

Testing S-Curves for Reasonableness: The NCCA S-Curve Tool

The requirement of the Weapon Systems Acquisition Reform Act of 2009 to disclose “the confidence level used in establishing a cost estimate for a major defense acquisition program or major automated information system program...” and the austerity of current Department of Defense (DoD) budgets has brought about an increased interest in risk analysis and widespread use of the S-curve (cumulative distribution function) of cost. As this interest intensified, experience in the use of S-curves widened.

As is becoming clear with experience so far gained, there is a natural evolution from naïve trust in S-curves; to the realization that not all S-curves are created equal; to the understanding that one of the quickest and surest ways to detect a suspicious S-curve is the coefficient of variation (CV); to the temptation for (if not the actuality of) gaming of CVs; to a mature practice of risk. The authors were centrally placed during the development and evolution of a company-wide risk analysis of the very sort that DoD is now undergoing. They sat on the Risk Working Group that determined policy and process from inception to completion; led implementation of accompanying tools in three different sectors of the company; and served on the committee that approved (and disapproved) the various candidate tools for use. In short, they were intimately involved in the life cycle of the risk evolution within the company, from the earliest stages until the practice had become mature. The briefing will outline the steps (and some missteps) that the Risk Working Group went through and apply the lessons learned to the current situation in the DoD.

Finally, a robust Excel tool has been developed for practitioners to display the S-curve as developed by the estimator and to compare it to a historically-based, commodity-specific, phase-appropriate S-curve. It can be used to benchmark estimates, to compare current and prior estimates, and to reconcile between two estimates, with a variety of historically-based adjustments to either or both. This tool will guide the practitioner in judging the S-curve and will produce output intended for presentation to decision makers. This briefing will describe and demonstrate the tool.

Lead author: Richard L. Coleman

Co-authors: Peter J. Braxton, Richard C. Lee, Brian J. Flynn