

Understanding the true costs and benefits of adopting new materials

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Whenever we wish to change the materials in a military system, the change must be shown to be cost-effective. The most common way to do this is with a cost-benefit analysis (CBA). However most CBAs are of limited usefulness since they simply compare processing costs and do not include some of the most important costs and benefits. To provide a better decision tool we have developed, under SERDP funding, a very extensive cost model called C-MAT (Calculation for Material Analysis Alternatives), that is part of a broader methodology for assessing new technologies that we call Implementation Assessment. This approach assesses the degree of readiness of the technology, and evaluates risks, costs, and how best to put the new technology into production. The C-MAT cost model includes all the upfront costs (including development, qualification and changes to drawings and TOs), as well as the downstream benefits (such as improved performance, easier logistics, and reduced service failures. Rather than simply comparing the cost of using the old technology with that of using the new, this approach allows us to estimate the full costs, benefits and risks of phasing out the old technology and phasing in the new, permitting us not only to compare cost, but to optimize the changeover for the optimum combination of cost, time and risk.

Summary

We describe a new approach, called Implementation Assessment, for evaluating the readiness, cost and risk of new materials for DoD use. The methodology measures technical readiness, and the full costs, benefits and risks to determine how the material can be cost-effectively implemented with the least technical and financial risk.