Defense Acquisition University Tri-Service Webcast Q&As

Q1. What is the schedule for the update to the Systems Engineering Plan (SEP) Prep Guide?

Q2. If the Office of the Secretary of Defense (OSD) had the foresight to see the calamity of ignoring good SE, why now would the authority to approve the SEP be left with the Program Executive Office (PEO)? It would appear if you are unhappy with today's performance, by leaving that authority with the PEO more of the same could be expected. With the plethora of tools being developed/available to help solve acquisition SE problems, i.e., requirements management and traceability, do you see the government moving toward standardizing these tools or providing resource centers for these tools?

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Q4. You have all briefly addressed the importance of SE certification. Will OSD lead the effort to develop a certification program, or is the INCOSE Certification test considered legitimate?

Q5. Are there any plans to integrate all of the Department's concepts into a guidebook that can be used by all the agencies?

Q6. How soon will the OSD/activity recertify engineers for SE when DoD is in a budget crunch for travel and training?

Q7. Does OSD intend to institute commercial industry best practices with its three knowledge points and associated rigorous criteria for its weapon system acquisition programs?

Q8. What is the timeline for the DAG rewrite, and who is involved? Also, what chapters will be addressed?

Q9. To what extent will Capability Maturity Model Integration (CMMI) be used in SE?

Q10. What is your view of the use of models to establish a standard for acquisition surveillance such as EIA 731 or CMMI?

Q11. In the mid-1990s, Acquisition Reform (AcqRef) spoke of improvements to software acquisition. The AcqRef Executive, Ms. Colleen Preston, AT&L, and the ASC C3I Software Program Managers Network responded to the call for "better, faster, and cheaper." Here we are 10 years later and we still can't get it right—what makes this new "systems/software engineering" different? And if it's different what will be done to implement open architected systems and software reuse to actually make it "faster, cheaper, and better"?

Q12. How do we allocate SE responsibilities between systems commands (SYSCOMs) and PEOs?

Q13. What does Technical Authority really entail relative to the acquisition process?

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Q15. You all address the element of SE in the concept phase. Is anybody looking at SE investment costs and control related to continually changing mission operating threats after system fielding, such as experienced in our Iraq conflict?

Q16. Suggestion: Before you have the Department of Defense Architecture Framework (DoD AF) Mission Architecture, you need to have a network that is built around the effects the warfighter requires. Then from the informal network you can develop the processes and from there DoD AF comes into play.One of the problems we have today from my view is we try to plan SE before we define the new relationships required for the new networks needed to resolve the future warfighting missions (Service centric, and in the future even Joint, will be morphed to national interdependencies). We focus on SE hard processes and spend a lot of money, but the requirements based on the new effects that the warfighter wants are not getting solved, or they become overcome by events by the time we incorporate a system into play. This requires a paradigm shift as the boundaries are widened by the DIME approach toward solving the problems more holistically in the future, and the military piece will have to be coordinated within these broader boundaries of national security for it to be effective. Any thoughts / comments?

Q17. How do Networks and Information Integration (NII) and each of the Services recommend using DoD AF views to substitute for traditional 5000.2 SE technical acquisition document Contract Data Requirements Lists (CDRLs) in the acquisition, development, and sustainment processes?

Q18. How can the SE process be applied to implement the Performance Based Logistics (PBL) requirements in sustaining legacy systems applications, especially the IT/Automated Information System/Command and Control systems?

Q19. For each Service rep: What structural/organizational and financial changes has your service implemented to work the cross-organizational "SE coordination overhead" required to truly work SoSE and SoS Management?

Q20. For Mr. Wiltsie: One might suggest that good technical planning (SE) can result in well-planned and predictable program execution. Why would one suggest that good SE practices (program execution) would not or could not help the Service both politically and with the Congress's funding stability? Certainly with failed program execution comes added political pressure and withholding of funding.

Q21. For Mr. Wiltsie: Could you please elaborate on the statement: "...SE is not part of the Requirements Process..."?

Q22. For Mr. Wiltsie: You mention SE training as an important initiative. How about SE education? Your slide displaying the paradigm shift shows how complex the design of systems has become. Should we therefore be formally making SE education (undergraduate and graduate degrees in SE) a priority so that we have systems engineers with the depth of knowledge that can lead us through these changes?

Q23. For Mr. Siel: I cannot access the ncee.navy.mil Web site you cited in your presentation. Do I have the correct address?

Q24. For Mr. Siel: Do we have an activity model that covers the SE domain?

Q25. For Mr. Siel: You mentioned on slide 26 an effort to make architectures "more usable," but it sounded like your explanation related this to high-level reuse of architecture views (DoD AF). Is there any appreciation for or effort to make architecting requirements more applicable to system engineers and developers? In other words, can we make DoD AF products meaningful to anyone other than JROC-level reviewers? It would be nice if they could be of value to system designers for model-driven development as well; right now they don't seem to be.

Q26. For Mr. Carl Siel: How rigorous does a DoD SE technical review need to be in the case of a commercially derivative program for which the U.S. government is leveraging an OEM's internal research and development; there is no hard requirement for rigorous SE in the current acquisition plan under the "Acquisition Reform" concept of using the OEM's own management systems, which are usually less rigorous than DoD?

Q27. For Mr. Siel: Please discuss competency alignment relative to SE activities.

Q28. For Mr. Siel: I am struck by the recurring problems with component reliability in major acquisition programs such as ASDS, the armed amphibious vehicle, and the LCS. In each case, cost has grown as a result of component failures during operational testing or because of failures during system integration. How do you see the SE process you have put in place addressing these failures? In your opinion are Navy programs adequately funded to ensure prime contractors do adequate environmental stress testing of components or require it from their subs?

Q29. For Mr. Siel: How do we ensure that SE on a system/equipment continues to be performed after the initial acquisition cycle is over? I perform in-service engineering on U.S. Navy in-service systems and equipment and rarely see any SE involvement in supporting the systems/equipment during its service life.

Q30. For Mr. Jaggers: If a program currently in sustainment was developed without a thorough SE emphasis, what SE concepts can be implemented to minimize the adverse effects of such an oversight?

Q31. For Mr. Jaggers: What initiatives have been implemented to move more engineering emphasis to the early phases of programs?

Q32. For Mr. Jaggers: For platforms that are in the sustainment phase (like the A-10) but are still modernizing the aircraft to make it viable in the current and future wartime environment, to what degree do we apply SE principles when we are seeing the MAJCOM pushing down solutions to integrate instead of requirements. Should the Program Office level be pushing back a need to establish requirements so that we can integrate SE principles up front?

Q1. What is the schedule for the update to the Systems Engineering Plan (SEP) Prep Guide?

SSE Response: We released a draft guide to the Systems Engineering (SE) Forum members for their coordination in April 2007, and we hope to publish in July. The content will be similar to that of the previous version but will be more specific in order to better facilitate technical planning. We are also streamlining the format to make it easier to read and follow. Back to top

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Q2. If the Office of the Secretary of Defense (OSD) had the foresight to see the calamity of ignoring good SE, why now would the authority to approve the SEP be left with the Program Executive Office (PEO)? It would appear if you are unhappy with today's performance, by leaving that authority with the PEO more of the same could be expected.

SSE Response: By Department of Defense (DoD) policy, SEP approval rests with the Milestone Decision Authority (MDA). The DoD Components, in their role as MDAs, are free to delegate this authority. OSD is working closely with all DoD Components to adopt rigorous standards and procedures for development, review, and approval of program technical planning, including SEPs. Back to top

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Q3. With the plethora of tools being developed/available to help solve acquisition SE problems, i.e., requirements management and traceability, do you see the government moving toward standardizing these tools or providing resource centers for these tools?

SSE Response: There are multiple initiatives across the SE community of practice on tools and tool sets. OSD is tracking the development of integrated tool sets through forums such as the National Defense Industrial Association, Government Electronics and Information Technology Association, Institute of Electrical and Electronics Engineers, and the International Council on Systems Engineering (INCOSE), and in coordination with the Services, agencies, industry, and academia. Any standardization would be through these forums to ensure sufficiently broad consensus toward specific tool solutions. Some acquisition centers/commands have established resource centers to meet their specific needs for tools. This distributed approach will most likely allow the acquisition community to continue to take advantage of emerging tool sets and apply the necessary tailoring to an acquisition program's unique needs. Back to top

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Q4. You have all briefly addressed the importance of SE certification. Will OSD lead the effort to develop a certification program, or is the INCOSE Certification test considered legitimate?

SSE Response: OSD has been working closely with the Services and agencies via the Systems Planning, Research, Development, and Engineering (SPRDE) Functional Integrated Product Team (FIPT) to establish more rigorous certification requirements for SE positions, which will be in place starting October 1, 2007. Before October, functional leaders in the Services and agencies, together with their Director of Acquisition Career Management (DACM) offices, will be assessing SPRDE positions to determine which can take best advantage of the more rigorous certification requirements. Official coding of positions and certification of individuals for those positions can begin in October 2007. The SPRDE FIPT is working with Defense Acquisition University (DAU) to determine the best way to include INCOSE certification in fulfilling some SPRDE requirements. Back to top

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Q5. Are there any plans to integrate all of the Department's concepts into a guidebook that can be used by all the agencies?

SSE Response: The Defense Acquisition Guidebook (DAG) continues to be the overarching guide across DoD. With the DAG as the context, Services and agencies develop guidance to address Component-specific needs and issues. The Systems Engineering Forum is the

mechanism to ensure that common concepts and approaches are adopted broadly and included in the DAG. Back to top

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Q6. How soon will the OSD/activity recertify engineers for SE when DoD is in a budget crunch for travel and training?

SSE Response: Certification of systems engineers into the new SPRDE career path—SPRDE Program Systems Engineer—can commence October 1, 2007. Components will determine which positions are to be coded to the new standard and will also determine how best to apply the certification requirements to balance resource constraints. Back to top

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Q7. Does OSD intend to institute commercial industry best practices with its three knowledge points and associated rigorous criteria for its weapon system acquisition programs? KP 1 occurs when a match is made between the customer's needs and available resources—technology, design, time, and funding. Key technologies must be demonstrated to Technology Readiness Level (TRL) 7. KP 2 occurs when the product's design demonstrates its ability to meet performance requirements and at least 90 percent of the engineering drawings are complete. KP 3 occurs when the product can be manufactured within cost, schedule, and quality targets and is reliable. Critical manufacturing processes are in control, i.e., Cpk (manufacturing process capability) = 1.33 or a defect rate of no more than 1 in 15,152 parts produced. If OSD does not intend to adopt these commercial industry best practices, why not?
Note: The Government Accountability Office (GAO) has issued numerous reports on this topic, and in GAO Report GAO-06-368, April 2006, found that major weapon systems continue to experience cost and schedule problems under DoD's revised policy, which did not include adopting commercial industry best practices. I believe the dashed red line on Mr. Jaggers's cumulative LCC chart represents the liability of not adopting commercial industry best practices.

SSE Response: Very good points. DoD policy and guidance are fully consistent with industry best practices. All too often, these best practices are not proposed by offerors, or when they are, they are not effectively applied to programs in execution. Event-based technical reviews, as required by our SE policy and as described in the DAG, Chapter 4, and included in our "wall chart," in essence are knowledge points as you describe. They should be conducted only when entrance criteria (i.e., knowledge points) are met for a particular review. For instance, a Critical Design Review (CDR) should be conducted when the product baseline is mature (approximately 90% of the product drawings have been released from engineering), not simply when it was scheduled. TRL 6 is now required for Milestone B, so that certainly should be part of an event-based SRR leading up to that milestone. The key is not new policy but instituting at all levels the SE policies and guidance we currently have in place. We have emphasized these points in the new SE Education and Training courses through DAU (including a Continuous Learning Module (CLM) on technical reviews) and in our guidance documents (SEP Preparation Guide, Risk Management Guide, DAG, and others), as well as through our program support reviews during which we assess programs' technical planning. Back to top

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Q8. What is the timeline for the DAG rewrite, and who is involved? Also, what chapters will be addressed?

SSE Response: We have begun the DAG rewrite. In addition to updating Chapter 4 (systems engineering), we plan to work with the appropriate communities to update Chapter 5 (logistics) and Chapter 9 (test) concurrently with Chapter 4 to achieve more synergy among these related topics. At this time the publication date is not fixed. We will communicate that information through all available means when we are farther along in the process. Back to top

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Q9. To what extent will Capability Maturity Model Integration (CMMI) be used in SE?

SSE Response: Sound SE practices as delineated in the DAG, Chapter 4, already incorporate many of the best practices contained in the CMMI-DEV model. In fact, a recently released guidebook titled Understanding and Leveraging a Suppliers' CMMI Efforts: A Guidebook for Acquirers contains an appendix that shows the mapping between the DAG, Chapter 4, and the CMMI-DEV model process areas. This mapping shows a good correlation among the engineering, project management, and support process areas.

Although many organizations have adopted CMMI, nothing in the rules of government acquisition demands the use of CMMI by government suppliers. Although some government organizations specified their suppliers demonstrate achievement of maturity level 3 to the Capability Maturity Model for Software (SW-CMM(r)) in the 1990s, and some continue that practice today with CMMI, DoD has never promulgated a policy requiring adherence to any CMMI maturity level rating. DoD does not place significant emphasis on capability level or maturity level ratings but rather promotes CMMI as a tool for internal process improvement. Back to top

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Q10. What is your view of the use of models to establish a standard for acquisition surveillance such as EIA 731 or CMMI?

SSE Response: EIA 731 was a source model for CMMI. It is no longer supported now that we have CMMI. There will not be a policy to use CMMI for acquisition surveillance. There will be guidance such as the CMMI guidebook, and CMMI process areas will align with the technical and technical management processes expected in a SEP. Back to top

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Q11. In the mid-1990s, Acquisition Reform (AcqRef) spoke of improvements to software acquisition. The AcqRef Executive, Ms. Colleen Preston, AT&L, and the ASC C3I Software Program Managers Network responded to the call for "better, faster, and cheaper." Here we are 10 years later and we still can't get it right—what makes this new "systems/software engineering" different? And if it's different what will be done to implement open architected systems and software reuse to actually make it "faster, cheaper, and better"?

SSE Response: Beginning in 2003, senior leaders in the DoD have taken a serious interest in revitalizing SE. In the past, software engineering has been viewed as a separate effort. Today, along with the command interest in SE, leadership has recognized that software engineering and system assurance are an integral part of the SE emphasis. The SE revitalization effort is providing a vehicle to establish a sound technical foundation across the entire life cycle, including the software perspective.

Across the Department, Services and agencies have stepped out by committing scarce resources to software-related initiatives. Likewise, OSD has shown a strong commitment by standing up a new deputy directorate—Software Engineering and System Assurance—within the Systems and Software Engineering directorate, to be a center of excellence. OSD, in concert with the Services and agencies and also in strategic partnership with industry, academia, and international allies, is working to spread existing pockets of excellence, share best practices, and take on new initiatives on key issues where there are now gaps in our efforts. Leadership across the Department, to the most senior levels, has shown commitment, even in a resource-constrained environment.

Important design considerations such as open architecture and software reuse can be key enablers to "faster, cheaper, and better" when thoughtfully applied as part of a rigorous SE approach. We must realize that even in the past 10 years, the complexity of requirements in software-intensive systems, and certainly what is being delivered, has grown by orders of

magnitude; in essence, to say a system is "software intensive" is becoming redundant. With a watchful eye to past efforts, and broad support from key leaders across the Department and external partners, we will successfully nurture and ingrain existing and new initiatives using the established SE framework. Back to top

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Q12. How do we allocate SE responsibilities between systems commands (SYSCOMs) and PEOs?

Army Response: SE responsibilities follow the program responsibilities. SE is part of program management. If a program is under the management responsibility of a PEO, then SE responsibility is with the PEO.

Air Force Response: MAJCOMs – organize, train, and equip: staffing, training, tools, processes and procedures, etc.; PEOs – execution at the program level: contract language, technical reviews, management/oversight, performance/ cost/schedule/risk, etc.

Navy Response: PEOs and Program Managers (PMs) are vested with the authority, accountability, and resources necessary to manage all aspects of assigned programs from concept to disposal while providing oversight on cost, schedule, and performance; and direction of life cycle management. SYSCOMs develop and employ an engineering process that provides safe, reliable, effective, integrated, timely, and affordable products for the Navy, including certification and authority to ensure safe and assured systems operations of new and in-service systems. Engineering responsibilities are allocated accordingly. Back to top

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Q13. What does Technical Authority really entail relative to the acquisition process?

Army Response: The Technical Authority for SE within each PEO is responsible for the development and execution of the SE strategy for both the organization and each individual program within the organization. The Technical Authority's responsibility starts with the review and recommendation of the SE plan to the MDA. The Technical Authority's responsibility then shifts to ensuring the program is executing the approved plan.

Navy Response: Navy's Technical Authorities (TAs) are recognized subject matter experts. A TA can be an adviser who provides authoritative advice or someone who renders technical decisions dependent upon the level of authority that the TA has been granted. Back to top

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Q14. Developers have been expected (required) to be CMMI Level 3. Are there plans to require Acquisition Commands to also achieve CMMI Level 3 using the CMMI Acquisition model, once it is released?

Army Response: The Army has no plans to require the PEOs to establish a CMMI level rating.

Air Force Response: No. We have realized that it is not appropriate to impose blanket statements about CMMI levels because not all performing elements of the assessed entity (e.g., business units within a company, programs within a business unit, IPTs within a program, etc.) consistently perform at the same level.

Navy Response: The Navy does not require developers to achieve CMMI. At this time the Navy does not require CMMI Level 3 of the Acquisition Command; however, this does not preclude Acquisition Commands from emphasizing CMMI processes or certification within their organization. Back to top

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Q15. You all address the element of SE in the concept phase. Is anybody looking at SE investment costs and control related to continually changing mission operating threats after system fielding, such as experienced in our Iraq conflict?

Army Response: The Army PMs, RDEC, and industry are doing an outstanding job of using SE to continually optimize their respective equipment for the ever-changing threats being realized in the current theater of operation. Areas in which changes are taking place in response to changing requirements include body armor, force protection, communications, and situational awareness. As requirements change the equipment is upgraded, modified, or replaced with the next generation. We also have been improving and continue to improve our system of systems (SoS) engineering.

Air Force Response: We cannot dispute the fact that we have to identify a mission environment when establishing a baseline set of system requirements for our contractors. Neither can we dispute the fact that the products/systems/platforms these contractors produce and deliver will experience different operational and threat environments during their life. For new acquisitions, including upgrades and modifications to existing systems and platforms where feasible, we are now emphasizing the need for robust designs that can be more readily adapted to meet evolving environments. We understand that these attributes of robustness and adaptability are not free, but applying SE principles early in concept refinement and emphasizing capabilities within a joint interoperable architecture should help ensure that robust capability for the system's operational life cycle.

Navy Response: The Navy has an established process for prioritizing and inserting emergent requirements (capabilities) into the acquisition system. The fleet and the acquisition community work closely together to ensure that candidate solutions are resourced and the urgency is documented.

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Q16. Suggestion: Before you have the Department of Defense Architecture Framework (DoD AF) Mission Architecture, you need to have a network that is built around the effects the warfighter requires. Then from the informal network you can develop the processes and from there DoD AF comes into play.

One of the problems we have today from my view is we try to plan SE before we define the new relationships required for the new networks needed to resolve the future warfighting missions (Service centric, and in the future even Joint, will be morphed to national interdependencies). We focus on SE hard processes and spend a lot of money, but the requirements based on the new effects that the warfighter wants are not getting solved, or they become overcome by events by the time we incorporate a system into play. This requires a paradigm shift as the boundaries are widened by the DIME approach toward solving the problems more holistically in the future, and the military piece will have to be coordinated within these broader boundaries of national security for it to be effective.

Any thoughts / comments?

Air Force Response: By emphasizing use of SE processes to translate capability need statements (at architecture/SoS level) into manageable and executable requirements for the constituent platforms and systems of the SoS, we expect the contractors for those assets to be better able to use product-focused SE in their development efforts. The objective end state is weapon systems, business/information technology (IT) systems, support systems, etc., that better meet mission requirements.

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Q17. How do Networks and Information Integration (NII) and each of the Services recommend using DoD AF views to substitute for traditional 5000.2 SE technical acquisition document Contract Data Requirements Lists (CDRLs) in the acquisition, development, and sustainment processes?

Air Force Response: Sorry, we don't understand the question. DoD AF architecture views are largely developed and utilized prior to MS/KDP A; CDRLs are contract deliverables most applicable post-MS/KDP B.

Navy Response: The Acquisition and Joint Capabilities Integration and Development System (JCIDS) process requires specific DoD AF views during the acquisition of a system, so no substitute is necessary. They are a derivative of the acquisition documentation that shows how a system fits within the larger set of systems to define the capabilities to satisfy missions.

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Q18. How can the SE process be applied to implement the Performance Based Logistics (PBL) requirements in sustaining legacy systems applications, especially the IT/Automated Information System/Command and Control systems?

Air Force Response: PBL consideration is a requirement like any other that needs to be introduced into the earliest phase of system design. As such, it can be traded like any other requirement, so it is difficult if not impossible to "duct-tape" these considerations onto existing legacy platforms and systems (and into their architectures). PBL can be addressed through system support contract provisions in terms of availability to users, but in many instances the contractors who originally designed and produced these systems (and the associated software) no longer exist.

Navy Response: In-Service PBL performance metrics (repairs, failures, mean time between failure, etc.) should be used as a feed to the SE process to deliver actual performance versus planned performance over time. Differences in performance can then be analyzed and used to refine the relevant system performance parameters or any planned P3I activities for a system.

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Q19. For each Service rep: What structural/organizational and financial changes has your service implemented to work the cross-organizational "SE coordination overhead" required to truly work SoSE and SoS Management?

Army Response: The Army policy requires each PEO to establish a lead system engineer at the PEO level as well as a system engineer for each program at the PM level. All Army PEOs recognize the importance of focusing on SoS engineering and have made adjustments to support their portfolio-level requirements. Some examples of these are PEO-C3T and PEO Missiles and Space. PEO-C3T has established a PEO-level SE organization to look at requirements and issues that span programs. PEO Missiles and Space has not only established a similar organization, it has established an SoS program that addresses and manages all aspects of the integration for an integrated air and missile defense capability.

Air Force Response: Implemented: None yet. From a leadership standpoint there is an acknowledged need across the AF that all stakeholders in "Big A" Acquisition (starting with requirements, acquisition, finance, planning; also including sustainment, test, human factors, safety, etc.) need to engage early and continuously on these and numerous related issues. AFSO21 "Develop and Sustain Warfighter Systems" is one forum in which this is being actively addressed.

Navy Response: Since the current acquisition process is "system" centric and has not yet evolved to support a capabilities-based acquisition, the Navy has established an SoS SE guidebook and a Systems Engineering Technical Review for cross-program coordination.

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Q20. For Mr. Wiltsie: One might suggest that good technical planning (SE) can result in well-planned and predictable program execution. Why would one suggest that good SE practices

(program execution) would not or could not help the Service both politically and with the Congress's funding stability? Certainly with failed program execution comes added political pressure and withholding of funding.

Army Response: Although SE will improve the performance and predictability of a program, SE will not dissuade Congress from making changes to the Department's budget requests. Congress will continue to adjust budgets based on many reasons that do not include the current performance of a respective program. Back to top

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Q21. For Mr. Wiltsie: Could you please elaborate on the statement: "...SE is not part of the Requirements Process..."?

Army Response: Currently the requirements-generation process and the SE process are separate and sequential. Although the requirements process does utilize analytical tools to determine the level of operational performance required, these analytical tools do not take into account technical issues such as performance, weight, space, and power requirements that can increase risk and cost. If SE was used as a formal method for evaluating requirements prior to the approval of the document, the user and the Army leadership would understand the level of difficulty a PM faces to achieve the user requirements as well as the trade space that could possibly achieve a less costly yet similar performance. Back to top

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Q22. For Mr. Wiltsie: You mention SE training as an important initiative. How about SE education? Your slide displaying the paradigm shift shows how complex the design of systems has become. Should we therefore be formally making SE education (undergraduate and graduate degrees in SE) a priority so that we have systems engineers with the depth of knowledge that can lead us through these changes?

Army Response: The Army is investing in SE education. The Army PEOs have taken the initiative to determine their individual SE education requirements. As an example, PEO Aviation and PEO Missiles and Space have each established a master's program in SE with the University of Alabama (Huntsville). PEO Ammo and C3T have established similar arrangements with Stevens Institute. Back to top

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Q23. For Mr. Siel: I cannot access the ncee.navy.mil Web site you cited in your presentation. Do I have the correct address?

Navy Response: The correct address is https://ncee.navy.mil/. Please note that you must have a valid PKI certificate or Common Access Card to enter this site. Back to top

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Q24. For Mr. Siel: Do we have an activity model that covers the SE domain?

Navy Response: DAU's Integrated Framework Chart augmented by the Naval SoS Systems Engineering Guidebook provides a reasonably good model for Department of the Navy. Back to top

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Q25. For Mr. Siel: You mentioned on slide 26 an effort to make architectures "more usable," but it sounded like your explanation related this to high-level reuse of architecture views (DoD AF). Is there any appreciation for or effort to make architecting requirements more applicable to system engineers and developers? In other words, can we make DoD AF products meaningful to anyone other than JROC-level reviewers? It would be nice if they could be of value to system designers for model-driven development as well; right now they don't seem to be.

Navy Response: Yes, there is an appreciation of many different uses of architectural information, to include the engineering and testing communities. Architecture data could serve

as a framework for the sharing of capabilities and requirements, just as the shipbuilding blueprints support cost trade-offs, mission analysis, or training assessments. The RDA CHENG has several initiatives that champion scalable and reusable architecture data framework. These include the Architecture Elements Reference Guide, which is a standard taxonomy for describing architectures and the establishment of processes to ensure that architecture products are relevant and reusable to the enterprise. Back to top

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Q26. For Mr. Carl Siel: How rigorous does a DoD SE technical review need to be in the case of a commercially derivative program for which the U.S. government is leveraging an OEM's internal research and development; there is no hard requirement for rigorous SE in the current acquisition plan under the "Acquisition Reform" concept of using the OEM's own management systems, which are usually less rigorous than DoD?

Navy Response: In the SE portion of the Defense Acquisition System—the "V" diagrams—the various readiness reviews conducted by the Program Manager exist to ensure his or her program remains executable from a management, budgetary, and technical risk perspective. Although less rigorous SE processes may exist for non-developmental items, vigilance is still required to ensure the vendor's product meets the capability needs of the Warfighter.

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Q27. For Mr. Siel: Please discuss competency alignment relative to SE activities.

Navy Response: The Navy Systems Commands are leading the charge by realigning along a Competency Aligned Organization (CAO). While NAVSEA is establishing maritime competencies of subs and surface ships, they are also establishing competencies that represent the SE process and could be tied to the Tech Authority Process. The SYSCOMs also have established a Systems Engineering Technical Review process that will become the cornerstone of a CAO. Back to top

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Q28. For Mr. Siel: I am struck by the recurring problems with component reliability in major acquisition programs such as ASDS, the armed amphibious vehicle, and the LCS. In each case, cost has grown as a result of component failures during operational testing or because of failures during system integration. How do you see the SE process you have put in place addressing these failures? In your opinion are Navy programs adequately funded to ensure prime contractors do adequate environmental stress testing of components or require it from their subs?

Navy Response: Every program has some risks associated with it. By employing SE processes and Technical Authority we can identify and reduce the risk associated with a program. By employing competent and trained individuals, we will manage the risk associated with a program. To mitigate these risks there are a number of reviews and assessments built into the Defense Acquisition System. These include independent Technology Readiness Assessments prior to Milestones B and C, the Design Readiness Review prior to proceeding to System Demonstration, and a Technical Readiness Review prior to commencing formal testing.

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Q29. For Mr. Siel: How do we ensure that SE on a system/equipment continues to be performed after the initial acquisition cycle is over? I perform in-service engineering on U.S. Navy in-service systems and equipment and rarely see any SE involvement in supporting the systems/equipment during its service life.

Navy Response: Throughout the life cycle of a system, we need to analyze and reuse the depot maintenance, shipyard, and in-service maintenance energies, with the goal that this will be a critical input of any current and planned P3I activities. Back to top

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Q30. For Mr. Jaggers: If a program currently in sustainment was developed without a thorough SE emphasis, what SE concepts can be implemented to minimize the adverse effects of such an oversight?

Air Force Response: The first step is to ensure that a technical baseline has been documented; subsequently, rigorous configuration and risk management processes must be employed to achieve continued mission assurance and operational safety, suitability, and effectiveness. These processes are also essential when acquirers, operators, and maintainers collaboratively look at planning for system upgrades, enhancements, modernization, etc. Back to top

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Q31. For Mr. Jaggers: What initiatives have been implemented to move more engineering emphasis to the early phases of programs?

Air Force Response: Implemented – none yet. From a leadership standpoint there is an acknowledged need across the AF that all stakeholders in "Big A" Acquisition (starting with requirements, acquisition, finance, planning; also including sustainment, test, human factors, safety, etc.) need to engage early and continuously on these and numerous related issues. AFSO21 "Develop & Sustain Warfighter Systems" is one forum where this is being actively addressed. We are also working closely with the Concept Development organizations at the four Product Centers to document their processes; the objective end state of this effort is to compile a set of best practices, and develop appropriate policy and guidance for their employment. Back to top

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Q32. For Mr. Jaggers: For platforms that are in the sustainment phase (like the A-10) but are still modernizing the aircraft to make it viable in the current and future wartime environment, to what degree do we apply SE principles when we are seeing the MAJCOM pushing down solutions to integrate instead of requirements. Should the Program Office level be pushing back a need to establish requirements so that we can integrate SE principles up front?

Air Force Response: Rigorous configuration and risk management processes must be employed to achieve continued mission assurance and operational safety, suitability, and effectiveness. Acquirers, operators, and maintainers must collaboratively look at planning for system upgrades, enhancements, modernization, etc. We must emphasize the need for realistic requirements that can be turned into robust designs that can be adapted to meet evolving environments—all in a timely manner. Back to top