

Success Stories

Earned Value Helps Air Force Software Division Excel

*By Walter Lipke, Deputy Chief
Oklahoma City Air Logistics Center, Software Division*

For nearly 15 years, the Oklahoma City Air Logistics Center's Software Division at Tinker AFB has successfully applied Earned Value Management on its software projects. Its utility was immediately apparent upon implementation in 1985. EVM gave us a way to look into what was happening on a project and take corrective action, if needed.

EVM has evolved since we first put it into practice. Initially, it was cumbersome due to paper-based data collection. Now, data collection is automated, making it much easier to use.

At first, there was a common myth that EVM could only be used on large development projects. Today, EVM is applied to both software maintenance and development projects. It is equally useful on small projects that last a few months, and large projects lasting several years. The return on investment of software process improvement, which included applying EVM, was determined in 1994 to be 8.5 to 1.

We have had tremendous success as a result of our commitment to EVM. In 1993, the Test Program Set (TPS) and Industrial Automation (IA) functions of the Software Division became the first Air Force software activity to achieve Software Engineering Institute (SEI) Capability Maturity Model (CMM) Level 2. In 1996, they became the first in federal service to achieve Level 4 distinction. EVM was largely responsible for achieving this high level of organizational maturity by providing process indicators.

In September 1998, the TPS and IA software functions achieved ISO 9001 and TickIT registration, an international standard of quality. In May 1999, they were named Institute of Electrical and Electronic Engineers (IEEE) Computer Society winner of the Software Process Achievement Award, a very prestigious honor.

Walter Lipke is a professional engineer and holds a Master's degree in Physics. He recently presented on software and EVM at the 11th Annual International Integrated Program Management Conference at Tyson's Corner, VA, discussing his March 1999 article from the journal Crosstalk, "Applying Management Reserve to Software Project Management." He can be contacted by e-mail at Walter.Lipke@tinker.af.mil.

B-2 Bomber Team's EVM Innovations Make Program Soar

*By Paul J. Solomon, B-2 EVMS Program Director
Northrop Grumman Corporation*

Earned Value Management successes are common at Northrop Grumman. The company has a long-standing policy to use EVM at all of its operating elements. In particular, the B-2 Spirit Stealth Bomber Program in Northrop Grumman's Integrated Systems and Aerostructures Sector demonstrates how successful EVM can be when used as part of an evolving, common integrated program management process.

The B-2 Spirit Stealth Bomber Program implemented several innovative process improvements using EVM. These include integrating Earned Value with systems engineering processes, defining improved software engineering metrics to support EVM, and developing a leaner, more effective methodology called Performance-Based Earned Value (PBEV). PBEV makes Earned Value less costly to administer and more effective as a measure of progress by reducing focus on small tasks. Instead, key metrics are defined at higher levels to best measure technical performance.

These changes paid off during upgrades of the B-2 weapon system. One of those upgrades was the development of the Joint Standoff Weapon/Generic Weapon Interface System (JSOW/GWIS), a software-intensive effort. The new metrics helped to make it a very successful program. The PBEV methodology was used to ensure that the warfighter received the most functionality from software development efforts. On JSOW, we provided 85% more capability than originally planned, on schedule and under budget.

Since the beginning of the B-2 program in the early 1980s, many lessons have been learned. Now Earned Value is used more effectively than ever. While its use does not guarantee that programs will stay within cost and schedule targets, it does allow program managers to independently assess performance data and take prompt actions.

Paul Solomon is a member of the National Defense Industrial Association Program Management Systems Subcommittee Team, which wrote the "Industry Standard Guidelines for EVMS." He shares lessons learned and best practices with the defense industry at the DoD Software Technology Conference, the Integrated Program Management Conference, and on the Software Program Managers Network. He can be reached at solompa@mail.northgrum.com.