



DoD INSTRUCTION 3110.05

SUSTAINMENT HEALTH METRICS IN SUPPORT OF MATERIEL AVAILABILITY

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| Approved by: | William A. LaPlante, Under Secretary of Defense for Acquisition and Sustainment |

Purpose: In accordance with the authority in DoD Directive 5135.02, this issuance:

- Establishes policy, assigns responsibilities, and provides direction for monitoring and reporting sustainment business health metrics and supporting data.
- Establishes materiel availability (A_M) and operational availability (A_O) as the two superordinate DoD enterprise sustainment health metrics that allow the DoD to measure and assess the effectiveness of the DoD sustainment enterprise.
- Establishes cost per day of availability (C/DA) for the primary mission asset inventory (PMAI) as the superordinate DoD enterprise sustainment health metric that allows the DoD to measure and assess the efficiency of the DoD sustainment enterprise. C/DA is the ratio of maintenance costs to availability achieved for PMAI assets.

- Specifies superordinate metrics that will allow decision makers at all levels across the DoD enterprise to assess the effectiveness and efficiency of weapon system sustainment using a standard structure and consistently applied methodology.
- Instantiates existing sustainment business health metrics guidance from the Deputy Secretary of Defense (DepSecDef), Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)), and the Assistant Secretary of Defense for Sustainment (ASD(S)).

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SECTION 1: GENERAL ISSUANCE INFORMATION

1.1. APPLICABILITY.

This issuance applies to OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the DoD (referred to collectively in this issuance as the “DoD Components”).

1.2. POLICY.

It is DoD policy that:

a. All major weapon systems in the April 19, 2023 ASD(S) Memorandum and its subsequent annual updates are to be maintained to the optimum A_M and A_O outcomes needed to meet the national defense strategy.

b. The metrics and supporting data required to be reported by this issuance must be retained until disposed of or transferred to the National Archives and Records Administration as required by an approved record schedule issued in accordance with DoD Instruction 5015.02. Each organization listed in Section 2 is responsible for managing records in accordance with DoD Instruction 5015.02.

1.3. INFORMATION COLLECTIONS.

In accordance with DoD Instruction 8320.02, Section 911 of Public Law 115-91, and the DoD Data Strategy, data for the A_M , A_O , C/DA, and supporting data will be contained in a Military Service’s authoritative data system and will be available for consumption across the DoD. Information collection must comply with requirements set forth in Volume 2 of DoD Manual 8910.01.

a. Metrics, supporting data, information, and information technology are considered enablers of information sharing to the DoD.

b. Such data, information, and information technology services will be made visible, accessible, understandable, trusted, and interoperable throughout their life cycles for all authorized users. Authorized users include DoD Components and support providers subject to law, policy, data rights, and security classifications.

SECTION 2: RESPONSIBILITIES

2.1. ASD(S).

Under the authority, direction, and control of the USD(A&S), the ASD(S) through the Deputy Assistant Secretary of Defense for Materiel Readiness:

a. Monitors A_M and A_O reporting for weapon systems and uses the superordinate metrics and supporting data for the oversight of sustainment programs and operations. Metrics covered in this issuance support the Sustainment Deputies Management Action Group and the DoD Strategic Readiness Assessment. Two analytic platforms used to provide oversight that can be consolidated by common weapon system types, Military Service, force elements, or other groupings useful for executive level decision making are:

(1) The Advana sustainment tier as part of business health metrics offers an enterprise level perspective tracking sustainment performance by quarter.

(2) The Maintenance and Availability Data Warehouse in Advana offers a detailed view of metrics and data.

b. Maintains this issuance to ensure the incorporation of policy and procedural changes that may affect its guidance.

c. Updates the ASD(S) weapon systems for sustainment reporting list and provides the Military Services an updated memorandum by October 1 of each year.

(1) The weapon systems for sustainment reporting list designates those weapon systems that are required to set metrics goals (including A_M and A_O) and report data into the Advana sustainment tier.

(2) The weapon systems for sustainment reporting list includes all covered systems, as defined by Section 4324 of Title 10, United States Code (U.S.C.), and other critical fielded weapon systems.

(3) The list of weapon systems also includes those rapid fielding middle tier acquisition pathway systems that meet the statutory definition of covered systems in Section 4324 of Title 10, U.S.C., and have transitioned to the major capability acquisition pathway from the middle tier acquisition pathway.

d. Ensures that the Military Services are setting requirements and submitting all required data elements set forth in the September 6, 2022 USD(A&S) Memorandum including A_M and A_O .

2.2. SECRETARIES OF THE MILITARY DEPARTMENTS.

The Secretaries of the Military Departments:

a. In accordance with Section 118 of Title 10, U.S.C., and existing guidance from the DepSecDef and the USD(A&S):

(1) Review the procedures and methodology established by this issuance annually.

(2) Recommend revisions to these procedures and methodology to the Office of the Deputy Assistant Secretary of Defense for Materiel Readiness (ODASD(MR)) as necessary.

(3) Report any revisions to the metrics goals or requirements to the ODASD(MR). Proposed changes will be briefed to the ODASD(MR), the Joint Staff J4 Maintenance Branch, and the Office of the Under Secretary of Defense for Personnel and Readiness.

b. Maintain superordinate metrics and supporting data outlined in Table 1 in authoritative data systems.

(1) Update metrics and supporting data in accordance with the frequencies listed in Table 1. For any metric for which the reporting is unable to meet the update frequencies in Table 1, provide plans, milestones, and timelines to include anticipated date of completion for compliance with the required frequencies. The Military Services will present these plans at sustainment executive steering committees, sustainment reviews, or sustainment integrated acquisition portfolio reviews.

(2) Provide access to the superordinate metrics and supporting data described by this issuance and contained within the Military Service's authoritative data systems which link to OSD data platforms listed in Paragraph 2.1.a.

(3) Ensure access by DoD Components to the superordinate metrics and supporting data described by this issuance and contained in the Military Service's authoritative data systems.

c. Follow the guidance in this issuance to review the superordinate metrics and supporting maintenance and supply data including consideration of optimum system reliability and cycle time in support of achieving targeted weapon system availability.

d. Identify and address the primary causes of high non-availability or excessive C/DA. Report these high non-availability or excessive C/DA issues in quarterly sustainment submissions into the Advana sustainment data tier so these issues can be resolved.

(1) High non-availability are those weapon systems that meet the following criteria:

(a) Total active inventory (TAI) or PMAI is 10 or greater for an aircraft, 5 or greater for a ship or submarine, and 50 or greater for a ground vehicle.

(b) The latest 6 month rolling average A_M or A_O for the weapon system is 25 percent or more below the Military Service established A_M or A_O target.

(2) Excessive C/DA metric costs are those weapon systems that meet the following criteria:

(a) PMAI is 10 or greater for an aircraft, five or greater for a ship or submarine, and 50 or greater for a ground vehicle.

(b) The C/DA metric, calculated on a fiscal year (FY) basis, has increased by more than 10 percent for each of the 3 previous FYs.

2.3. CHAIRMAN OF THE JOINT CHIEFS OF STAFF.

The Chairman of the Joint Chiefs of Staff, through the Director for Logistics, Joint Staff J4:

a. Manages oversight and approval of sustainment metrics in the Joint Capabilities Integration and Development System process.

b. Reviews all changes to A_M and A_O requirements pursuant to the September 6, 2022 USD(A&S) Memorandum at integrated acquisition portfolio reviews, the Executive Readiness Management Group, and sustainment reviews.

SECTION 3: METRICS TO ASSESS DESIRED OUTCOMES

3.1. Collected and accessible superordinate metrics and supporting data reinforces DoD logistical, operational, and planning requirements pursuant to DoD Directives 7730.65 and 4151.18 and Section 117 of Title 10, U.S.C. There are three superordinate metrics that enable DoD visibility into sustainment outcomes:

- a. A_M, which measures the effectiveness of the TAI.
- b. A_O, which measures the effectiveness of the PMAI.
- c. C/DA, which measures the efficiency of the PMAI.

3.2. Table 1 lists the superordinate metrics, supporting data, and update frequency required by the Military Services:

Table 1. Superordinate Metrics, Supporting Data, and Update Frequency

| Type of metric or data | Metric or supporting data name | Update frequency |
|--|---|------------------|
| Superordinate metrics | A _M | Monthly |
| | A _O | Monthly |
| | C/DA | Quarterly |
| Supporting data | TAI | Monthly |
| | Total inactive inventory (TII) | Monthly |
| | End of planned service-life inventory (EPSLI) | Monthly |
| | PMAI | Monthly |
| | Not Mission Capable Maintenance (NMCM) time for each individual asset | Monthly |
| | Not Mission Capable Supply (NMCS) time for each individual asset | Monthly |
| | Depot not available time for each individual asset | Monthly |
| | Unit Possessed Not Reported (UPNR) time for each individual asset | Monthly |
| Possible time (in hours or days for each individual asset) | Monthly | |

3.3. The superordinate metrics support the August 31, 2022, DepSecDef Memorandum and the September 6, 2022 USD(A&S) Memorandum for a routine and standardized review of sustainment performance and cost metrics. The metrics:

- a. Form the basis of a routine and standardized review of sustainment performance and cost metrics throughout the weapon system’s life cycle.
- b. Align with:
 - (1) Joint Capabilities Integration and Development System sustainment requirements.

(2) The metrics tracked in the Advana Sustainment Tier and the Maintenance and Availability Data Warehouse.

3.4. A_M and A_O reporting is not to be confused with unit readiness reporting. A_M and A_O are only two factors in assessing the status of unit readiness. A_M and A_O reporting is not impacted by the other reporting factors associated with unit readiness such as personnel strength, training status, or the supply status of key equipment, including radios, night vision devices.

a. This distinction is particularly applicable to reporting the superordinate metrics of Navy vessels because they can be considered both individual weapon systems and units.

b. Each ship's superordinate metrics roll up into class-level metrics.

3.5. Supply and transportation metrics are not considered in assessing sustainment health for weapon systems. For supply and transportation metrics, see the Supply Chain Metrics Guide and DoD Instruction 4500.57, respectively.

SECTION 4: PROCEDURES

4.1. A_M AND A_O TARGET SETTING AND TARGET REPORTING.

a. In accordance with DepSecDef and USD(A&S) direction, the Military Services must establish A_M and A_O targets for each of their weapon systems. These targets will be developed in accordance with Chairman of the Joint Chiefs of Staff Instruction 5123.01I sustainment key performance parameters and Military Service or Joint Staff requirements. The targets will be informed by estimates of the maximum achievable A_M and A_O given the systems' designed reliability and maintainability and will consider planned usage in support of war plans and current operations. The A_M and A_O targets must be reviewed by the Military Services at least annually and revised when necessary to ensure validity. These A_M and A_O targets are necessary to:

(1) Establish a basis for using a standard method to measure the effectiveness of sustainment efforts in achieving the required levels of availability of the TAI and PMAI.

(2) Stress the importance of meeting current and future Military Services' operational requirements.

(3) Measure the percentage of a weapon system fleet or group of fleets in the TAI and PMAI that are or will be available for mission requirements at any point in time.

b. Each Military Service must designate one office to act as the focal point for reviewing the A_M and A_O targets annually and for maintaining a documentary record of the basis for the A_M and A_O targets chosen and other key decisions in the A_M and A_O target-setting process.

c. The Military Services may consider flexible A_M and A_O targets that consider a unit's task or deployment status, such as establishing higher A_M and A_O targets for deploying units and lower A_M and A_O targets for non-deployed units.

d. For aircraft, ground combat vehicles, and other weapon system types, A_M and A_O targets must be established at the type model series (TMS) level of detail. For Navy vessels, A_M and A_O targets must be at the ship class level.

e. The ASD(S) provides an updated weapon system list to the Military Service office described in Paragraph 4.1.b. by October 1 of each year. Each Military Service must report its A_M and A_O targets for each weapon system designated on the updated list:

(1) Military Services submit updated A_M and A_O targets for each weapon system by October 30 of each year to the ODASD(MR).

(2) The Joint Staff J4 Maintenance Division, ODASD(MR), and the Military Departments will review any relevant changes to A_M and A_O targets at sustainment integrated acquisition portfolio reviews, the Executive Readiness Management Group, and sustainment reviews (which occur every 5 years after initial operational capability) pursuant to the September 6, 2022 USD(A&S) Memorandum.

4.2. SUPERORDINATE METRICS AND SUPPORTING DATA REPORTING.

a. The superordinate metrics and supporting data listed in Table 1 must be accessible by individuals throughout the DoD who have responsibilities relating to requirements, capability design, development, production, testing, evaluation, operation, and sustainment.

b. A_M and A_O metrics and supporting data specified must be accessible at the serial, tail, hull, bureau, or any other unique weapon system identifier level of detail. Results for the C/DA metric and supporting data specified in this paragraph must be accessible at the TMS level of detail. The following metrics and supporting data must be maintained:

(1) The A_M and A_O metrics and not available time data, in accordance with the computational methodologies outlined in Paragraphs 5.1.a., 5.1.b., and 5.3.a. The units of measure for possible, available, and not available times that are the components of the A_M and A_O metrics may be reported in either hours or days. The Military Service is not required to change the unit of measure used in possible, available, and not available time reporting (e.g., hours or days). All data will be converted to days of availability at the DoD level.

(2) The total number of each weapon system in the inventory for the following categories in accordance with the computational methodologies outlined in Paragraph 5.2.:

- (a) TAI.
- (b) TII.
- (c) EPSLI.
- (d) PMAI.

(3) The maintenance costs expended in accordance with the computational methodologies outlined in Paragraph 5.1.c. and 5.3.b. These maintenance costs, along with the A_O results, form the basis of the C/DA calculation.

(a) The C/DA metric establishes a common measure of efficiency of sustainment efforts that affect the availability of a defined population of weapon systems. As a common measurement, the C/DA metric utilizes the maintenance costs depicted in Figure 7 as the numerator of the calculation and days of availability achieved for the PMAI as the denominator of the calculation.

(b) Specifically, C/DA includes maintenance labor hours, consumables, and depot level repairables costs. Both the maintenance costs and days of availability achieved are common units of measure because they easily convert, calculate, and compare across all types of weapon systems.

SECTION 5: COMPUTATIONAL METHODOLOGY

5.1. COMPUTING SUSTAINMENT HEALTH METRICS.

a. A_M .

Figure 1 shows the formula to calculate A_M .

Figure 1. A_M Formula

| | |
|------------------|---|
| $A_M =$ | $\frac{\text{Available time for the TAI}}{\text{Possible time for the TAI}}$ |
| Available time = | the total number of hours or days a weapon system is available to perform assigned missions in a given timeframe (T_F). |
| Possible time = | TAI x hours or days in T_F . |

b. A_O .

Figure 2 shows the formula to calculate A_O .

Figure 2. A_O Formula

| | |
|------------------|---|
| $A_O =$ | $\frac{\text{Available time for the PMAI}}{\text{Possible time for the PMAI}}$ |
| Available time = | the total number of hours or days a weapon system is available to perform assigned missions in a given timeframe (T_F). |
| Possible time = | PMAI x hours or days in T_F . |

c. C/DA.

It is useful and important to monitor C/DA trends. The C/DA for each weapon system may be increasing, flat, or decreasing over time.

(1) Flat or decreasing C/DA trends signify that the availability being generated for the weapon system is being purchased at the same or lower unit cost rate as in the past.

(2) An increasing C/DA trend signifies it is becoming more expensive over time to purchase the availability being generated for the weapon system on a unit cost basis. An increasing C/DA trend needs immediate attention if C/DA has increased by more than 10 percent for each of the 3 previous FYs.

(3) Figure 3 shows how C/DA is expressed mathematically.

Figure 3. Mathematical Expression of C/DA

| |
|--|
| $C/DA = \frac{\text{Total maintenance cost of the PMAI of the weapon system for } T_F}{\text{Days of availability achieved for the PMAI of the weapon system for } T_F}$ |
|--|

d. Example.

A notional weapon system (M123A) example calculation of superordinate metrics in FY 2021:

(1) Maintenance cost depicted in the Military Service's authoritative data system for the entire TAI M123A fleet in FY 2021: \$175 million. Maintenance cost depicted for the PMAI portion of the fleet in FY 2021: \$150 million.

(2) Average TAI of the M123A fleet in FY 2021: 691 vehicles. Average PMAI of the M123A fleet in FY 2021: 600 vehicles.

(3) T_F is 365 days (1 FY).

(4) The depicted number of available days generated for TAI of the M123A fleet in FY 2021: 226,994 days. The depicted number of available days generated for PMAI of the M123A fleet in FY 2021: 200,000 days.

(5) A_M is calculated as: total number of days the TAI of the M123A is available (226,994 days) divided by TAI (691 vehicles) times days in T_F (365 days). This equates to 226,994 days divided by 252,215 days, which equals 90.0 percent.

(6) A_O is calculated as: total number of days the PMAI of the M123A is available (200,000 days) divided by PMAI (600 vehicles) times days in T_F (365 days). This equates to 200,000 days divided by 219,000 days, which equals 91.3 percent.

(7) C/DA is calculated as: maintenance cost for the PMAI of the M123A fleet (\$150 million) divided by available days of the PMAI (200,000) = \$750 per day of availability.

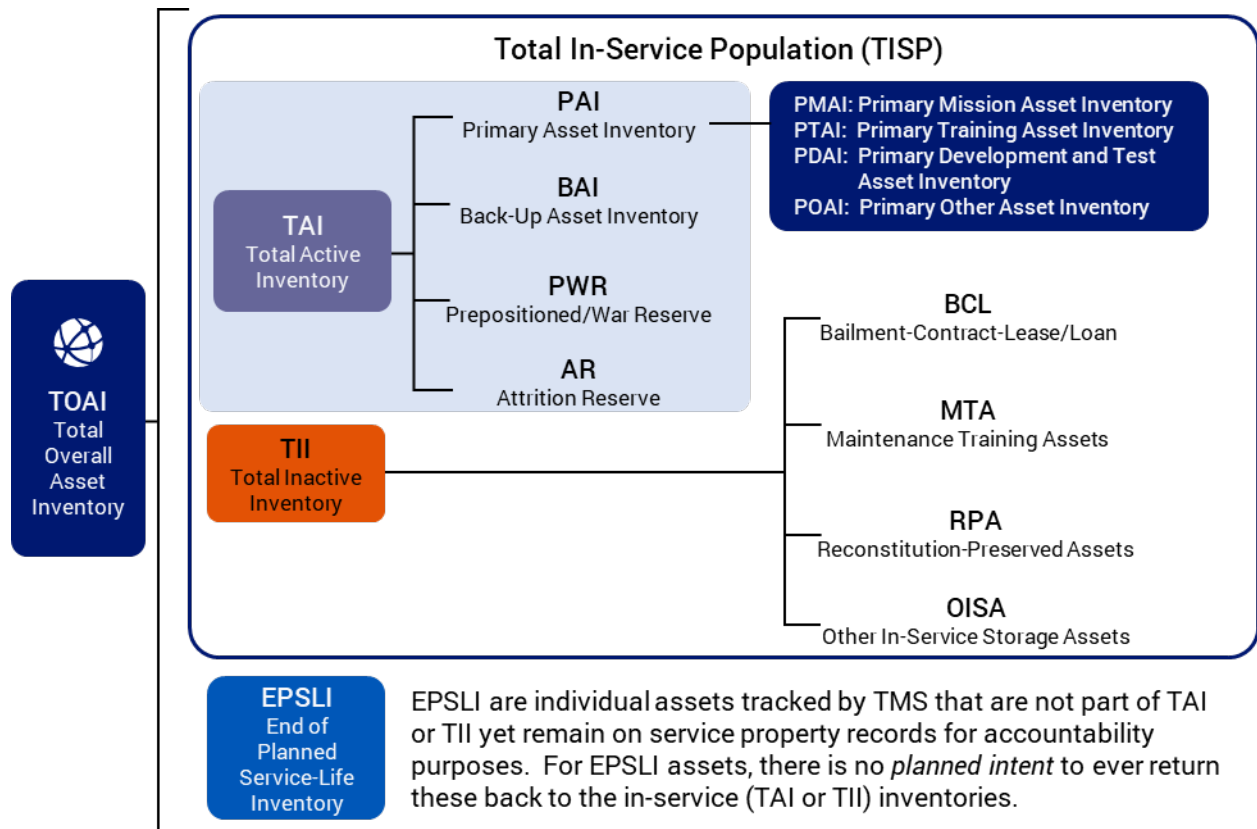
5.2. COMPUTING WEAPON SYSTEMS INVENTORY CATEGORIES AND SUBCATEGORIES.

a. Total Overall Asset Inventory (TOAI).

(1) TOAI is the total weapon system population by TMS. The TOAI includes all TAI, TII, and EPSLI. Figure 4 illustrates the TOAI with its three main categories of inventory (TAI, TII, and EPSLI) along with their respective subcategories.

(2) TOAI is expressed mathematically as: $TOAI = TAI + TII + EPSLI$.

Figure 4. TOAI Hierarchy



b. Total In-Service Population (TISP).

TISP is calculated as: $TISP = TAI + TII$.

c. TAI.

(1) TAI is comprised of individual assets tracked by TMS assigned primarily (e.g., directly to a specific unit) or secondarily (e.g., not assigned to specific unit) to the Military Services for mission, training, test and development, or maintenance functions (excluding maintenance training).

(2) The number of individual assets that are included in TAI are generally tied to current operational plans, but include all individual assets needed for both current and anticipated operational missions and mission-support requirements to fulfill national strategic objectives. The total number of individual assets in TAI is a function of how many are needed for each of the following purposes (depicted in Figure 5):

(a) Primary asset inventory (PAI), which consists of:

1. PMAI.
2. Primary training asset inventory.
3. Primary development and test asset inventory.
4. Primary other asset inventory.

(b) Back-up asset inventory (BAI).

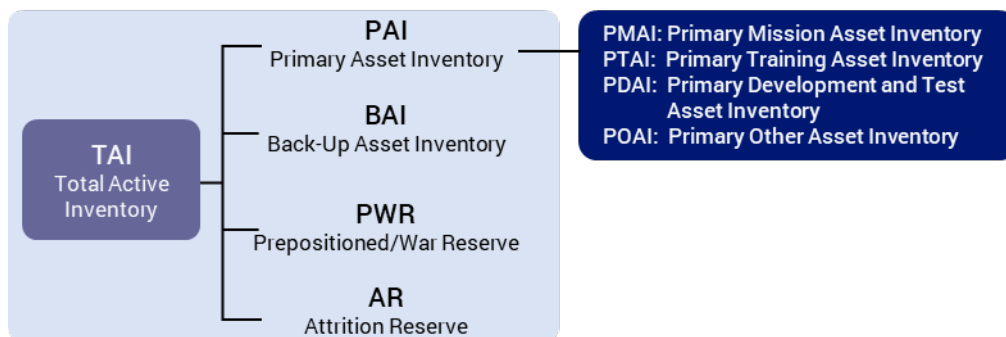
(c) Assets for prepositioned/war reserve (PWR).

(d) Assets for attrition reserve (AR).

(3) Assets counted as TAI will not be removed from a Military Service's active inventory for scheduled or unscheduled depot maintenance unless the Military Service determines a different inventory category is appropriate.

(4) TAI is expressed mathematically as: $TAI = PAI + BAI + PWR + AR$.

Figure 5. TAI and Subcategories



d. TII.

(1) TII is comprised of individual assets tracked by TMS that are not part of TAI but have remaining service life. TII includes individual assets:

- (a) In storage but not operationally available.
- (b) Identified for anticipated future operational requirements.

- (c) Of one TMS awaiting refurbishment to become a different TMS.
- (d) Used in maintenance training.
- (e) Used as government furnished equipment.
- (f) In bailment, contract, loan, or lease not assigned to a military unit.
- (g) Otherwise not readily available to the Military Services.

(2) Individual assets that have reached their end of useful service life or are awaiting final disposition are not included in TII. Additionally, individual assets counted in TII will not be removed from Military Services' inactive inventories unless:

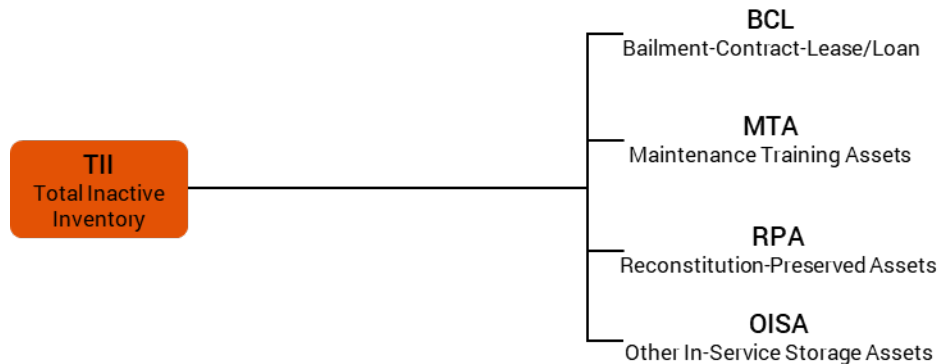
- (a) The individual asset is specifically funded and inducted into depot maintenance for overhaul;
- (b) Other maintenance work is initiated to restore the individual asset's availability back to TAI; or
- (c) The individual asset has reached its end of planned service life.

(3) TII is comprised of the following sub-categories (depicted in Figure 6):

- (a) Bailment-contract-lease/loan (BCL).
- (b) Maintenance training assets (MTA).
- (c) Reconstitution-preserved assets (RPA).
- (d) Other in-service storage assets (OISA).

(4) TII is expressed mathematically as: $TII = BCL + MTA + RPA + OISA$.

Figure 6. TII and Subcategories



e. EPSLI.

(1) EPSLI is comprised of individual assets tracked by TMS that are not part of TAI or TII and have reached their end of useful service life yet remain on Military Service property records for accountability purposes and for which there is no intent to return these individual assets to TAI or TII.

(2) Individual assets counted as EPSLI are determined excess to DoD operational needs, typically have no preservation plan, and are awaiting final disposition or disposal. Individual assets counted as EPSLI will not be removed from a Military Service's property records until final disposition is made. EPSLI includes, but is not limited to:

- (a) Permanent, demilitarized assets on display.
- (b) Nonfunctioning training aids.
- (c) Range targets.
- (d) Assets that have been coded for scrap or reclamation or classified as not economic to repair.

f. Total Procurement Quantity.

Total procurement quantity:

- (1) Is separate from the inventory metrics.
- (2) Represents the total number of weapon systems procured. It includes fully configured end items from the engineering and manufacturing development and production and deployment phases of the acquisition cycle.
- (3) May match TOAI initially, but TOAI will decrease compared to total procurement quantity as systems are divested, attrited, or otherwise removed from inventory calculations.
- (4) Is tracked in the Advana sustainment tier to provide linkage to the acquisition program that fielded a weapon system program.

5.3. COMPUTING NOT AVAILABLE TIME AND MAINTENANCE COST.

a. Not Available Time Reporting.

Weapon system not available time is the difference between the possible time (the denominator in the A_M and A_O availability calculations in Paragraphs 5.1.a. and 5.1.b.) and the available time (the numerator in the A_M and A_O availability calculations in Paragraphs 5.1.a. and 5.1b.)). The following schema will be used to record the not available time monthly:

- (1) Field level maintenance not available time (hours or days):

(a) NMCM time measures the number of individual asset non-available hours or days due to maintenance actions.

(b) Measurement of NMCM time starts for:

1. Unscheduled maintenance when a malfunction is discovered or at mission completion, whichever is later.

2. Scheduled maintenance when an individual asset cannot be returned to fully mission capable (MC) or partially MC operating status within 2 hours after the start of the scheduled maintenance activity.

(c) Measurement of NMCM time stops when:

1. Maintenance has been completed; or

2. Maintenance work initiated to correct an NMCM condition for an individual asset stops due to supply shortage. The period of work stoppage due to supply shortage must be measured as NMCS time. Recording as NMCM time resumes when required supply items are delivered to the unit executing the maintenance.

(d) NMCS time measures the number of individual asset non-available hours or days caused by waiting for parts or consumables.

(e) Recording of NMCS time starts when:

1. Maintenance work initiated to correct an NMCM condition for an individual asset stops because of lack of parts.

2. The needed part(s) are not available for at least one hour from the start of the stoppage of the maintenance work initiated to correct the NMCM condition.

(f) Recording of NMCS time stops when:

1. The required parts or consumables necessary to complete the maintenance work are delivered to the unit executing the maintenance; or

2. The required maintenance work for which the parts or consumables were needed is completed or no longer necessary.

(g) UPNR time is the amount of time an individual asset in the possession of an organizational unit is not available for use for reasons other than NMCM, NMCS, or depot not available time. It also includes time that accounts for differences in reported inventory totals between a Military Service's authoritative inventory and authoritative sustainment databases. Examples of UPNR time include:

1. Time an individual asset is in-transit or awaiting disposition.

2. During a 30-day calendar month, if the inventory system reports 100 individual assets of a TMS as part of the PMAI but the availability reporting system depicts only 95 assets, then the difference of 150 days (100 assets minus 95 assets times 30 days) will be reported as UPNR time.

(2) Depot not available time reflects the loss of availability due to depot level work.

(a) Depot not available time is expressed as hours or days of lost available time. Recording of depot not available time starts when the depot inducts the individual asset (i.e., takes ownership of the individual asset on the depot's property books).

(b) The recording of depot not available time ends when the status of the individual asset is changed to reflect the asset is able to resume its intended mission or that it is no longer a part of TAI.

b. Maintenance Cost.

(1) Maintenance cost incurred by units that possess PMAI assets is the numerator in the C/DA metric. The cost for sustaining weapon systems and their supporting equipment is the expended maintenance cost as reported in authoritative logistics and cost data systems.

(2) Maintenance cost elements are documented in Table 4-2 of the Cost Assessment and Program Evaluation Operating and Support Cost-Estimating Guide.

(a) The total maintenance cost for a defined weapon system population reflects fully burdened rates for labor and specifically captures supply, labor, and all overhead costs for both field level (unit and intermediate) and depot level maintenance, and maintenance executed by both organic government and commercial organizations.

(b) Weapon systems maintained in part or whole by contractor-supported maintenance (e.g., interim contractor support, contractor logistics support, field service representatives, or performance-based logistics) must comply with DoDI 5000.73, the Federal Acquisition Regulation, and the Defense Federal Acquisition Regulation Supplement. Data deliverables requirements must be included in maintenance contracts.

(c) Maintenance costs do not include operating and sustainment costs that are not maintenance costs (e.g., fuel or pilot salary). Inclusion of these non-maintenance costs in the C/DA metric can skew the understanding as to what generates true "availability." The maintenance cost elements that are documented in Table 4-2 and Element 5.1 (Hardware Modifications) of the Cost Assessment and Program Evaluation Operating and Support Cost-Estimating Guide are calculated in authoritative logistics and cost data systems and reported at the TMS level of detail.

(d) The cost elements included in calculating the maintenance costs for the PMAI are delineated in Figure 7. To calculate the maintenance costs incurred from an operational unit perspective, only costs incurred internal to those units possessing PMAI are included in the C/DA calculation. The costs internal to those units are cost elements 1.2 (Unit-Level Maintenance Manpower), 3.1 (Consumables), and 3.2 (Depot Level Repairables). These cost

elements include the maintenance costs both for organic (government) and contractor (private industry) performed maintenance. Only the yellow highlighted maintenance cost elements shown in Figure 7 are included in the C/DA calculation.

Figure 7. Maintenance Cost Elements for the PMAI

| Maintenance Costs of the PMAI - C/DA |
|--|
| 1.2 Unit-Level Maintenance Manpower |
| 3.0 Maintenance |
| 3.1 Consumables |
| 3.2 Depot Level Repairables |
| 3.3 Intermediate Maintenance |
| 3.4 Depot Maintenance |
| 4.2 Support Equipment Replacement and Repair |
| 4.3 Sustainment/Systems Engineering |
| 4.4 Program Management |
| 5.1 Hardware Modifications |
| 5.2 Software Maintenance |

SECTION 6: DATA REQUIREMENTS

6.1. EXCEPTION REPORTING.

Each individual asset that is part of TAI, down to the unique weapon system identifier level of detail, must be accounted for monthly in the Military Service's authoritative data systems. Any possible time as defined in Paragraph 5.1.a. not accounted for in recording of available hours or days or not available hours or days will be considered UPNR time.

6.2. METADATA REQUIREMENTS.

Metadata should be applied at the most appropriate time between creation and storage and follow all DoD requirements and guidance, including the DoD Metadata Guidance.

6.3. RECORDS MANAGEMENT.

Each Military Service will ensure each authoritative logistics data system complies with records management requirements in accordance with:

- a. Chapters 29, 31, 33, and 35 of Title 44, U.S.C.
- b. Subchapter B of Chapter XII of Title 36, Code of Federal Regulations.
- c. DoDI 5015.02.

GLOSSARY

G.1. ACRONYMS.

| ACRONYM | MEANING |
|----------------|--|
| A _M | materiel availability |
| A _O | operational availability |
| AR | attrition reserve |
| ASD(S) | Assistant Secretary of Defense for Sustainment |
| BAI | back-up asset inventory |
| BCL | bailment-contract-lease/loan |
| C/DA | cost per day of availability |
| DepSecDef | Deputy Secretary of Defense |
| EPSLI | end of planned service-life inventory |
| FY | fiscal year |
| MC | mission capable |
| MTA | maintenance training assets |
| NMCM | not mission capable maintenance |
| NMCS | not mission capable supply |
| ODASD(MR) | Office of the Deputy Assistant Secretary of Defense for Materiel Readiness |
| OISA | other in-service storage assets |
| PAI | primary asset inventory |
| PMAI | primary mission asset inventory |
| PWR | prepositioned/war reserve |
| RPA | reconstitution-preserved assets |
| TAI | total active inventory |
| T _F | given timeframe |
| TII | total inactive inventory |
| TISP | total in-service population |
| TMS | type model series |
| TOAI | total overall asset inventory |

| ACRONYM | MEANING |
|----------------|--|
| UPNR | unit possessed not reported |
| U.S.C. | United States Code |
| USD(A&S) | Under Secretary of Defense for Acquisition and Sustainment |

G.2. DEFINITIONS.

Unless otherwise noted, these terms and their definitions are for the purpose of this issuance.

| TERM | DEFINITION |
|-------------|---|
| AM | A measure of effectiveness for the TAI of a weapon system. A_M is the available time for the TAI divided by the possible time for the TAI. The result is the percent of TAI that is available. |
| Ao | A measure of effectiveness for the PMAI of a weapon system. A_o is the available time for the PMAI divided by the possible time for the PMAI. The result is the percent of PMAI that is available. |
| AR | Individual assets procured for the specific purpose of replacing anticipated weapon system losses due to peacetime or wartime loss or damage. |
| BAI | The number of individual assets in addition to PAI that permit scheduled and unscheduled depot level maintenance, modifications, inspections, repairs, and other events to occur without reduction of individual assets available for assigned mission requirements. |
| BCL | Bailment occurs when individual assets are furnished by a DoD organization to the physical custody of a nongovernmental organization pursuant to the requirements of a Federal Government contract. Contracted individual assets are those used by the military through a contractual agreement with a nongovernment party. Leased individual assets are those provided to parties outside of the DoD on a temporary basis under an arrangement governed by a memorandum of agreement or contract. Loaned individual assets are those provided to other Federal Government departments and agencies on a temporary basis governed by a memorandum of agreement. |

| TERM | DEFINITION |
|--|---|
| C/DA | An efficiency metric measuring the historical maintenance cost of the PMAI expended during a time period divided by days of availability achieved of the PMAI during the same time period. The C/DA metric is used to understand and scope maintenance trends of the PMAI over time (increasing, constant, or decreasing). Through its prognostic tools, measuring C/DA provides insight into the maintenance cost of buying future availability of the PMAI. |
| depot not available time | The amount of time measured in hours or days a weapon system or individual asset spends undergoing depot level maintenance. |
| excessive C/DA costs | C/DA for weapon systems for which TAI is 10 or greater for an aircraft, five or greater for a ship or submarine, and 50 or greater for a ground vehicle system and the C/DA, calculated on an FY basis, has increased by more than 10 percent for each of the 3 previous FYs. |
| high weapon system non-availability | Weapon systems for which TAI is 10 or greater for an aircraft, five or greater for a ship or submarine, and 50 or greater for a ground vehicle system and the latest 6 month rolling average A_M or A_O for the weapon system is 25 percent or more under the Military Service-established A_M or A_O target. |
| individual asset | A single asset of a weapon system fleet identified by serial, tail, hull, bureau, or any other unique weapon system identifier level of detail. |
| MC | A materiel condition indicating that individual assets can perform an identified mission. |
| MTA | Individual assets employed for maintenance training or for ground mock-up training that does not require actual airborne or ground operations. |
| NMCM | A materiel condition indicating that individual assets are not capable of performing an identified mission because of unit level maintenance requirements. |
| NMCS | A materiel condition indicating that individual assets are not capable of performing an identified mission because of maintenance work stoppage due to a supply shortage. |

| TERM | DEFINITION |
|---|---|
| not available time | The amount of time a weapon system or individual asset is determined to be incapable of performing its mission safely. Not available time is classified into one of four categories: NMCM, NMCS, depot not available time, and UPNR. |
| not mission capable | A materiel condition indicating that individual assets are not capable of performing an identified mission. |
| PAI | The number of individual assets assigned to meet the primary materiel authorization. PAI is the sum of mission, training, development-test, and other inventory sub-categories. |
| PMAI | The number of individual assets assigned for performance of an operational mission. |
| primary development and test asset inventory | The number of individual assets assigned to meet development and test requirements. |
| primary other asset inventory | The number of individual assets assigned for special missions not elsewhere classified. |
| primary training asset inventory | The number of individual assets assigned for technical and specialized training for operator or crew personnel or leading to operator or crew qualification. |
| PWR | Weapon systems that are prepositioned afloat or forward stored that are planned for immediate assignment to the operating forces in the event of mobilization. |
| RPA | Individual assets that have been removed from TAI with a preservation plan and parts or cannibalization control authorities in place to minimize non-availability due to corrective maintenance actions, where the individual assets removed from TAI could be re-assigned back into TAI upon Military Service or Congressional decision. |
| TAI | The count of all individual assets in the fleet with an active mission, such as operations, training, test, backup, pre-positioned, and war reserve. |
| TISP | Individual assets that are counted by the Military Services as part of the TAI and TII of a TMS. |

| TERM | DEFINITION |
|-----------------------|---|
| TMS | The identifier by which different weapon system types are labeled. |
| unit possessed | An individual asset that has been received by the organizational unit through an acceptance inspection, change of status, or other means indicating the individual asset is under the control of the organizational for maintenance, property accountability, or safekeeping reasons. |
| UPNR | The time in which an individual asset is in transit or awaiting disposition as well as time that accounts for differences in reported inventory totals between a Military Service's authoritative inventory and authoritative availability logistics data systems. |

REFERENCES

- Assistant Secretary of Defense for Sustainment Memorandum, “2023 Annual Update of Weapon Systems for Sustainment Reporting,” April 19, 2023
- Chairman of the Joint Chiefs of Staff Instruction 5123.01I, “Charter of the Joint Requirements Oversight Council and Implementation of the Joint Capabilities Integration and Development System,” October 30, 2021
- Code of Federal Regulations, Title 36, Subchapter B, Chapter XII
- Defense Federal Acquisition Regulation Supplement, current edition
- Deputy Secretary of Defense Memorandum, “Establishing Data-Driven Approaches to Containing Sustainment Costs,” August 31, 2022
- DoD Chief Digital and Artificial Intelligence Officer, “DoD Metadata Guidance,” Version 1.0, January 2023
- DoD Directive 4151.18, “Maintenance of Military Materiel,” March 31, 2004, as amended
- DoD Directive 5135.02, “Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)),” July 15, 2020
- DoD Directive 7730.65, “DoD Readiness Reporting System,” May 31, 2023
- DoD Instruction 4500.57, “Transportation and Traffic Management,” March 7, 2017, as amended
- DoD Instruction 5000.73, “Cost Analysis Guidance and Procedures,” March 13, 2020
- DoD Instruction 5015.02, “DoD Records Management Program,” February 24, 2015, as amended
- DoD Instruction 8320.02, “Sharing Data, Information, and Technology (IT) Services in the Department of Defense,” August 5, 2013, as amended
- DoD Manual 8910.01, Volume 2, “DoD Information Collections Manual: Procedures for DoD Public Information Collections,” June 30, 2014, as amended
- Federal Acquisition Regulation, current edition
- Office of the Deputy Assistant Secretary of Defense for Logistics, “Supply Chain Metrics Guide,” current edition
- Office of the Deputy Secretary of Defense, “DoD Data Strategy,” September 2020
- Office of the Secretary of Defense Cost Assessment and Program Evaluation, “Operating and Support Cost-Estimating Guide,” September 2020
- Public Law 115-91, Section 911, “National Defense Authorization Act for Fiscal Year 2018,” December 12, 2017
- Under Secretary of Defense for Acquisition and Sustainment Memorandum, “Establishing Sustainment Metrics for Routine Review,” September 6, 2022
- United States Code, Title 10
- United States Code, Title 44