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MIL-HDBK-1798 (USAF)
19 December 1997

SUPERSEDING
MIL-STD-1798 (USAF)
24 March 1993

DEPARTMENT OF DEFENSE HANDBOOK

MECHANICAL EQUIPMENT AND SUBSYSTEMS INTEGRITY PROGRAM

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DEPARTMENT OF DEFENSE
WASHINGTON, DC 20301

Mechanical Equipment and Subsystems Integrity Program

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FOREWORD

This standard sets forth programmatic tasks for the development, acquisition maintenance, modification, and operation of mechanical equipment and mechanical elements of airborne, support and training subsystems to assure operational soundness, dependability and affordability throughout the life cycle of Air Force Systems. The Mechanical Equipment and Subsystems Integrity Program, MECSIP, consists of a series of disciplined time phased actions, procedures, analyses, tests, etc., which when developed and applied in accordance with this standard will ensure more reliable, affordable,and supportable equipment and subsystems, thus contributing to the enhancement of total systems mission effectiveness and operational suitability.

CONTENTS

1. SCOPE

1.1 Purpose. The purpose of this standard is to describe the general process (program) to achieve and maintain the integrity of aerospace and ground mission mechanical systems, subsystems, and equipment. This standard allows for tailoring the process in a competitive environment to meet specific subsystem, equipment and/or system requirements. Mechanical Equipment and Subsystems Integrity Program (MECSIP) is implemented into the procurement through the Statement of Work (SOW). This standard should be tailored for each procurement in accordance with specific program strategy.

1.2 Use. This standard cannot be used for contractual purposes without being tailored with specific supplemental information pertinent to the equipment or subsystem being procured. After being tailored, the information in this standard is intended to be included in the Request for Proposal (RFP) and contract SOW as an appendix, annex, or incorporated by reference.

1.2.1 Structure. The supplemental information required is identified within the requirements of this standard.

1.2.2 Supplemental information Error! Bookmark not defined.. The attached appendix provides supplemental information and guidance to assist in the application and tailoring of this standard.

1.3 Program approach Error! Bookmark not defined.. MECSIP is an organized and disciplined engineering and management process to assure that the integrity (e.g., durability, safety, reliability, and supportability) of subsystems and equipment is achieved in development and maintenance throughout operational service. The process consists of phased tasks that focus on the following:

a. Application of a disciplined system engineering approach to design and development with emphasis on determining and understanding failure processes and consequences on operational performance.

b. Understanding total system operational and support needs and the development of subsystem and equipment requirements and characteristics to assure that these needs are met.

c. Emphasis on realistic integrity requirements, required operational service life, understanding of usage and environments (including maintenance and support) as the basis for design and qualification.

d. Early trade studies to evaluate operation and support factors together with cost, weight, and performance and to ensure compatibility between design solutions and support equipment needs and maintenance concept.

e. A disciplined design and development process scheduled to assure early evaluation of equipment response to design usage, material characteristics, manufacturing processes, and the establishment of operational limits (failure modes and service lives) in terms of design usage.

f. An integrated analysis and ground test program to evaluate design performance and integrity characteristics and to verify requirements.

g. Scheduling of tests and demonstrations to assure that test findings are incorporated into design in advance of major economic and/or production commitments.

h. Controls on manufacturing as required to ensure quality and integrity of hardware throughout production.

i. Development of force management requirements (including maintenance and inspection requirements) based on the results of the development process.

j. A program to measure actual usage and environment for the fielded equipment.

k. Investigation of the need to track usage on components and subsystems in service.

l. An Air Force program to accomplish force management.

1.4 Program overview. The effectiveness of any military force depends on the mission effectiveness and operational readiness of its weapons systems. A major factor which affects readiness and mission reliability is the integrity (including durability, safety, reliability, and supportability) of the various subsystems and equipment that comprise the total weapons system. To enhance the effectiveness of this equipment in meeting operational needs, the Air Force has adopted the "Integrity Process" as the key vehicle to economically develop, achieve, and maintain required performance for the various elements of the weapon system. The integrity process has been adopted from the highly successful Aircraft Structural Integrity Program (ASIP), first employed in the late l950's for structure. This process captures the generic features of ASIP building upon the evolution and experiences gained over the last three decades. Although originally conceived to address safety issues with primary structure, ASIP now addresses the economics and durability aspects of operating, maintaining, and supporting the air frame. It is this broader emphasis that has allowed ASIP to become a more effective and responsive approach. The integrity process has been developed for the following: ENSIP for engine structures, AVIP for avionics and electronics, SDIP for software development, and MECSIP for mechanical equipment and subsystems as described in this standard.The integrity process has been adopted from the highly successful aircraft Structural Integrity Program (ASIP), first employed in the late 1950s for structure.

Although a uniform approach has been used to derive ASIP, ENSIP, AVIP, SDIP, and MECSIP, each represents an intermediate tailoring step and each has peculiar features necessary to address the specific hardware and equipment. It is likely that in most situations additional tailoring will be required to further apply these approaches to specific procurements.

The MECSIP description in this standard is intended to illustrate the various tasks required to achieve specific performance and supportability requirements. Although the application most generally will be to a system, rather than individual components, MECSIP can and will be required to be tailorable for single hardware components. The process described herein may be tailored and applied to evaluate the capability of existing subsystems and equipment and off-the-shelf components.

The MECSIP process consists of a strategy, master plan, and statement of work (covering planning elements, information, analyses, tests, and force management tasks) which are needed to provide mechanical systems, subsystems, and equipment with the required integrity throughout the operational service life.

1.5 Applicability. This standard applies to all subsystems, equipment, components, and hardware whose primary function is mechanical in nature; examples include: mechanical, hydromechanical, electromechanical devices, pumps, valves, fittings, tubing, pressure vessels, controls, levers, etc. It is intended to be used for specific aerospace and ground mission subsystems including, but not limited to, hydraulic and pneumatic power systems, flight control systems and/or components, landing gears, wheels, brakes, steering systems, environmental control systems, fuel systems, crew escape systems, ground support, training and maintenance systems.

2. REFERENCED DOCUMENTS

2.1 Government documents

2.1.1 Standards. Unless otherwise specified, the following standards of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

Standards

Military

MIL-STD-882	System Safety Program Requirements
MIL-STD-1568	Materials and Processes for Corrosion Prevention and Control in Aerospace Weapons Systems
MIL-STD-1629	Procedures for performing a Failure Mode, Effects and Criticality Analysis Materials and Processes for Corrosion Prevention and Control in Aerospace Weapons Systems

(Copies of specifications, standards, handbooks, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

2.2 Order of precedence. In the event of a conflict between the text of this standard and the references cited herein, the text of this standard shall take precedence.

3. DEFINITIONS

Definitions applicable to this standard are as follow:

3.1 Integrity. The essential characteristics of systems and equipment that allow specified performance reliability and supportability to be achieved under specified operational conditions over a defined service lifetime.

3.2 Required operational service life. That operational life specified for the specific system, subsystem, or component usually in terms of service or operation time.

3.3 Required operational service period. A portion of the service time; a portion of the required operational service life.

3.4 Usage. The operational parameters critical to function, performance, and service life of the subsystem and equipment (e.g., missions, duty cycles, loading, environments, etc.).

3.5 Durability. The ability of the subsystem or component to resist deterioration, wear, cracking, corrosion, thermal degradation, etc., for a specified period of time.

3.6 Economic life. The operational service period during which it is judged to be more economically advantageous to repair than replace a component, based on an evaluation of data developed during full-scale development (e.g., tests).

3.7 Durability critical component. A component whose failure may result in a major economic impact on system or subsystem performance by requiring costly maintenance and/or part repair and replacement, which if not performed would significantly degrade performance and operational readiness. These components are not safety or mission critical.

3.8 Maintenance free operating period. That segment of the required operational service life during which no preventive maintenance is required to assure performance and operational readiness. The maintenance free operating period is determined using the results of the development testing and analyses conducted during full-scale development as part of the tailored MECSIP.

3.9 Durability noncritical component. A component whose failure would result in a minor economic impact on system or subsystem performance but would require maintenance and/or repair or replacement to assure continued performance. These components do not usually require special attention during production and could be maintained on either a corrective or preventive maintenance basis.

3.10 Other/expendable components. All components of a system, subsystem not classified as safety, mission, durability critical, or durability noncritical. The failure of these components could be handled during routine maintenance and would not impact mission, safety, or operational readiness.

3.11 Damage tolerance. The ability of critical equipment to resist failure or loss of function due to the presence of flaws, cracks, damage, etc., for a specified period of unimpaired service usage.

3.12 Mission critical component. A component whose failure would (a) prohibit the execution of a critical mission, (b) significantly reduce the operational mission capability, and/or (c) significantly increase the system vulnerability during a critical control mission.

3.13 Safety critical item. A component whose failure would cause loss of the air vehicle or injury to personnel or extensive damage to critical equipment or structure which could adversely affect safety of flight or personnel injury.

3.14 Inspection. Inspection is that visual review and evaluation of physical items, documentation, drawings, etc., for conformance with the requirements of the procurement and acquisition. This effort is usually performed by the contractor but may be performed by cognizant Air Force personnel where indicated in applicable contractual documents.

3.15 Analysis. That analytical effort accomplished to show that contractual requirements have been achieved. This effort may include solution of equations, performance of simulations, evaluation and interpretation of charts and reduced data, and comparisons of analytical predictions versus test data. The normal reduction of data generated during ground and flight tests is not included. This effort is usually performed by the contractor.

3.16 Demonstration. Demonstration is an engineering effort performed to show that contractual requirements have been met. Compliance or noncompliance is determined by observation only. Fit and function checks may be accomplished as demonstrations. This effort is usually performed by the contractor.

3.17 Test. Test is an empirical effort performed to show that contractual requirements have been met. Documented procedures, instrumentation, and known environmental conditions are normally applicable. Compliance or noncompliance is determined by observation, where practical, and

evaluation of collected data. Most ground and flight empirical efforts associated with this procurement and acquisition qualify as tests. This effort is usually performed by the contractor.

4. REQUIREMENTS

4.1 Mechanical Equipment and Subsystems Integrity Program (MECSIP). The overall MECSIP consists of program strategy master planning and a statement of work covering the basic elements, tasks, subtasks, analyses, tests, and force management actions required to achieve and maintain product integrity throughout the operational service life.

The MECSIP program shall be established and maintained in accordance with this standard and/or shall be tailored to satisfy specific program strategy. Application of MECSIP requires tailoring of the various tasks, subtasks, and elements contained herein. It is intended that a separate tailored MECSIP will be developed for each major subsystem or equipment acquisition and will be integrated into the top level systems acquisition plan. To be most effective, MECSIP should begin early in the acquisition cycle with the initial Task I elements described herein. Early implementation generally assures that system level requirements are appropriately translated into requirements for individual subsystem elements both airborne and ground support and training. Early implementation will also ensure that important concept and performance trade studies are influenced. Table I summarizes the various MECSIP tasks described in this standard

4.1.1 Tailoring approach. Early in the acquisition process, the Air Force will establish the requirement to scope, tailor, and implement MECSIP along with the other integrity approaches to the total system. This information will be provided with the instructions to the offeror (ITO) as part of the RFP package. In his response to the RFP, the contractor will define his application strategy and will set forth program objectives, schedules, milestones, delineation of tasking requirements for different subsystems and equipment, and other information concerning the tailoring and application of the requirements of this standard. Tailoring and application will be one of the MECSIP Task I elements as described in 4.2. The purpose for developing a program strategy and tailoring approach is to ensure that appropriate program management and planning attention is given to the implementation of MECSIP. Especially important is the need to ensure that subsystem, support, and training system technical requirements, and design criteria reflect overall systems needs, and that proper integration, plans, tasking, and scheduling are provided throughout the acquisition for these subsystems and equipment.

4.1.2 Implementing statement of work. The MECSIP procurement is normally accomplished through statement of work tasks. In accordance with procurement guidelines, a statement of work shall be developed covering the tailored tasks, subtasks, strategy, plans, and the effort to be accomplished.

TABLE I. Mechanical Equipment & Subsystems (MECSIP) Tasks.

TASK I	TASK II	TASK III	TASK IV	TASK V	TASK VI
PRELIMINARY PLANNING AND EVALUATION • Program Strategy • Trade Studies • Development & Refinement of Requirements • Preliminary Integrity Analysis	DESIGN INFORMATION • MECSIP Master Plan • Design Criteria • Design Service Life/Design Usage • Critical Parts Analyses & Class • M&P Selection/Characterization • Product Integrity Control Plan • Corrosion Prevention & Control	DESIGN ANALYSES AND DEVELOPMENT TESTS • Load Analyses • Design Stress Environment Spectra Dev • Performance & Functional Sizing Analysis • Thermal/Environment Analysis • Stress/Strength Analysis • Durability Analysis • Damage Tolerance Analysis • Vibration/Dynamics/Acoustics Analysis • Material Characterization Tests • Design Development Tests	COMPONENT DEV AND SYS FUNCTIONAL TESTS • Functional Tests • Strength Testing • Durability Testing • Vibration Dynamics/Acoustic Testing • Damage Tolerance Testing • Thermal & Environment Survey • Maintainability/Repairability Demo • Eval and Interpret of Test Results • Integrated Test Plan	INTEGRITY MANAGEMENT DATA PACKAGE • Final Analyses • Maintenance Planning and Task Development • Individual Systems Tracking	INTEGRITY MANAGEMENT • Operational Usage Survey • Maintenance Records Service Reporting • Individual Subsystem Maintenance Times

4.2 (Task I) Preliminary planning and evaluation. Task I is intended to be accomplished in advance of full-scale development (FSD) (e.g., during concept evaluation and/or demonstration/validation) to scope the tailoring, plan and develop strategy for applying MECSIP. For a major weapons system procurement, for example, tasks expected during this period would include:

4.2.1 Preliminary program strategy. A preliminary MECSIP program strategy shall be developed to set forth definitive objectives early in the acquisition. The MECSIP strategy will support and be one of the elements of the overall acquisition strategy for the system. Areas such as materials, processes, manufacturing, testing, facilities, manpower, funds, and schedules are all involved in developing this strategy. Technology improvements and advancements that must be available to achieve specific program objectives must be defined, quantified, scheduled, and evaluated for cost benefits. The strategy will become progressively more definitive as the acquisition strategy matures, and as it becomes possible to develop and weigh alternative approaches to satisfy mission and other system needs. Simply stated, the strategy should address the "what", "how", "when", and "with what" aspects of applying MECSIP to full acquisition and deployment of the subsystem and equipment.

4.2.2 Trade studies. As part of the early acquisition process, system engineering trade studies should be conducted for the subsystems, support, and training equipment as appropriate. The purpose of these trades is to examine alternative concepts and approaches which satisfy the system. When conducting these trades, it is necessary that proper consideration be given to supportability and maintainability along with technical performance.

4.2.3 Development and refinement of requirements. Part of the early acquisition process should be devoted to study and refine system level requirements as they evolve from the consideration of operational needs, supportability goals, etc. As part of this refinement process, subsystem and equipment requirements should be evaluated, particularly in conjunction with the early trade studies. The objective is to enter into full-scale development having optimized and balanced design requirements and prepared subsystem specifications (part 3 and 4) based on specific procurement instructions and Mil-Prime guidance.

4.2.4 Preliminary integrity analysis. As related to a specific procurement, the pre-FSD activity should attempt to predict or estimate the potential for candidate subsystem concepts to achieve performance and integrity goals. This involves understanding of physical concepts and failure modes and a limited data base for candidate materials, processes, and technologies. These analyses may be particularly important as they usually are required to support the early engineering trade studies. Preliminary analyses should include, but not be limited to, equipment sizing, estimates of service life potential (durability), failure modes analysis, and classification of critical components.

4.3 (Task II) Design information. Design information tasking encompasses those efforts required to apply the existing technical data base and operational criteria to the initial design, development, materials, processes, and production planning for each specific subsystem/equipment application. The objective is to ensure that appropriate criteria are applied to the design/development so that specific, operational, and support needs are met. Tasking is initiated as early as practical in the procurement. Several subtasks are iterated during the design development cycle and finalized later in the system life cycle. Information in Task II is developed by the contractor based on instructions provided by the procuring activity in the ITO and supported by the results of Task I.

4.3.1 MECSIP master plan. A master plan will be developed to define and document the details and approaches for accomplishing all tasks and subtasks of MECSIP. The plan will define and

detail overall strategy and the time phased scheduling and integration of the various tasks and subtasks for design, development, qualification, and force management of the integrity of the specific subsystem hardware. The plan shall include discussion of unique features of the program, exceptions and tailoring of this standard, a complete discussion of each proposed task, rationale for each task and subtask, and an approach to address and resolve all problems anticipated in the execution of the plan. The development of the schedule shall consider other program interfaces, impact of schedule delays (e.g., delay due to test failures), mechanisms for recovery, programming, and other potential problems areas.

The plan will include the time phased scheduling and integration of subsystem development tasks which support performance and integrity requirements of the tailored air vehicle or other specifications for the equipment being acquired. The plan is intended to highlight programmatic issues, schedules, functional tests, development and verification tests, test data, evaluation criteria, contractor/vendor tasks and milestones, etc. The plan shall identify approaches for all analyses and tests, including descriptions of proposed analysis and test methods, assumptions, data criteria, etc. The plan shall include the design criteria to be used, the basis for criteria selection, and the relationship of criteria to overall system requirements.

The MECSIP master plan shall be a living document and updated periodically throughout the acquisition. An initial version shall be submitted in the response to the RFP in accordance with specific instructions. While the specific content of the plan will not be contractual, the document will be a deliverable item and each submittal shall be subject to Air Force approval.

The MECSIP master plan should delineate the approach to include all elements of each specific subsystem application. It should address approaches to include subcontractor and vendor equipment in the overall application. The plan should contain the approach used to address government furnished equipment (GFE) and off-the-shelf (OTS) equipment which will be included in each subsystem. It shall be the responsibility of the contractor to address GFE and OTS equipment through an assessment approach utilizing the process described in this standard to ensure that requirements are satisfied and that maintenance requirements can be defined and included in the overall force management plan.

4.3.2 Design criteria. The contractor shall translate the system and subsystem requirements into specific design criteria to be used for material selection, equipment sizing, design and analysis, and test verification of the subsystem/equipment. The objective is to ensure that criteria which reflect planned usage of the subsystem are applied to the development process so that specific performance, operational, and maintenance/support requirements can be met. The task of developing design criteria begins as early as practical in the development cycle. Specific criteria shall be developed to support functional performance, durability, damage tolerance, strength, vibration/dynamic response, maintenance, integrity management, and other requirements as specified.

Final selected design criteria shall be included with the MECSIP master plan.

4.3.3 Design service life/design usage. Design criteria will be derived to reflect required operational service life and usage as contained in subsystem level requirements documents. These criteria may reflect findings of subsystem trade studies conducted early in the acquisition process (e.g., Task I). The operational service life requirements may be satisfied by a designed-in maintenance free operating period and scheduled preventive maintenance. In early trade studies, the contractor shall evaluate the impact of alternate maintenance free/scheduled maintenance operating period on cost, weight, and performance, while considering logistics and support requirements and the overall maintenance concept of the system. The result of these trade studies

will be used to define the design service life criteria for specific components as well as in-service maintenance required to achieve the Air Force specified total required operational service life. Establishing designed-in periodic scheduled preventive maintenance at intervals less than the specified required operational service life will be consistent with operational, logistics, and support requirements. The approach to defining/developing the design service life/design usage will be included with the MECSIP master plan and will be subject to Air Force approval.

4.3.4 Critical parts analysis and classification. As early as is practical, the contractor shall establish an approach to identify and classify critical hardware components for the specific subsystem. Critical parts must be identified for application of specific criteria (e.g., durability and damage tolerance), specific material, processing, manufacturing and quality controls, maintenance and tracking requirements, and any other appropriate special provisions dictated by the specific nature of the subsystem application and/or procurement. As a minimum, the following five categories shall be used. (See section 3 for specific definitions.)

a. Safety Critical

b. Mission Critical Components

c. Durability Critical Components

d. Durability Noncritical Components

e. Other/Expendable Components

This classification should be accomplished by conducting a failure modes effect and criticality evaluation for each specific subsystem. Criteria and analysis/evaluation procedures should be developed considering overall system and personnel safety, mission criticality, flying qualities, etc. The overall approach, analysis assumptions, and candidate component lists shall be provided for Air Force review as part of the MECSIP master plan. Critical part classification shall utilize, as appropriate, MIL-STD-1629, MIL-STD-882, and MIL-STD-1843 criteria and methods.

4.3.5 Materials and process selection and characterization. In the response to the RFP, the contractor shall identify the candidate materials and manufacturing processes to be used for each component of the specific subsystem, the rationale for the choice and the criteria to be used for final selection. After contract award and during the design activity, the contractor shall document the complete rationale, trade studies, and evaluation criteria used in the final selection. The rationale shall consider prior operational experiences and technical data.

An approach and plan shall be developed which describes the process and procedures to be used to characterize and select materials and processes for all elements of the subsystem. The approach/plan should contain subsystem equipment requirements, available data base(s) for proposed materials, additional testing requirements, and the rationale to be used for making final materials and process selections. The approach/plan should identify methods and criteria for vendor substantiation, testing requirements for materials and process characterization, etc. The contractor shall develop an approach to assure minimum properties and processes as required to support 4.3.6. The materials and process selection and characterization plan shall be included as part of the MECSIP master plan.

4.3.6 Product integrity control plan. The contractor shall define and implement special controls to assure the achievement of required integrity characteristics of critical parts throughout production and the assurance of continued integrity of these items throughout the life cycle. Candidates for

specialized controls are parts classified as safety, mission, and durability critical. Specialized controls may encompass materials, processes, manufacturing, quality, nondestructive inspection, corrosion prevention, etc. As a minimum, this approach and plan shall include:

a. The critical parts list and selection rationale (see 4.3.4).

b. Basic material properties, allowables, and process data used in the analyses and trade studies obtained from existing sources or as developed in accordance with 4.4.2.1 and 4.4.2.2.

c. Procedures for zoning drawings to identify critical parts and to incorporate any special provisions.

d. Nondestructive inspections to be performed or critical components to support damage tolerance requirements.

e. Acceptance/proof tests for individual components as required.

e. Material procurement specifications, process specifications to assure that critical parts will have required properties (e.g., strength, fracture toughness, fatigue).

f. Requirements for material/part traceability specifically for safety and mission critical components which receive processing and fabrication operations by contractors and vendors which could degrade overall integrity.

h. All vendor and supplier controls for these items.

i. Special nondestructive inspection (NDI) capability demonstration programs to be conducted in support of damage tolerance requirements (manufacturing and in-service capability).

Economic trade studies shall be conducted to ensure the effective development and implementation of this plan and to justify the approach(es) taken. The product integrity control plan shall be one of the primary data items submitted under MECSIP and shall be subject to Air Force approval.

4.3.7 Corrosion prevention and control. The contractor shall identify and define an approach to the development, evaluation, and incorporation of corrosion resistant materials, protective treatments, finishes, maintenance, etc., to ensure that the subsystem will operate satisfactorily without detrimental material degradation in the specified service environments. A plan to accomplish these tasks shall be prepared and incorporated in the MECSIP master plan. MIL-STD-1568 shall be used as guidance. Implementation of this plan shall be in accordance with the specific product integrity control plan (see 4.3.6).

4.4 (Task III) Design analyses and development tests. Analyses and development tests shall be performed to support the design activity and to verify that the specific performance, function, and integrity requirements have been met. These tasks should be conducted using methods which have been verified in prior programs or which will be verified during this specific development. All analysis approaches and methods and development test plans shall be described in the MECSIP master plan.

4.4.1 Analyses. Design analyses shall include, but not be limited to, the following:

4.4.1.1 Load analysis. These analyses are used to establish the magnitude and distribution of significant static, dynamic, and repeated loads which the subsystem equipment may encounter when operating within the envelope established by the specific subsystem requirements and detailed design criteria. This analysis consists of determining the effects of the systems' internal and external operating load sources as well as inertia effects imposed by accelerations, decelerations, angular velocities, external air loads, and gyroscopic moments resulting from operating the maneuvering aircraft or from ground operation, as appropriate. Where applicable, the analysis shall include the effects of temperature and subsystem installation (e.g., dynamic response and deformation of the airframe or support structure), maintenance, storage, and transportation. Repeated loads sources imposed by the airframe shall be included as applicable.

4.4.1.2 Design stress environmental spectra development. This analysis shall be used to develop the design stress/environment spectra for individual subsystem elements. The design stress/environment spectra shall characterize the repeated operating loads, pressures, thermal cycles, and chemicals (see 4.4.1.1) in sequential format which represents the primary functional duty cycle and usage of the equipment. The intent is to develop a spectra which characterizes the significant usage events which may affect primary failure modes (e.g., fatigue, cracking, stress, corrosion, cracking, wear, etc.). This spectra shall be used to assist in material selection, component sizing and verification of functional and integrity performance.

4.4.1.3 Performance and function sizing analyses. Analyses shall be conducted to support sizing and configuration development for the subsystem and specific components and in part to verify specific performance requirements.

4.4.1.4 Thermal/environmental analysis. These analyses shall be conducted to determine the steady state and transient thermal and chemical environment for individual elements of the subsystem. Input for this analysis shall be the environments contained in the requirements documentation. Thermal and chemical environments shall be used in development and verification analyses and tests (e.g., strength, durability, damage tolerance, vibration/dynamics, etc.).

4.4.1.5 Stress/strength analyses. These analyses shall be conducted to determine the stresses, deformations, and margins of safety resulting from the applications of design conditions, operating loads, temperatures, and environments. These analyses are required for verification of strength as specified in the contractual documents.

4.4.1.6 Durability analysis. These analyses shall be conducted to show that individual subsystem components will perform for the required operational usage and service life. Analyses shall be conducted early in the acquisition phase to support development of design concepts, material candidates, weight, cost, and performance trades to satisfy the durability criteria. Early analyses will enable identification of failure modes and sensitive areas, particularly those with potential for early cracking, wear, environmental degradation, or thermal distress. Allowable limits for critical failure modes, cracking, wear, and environmental degradation shall be defined as part of these analyses. Emphasis should be placed on early analysis in order to minimize occurrences of deficiencies later during development and Task IV. Material and process data required to support analysis methods development shall be generated in accordance with 4.4.2.1 and 4.4.2.2.

Durability analyses shall be used to predict the expected operational life available with and without scheduled maintenance, considering material variability, initial manufacturing quality, and functional limits for each critical failure mode. Analyses shall show that adverse cracking, wear, delamination, or other damage formation will not occur within the required operational service period when subjected to the required usage and environment. Individual component analysis results should be

used to show that the available economic life of the total subsystem is at least equal to the required operational service life as specified in the contractual documents.

4.4.1.7 Damage tolerance analysis. These analyses shall be conducted early in the acquisition to develop design concepts/material choices, and weight/performance/cost trade studies for identified components (e.g., safety critical and mission critical). Early analyses will enable identification of structurally sensitive areas which do not meet specific flaw or crack tolerance, redundancy, leak before break, or other damage tolerance characteristics so that design changes can be introduced early with minimum impact. Material property data required to support analysis shall be developed in accordance with 4.4.2.1 and 4.4.2.2. Analysis methods shall be verified by test. Damage tolerance analyses shall predict flaw tolerance margin, the safe operational life fail safety (including leak before break) or other features which have been incorporated to satisfy safety and damage tolerance criteria as specified in the contractual documents.

4.4.1.8 Vibration/dynamics/acoustic analyses. Dynamic analyses shall be conducted as required to establish component vibrational and acoustic mode shapes and frequencies and to satisfy specific criteria derived from requirements documentation. An analytical dynamic model of the subsystem and/or critical components shall be developed to identify critical system modes, potential forcing functions, and reasonance conditions.

4.4.2 Development tests. The amount and type of tests required to support the design and development will vary. These tests shall include, but not be limited to, the following:

4.4.2.1 Materials characterization tests. Material properties and characteristics data such as strength, fatigue, fracture toughness, crack growth rate, stress corrosion resistance, cracking and corrosion resistance, wear, and thermal stability are required to support the design and to meet specific integrity related and functional requirements. When otherwise not available, material properties shall be established by test. When required, test specimens shall be fabricated to include critical manufacturing processes (e.g., forming, joining, assembly techniques). The plan for this segment of testing shall identify vendor material characteristic test requirements in accordance with this standard to assure minimum required properties in finished parts throughout the production run.

Existing data obtained from literature sources or previous program experiences may be used; however, for critical component application (see 4.3.3) these properties shall be verified using specimens fabricated from actual parts as required.

Materials for critical subsystems and components (see 4.3.3) should be characterized to include the full range of design and operating conditions expected. Cyclic loading and time dependent properties should reflect the environmental and design usage defined in the contractual documents or as modified in this standard.

4.4.2.2 Design development tests. Tests shall be conducted during design development phase to support component and system sizing, material selection, design concept trades, analysis verification, material and structural allowables, and to obtain an early indication of compliance with specific performance. Examples of design development tests are tests of coupons, small elements, joints, fittings and sealing concepts, controls, linkages, operating mechanisms, and major components, such as pumps, reservoirs, actuators, and mechanical subassemblies.

The scope of development testing shall be established in response to the request for proposal and shall be included with the MECSIP master plan and shall include rationale for the tests, description of the test articles, test procedures, test load conditions, test duration, and criteria for interpreting test results.

4.5 (Task IV) Component development and systems functional tests. These tests are intended to evaluate and verify the subsystem integrity performance. Tests may be conducted on individual components, in simulated system installation environments or during flight or ground tests as appropriate. Testing requirements rationale, procedures, evaluation, and acceptance criteria shall be summarized in the MECSIP master plan. All testing shall be planned, scheduled, and conducted in accordance with the overall system test plan and specific requirements and milestones. Testing shall include, but not be limited to, the following:

4.5.1 Functional tests. Full-scale component/system ground (e.g., Iron Bird, simulator, etc.) and/or flight tests will be required to verify specific functional performance requirements for mechanical equipment. Examples of functional testing include: fluid flow performance, leakage, environmental suitability of seals, brake performance, steering performance, flight control performance, etc. These tests should be used to evaluate and to verify equipment integrity, where feasible and practical.

4.5.2 Strength testing. Testing of components, assemblies and/or full subsystems shall be performed to verify strength performance requirements. The strength testing program description shall include testing requirements, testing techniques, rationale, instrumentation, acceptance, and evaluation criteria. Thermal and other environmental effects shall be simulated along with load applications where these conditions impose significant effects on the component strength. Test results will be used to evaluate design margins and growth capability.

4.5.3 Durability testing. A test program shall be conducted to substantiate the overall durability of subsystem components. Durability testing consists of component, assembly and/or full subsystem tests subjected to repeated loads, thermal, and environmental conditions which represent design usage and design service life criteria.

Scheduling of tests (particularly for expensive and long lead development items) shall be such that an early indication of critical areas and failure modes (e.g., cracking, deterioration, leakage) can be achieved and the findings incorporated into final design prior to major economic production commitments. All durability verification testing shall be satisfactorily completed prior to the delivery of the first production system. Testing milestones shall be established as part of the overall system test planning.

The results of durability testing shall be the basis for any design modifications, special inspections and maintenance actions for critical components and installed subsystems.

Test duration requirements will vary depending on the specific application. Structural components are usually tested to at least two times the design service life (the economic life should be demonstrated to be at least one design service life.) Other test life factors may be used; however, the criteria for test compliance and interpretation of test findings should be as agreed upon with the procuring activity and included in the MECSIP master plan.

Test articles shall be selected so as to represent the production and/or operational configurations as close as is practical.

Test loadings and environments shall represent the significant elements of the design service usage spectrum. Truncation, simplification, and substantiation during development of the repeated loads and environment spectrum shall be substantiated by analysis and test to verify equivalency to the design usage spectrum.

4.5.4 Vibration/dynamics/acoustics testing. These tests are conducted to evaluate/verify the vibration, dynamics, and acoustic response characteristics of the critical subsystem components and/or the total subsystem installation and to satisfy specific functional and integrity requirements.

4.5.5 Damage tolerance testing. These tests are developed/conducted to verify the damage tolerance characteristics of critical subsystem components. These tests are used to establish damage tolerance margins, crack growth rates, critical crack lengths, residual strength, fail safety, leak before break or other characteristics as per the specific damage tolerance criteria. Where practical, testing shall be conducted on full-scale components and in conjunction with other tests (e.g., durability, strength, functional test components).

4.5.6 Thermal and environment survey. Temperatures, loads and other environmental factors shall be measured during the component development and subsystem functional test phase to compare with predicted values and to verify design criteria. Data obtained from these surveys will be used to adjust operational limits and maintenance actions as determined from analysis and tests. The information will also be retained as "lessons learned" to assist in developing criteria for future applications. The plan and approach for conducting this survey shall be included with the MECSIP master plan.

4.5.7 Maintainability/repairability demonstrations. The contractor shall conduct a program to develop and demonstrate repair and maintenance procedures. The demonstrations may be conducted in conjunction with development and/or full system tests as appropriate. Authorized repairs and repair limits shall be in accordance with maintenance and logistics requirements contained in the requirement documentation for the specific procurement. Testing will be conducted as required to validate the integrity of authorized repairs.

4.5.8 Evaluation and interpretation of test results. The contractor shall describe the procedures to be employed to evaluate, interpret and incorporate all test findings (e.g., cause, corrective actions, program implications, maintenance projections, and costs). This evaluation shall define corrective actions required to demonstrate that design requirements are met. Each problem (failure, cracking, yielding, wear, deterioration, leakage, etc.) that occurs during tests shall be evaluated. Inspections, disassembly, and destructive teardown evaluations shall be conducted.

4.5.9 Integrated test plan. All test requirements identified for the specific subsystem equipment shall be defined, scoped, and scheduled in an integrated test package. This includes tests associated with development Task III and full qualification tests conducted under Task IV, as well as any subsequent growth or margin testing scheduled to be completed. Vendor and supplier tests shall be included in this plan. In compiling the integrated test plan, the contractor shall seek the most economical balance of requirements, verification, and test articles. Since scheduling and milestones are critical to early development testing, this item shall be given highest priority in developing the integrated test package. For contractual purposes the integrated test plan shall be incorporated into the overall systems test plan. For informational purposes, the proposed test plan shall be incorporated into the MECSIP master plan.

4.6 (Task V) Integrity management data package

4.6.1 Final integrity analyses. Design analyses (Task III) for selected critical subsystems and components (e.g., safety, mission, and durability critical) shall be updated to account for significant differences between analyses and tests that are revealed during the development and full-scale tests and the thermal/environment/load survey. These updated analyses shall provide data on operational limits to be used in maintenance, inspection and repair times for critical components.

These analyses and evaluation of test results shall be utilized to develop maintenance and inspection planning. Analyses to be updated shall include, but not be limited to, the following:

a. Durability analysis

b. Strength analysis

c. Damage tolerance analysis

d. Loads

e. Stress/environmental and thermal

These final analyses shall be submitted in accordance with specific program guidance and shall be subject to Air Force approval.

4.6.2 Maintenance planning and task development. Required maintenance actions (e.g., component inspection, repair, or replacement requirements) shall be developed to assure the integrity and operability of the subsystem for the required operational service life. Initial maintenance action requirements and times shall be based on updated analyses and test data in accordance with 4.6.1. These actions and times will be modified as appropriate based on information and experience feedback from the field as to actual operation of the subsystem.

The required maintenance action times shall be based on design duty cycles and usage in accordance with specific design criteria and system requirements.

The initial maintenance plan shall be developed during FSD following completion of the design/development test and analysis phase and shall be submitted in accordance with specific program requirements. This plan shall require Air Force approval.

4.6.3 Individual systems tracking. In-service usage tracking of individual critical components may be required to support maintenance actions conducted on individually installed components. Requirements for tracking will be developed and shall consider economic and technical benefits as well as operational and support aspects for the total system and air vehicle. Trade studies shall be conducted to support these requirements. A program to serialize critical components shall be developed as required to assist in tracking. All elements identified as safety mission and durability critical are candidates for in-service tracking.

An individual systems tracking and serialization plan shall be developed and incorporated as part of force maintenance planning (4.6.2) and shall be subject to Air Force approval.

4.7 (Task VI) Integrity management. This task is the responsibility of the Air Force and will be performed by the appropriate commands utilizing the data package supplied by the contractor in Task V with the minimum amount of contractor assistance. The Air Force will define contractor responsibilities in Task VI which will be specified in the contract specifications.

4.7.1 Operational usage survey. The requirement to obtain operational usage data shall be evaluated based on technical need as developed through the application of MECSIP. A program and plan shall be developed by the Air Force to obtain operational usage data on specific subsystems and critical components. The plan will include requirements, usage types, data gathering, data evaluation, and amounts of data required. The requirements, approach, and plan shall be incorporated into the MECSIP master plan by the Air Force.

4.7.2 Maintenance records/service reporting. A program and plan shall be developed to report and maintain maintenance and service records and actions on individual subsystems. This data is required to support maintenance planning and task development and to document time compliance actions. AFLC and the appropriate Using Command will be responsible for maintaining records. The requirements, approach, and plan shall be incorporated into the MECSIP master plan by the Air Force.

4.7.3 Individual subsystems maintenance times. A program and plan shall be developed to define individual maintenance, inspection, and repair times for critical subsystems and components as described in this standard. With the specific maintenance plan and the individual subsystems maintenance time requirements available, the Air Force can schedule force maintenance actions on a selective basis that account for significant usage parameters and duty cycle events.

5. VERIFICATIONS

5.1 Mechanical Equipment and Subsystems Integrity Program (MECSIP). The development and establishment of the MECSIP program shall be verified by inspection and review of contractor submitted documentation by cognizant Air Force personnel.

5.1.1 Tailoring approach. Verification shall be by inspection.

5.1.2 Implementing statement of work. Verification shall be by inspection.

5.2 (Task I) Preliminary planning and evaluation

5.2.1 Preliminary program strategy. Verification shall be by inspection.

5.2.2 Trade studies. Verification shall be by inspection.

5.2.3 Development and refinement of requirements. Verification shall be by inspection.

5.2.4 Preliminary integrity analysis. Verification shall be by inspection.

5.3 (Task II) Design information. The verification of design information shall be by inspection and review of contractor submitted documentation for completeness by cognizant Air Force personnel.

5.3.1 MECSIP master plan. A report shall be prepared and submitted in accordance with specific guidance and instructions. Verification shall be by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel.

5.3.2 Design criteria. Design criteria shall be submitted with the MECSIP master plan.

5.3.3 Design service life/design usage. This information is provided by the procuring activity. Verification will be in conjunction with 5.3.2.

5.3.4 Critical parts analysis and classification. This task shall be verified by inspection and review for completeness and compliance with requirements of this standard and in association with 5.3.6 by cognizant Air Force personnel. Criteria and approaches shall be submitted with the MECSIP master plan (5.3.1).

5.3.5 Material and process selection and characterization. The approach developed by the contractor shall be submitted with the MECSIP master plan and shall be verified by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel in conjunction with 5.3.1.

5.3.6 Product integrity control plan. A report shall be prepared and submitted in accordance with specific guidance and program instructions. This plan shall be prepared by the contractor and shall be verified by inspection and review for completeness and compliance with requirements by cognizant Air Force personnel. This review shall be completed satisfactorily prior to approval by the Air Force.

5.3.7 Corrosion prevention and control. This approach shall be prepared by the contractor and submitted with the MECSIP master plan. It shall be verified by inspection and review for completeness and compliance with requirements by cognizant Air Force personnel in conjunction with 5.3.1.

5.4 (Task III) Design analysis and development tests. The verification shall be by inspection and review for completeness by cognizant Air Force personnel in conjunction with 5.3.1.

5.4.1 Analysis. When required, the analyses conducted by the contractor shall be verified by inspection and review for completeness and compliance with the requirements of this standard by the cognizant Air Force engineering personnel. When required by specific program instructions, this review shall be completed satisfactorily prior to approval of the analyses by the Air Force.

5.4.1.1 Loads analysis. (See 5.4.1)

5.4.1.2 Design stress/environmental spectra development. (See 5.4.1)

5.4.1.3 Performance and functional sizing analysis. (See 5.4.1)

5.4.1.4 Thermal/environment analysis. (See 5.4.1)

5.4.1.5 Stress/strength analysis. (See 5.4.1)

5.4.1.6 Durability analysis. (See 5.4.1)

5.4.1.7 Damage tolerance analysis. (See 5.4.1)

5.4.1.8 Vibration/dynamics/acoustics analysis. (See 5.4.1)

5.4.2 Development tests. The development test approach shall be prepared by the contractor and shall be verified by inspection and review for completeness and compliance with the requirements of this standard by cognizant Air Force personnel in accordance with 5.3.1. As required, the performance and results of the testing efforts accomplished by the contractor shall also be reviewed and inspected.

5.4.2.1 Materials characterization tests. (See 5.4.2)

5.4.2.2 Design development tests. (See 5.4.2)

5.5 (Task IV) Component development and system functional tests. The testing approach shall be prepared by the contractor and shall be verified by inspection and review for completeness

and compliance with the requirements of this standard by cognizant Air Force personnel in accordance with 5.3.1.

When required, the performance and results of the testing efforts accomplished by the contractor shall be reviewed and completed by the cognizant Air Force engineering personnel.

5.5.1 Functional tests. (See 5.5)

5.5.2 Strength testing. (See 5.5)

5.5.3 Durability testing. (See 5.5)

5.5.4 Vibration/dynamics/acoustics testing. (See 5.5)

5.5.5 Damage tolerance testing. (See 5.5)

5.5.6 Thermal and environmental survey. (See 5.5)

5.5.7 Maintainability/repairability demonstrations. (See 5.5)

5.5.8 Evaluation and interpretation of test results. (See 5.5)

5.5.9 Integrated test plan. The test plan shall be prepared by the contractor and shall be verified by inspection and review for completeness and compliance with the requirements of this standard by cognizant Air Force personnel in accordance with 5.3.1 and the specific systems test plan as appropriate.

5.6 (Task V) Integrity management data package

5.6.1 Final integrity analyses. A report shall be prepared by the contractor and shall be verified by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel. This review and inspection shall be completed satisfactorily prior to approval of the report by the Air Force.

5.6.2 Maintenance planning and task development. A report shall be developed and prepared by the contractor and shall be verified by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel. This review and inspection shall be satisfactorily completed prior to approval of the plan by the Air Force.

5.6.3 Individual system tracking. The approach shall be developed and prepared by the contractor and shall be verified by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel in accordance with 5.6.2.

5.7 (Task VI) Integrity management. Any plans developed by the contractor will be verified by inspection and review for completeness and compliance with requirements of this standard by cognizant Air Force personnel.

5.7.1 Operational usage survey. (See 5.7)

5.7.2 Maintenance records/service reporting. (See 5.7)

5.7.3 Individual systems maintenance time. (See 5.7)

6. NOTES

6.1 Intended use. Mechanical Equipment and Subsystems are essential elements of air and ground vehicles which provide power, control, and other contributory functions.

6.2 Data requirements. When this standard is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirement List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of the DoD FAR clause on data requirements (currently DoD FAR Supplement 52.227-7031) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this standard is cited in the following paragraphs.

Paragraph No.	Data Requirement Title	Applicable DID No.	Option

(Data item descriptions related to this standard, and identified in section 6 will be approved and listed as such in DoD 5000.19-L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.3 Subject term (key word) listing

Equipment, Air Vehicle
Equipment, Ground Vehicle
Integrity
Maintainability
Reliability
Subsystems
Systems, Mechanical

6.4 Responsible engineering office. The office responsible for development and technical maintenance of this standard is ASD/ENF, Wright-Patterson AFB OH 45433-6503, Autovon 785-5748, Commercial (513) 255-5748. Any information obtained relating to government contracts must be obtained through contracting offices.

Custodian:
Air Force - 11

Preparing activity:
Air Force - 11

Project No. GDRQ-F078

APPENDIX

MECSIP Supplemental Information

10. PURPOSE

This appendix provides supplemental information intended to be of assistance in the application and tailoring of this standard.

20. MECSIP RELATIONSHIP TO ACQUISITION

Table 2 provides a summary of the various MECSIP tasks in relation to system acquisition, deployment, and operation. This table indicates the specific phase during which each task is normally conducted. Those tasks normally conducted to verify specific performance requirements are so noted by reference to the applicable paragraph of the MECSIP companion document, AFGS-87249, Mechanical Equipment and Subsystems, Requirements for the Integrity of.

Data and information requirements are summarized in this table as they normally relate to the items listed in section 6.1 of the basic document.

TABLE II. MECSIP - Relationship to Acquisition

TASK	AFGS-87249 ref:	ACQUISITION PHASE				OPERATION/ DEPLOYMENT	DATA/ INFORMATION REQUIREMENTS
		CONCEPT/ EVAL	DEM/VAL	FULL SCALE DEV (FSD)	PRODUCTION		
I PRELIMINARY PLANNING AND EVALUATION (4.2)							
Preliminary Program Strategy (4.2.1)		X	X				
Trade Studies (4.2.2)		X	X				
Development and Refinement of Requirements (4.2.3)		X	X				
Preliminary Integrity Analysis (4.2.4)		X	X				
II DESIGN INFORMATION (4.3)							
MECSIP Master Plan (4.3.1)		X Optional	X Optional	X	X	X	CDRL Item (MP)
Design Criteria (4.3.2	3(A11)			X			W/(MP)
Design Service Life /	3.2			X			W/(MP)
Design Usage (4.3.3)	3.4 & 3.5			X			W/(MP)
Critical Parts Analysis and Classification	3.3			X			W/(MP)
Materials and Processes Selection and Characterization (4.3.5)				X	X		CDRL Item (PICP)
Product Integrity Control Plan (4.3.6)	3.4			X	X	X	W/(MP) W/(PICP)
Corrosion Prevention and Control							

TABLE II. MECSIP - Relationship to Acquisition (Cont'd)

TASK	AFGS-87249 ref:	ACQUISITION PHASE				OPERATION/ DEPLOYMENT	DATA/ INFORMATION REQUIREMENTS
		CONCEPT/ EVAL	DEM/VAL	FULL SCALE DEV (FSD)	PRODUCTION		
III DESIGN ANALYSES AND DEVELOPMENT TESTS (4.4)							
Load Analysis (4.4.1.1)				X			W/(MP)
Design Stress/Environment Spectra (4.4.1.2)				X			W/(MP)
Performance and Function Sizing Analyses (4.4.1.3)				X			W/(MP)
Thermal/Environmental Analysis (4.4.1.4)				X			W/(MP)
Stress/Strength Analyses (4.4.1.5)	3.6			X			W/(FIA) (FINAL)
Durability Analysis (4.4.1.6)	3.4			X			W/(FIA) (FINAL)
Damage Tolerance Analysis (4.4.1.7)	3.5			X			W/(FIA) (FINAL)
Vibration/Dynamics/Acoustic Analyses (4.4.1.8)	3.7			X			W/(FIA) (FINAL)
Materials Characterization Tests (4.4.2.1)				X			W/(MP)
Design Development Tests (4.4.2.2)				X			W/(MP)

TABLE II. MECSIP - Relationship to Acquisition (Cont'd)

TASK	AFGS-87249 ref:	ACQUISITION PHASE				OPERATION/ DEPLOYMENT	DATA/ INFORMATION REQUIREMENTS
		CONCEPT/ EVAL	DEM/VAL	FULL SCALE DEV (FSD)	PRODUCTION		
IV. COMPONENT DEVELOPMENT AND SYSTEMS FUNCTIONAL TESTS (4.5)							
Functional Test (4.5.1)				X			W/(MP)
Strength Testing (4.5.2)	3.6			X			W/(MP)
Durability Testing (4.5.3)	3.4			X			W/(MP)
Vibration/Dynamics/Acoustics Testing (4.5.4)	3.7			X			W/(MP)
Damage Tolerance Tests (4.5.5)	3.5			X			W/(MP)
Thermal and Environmental Survey (4.5.6)				X			W/(MP)
Maintainability/Repairability/ Demonstrations (4.5.7)	3.8			X			W/(MP)
Evaluation and Interpretation of Test Results (4.5.8)	3(A11)			X			W/(MP)
Integrated Test Plan (4.5.9)				X			Summarized W/(MP)
V INTEGRITY MANAGEMENT DATA PACKAGE (4.6)							
Final Integrity Analyses (4.6.1)				X			CDRL Item (FIA)
Maintenance Planning and Task Development (4.6.2)				X			CDRL Item (MPTD)
Individual Systems Tracking (4.6.3)				X			W/(MPTD)

TASK	AFGS-87249 ref:	ACQUISITION PHASE				OPERATION/ DEPLOYMENT	DATA/ INFORMATION REQUIREMENTS
		CONCEPT/EVAL	DEM/VAL	FULL SCALE DEV (FSD)	PRODUCTION		
VI. INTEGRITY MANAGEMENT (4.7) Operational Usage Survey (4.7.1) Maintenance Records/Service Reporting (4.7.2) Individual Subsystems Maintenance Times (4.7.3)						X* X* X* * Air Force Tasks	Approach W/(MP)

NOTES

* = Task Required to Support Verification of Specific Functional and/or Integrity Requirement

Spec Reference (3.4) = Reference Specification Number (Ref AFGS-87249)

30. DATA REQUIREMENTS. When this standard is used in an acquisition requiring the delivery of data in accordance with the contract requirements, the following Data Item Description should be considered.

DATA REQUIREMENTS SUMMARY

Paragraph	Data Requirements Title	DID or Format	Options
4.3.1	MECSIP Master Plan	DI-XXXX(A)	
4.3.6	Product Integrity Control Plan	DI-XXXX(C)	
4.6.1	Final Integrity Analysis	DI-XXXX(B)	
4.6.2	Maintenance Planning and Task Development	DI-XXXX(D)	

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached and mailed. In block 5, abe as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and being considered.

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INSTRUCTIONS

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2. The submitter of this form must complete blocks 4, 5, 6, and 7, and send to preparing activity.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-1798 (USAF)	2. DOCUMENT DATE (YYYYMMDD) 880620

3. DOCUMENT TITLE
MECHANICAL EQUIPMENT AND SUBSYSTEMS INTEGRITY PROGRAM

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON *(if applicable)*	**7.DATE SUBMITTED** (YYYYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *Include Area Code)* (1) Commercial (2) AUTOVON
c. ADDRESS *(Include Zip Code)*	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Standardization Program Office (DLSC-LM) 8725 John J. Kingman road, Suite 2533, Ft. Belvoir, VA 22060-2533 Telephone (703) 767-6888 AUTOVON 427-6888

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