



DEPUTY UNDER SECRETARY OF DEFENSE FOR
LOGISTICS AND MATERIEL READINESS
3500 DEFENSE PENTAGON
WASHINGTON, DC 20301-3500

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MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS

SUBJECT: Condition Based Maintenance Plus

This memorandum establishes interim policy on Condition Based Maintenance Plus (CBM⁺), outlining policy, providing definition and directing the Military Departments and Defense Agencies to examine, evaluate, develop and implement CBM⁺ enabling technologies and process improvements. CBM⁺ shall be implemented to improve maintenance agility and responsiveness, increase operational availability, and reduce life cycle total ownership costs.

The Maintenance Technology Senior Steering Group will monitor CBM⁺ initiatives and programs and will provide a forum for the exchange of information, ensuring DoD's efforts in this area are coordinated and synchronized as appropriate.

Attached is further policy on CBM⁺. The policy in this memorandum and its attachment is effective immediately; it will be incorporated into the DoD directives system within 180 days. My focal point in this regard is CAPT Bret Gordon, USN, OADUSD(L&MR)/MPP&R, (703) 695-0338.

A handwritten signature in black ink, appearing to read "Diane K. Morales".

Diane K. Morales

Attachment
As stated

cc:
DLA

Policy for Department of Defense Conditioned-Based Maintenance Plus

Policy:

Department of Defense (DoD) policy requires that the tenets of Conditioned-Based Maintenance Plus (CBM⁺) shall be implemented in weapon systems maintenance and logistics support programs where cost effective. These tenets include: designing systems that require minimum maintenance; need-driven maintenance; appropriate use of embedded diagnostics and prognostics; improved maintenance analytical and production technologies; automated maintenance information generation; trend based reliability and process improvements; integrated information systems providing logistics system response based on equipment maintenance condition; and smaller maintenance and logistics support footprints. CBM⁺ shall be implemented to improve maintenance agility and responsiveness, increase operational availability, and reduce life cycle total ownership costs.

The Military Services, in conjunction with the Defense Logistics Agency (DLA), shall pursue the examination, evaluation, development, and implementation of CBM⁺ enabling technologies and process improvements. Exploration and development shall be coordinated, to the extent appropriate and practical, among the Military Services and DLA; information regarding programs, approaches, implementation, and results shall be shared in a routine manner through the Maintenance Technology Senior Steering Group (MTSSG). Both public and private sources of CBM⁺ technologies, tools, and procedures that conform to the total CBM⁺ strategy and vision shall be considered.

CBM⁺ technologies and concepts will be incorporated in organic (DoD in-house) maintenance capabilities and operations as well as in commercially supported DoD systems/programs. Major Defense Acquisition Programs will consider CBM⁺ opportunities as system performance requirements during the design and development phase and throughout the life cycle. If adopted, CBM⁺ requirements will be included in the acquisition requirements package. The incorporation of CBM⁺ into legacy weapon systems shall be evaluated based upon the relative value of the systems to DoD mission requirements, the current technology and performance of the system, the operational and logistics risks of not retrofitting the system with CBM⁺ capabilities, and cost effectiveness. The Military Services shall be responsible for programmatic (e.g., funding and schedule) related to implementation of CBM⁺, except as otherwise agreed to with activities within the Office of the Secretary of Defense.

DoD will establish a CBM⁺ environment for the maintenance and support of weapon systems by establishing appropriate policies, processes, procedures technological capabilities, information systems, and logistics concepts such as:

- System health monitoring using applicable and effective embedded sensors and analysis
- Condition-driven maintenance actions directed by decision support capabilities
- Automatic entry and retrieval of highly accurate maintenance data

- Integrated maintenance and logistics information systems
- Configuration management and asset visibility
- In-service history-based maintenance planning (trend analysis)
- Low ambiguity fault detection, isolation, and prediction
- Interactive electronic technical manuals (IETMs)
- Data-based interactive training and technical assistance capability
- Electronic portable or point-of-maintenance aids

Applicability:

This policy applies to DoD acquisition, logistics, and maintenance activities. It applies to both legacy systems and new acquisition programs. CBM⁺ concepts apply to organic weapon system operations as well as to commercially supported systems within DoD.

Objectives:

Maintenance comprises a major portion of total weapon systems ownership costs. Unnecessary maintenance and related resources contribute to higher ownership costs and reduced operational availability. Proper application of CBM⁺ capabilities and concepts focuses maintenance on essential requirements, reduces excess infrastructure, and improves the responsiveness of the entire logistics support system. Specific objectives of implementing CBM⁺ include:

- Enhanced maintenance and logistics effectiveness; a more integrated maintenance and logistics system
- Integration of advanced engineering, maintenance, and information technologies
- Designing weapon systems that use measurable, consistent and accurate predictive parameters that are related to specific failure modes when cost analysis determines embedded CBM⁺ capabilities should be employed
- Application of CBM⁺ technologies and techniques to legacy systems and maintenance processes where feasible, effective, and efficient
- Improved data about maintenance operations and parts/system performance
- Improved diagnostics and prognostics capabilities
- More accurate and in-depth configuration management
- Reduced unscheduled maintenance
- Increased system reliability
- More effective maintenance training
- Smaller maintenance and logistic footprint
- Improved supply/maintenance planning and responsiveness
- Increased Operational Availability
- Minimized unique support equipment and information systems for individual equipment application

CBM⁺ Defined:

Condition-based maintenance (CBM) can be defined as a set of maintenance processes and capabilities derived, in large part, from real-time assessment of weapon system condition obtained from embedded sensors and/or external tests and measurements using portable equipment. The goal of CBM is to perform maintenance only upon evidence of need. CBM⁺ expands on these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. A variety of advanced engineering, maintenance, and information system technologies as well as contemporary business processes underpin CBM⁺. CBM⁺ characteristics include, but are not limited to:

- Hardware - embedded sensors; integrated data bus
- Software - decision support and analysis capabilities, on and off equipment
- Design - open system architecture; integration of maintenance and logistics information systems; interface with operational systems
- Processes - reliability centered maintenance program development; a balance of reactive, preventive, and predictive maintenance processes
- Tools - IETMs (digitized data); Automatic Identification Technology; portable maintenance aids; embedded, data-based, interactive training
- Functionality - Fault detection; fault isolation; fault prediction

Monitoring CBM⁺ Implementation:

The MTSSG will monitor CBM⁺ initiatives and programs. The MTSSG will provide a forum for the exchange of information about CBM⁺ in DoD maintenance programs, ensuring that DoD's efforts in this area are coordinated and synchronized as appropriate. The MTSSG will establish and manage a CBM⁺ integrated process team (IPT), chartered to assist in the implementation of CBM⁺ throughout the Department's acquisition, logistics, and maintenance processes. The chairperson of the MTSSG, with the head of the CBM⁺ IPT, will be responsible for advising the Deputy Under Secretary of Defense (Logistics and Materiel Readiness) about CBM⁺ progress and issues.

Each Military Service and DLA shall establish a single focal point to serve as their representative to the CBM⁺ IPT. Plans for implementing CBM⁺ shall be developed and provided to the MTSSG. In addition to weapon system-peculiar implementation efforts, the plans should address information system and logistics process changes needed to support CBM⁺.

The Military Services will track the implementation of CBM⁺ technologies and practices. Status will be presented to the MTSSG on an annual basis as scheduled by the chairperson. To establish the degree and speed of progress in incorporating a CBM⁺ upgrade or acquiring a CBM⁺ capability within a weapon system or platform, the number of like-systems with CBM⁺ can be compared to the total inventory.