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Life Cycle Assessment for Technology Insertion in Systems Engineering Process

On 29 Jun 1994, the Honorable William Perry, Secretary of Defense, issued what has become known as the Perry Memorandum covering the subject, Specifications & Standards - A New Way of Doing Business. Among the dictates of this now historic memorandum to all services was direction to use Commercial Off The Shelf (COTS) equipment in today's weapon systems to the maximum extent possible and practical.

While this initiative offers extensive possibilities for cost avoidance and technological advances in system design, COTS insertion also presents myriad new and complex problems for the Systems Engineering community, involving selection and support of COTS products. Economic factors and commercial competition drive the commercial manufacturer to re-design, improve or introduce new technology at a pace much higher than what has customarily been seen in past military systems. The impact of this on military systems is an expected obsolescence problem, in short, 3-5 year cycles, as oppose to, 8-12 year cycles seen using Mil equipment. It now becomes apparent that while lower cost of the initial COTS equipment is enticing, total cost could suffer if this equipment must be replaced 3 or 4 times as often as the more expensive Mil equipment.

The Total Cost Delta (TCD) model was developed as an engineering tool by which design decisions could be made with cost impact as a major consideration. For COTS programs specifically, the Statement of Work (SOW) should require that the design and selection, "include analysis through the design and selection process to maximize marketplace support, minimize impacts of cyclic replacements, and minimize total cost." This statement captures all of the concerns seen for COTS implementation, and the TCD model was developed implicitly to address these issues.