



**CBM+**

## Conditioned-Based Maintenance Plus (CBM+)

“Full Spectrum Dominance--attaining that goal requires the steady infusion of new technology. Of greater importance is the development of doctrine, organizations, training and education, leaders and people that effectively take advantage of the technology” – Joint Vision 2020

### FACT SHEET

#### What is CBM +

CBM+ has a broad scope: It is built upon the concept of Condition-Based Maintenance, but is enhanced by reliability analysis.

The Air Force slightly modified the CBM+ definition to clearly communicate that CBM+ is integrated throughout the life of the AF weapon systems. The AF definition is:

*Definition: Condition-Based Maintenance (CBM) can be defined as a set of maintenance processes and capabilities derived from real-time assessment of weapon system condition obtained from embedded sensors and/or external test and measurements using portable equipment. The goal of CBM is to perform maintenance only upon evidence of need.*

*Definition: Conditioned- Based Maintenance Plus (CBM+) expands upon these basic concepts, encompassing other technologies, processes, and procedures that enable improved maintenance and logistics practices. These future and existing technologies, processes, and capabilities will be addressed during the capabilities planning, acquisition, sustainment, and disposal of a weapon system.*

Ten enabling technologies and concepts constitute the initial AF baseline for achieving the DOD vision for CBM+ implementation

#### Technologies:

- Prognostics
- Diagnostics
- Portable Maintenance Aids
- Interactive Electronic Technical Manuals
- Interactive Training
- Data Analysis
- Integrated Information Systems
- Automatic Identification Technology

#### Concepts:

- Reliability Centered Maintenance
- Joint Total Asset Visibility

CBM+ represents a conscious effort to shift equipment maintenance from an unscheduled, reactive approach at the time of failure to a more routine and predictive approach. The Condition-Based Maintenance Plus approach to maintenance is based on evidence of need before failure occurs. Evidence of a need forecasted by analyzing data collected automatically by sensors.

CBM+ is supported by automated maintenance information systems that seamlessly integrate with other logistics systems. Therefore, Conditioned-Based Maintenance Plus leads to more efficient maintenance, better readiness, and the cost savings associated with smaller logistics footprints.

CBM+ encourages the use of portable maintenance aids to:

- Reference technical manuals and checklist
- Assist in production management
- Enable data recording and recall
- Provide a platform for training
- Access embedded diagnostics and prognostics

For new systems, planning for CBM+ elements occurs during the design phase, long before acquisition. For legacy systems, appropriate CBM+ capabilities can be inserted as newer technologies emerge. CBM+ technologies are currently in use in the DoD maintenance environment, such as

- Sensors that monitor and record equipment operating parameters and facilitate remote analysis
- Portable maintenance aids with interactive electronic technical manuals
- Equipment health and usage management systems installed on multiple platforms.

The CBM+ approach is already reflected in the developing maintenance plans for the Joint Strike Fighter.

## A Comprehensive Approach to Prognostics & Health Management

