

Engineering & Technical Management Functional Area – Tier 2: Core Readiness Competencies

ETM – TIER 2 CORE READINESS COMPETENCIES		
1. <u>Leading Change</u>	4. <u>Technical Management</u>	7. <u>Digital Literacy</u>
2. <u>Mission and Systems Thinking</u>	5. <u>Design Considerations</u>	8. <u>Software Literacy</u>
3. <u>Requirements Definition and Analysis</u>	6. <u>Product Realization</u>	9. <u>Technical Perspective on Defense Contracting</u>

FUNCTIONAL AREA TITLE: Engineering and Technical Management (ETM)	
FUNCTIONAL AREA DESCRIPTION: The ETM workforce has a vital role in developing, fielding, and sustaining high-quality, innovative, affordable, supportable, and effective defense systems and ensuring that DoD products are delivered on time, perform as expected, and are cost-effective. The role requires developing and implementing products and services with an integrated technical approach across the total life-cycle. That includes providing the systems, software, and people to satisfy stakeholder needs and expedite transition of technology to the user, as well as early production planning and systematically examining producibility. The ETM workforce has the strategic perspective, technical competence, and critical thinking needed to operate within various product domains and other engineering and technical disciplines.	
COMPETENCY 1 TITLE: Leading Change	
COMPETENCY 1 DEFINITION: Applying techniques to inspire a culture of innovation, communication, collaboration, and high trust that enables others to develop the best solutions, remove barriers, and focus on delivery and continuous improvement to further the goals and priorities of the organization.	
TIER 3 TRACEABILITY:	
TASK STATEMENTS:	Task 1.A: Relate to others in a way that fosters trust and a legitimate belief in the leader’s intentions and those of the organization.
	Task 1.B: Collaborate across the functional areas to share and receive pertinent and timely information.
	Task 1.C: Adapt quickly, learning, responding, and thriving when work tasks, the environment, context, or conditions change.
	Task 1.D: Encourage others to see change as an opportunity and seek better ways of doing their work.
	Task 1.E: Foster an inspiring, collaborative, inclusive, and engaging environment.
	Task 1.F: Create, or seek from others, new or significantly improved products or processes, as well as develop original approaches to handle challenges and opportunities.

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COMPETENCY 2 TITLE: Mission & Systems Thinking	
COMPETENCY 2 DEFINITION: Applying mission level thinking for deliberate planning, analyzing, organizing, and integrating of current and emerging operational and system capabilities to achieve forward looking solutions that achieve desired warfighting mission effects. Seeking and applying holistic explanations, relationships, and viewpoints when examining technical problems, and focusing on connections and interfaces among the subsystems in a system.	
TIER 3 TRACEABILITY: Mission Capability Analysis, Definition, and Characterization; Mission Engineering Approach; Mission Engineering Documentation; Systems Engineering Management; System of Systems (SoS) / Family of Systems (FoS); Architecture Design; Cyber Acumen for Engineering; Analysis of Adversity and Adverse Effects; Modeling, Simulation, and Analysis	
TASK STATEMENTS:	Task 2.A: Deliver solutions within the political, economic, and social aspects, context or landscape.
	Task 2.B: Identify the stakeholders that are part of the mission.
	Task 2.C: Manage product movement through the lifecycle, including setting criteria by which the technical product may be evaluated as it passes from one stage to another.
	Task 2.D: Understand interfaces within and between systems, and recognizing potential for emergent behavior because of differences in system components and interfaces.
	Task 2.E: Predict adversity and disruptive technologies and/or evolving technology threats (e.g., cyber, physical, technological, etc.) affecting DoD capability development.
	Task 2.F: Evaluate open systems architecture/architecture design.
	Task 2.G: Process opposing views simultaneously to make better decisions.
COMPETENCY 3 TITLE: Requirements Definition & Analysis	
COMPETENCY 3 DEFINITION: Translating the stakeholder’s behavioral and functional needs and expectations into technical statements (including technical priorities, problem scope, product constraints, and requirements). Assessing requirements and deriving lower level requirements for clarification and improved fidelity needed for developers (or designers).	
TIER 3 TRACEABILITY: Systems Engineering Management; Stakeholder Requirements Definition; Requirements Analysis; Verification and Validation; Cyber Acumen for Engineering; Adversity-Driven Requirements Derivation; Analysis of Adversity and Adverse Effects; Adversity-Driven Design; Adversity-Driven Design Realization; Adversity-Driven Test, Evaluation, Verification, and Validation; DevSecOps; Software Configuration Management; Process Capability and Control; Quality Management; Manufacturing Planning, Scheduling, and Control; Industrial Workforce Planning; Materials Management; Facilities	
TASK STATEMENTS:	Task 3.A: Refine operational needs, attributes, performance parameters, and constraints that flow from the Joint Capability Integration and Development System described capabilities (or Problem Statement for Defense Business Systems), ensuring all relevant requirements and design considerations are addressed to establish a set of baseline requirements.
	Task 3.B: Decompose needs and constraints into clear, achievable, and verifiable requirements that meet stakeholder needs.
	Task 3.C: Allocate requirements to system elements and enabling system elements (hardware and software) to be designed and developed as system design evolves.
	Task 3.D: Translate requirements definition and analysis into a system architecture baseline.

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COMPETENCY 4 TITLE: Technical Management	
COMPETENCY 4 DEFINITION: Applying a systematic approach in organizing technical resources, activities, and artifacts to include hardware and software.	
TIER 3 TRACEABILITY: Mission Engineering Documentation; Systems Engineering Management; Integration; Verification and Validation; Transition; Technology Portfolio Management; Technology Protection; Technology Transition/Transfer; Software Configuration Management; Technology and the Industrial Base; Process Capability and Control; Quality Management; Surveillance Activities; Manufacturing Planning, Scheduling, and Control; Industrial Workforce Planning; Materials Management; Facilities	
TASK STATEMENTS:	Task 4.A: Scope technical work across all technical phases from analysis and design through to development, deployment, and operation.
	Task 4.B: Manage the technical aspects (e.g., interoperability, etc.) external to the system.
	Task 4.C: Identify the strategy, approach, and required fidelity to provide meaningful data/information to support decision making.
	Task 4.D: Optimize people, processes, and tools to achieve mission objective(s) efficiently.
	Task 4.E: Assess and balance cost, schedule, performance, risks, and supportability.
COMPETENCY 5 TITLE: Design Considerations	
COMPETENCY 5 DEFINITION: Applying unique aspects of engineering and specialty engineering principles and techniques to analyze alternatives during development and incorporate design features which meets requirements while utilizing resources effectively.	
TIER 3 TRACEABILITY: Systems Engineering Management; Requirements Analysis; Implementation; Architecture Design; Cyber Acumen for Engineering; Adversity-Driven Requirements Derivation; Analysis of Adversity and Adverse Effects; Adversity-Driven Design; Adversity-Driven Design Realization; Adversity-Driven Test, Evaluation, Verification, and Validation; Modeling, Simulation, and Analysis; Software Configuration Management	
TASK STATEMENTS:	Task 5.A: Transform a broadly stated decision opportunity into a traceable, defensible, and actionable plan through a robust process that identifies one or more course(s) of action to balance competing objectives and communicates the assessment results and impact of uncertainties to decision makers.
	Task 5.B: Consider engineering, specialty engineering, software, information technology, performance, shelf and service life, environmental conditions, and production requirements in system design.
	Task 5.C: Analyze life-cycle cost drivers in system design (both hardware and software) to ensure a system is affordable across the life cycle.
	Task 5.D: Analyze risks associated with materials (including basic/raw materials, components, semi-finished parts, and subassemblies). Includes materials properties and maturity, security, availability (including scale-up, long-lead, single/sole/foreign sources), subcontractor management and supply chain issues, special handling, storage (hazardous materials), shelf-life, and Government Furnished Property/Material/Equipment/Facilities issues.
	Task 5.E: Analyze the risks associated with usage and operations of the system in the intended environment.

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COMPETENCY 6 TITLE: Product Realization	
COMPETENCY 6 DEFINITION: Utilizing systematic methods and technical skills to design and guide the development process and applying production, quality, and manufacturing methods to convert the design into a desired product.	
TIER 3 TRACEABILITY: Systems Engineering Management; Integration; Transition; Cyber Acumen for Engineering; Analysis of Adversity and Adverse Effects; Adversity-Driven Design; Adversity-Driven Design Realization; Adversity-Driven Test, Evaluation, Verification, and Validation; Technology Transition/Transfer; Modeling, Simulation, and Analysis; Technology and the Industrial Base; Process Capability and Control; Quality Management; Manufacturing Planning, Scheduling, and Control; Industrial Workforce Planning; Materials Management; Facilities	
TASK STATEMENTS:	Task 6.A: Expedite product into production for test and evaluation, operations, and sustainment.
	Task 6.B: Confirm fabrication or creation of a system element (hardware or software) conforms to that element’s detailed design and requirements.
	Task 6.C: Process systematic assembly of lower-level system elements (hardware and software) into successively higher-level system elements to realize the complete system.
COMPETENCY 7 TITLE: Digital Literacy	
COMPETENCY 7 DEFINITION: Considering digital behaviors and practices to support implementations of digital concepts (e.g., IT, cybersecurity, and digital engineering).	
TIER 3 TRACEABILITY: Systems Engineering Management; Architecture Design; Digital Environment Development; Digital Environment Operations and Support; Modeling, Simulation, and Analysis; Software Assurance; DevSecOps	
TASK STATEMENTS:	Task 7.A: Operate within a digital environment to include identifying, communicating, and preserving information.
	Task 7.B: Integrate digital approaches that use authoritative sources of systems' data and models as a continuum across disciplines to support lifecycle activities from concept through disposal.
	Task 7.C: Account for cyber-security aspects and software tools within a digital environment.
COMPETENCY 8 TITLE: Software Literacy	
COMPETENCY 8 DEFINITION: Considering the diverse role of software in delivering, designing, and utilizing various system types (e.g., system-of-systems, cloud-native systems, cyber physical systems, and embedded systems) to achieve required capability that minimizes complexity; anticipates change; and plans for verification, reuse, and software activities estimation.	
TIER 3 TRACEABILITY: Software Engineering/Design; Software Assurance; DevSecOps; Software Configuration Management	
TASK STATEMENTS:	Task 8.A: Operate within a DevSecOps culture to include utilizing people, tools, and processes.
	Task 8.B: Transition legacy systems to a modern software approach.
	Task 8.C: Account for cyber-security and resilience aspects of software.

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COMPETENCY 9 TITLE: Technical Perspective on Defense Contracting	
COMPETENCY 9 DEFINITION: Planning and implementing the technical contracting activities [e.g., Small Business Innovative Research (SBIRs), Cooperative Research and Development Agreements (CRADAs), pre-award surveys, unique Federal Acquisition Regulations (FAR) clauses, specific recommended statement of work (SOW) wording, Sections L & M considerations] necessary to execute Engineering and Technical Management (ETM) functions.	
TIER 3 TRACEABILITY:	
TASK STATEMENTS:	Task 9.A: Develop and provide written technical requirements, technical evaluations, and technical presentations.
	Task 9.B: Provide evaluation and technical recommendations in the use of non-traditional and non-FAR based strategies such as Other Transactions, Cooperative Research and Development Agreements, and Grants.
	Task 9.C: Plan and employ appropriate contracting methods and effectively manage contractor performance.
	Task 9.D: Prepare evaluations of Small Business Innovative Research, Small Business Technology Transfer, and other proposals.
	Task 9.E: Participate in source selection activities.
	Task 9.F: Revise Qualified Product Database.
	Task 9.G: Reconcile acquisition strategy-based technical contractor requirements into the procurement package documentation.
	Task 9.H: Compile technical input and validation to be included in acquisition planning documents.
	Task 9.I: Prepare technical contract recommendations.
	Task 9.J: Prepare technical inputs to be incorporated into the Technical Support to Negotiations (TSN).
Task 9.K: Prepare technical recommendations for post-award activities.	

Engineering & Technical Management Functional Area – Tier 3 Specialty Competencies

ETM – TIER 3 SPECIALTY COMPETENCIES			
1. <u>Mission Capability Analysis, Definition, and Characterization</u>	10. <u>Transition</u>	19. <u>Technology Portfolio Management</u>	28. <u>Software Configuration Management</u>
2. <u>Mission Engineering Approach</u>	11. <u>System of Systems / Family of Systems</u>	20. <u>Technology Protection</u>	29. <u>Technology and the Industrial Base</u>
3. <u>Mission Engineering Documentation</u>	12. <u>Architecture Design</u>	21. <u>Technology Transition/ Transfer</u>	30. <u>Process Capability and Control</u>
4. <u>Systems Engineering Management</u>	13. <u>Cyber Acumen for Engineering</u>	22. <u>Software Engineering/ Design</u>	31. <u>Quality Management</u>
5. <u>Stakeholder Requirements Definition</u>	14. <u>Adversity-Driven Requirements Derivation</u>	23. <u>Digital Environment Development</u>	32. <u>Surveillance Activities</u>
6. <u>Requirements Analysis</u>	15. <u>Analysis of Adversity and Adverse Effects</u>	24. <u>Digital Environment Operations and Support</u>	33. <u>Manufacturing Planning, Scheduling, and Control</u>
7. <u>Implementation</u>	16. <u>Adversity-Driven Design</u>	25. <u>Modeling, Simulation, and Analysis</u>	34. <u>Industrial Workforce Planning</u>
8. <u>Integration</u>	17. <u>Adversity-Driven Realization</u>	26. <u>Software Assurance</u>	35. <u>Materials Management</u>
9. <u>Verification and Validation</u>	18. <u>Adversity-Driven Test, Evaluation, Verification, and Validation</u>	27. <u>DevSecOps</u>	36. <u>Facilities</u>

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COMPETENCY 1 TITLE: Mission Capability Analysis, Definition, and Characterization	
COMPETENCY 1 DEFINITION: Analyze the problem scenario to determine what capabilities are required and to develop a Concept of Operations (CONOPS) for the mission. Define and document the problem and mission to form analysis inputs.	
TIER 2 TRACEABILITY: Mission & Systems Thinking	
CREDENTIALING AREA TRACEABILITY: Mission Engineering (ME)	
TASK STATEMENTS:	Task 1.A: Identify purpose and the mission context.
	Task 1.B: Analyze the problem scenario to determine what capabilities are required and to develop a CONOPS for the mission.
	Task 1.C: Define and articulate mission capabilities, mission success criteria, effects, and metrics [Measures of Effectiveness (MOE), Measures of Performance (MOP)] needed to measure operational effectiveness.
	Task 1.D: Depict the projected operational environment which includes timeframe, region, theater, threats and other details as needed.
	Task 1.E: Identify the stakeholders that are part of the mission.
	Task 1.F: Ensure mission capability alignment with relevant operational guidance (commander’s intent, policy, doctrine, treaties regulations and operating procedures).
COMPETENCY 2 TITLE: Mission Engineering Approach	
COMPETENCY 2 DEFINITION: Perform analysis and modeling to determine the efficacy of proposed operational approaches to conduct the mission.	
TIER 2 TRACEABILITY: Mission & Systems Thinking	
CREDENTIALING AREA TRACEABILITY: Mission Engineering (ME)	
TASK STATEMENTS:	Task 2.A: Identify relevant Fleet/Joint CONOPS and Tactics, Techniques, and Procedures (TTP).
	Task 2.B: Determine the strategy and approach to provide meaningful data/information to support decision making.
	Task 2.C: Perform Kill Chain analysis for different Weapon-Platform pairings to demonstrate operational objectives are met.
	Task 2.D: Define the Mission Thread (modeling end-to-end set of operational activities, their sequencing, and the information flows between them).
	Task 2.E: Identify assumptions, approximations, models (and fidelity), and determine analytical methods (war gaming, modeling & simulation, etc.).
	Task 2.F: Support Mission-oriented system of systems (SoS) implementation (support to designing and developing new systems, modifying existing systems, and/or modifying doctrine, policies, procedures, and other non-materiel means to help achieve the mission).
	Task 2.G: Mission verification and validation (verification that the system/SoS, as delivered, satisfies the requirements and validates that the system fulfills the mission purpose and stakeholder needs).

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	Task 2.H: Conduct analysis and cost impacts on the operational approaches and explore excursions to key parameters of interest in a sensitivity analysis.
COMPETENCY 3 TITLE: Mission Engineering Documentation	
COMPETENCY 3 DEFINITION: Document and provide the results of the mission analysis to inform tactical and technical decisions.	
TIER 2 TRACEABILITY: Mission & Systems Thinking, Technical Management	
CREDENTIALING AREA TRACEABILITY: Mission Engineering (ME)	
TASK STATEMENTS:	Task 3.A: Document the warfighting objective (the desired effect) for near-term (current missions) and define the warfighting objective (future missions) based on iterative collaboration with the operational community, stakeholder requirements, and Fleet/Joint CONOPS (tactical-technical integration).
	Task 3.B: Document mission effectiveness efficacy based on analysis and determine confidence levels.
	Task 3.C: Identify current and future operational gaps.
	Task 3.D: Identify mission risks (at the system and SoS level) for the mission thread.
	Task 3.E: Provide inputs to systems engineering and program office trade-off analysis, including cost models.
	Task 3.F: Identify most effective mission approach.
COMPETENCY 4 TITLE: Systems Engineering Management	
COMPETENCY 4 DEFINITION: Apply Systems Engineering in an integrated technical approach across the total life-cycle that includes hardware, systems, software, and people to satisfy stakeholder needs using systems principles and concepts and scientific, technological, and management methods to maintain consistency of a product or system’s attributes with its requirements and evolving technical standards and baselines.	
TIER 2 TRACEABILITY: Mission & Systems Thinking, Technical Management, Requirements Definition & Analysis, Product Realization, Design Considerations, Digital Literacy	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering; Quality Assurance (QA); Systems Engineering (SE)	
TASK STATEMENTS:	Task 4.A: Audit design review content against milestone entry and exit criteria to ensure that the contractor delivers quality products on time and within budget.
	Task 4.B: Evaluate the potential impact of changes on future systems across projects and programs.
	Task 4.C: Encourage the selection of a systems engineering process improvement framework based on the systems engineering life cycle.
	Task 4.D: Confirm progress in program risk areas during systems development using Technical Performance Measures.
	Task 4.E: Compute trend analyses of significant trends and/or anomalies concerning program/technical performance to develop a proactive recommendations for the program.
	Task 4.F: Develop implementation plans, including process improvement goals, schedules, and estimated resources, to continuously improve systems engineering processes.

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	Task 4.G: Coordinate the quality assurance program in the systems acquisition and/or the Government operational organization.
	Task 4.H: Evaluate the contractor quality assurance program for adherence to documented quality processes and work product specifications.
	Task 4.I: Research contractor documentation for the integrated baseline review to assure consistency with the Statement of Work (SOW), work breakdown structure (WBS), and proposed technical approach.
	Task 4.J: Conduct Functional and Physical Configuration Audits and provide recommendations.
	Task 4.K: Evaluate Engineering Change Proposals and provide recommendations.
	Task 4.L: Conduct Production Readiness Reviews (PRR) and provide recommendations.
	Task 4.M: Provide technical inputs to the Systems Engineering Plan (SEP).
	Task 4.N: Conduct technical related Risk Management activities and provide observations and recommendations.
	Task 4.O: Conduct surveillance of production activities and schedules.
	Task 4.P: Evaluate the producibility of the design and provide observations and recommendations.
COMPETENCY 5 TITLE: Stakeholder Requirements Definition	
COMPETENCY 5 DEFINITION: Collaborate with stakeholders to establish and refine operational needs, attributes, performance parameters, and constraints that flow from the Joint Capability Integration and Development System (JCIDS) described capabilities (or Problem Statement for Defense Business Systems), ensuring all relevant requirements and design considerations are addressed to establish a set of baseline requirements.	
TIER 2 TRACEABILITY: Requirements Definition & Analysis	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 5.A: Collaborate with stakeholders to build consensus and resolve conflict in regards to requirements and other aspects of a system life-cycle.
	Task 5.B: Develop the business and mission need for systems that will provide services, capabilities, or platforms to end-users and other stakeholders.
	Task 5.C: Appraise capability needs and operational constraints, in collaboration with the stakeholders, to derive system requirements and technical performance measures for system development.
	Task 5.D: Develop the constraints on a system solution that stem from existing agreements, management decisions, and technical decisions.
	Task 5.E: Evaluate capability needs and operational constraints, in collaboration with the customer, to derive system requirements and technical performance measures for system development.
	Task 5.F: Generate stakeholder requirements (e.g., health, safety, security, and environment) that relate to critical qualities.
	Task 5.G: Identify the suitability of the Modular Open Systems Approaches (MOSA) to the system design.
	Task 5.H: Identify whether the use of Digital Engineering / Modeling & Simulation is suitable for the system design.

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COMPETENCY 6 TITLE: Requirements Analysis	
COMPETENCY 6 DEFINITION: Evaluate stakeholder and derived requirements (including constraints) and transform those requirements into a functional and technical view of a system capable of meeting the stakeholders’ needs. Decompose needs and constraints into clear, achievable, and verifiable high-level requirements. As the system design evolves, allocate and derive requirements to the system elements and enabling system elements (hardware and software) to be designed and developed.	
TIER 2 TRACEABILITY: Requirements Definition & Analysis, Design Considerations	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 6.A: Evaluate the results of threat analysis to support a materiel or non-materiel solution.
	Task 6.B: Compare the impact of requirements changes on the solution and program.
	Task 6.C: Decompose requirements across a system for allocation purposes.
	Task 6.D: Develop specification documents for a system.
	Task 6.E: Establish threshold and objective values for system requirements.
	Task 6.F: Resolve requirement conflicts in order to establish a complete and consistent requirement set for the system of interest throughout the life-cycle of the system.
	Task 6.G: Determine if requirements address availability, reliability, and maintainability.
	Task 6.H: Develop critical technical performance measures to monitor the system development.
	Task 6.I: Identify traceability of system requirements.
	Task 6.J: Evaluate system requirements to determine design detail and performance characteristics.
COMPETENCY 7 TITLE: Implementation	
COMPETENCY 7 DEFINITION: Ensure the fabrication or creation of a system element (hardware or software) conforms to that element’s detailed design and requirements.	
TIER 2 TRACEABILITY: Design Considerations	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 7.A: Plan for corrective action for any discovered hardware or software deficiencies.
	Task 7.B: Evaluate product reuse taking into consideration the status from enabling products, supporting documentation, and user manuals.
	Task 7.C: Develop the product implementation strategy for a system or program.
	Task 7.D: Assist with product fabrication by enabling product status assessment, product fabrication monitoring, and support documentation preparation.
	Task 7.E: Assist with the purchase of products by reviewing product technical information, assisting in product inspection, assessing product validation status, and assessing enabling product status.
	Task 7.F: Evaluate technology insertion in the manufacturing and production process for future system modifications.

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COMPETENCY 8 TITLE: Integration	
COMPETENCY 8 DEFINITION: Ensure the systematic assembly of lower-level system elements (hardware and software) into successively higher-level system elements to realize the complete system.	
TIER 2 TRACEABILITY: Product Realization, Technical Management	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 8.A: Identify integration strategies that meet business/mission needs and address integration and interoperability challenges, integration and interoperability challenges.
	Task 8.B: Evaluate resource information necessary define resources needed to create and complete an integration plan.
	Task 8.C: Maintain integration principles across specialized disciplines.
	Task 8.D: Generate an integrated picture that encompasses multiple, interoperable systems, their environments, components, and interfaces.
	Task 8.E: Direct the development of detailed planning which includes identification of integration, interface, and interoperability constraints within and across environments.
	Task 8.F: Collect work products and related information from product integration activities.
	Task 8.G: Guarantee subsystem configuration and documentation supports higher level SoS integration.
	Task 8.H: Evaluate integration and interoperability options for evolving systems, phasing out of legacy systems, or phasing in of new systems.
	Task 8.I: Confirm system performance and conformance to requirements in integration testing and evaluation.
	Task 8.J: Recommend resources needed to complete the integration plan and activities, and participates in integration testing and evaluation to assess system performance and conformance to requirements.
COMPETENCY 9 TITLE: Verification and Validation	
COMPETENCY 9 DEFINITION: Apply verification and validation methods to generate objective evidence that the system or system element (hardware or software) performs its intended functions, meets all performance requirements listed in the system performance specification and functional and allocated baselines, and that the system capability complies with stakeholder performance requirements in its intended operational environment.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 9.A: Evaluate product verification outcomes for a system.
	Task 9.B: Confirm requirements traceability from the lowest to highest level of integration.
	Task 9.C: Develop an approach to verify requirements using inspection, demonstration, analysis, and testing.
	Task 9.D: Evaluate the specialty test results in collaboration with the specialist to prioritize the problems along with the other system problems.
	Task 9.E: Develop a mitigation strategy that recommends corrective actions to resolve problems, and to re-test and re-

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	evaluate the system.
	Task 9.F: Participate in developmental testing for a system.
	Task 9.G: Prepare evidence (e.g., test results, digital artifacts, and plan of action and milestones) for stakeholder acceptance and certification.
	Task 9.H: Evaluate system validation outcomes to enable program decisions.
	Task 9.I: Coordinate system validation activities (e.g., operational testing, Modeling & Simulation, limited user testing) according to the plans.
	Task 9.J: Develop validation plans and procedures for a system, including identification of method and timing for each activity.
COMPETENCY 10 TITLE: Transition	
COMPETENCY 10 DEFINITION: Advance the system elements to the next level in the physical architecture or provide the end item to the user after ensuring integration with other systems and interface management, both internal and external, for use in the operational environment. Deploying the technical product into production, test, operations and sustainment.	
TIER 2 TRACEABILITY: Technical Management, Product Realization	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 10.A: Evaluate the risks to successful production transition and program sustainment activities during preparation for production.
	Task 10.B: Develop a product transition strategy for a system.
	Task 10.C: Direct transition to fielding and sustainment activities according to plan.
	Task 10.D: Coordinates with receiving sites to ensure they have the personnel availability and skills and product transition procedures to receive the end product for a system.
	Task 10.E: Guarantee the adequacy of packaging material, handling equipment, storage facilities, and shipping services for a system.
	Task 10.F: Secure the adequacy of the logistics tail (such as Reliability, Maintainability, Lowest Replaceable Units, Training Plans, Expected life of the system).
	Task 10.G: Compile work artifacts throughout the life-cycle of a system as part of the system engineering process.
COMPETENCY 11 TITLE: System of Systems / Family of Systems	
COMPETENCY 11 DEFINITION: Identify a set or arrangement of systems that results when independent and useful systems are integrated into a larger system that delivers unique capabilities.	
TIER 2 TRACEABILITY: Mission & Systems Thinking	
CREDENTIALING AREA TRACEABILITY: Systems Engineering (SE)	
TASK STATEMENTS:	Task 11.A: Evaluate the difference between systems engineering and system of systems engineering.
	Task 11.B: Identify core SoS/Family of Systems (FoS) elements and describe their relationship to basic systems

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	engineering processes.
	Task 11.C: Develop the systems engineering processes to support each SoS/FoS systems engineering element and how they differ when implemented for a SoS.
	Task 11.D: Identify approaches and emerging principles for SoS/FoS.
	Task 11.E: Identify SoS/FoS challenges.
COMPETENCY 12 TITLE: Architecture Design	
COMPETENCY 12 DEFINITION: Create a system or mission architecture design using digital models that satisfies the documented requirements for hardware, software, and human elements; their enabling processes; and related internal and external interfaces.	
TIER 2 TRACEABILITY: Digital Literacy, Mission & Systems Thinking, Design Considerations	
CREDENTIALING AREA TRACEABILITY: Digital Engineering (DE) for Technical Workforce; Mission Engineering (ME); Systems Engineering (SE)	
TASK STATEMENTS:	Task 12.A: Develop Architecture Framework products to describe system data exchange requirements, formats, and system interfaces for interoperable systems.
	Task 12.B: Identify the overall architecture to ensure it meets requirements.
	Task 12.C: Design architecture solution and products that capture operational or systems requirements.
	Task 12.D: Create solutions by building analytic models, conducting experiments, and using visualization techniques.
	Task 12.E: Construct the functional, allocated, and product baselines for use throughout the system life-cycle.
	Task 12.F: Plan the design process taking into account suitability of design attributes.
	Task 12.G: Evaluate concept feasibility to support architectural design tradeoffs.
	Task 12.H: Investigate design considerations (e.g., boundaries, interfaces, standards) to ensure they are properly addressed in the technical baselines.
	Task 12.I: Generate analysis of alternatives to enable program decisions.
	Task 12.J: Confirm the system design meets requirements.
	Task 12.K: Identify systems interfaces and interoperability concerns to achieve resolution.
	Task 12.L: Design for manufacturability and maintainability.
	Task 12.M: Maintain system components & platforms to be separated and independently developed thru the lifecycle.
	Task 12.N: Evaluate using Modeling & Simulation technologies to enhance the design process.
	Task 12.O: Account for System Security thru the lifecycle.
Task 12.P: Create and manage system digital models, required architectural products, digital artifacts, and interface standards for a system or system-of-systems.	
Task 12.Q: Provide architecture assessment to make decisions based on the digital model architecture.	
Task 12.R: Construct models to be traceable from concept to disposal (authoritative source of truth).	
Task 12.S: Assess aspects of model quality including conformance to modeling language and application method constraints.	

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	Task 12.T: Analyze and determine common architectural elements.
	Task 12.U: Identify the high-level architecture of the SoS interactions and its compatibility with the desired mission.
	Task 12.V: Develop Mission models and accompanying mission architectures.
	Task 12.W: Determine if current architecture modifications or a new reference architecture is needed.
	Task 12.X: Develop operational view (what needs to be accomplished and who does it).
	Task 12.Y: Develop system view (relate systems and characteristics to operational needs).
	Task 12.Z: Develop technical view (prescribes standards and conventions).
	Task 12.AA: Document Reference Architecture(s).
COMPETENCY 13 TITLE: Cyber Acumen for Engineering	
COMPETENCY 13 DEFINITION: Acquire and develop awareness, insights, and skills necessary to specify, design, and realize systems given the protection concerns enabled/induced by or within contested cyberspace, and the protection concerns associated with the computational, communication, and physical (i.e., cyber-physical characteristics of systems). The protection concerns of contested cyberspace span the entire life cycle of the system and its enabling and supporting systems, the entire life cycle of technology, data, and information associated with the system; and includes the maintenance, logistics, and supply chain.	
TIER 2 TRACEABILITY: Mission & Systems Thinking, Requirements Definition & Analysis, Design Considerations, Product Realization	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	
TASK STATEMENTS:	Task 13.A: Appraise and differentiate the purpose and application of principles, concepts, and techniques for design of trustworthy secure and resilient systems, networks, and communications.
	Task 13.B: Identify and differentiate technologies, components, products, and services that provide secure and resilient systems, communications, and networks.
	Task 13.C: Identify and differentiate the attack methods, strategies, and technology used to produce adverse effects in systems, networks, and communications, and used to compromise, steal, or destroy technology, data, and information.
	Task 13.D: Identify and differentiate exposure, susceptibility, and vulnerability of technologies, components, products, and services used in systems, communications, and networks.
	Task 13.E: Appraise and differentiate methods and approaches for the application of methods to provide confidence in the engineering of secure and resilient systems, communications, and in the secure and resilient performance predictions of systems, communications, and networks.
	Task 13.F: Provide a credible and compelling argument, based on quality evidence and assumptions that can be validated, that provides assurance in the system, communications, and network protection performance and effectiveness, and the extent to which those protections are effective.
COMPETENCY 14 TITLE: Adversity-Driven Requirements Derivation	
COMPETENCY 14 DEFINITION: Generate system, communications, and network requirements that accurately reflect concerns driven by contested cyberspace. Applies equally to stakeholder requirements definition and requirements analysis of systems engineering.	

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TIER 2 TRACEABILITY: Requirements Definition & Analysis, Design Considerations	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	
TASK STATEMENTS:	Task 14.A: Identify and prioritize capability, component, technology, data, information, and human assets requiring protection.
	Task 14.B: Derive stakeholder adversity-driven concerns, needs, preferences, expectations, and priorities to protect against unacceptable adverse effects (i.e., loss) while achieve mission objectives.
	Task 14.C: Appraise, differentiate, and confirm the classes of supply chain and cyberspace enabled attack methods that are relevant to the system of interest, communications of interest, and networks of interest.
	Task 14.D: Appraise and confirm threat data that is specific and actionable, and has sufficient accuracy, credibility, relevance, and sample size to be used to supplement the knowledge of generalized attack classes of attack methods.
	Task 14.E: Define protection-oriented design constraints for the system, communications, and networks that optimize capability and protection performance, constraints, and priorities, that are consistent with existing agreements, and that are consistent with applicable regulations.
	Task 14.F: Define protection-oriented considerations and objectives for requirements verification and validation.
COMPETENCY 15 TITLE: Analysis of Adversity and Adverse Effects	
COMPETENCY 15 DEFINITION: Provide adversity-driven technical data about system, communication, and network behaviors and outcomes that is sufficient to inform life cycle engineering, programmatic, and risk decisions.	
TIER 2 TRACEABILITY: Mission & Systems Thinking, Requirements Definition & Analysis, Design Considerations, Product Realization	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	
TASK STATEMENTS:	Task 15.A: Identify the specific classes and types of capability, component, technology, data, information and human asset loss concerns.
	Task 15.B: Collect sufficient data that provides insight to all intentional adversity (attacks) and unintentional adversity (errors, faults, failures) to which the system is subjected.
	Task 15.C: Develop adversity-driven system functional and system control scenarios associated with all system normal, alternate, and contingency modes of operation. The scenarios reflect how events and conditions in the environment and within the system produce behavioral and outcome adverse effects (i.e., loss effects).
	Task 15.D: Evaluate adversity-driven scenarios using methods to include modeling, simulation, prototyping, and trade studies.
	Task 15.E: Record and report adversity-related technical data to support engineering activities and to support decision-making.
COMPETENCY 16 TITLE: Adversity-Driven Design	
COMPETENCY 16 DEFINITION: Produce a system, communications, and network design for realization that is effective against adversarial and non-adversarial actions in cyberspace.	

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TIER 2 TRACEABILITY: Requirements Definition & Analysis, Design Considerations, Product Realization	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	
TASK STATEMENTS:	Task 16.A: Select a system, communications, and network design that is optimal in achieving the objectives for security and resilience. These objectives provide adequate protection of capability, component, technology, data, information and human assets despite intentional and unintentional adversity.
	Task 16.B: Alter the system, communications, and network design to reduce the risk associated with the inherent susceptibility and vulnerability of the selected design.
	Task 16.C: Employ protection-oriented features and devices to enforce constraints on system, communications, and network behavior and outcomes that are necessary to achieve the security and resilience objectives despite adversity.
	Task 16.D: Employ features to provide warnings and cautions that provide operators with sufficient system situational-awareness to take appropriate response action in response to system, communications, and network anomalies, to include anomalies that are indicative of an attack if not confirmed to be an attack.
	Task 16.E: Derive system, communications, and network requirements for security and resilience that achieve the design alterations and employment of protection-oriented features and devices.
COMPETENCY 17 TITLE: Adversity-Driven Design Realization	
COMPETENCY 17 DEFINITION: Realize the system, communications, and network design in a manner that achieves the design intent for effectiveness against adversarial and non-adversarial actions in cyberspace.	
TIER 2 TRACEABILITY: Requirements Definition & Analysis, Design Considerations, Product Realization	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	
TASK STATEMENTS:	Task 17.A: Optimize the selection and use of security products and services.
	Task 17.B: Develop an adversity-informed integration approach to achieve the intended effectiveness of security function and component, and to minimize the extent to which emergence and side-effects adversely impacts the security and resilience posture of the system, communications, and network.
	Task 17.C: Identify the system risk due to susceptibility and vulnerability using probabilistic and non-probabilistic risk identification and assessment methods.
COMPETENCY 18 TITLE: Adversity-Driven Test, Evaluation, Verification, and Validation	
COMPETENCY 18 DEFINITION: Provide objective evidence to substantiate claims that the realization of the system, communications, and network design (a) fulfills its specified requirements and characteristics, (b) and then when in use, fulfills its mission objectives and stakeholder requirements to achieve its intended use in the intended operational environment despite adversarial and non-adversarial actions in cyberspace.	
TIER 2 TRACEABILITY: Requirements Definition & Analysis, Design Considerations, Product Realization	
CREDENTIALING AREA TRACEABILITY: Secure Cyber Resilient Engineering (SCRE)	

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TASK STATEMENTS:	Task 18.A: Develop an approach to verify/validate requirements in based on known adversity (threats, attacks, susceptibility, and vulnerability) using inspection, demonstration, analysis, and testing.
	Task 18.B: Develop an approach to verify/validate requirements in consideration of unknown adversity (attacks, susceptibility, and vulnerability) using inspection, demonstration, analysis, and testing.
	Task 18.C: Interpret verification/validation results and ascertain deficiencies and trends that diminish system protection performance to adversity. Prepare assessment reports to ensure the appropriate corrective action is determined and taken.
COMPETENCY 19 TITLE: Technology Portfolio Management	
COMPETENCY 19 DEFINITION: Develop a schema to prioritize technology portfolios consistent with service/agency priorities. Continue to assess portfolio execution.	
TIER 2 TRACEABILITY: Technical Management	
CREDENTIALING AREA TRACEABILITY: Science and Technology Manager (S&TM)	
TASK STATEMENTS:	Task 19.A: Determine Department of Defense and Component priorities that apply to the portfolios under consideration.
	Task 19.B: Develop criteria to be used in prioritizing projects within a portfolio.
	Task 19.C: Apply criteria to determine which projects will be pursued.
	Task 19.D: Regularly assess project progress and make any needed adjustments to priorities within a portfolio.
COMPETENCY 20 TITLE: Technology Protection	
COMPETENCY 20 DEFINITION: Develop plans and procedures to assess the level of acceptable risk of adversarial exploitation and compromise of technologies.	
TIER 2 TRACEABILITY: Technical Management	
CREDENTIALING AREA TRACEABILITY: Science and Technology Manager (S&TM)	
TASK STATEMENTS:	Task 20.A: Identify the information and technology elements that require protection.
	Task 20.B: Conduct risk assessment including impact, threats and vulnerabilities.
	Task 20.C: Develop S&T protection plans.
COMPETENCY 21 TITLE: Technology Transition/Transfer	
COMPETENCY 21 DEFINITION: Plan the process of inserting critical technology into military systems to provide effective weapons and support system needed by the warfighter to carry out assigned missions. This includes transition or rapid fielding to an acquisition program or directly to a warfighter.	
TIER 2 TRACEABILITY: Product Realization, Technical Management	
CREDENTIALING AREA TRACEABILITY: Science and Technology Manager (S&TM)	
TASK STATEMENTS:	Task 21.A: Develop a Technology Transition Agreement.
	Task 21.B: Assess transition readiness (Technical, Manufacturing, Mission, Resource, and Organization) and transition success.
	Task 21.C: Identify primary transition path for products of S&T development efforts.

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	Task 21.D: Advance the system elements to the desired Technology Readiness Level (based on transition path) and assist system developers or end users with defining integration or deployment requirements and opportunities.
	Task 21.E: Provide or assist system developers/users with business based analysis to produce objective measures of merit for assessing the utility of adapting the technologies being developed.
	Task 21.F: Tailor technology development efforts with an understanding of how they will fit into the DoD acquisition process.
	Task 21.G: Design and implement a testing, experimentation and assessment process for technology solutions to support specific decisions for technology development purposes. Consider selecting pilot programs to exercise the process.
	Task 21.H: Identify and utilize mechanisms to transfer technologies to entities outside the Department of Defense.
	Task 21.I: Plan and employ appropriate contracting methods and effectively manage contractor performance.
COMPETENCY 22 TITLE: Software Engineering/Design	
COMPETENCY 22 DEFINITION: Plan and implement software (including prototypes and executable models) within a continuous integration and continuous delivery pipeline that can transition into a development program for fielding as well as for long-term maintainability using software development methodologies, architectural structures, viewpoints, styles, design decisions, and frameworks.	
TIER 2 TRACEABILITY: Software Literacy	
CREDENTIALING AREA TRACEABILITY: Software Engineering (SwE)	
TASK STATEMENTS:	Task 22.A: Identify internal and external software interface requirements.
	Task 22.B: Develop requirement allocation for all capabilities and interfaces using product roadmaps.
	Task 22.C: Create and apply conditions or acceptance criteria for a software product.
	Task 22.D: Maintain and groom the list of capabilities to be developed throughout the software lifecycle continually applying Definition of Ready and Definition of Done to backlog.
	Task 22.E: Plan and implement software prototypes and/or design models, where appropriate.
	Task 22.F: Design product strategy and graphical user interface (GUI) frontends based on understanding of domains and through the use of prototyping user experience (UX)/user interface (UI) designs, framing the product, and implementing human-centered design.
	Task 22.G: Monitor and evaluate new technologies and tools that apply to software engineering activities and apply when appropriate.
	Task 22.H: Use continuous integration methods, processes, and tools in developing and deploying software including test case writing against completion criteria, build automation, and build processes.
	Task 22.I: Develop detailed plans for transitioning accountability of the software requirements, design, code, and verification artifacts to the sustainment organization.
	Task 22.J: Develop detailed plans for sustainment of the software through system termination.
COMPETENCY 23 TITLE: Digital Environment Development	

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COMPETENCY 23 DEFINITION: Develop a digital enterprise environment which is an integrated digital development framework in which digital models and representations are interconnected such that the content and activities within it are managed to accomplish the organizational objectives of the enterprise.	
TIER 2 TRACEABILITY: Digital Literacy	
CREDENTIALING AREA TRACEABILITY: Digital Engineering (DE) for Technical Workforce	
TASK STATEMENTS:	Task 23.A: Establish an end-to-end digital engineering enterprise (i.e., production, delivery and sustainment of the end item).
	Task 23.B: Select digital engineering tools, technologies, and process innovations based on stakeholders' current and future needs.
	Task 23.C: Produce reports and analysis to support digital enterprise environment asset management activities and aid decision making.
	Task 23.D: Create and maintain digital environment policy, standards, procedures and documentation for security.
COMPETENCY 24 TITLE: Digital Environment Operations and Support	
COMPETENCY 24 DEFINITION: Operate within and supporting a digital enterprise environment.	
TIER 2 TRACEABILITY: Digital Literacy	
CREDENTIALING AREA TRACEABILITY: Digital Engineering (DE) for Technical Workforce	
TASK STATEMENTS:	Task 24.A: Create technology roadmaps.
	Task 24.B: Set parameters for the prioritization of digital resources and the changes to be implemented and the configuration of digital engineering methods and tools to address the project needs.
	Task 24.C: Develop, mature, and implement methods and processes to support digital enterprise environment activities across the enterprise and lifecycle.
	Task 24.D: Provide guidance to support digital enterprise environment systems testing and quality assurance functions, to assist in improving procedures.
	Task 24.E: Contribute to and enforce digital environment security controls (physical, procedural, technical).
	Task 24.F: Implement digital enterprise environment management strategy.
COMPETENCY 25 TITLE: Modeling, Simulation, and Analysis	
COMPETENCY 25 DEFINITION: Create and analyze a digital prototype of a physical model to predict its performance in the real world. Models and simulations are used to help system designers and engineers understand whether, under what conditions, and in which ways a system component could fail and what loads it can withstand through analysis.	
TIER 2 TRACEABILITY: Digital Literacy, Design Considerations, Mission & Systems Thinking, Product Realization	
CREDENTIALING AREA TRACEABILITY: Digital Engineering (DE) for Technical Workforce	
TASK STATEMENTS:	Task 25.A: Advise on selection of appropriate modeling or analysis approach (e.g., model-based systems engineering).
	Task 25.B: Create and manage digital models and simulation artifacts.

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	Task 25.C: Interpret and use outcomes of modeling and analysis.
	Task 25.D: Assess aspects of model quality including conformance to modeling language and application method constraints.
COMPETENCY 26 TITLE: Software Assurance	
COMPETENCY 26 DEFINITION: Explore and specify how the system is meeting the key security attributes that the software solution must satisfy. Examples of key attributes include availability, integrity, and confidentiality.	
TIER 2 TRACEABILITY: Software Literacy, Digital Literacy	
CREDENTIALING AREA TRACEABILITY: Software Engineering (SwE)	
TASK STATEMENTS:	Task 26.A: Apply and execute the software security practices and analyses necessary to meet system requirements.
	Task 26.B: Understand supply chain risks as it pertains to software (procured and developed).
	Task 26.C: Select and use appropriate security testing tools (i.e., static and dynamic, port scanning, spoofing, and fuzzing).
	Task 26.D: Understand and apply Software Assurance Practices and policies throughout the software lifecycle.
	Task 26.E: Conduct appropriate analyses necessary to ensure the resultant system will meet all other specified software assurance quality attributes.
	Task 26.F: Select and use appropriate secure coding standards and analyze code for common weaknesses, vulnerabilities, and hardening against common attack patterns.
COMPETENCY 27 TITLE: DevSecOps	
COMPETENCY 27 DEFINITION: Analyze DevSecOps methodologies, including interface to documentation and production requirements.	
TIER 2 TRACEABILITY: Software Literacy, Digital Literacy, Requirements Definition & Analysis	
CREDENTIALING AREA TRACEABILITY: Software Engineering (SwE)	
TASK STATEMENTS:	Task 27.A: Understand and implement steps for each release to higher levels of integration testing, certification activities, and/or operations using testbeds, modeling and simulation to synchronize software releases with the development of an operations environment(s) to ensure compatibility. Includes the continuous improvement of release planning procedures in response to changes in program needs.
	Task 27.B: Identify and implement tooling for controlling the steps in a continuous integration (CI) and continuous deployment (CD) pipeline.
	Task 27.C: Develop and implement automatic test tools in a CI/CD pipeline. This could include Static Application Security Test (SAST) tools, Dynamic Application Security Test (DAST) tools, Unit Test tools, Static Code Analysis (SCA) tools, etc.
	Task 27.D: Develop code within a CI/CD Pipeline.
	Task 27.E: Select appropriate language and coding standards for software application for appropriate CI/CD framework.
	Task 27.F: Applies testing activities, understands fault vs. failures, conduct basic test planning, develop test selection or adequacy criteria, crafts test documentation, ensures test coverages, and conducts automated testing.

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	Task 27.G: Select and implement telemetry within the CI/CD pipeline and Ops software to support metrics and problem discovery and resolution.
	Task 27.H: The ability to use continuous integration methods, processes, and tools in developing and deploying software including test case writing against completion criteria (for each release, capability, micro-service, or component), build automation, and build processes.
	Task 27.I: Transition embedded and non-embedded software developed and sustained using traditional software methods into a DevSecOps environment.
COMPETENCY 28 TITLE: Software Configuration Management	
COMPETENCY 28 DEFINITION: Establish and maintain consistency of a product or system’s attributes with its requirements and evolving technical baseline over its life-cycle. This includes strategies for identifying and managing the configuration throughout the lifecycle of: <ul style="list-style-type: none"> – System and software development and test environment(s), – Design, test, and analysis artifacts (including documentation), – The software itself, and – External dependencies like associated systems, underlying hardware, and software stack. 	
TIER 2 TRACEABILITY: Software Literacy, Technical Management, Requirements Definition & Analysis, Design Considerations	
CREDENTIALING AREA TRACEABILITY: Software Engineering (SwE)	
TASK STATEMENTS:	Task 28.A: Selection and implementation of appropriate tooling to manage source code, scripts (test, deployment), executables, and other necessary elements (e.g., data, configuration files, etc.).
	Task 28.B: Understand release planning and release iterations (e.g., trains).
	Task 28.C: Understand all program environments (development, test, integration, operations) and their relationships.
	Task 28.D: Implement a data strategy that supports the application and its development and operational needs.
	Task 28.E: Ensure IP and Data Rights are protected and maintained throughout the development and operations usage.
COMPETENCY 29 TITLE: Technology and the Industrial Base	
COMPETENCY 29 DEFINITION: Analyze national technology and industrial base capability to support the design, development, production, operation, uninterrupted maintenance support of the system and eventual disposal, including environmental impacts. Knowledge of Department of Defense industrial base programs including the Manufacturing Technology Program, Defense Priorities and Allocations System, Defense Production Act Title III Program, Science and Technology program structure and Technology Readiness Levels.	
TIER 2 TRACEABILITY: Technical Management, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering	
TASK STATEMENTS:	Task 29.A: Conduct assessments of the capabilities of the technology and industrial base to support the project/program and summarize results for inclusion in the Acquisition Strategy.
	Task 29.B: Identify foreign sources and develop plans for alternate sources of supply.
	Task 29.C: Develop plans to surge production to meet accelerated rates.

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	Task 29.D: Identify emerging technologies for manufacturing feasibility.
	Task 29.E: Identify manufacturing processes beyond the current state of the art for potential Manufacturing Technology projects.
	Task 29.F: Assess progress of implemented Manufacturing Technology projects.
	Task 29.G: Monitor the industrial base for potential Diminishing Manufacturing Sources risks and develop mitigation plans.
	Task 29.H: Develop Industrial Base Shutdown plans for the project/program.
COMPETENCY 30 TITLE: Process Capability and Control	
COMPETENCY 30 DEFINITION: Analyze the risks in manufacturing processes' ability to reflect the design intent (repeatability and affordability) of key characteristics, (e.g., manufacturing modeling and simulation (product and process), manufacturing process maturity, and process yields and rates.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering; Quality Assurance (QA)	
TASK STATEMENTS:	Task 30.A: Define and assess process capabilities to be used for qualification and continuous process improvement (e.g., producibility, use of modeling and simulation, process capability studies, Statistical Process Control (SPC).
	Task 30.B: Identify the methods to verify the capabilities to meet stakeholder needs and design requirements (e.g., PRR, pilot production lines, first article, production lot testing, product verification testing).
	Task 30.C: Lead/participate in root cause analysis and corrective and/or preventative action investigation.
	Task 30.D: Conduct assessments of manufacturing process maturity, including process capability studies to determine whether manufacturing processes are able to meet design requirements.
	Task 30.E: Assess manufacturing readiness and manufacturing process maturity to develop Manufacturing Readiness Assessment report(s); and risk mitigation approaches.
	Task 30.F: Analyze manufacturing and production processes being demonstrated in preparation for Milestone Decision Reviews, Low Rate Initial Production (LRIP); and proposed Engineering Change Proposals (ECPs) to identify the impact of the proposed changes on Production, Quality, or Manufacturing.
COMPETENCY 31 TITLE: Quality Management	
COMPETENCY 31 DEFINITION: Identify the risks and management efforts to control quality, and foster continuous improvement. Includes knowledge of quality management (quality models, quality strategy, quality planning, and quality tools (such as Quality Function Deployment, Design Of Experiments, SPC, Key Characteristics, etc.), product quality (product inspection and acceptance testing – in-process and final), cost of quality, scrap, rework and repair rates, and MRB actions, and Supplier Quality Management (including supply base quality improvement). Knowledge of principles to reduce waste in new and existing processes to improve production efficiency and effectiveness.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Quality Assurance (QA)	
TASK STATEMENTS:	Task 31.A: Conduct Quality Management System Audit.
	Task 31.B: Conduct quality surveillance and inspection.

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	Task 31.C: Conduct and analyze SPCs.
	Task 31.D: Conduct surveillance of a contractor’s subcontractor management plan.
	Task 31.E: Conduct product quality surveillance or inspection.
	Task 31.F: Conduct root cause analysis of system and product failures.
	Task 31.G: Conduct surveillance of a contractor’s continuous process improvement program.
	Task 31.H: Conduct analysis and provide recommendations on Failure Mode and Effects Analysis (FMEA) and Failure Mode, Effects, and Criticality Analysis (FMECA) results.
	Task 31.I: Conduct cost saving analysis Value Engineering Program.
	Task 31.J: Conduct surveillance of a contractor’s Value Engineering Program.
COMPETENCY 32 TITLE: Surveillance Activities	
COMPETENCY 32 DEFINITION: Assess Contract Administrative Services roles, responsibilities and capabilities, including monitoring contractor deliveries and progress payments, reviews and audits of contractor facilities and processes (manufacturing and business), manufacturing in-process reviews, non-conformance material assessments, compliance reviews, process capability studies as well as the acceptance process and Material Inspection Receiving Reports (MIRR).	
TIER 2 TRACEABILITY: Technical Management	
CREDENTIALING AREA TRACEABILITY: Quality Assurance (QA)	
TASK STATEMENTS:	Task 32.A: Conduct a pre-award survey and provide award/no award recommendation.
	Task 32.B: Conduct Production, Quality, and Manufacturing (PQM) Assessments and provide recommendations.
	Task 32.C: Conduct reviews and audit and provide observations and recommendations.
	Task 32.D: Conduct product acceptance process.
	Task 32.E: Conduct assessment of Contractor’s delivery and resource utilization and provide observations and recommendations.
	Task 32.F: Conduct assessment of Contractor’s Continuous Process Improvement Activities and provide observations and recommendations.
	Task 32.G: Identify and analyze production and quality failures and provide observations and recommendations.
	Task 32.H: Conduct production restart reviews and provide recommendations.
	Task 32.I: Monitor vendor and supply availability and provide observations and recommendations.
	Task 32.J: Conduct Production Quality Deficiency Report (PQDR) and Material Review Board (MRB) investigations and provide observations and recommendations.
	Task 32.K: Provide recommendations on the disposition of nonconforming material.
COMPETENCY 33 TITLE: Manufacturing Planning, Scheduling, and Control	

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COMPETENCY 33 DEFINITION: Process all elements of the organization needed to translate the design into an integrated and fielded system (meeting program goals for affordability and availability). Includes manufacturing strategy development, manufacturing planning, scheduling & control, materials planning, and industrial engineering activities.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering	
TASK STATEMENTS:	Task 33.A: Conduct an evaluation of contractor’s work instruction on meeting contract requirements.
	Task 33.B: Conduct surveillance of the contractor’s production and materials plans to meet contract requirements.
	Task 33.C: Conduct surveillance of a contractor’s make buy program.
	Task 33.D: Conduct surveillance of a contractor’s Bill of Material (BoM) systems including the design BoM, the manufacturing BoM and the purchasing BoM.
COMPETENCY 34 TITLE: Industrial Workforce Planning	
COMPETENCY 34 DEFINITION: Identify the number of personnel required, as well as skills, availability, and training/certification requirements needed to support the manufacturing effort.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering	
TASK STATEMENTS:	Task 34.A: Identify program human resource requirements.
	Task 34.B: Conduct assessment of contractor’s labor plan to meet manufacturing plan.
	Task 34.C: Conduct assessment of contractor’s bargaining unit agreement risks.
COMPETENCY 35 TITLE: Materials Management	
COMPETENCY 35 DEFINITION: Identify the risks associated with materials (including basic/raw materials, components, semi-finished parts, and subassemblies). Includes materials properties and maturity, security, availability (including scale-up, long-lead, single/sole/foreign sources), subcontractor management and supply chain issues, special handling, storage (hazardous materials), shelf-life, and Government Furnished Property/Material/Equipment/Facilities issues.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering	
TASK STATEMENTS:	Task 35.A: Review the Technical Data Package to identify specific material specifications to verify that the material requirements are clear and understood.
	Task 35.B: Assess materials maturity and material risk, including identification of sole sources, obsolescence, any new critical technology items, and/or long lead times associated with materials.
	Task 35.C: Identify scale-up plans, issues and risks for the acquisition to include projected lead times for all difficult to obtain, difficult to process, or hazardous materials.

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	Task 35.D: Review the Integrated Master Schedule (IMS) to address materials availability to meet the program schedule to include: subcontractor supplied materials, Government Furnished materials/equipment, and mitigation of any critical path materials.
	Task 35.E: Identify and document any special handling requirements.
	Task 35.F: Review the supply chain management plan/program, including the use of alternate sources, and ensure a counterfeit prevention program is in place.
COMPETENCY 36 TITLE: Facilities	
COMPETENCY 36 DEFINITION: Review the capabilities and capacity of public or private (government or contractor) manufacturing facilities, such as, maintenance/repair depots, prime contractor, subcontractor, supplier, and vendor engineering/manufacturing plants, including tooling and test equipment.	
TIER 2 TRACEABILITY: Technical Management, Requirements Definition & Analysis, Product Realization	
CREDENTIALING AREA TRACEABILITY: Manufacturing Engineering	
TASK STATEMENTS:	Task 36.A: Conduct a risk assessment of the facilities capability to meet program requirements.
	Task 36.B: Conduct evaluation of a program’s environmental, health, and safety risks and issues.
	Task 36.C: Conduct an assessment of the contract to insure it includes environmental, health, and safety requirements.
	Task 36.D: Conduct surveillance of a facilities environmental, health, and safety program and provide an assessment.
	Task 36.E: Document manufacturing tooling requirements and coordinate their development if applicable.
	Task 36.F: Document inspection equipment requirements and coordinate their development if applicable.
	Task 36.G: Conduct surveillance of a contractor’s tooling and inspection equipment program(s) and access program risks and issues.
	Task 36.H: Determine if process yields meet program requirements.
	Task 36.I: Conduct an analysis of a contractor’s contingency plans for work interruptions, restart, and surge.