

## ▶ WHAT IS RCM

A logical, structured process used to determine the optimal failure management strategies for any system, based on system reliability characteristics and the intended operating context.

## ▶ PRECEPTS OF RCM

- ▶ RCM seeks to preserve a desired level of system or equipment functionality.
- ▶ RCM is a life-cycle management tool, applied from design through disposal.
- ▶ RCM seeks to manage the consequences of failure, not prevent all failures.
- ▶ RCM identifies the most applicable and effective maintenance task or other logical action.
- ▶ RCM is driven by safety or critical considerations such as environmental law, the ability to complete the mission, and economics.
- ▶ RCM acknowledges design limitations and the operating context.
- ▶ RCM is a continuous process that requires sustainment throughout the life cycle.



## ▶ KEY RCM REFERENCES

- ▶ AFI 21-118
- ▶ AR 750-1
- ▶ MCO 4000.57A
- ▶ MIL-STD-3034
- ▶ NAVAIR 00-25-403
- ▶ SAE JA 1011/1012

## ▶ RCM INFORMATION

<http://www.acq.osd.mil/log/mpp/cbm+.html>

<https://acc.dau.mil/CommunityBrowser.aspx?id=111386>



RELIABILITY  
CENTERED  
MAINTENANCE  
RCM

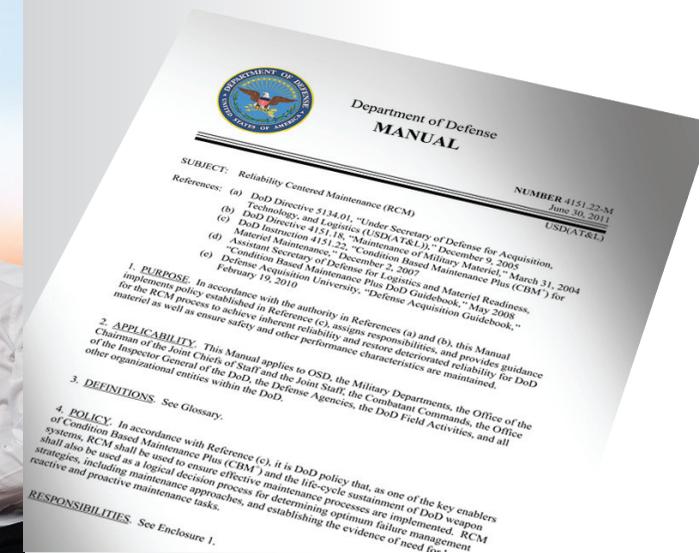


## ▶ POLICY

It is DoD policy that, as one of the key enablers of Condition Based Maintenance Plus (CBM+) and the life-cycle sustainment of DoD weapon systems, RCM shall be used to ensure effective maintenance processes are implemented. RCM shall be used as a logical decision process for determining optimum failure management strategies, including maintenance approaches, and establishing the evidence of need for both reactive and proactive maintenance tasks.

## ▶ DOD MANUAL 4151.22-M

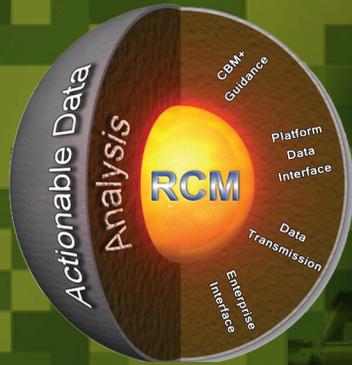
Developed by the RCMWIPT and released in June 2011, the 4151.22-M implements policy established in DoDI 4151.22 (CBM+ for Materiel Maintenance), assigns responsibilities, and provides guidance for the RCM process in DoD.





# ARMY

## RCM PROVIDES FUNDAMENTAL KNOWLEDGE REQUIRED TO EFFECTIVELY SUSTAIN COMPLEX WEAPON SYSTEMS



### CONDITION BASED MAINTENANCE+

- ▶ TACOM is partnering with Penn State ARL and Control Point Corporation (CPC) to develop a ground platform standardized RCM process and training program
- ▶ The Army is exploring opportunities to synergize RCM efforts with the Marine Corps for the Joint Light Tactical Vehicle (JLTV)
- ▶ AMRDEC is continuously enhancing RCM by developing tools such as the Aviation System Assessment Program (ASAP) that provide weapon system RAM performance that feeds RCM analyses.



# AIR FORCE

## RCM IS AN INTEGRATED PROCESS CRITICAL TO THE SUCCESSFUL EXECUTION OF CBM+ PROGRAMS

- ▶ **C-5 MSG-3 PROGRAM**
  - PDM intervals extended from 5-7 years to 8 years
  - Cost avoidance of ~\$1.38B through 2040
  - Aircraft Availability increased by ~7 tails per day
- ▶ **F-15 RCM ANALYSIS (NAVAIR 00-25-403, WEIGHTED)**
  - Scheduled maintenance cost avoidance of ~\$15M or ~159k Man-hours annually
- ▶ **E-8C (JSTARS) PREVENTIVE MAINTENANCE PACKAGE**
  - Optimize RCM goals
    - Home Station Check (HSC)
      - Work Cards reduced ~34%
      - Tasks reduced ~37%
    - Isochronal (ISO)
      - Work Cards reduced ~ 19%
      - Tasks reduced ~24%

### AIR FORCE RCM GUIDANCE/REFERENCES

- AFI 63-101
- AFI 63-107
- AFI 63-128
- AFI 21-101
- AFI 21-104
- AFI 21-118
- AFMCI 21-103
- NAVAIR - 00-25-403
- MIL-STD-1798B
- SAE JA1011
- SAE JA1012

**GOAL:** TO INCREASE SYSTEM AVAILABILITY AND DECREASE COST THROUGHOUT THE LIFE CYCLE



# NAVY

## AVIATION (NAVAIR)

- ▶ RCM is applied to new acquisition & legacy aircraft, propulsion, support equipment, and plant equipment in a continuous manner throughout the life cycle.
- ▶ NAVAIR 00-25-403 provides guidance for process, metrics, software, training, and certification.
- ▶ Prognostics and Health Management integrates predictive algorithms, data collection, and maintenance tasking.
- ▶ Event Based Maintenance takes RCM justified maintenance tasks & intervals and optimizes maintenance events by BUNO.

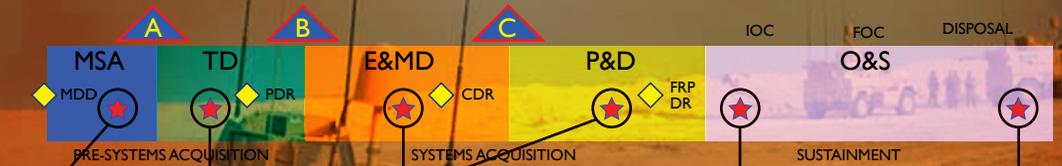
## MARITIME (NAVSEA)

- ▶ Fleet Maintenance Effectiveness Reviews apply RCM across all platforms to optimize maintenance workload and capitalize on best practices
- ▶ MIL-STD 3034 Reliability Centered Maintenance Process is the NEW Mil-Standard process for maintenance development
- ▶ RCM Certification & Training Program – since 2001, over 6,000 persons trained in RCM principles and processes



# MARINES

## INTEGRATED DOD ACQUISITION, TECHNOLOGY, AND LOGISTICS LIFE CYCLE



RCM begins at concept development – making sure requirements are what the user wants.

Iterative analyses as design matures, testing progresses and system performance becomes more well known.

Tailored iterative analyses throughout O&S address unexpected performance/reliability issues.

Final analysis to ensure disposal is economical and efficient.

**★ = RCM ANALYSIS**

The application of sound RCM practices on various ground and C2 systems throughout the Marine Corps has resulted in recommendations that will dramatically reduce planned maintenance and total ownership cost, while increasing system availability