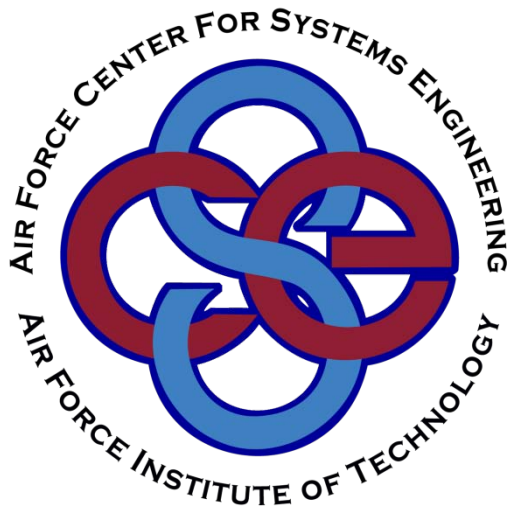




Develop America's Airmen Today ... for Tomorrow

Disciplined Systems Engineering & The Foundational Team SE Skill Set



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The Issue



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- Chief Engineer's are accountable for implementing a disciplined systems engineering process with the skills of the staff they have
 - Staff planning is required content in the Systems Engineering Plan

How does the chief engineer know that the skills of their staff are adequate to implement a disciplined systems engineering process?



What to Do



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- Define the minimum collective staff skill set required to implement a disciplined systems engineering process

- Create an assessment tool for the Chief Engineer
 - Identify skills of the current staff
 - Identify gaps between current staff skills and the defined minimum collective skill set

- Publish the minimum collective staff skill set and assessment tool in the appropriate Air Force level document.



Outline of Basic Tasks



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- Establish the process
- Develop the skills dictionary
- Assessment tool selection
- Pilot project, wing level
- Draft policy guidance
- Publish policy guidance



Establish the Process



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- Who owns the process?
 - Wing/Group/Squadron Chief Engineer?
- Process covers the technical staff
- Process should not require additional manpower



Develop the Skills Dictionary



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- Skills should cover SE process execution across the life cycle
 - Not intended to cover detailed skills of experts in a specific technical discipline
- Skill set should be adaptable and capable of easy modification

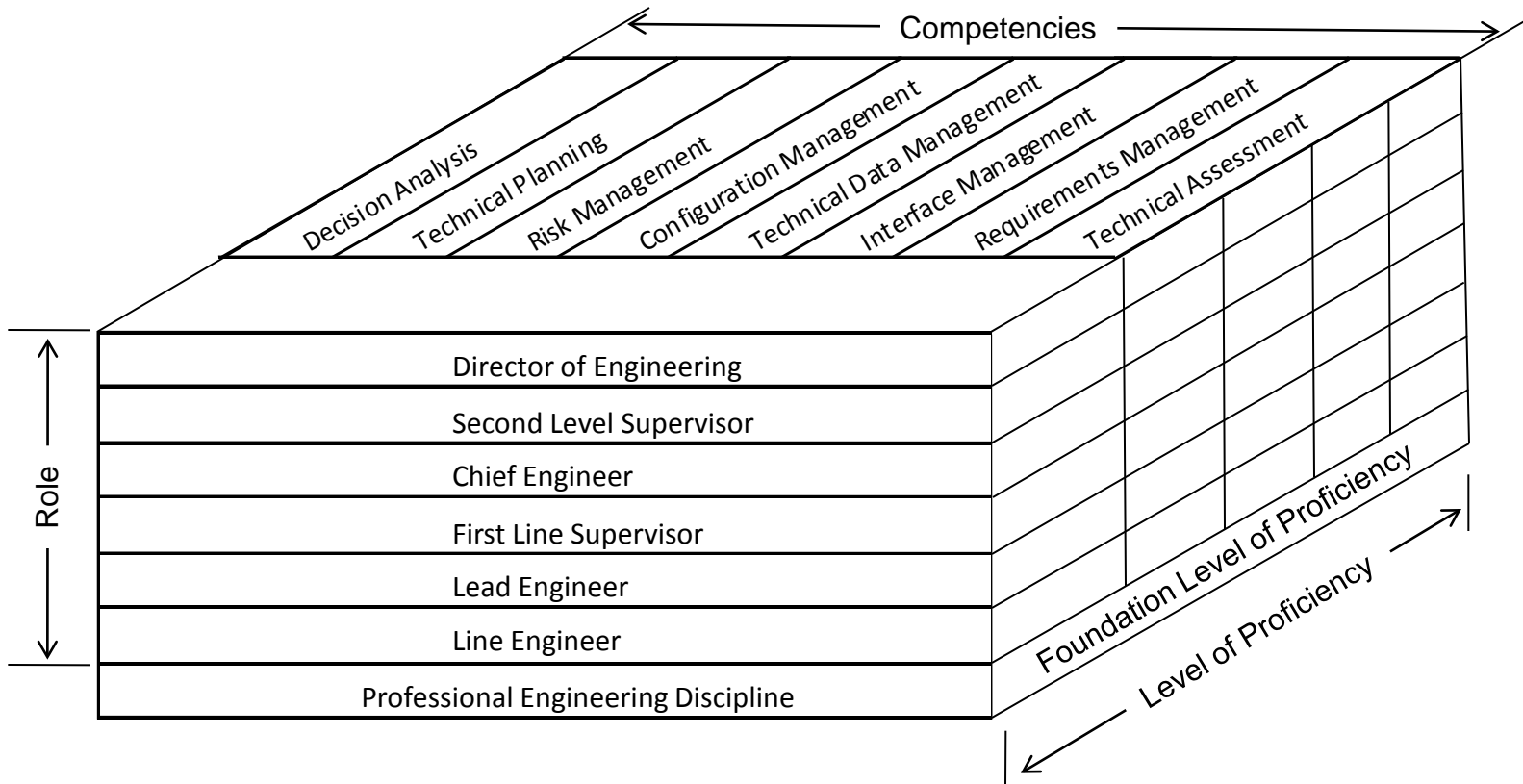
Team has identified 32 skills within the skills dictionary labeled “Foundational Team SE Skill Set”.



Competency Model



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Systems Engineering Foundational Team Competency Model



Foundational Team SE Skill Set

Slide 1



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Decision Analysis

- Can carefully identify the decision at hand and the decision context using appropriate disciplines and disciplined practices
- Can articulate one's objectives in the situation at hand
- Can articulate the benefits of decision analysis
- Can identify the various elements of the situation, i.e. 1) values, priorities and objectives, 2) decisions to be made, 3) certain and uncertain events, 4) consequences, 5) assumptions, 6) limitations and constraints, 7) stakeholders, 8) variation
- Can structure decisions using influence diagrams and/or decision trees and/or other methods and models
- Can structure values and objectives
- Can specify ways to measure achievement of objectives
- Can apply a decision-analysis process
- Can assess the completeness, fidelity, suitability and implications of the decision context

Technical Planning

- Can plan and properly sequence all technical steps
- Can manage risks from out-of-sequence technical steps
- Can manage the application of all relevant technical specialties at the right time
- Can link the technical process with business and management processes
- Can plan and properly sequence all technical review activities
- Can plan and manage testing as well as validation and verification activities
- Can plan and manage technical activities that span the acquisition phases
- Can develop, tailor, implement, integrate and manage the following technical processes: requirements development, logical analysis, design solution, implementation, integration, verification, validation, and transition.



Foundational Team SE Skill Set

Slide 2



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Risk Management

- Can actively manage risk on a continuing basis across the life cycle
- Can adjust risk handling plans to changing circumstances
- Can identify potential additional risks resulting from interactions between multiple risk sources

Configuration Management

- Can implement control processes that regulate change at all levels of the product hierarchy from the system-of-systems level down to the piece part level

Technical Data Management

- Can implement control processes that regulate the creation, change, dissemination, archiving and retrieval of technical data

Interface Management

- Can implement control processes that regulate the creation of, change to, and agreement with documented descriptions of the physical and functional boundaries at all levels of the product hierarchy.
- Can establish forums for interface management when no single organization has responsibility for the entire product hierarchy.



Foundational Team SE Skill Set

Slide 3



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Requirements Management

- Can establish control processes that regulate the establishment of, change to, and agreement with a specific documented set of technical requirements at a given level of the product hierarchy.
- Can articulate the effect of user requested changes on documented technical requirements at all levels of the product hierarchy.
- Can identify risks of achieving specific technical requirements for input into the risk management process.
- Can complete trade studies that balance an achievable set of requirements within cost and schedule constraints.

Technical Assessment

- Can establish and use technical performance measures to track achievement of key performance parameters
- Can establish and use leading indicators to monitor the health and status of systems engineering process execution
- Can conduct thorough, comprehensive technical reviews that accurately convey technical progress
- Can use manufacturing and technology readiness levels to judge the risk of achieving desired technical requirements



Tool Selection



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- Tool should be easily accessible to chief engineers
- Tool should allow easy skill set adjustments
- Tool should be common across wing/group/squadron
- Tool will be an individual self assessment for all 32 skills identified
 - Proficiency level
 - Importance – aid to judging if we have the correct skill mix
- Supervisor review of individual self assessments



Self Assessment Proficiency Level



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- No Skill - neither understands concepts of nor can apply this skill
- Newbie - general understanding of concepts and can apply skill under supervision
- Capable - general understanding of concepts and can apply skill with guidance
- Proficient - depth of understanding of concepts permits independent application
- Expert - leads others in applying this skill and is sought out by others for guidance



Self Assessment Importance



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- Not Important - this skill is not important for success
- Useful - this skill is helpful but not necessary for success
- Important - having this skill contributes to success
- Vital - it is not possible to be successful without this skill



Pilot Project, Wing Level



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- Analogous to “fly-fix-fly” approach in aircraft acquisition
- Learn as you go and refine the bumps in the road before issuing policy guidance
- Seek willingness to participate at the wing level

303rd AESW will participate in the pilot project.



Draft Policy Guidance



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- Coordinate draft within the team
- Refine the draft with lessons learned from the pilot program
- Gain consensus to proceed with formal publication