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## COTS/NDI Technology

### Description:

In 1972, a Commission on Government Procurement recommended a shift toward commercial product acquisition. Although the commission's recommendations became policy in 1976, the use of commercial off-the-shelf (COTS) products did not become widespread or commonplace. Ten years later, the President's Blue Ribbon Commission on Defense Management sounded another call for greater use of off-the-shelf products (components, systems, and services). It was not until 1994, however, that a clear and direct policy concerning the use of COTS and non-developmental items (NDI) was issued. In what many think was a landmark decision, then Secretary of Defense William Perry changed the way that the DoD does business. In his June 29, 1994 memorandum, titled "Specifications & Standards - A New Way of Doing Business," he clearly stated the importance of leveraging commercial technology.

Subsequent policy memoranda and guidance documents from DoD specifically identified a clear preference for COTS products whenever practical. Today, the use of commercial items in military systems is no longer a question of "yes or no" but a question of "to what degree" and a formal decision process for considering COTS has been established. In the Federal Acquisition Streamlining Act of 1994, Congress broadened the preference for acquisition of commercial items to a preference for the acquisition of non-developmental items (NDI). NDI is any previously developed item used exclusively for Government purposes by "federal agency, a state or local Government or a foreign Government with which the US has a mutual defense cooperation agreement." COTS items are items available in a domestic or foreign commercial marketplace.

### How It Can Benefit You:

The primary objective of using COTS is to capitalize on proven designs, thereby reducing the development time and risk associated with a new product. In contrast to designing a completely new product, a proven product is used or proven components and subsystems are incorporated in a new product. Whether it is the Government or a commercial company, using COTS can potentially reduce costs, risks, and acquisition time. However, some compromises in the required functional performance (including reliability) of the product may be necessary to use a COTS item without modification, and other issues, such as logistics support, must also be considered.

The decision to use COTS must be based on a thorough evaluation of its ability to perform the required function in the intended environment and to be operated and supported over the planned life of the product.

The use of COTS offers the following benefits:

- Lower life cycle cost
- Increased competition
- More rapid deployment
- Broader industrial base
- Proven capability
- Access to state-of-the-art technology

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### RAC Capability:

IITRI engineers at the Assurance Technology Center (ATC) in Rome, NY, have been involved with the use and application of COTS and NDI. IITRI was teamed with the Navy Air Warfare Center at Crane, IN to develop a supportability handbook on the use of commercial products in military systems. IITRI also developed a RAC handbook that focuses on the reliability issues concerning the use of COTS and NDI.

In the latter handbook, case studies provide valuable insights into actual applications of COTS/NDI in military systems. The handbook describes the risks associated with applying products in environments for which they were not designed and techniques for reducing these risks.

In addition to the handbooks on supportability and reliability of COTS/NDI, IITRI engineers developed a software tool to assist in the selection and application of COTS. This tool was developed under contract to the Air Force Rome Laboratory (RL). Under this contract, called "Commercial Equipment Environmental Readiness Factors," IITRI developed a stand-alone, easy-to-use PC-based software tool that addresses concerns regarding the selection and reliable use of COTS equipment in military applications.

IITRI leveraged the results of previous studies and discussions in the literature, and

modified them accordingly, to define a set of algorithms that quantify COTS equipment reliability (MTBF) and risk factors in military/severe environment applications and incorporated them into an automated PC-based software tool. The tool is called SELECT, which stands for Selection of Equipment to Leverage Commercial Technology.

Numerous sources of COTS equipment quantitative and qualitative data were identified and analyzed as part of the model development effort to define the predicted-to-operating MTBF algorithm and risk factor scoring criteria, and to further define risk reduction techniques and their effects on COTS equipment operational reliability and risk.

The resulting tool allows users to quantify the reliability (and associated risks) of COTS equipment in severe environments, providing visibility into the environmental drivers that affect reliability, and design "fixes" or test programs that may help eliminate or minimize those risks. The scope of the SELECT tool addresses COTS hardware applications in aircraft (fixed- and rotary-wing), ground-based and space environments. Its breadth covers COTS equipment considered to be the most likely candidates for use by the military.

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