Managing Obsolescence: Value Engineering Change Proposal Proves Its Worth

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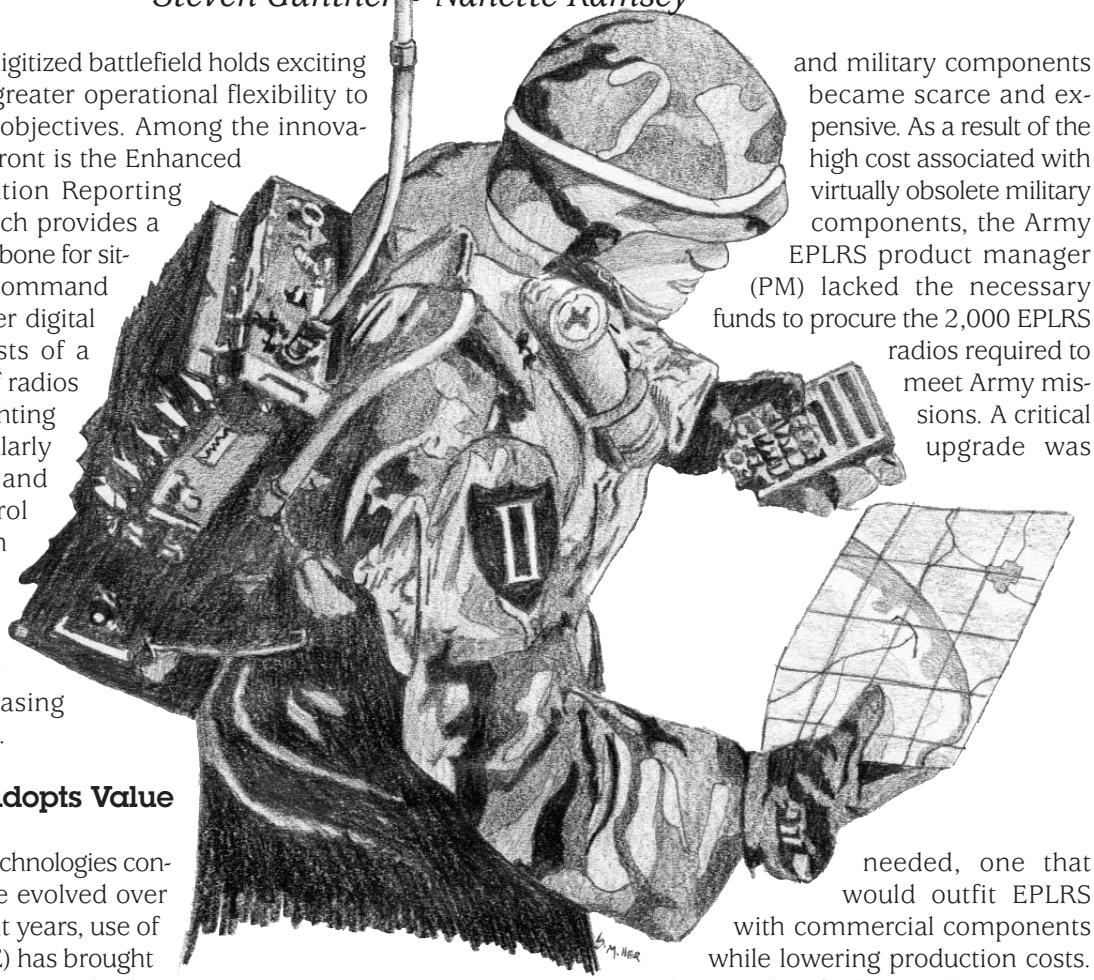

The emerging digitized battlefield holds exciting potential for greater operational flexibility to meet tactical objectives. Among the innovations on this front is the Enhanced Position Location Reporting System (EPLRS), which provides a communications backbone for situational awareness, command and control, and other digital messaging. It consists of a dedicated network of radios that move key warfighting information—particularly situation awareness and command and control information—between the user and higher headquarters quickly (within minutes) and efficiently (automatically), greatly increasing combat effectiveness.

EPLRS Program Adopts Value Engineering

The capabilities and technologies contained in EPLRS have evolved over 20 years, but in recent years, use of value engineering (VE) has brought significant improvements and substantial acquisition savings to the EPLRS program, resulting in enhanced system performance, reduced procurement cost, and lower life cycle cost.

In 1997, the EPLRS radio design, like most defense products, was based on around 99 percent use of military components. However, the telecommunications boom in the 1990s coupled with the Perry initiative, which eliminated numerous military specifications, drove the component manufacturers to focus primarily on commercial markets. The military component market declined rapidly, and military components became scarce and expensive. As a result of the high cost associated with virtually obsolete military components, the Army EPLRS product manager (PM) lacked the necessary funds to procure the 2,000 EPLRS radios required to meet Army missions. A critical upgrade was needed, one that would outfit EPLRS with commercial components while lowering production costs. The PM identified VE as the appropriate process to achieve the necessary upgrade: it would provide financial incentive to the contractor, Raytheon Company, and result in acquisition savings.

Value Engineering Change Proposal Provides Incentive to Redesign

A value engineering change proposal (VECP) is a change proposal submitted to the government by a contractor in accordance with the VE clause in the contract. If accepted, a VECP will result in acquisition savings that will be shared by the government and the contractor.

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Illustration by Staff Sgt. Scott Miller, USAF

The VECP provided Raytheon with the incentive to redesign EPLRS. A VECP teaming approach was used to create an atmosphere of open communication and trust. This was a critical factor because Raytheon would be investing their own funds to identify improvements to system performance while reducing production cost. As part of that teaming approach, the PM shared feedback on the initial proposal from Raytheon and helped identify key areas of system improvement. The team worked together to complete negotiations quickly and to avoid delays in implementation that could reduce projected savings. As a result, Raytheon completed development of the new EPLRS radio while the team members were negotiating the contract changes and related issues. After VECP implementation and development costs were paid to Raytheon out of the contract savings, life cycle savings were estimated to be nearly $25 million. The PM was able to procure additional EPLRS radios with enhanced system performance, more reliability (circuit card assemblies reduced from 18 to 12), and lower life cycle costs.

The VECP is a tool for both the government and contractor to deal with technology obsolescence and spiraling costs yet still develop systems that perform better, are more reliable, and cost less.

Even though the initial problem of obsolescence had been tackled head on by this approach, Raytheon and the EPLRS PM office maintained their VE team methodology to identify opportunities where new technology could improve performance and provide the warfighter with a better system at a lower cost. In 2001, a second VECP enabled the insertion of new technology. Using the latest hardware packaging techniques, the number of circuit card assemblies was cut almost in half (from 12 to 7), and 5 interconnections were eliminated, which further reduced life cycle cost. Additional improvements increased the system reliability and boosted system data rates by 250 percent (115 Kbps to 288 Kbps).

A third VECP was implemented in April 2003. In this change, four card assemblies from four manufacturers were integrated into one assembly. A host of other hardware advances were added to further enhance system reliability and reduce costs, among them reduction in components by integrating functions into larger programmable devices, cable redesign, and EMI shielding improvements. In addition, over-the-air programming is being added to reduce the manpower necessary for future software upgrades. The third VECP savings translate into a unit cost reduction of approximately $4,000, and—once again—the savings offset implementation costs. The changes were implemented without any increase to the contract price.

More Than Cost Savings

Of course, a successful VECP submission results in more than cost savings. "The value engineering process has enhanced Raytheon's reputation as a cost-conscious producer while creating an environment where our workforce is engaged in a dynamic and challenging technology refreshment cycle," says Tushar Patel, Raytheon EPLRS program manager. Raytheon's share of the VE savings is specifically excluded from contract profit limits, thus providing added incentive to continue to develop and introduce effective VE upgrades. The share of the program savings increased from $3.7 million in 1997 to $4.7 million in 1999 (the contractor share for 2003 is yet to be determined), while the non-recurring engineering effort, paid for through the VECP savings, increased by an additional $11.2 million in 2003.

Various factors contributed to the success of the EPLRS VECP process. The EPLRS PM encouraged and fully supported the process. A robust teaming environment kept communication flowing freely between all concerned parties. This environment accelerated the government evaluation period because the PM was involved at every stage and was able to anticipate proposed changes. In addition, the effects of implemented changes were swiftly integrated into the production and testing cycles. And finally, Raytheon was able to participate as a partner throughout the entire process.

An additional benefit to the government is identified when one takes into account that the second and third VECP were implemented under a performance specification. It is a common misconception that a contractor benefits more by keeping all the savings under an existing performance specification for the allowable period, as opposed to submitting a VECP. The EPLRS program demonstrates that a successful VECP submission is a powerful incentive indeed. The VECP is a tool for both the government and contractor to deal with technology obsolescence and spiraling costs yet still develop systems that perform better, are more reliable, and cost less.

Editor's Note: The authors welcome comments and questions on this article. Gunther can be reached at steven.gunther@us.army.mil and Ramsey at nan.ramsey@us.army.mil