System of Systems Engineering Collaborators Information Exchange (SoSECIE)

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Systems-of-Systems Assurance

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Abstract
Systems of great complexity that require high levels of assurance are increasingly foundational to national security as well as economic and social activities. These systems not only need to behave as required by legitimate users but also to resist and recover from exploits attempted by malicious users. The analysis, design, and implementation of such systems have typically been addressed in terms of separate life cycles such as system engineering, security, and assurance. However, the concerns and responses in these various disciplines are clearly interrelated and would benefit from greater coordination. This brief describes an approach that superimposes -- or rather interweaves – the processes of risk management, system assurance, and related system engineering approaches. Using an iterated Plan-Do-Check-Act (Shewart) cycle, this perspective correlates these activities and indicates where economies can be realized through consolidation of efforts. This framework is based on internationally recognized standards for systems engineering processes and will examine each of these processes to provide an example narrative. For example, the development of assurance cases is treated as a progressive and iterative life cycle tightly coupled with the development of system components and other project deliverables.

Biography
Mr. Taz Daughtrey is Senior Scientist leading software engineering activities at the Cyber Security and Information Systems Information Analysis Center. He also teaches graduate-level secure software engineering for James Madison University, where he has been a member of the Computer Science faculty since 2001. Mr. Daughtrey is a Fellow of the American Society for Quality, the Founding Editor of the peer-reviewed journal SOFTWARE QUALITY PROFESSIONAL, and a Director of the American Software Testing Qualifications Board. His previous twenty years in industry included responsibilities as corporate Quality Manager and Chief Security Officer, as well as a number of roles in software development, training, and quality improvement in commercial and naval nuclear manufacturing and engineering.