System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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The Human Systems Integration Framework (HSIF): Defining a New Role to Enhance Cross-Domain Collaboration

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Abstract
Although Human-Systems Integration (HSI) and systems engineering each have established technical processes, it remains a challenge for these disciplines to communicate best practices effectively. Current HSI guidance is often difficult to interpret, reducing the clarity and timeliness of collaboration opportunities among HSI domains. The HSI Framework (HSIF) is a sequence of process diagrams that display the technical activities, collaborations, and products of HSI domains across the DoD acquisition life cycle. Activities originate from relevant HSI-related guidance, standards, and best practices across DoD Services and non-DoD organizations. A timeline display references HSI activities to systems engineering technical reviews (SETR) and acquisition milestones. The HSIF provides technical value to HSI practitioners, program managers, technical authorities, system engineers, and prime contractors.

For HSI practitioners and system engineers, the HSIF provides technical guidance and best practices for HSI domains, scoped and synchronized to SETR events and acquisition milestones. For program managers, the HSIF provides a list of potential HSI-related activities to develop and tailor an HSI program. While the HSIF makes HSI activities and domain collaboration explicit, responsibility and tasks to facilitate coordination and trade-offs remain unknown. To address this challenge, an HSI integrator role and related activities were developed to serve as an interface between the HSI domains. Through analysis of the HSIF collaboration points, it became apparent that HSI would benefit from a mechanism or role similar to a “Chief Engineer” to provide SoS/FoS oversight, facilitate trade-offs among domains, communicate HSI risk within an organization, and identify HSI trends across programs.

This presentation will provide an overview of development progress and a task-based walk-through of the interactive HSIF tool. It will also introduce the concept and demonstrate the utility of the HSI integrator role to coordinate activities requiring cross-domain collaboration. These emergent coordinating activities are intended to facilitate the consistent application and effectiveness of HSI throughout system development which can also serve as a valuable input for future HSI standards.

Biographies
Dr. Risser is a Senior Human Factors Scientist at Pacific Science & Engineering Group (PSE) in San Diego with expertise in designing and assessing interactions between humans and complex systems. He has over 19 years of applied human factors research and engineering experience within academia, government, and DoD. Dr. Risser’s work focuses on the application and practice of human factors principles, methods, and standards in support of the HSI process for DoD acquisition to reduce human error, facilitate decision-making, and improve system reliability. He has experience with more than 23 acquisition programs, including C4I and EIS systems. He also develops HSI guidance, process, and tools to facilitate the acceptance and implementation of HSI in acquisition. He earned his Ph.D. in Industrial/Organizational Psychology from Old Dominion University with an emphasis in Human Factors Engineering and Engineering Management.

Mr. Lacson is a Human Factors Engineer at Pacific Science & Engineering Group (PSE) with expertise in Human Systems Integration methods and process development. Mr. Lacson conducts HSI and HFE analyses, design, and testing in support of DoD Acquisition. He has leveraged over 10 years of applied HFE experience to improve the operational suitability of Navy C4I and Enterprise Information Systems and to enhance the effectiveness of Air Force HSI tools and processes. He earned his B.S. in Industrial Engineering and his M.S. in Engineering Psychology from the University of Illinois, Urbana-Champaign. He also holds a certification in Systems Engineering from the University of California, San Diego.