



SYSTEMS ENGINEERING & ARCHITECTURE

ORGANIZATION HIGHLIGHT: SPECIALTY ENGINEERING

JULY 2024

SPECIALTY ENGINEERING

The Systems Engineering and Architecture (SE&A) Specialty Engineering (SpE) Directorate supports the Department of Defense (DoD) mission by ensuring current and future forces are operationally ready. This support focuses on improving the engineering of advanced capabilities' reliability and maintainability (R&M), manufacturing and quality (M&Q), system safety (SS), and human systems integration (HSI), while applying value engineering (VE) practices throughout the life cycle of DoD systems to increase the readiness of U.S. forces.

SpE's objective is to increase availability of warfighting capabilities through the reduction of failure modes, hazards, and defects, while improving total system performance, warfighter trust, and value at the lowest cost throughout the capability life cycle.

❖ ORGANIZATION FOCUS AREAS

Reliability & Maintainability (R&M): Influences system design through policy, guidance, workforce development, and standards to increase mission capability and availability and decrease logistics burden and cost over a system's life cycle. R&M engineering reduces cost and schedule risks by preventing or identifying R&M deficiencies early in development.

Manufacturing & Quality (M&Q): Establishes policy, guidance, workforce development, and standards to promote M&Q considerations during the earliest stages of basic research through development, production, operations, and sustainment.

System Safety (SS): Improves the DoD's application of engineering and management principles, criteria, and techniques to achieve acceptable risk within the constraints of operational effectiveness and suitability, schedule, and cost throughout all phases of the system life cycle through improved policy, guidance, workforce development, and standards.

Human Systems Integration (HSI): Instantiates human-centered requirements throughout the acquisition life cycle to optimize total system performance and minimize total system ownership costs in DoD acquisitions.

Value Engineering (VE): Reinvigorates VE practice in DoD to maintain or improve functions in equipment and processes while reducing acquisition and ownership costs or capability delivery timelines wherever VE is advantageous.

❖ LINES OF EFFORT

SpE focuses on four of the SE&A lines of effort.



❖ COLLABORATION

SpE collaborates across numerous communities of practice (CoPs) for each specialty domain and any additional Secretary of Defense-directed initiatives, leading or participating in dozens of working groups with topics including digital engineering, artificial intelligence, civilian harm mitigation and response (CHMR), defense safety, and many others. SpE works with the other OUSD (R&E) offices, the Services, Defense Acquisition University, industry, and academia on policies, guidance, and best practices for specialty engineering disciplines.

Secretary of Defense Priorities



Trust is a human condition. Trusting new technology starts with engineering systems with the human in mind.

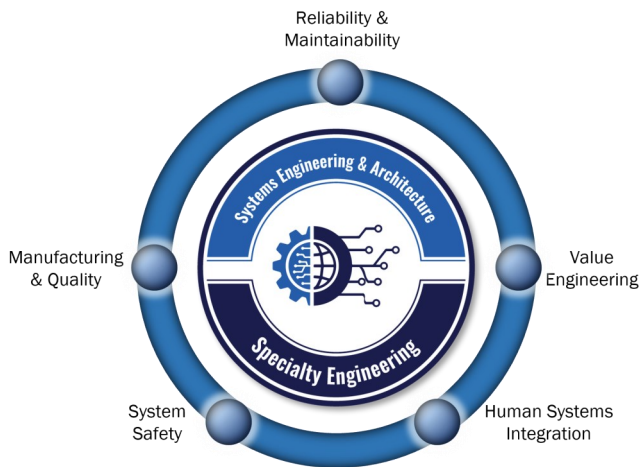


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❖ COMMUNITIES OF PRACTICE

SpE collaborates with organizations across the DoD, industry, and academia through CoPs and similar fora. CoPs allow valuable interaction among acquisition professionals to support capability development and knowledge sharing.



Trust is a human condition. Warfighters must trust that their systems are safe, usable, and available.

❖ WORKFORCE

SpE conducts outreach activities throughout its respective CoPs to ensure DoD incorporates best practices and current technologies into engineering workforce competencies and guidance. SpE identifies opportunities to further integrate practices and technologies across specialty engineering areas.

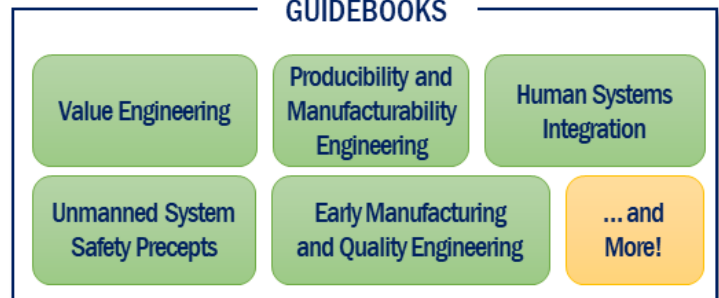
❖ POLICY & GUIDANCE

SpE, under the authorities of the USD(R&E) charter (DoD Directive 5137.02), develops instructions, manuals, guidance, and competencies to govern specific engineering activities.

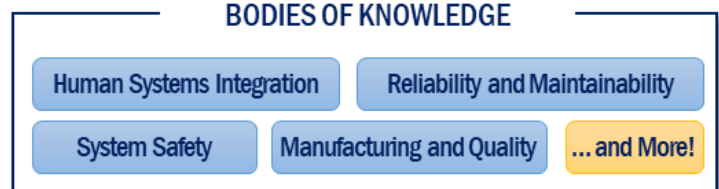
POLICY & GUIDANCE RESPONSIBILITIES



GUIDEBOOKS



BODIES OF KNOWLEDGE



❖ CIVILIAN HARM MITIGATION & RESPONSE

SpE co-chairs the Civilian Harm Mitigation and Response (CHMR) Capabilities Sub-Working Group to support the Secretary of Defense direction to improve mitigation and response for civilian harm. SpE's focus is to lead on USD(R&E) responsibilities in DoDI 3000.17, "Civilian Harm Mitigation and Response," and the corresponding Action Plan Implementation while taking a broader role for the DoD with the Sub-Working Group. These efforts include identifying critical and emerging technologies that may improve CHMR task accomplishment within missions at all levels of warfare.

❖ RESOURCES

SpE - <https://www.cto.mil/sea/spe>

ASSIST (Standards) - <https://assist.dla.mil>

HSI CoP - <https://www.dau.edu/cop/hsi/Pages/Default.aspx>

R&M CoP - <https://www.dau.edu/cop/rm-engineering/Pages/Default.aspx>

