Administrative Changes to AFMCI21-103, *Reliability-Centered Maintenance (RCM) Programs*

30 JULY 2021

Reference NAVAIR 00-25-403, *The Naval Aviation Reliability-Centered Maintenance Process*, can be found at the Naval Air Technical Data and Engineering Service Center, https://mynatec.navair.navy.mil/. Registration with a DoD CAC is required for access. 30 JULY 2021

References to "HQ AFMC/A4F" should be changed to "HQ AFMC/A4/10-EN" throughout the publication. 30 JULY 2021

BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AIR FORCE MATERIEL COMMAND
INSTRUCTION 21-103

3 NOVEMBER 2017
CERTIFIED CURRENT 29 JULY 2021

Maintenance

RELIABILITY-CENTERED MAINTENANCE (RCM) PROGRAMS

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

ACCESSIBILITY: Publications and forms are available for downloading or ordering on the e-Publishing website at **www.e-Publishing.af.mil**

RELEASABILITY: There are no releasability restrictions on this publication

---

OPR: HQ AFMC/A4F

Certified by: HQ AFMC/A4
(Col Fredrick G. Plaumann)

Supersedes: AFMCI21-103, 8 August 1994

Pages: 15

This instruction implements policy provided in Air Force Policy Directive (AFPD) 21-1, *Maintenance of Military Materiel* (Attachment 1, Reference 4). This instruction provides additional policy relating to Air Force Materiel Command (AFMC) implementing the Air Force (AF) policy on Reliability-Centered Maintenance (RCM). It provides requirements, guidance and procedures for establishing, implementing, monitoring, and sustaining preventive maintenance programs for weapon systems and equipment using RCM methodology. This publication is not applicable to the Air Force Reserve Command (AFRC) or Air National Guard (ANG). This AFMCI may NOT be supplemented at any level. The authorities to waive requirements in this publication are identified with a Tier ("T-0, T-1, T-2, T-3") number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the waiver approval authorities and the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the Publication OPR for non-tiered compliance items. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication;* route AF Forms 847 from the field through the appropriate functional chain of command to HQ AFMC A4F. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, *Management of Records* (Attachment 1, Reference 2), and disposed of IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS) located at **https://www.my.af.mil/afrims/afrims/afrims/rims.cfm**. In this instruction content

that is recommended, informational or descriptive (i.e., not mandatory) is indicated as "recommended" or is indicated by words such as "should," "may," "can," "consider," etc. All other content is mandatory and may include words such as "shall," "must," or "will" for additional emphasis. See Attachment 1 for a glossary of references and supporting information.

SUMMARY OF CHANGES

This revision aligns the instruction with AFPD 21-1. This instruction clarifies AFMC policy for establishing preventive maintenance (PM) using Reliability-Centered Maintenance (RCM) methodology, and provides updated RCM program requirements and guidance needed to optimize systems/equipment availability, and improve their reliability and maintainability.

Section A—General Information about the Program

1. Objective. The purpose of this instruction is to define the Air Force Materiel Command (AFMC) Reliability-Centered Maintenance (RCM) program policy and responsibilities within AFMC. This instruction provides requirements, guidance and procedures for establishing, implementing, monitoring, and sustaining PM programs for weapon systems and equipment using RCM. This instruction covers the entire weapon system/equipment life cycle from concept development, design, acquisition, sustainment until system retirement (i.e. cradle to grave). **(T-2)**.

1.1. It is AFMC policy that scheduled preventive maintenance requirements shall be developed using RCM analysis procedures or similar data-driven analysis. Guidance for implementing RCM programs or performing RCM analysis is provided by the NAVAIR 00-25-403 RCM process. RCM processes and equivalent or similar data-driven analyses shall be compliant with SAE JA1011 Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes. RCM shall be employed throughout the weapon systems' and equipment's life cycle to determine proper balance of PM, and to establish effective failure management strategies. **(T-2)**.

1.2. RCM programs for Major Range and Test Facility Bases (MRTFB) as defined by DoDD 3200.11 are not required but encouraged. MRTFB asset owners and managers should consider the potential return on investment before implementing RCM on an individual basis for each test facility. MRTFB programs may comply with some, all or none of the requirements in NAVAIR 00-25-403 or SAE JA1011.

2. Program Definition. RCM programs ensure that maintenance practices support the safest and most reliable operation of which the weapon system or equipment end item is capable. Through careful application of inspection and scheduled maintenance requirements, critical failures that can be anticipated will be minimized, and the highest probability of war-fighting capability will be achieved. RCM analysis is used to develop scheduled inspection and maintenance requirements. The methodology involves the application of an RCM decision logic process to a problem or failure mode identified by the Failure Modes, Effects and Criticality Analysis (FMECA) for new weapon systems and equipment end items, or a combination of an updated FMECA and field failure data for in-service weapon systems and equipment end items. **(T-2)**.

2.1. RCM analysis may be performed on a complete system or systems of a unit, including engines, or on individual items or tasks. Initially, an analysis will be performed on the complete system. In addition to periodic assessments, a subsystem or item analysis will be performed, when dictated, by modifications, maintenance performance data, or other valid indicators. **(T-2)**.

2.2. Analysis performed on new weapon systems and equipment end items will rely primarily on predicted failure rates, failure modes and effects and, where feasible, equipment performance from similar weapon systems and equipment end items or testing results. RCM analysis of fielded, in-service systems also relies on FMECA using, equipment performance data, materiel deficiency reporting and the maintenance data collection system. This data and the RCM analysis procedure are used to validate new inspection requirements generated by field input, operational experience, or modifications. **(T-2)**.

2.3. Reliability growth testing, engineering testing, and developmental test and evaluation (DT&E) data may help to confirm, verify, and update predicted or suspected failure rates, failure modes, failure mechanisms, and time-to-failures. In addition, these tests provide an accurate focus for corrective actions, and preventive maintenance tasks. DT&E should be used in cases of substandard system performance when information is required in addition to the FMECA to investigate, system, subsystem, assembly, or item parameters and characteristics and/or determine the quality of modifications or configurations.

2.4. An RCM program covers four main areas: planning, analysis, implementation, and sustainment. NAVAIR 00-25-403 provides ample information on these four areas. **(T-2)**.

3. Terms. Terms and References used in this instruction are listed in Attachment 1.

Section B—RCM Program Policy

4. Initial Requirements. The organization initiating new developments or modifications shall develop the initial inspection and preventive maintenance requirements based on an RCM analysis or similar data-driven analysis. **(T-2)**.

4.1. Periodic Assessment of Requirements. The Program Manager will assess preventive maintenance requirements for systems and equipment at least every 2 years. Note that for any preventive maintenance program for operational systems with extensive maintenance histories and structured programs to adjust maintenance tasks and intervals, which were determined with an analysis other than RCM, the reassessment does not have to involve a specific RCM decision logic analysis. Reassessment should include failure and replacement data provided by the using commands. This may be done on a continuous basis if enough documented proof of this procedure is kept. **(T-2)**.

4.2. Documentation. The Program Manager is responsible for conducting the RCM analysis and using the results to establish the initial inspection and maintenance requirements. If the system is operational, the Program Manager will use field failure data, operational maintenance data, and RCM analysis and principles to update inspection and preventive maintenance requirements. The initial RCM analysis and all updating analyses must be documented and archived to preserve the history and rationale for maintenance tasks. This documentation provides a basis from which to monitor the effectiveness of the inspection and maintenance program and to establish an audit trail of all RCM decisions. **(T-2)**.

4.3. New acquisition and modification programs must use the RCM process to develop and document PM requirements. **(T-2)**.

4.4. Prior to DoDI 5000.02, Milestone C, RCM results will be incorporated into maintenance plans and technical publications. **(T-2)**.

4.5. RCM must be sustained and continuously used to update failure management strategies throughout the entire life cycle of the program. Any PM program, which was determined by an analysis process other than NAVAIR 00-25-403 RCM, may be sustained using the original method. **(T-2)**.

4.6. RCM analyses must be documented in a digital data format capable of being imported. **(T-2)**

4.7. Mil-STD-1798C, Mechanical Equipment and Subsystems Integrity Program (MECSIP), Subtask 4, requires the Program Office (PO) to conduct RCM, Maintenance Steering Group (MSG)-3, Condition Based Maintenance Plus (CBM+) or equivalent analysis to identify preventive maintenance. **(T-2)**.

4.7.1. MSG-3 is published by the Air Transport Association of America (ATA) for original equipment manufacturer (OEM) and commercial airline. MSG-3 is intended for developing an initial projection of scheduled maintenance prior to aircraft introduction into service, therefore it requires a follow-on program for a life-long sustainment. DoDM 4151.22 directs the incorporation of RCM throughout the total system life cycle, from requirements development through disposal. **(T-2)**.

4.7.2. Prognostics and Health Management (PHM) or CBM+ programs must be based on RCM analysis, readiness requirements, and life-cycle cost goals. DoDI 4151.22 directs implementation of RCM and establishes RCM as a key enabler of CBM+. **(T-2)**.

4.8. AF RCM engine policy resides in AFI 20-115 Propulsion Management for Aerial Vehicles and AFMAN 20-116 Propulsion Life Cycle Management for Aerial Vehicles.

4.9. Mil-STD-3024, Propulsion System Integrity Program (PSIP) cites AFMCI 21-103.

4.10. AFMAN 63-143, Centralized Asset Management Procedures, establishes maintenance requirements based on RCM.

4.11. TO 00-20-1, Technical Manual, Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures, establishes that changes to inspections intervals, concepts or requirement will be made by the Single/Program Manager only after thorough analysis of the data from the Maintenance Information System (MIS) and from the appropriate RCM analysis. **(T-2)**.

4.12. TO 00-25-04, Technical Manual, Depot Maintenance of Aerospace Vehicles and Training Equipment, establishes depot maintenance programs requirements based on RCM. **(T-2)**.

4.13. An agreement and approach for the development and use of a design FMECA and an initial RCM program prior to DoDI 5000.02, Milestone B, and an updated FMECA and RCM program prior to Milestone C to support system safety, reliability and maintainability (R&M), and supportability analyses, and RCM requirements should be established.

4.14. Scope of RCM Analysis. The analysis program will consist of the following:

4.14.1. A FMECA on significant systems, assemblies, and items. This includes analysis of hardware to find out what failure modes can occur on each item being analyzed and the effect each failure mode has on the item and the total system. When determining the scope of an analysis, extreme care and conservative judgment must be used to ensure that no items with significant impact on safety, environmental compliance, operations, and cost are excluded. **(T-2)**.

4.14.2. A decision logic procedure that guides the analyst through a screening process to establish maintenance requirements based on known or probable failure modes and effects. This decision logic is contained in NAVAIR 00-25-403 RCM Process. **(T-2)**.

4.14.3. A frequency determination to select the best interval for each inspection and preventive maintenance requirement. **(T-2)**.

4.14.4. A periodic assessment of individual inspection requirements and intervals to evaluate basic maintenance concepts (e.g., phase versus periodic), Programmed Depot Maintenance (PDM), and maintenance tasks program intervals (e.g., 50-hour phase versus 75- or 100-hour phase). Since initial program intervals are based on failure predictions and may not be accurate, an aggressive RCM program to drive accuracy of failure rates based on field data and the identification of the appropriate maintenance strategy and tasks requirements is needed. **(T-2)**.

4.14.5. Documentation of RCM analyses and assessments to have consistently traceable maintenance requirements. Previous analyses should be compared to current analyses to establish new maintenance requirements or refine existing ones.

4.14.6. Potential Programmed Depot Maintenance (PDM) and Analytical Condition Inspection (ACI) Tasks. The RCM process will reveal potential PDM or ACI tasks. These tasks must be defined, justified, and submitted for approval by the Engineering Requirements Review Process (ERRP) per AFMAN 63-143. **(T-2)**.

Section C—RCM Program Procedures

5. Initial Analysis. The procedures for accomplishing an initial RCM analysis are as follows:

5.1. Identification of Items to be Analyzed. Identify the candidate items to be analyzed. All significant items will be subjected to the analysis contained in NAVAIR 00-25-403. Significant Items refers to parts whose failure, failure-effect, and failure-consequence could impact safety, environmental compliance, mission performance, operations, or cost. Hardware selection is the determination of which hardware items in the hardware breakdown will be analyzed. If a complete analysis will be performed, hardware selection is simply identifying all the items at the selected level of analysis, minus items that do not warrant analysis. **(T-2)**.

5.2. Screen for significant item candidates identified from technical and engineering data and mission equipment lists. When preliminary or published work unit codes are available, each coded item is a candidate. When preliminary or published inspection and maintenance requirements manuals or inspection work cards are available, analyze all items listed as significant to validate, revise, or delete the maintenance requirements. **(T-2)**.

5.3. Include the completed lists of significant items as part of the index for the maintenance requirements analysis package for each program. This identifies those items that have been considered and determines where the analysis information is stored for future reference. **(T-2)**.

5.4. Failure Mode, Effects and Criticality Analysis. RCM analysis stresses systematic and thorough analysis of significant failure modes and their effects on the safety and reliability of the system. Failure modes, item functions, and proposed inspection tasks will then be subjected to the decision logic tree process to establish the validity of each maintenance requirement. Documentation of the failure modes, effects and criticality analysis, the decision logic process, and the resulting tasks will provide consistent traceable maintenance requirements from which the maintenance program will be developed and refined. When

changes are made in system design that may expand, remove, or reduce the impact of identified failure modes, the FMECA must be repeated for the redesigned or modified portions to ensure that all predictable failure modes in the new design or modification are considered. Note, however, that it is not necessary to completely re-accomplish the existing FMECA. **(T-2)**.

5.5. Consider all types of failure modes and effects that pertain to reliability, including but not limited to deterioration and corrosion. Conduct a complete evaluation of each significant assembly or item with primary consideration for safety, operational readiness, mission reliability and performance, environmental impact, and economy. Document failure modes, effects and criticality analysis on items that do not warrant maintenance requirements to preclude future duplication of effort. **(T-2)**.

5.6. In conducting the FMECA, overall mission effectiveness and the reliable operation of systems and subsystems must remain paramount. Consider the functional and operational relationships of the significant items and assemblies being analyzed to the overall system. Thus, the analysis should consider the effects of failure of items on higher or lower level assemblies, systems, or structures. **(T-2)**.

5.7. Failure modes, effects, and criticality are a primary design consideration to provide maximum safety and operational effectiveness. They are frequently the determining factor for redundancy of equipment or functions and for safety or protective devices. Any subsequent analysis to determine inspection and maintenance requirements should consider these design considerations because they frequently reduce the impact of failures on safety or mission effectiveness. **(T-2)**.

5.8. The analyst will apply the RCM logic process, establish the inspection or time change requirements and the frequency, recommend the equipment maintenance facility (field or depot), and provide documented rationale for each maintenance requirement. The initial analysis program will establish the inspection tasks. The information is kept for future reference on those items analyzed and determined to have no scheduled preventive maintenance requirements. **(T-2)**.

5.9. Failure Analysis and Corrective Action System (FRACAS). The purpose of FRACAS is to establish a closed loop failure reporting system, procedure for analysis of failures to determine cause, and documentation for recording corrective actions taken. FRACAS starts early in the development phase and continues throughout the program's life cycle. Although FRACAS and FMECA are designed and capable of being performed independently of each other, there is a synergistic effect when the two are coupled. FRACAS provides engineering documentation, failure analysis, data for reliability analysis, and a centralized location for deficiencies, failure data, and actions taken by the Government or contractor to correct root causes, prevent recurrence of failure, and/or restore the equipment to an operational status. The FRACAS process promotes reliability improvement throughout the system's or equipment's life cycle.

6. In-Service Systems Analysis. After a maintenance program is established, it must be continually evaluated and updated to maintain maximum efficiency and provide minimum impact on operational readiness. This process involves surveillance and resolution of day-to-day problems that impact inspection and maintenance requirements as well as a periodic assessment of the total overall program tasks and intervals. Incoming documentation that may affect RCM programs must be assessed to ensure proper evaluation. **(T-2)**.

6.1. New Maintenance Tasks. Each reported problem or modification that may result in establishing new maintenance requirements will be analyzed using RCM. The analysis will use RCM principles to justify the resulting maintenance requirements. The analysis will be documented as well as the supporting engineering rationale. Any new maintenance requirements or changes to existing maintenance tasks will require product support analyses, like maintenance task analysis (MTA), to determine the product support elements (PSE), such as consumables and tools, needed to accomplish new tasks or implement changes to existing ones. RCM is a required input to other supportability analyses that identify all of the requirements, support resources, and support infrastructure needed to perform maintenance and other mitigating and corrective actions. **(T-2)**.

6.2. Periodic Assessment. The Program Manager will conduct a periodic assessment (at least every 2 years) of all maintenance requirements to determine if current failure data and experience indicates the need to refine the tasks or intervals. Note: Data collection system(s) used as sources for data may have limited storage capabilities (i.e. storage capacity, cyclical/timed obsolete data purging, etc.). In order to prevent or minimize loss of electronic data, supporting decision-making, physical records may be kept. **(T-2)**.

6.3. FMECA Updates. During the sustainment phase FMECAs must be continuously updated with new or missed failure modes, causes, and effects information, re-evaluated failure rates assumed during design phase, and new criticality analyses reflective of actual operational performance and real-world service histories. **(T-2)**.

7. Decision Logic Process. Coupled with the FMECA on significant items and assemblies, failure data and reports, the RCM decision logic process prescribes the analytical procedures used to validate preventive maintenance requirements, to determine the appropriate failure management strategy, and to accept, eliminate or lessen the consequences of functional failures. **(T-2)**.

7.1. RCM decision logic diagrams and procedures are found in NAVAIR 00-25-403. The diagrams contain the essential decision logic requirements for application to RCM analysis. These procedures may be expanded to include additional considerations. Avoid considerations that would compromise safety, mission effectiveness, reliability, or economy. **(T-2)**.

7.2. The RCM decision logic diagrams contain a series of questions that are answered with either "yes" or "no" answers. The answers, based on the FMECA or failure data and reports, determine whether or not an inspection task is required. Although some systems and equipment will not have an initial RCM analysis baseline, all changes to existing inspection and maintenance requirements will be validated by using RCM principles. This analysis ensures a positive approach to establishing and refining maintenance requirements. **(T-2)**.

8. Interval Determination. The RCM decision logic process and the FMECA do not consider the frequency of inspections. The decision logic process must be supplemented with inspection interval analysis to provide an effective inspection program. Since the frequency greatly determines the amount of work expended in a maintenance program, there should be as much emphasis placed on this determination, as on the selection process. An initial interval must be established for all new inspections and the interval for an established inspection will require review and analysis for possible refinement. **(T-2)**.

9. Responsibilities. The Program Manager shall:

9.1. Plan, conduct, document, implement, and sustain RCM programs IAW SAE JA1011 Evaluation Criteria for Reliability Center Maintenance Processes using as guidance NAVAIR 00-25-403. **(T-2)**.

9.2. Use FMECA, RCM process, Product Support Analysis, reliability predictions, maintenance data, failure data, reliability analysis, failure analysis reports, system safety hazard risk analyses, operational studies, engineering analysis and tradeoff studies, and past performance studies to support RCM analyses and programs. **(T-2)**.

9.3. Use the results of the RCM analysis to determine and reassess preventive maintenance requirements. **(T-2)**.

9.4. Summarize results of RCM programs and submits for Air Logistics Complex (ALC) and Major Command (MAJCOM) to evaluate impacts to the PDM or Maintenance/Modification packages in the Engineering Requirements Review Process (ERRP, AFMAN 63-143). **(T-2)**.

9.5. Analyze all proposed changes/refinements to maintenance requirements using data from all available sources including AFTO Forms 22, Technical Order System Publication Improvement Report and Reply, and interim operational and safety supplements that are a result of mishaps. **(T-2)**.

9.6. Evaluate and analyze all recommended refinements in the established preventive maintenance program by using the principles of RCM. **(T-2)**.

9.7. Maintain RCM documentation. **(T-2)**.

9.8. Coordinate proposed new maintenance requirements involving engines and time change items with the item manager before publication. **(T-2)**.

9.9. Coordinate any significant changes in organization workload with the using command, using AFMC organizations, and AFSC before publishing them in technical order manuals.

9.10. Periodically assess preventive maintenance requirements, program intervals, and special inspections by conducting reviews and requesting assistance from the item manager, Equipment Specialist (ES), and commodity engineer. **(T-2)**.

9.11. Initiate periodic joint Program Manager, item manager, ES, commodity engineer, and using command Program Review Conferences or meetings to increase collaboration. **(T-2)**.

9.12. Obtain all funding needed to plan, develop, execute, and sustain the RCM program. **(T-2)**.

10. Contracting for RCM . Sometimes it may be necessary to contract for RCM with the OEM or support contractors. This decision should be carefully considered to ensure the RCM effort is accomplished and sustained to a level that is satisfactory to the Program Manager, equipment operators, and maintainers. When contracting for RCM, the statement of work (SOW) should utilize SAE JA1011, NAVAIR 00-25-403, Mil-STD-3034A, FMECA, and Mil-STD-882E documents, to ensure the contractor is proposing a process that is compliant with the tenets of RCM. During the contract, the Government activity and personnel responsible for the long-term support and sustainment of the RCM program and the resulting preventive maintenance program should remain directly involved and provide appropriate expertise in the conduct and review of the contractor analysis efforts. Particularly, there may be a need to ensure appropriate interaction and information is gained from the operators, maintainers, supporting engineers, and logisticians. The deliverables should be scheduled such that appropriate progress is ensured and any problems are identified before investment of resources is put into follow-up activities. Contractual provisions should ensure pertinent RCM data are available to the Government for access and retrieval throughout the system's or equipment's life cycle.

FREDRICK G. PLAUMMAN, Colonel, USAF
Deputy Director of Logistics, Civil Engineering,
and Force Protection

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFI 33-360, Publications and Forms Management, 1 December 2015

AFMAN 33-363, Management of records, 1 March 2008, Incorporating Change 2, 9 June 2016, Certified Current 21 July 2016

AFMAN 63-143, Centralized Asset Management Procedures, 12 August 2015

AFPD 21-1, Maintenance of Military Materiel, 29 October 2015

DoDD 4151.18, Maintenance of Military Materiel, 31 March 2004

DoDD 5000.01, The Defense Acquisition System, Certified Current as of 20 November 2007

DoDD 3200.11, Major Range and Test Facility Base (MRTFB), 27 December 2007

DoDI 4151.22, Condition Based Maintenance Plus (CBM+) for Materiel Maintenance, 16 October 2012

DoDI 5000.02, Operation of the Defense Acquisition System, 7 January 2015

DoDM 4151.22-M, Reliability Centered Maintenance (RCM), 30 June 2011

Mil-HDBK-502A, DoD Handbook, Product Support Analysis, 8 March 2017

Mil-STD-882E, DoD Standard Practice, System Safety, 11 May 2012

Mil-STD-1798C, DoD Standard Practice, Mechanical Equipment and Subsystems Integrity Program, 8 August 2013

Mil-STD-3024 w/CHANGE 1, DoD Standard Practice, Propulsion System Integrity Program (PSIP), 13 July 2015

Mil-STD-3034A, DoD Standard Practice, Reliability-Centered Maintenance (RCM) Process, 29 April 2014, (Note: Naval Sea Systems Command publication. For of the purpose of this standard, the term “ship” refers to submarines, surface ships, aircraft carriers, and craft.)

NAVAIR 00-25-403, The Naval Aviation Reliability-Centered Maintenance Process, 1 June 2016

TO 00-20-1, Technical Manual, Aerospace Equipment Maintenance Inspection, Documentation, Policies, and Procedures, 1 April 2016

TO 00-25-04, Technical Manual, Depot Maintenance of Aerospace Vehicles and Training Equipment, 30 April 2016

SAE JA1011, Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes, August 2009. DoD adopted this standard for use on 23 February 2016.

Abbreviations and Acronyms

ACI—Analytical Condition Inspection

ALC—Air Logistics Complex

AF—Air Force

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFPD—Air Force Policy Directive

ATA—Air Transport Association of America

CA—Criticality Analysis

CBM+—Condition Based Maintenance Plus

DODD—Department of Defense Directive

DODI—Department of Defense Instruction

DODM—Department of Defense Manual

DT&E—Developmental Test and Evaluation

ELMP—Engine Life Management Plan

ERRP—Engineering Requirements Review Process

ES—Equipment Specialist

FMEA—Failure Modes, Effects, and Analysis

FMECA—Failure Modes, Effects, and Criticality Analysis

FRACAS—Failure Analysis and Corrective Action System

IAW—In Accordance With

MAJCOM—Major Command

MECSIP—Mechanical Equipment and Subsystems Integrity Program

MRTBF— Major Range and Test Facility Base

MSG—Maintenance Steering Group

MTA—Maintenance Task Analysis

NAVAIR—Naval Air Systems Command

NAVSEA—Naval Sea Systems Command

OEM—Original Equipment Manufacturer

OPR—Office of Primary Responsibility

PDM—Programmed Depot Maintenance

PO—Program Office

PM—Preventive Maintenance

PSE—Product Support Elements

PHM—Prognostics and Health Management

PSIP—Propulsion System Integrity Program

RDT&E—Research Development Test and Evaluation

RCM – Reliability—Centered Maintenance

R&M—Reliability and Maintainability

SOW—Statement of Work

Terms

Aerospace Equipment (Weapon Systems and Equipment)—The term refers to weapon systems and equipment such as aerospace vehicles, equipment, missiles, nuclear weapons, Test Measurement and Diagnostic Equipment (TMDE), ground communication electronics (C-E), trainers, training equipment, engines, Flight Support Equipment (FSE), industrial plant equipment, and all related Support Equipment (SE). (TO 00-20-1)

Aerospace Vehicle—Any vehicle that is design to operate in the atmosphere and/or space environment.

Aircrew Flight Equipment (AFE)—Individual items worn by, attached to, used by or provided for aircrew and passengers to maintain life, health, function, and safety during flight and to provide for escape, descent, survival, and recovery. Also identified as FSE.

Analytical Condition Inspection (ACI)—The systematic disassembly and inspection of a representative sample of aircraft to find hidden defects, deteriorating conditions, corrosion, fatigue, overstress and other deficiencies in the aircraft structure or systems. ACIs are normally over and above those inspections specified in the technical order or PDM work specifications.

Best Practice—Procedures that are accepted or prescribed as most effective.

Common Support Equipment (CSE) – Aerospace maintenance support equipment that is used across multiple weapons systems such as Aerospace Ground Equipment (AGE); Test, Measurement and Diagnostic Equipment (TMDE), Automated Test Systems (ATS); Propulsion Support Equipment (PSE); and Munition Materiel Handling Equipment (MMHE).—Criticality Analysis – A procedure that prioritizes each failure mode identified in the FMEA according to the combined influence of its severity and its probability of occurrence.

Depot Industrial Plan Equipment (DIPE)—Depot Industrial Plant Equipment is known as equipment utilized in depot industrial maintenance area as outlined in AFMCI 21-127, Depot Maintenance Plant Management.

Failure Cause—The physical or chemical processes, design defects, quality defects, part misapplication, or other processes which are the basic reason for failure or which initiate the failure mechanisms by which deterioration proceeds to failure.

Failure Consequences—The impact of a functional failure (including secondary damage) caused by failure mode(s) based on evidence of failure and adverse effect on safety, mission effectiveness, environment, operations, and economics.

Failure Effects—The result of a functional failure on surrounding items, the functional capability of the end item, and hazards to personnel and the environment.

Failure Mechanism—Failure mechanisms are the chemical, electrical, physical, mechanical, structural, or thermal processes leading to failure.

Failure Mode—The manner by which a failure is observed.

Failure Mode, Effects and Criticality Analysis (FMECA)—A process which combines a Failure Mode and Effects Analysis (FMEA) and a Criticality Analysis (CA).

Failure Mode, Effects and Analysis (FMEA)—A process used to determine the function(s) of each item, the functional failures associated with each function, the failure modes that have the potential to cause each functional failure, and the effect and severity of each failure mode. This analysis identifies all potential, predicted and actual functional failures of an item.

Failure Rate—The frequency with which an item or component fails, expressed in failures per unit of time.

Function—An intended purpose of an item as described by a required standard of performance.

Functional Failure—The inability of an item to perform a specific function within specified limits.

Maintenance Steering Group (MSG—3) – Air Transport Association of America (ATA) Publication MSG-3, Operator/Manufactured Schedule Maintenance Development.

Materiel—All items necessary to equip, operate, maintain, and support military activities without distinction as to its application for administrative or combat purposes.

Peculiar Support Equipment (PSE)—PSE is any aerospace maintenance support equipment designed to service and/or support a specific MDS/Weapon System.

Program Manager—The Program Manager, as defined in DoDD 5000.01, is the designated individual with responsibility for and authority to accomplish program objectives for development, production, and sustainment to meet the user's operational needs. The Program Manager has responsibility and authority to accomplish objectives for the total life cycle of the program. The Program Manager is responsible for assuring the OSS&E of systems, subsystems and end items.

Preventive Maintenance (PM)—Actions performed prior to functional failure (multiple failures or demand requirements for hidden failures) to achieve the desired level of safety and reliability for an item.

Prognostics and Health Management (PHM) Systems—Diagnostic or prognostic devices and systems that are used to monitor equipment condition and provide indications to the operator or maintainer. These systems may also initiate automatic actions to deal with the condition(s) sensed or predicted.

Test, Measurement and Diagnostic Equipment (TMDE)—TMDE are those devices used to maintain, evaluate, measure, calibrate, test, inspect, diagnose or otherwise examine materials, supplies, equipment, and systems to identify or isolate actual or potential malfunction, or decide if they meet operational specifications established in technical documents.

Trainer—Equipment designed and procured specifically for formal training programs.

Weapon System—A combination of one or more weapons with all related equipment, materials, services, personnel, and means of delivery and deployment (if applicable) required for self-sufficiency. (Joint Pub 1-02)