SYSTEMS ENGINEERING & ARCHITECTURE

ORGANIZATION HIGHLIGHT:

SPECIALTY ENGINEERING

AUGUST 2025

SPECIALTY ENGINEERING

The Specialty Engineering (SpE) directorate advances foundational engineering practices in the Department of Defense (DoD) and supporting industrial base. SpE seeks to influence designs to enhance the readiness, lethality, and effectiveness of current and future forces and organizations. Specialties include reliability and maintainability, manufacturing and quality, system safety, human systems integration, and value engineering.

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

❖ ORGANIZATION FOCUS AREAS

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.

Manufacturing & Quality (M&Q): Promotes M&Q considerations during the earliest stages of basic research through development, production, operations, and sustainment.

Reliability & Maintainability (R&M): Influences system design 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.

System Safety (SS): Improves the DoD's application of engineering to achieve acceptable risk within the constraints of operational effectiveness and suitability, schedule, and cost throughout all phases of the system life.

Value Engineering (VE): Maintains or improves functions in equipment and processes while reducing acquisition and ownership costs or capability delivery timelines wherever VE is advantageous.

❖ LINES OF EFFORT

Figure 1. SE&A Lines of Effort (LoEs)

❖ 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.

Figure 2. Secretary of Defense Priorities

SpE focus areas address the SE&A lines of effort by prioritizing activities in collaboration with leadership and broader engineering communities.

ORGANIZATION HIGHLIGHT:

SPECIALTY ENGINEERING, cont'd

❖ 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.

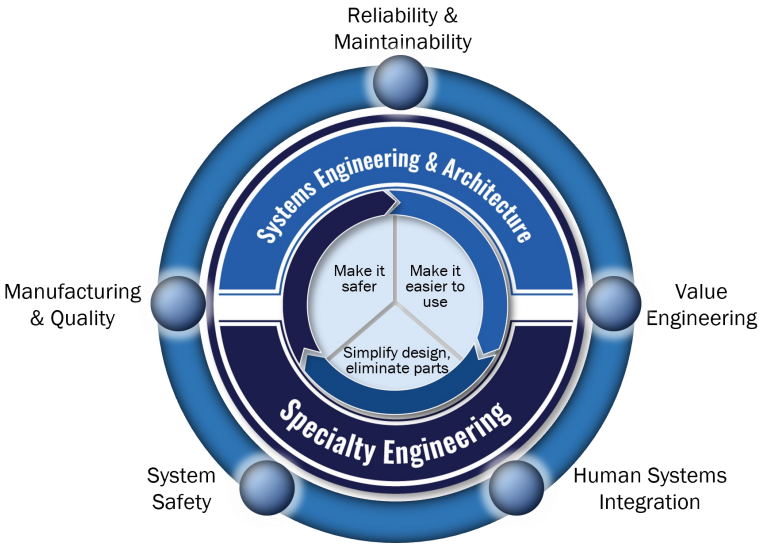

Figure 3. Strengthening Engineering Principles

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.

❖ RESOURCES

SpE – https://www.cto.mil/sea/spe
HSI CoP – https://www.dau.edu/cop/hsi
M&Q CoP – https://www.dau.edu/cop/mq
R&M CoP – https://www.dau.edu/cop/rm-engineering
SS CoP – https://www.dau.edu/cop/se/resources/system-safety
VE CoP – https://www.dau.edu/cop/se/resources/value-engineering
ASSIST (Standards) – https://assist.dla.mil

❖ 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.

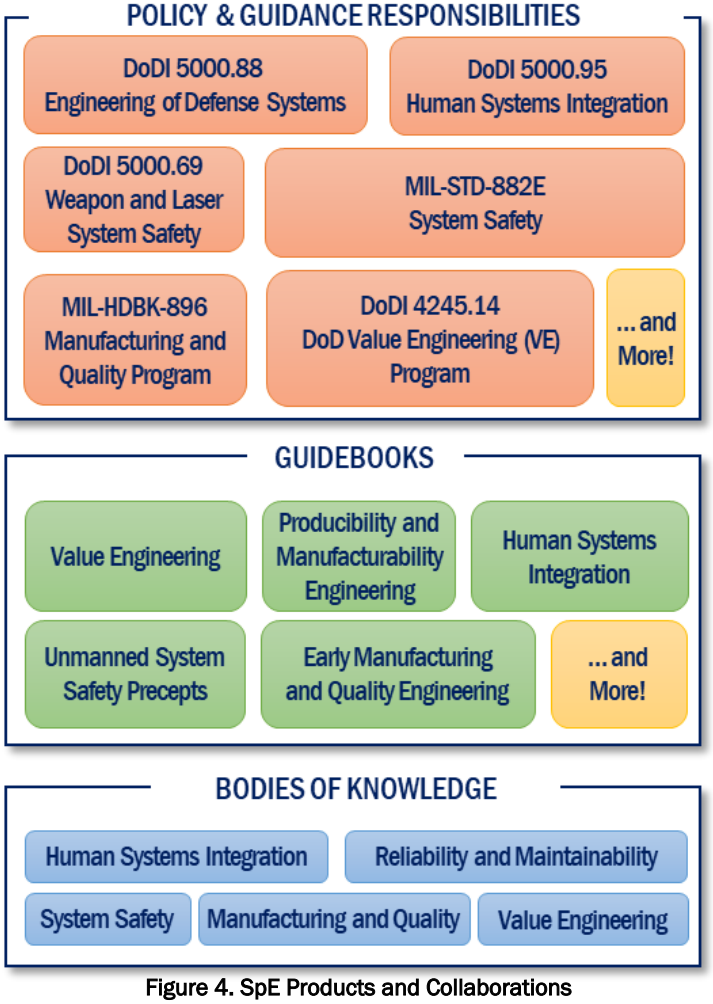

Figure 4. SpE Products and Collaborations

❖ VALUE ENGINEERING

- Achieves essential functions at the lowest life-cycle cost
- Eliminates unnecessary costs, improving value

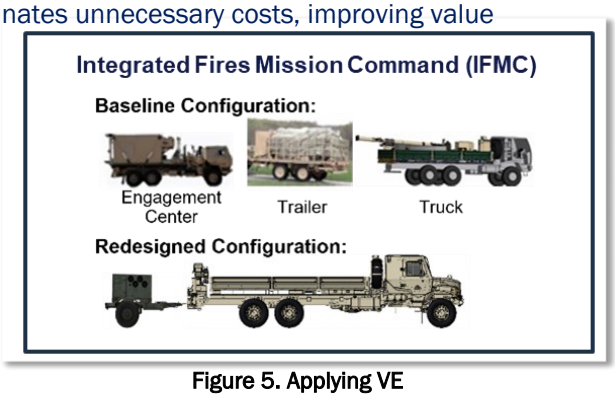

Figure 5. Applying VE