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INSPECTION AND ANALYSIS
HANDBOOK

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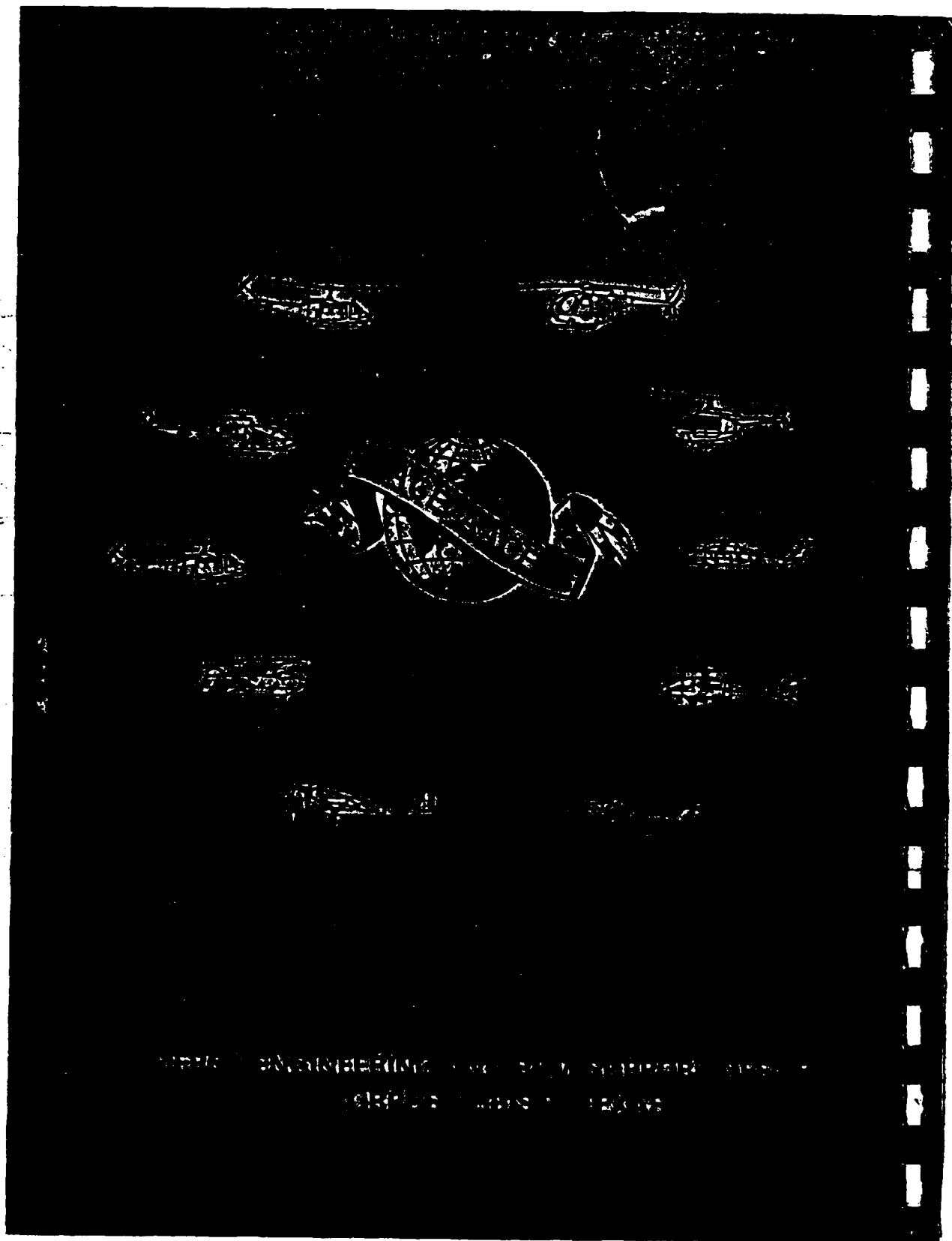
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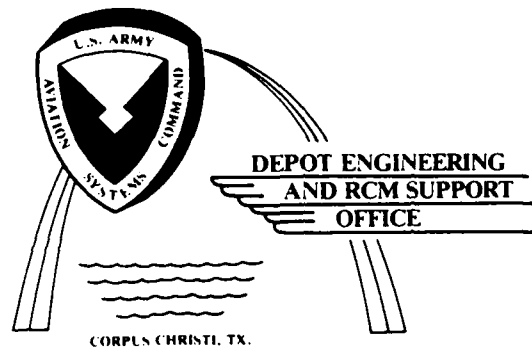
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19. ABSTRACT (Continue on reverse if necessary and identify by block number) This is the Airframe Condition Evaluation and Aircraft Analytical Corrosion Evaluation (ACE/AACE) inspection and analysis handbook which was prepared to provide U.S. Army Aviation Systems Command (AVSCOM) managers, commanders of operational units, engineers, team members, and others with a practical reference document of criteria, guidelines, and other information applicable to the ACE/AACE program. The handbook is in three parts: Part I-Management, Part II-Engineering, and Part III-Profiling.					
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ACE/AACE INSPECTION AND ANALYSIS HANDBOOK

PART I - MANAGEMENT



Prepared as a Special Task under the auspices of the
Nondestructive Testing Information Analysis Center
for

U.S. ARMY AVIATION SYSTEMS COMMAND

APRIL 1985

FOREWORD

It is the policy of the U.S. Army Aviation Systems Command (AVSCOM Reg 750-7) that an airframe condition evaluation and aircraft analytical corrosion evaluation (ACE/AACE) be performed annually on all first line/mission essential Army aircraft worldwide. ACE/AACE is part of AVSCOM's On-Condition Maintenance (OCM) program. OCM is a maintenance concept designed for the purpose of selecting Army aircraft for depot maintenance. ACE involves an annual structural evaluation of each aircraft in the operational fleet to identify those that are in the greatest need of depot maintenance; it is performed in accordance with the requirements of AVSCOM Pamphlet series 750-1. AACE, a special corrosion evaluation program, was established as a companion to ACE and is performed in accordance with AVSCOM Pamphlet series 750-2.

This handbook is intended to provide AVSCOM managers, commanders of operational units, ACE/AACE engineers, ACE/AACE team members, and others involved in ACE/AACE with a practical reference document of criteria, guidelines, and other information applicable to the ACE/AACE program. The handbook is organized into three parts, each bound separately.

Part I (Management) is directed to AVSCOM managers, commanders of operational units, and other managers responsible for the use, maintenance and operational readiness of fielded U.S. Army aircraft. It provides an overview of Army aircraft maintenance and gives other general information pertaining to the purpose and substance of the ACE/AACE program and the closely related reliability-centered maintenance (RCM) discipline, thus establishing a framework for performing the engineering and profiling tasks addressed in Part II and Part III.

Part II (Engineering) is directed to ACE/AACE engineers and others who are involved in planning and analysis in the ACE/AACE program. It provides a ready reference of general information pertaining to ACE/AACE methodology, the selection and revision of indicators, the analysis of field profiling data, and the determination of optimum engineering thresholds. Guidelines are included for the identification of new indicators to be incorporated into AVSCOM Pamphlet series 750-1 and 750-2.

Part III (Profiling) is directed to ACE/AACE team members and others who are involved in profiling in the ACE/AACE program. It provides a ready reference of general information pertaining to aircraft evaluation and inspection.

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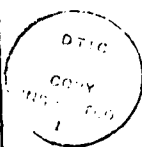
This handbook was prepared by Reliability Technology Associates (RTA) as a Special Task under the auspices of the Nondestructive Testing Information Analysis Center (NTIAC) at Southwest Research Institute (SwRI) under Contract No. DLA900-84-C-0910, CLIN 0001A. At RTA, Mr. Douglas C. Brauer compiled and organized the technical material and developed the handbook under the overall technical direction of Dr. Daniel Henry. Final editorial preparation and publication was performed by NTIAC under the direction of Dr. George A. Matzkanin and Technical Publication Specialist, Mr. Don Moore.

On the part of the AVSCOM, the project was under the technical management of Mr. Lewis Neri, Chief, Depot Engineering and RCM Support Office. Mr. Thomas R. Tullos guided the development of this handbook and provided the necessary Army pamphlets, forms, and other information used as input.

This handbook is for reference only and does not in any way supercede or supplement any official Army document, specifically the 750-1 and 750-2 Pamphlet series. Revision and updating of the handbook is envisioned at appropriate intervals.

The proponent of this publication is HQ, AVSCOM. Users are invited to send comments to the Depot Engineering and RCM Support Office, Attn: AMSAV-7, Corpus Christi, TX 78419-6195.

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PART II - ENGINEERING

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4.0 DETERMINATION OF PROFILE INDEX AND THRESHOLD
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PART III - PROFILING

Bound Separately

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3.0 AACE PROFILING GUIDELINES

APPENDIX A - Forms and Completion Data

APPENDIX B - Army Aircraft Logbook List

APPENDIX C - Corrosion Forms and Causes

APPENDIX D - World Traveler Data

1.0 BACKGROUND

The achievement of an effective On-Condition Maintenance (OCM) program, based on airframe condition evaluation (ACE) and aircraft analytical corrosion evaluation (AACE), requires careful planning followed by well executed aircraft evaluations, inspections, and engineering analyses. OCM/ACE/AACE is conducted as an integral part of the overall Army aircraft maintenance system and functions within the reliability-centered maintenance (RCM) process. This first part of the handbook presents an overview of the Army maintenance system and describes the RCM process as it is being implemented by AVSCOM. With this background, the ACE/AACE program is then introduced, the responsibilities of the various AVSCOM Directorates are outlined, and a brief discussion on some of the major thrusts that will shape the maintenance system in the immediate future is presented.

This first part is designed to be compatible with the other two parts of the handbook. Part II provides specific guidelines to aid in the selection and revision of ACE/AACE indicators, the analysis of field profiling data, and the determination of optimum engineering thresholds. Part III provides specific guidelines to aid in the actual evaluation and inspection of operational aircraft.

Overview of Army Aircraft Maintenance

Army aircraft are maintained within a three-level maintenance concept (Figure 1-1). The *first level*, aviation unit maintenance (AVUM), consists primarily of preventive maintenance and associated minor repairs and component replacement. The *second level*, aviation intermediate maintenance (AVIM), consists of maintenance tasks which exceed AVUM capabilities, such as the performance of specialized aircraft inspections and the repair of certain components. The *third level*, depot maintenance, consists of those maintenance tasks which exceed AVUM and AVIM capability.

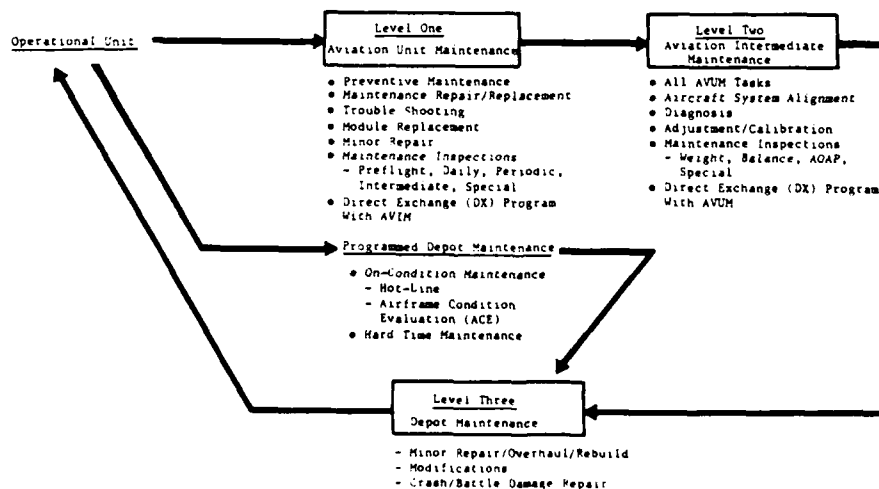


Figure 1-1 Army Maintenance Levels

Depot maintenance is carried out in accordance with Depot Maintenance Work Requirements (DMWRs), documents which establish requirements for disassembly, cleaning, inspection, repair, reconditioning, rehabilitation, modification, reassembly, servicing, testing, and storage of assemblies or parts.

The three level maintenance concept is implemented in concert with the Army's RCM program. RCM involves application of a decision logic process that employs systematic analysis of failure mode, rate, and criticality data in establishing the most effective maintenance program for an aircraft system. RCM was initially structured by the airlines in the early 1970s as a broadly applicable new philosophy of maintenance, endorsed by the Air Transport Association (ATA), the Aerospace Manufacturers Association (AMA), and the Federal Aviation Administration (FAA). The concept has been referred to as MSG-2 and more recently, in a revised form, as MSG-3. MSG represents the Management Steering Group, an airline industry body which originally formulated the RCM concept.

RCM, as it is now structured within the Department of Defense (DoD), segregates maintenance actions into three distinct categories: (1) hardtime, or scheduled, maintenance actions; (2) maintenance actions based upon condition monitoring sensors or indicators; and (3) maintenance determined to be necessary "on-condition", i.e., as determined during a scheduled inspection or screening. Maintenance resulting from this third category is called "on-condition maintenance" (OCM).

Within the U.S. Army Aviation Systems Command (AVSCOM), the OCM concept is used as a management tool in selecting aircraft for depot maintenance and thereby making depot operations more cost effective. As a management tool, OCM provides scheduling flexibility not obtainable through other programs. This flexibility provides a readily adaptable program that can be tailored to the particular needs of the user. The most significant by-product of the program is the benefit derived by the individual fleet managers who can draw upon more current and timely information for making management decisions. Valuable data on the condition of the airframe are collected under OCM. Maintenance data are also recorded as repairs are performed on the items. These data provide an up-to-date and realistic assessment of depot repairs and the OCM program. They also help to identify the design deficiencies of items and lend themselves to the support of the Product Improvement Program (PIP), Engineering Change Proposals (ECP), and other corrective actions. All of these provide a basis for realistic projection of budget and depot resource requirements.

The ACE/AACE program was established as an OCM technique to provide a meaningful and inexpensive method for ranking the aircraft within the fleet as candidates for depot level maintenance. It involves a particular approach to OCM in which the state of an aircraft is deduced from a carefully designed profiling technique which can be effectively carried out by trained personnel.

Within the ACE/AACE program, the aircraft which need repair or reconditioning are identified using noninvasive techniques. The noninvasive visual condition inspection technique used in ACE involves an evaluation of the structural integrity of the aircraft in terms of certain thoughtfully selected parameters, called indicators. Typical indicators include the condition of the main lift beam, the nose fuselage skin, and the upper bulkhead, and the state of the corrosion protection. Weights are then assigned to each of the indicators using ranking and distribution techniques.

AACE, as a companion to ACE, provides a method of selecting aircraft as corrosion candidates for depot level repair. The basic aircraft structure is examined for corrosion defects together with an assessment of the external areas of components, both structural and dynamic, for deterioration caused by corrosion. AACE pertains principally to fuselage structural members that are replaceable at the depot, but also pertains to dynamic components and component structures.

ACE/AACE relies on other RCM data in the selection, development, and review of indicators. Further knowledge of the RCM process, then, is necessary for a full understanding of ACE/AACE.

Reliability-Centered Maintenance (RCM)

RCM is based on the premise that reliability is an inherent design characteristic to be realized and preserved during operational life. The philosophy asserts, furthermore, that efficient and cost-effective life-time maintenance and logistic support programs can be developed using a well disciplined decision logic which focuses on the consequences of failure. The resultant maintenance program provides the desired or specified levels of operational safety and reliability at the lowest possible overall cost.

The RCM analysis process uses a rigorously defined approach in analyzing reliability to highlight maintenance problem areas for consideration and for establishing the most effective preventive maintenance program for the system. RCM identifies specific preventive maintenance tasks and requirements for:

- Detecting and correcting incipient failures either before they occur or before they develop into major defects,
- Reducing the probability of failure,
- Detecting hidden failures that have occurred, and
- Increasing the cost effectiveness of the system's maintenance program.

As previously discussed, RCM, as it is now generally structured within DoD, segregates maintenance requirements into three categories:

- (1) On-Condition Maintenance (OCM) requirements - scheduled inspection or tests designed to measure deterioration of an item. Based on the deterioration of the item, either corrective maintenance is performed or the item remains in service.
- (2) Hard Time Maintenance requirements - scheduled removal at predetermined fixed intervals of age or usage.
- (3) Condition Monitoring requirements - unscheduled tests or inspections on components where failure can be tolerated during operation of the system or where impending failure can be detected through routine monitoring during normal operation.

RCM is based upon the following criteria:

- (1) Scheduled maintenance tasks should be performed on noncritical components only when performance of the scheduled tasks will reduce the life-cycle cost of ownership of the system/equipment.
- (2) Scheduled maintenance tasks should be performed on critical components only when such tasks will prevent a decrease in reliability and/or deterioration of safety to unacceptable levels or when the tasks will reduce the life-cycle cost of ownership of the system/equipment.

The RCM process is intended for application once the system's significant parameters (i.e. component failure modes, their effects, and criticality) have been identified. Traditionally, these parameters have been identified by conducting a failure mode, effects, and criticality analysis (FMECA) as part of design-related reliability engineering activities. The FMECA, by identifying the system and component failure modes, provides the basis for defining detailed preventive and/or corrective maintenance requirements to be applied during system operation.

It is also recognized that, while a maintenance program conceived during design and production suffers from a lack of hard field experience, the program must be

in place at the time of delivery of the first production systems to their users. To cope with this dilemma, it is necessary to upgrade an existing maintenance program to accommodate the net results of Army field data collection programs and operational experiences applicable to specific systems. One effective method for accomplishing this objective is to augment this process through the use of fault tree analysis (FTA). FTA can be used to apply actual field data to the improvement of an existing maintenance program and thus improve the RCM process.

Regardless of when it is applied, RCM derived maintenance programs make use of a logic process (using logic diagrams) to establish the set of maintenance activities. Presently, RCM logic diagrams, as used by the Army in general, are referenced for Army systems in two documents. The RCM logic diagram for fielded systems is given in DOA Pamphlet 750-40 and the logic diagram for application during the full scale development phase on new systems is given in AMC Pamphlet 750-16. Both diagrams are structured to lead (through the answering of several questions) to a decision identifying one of the three preventive maintenance activities.

AVSCOM's RCM process meets the provisions of AMC Pamphlet 750-16 and involves application of the following eight steps:

- Step 1: Determine Maintenance Significant Items
- Step 2: Acquire Failure/Repair Data
- Step 3: Develop FMECA/Fault Tree Analysis (FTA) Data
- Step 4: Apply Decision Logic to Catastrophic and Critical Failure Modes
- Step 5: Use FMECA/FTA Data to Help Answer Decision Logic Questions
- Step 6: Compile/Record Maintenance Classification
 - Hard Time
 - On-Condition
 - Condition Monitoring
- Step 7: Implement RCM Decisions
 - Depot Maintenance Work Requirements (DMWRs)
 - Phase Maintenance
 - Programmed Depot Maintenance (PDM)
 - Preshop Analysis (PSA)
 - Army Oil Analysis Program (AOAP)
- Step 8: Apply sustaining engineering based on actual experience data, eliminate default decisions, provide audit trail and assessment.

AVSCOM has structured a new RCM decision logic, based on MSG-3, and a companion FTA-based safety analysis model specifically for Army aircraft. To implement the RCM process based on this new decision logic and safety analysis model, AVSCOM uses the "Automated Army Aircraft RCM," (A³RCM) computer software package. A³RCM provides the capability to rapidly develop a uniform and complete RCM-based maintenance program from standard, readily available input sources. It provides a maintenance history for each aircraft where requirements are correlated to specific parts and their failure modes. It assures that all maintenance significant parts and failure modes are considered in the development of the maintenance requirements for an aircraft.¹

¹Further information on the new RCM decision logic and safety analysis model and the companion computer software package is available in two reports prepared by Reliability Technology Associates for AVSCOM: "Application of RCM to the T53-L-13B Engine," May 1984 and "Automated Army Aircraft RCM Analysis," September 1984.

2.0 INTRODUCTION TO ACE/AACE

As a part of the implementation of reliability-centered maintenance (RCM), the on-condition maintenance (OCM) concept is implemented within Army aviation by the use of profiling techniques for evaluating the condition of aircraft and for identifying items most in need of depot attention. These techniques, known as airframe condition evaluation (ACE) and aircraft analytical corrosion evaluation (AACE), are performed in accordance with the requirements of AVSCOM Regulation 750-7 and the 750-1 and 750-2 Pamphlet series published by the Depot Engineering and RCM Support Office. The overall ACE/AACE process is illustrated in Figure 2-1. The figure also identifies the location of the various concepts, by part and section, within the handbook.

ACE uses for its evaluation a representative list of indicators of structural condition selected for each aircraft type. Each indicator is further defined by condition codes which depict the condition of the indicator, i.e., no defect, cracked, buckled, etc. Results are recorded on special worksheets provided in the 750-1 Pamphlet series. ACE is performed annually on all first line/mission essential Army aircraft worldwide in accordance with AVSCOM Regulation 750-7.

AACE, a special corrosion structural examination, is a companion to the ACE program and is performed annually on each operational aircraft during ACE. It uses a representative list of indicators on corrosion only and has condition codes for degree of corrosion severity. One or two team members go with the ACE team, using separate worksheets (provided in the 750-2 Pamphlet series) analogous to the ACE worksheets. The AACE data, like ACE data, are submitted to the Depot Engineering and RCM Support Office.

The process of identification, selection, and review of indicators is a key element of the ACE/AACE process. Indicators are developed by ACE/AACE engineers who conduct a thorough analysis on the specific aircraft involved. As part of the selection process, four criteria are considered: aeronautical importance, depot capability, accelerated deterioration, and general deterioration. Those which have significant impact are identified as indicators for that particular aircraft. In order to avoid any extensive airframe disassembly or the use of cumbersome and overly complex equipment in the field as part of the ACE/AACE process, indicators selected are those through which structural integrity can be readily inferred. A corresponding list of condition codes is then developed for each indicator to denote the pertinent range of severity encountered. The number of indicators for different aircraft varies from 40-50 and the condition codes from 1 and 9. In each case, the two lists are continually reviewed and updated to reflect current field experience and changing depot capability.

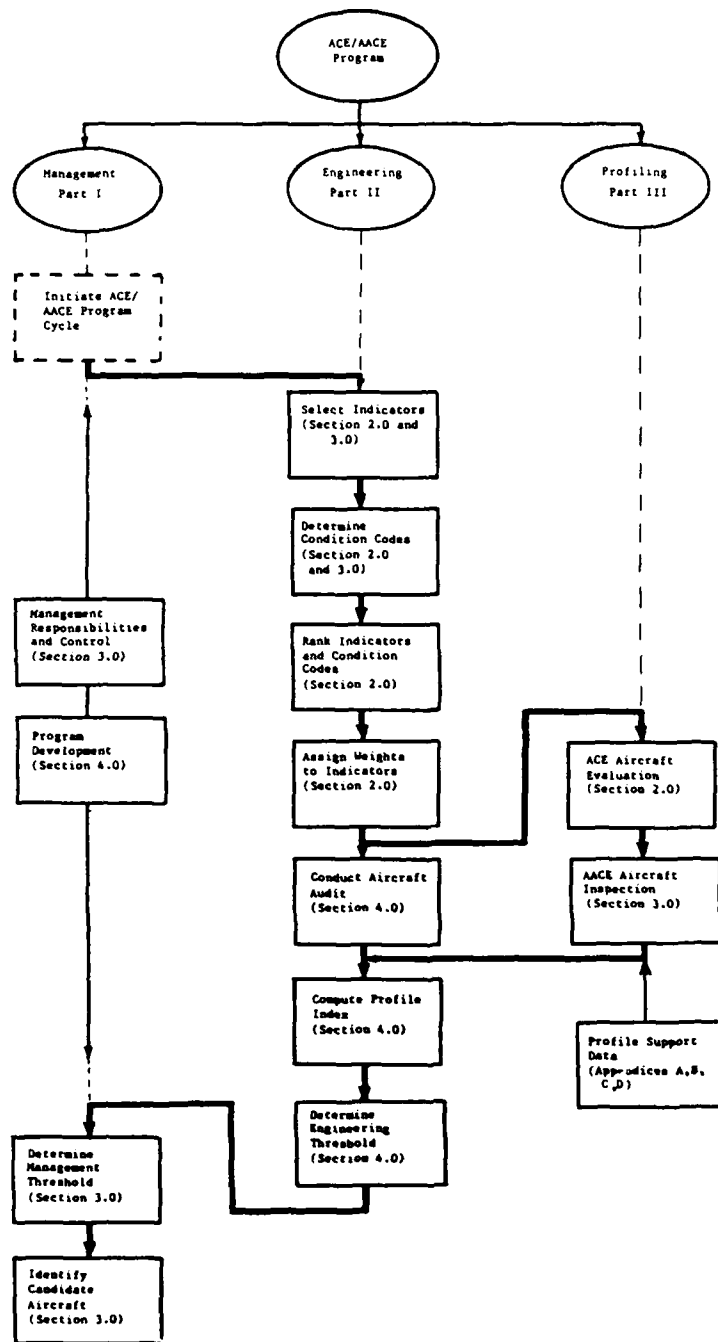


Figure 2-1 ACE/AACE Process

40-50 and the condition codes from 1 and 9. In each case, the two lists are continually reviewed and updated to reflect current field experience and changing depot capability.

Indicators are assigned weights in accordance with their degree of criticality. In assigning weights to indicators, the indicators are first ranked by their degree of criticality using the four criteria. The ranking is based on the safety and economic benefits to be derived if the reported symptom and, more importantly, its cause are eliminated by depot maintenance. Experienced personnel then use a subjective technique based on the Pareto distribution ($xy = A$) to establish a logical balance between the various ranked indicators in terms of their relative criticality (Figure 2-2). The weight distribution for the indicators is determined by using the ratios of areas under the truncated curve. By proper choice of the constant A , weighting of the indicators can be adjusted to achieve the curve balance desired. The choice of A is a management decision and is usually related to the desired weight percentage of the first designated number of indicators. Once the indicators, condition codes, and weights are established, the process is ready for implementation, starting with activities of the ACE/AACE team in the field.

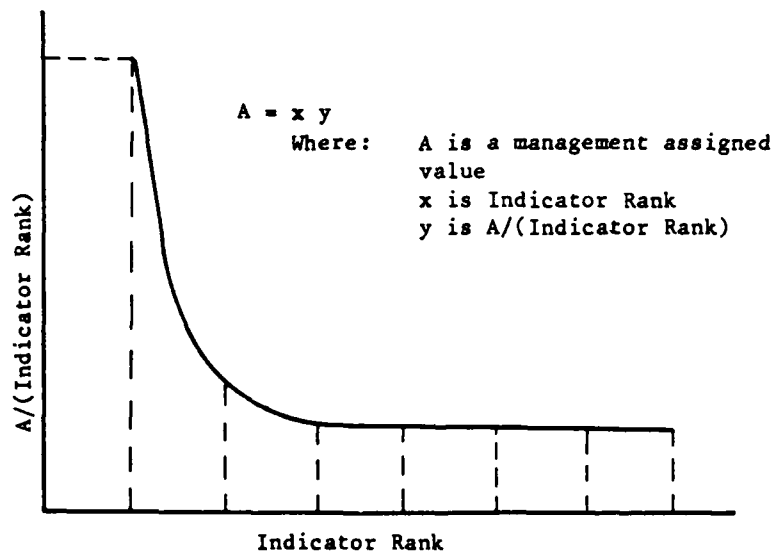


Figure 2-2 Pareto Distribution Curve

A trained ACE/AACE team conducts an annual evaluation of each aircraft's condition, using the established indicator and condition codes, and determines its profile in accordance with the applicable AVSCOM 750-1 and 750-2 Pamphlets. Each aircraft (designated by its tail number) is profiled by noting any faulty indicators in terms of their worst condition code (degree of severity). The team does not attempt to assign weights or make any other computation in the field. The ACE/AACE profiling does not require a complete technical inspection of the aircraft and, therefore, does not duplicate any other scheduled inspections required to be performed by the owning unit's regularly assigned personnel, nor can it be construed as such. However, any safety-of-flight discrepancies noted by the team are verbally brought to the attention of the owning unit, and responsibility for action rests there. The activities of the ACE/AACE team are limited to its specific defined function and do not constitute an evaluation of the field unit's maintenance capability or performance. The data collected by the ACE/AACE team creates a data base whereby better management decision and actions can be derived through engineering analysis.

After the field evaluation, the condition of each aircraft in the fleet is computed in terms of a numerical value known as the profile index (PI). The higher the profile index is, the worse is the condition of the aircraft. A PI distribution is then generated as shown in Figure 2-3 where aircraft population is plotted against PI value. This type of presentation provides a concise ranking profile of the entire fleet and permits the necessary management decisions to be approached in a straightforward manner. With the aircraft ranked by their need for repair, criteria for determining which aircraft are depot candidates are developed. The establishment of a threshold for the induction of aircraft into depot maintenance is a key area in the ACE program since it determines the operational acceptance level for the airframes of the active fleet. A threshold is expressed in terms of PI. Once an aircraft's PI reaches or exceeds its threshold, it becomes a candidate for depot repair. Various different evaluation criteria can be used to establish a threshold, such as safety, mission capability, availability for readiness, reliability, depot facility, or economic considerations. The threshold is a powerful discriminator. The condition of the entire fleet as well as the money spent on depot repair is affected by the threshold value. If management decisions change, then the threshold must be reevaluated.

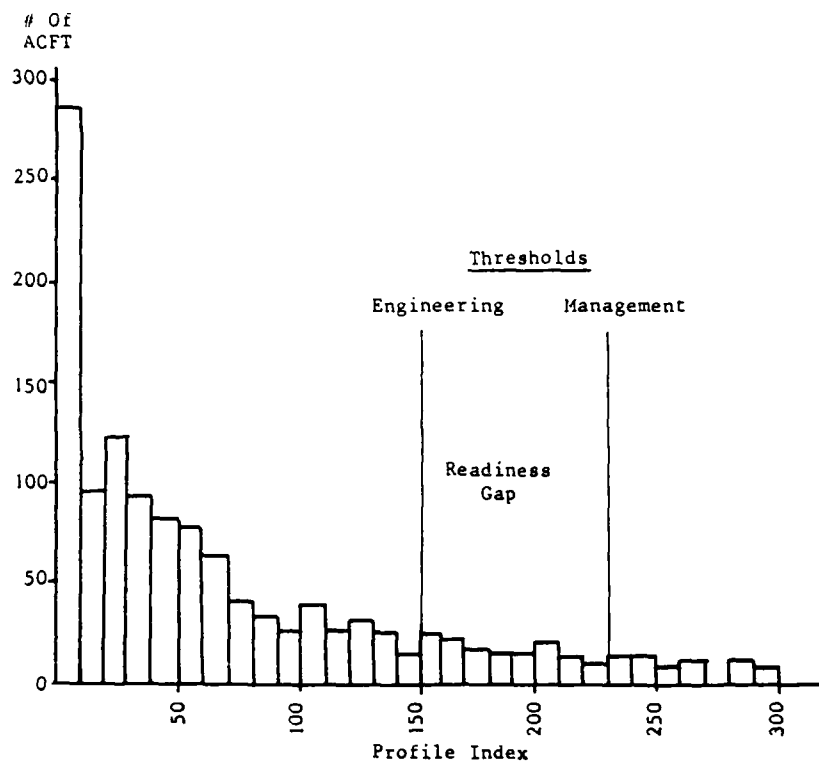


Figure 2-3 Profile Index Distribution and Thresholds

Once a threshold based on engineering considerations has been set, consequences are apparent. If, for example, it has been determined that all aircraft exhibiting a PI in excess of a given engineering threshold should be returned to the depot for safety and/or mission readiness considerations, all aircraft having that level of PI or greater are candidates. If, at the same time, funding limitations dictate that only some lesser number can be accommodated, it is possible to define another threshold, a management threshold, in terms of that decision, as shown in the figure. The range between the two thresholds defines a readiness gap, both in terms of the number of aircraft having questionable availability and in terms of the cost of addressing that deficiency.

Specific guidelines to aid in the planning and analysis of ACE/AACE indicators/conditions are given in Part II of this handbook; specific guidelines for evaluating, inspecting, and profiling aircraft condition are given in Part III.

3.0 MANAGING OCM/ACE/AACE

The Depot Induction Process

The Airframe Condition Evaluation (ACE)/Aircraft Analytical Corrosion Evaluation (AACE) program identifies aircraft candidates for depot repair. It provides a priority-of-need list, based on the condition of the aircraft, organized by aircraft type, tail number, geographic area, and command. The actual selection of aircraft for depot repair is made in the broader context of the Reliability-Centered Maintenance (RCM)/On-Condition Maintenance (OCM) program. It is made only after a complete review of all aircraft within a command. Only those aircraft whose PIs exceed a specified threshold are considered as OCM candidates. Requirements for the aircraft depot program are based on the quantity of aircraft with profiles over a specified threshold. Actual requirements are established at the annual Worldwide Aviation Logistics Conference (WWALC). During the WWALC, depot programs are developed based on an acceptable mix of aircraft with PIs above the thresholds in each theatre/Army area. Within the constraints of funds and facilities available, depot repair and replacement schedules are arranged to minimize the effect on readiness posture, reduce transportation costs, and provide controlled input to depot facilities.

Under this system, individual commands are provided aircraft tail numbers for those aircraft in their area that are to be repaired at the depot. Based on mission requirements, the user command decides which aircraft will be returned first. The user command also decides when and where replacement aircraft are located. In most cases when a user command makes the request, a change in the repair schedule due to unprogrammed mission requirements can be accommodated. The entire program is designed to provide major commands with maximum control and flexibility in management of their aviation assets to meet the mission. Under this approach, the aircraft in the greatest need may not be the first to reach the depot but it will be in the group of aircraft identified and returned, as originally determined by funds and facilities available, in a given program cycle. This flexible approach is in keeping with the concept of "putting the maintenance dollar where it's needed most."

Planning of depot repair schedules takes place long before actual call-in and units caught short should look to a breakdown in their line of communication in an effort to solve the problem. On the other hand, an aircraft that has been identified as a candidate could remain in the field quite some time before being returned to depot. This is why commanders should insure that aircraft which have been identified as candidates continue to receive the same care and maintenance as all

aircraft in the unit. Even when an aircraft is identified for depot repair, it may be displaced and not be called in as programmed. Only when the unit has been officially notified through their command channels to prepare an aircraft should it be considered as scheduled for return. Units and major commands preparing an aircraft for return to the depot should also be aware that aircraft retrograded from a major command are returned to that command after they complete depot repair, when it is feasible and reduces costs and configuration problems.

Although no solid correlation has yet been made between the PI of a given aircraft and the ultimate cost of its overhaul, efforts are currently underway to establish such a relationship, at least in terms of which condition codes are the drivers. The correlation is essential in making important management decisions effecting both readiness and maintenance/logistics support budgets. Obviously, with limited budgets for depot repair, not all of the candidates presented by the ACE/AACE process can always be accommodated. The aircraft population represented by those which require overhaul in accordance with the ACE/AACE process but are not returned because of budget limitations constitute a very real "readiness gap" from the perspective of the operational command. To the extent that meaningful cost correlation data is available, the readiness gap aircraft and their associated PI data also provide a basis for establishing or adjusting depot budgets in rational, operationally oriented cost-benefit terms.

Management Responsibilities

AVSCOM Regulation 750-7 requires that structural evaluations be performed annually on first line/mission essential Army aircraft. The Regulation specifically states that:

"Necessary action will be taken to perform ACE/AACE for first line/mission essential Army aircraft worldwide. This action will require coordination with DARCOM (AMC) Logistics Assistance Officers (LAOs) located at major commands with the AVSCOM Senior Maintenance Specialist (on-site) concerning OCM briefings/ACE team operations. Tentative travel itineraries of ACE/AACE teams will be provided to applicable Army areas."

The Regulation prescribes procedures and responsibilities applicable to the following AVSCOM Directorates:

Engineering

- (1) Serves as the technical focal point providing the coordination monitoring and management technical control necessary to establish and maintain

the OCM concept for selecting aircraft to be returned for Programmed Depot Maintenance (PDM).

- (2) Provides staffing and technical training of permanent ACE/AACE personnel to schedule, monitor, and evaluate all OCM programs including contractual matters.
- (3) Conceptualizes, designs, develops, establishes and monitors computer programs used in determining aircraft candidates for input to PDM.
- (4) Designs, develops and validates the guides and indicators which establish the ACE/AACE requirements.
- (5) Performs all engineering analysis to determine profile indices and recommends PDM.
- (6) Provides statistical summaries to development activities Project Offices by Maintenance Data Systems (MDS) on failure rates at key locations for engineering analysis.
- (7) Establishes and submits budgetary requirements for support of the ACE/AACE program and furnishes Systems Management an information copy.

Maintenance

- (1) Receives and reviews data provided from ACE/AACE utilizing engineering thresholds for the selection of a tentative list of aircraft scheduled for PDM.
- (2) Furnishes copies of tentative aircraft listings by serial number to Materiel Management, Systems Management, Directorate of Procurement and Production, Engineering, and major Army Commands 90 days prior to scheduled input to PDM.
- (3) Assures coordination of all input schedule changes directed by DARCOM (AMC), with elements responsible for contents herein.
- (4) Receives and reviews the configuration status of the input aircraft and notifies the appropriate overhaul activity of the schedule and required

configuration and designation of the aircraft upon completion of overhaul.

- (5) Develops configuration status accounting of PDM candidates and provides configuration status to Materiel Management, Engineering, and Systems Management. Monitors configuration on all scheduled PDM aircraft, and updates configured base data accordingly.

Materiel Management

- (1) Responds to Maintenance request in regard to aircraft movement, accountability, and transportation funding (AR 700-120).
- (2) Provides advance notice of candidate selection and configuration record to major commands and confirms configuration of aircraft scheduled for PDM.
- (3) Receives confirmed configuration records from major commands and provides confirmed configuration to Maintenance and Engineering.
- (4) Provides Maintenance and Engineering with tentative destination and desired configuration of overhaul candidate.
- (5) Assures that major Army commands are provided detailed transfer instructions 30 days prior to scheduled induction date of aircraft into a depot maintenance facility.
- (6) Assures aircraft withdrawn from major commands for depot maintenance will be replaced by Repair Cycle Float Aircraft of the same configuration whenever possible.
- (7) Coordinates with Maintenance and Engineering on all data pertinent to OCM.

Procurement and Production

- (1) Performs duties of coordinator whenever contact with contractor is required.
- (2) Coordinates with Maintenance and Engineering on all data pertinent to OCM.

Systems Management

- (1) Reviews scheduled input of candidates from OCM.
- (2) Directs/approves reprogramming/scheduling action concerning Systems Management assigned aircraft.
- (3) Coordinates with Maintenance and Engineering on program slippages as applied to Systems Management assigned aircraft.

4.0 ORGANIZING FOR THE FUTURE

The concept of reliability-centered maintenance (RCM), and especially the use of on-condition maintenance (OCM) criteria, have gained wide acceptance within the Department of Defense (DoD) and the U.S. Army. Army aviation has led in the introduction of RCM/OCM and has been responsible for many of the innovations now being successfully implemented in the field. A standardized and mechanized RCM and airframe condition evaluation (ACE)/aircraft analytical corrosion evaluation (AACE) in its present form are among the more significant thrusts. These and certain other developments now underway together with the appropriate procedural changes which will naturally accompany the introduction of technologically based maintenance concepts will contribute greatly to the achievement of force readiness at minimum cost. While it is not the purpose of this section or within its purview to present the Army's plans, it is appropriate to suggest where the presently identifiable thrusts may carry Army aviation in the future and to indicate both the benefits to be derived and the steps necessary for implementation.

The following major thrusts are seen as the primary factors shaping the future of maintenance and logistic support within U.S. Army aviation:

- (1) Further improvement in RCM and standardization of the actual procedures within Army aviation and, ultimately, throughout the entire DoD maintenance and logistics support systems.
- (2) Full integration of the OCM/ACE/AACE process into the RCM system.
- (3) Full automation of the presently mechanized A³RCM system and its integration with the logistic support apparatus.
- (4) Unification of the present experience-based reliability and maintainability data bases to provide the necessary interfaces and compatibility for joint use, automatic updating, and quality control within a service-wide integrated RCM/logistic support system.
- (5) Continued development and implementation of formal RCM/OCM/ACE/AACE training programs, films, graphics, guidebooks, and handbooks to achieve and maintain maximum personnel effectiveness in both field and depot operations.

- (6) Development of formulae for cost-oriented threshold determination and indicator ranking to provide support in engineering decision making.
- (7) Development and implementation of an organizational focus of responsibility such that the dynamic system and corporate memory achieved through successful implementation of the other factors can be managed and supported for maximum effectiveness.

It should be anticipated that the continued organizational evolution of U.S. Army aviation acquisition and readiness organizations, especially those involved directly with maintenance and logistic support, will reflect the growing acceptance of the concepts dealt with in this handbook. The manner in which this evolution will occur, however, and the pace with which the changes will be implemented will depend to a great extent on the creativity and initiative of command and management personnel at all levels, but particularly of those most directly involved with the day-to-day activities described previously.

The management overview contained in this part of the handbook should be used to foster an appreciation of the importance of the RCM/OCM/ACE/AACE concepts, to familiarize command and management personnel with the overall maintenance program in the context of Army aviation, and to engender an aggressive attitude toward implementation and further development. The intent is to stimulate an awareness that full realization of the potential for improved, cost effective readiness in Army aviation inherent in these programs, requires the personal commitment and involvement of those who manage and command and whose needs, clearly enunciated, will be the catalyst for change.