



ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

**THE UNDER SECRETARY OF DEFENSE**

3010 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3010

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**MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS  
(ATTN: SERVICE ACQUISITION EXECUTIVES)**

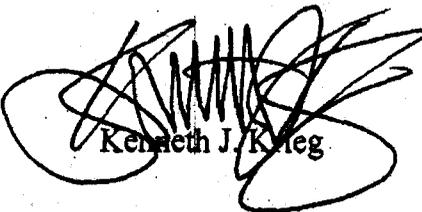
**SUBJECT: Total Life Cycle Systems Management (TLCSM) Metrics**

The Defense Business Board recommended to the Deputy Secretary of Defense that the Department aggressively pursue implementation of Performance-Based Logistics, for all its weapons, new and legacy.

In a memorandum dated August 16, 2004, my predecessor directed measuring performance in terms of Operational Availability, Mission Reliability, Cost per Unit of Usage, Logistics Footprint, and Logistics Response time. For consistency, this memorandum provides specific definitions of those metrics for use across the Department (attached). I direct their use as the standard set of metrics for evaluating overall TLCSM.

I also direct the TLCSM Executive Council to develop a "TLCSM Metrics Handbook," with specific metrics, formulas and calculation methodologies. It will be used in performance-based contracts and for sustainment oversight. The handbook will also define supporting data requirements that should be incorporated into emerging logistics information systems.

The principal point of contact for administration of the handbook is Mr. Lou Kratz, Assistant Deputy Under Secretary of Defense (Logistics Plans and Programs), 703-614-6327, [Louis.Kratz@osd.mil](mailto:Louis.Kratz@osd.mil).

  
Kenneth J. Kiege

Attachment:  
As stated



## **Total Life Cycle Systems Management (TLCSM): Metrics Formulas**

### **I. Metric: Operational Availability**

**Metric Definition:** The percent of time that a weapon system is available to sustain operations.

**Formula:**

$$A_o = \frac{MTBM}{MTBM + MDT}$$

**Variable Definitions:**

**Mean Time Between Maintenance (MTBM):** The mean time between maintenance actions (both preventive and corrective); a measure of the reliability taking into account maintenance policy.

**Mean Down Time (MDT):** The average time a system is unavailable for use due to either corrective or preventive maintenance. Time includes actual repair time and all delay time(s).

### **II. Metric: Mission Reliability**

**Metric Definition:** The measure of a weapon system in meeting mission success objectives (percent of objectives met, by weapon system). Depending on the weapon system, a mission objective would be a sortie, tour, launch, destination reached, capability, etc.

**Formula:**

$$R_M = 1 - \frac{\text{Total \# of System Related Mission Failures}}{\text{Total \# of Missions Attempted}}$$

**Variable Definitions:**

**System Related Mission Failures:** A mission that fails due to a hardware or software malfunction of a system. A mission that fails due to operator error, intelligence error, or other similar errors are not system related mission failures.

### **III. Metric: Total Life Cycle System Cost per Unit of Usage**

**Metric Definition:** The total operating and life cycle costs divided by the appropriate unit of measurement for a given weapon system. Depending on weapon system, the measurement unit could be a flight hour, steaming hour, launch, mile driven, etc.

**Formula:**

$$\begin{array}{l} \text{Total Life Cycle} \\ \text{System Cost per} \\ \text{Unit of Usage} \end{array} = \frac{\begin{array}{l} \text{Consumables + Energy + Repair Parts + Depot} \\ \text{Level Repairable Items + Contract Maintenance +} \\ \text{Intermediate Maintenance + Unit Personnel +} \\ \text{Depot Maintenance + Continuing System} \\ \text{Improvements + Initial Acquisition} \end{array}}{\text{Weapon System Unit of Measurement}}$$

**Variable Definitions:**

**Consumables:** The costs of material consumed in the maintenance and support of a primary system and its associated support and training equipment at the unit level.

**Continuing System Improvements:** The costs of hardware and software updates that occur after deployment of a system that improve a system's safety, reliability, maintainability, or performance characteristics to enable the system to meet its basic operational requirements throughout its life.

**Contract Maintenance:** The cost of contract labor, material, and assets used in providing maintenance services to a weapon system, subsystem, support equipment, training device, or simulator at the unit level.

**Depot Level Repairable Items (DLRs):** The net cost (reflects the credit units receive for returning serviceable items) the operating unit incurs for DLR spares (also referred to as exchangeable items) used to maintain equipment at the unit level.

**Depot Maintenance:** The cost of labor, material, and overhead incurred in performing major overhauls or other depot level maintenance on a system, its components, or other associated equipment at centralized repair depots, contractor repair facilities, or on site by depot teams.

**Energy:** The costs of Petroleum, Oil, and Lubricants (POL), propulsion fuel, and fuel additives used by systems in performing their missions.

**Initial Acquisition:** The cost of Research and Development (R&D) and production of a primary weapon system.

**Intermediate Maintenance:** The cost of labor and materials and other costs expended by intermediate level maintenance organizations in support of a primary system, simulators, training devices, and associated support equipment.

**Repair Parts:** The costs of materials used to repair primary systems and associated support and training equipment at the unit level.

**Unit Personnel:** The costs of operators, maintainers, and other support personnel assigned to operating units.

**Weapon System Unit of Measurement:** The standard measurable unit relevant to the weapon system. (e.g., flight hour, steaming hour, launch, mile driven)

#### **IV. Metric: Cost per Unit of Usage**

**Metric Definition:** The variable operating costs divided by the appropriate unit of measurement for a given weapon system. Depending on weapon system, the measurement unit could be a flight hour, steaming hour, launch, mile driven, etc.

**Formula:**

$$\text{Cost Per Unit of Usage} = \frac{\text{Consumables + Energy + Repair Parts + Depot Level Repairable Items + Contract Maintenance + Intermediate Maintenance + Unit Personnel + Depot Maintenance}}{\text{Weapon System Unit of Measurement}}$$

**Variable Definitions:**

**Consumables:** The costs of material consumed in the maintenance and support of a primary system and its associated support and training equipment at the unit level.

**Contract Maintenance:** The cost of contract labor, material, and assets used in providing maintenance services to a weapon system, subsystem, support equipment, training device, or simulator at the unit level.

**Depot Level Repairable Items:** The net cost (reflects the credit units receive for returning serviceable items) the operating unit incurs for DLR spares (also referred to as exchangeable items) used to maintain equipment at the unit level.

**Depot Maintenance:** The cost of labor, material, and overhead incurred in performing major overhauls or other depot level maintenance on a system, its components, or other associated equipment at centralized repair depots, contractor repair facilities, or on site by depot teams.

**Energy:** The costs of POL, propulsion fuel, and fuel additives used by systems in performing their missions.

**Intermediate Maintenance:** The cost of labor and materials and other costs expended by intermediate level maintenance organizations in support of a primary system, simulators, training devices, and associated support equipment.

**Repair Parts:** The costs of materials used to repair primary systems and associated support and training equipment at the unit level.

**Unit Personnel:** The costs of operators, maintainers, and other support personnel assigned to operating units.

**Weapon System Unit of Measurement:** The standard measurable unit relevant to the weapon system. (e.g., flight hour, steaming hour, launch, mile driven)

**V. Metric:** Logistics Footprint

**Metric Definition:** The government / contractor size or "presence" of logistics support required to deploy, sustain, and move a weapon system. Measurable elements include inventory / equipment, personnel, facilities, transportation assets, and real estate.

**Formula:** Only two elements of footprint were chosen as representative elements

Logistics Footprint (Weight) = Total weight of deployable consumables, support equipment, energy, and spares

Logistics Footprint (Personnel) = Total number of personnel in the deployed area required to transport and sustain the weapon system

Logistics Footprint (Volume) = Total volume of deployable consumables, support equipment, energy, and spares

**Variable Definitions:**

**Consumables:** Material consumed in the maintenance and support of a primary system and its associated support and training equipment at the unit level for an appropriate and sustainable period of time.

**Energy:** POL, propulsion fuel, and fuel additives used by systems in performing their missions for an appropriate and sustainable period of time.

**Support Equipment:** The equipment that is needed to operate or maintain a primary system, subsystem, training systems, and other support equipment.

**Spares:** The sum of repair parts and DLRs.

- **DLRs:** Spares (also referred to as exchangeable items) used to maintain equipment at the unit level for an appropriate and sustainable period of time.
- **Repair Parts:** The materials used to repair primary systems and associated support and training equipment at the unit level for an appropriate and sustainable period of time.

## **VI. Metric: Logistics Response Time**

**Metric Definition**: This is the period of time from logistics demand signal sent to satisfaction of that logistics demand. "Logistics Demand" refers to systems, components, or resources, including labor, required for weapon system logistics support.

### **Formula**:

$$\text{LRT} = \frac{\sum (\text{Receipt Date} - \text{Requisition Date})}{\text{Total Requisitions}}$$

### **Variable Definitions**:

**Class IX Repair parts (less medical-peculiar repair parts)**: all repair parts and components, to include kits, assemblies, and subassemblies – repairable and nonrepairable – required for maintenance support of all equipment.

**Requisition Date**: Date entered at the retail level supply system when placing a requisition for an item from DoD wholesale supply system.

**Receipt Date**: Date entered at the retail level supply system when the material for a specific requisition is received from DoD wholesale supply system.

**Total Requisitions**: Sum of Class IX Repair Parts retail level requests from DoD wholesale supply system.