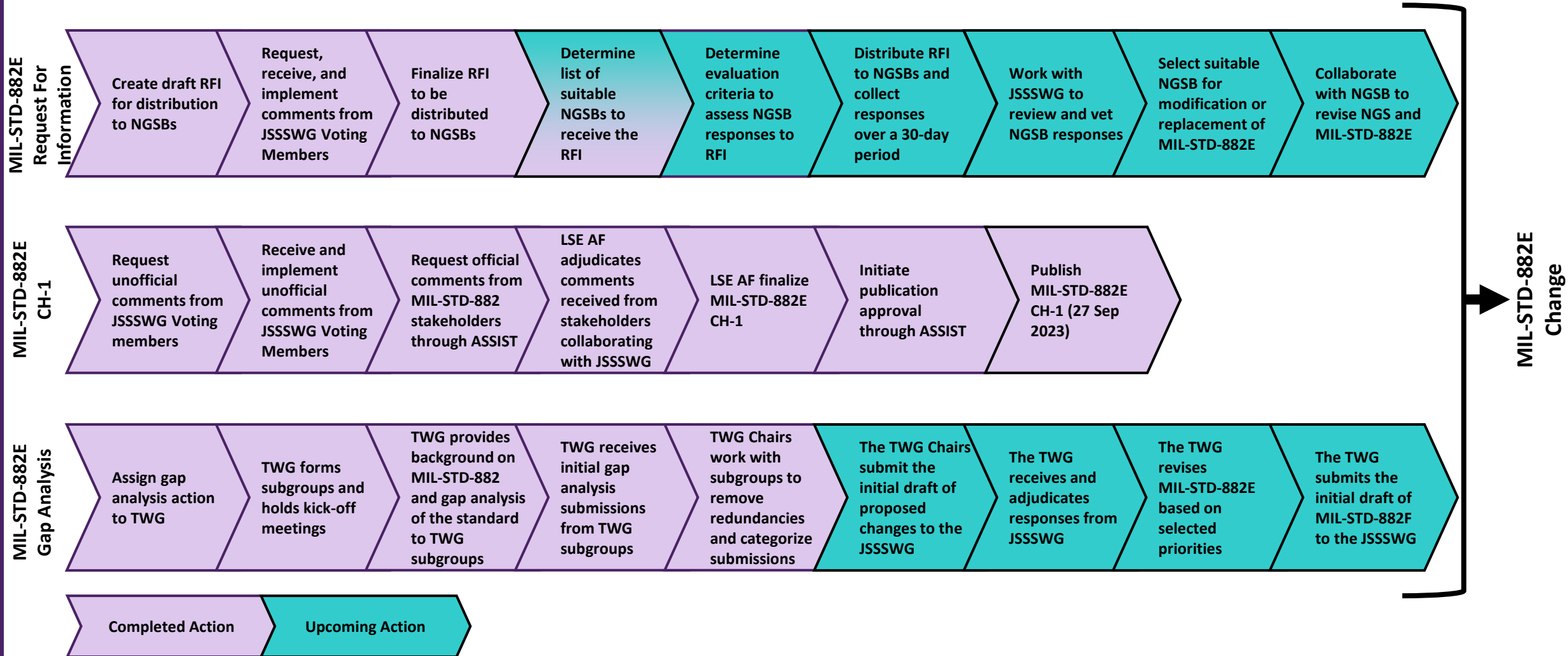
26TH NATIONAL DEFENSE INDUSTRIAL ASSOCIATION SYSTEMS &
MISSION ENGINEERING CONFERENCE
ABSTRACT #1559945
OCTOBER 2023

AGENDA

- SNAPSHOT OF MILITARY-STANDARD (MIL-STD)-882E INITIATIVES & PROGRESS TO DATE
- BACKGROUND ON JOINT SYSTEM SAFETY STANDARDS WORKING GROUP (JSSSWG)
- STATUS UPDATE
 - JSSSWG EFFORTS 2022 – 2023
 - Civilian Harm Mitigation Response & MIL-STD-882E Change (CH-1)
- JSSSWG NEXT STEPS

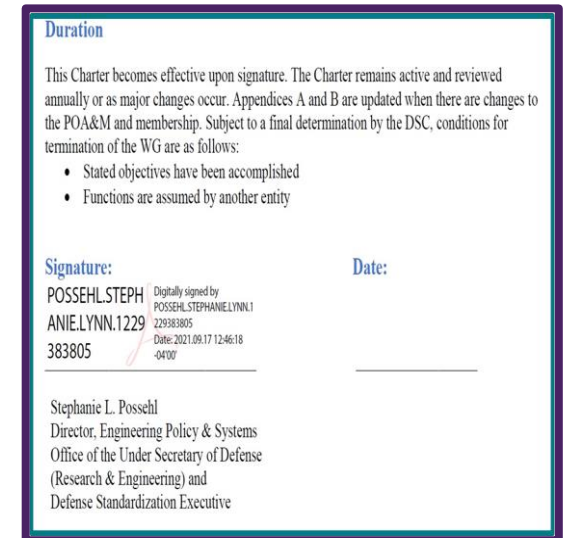


• SNAPSHOT OF MIL-STD-882E INITIATIVES & PROGRESS TO DATE



BACKGROUND ON JSSSWG

- The Defense Standardization Executive in consultation with Defense Standardization Council (DSC) decided on 10 Feb 2021 to establish and charter the Joint System Safety Standards Working Group (JSSSWG)
- The Department of Defense (DoD) Acquisition Environment, Safety, and Occupational Health (ESOH) Integrated Product Team developed the JSSSWG Charter at the request of the Defense Standardization Office (DepSO).
 - Charter approved on 17 Sep 2021.
- The JSSSWG's primary objectives are:
 - Consider Non-Government Standards (NGSs) containing system safety for adequacy in meeting DoD needs for a standard practice.
 - Assess a system safety standard that complies and aligns with DoD acquisition policies.
 - Recommend solutions to the DepSO and DSC (i.e., adopt a system safety NGS, cancel Military-Standard (MIL-STD)-882E, or revise MIL-STD-882E.



BACKGROUND (CONT.)

- JSSSWG is comprised of Co-Chairs with Voting and Non-Voting members (aka the Technical Working Group [TWG]).

VOTING MEMBERS	
SERVICE	ORGANIZATION
Office of the Secretary of Defense	OUSD(A&S) / ODASD(E&ER)
	OUSD Personnel & Readiness (P&R) / ODASD(Readiness)
	OUSD Research & Engineering (R&E) / Systems Engineering and Architecture, Specialty Engineering Directorate.
Army	Office of the United States Assistant Secretary of the Army (OASA) for Acquisition, Logistics, and Technology (ALT)
	DEVCOM Armaments Center
Marine Corps	Marine Corps Systems Command (MARCORSYSCOM)
Navy	Assistant Secretary of the Navy (ASN) Research, Development and Acquisition (RDA) / Deputy Assistant Secretary of the Navy (DASN) for Research Development Test and Engineering (RDT&E)
	Office of the Assistant Secretary of the Navy (Energy, Installations and Environment) (OASN EI&E) / Office of the Deputy Assistant Secretary of the Navy (ODASN) (Environment)
Air Force	Secretary of the Air Force (SAF)/ Science, Technology, and Engineering Leadership (AQR), Lead Standardization Agency
	Air Force Materiel Command (AFMC/SES) Preparing Activity
Space Force	Systems and Missile Systems Center (SMC)/ECS
United States Special Operations Command (USSOCOM)	USSOCOM AT&L
Missile Defense Agency (MDA)	MDA/QSS

- Co-Chairs:**
- ODASD (Environment & Energy Resilience)
 - OUSD (Research & Engineering) Specialty Engineering

NON-VOTING MEMBERS	
SERVICE	ORGANIZATION
Office of the Secretary of Defense	OUSD Research & Engineering (R&E) / Systems Engineering and Architecture, Specialty Engineering Directorate.
	Department of Defense Explosives Safety Board (DDESB-PD)
Army	Department of the Army System Safety Council
Marine Corps	Marine Corps Systems Command (MARCORSYSCOM) (00T)
Navy	Department of Navy Acquisition Safety Steering Committee
Air Force	SAF/AQRE Engineering Policy and Standards and Specialty Engineering Team
Space Force	Space and Missile Systems Center (SMC)/DCE
Missile Defense Agency	GMD Safety Division
Specialty Workgroups (WG)	Joint Human Systems Integration
	Joint Weapon Safety
	Joint Services Software System Authorities
	Office of Chief Digital Artificial Intelligence Officer (OCDAO)

- JSSSWG kick-off meeting was held on 27 Oct 2021.

JSSSWG EFFORTS IN 2022

- JSSSWG meetings continued from kick-off meeting through Sep 2022 to:
 - Identified 31 potential NGSs for evaluation
 - Developed NGS review criteria
 - Determined 10 core elements as essential criteria for DoD system safety requirements

All 10 core elements must be met for a NGS to be considered practical and adequate as a replacement of MIL-STD-882E.

The 10 Essential DoD System Safety Core Elements:

Address hazard analyses involving hardware, software, and the human

Include a system safety order of precedence

Applicable to any type of DoD system (i.e., Cyber, Land, Sea, Air, and Space domains)

Allow for DoD participation in updates and inclusion of DoD specific guidance

Accommodate the risk assessment of DoD systems (i.e., compatible risk assessment matrix and include formal risk acceptance requirement)

Have an existing licensing agreement to use the standard

Include primary hazard tracking criteria and data element requirements

Address the incorporation of system safety into the development process

Provide multi-step methodology that easily explains the system safety process

Allow content of the standard, as written, to be contractually binding

JSSSWG EFFORTS IN 2022 (CONT.)

- Only one NGS determined as a viable system safety standard
 - GEIA-STD-0010 Rev A, *Standard Best Practices for System Safety Program Development and Execution*, by SAE International
- TWG conducted the NGS evaluation during Oct – Dec 2022
 - Determined the GEIA-STD-0010 Rev A was not a viable replacement.
- The JSSSWG Voting Members concurred in Dec 2022 with the TWG's recommendation.

JSSSWG 2023 STATUS

- The DepSO was briefed on 8 Feb 2023 on the findings and recommendations from the NGS evaluation.
 - DepSo advised to proceed forward with briefing the DSC.
- The JSSSWG was tasked by the DSC from the 2 Mar 2023 briefing to address due diligence concerns in meeting public law requirements.
 - Create and distribute a Request for Information (RFI) to NGS Bodies (NGSBs).
 - Public law requires Federal agencies to use NGSs when lawful and practical.
 - Identify gaps and failures in MIL-STD-882E and suggest solutions for changes to the standard and to guide NGS efforts.

Why Use NGS

Office of Management and Budget, Circular A-119, *Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities*, 27 Jan 2016

Directs Federal agencies to use voluntary standards in lieu of Governmental standards whenever feasible.

DoD Manual 4120.24, *Defense Standardization Program (DSP) Procedures*, Change (CH)-2, 15 Oct 2018

Requires DoD to first consider using an existing NGS or support revising or developing an NGS to meet DoD needs.

JSSSWG 2023 STATUS (CONT.)

- Summary of evaluation findings on GEIA-STD-0010 Rev A:
 - Insufficient guidance on hazard analyses to address hardware, software, and humans.
 - No mandatory risk assessment matrix and matrices herein not consistent with 882E.
 - Insufficient information on risk acceptance authority and lacks requirement to obtain approval prior to exposing people, equipment, and the environment to system-related hazards.
 - Lack sufficient criteria for hazard tracking.
 - Multi-step methodology similar to MIL-STD -882E.
 - Not clear whether NGS will allow DoD specific guidance for inclusion in standard even though there are participating DoD representatives.
 - Lack of existing license agreement with DoD to use the NGS; have to purchase for use.
 - Language/requirements not contractually binding.

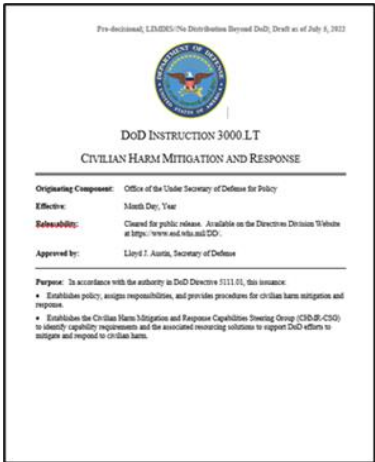
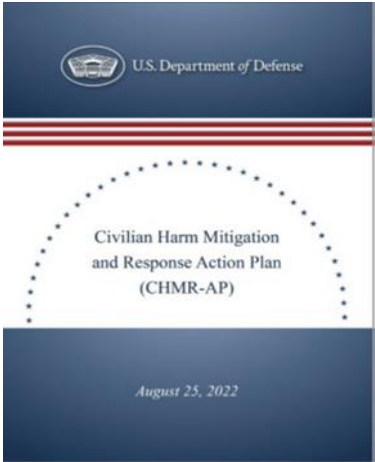
JSSSWG 2023 STATUS (CONT.)

- International Electrotechnical Commission (IEC) representatives provided to JSSSWG on 26 Apr 2023 an overview of IEC 63187-1, *Systems Engineering – System Safety – Complex Systems and Defence Applications*, 2022.
- TWG kicked off the MIL-STD-882E gap analysis on 31 May 2023.
 - TWG subgroups established timelines for performing the gap analysis on 8 Jun 2023.
 - Expectation was a 2 to 3-month effort to rack and stack the analysis findings and determine priority areas for updating 882E.
- Lead Standardization Authority Air Force (LSA AF) prepared the RFI for NGSBs with assistance from the JSSSWG.
 - RFI comprised of 9 data points to solicit feedback on the interest and capability of the NGSB.
 - Final Draft RFI transitioned to the JSSSWG Co-Chairs in June 2023 to finalize and distribute to qualifying NGSBs.
 - Initial list of NGSBs identified in July 2023.

CIVILIAN HARM MITIGATION RESPONSE (CHMR)

- United States Secretary of Defense (SECDEF) declared “the protection of civilians is a strategic priority as well as a moral imperative.”
 - Memorandum of 25 Aug 2022 issued with the approval and issuance of the *DoD Civilian Harm Mitigation and Response Action Plan (CHMR-AP)*
- Draft DoDI 3000.LT, *Civilian Harm Mitigation and Response*, pending SECDEF approval.
- The Department at all levels and across the range of military operations is responsible for exercising the leadership necessary to reduce the risk of harm to civilians and civilian objects.

CHMR considerations are integral throughout decision-making and informs on how we plan and conduct operations to mitigate and respond to civilian harm.



CHMR (CONT.)

- CHMR-AP outlines 12 objectives that are aligned to a four-phased approach for Fiscal Year (FY) 2022 – 2025.

Objective Number	Synopsis
1	Establish a CHMR Steering Committee
2	Establish a Civilian Protection Center of Excellence
3	Incorporate guidance for addressing civilian harm across the full spectrum of operations into strategy, doctrine, plans, education, training, and exercises
4	Improve knowledge of the civilian environment and civilian harm mitigation capabilities and processes
5	Incorporate deliberate and systemic measure to mitigate the risk of target misidentification
6	Develop standardized civilian harm operational reporting and data management processes

CHMR (CONT.)

- CHMR-AP objectives (Cont.).

Objective Number	Synopsis
7	Establish Department-wide procedures for assessing investigating civilian harm resulting from operations
8	Review DoD guidance on responding to civilian harm (e.g., condolences and public acknowledgement) and update guidance and implementation processes
9	Establish and resource CHMR as a component of security cooperation programs and implement tailored conditionality to program ally/partner efforts
10	Establish guidance, responsibilities, and processes for incorporating CHMR during all phases of multinational operations/operations with non-state actors
11	Create dedicated positions for CHMR efforts at Office of Secretary of Defense, Joint Staff, combatant commands, military department and other relevant DoD components
12	Develop standardized civilian harm operational reporting and data management processes

STATUS UPDATE - MIL-STD-882E CH-1

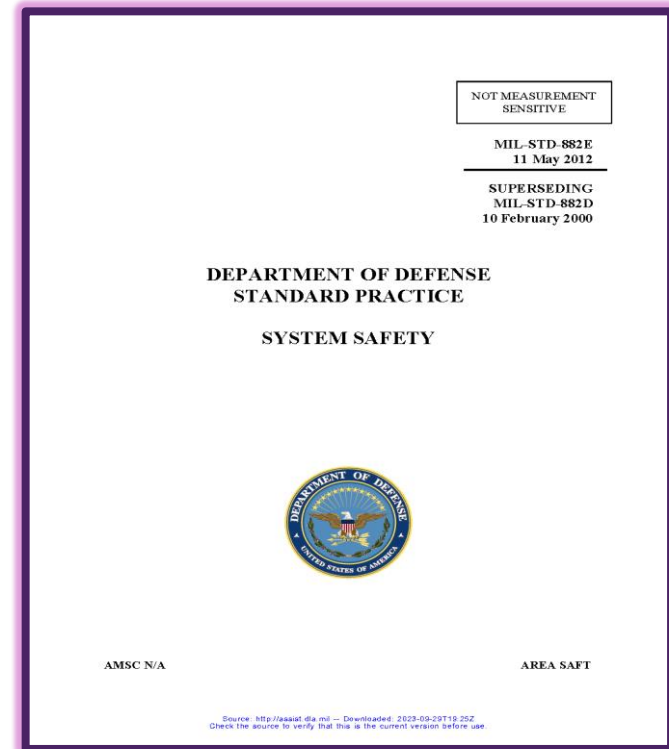
- Purpose was to integrate CHMR considerations/requirements.
- Driver was CHMR-AP Objective 4 - Improve knowledge of the civilian environment and civilian harm mitigation capabilities and processes.
 - Action 4.k of the CHMR-AP required the update to MIL-STD-882E as a Phase 1 action with completion by the end of FY 2023.

USD(A&S), in coordination with the Under Secretary of Defense for Research and Engineering (USD(R&E)), updates MIL-STD 882E Department of Defense Standard Practice System Safety to incorporate features into system safety reviews for future weapons systems that support civilian harm mitigation objectives, such as render safe, pre-planned post-launch abort, and scalable yield.

- LSA AF drafted the baseline CHMR recommendations for incorporation into the Standard in collaboration with the JSSSWG.

STATUS UPDATE - MIL-STD-882E CH-1 (CONT.)

- Draft baseline recommendations completed in June 2023.
- Request for official review through the Acquisition Streamlining and Standardization Information System (ASSIST) effected in June with receipt of comments on 14 Jul 2023.
- LSA AF completed adjudication of comments in August 2023.
- MIL-STD-882E CH-1 was adopted and issued by DoD on 27 Sep 2023.



INTEGRATION OF CHMR & MIL-STD-882E CH-1

- Foreword, Paragraph 3
 - DoD is committed to protecting personnel from accidental death, injury, or occupational illness, mitigating risk of civilian harm, and safeguarding defense systems, infrastructure, and property from accidental destruction, or damage while executing its mission requirements of national defense...It should be used not only by system safety professionals, but also by other functional disciplines such as fire protection engineering, civilian harm mitigation and response planning, occupational health professionals, and environmental engineers to identify hazards and mitigate risks through the systems engineering process...
- Paragraph 3.1 Acronyms
- Paragraph 3.2 Definitions
 - Civilian Harm. Civilian casualties (i.e., death or injury of civilians) and damage to or destruction of civilian objects not constituting military objectives under the law of war resulting from military operations during the conduct of hostilities. Other adverse effects on the civilian population, and the personnel, organizations, resources, infrastructure, essential services, and systems on which civilian life depends are also considered in CHMR efforts to the extent practicable.

INTEGRATION OF CHMR & MIL-STD-882E CH-1 (CONT.)

- Paragraph 4.3.1.b:
 - Identifying and documenting the prescribed and derived requirements applicable to the system. Examples include Insensitive Munitions (IM) requirements, Electromagnetic Environmental Effects (E3) requirements, Civilian Harm Mitigation and Response (CHMR) requirements, pollution prevention mandates, design requirements, technology considerations, and occupational and community noise standards. Once the requirements are identified, ensure their inclusion in the system specifications and the flow-down of applicable requirements to subcontractors, vendors, and suppliers.
- Other minor changes for currency and readability included:
 - Adding Distribution A statement.
 - Citing DoDI 5000 series vice DoDI 5000.02.
 - Revising Section 4.1 General to contractually binding language.
 - Reformatting and clarifying Section 4.2 System Safety Requirements.

JSSSWG NEXT STEPS

- Finalize NGSBs list for receipt of RFI.
- Define RFI evaluation criteria.
- Assess RFI input received from NGSBs against the evaluation criteria.
- Determine path forward of NGS, MIL-STD-882E updates, or some hybrid.

QUESTIONS?

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BACK UP

GEIA-STD-0010 REV A CORE ELEMENTS REVIEW

EVALUATION FINDINGS

	Core Element	Comments on GEIA-STD-0010 Rev A
1.	Is the NGS applicable to addressing hazard analyses involving hardware, software, and the human?	- The NGS provides insufficient guidance to address hardware, software, and the human in hazard analyses. Hardware and software components are mentioned, but not sufficiently enough to adequately guide rigorous analyses activity.
2.	Is the NGS applicable to any type of DoD system in the Cyber, Land, Sea, Air, and Space domains?	- The NGS directs users to SAE ARP4754 or SAE ARP 4761 for commercial aircraft manufacturing. Occasionally, DoD does procure commercial derivative aircraft, so this applicability is not absolute.
3.	Does the NGS accommodate the risk assessment of DoD systems?	- The NGS does not provide sufficient accommodation for the risk assessment of DoD systems
	a) Is there a Risk Assessment Matrix consistent with 882E (must be compatible with what DoD uses now and support traceability of risk levels across DoD)?	- The Risk Assessment Matrix is not in a mandatory section of the standard. Several risk matrices are provided which results in inconsistency with MIL-STD-882E. The lack of a concise risk matrix requirement does not meet DoD needs.
	b) Does the NGS have a requirement for formal risk acceptance by the appropriate risk acceptance authority, prior to exposing people, equipment, or the environment to a known hazard, consistent with applicable DoD policy?	- The NGS does not provide sufficient information on risk acceptance authority and no requirement exists for risk to be accepted prior to exposing people, equipment, or the environment to known system-related hazards per DoD policy.
4.	Does the NGS have primary hazard tracking criteria and data element requirements that include all the elements currently required in accordance with MIL-STD-882E, Section 4.3.1D?	- The NGS does not provide specific criteria on hazard tracking and instead only provides general requirements.
5.	Does the NGS provide multi-step methodology (like 882E) that easily explains / addresses the system safety process (Comparable to the MIL- STD-882E, Section 4.3, 8-step process)?	- The five elements that are provided by the NGS, mostly cover the 8-step process found within MIL-STD-882E. The language of the five elements provided are not contractually binding and do not meet DoD policy needs.

EVALUATION FINDINGS (CONT.)

	Core Element	Comments on GEIA-STD-0010 Rev A
6.	Does the NGS include a system safety order of precedence that is comparable to MIL-STD-882E, Section 4.3.4?	- The NGS includes specifics found in a system safety order of precedence, but does not include requirements, such as signage, covered in MIL-STD-882E.
7.	Will the organization owning the NGS allow for:	
	a) DoD participation in updates/changes?	- The G-48 has voting and non-voting members representing DoD services who participate in developing changes to the standard.
	b) DoD to be a voting member on all proposed changes to the NGS?	- The G-48 has voting members representing DoD services who do vote on the changes.
	c) Allow for DoD specific guidance in the standard (e.g., IEE 15288.1, “The Institute of Electrical and Electronics Engineers (IEEE) Standard for Application of Systems Engineering on Defense Programs”, and IEE-15288.2-2014, “IEEE Standard for Reviews and Audits on Defense Programs”)?	- It is unclear if the NGS will allow for DoD specific guidance to be included in the standard.
8.	Does the DoD have an existing licensing agreement to use the NGS?	- The DoD does not have an existing license agreement to use the NGS. Various components within the DoD have purchase access and provide availability via technical libraries. However, it is unknown if this is universal throughout DoD.
9.	Does the NGS address the incorporation of system safety into the development process?	- The NGS does address the incorporation of system safety into the development process, but it is not contractually binding and possibly not satisfactory for DoD requirements.
10.	Is the NGS written in a manner where the content of the NGS, when placed on contract, are contractually binding?	- The language found in the NGS is not contractually binding.