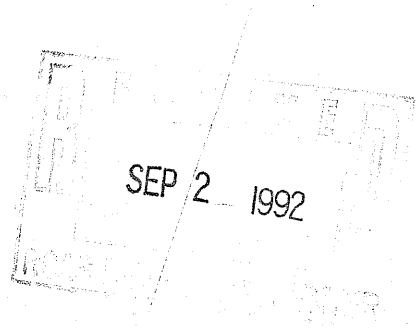
AR 70-62

Army Regulation 70–62 Cy 1

Research and Development

Airworthiness Qualification of US Army Aircraft Systems

This copy is a reprint of this publication



Headquarters
Department of the Army
Washington, DC
15 July 1978

SUMMARY of CHANGE

AR 70-62
Airworthiness Qualification of U.S. Army Aircraft Systems

This is a transitional reprint of this publication which places it in the new UPDATE format. Any previously published permanent numbered changes have been incorporated into the text.

Headquarters
Department of the Army
Washington, DC
15 July 1978

Army Regulation 70–62

Effective 15 September 1978

Research and Development

Airworthiness Qualification of US Army Aircraft Systems

This UPDATE issue is a reprint of the original form of this regulation that was published on 15 July 1978. Since that time, no changes have been issued to amend the original.

By Order of the Secretary of the Army:

BERNARD W. ROGERS
General, United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Brigadier General, United States Army
The Adjutant General

Summary. This regulation implements Army policy for airworthiness qualification of aircraft systems, subsystems, and allied equipment undergoing development and for major modifications to standard and nonstandard Army aircraft.

Applicability. See paragraph 2.

Supplementation. Local supplementation of this regulation is permitted, but is not required. If supplements are issued, Army staff agencies and major Army commands will furnish one copy of each to Commander, USAAVRADCOM (DRDAV–EQ), P.O. Box 209, St. Louis, MO 63166; other commands will furnish one copy of each to the next headquarters.

Suggested improvements. The proponent agency of this regulation is the US Army Materiel Development and Readiness Command. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to Commander, USAAVRADCOM, ATTN: DRDAV–EQ, P.O. Box 209, St. Louis, MO 63166.

Distribution. Active Army and USAR, B: To be distributed in accordance with DA Form 12–9A requirements for Research & Development. ARNG, B.

Contents (Listed by paragraph number)

Purpose • 1
Applicability • 2
Explanation of terms • 3
Policy • 4
Responsibilities • 5
Procedures • 6
References • 7

1. Purpose

This regulation prescribes the policies, responsibilities, and procedures for airworthiness qualification of aircraft systems and subsystems, including the installation of allied equipment for standard and nonstandard Army aircraft (for which the US Army Aviation Research and Development Command (USAAVRADCOM) has engineering cognizance) which are assigned, bailed, borrowed, loaned, or leased.

2. Applicability

This regulation applies to—

a. All Department of the Army activities involved in the development of aircraft systems, subsystems, or aircraft allied equipment.

b. All Active Army, National Guard, and Army Reserve activities that use, operate, or maintain Army aircraft when such activities propose to make a major modification to aircraft configuration.

3. Explanation of terms

a. Airworthiness. A demonstrated capability of an aircraft or aircraft subsystem or component to function satisfactorily when used within prescribed limits.

b. Aircraft system. A self-powered aerial vehicle, excluding ground effects machines, that may be flown by a human pilot.

c. Aircraft subsystem. Equipment that is installed as an integral part of an aircraft system, which, if inoperable or removed, will prevent the aircraft from flying or make it unsafe (e.g., helicopter tail rotor assembly).

d. Aircraft allied equipment. Equipment that is installed as an integral part of an aircraft system but is not required for flight (e.g., a weapon that is attached to an aircraft).

e. Aeronautical design standards (ADS). A complete collection of design standards covering the engineering of aircraft systems and subsystems design and performance. ADS provide an effective means for documenting current technology that is so essential in the evaluation for airworthiness qualification. This collection includes:

(1) Military and Federal civil agency specifications, standards, and handbooks;

(2) Industrial specifications and standards (e.g., those published by nationally recognized associates, committees, and technical societies), having coordinated status established under DOD policies and procedures;

(3) Company specifications and standards when such documents are acceptable for inclusion under the order of precedence established by MIL–STD–143;

(4) Design handbooks recognized by the engineering discipline;

(5) Published design criteria based on past experience; and

(6) Published test and evaluation procedures and criteria.

f. Operating limits. The full range of safe and reliable operating limitations for the aircraft system as determined by analysis, tests, and operating experiences. These limitations include those covering crew requirements and:

(1) Flight limits, such as airspeed; maneuvering; and environmental restrictions on altitude, temperature, and other weather conditions.

(2) Loading limits, including weight, center of gravity, fuel load, cargo, external store, and armament loadings.

(3) Propulsion system limits, such as propeller, rotor, and engine subsystem rotational speeds, start-up, shutdown, torque input, torque output, fuel grades, lubrication system temperature and pressure limits.

(4) Other subsystem limits such as electrical load limitations, and operating restrictions during degraded mode flight such as single boost or with automatic flight control system inoperative.

g. Airworthiness release. A technical document that provides interim operating instructions and limitations necessary for safe flight of an aircraft system, subsystem, or allied equipment. This release is—

(1) Based on the results of design analysis, engineering ground test, and/or flight test of an aircraft system, subsystem, or allied equipment; and

(2) Required prior to operation of a new aircraft system or a fielded aircraft system that has undergone a major modification (as defined in AR 705–24).

h. Interim statement of airworthiness qualification. A preliminary or provisional airworthiness release that is issued when an aircraft and/or its subsystems must be used before the normal test cycle is completed or when limited production of the item is started. The interim release is based on preliminary results of contractor and Government engineering tests. It lists all known or suspected conditions and limitations, provides precautions necessary for use of the aircraft and its subsystems or allied equipment, and is periodically updated as additional test data become available. The initial Operator's Manual is based on the limitations of this interim airworthiness release.

i. Statement of airworthiness qualification. A final airworthiness release that is issued in conjunction with the Airworthiness Qualification Substantiation Report. The statement is based on final results of engineering tests conducted on the aircraft and its subsystem or allied equipment. Issuance of this statement coincides with type classification Standard A, if applicable, and normally completes the airworthiness qualification program.

j. Airworthiness approval. Any technical document that provides operating instructions and limitations necessary for safe flight of an aircraft system, subsystem, or allied equipment. This document is issued by the agency (Federal Aviation Agency, National Aeronautics and Space Administration, US Air Force, or US Navy) exercising engineering cognizance over the aircraft system for which the airworthiness approval is granted. This approval is:

(1) Based on the results of design analysis, engineering ground test, and/or flight test of an aircraft system, subsystem, or allied equipment; and

(2) Required prior to operation of a new aircraft system or an aircraft system that has undergone major modification (as defined in AR 705–24).

4. Policy

a. Army aviators will not operate aircraft in the performance of official duties if there is no airworthiness release, interim statement of airworthiness qualification, statement of airworthiness qualification, or airworthiness approval.

b. Airworthiness qualification procedures will make maximum use of recognized sound technical and management techniques. ADS establish the criteria used in qualification of aircraft as set forth in this regulation. Techniques used generally will be—

(1) Engineering analysis.

(2) Formal inspections, design reviews, and safety assessments.

(3) Contractor development tests.

(4) Component qualification test (MIL–STD–810, MIL–E–8593, MIL–STD–454, MIL–E–5400, etc.).

(5) Formal contractor demonstrations.

(6) Government testing.

c. An airworthiness qualification specification for the total system will be published and made an integral part of the requirements document and its resulting contract. All qualification requirements for subsystems and components will also be included in this specification or be referenced in the specification.

d. Testing and/or analyses will be conducted to demonstrate or verify compliance with applicable ADS (military standards, specifications, and other appropriate design standards); demonstration addendum; and other technical characteristics cited in contracts. Airworthiness qualification testing will be integrated with contractor and other government testing. The Coordinated Test Program (CTP) will reflect the integration and results. Included, as applicable, will be:

(1) Allied equipment testing.

(2) Subsystems or component testing.

(3) Total systems testing, including flight tests and demonstrations.

(4) Analytical design substantiating reports.

e. Airworthiness qualification and technical safety data requirements (MIL–STD–882A) will be included in requests for proposals and invitations for bids. Appropriate data items will be obtained from the data listed in DOD List 5000.19–L. These data requirements will be made a part of the applicable contract.

f. Major modifications to the aircraft systems (AR 705–24) will subject the aircraft to requalification. Modifications which would measurably affect the airworthiness of an aircraft include—

(1) Those that could affect:

(a) Structural integrity.

(b) Propulsion or drive system operation.

(c) Aircraft performance.

(d) Aerodynamic characteristics, including drag.

(e) Control response and stability.

(f) Electromagnetic characteristics.

(g) Navigational system effectiveness.

(h) Flight control system authority and effectiveness.

(i) Weight and balance.

(2) Those that could restrict the flight crew in the performance of normal duties.

(3) Those that could increase the danger to the crew in the event of an accident.

(4) Incorporation of a source of energy which could be hazardous, such as explosive ordnance, explosive or flammable fluids, and laser energy.

(5) Those which could affect the operating limits and/or emergency procedures specified in the Operator's Manual.

g. An airworthiness release is required for major modifications of standard Army aircraft and nonstandard Army aircraft for which USAAVRADCOM has engineering cognizance. Issuance of an airworthiness release is based on a technical data review and/or inspection of the installed modification.

h. An airworthiness approval is required for major modifications of nonstandard Army aircraft for which USAAVRADCOM does not have engineering cognizance or has delegated responsibility (e.g., Federal Aviation Agency type certification of off-the-shelf aircraft). The airworthiness approval is required prior to first flight. Issuance of the airworthiness approval is based on the technical data requirements established by the agency that exercises engineering cognizance over the aircraft system.

i. All hazards identified in the System Safety Program will be addressed by the airworthiness qualification documentation. A safety statement that summarizes the safety data and documents the conditions under which unresolved hazards are acceptable will be included in the statements of airworthiness qualification and airworthiness release.

5. Responsibilities

a. Commanding General, US Army Materiel Development and Readiness Command (CG DARCOM). The CG DARCOM—

(1) Exercises staff supervision for airworthiness qualification within the Army.

(2) Ensures that product improvement programs (PIP) for aircraft systems and their major components include appropriate efforts for airworthiness qualification.

(3) Ensures that approved configurations of aircraft systems have been determined to be airworthy before issuing the item to the user.

b. Commanding General, US Army Aviation Research and Development Command (CG USAAVRADCOM). The CG USAAVRADCOM is the approving authority for the airworthiness of standard Army aircraft and nonstandard Army aircraft for which USAAVRADCOM has engineering cognizance. The CG USAAVRADCOM—

(1) Develops and implements a fully coordinated program for airworthiness qualification for aircraft systems, subsystems, and allied equipment.

(2) Reviews all planned Army aircraft development programs; off-the-shelf

procurements; and alterations to systems, subsystems, and allied equipment affecting airworthiness to establish requirements for airworthiness qualification.

(3) Identifies and coordinates appropriate test requirements with those agencies that will witness or confirm that the specified qualification requirements have been met.

(4) Grants engineering approval for individual documents which are needed for airworthiness qualification of aircraft systems, subsystems, and allied equipment.

(5) Issues the official notice of airworthiness release for Army tests or operations, statement of interim airworthiness qualification, and statement of airworthiness qualification, together with the applicable flight envelope and specific operating instructions. This notice includes—

(a) Approval of all qualification data published in technical manuals for the system; and

(b) Procedures, cautions, warnings, limitations, and performance data.

(6) Ensures that the maximum degree of safety is applied through the practical application of systems safety engineering.

(7) Establishes and maintains a single office for the execution of all airworthiness qualification actions.

(8) Provides a single point of contact between the Army and other agencies (Federal Aviation Administration, US Air Force, US Navy) performing qualification or certification tasks on Army aviation material.

c. Commanders of major subordinate commands and commanders of separate installations and activities reporting directly to Headquarters, DARCOM. These commanders will participate in, and furnish personnel for, airworthiness evaluations on aircraft systems, subsystems, or aircraft allied equipment under their cognizance.

d. Heads of appropriate Army activities, project managers, and product managers. The head of each appropriate Army activity, project manager, or product manager (aircraft or aircraft allied equipment) is responsible for funding for an airworthiness release or qualification and for ensuring that the airworthiness of the aircraft system has been determined.

e. Operational unit commanders. All commanders of operational units will insure that an airworthiness release is obtained before using any aircraft incorporating a major modification.

6. Procedures

a. Requests for airworthiness releases and/or interim or complete airworthiness qualification for standard Army aircraft and nonstandard Army aircraft for which USAAVRADCOM has engineering cognizance will be forwarded to the Commander, USAAVRADCOM, ATTN: DRDAV-EQ, P.O. Box 209, St. Louis, MO 63166.

b. Requests for airworthiness approval for major modifications installed on aircraft not under USAAVRADCOM engineering cognizance will be forwarded to the appropriate engineering cognizant agency (Federal Aviation Agency, National Aeronautics and Space Administration, US Air Force, or US Navy).

c. The design and performance criteria to be substantiated for airworthiness qualification will be established. These criteria will be included in the detail specification or system description, and the airworthiness qualification data and demonstration requirements will be included in an airworthiness qualification specification for the aircraft.

d. Design and test guidance pertaining to airworthiness qualification will be provided to contractors, as required, through procurement channels.

e. If the proposed air item is determined not to be airworthy, USAAVRADCOM will immediately inform the appropriate agencies, citing specific reasons for disapproval and providing recommendations for further action to make qualification possible. In the case of developmental aircraft, this notification will include HQDA (DAMA-WSA) WASH DC 20310. The Commanding General, DARCOM, will be kept abreast of sensitive areas between USAAVRADCOM and industry or commodity commands.

f. Following successful accomplishment of the airworthiness qualification program, an airworthiness qualification substantiation report will be published. This report will contain, but not be limited to, the following:

(1) The degree of compliance with the design and performance criteria of the detail specification or system description on a paragraph-by-paragraph basis.

(2) Consolidation of all significant airworthiness data accumulated during the testing conducted by the contractor and the qualifying agency.

(3) Documentation of all operating limitations, fatigue life of critical components, cautions, and warnings, together with technical justification.

g. Necessary procedures, placards, limitations, cautions, performance data, etc., obtained during the airworthiness qualification program will be published in technical manuals for applicable systems.

h. To preclude duplication of effort, an adequate file will be maintained of each airworthiness qualification completed. Copies of pertinent documents also will be furnished the cognizant engineering project office within USAAVRADCOM, the project manager, if required, and the Defense Documentation Center.

7. References

a. AR 70–10

b. AR 71–1

c. AR 385–16

d. AR 705–24

e. DOD List 5000.19–L

* U.S. G.P.O.:1991-283-096:40021

PIN 014856–000