U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Primary Category Aircraft
Date: 6/14/94
Initiated by: AIR-110
AC No: 21-37
Change:

1. Purpose. This advisory circular (AC) provides guidance for complying with Part 21 of Subchapter C, Chapter 1, Title 14 of the Code of Federal Regulations (CFR), which contains the certification procedures for products and parts. It explains an acceptable means, but not the only means, of ensuring compliance with the Federal Aviation Regulations (FAR) part 21 § 21.24, Issuance of Type Certificate: Primary Category Aircraft. While these guidelines are not mandatory, they are derived from extensive Federal Aviation Administration (FAA) and industry experience in determining compliance with the pertinent regulations. This AC does not change, create any additional, authorize changes in, or permit deviations from, regulatory requirements. This AC provides guidance for complying with the regulations that have been modified to include requirements unique to primary category aircraft. It discusses type, production, and airworthiness certification. It also discusses the associated maintenance procedures and operating limitations. This AC does not discuss other general certification requirements that are common to aircraft that also apply to primary category aircraft. Their absence from this AC may not be construed to imply that these other requirements are not applicable to primary category aircraft.

2. Related Regulations and Documents.

a. FAR Part 21--Certification procedures for products and parts.

b. FAR Part 23--Airworthiness standards: normal, utility, acrobatic, and commuter category airplanes.

c. FAR Part 27--Airworthiness standards: normal category rotorcraft.

d. FAR Part 31--Airworthiness standards: manned free balloons.

e. FAR Part 33--Airworthiness standards: aircraft engines.

f. FAR Part 35--Airworthiness standards: propellers.

g. FAR Part 36--Noise standards: aircraft type and airworthiness certification.

h. FAR Part 43--Maintenance, preventive maintenance, rebuilding, and alteration.

i. FAR Part 91--General operating and flight rules.

j. FAR Part 147--Aviation maintenance technician schools.

k. FAR Part 183--Representatives of the Administrator.

3. Background.

a. On March 7, 1989, the FAA issued a Notice of Proposed Rulemaking (NPRM), Notice No. 89-7 (54 FR 9738), proposing the adoption of a new category of aircraft to be known as primary category aircraft, which would be of simple design and intended for pleasure and personal use only. As described in the notice, primary category aircraft (airplanes, gliders, rotorcraft, manned free balloons, etc.) would be unpowered or powered by a single naturally aspirated engine having a certificated takeoff rating of 200 shaft horsepower or less, would have maximum weight of 2,500 pounds or less, and would have an unpressurized cabin. The notice proposed to permit pilot-owners of primary category aircraft to do certain maintenance procedures, including inspections, on their own aircraft after receiving the appropriate training. The notice also proposed to permit the conversion of aircraft that are within the primary category engine and weight limits from standard category to primary tegory. The notice proposed to allow the use of primary category aircraft for pilot training and to prohibit the use of all primary category aircraft for compensation or hire.

b. On August 1, 1991, the FAA issued a Supplemental Notice of Proposed Rulemaking (SNPRM), (56 FR 36972), to correct a statement in the original NPRM that indicated that part 36 noise requirements do not apply to primary category aircraft. The SNPRM explained that the FAA has no discretion in the application of noise requirements; part 36 applies to primary category aircraft.

c. On August 1, 1991, the FAA also published Notice No. 89-7A (56 FR 36976), reopening the comment period to address new information and proposals presented to the FAA. The reopening was based on a February 1990 meeting between representatives of the Experimental Aircraft Association (EAA), the Aircraft Owners and Pilots Association, and the FAA. Because of that meeting and subsequent EAA comments, the FAA reopened the comment period to solicit comments on several EAA-requested changes from the original March 1989 NPRM. Those proposed

changes were: changing the maximum weight criteria from 2,500 to 2,700 pounds; replacing the 200-horsepower engine limitation with a 61-knot stall speed limitation for airplanes and a 6-pound per square foot main rotor disc maximum load for rotorcraft; allowing the use of primary category aircraft for primary pilot training and for rental if the aircraft is maintained by an FAA-certificated mechanic or repair station; and allowing the use of primary category aircraft that are maintained by the pilot-owner, rather than an FAA-certificated mechanic or repair station, to provide limited checkouts for other primary category pilots.

d. The final rule, Amendments 21-70, 36-19, 43-34, 91-230, and 147-6 to FAR parts 21, 36, 43, 91, and 147, was published in the Federal Register on September 9, 1992 (57 FR 41360) and became effective on December 31, 1992.

4. Definition of Primary Category Aircraft. A primary category aircraft is of simple design and is intended exclusively for pleasure and personal use. A primary category aircraft (airplanes, gliders, rotorcraft, manned free balloons, etc.) may be unpowered or powered by a single, naturally aspirated engine, with a 61-knot or less stall speed limitation for airplanes and a 6-pound per square foot main rotor disc loading limitation for rotorcraft. A primary category aircraft may have a maximum certificated weight of no more than 2,700 pounds, a maximum seating capacity of four, and an unpressurized cabin. Although a primary category aircraft may be available for rental and flight instruction under certain conditions, the carrying of persons or property for hire is prohibited.

5. Optional Nature of Primary Category Aircraft. Primary category certification is optional. An applicant may certificate his or her aircraft design to these standards or may choose to use one of the other small aircraft procedures. An applicant's decision may be influenced by the design of the aircraft to be certificated, the individual financial status of the applicant, and the demand the applicant foresees for the particular aircraft being developed. An applicant will elect to use the primary category procedures only if it is in his or her economic interest to do so. Other available small aircraft certification procedures and standards are listed below:

a. Traditional certification standards; i.e., FAR part 23 for small airplanes and FAR part 27 for small rotorcraft.

b. AC 21.17-3, Type Certification of Very Light Airplanes under FAR 21.17(b).

c. AC 23-11, Type Certification of Very Light Airplanes with Powerplants and Propellers Certificated to parts 33 and 35 of the Federal Aviation Regulations.

6. Use of Designated Engineering Representative (DER). An applicant is encouraged to use the services of FAA DER's. A list of consultant DER's is available from every FAA aircraft certification office (ACO). An applicant also may nominate its own qualified engineers and flight test pilots for designation as company DER's. Further information and advice on the use of DER's may be obtained from the ACO.

a. A DER can participate in various phases of an engineering examination; approval of a type certificate, a change in type design project, or a supplemental type certificate (STC); and in data approval for major alterations and repairs. Approval of the data, as specified on FAA Form 8110-3, Statement of Compliance with the Federal Aviation Regulations, means that the DER has determined that the data complies with all pertinent FAA requirements.

b. Engineering data approved by a DER within the limits of the DER's authority is a means of finding compliance with previously approved FAA airworthiness requirements. These requirements can take many forms including, but not limited to, Federal Aviation Regulations, Special Federal Aviation Regulations, special conditions, technical standard orders (TSO), orders, and non-FAA requirements -- such as the joint aviation regulations for very light aircraft -- that have been adopted or accepted by the FAA as a certification basis for an aircraft or aircraft component.

7. § 21.17 Designation of Applicable Regulations.

a. The intent of FAR section 21.17(f)(1) is to provide a means whereby private industry can develop airworthiness design standards for primary category aircraft and submit them to the FAA for approval. As used here, private industry includes, but is not limited to, associations such as the EAA, consensus standards developing groups such as the Society of Automotive Engineers, manufacturers, aircraft designers and individuals.

b. Applicable airworthiness standards will be approved using a procedure similar to the FAA's TSO program. Primary category standards may be proposed to the FAA, either a local ACO or the appropriate aircraft certification directorate. The recipient FAA office reviews the standards and, if necessary, refers them to an appropriate standards development group. In addition, a notice advising the public of the existence of the proposed standards and their availability to anyone who would like to review and comment on them is placed in the Federal Register. After disposition of any comments and after all necessary evaluations and revision, the standards will be published by the appropriate Directorate, in a TSO format, as approved FAA airworthiness standards.

c. The Rotorcraft Directorate is the appropriate Directorate for primary category rotorcraft certification. The Small Airplane Directorate is the appropriate Directorate for all other primary category aircraft certification (airplanes, gliders, manned free balloons, etc.).

d. The FAA will approve proposed primary category airworthiness standards using the following procedures.

(1) An applicant submits to the nearest ACO a proposed set of standards.

(2) The ACO forwards the proposed standards to the appropriate Directorate by means of an issue paper for processing and publication in the Federal Register as a notice of availability and request for comments. As a minimum, the Directorate will allow a 30-day comment period. After the public comment period closes, the ACO disposes of all comments and revises the proposed airworthiness standards as necessary.

(3) Simultaneously with the Directorate review and public comment period, the ACO conducts its own review. The ACO also may forward the proposed standards to appropriate industry organizations for their review and comment. As an alternative to individual reviews, a team composed of representatives of the ACO, Directorate, and industry may conduct one joint review.

(4) After all reviews are completed and the comments are disposed of, the ACO prepares the final airworthiness standards, taking into account the comments and review findings.

(5) The final airworthiness standards are sent to the appropriate Directorate, which issues them as acceptable primary category airworthiness standards and publishes a notice of their availability in the Federal Register.

8. § 21.24 Issuance of TC: Primary Category Aircraft.

a. The certification basis for primary category aircraft is FAR § 21.17(f). Application for a TC must be made in accordance with § 21.15; however, the simplified certification procedures allowed in § 21.24 should result in less FAA involvement as compared to traditional certification procedures. The intent is to speed up and make less costly the type certification of primary category aircraft, with minimum FAA participation -- as discussed in paragraph b below -- in any individual type certification program. The responsibility to make findings regarding the issuance of type certification remains with the FAA.

b. An applicant for a TC may use airworthiness standards previously approved under § 21.17, or the applicant may propose

other airworthiness standards. If an applicant chooses to propose his or her own standards, the applicant can proceed in one of two ways. The applicant may submit its own standards under § 21.17 simultaneously with its application for a TC. Alternatively, the applicant may first propose and obtain approval of its standards prior to making application. Section 21.17(c), the 3-year limitation for a TC application, applies to primary category aircraft. When applying for a TC, the applicant will present its proposed TC program to the FAA, indicating when and where the applicant wants FAA involvement. In the spirit of the primary category concept, the ACO will minimize its participation and try to restrict its involvement to critical review and testing requirements (e.g., loads analysis, selected flight testing, or the reviewing of video tapes pertaining to structural/flight testing, etc.). At the preliminary certification board meeting, the ACO will inform the applicant as to the extent of the ACO's participation. The FAA retains the authority to issue the TC.

c. Section 21.24(b) requires the preventive maintenance program, which is allowed under FAR part 43, appendix A, paragraph c(30), to be a part of the TC or supplemental TC. An applicant who desires this privilege must submit a preventive maintenance program along with the other TC data. The Southwest Region Aircraft Evaluation Group (FTW-AEG), with engineering assistance from the Rotorcraft Directorate, ASW-100, will review and accept or reject primary category rotorcraft preventive maintenance programs. The Central Region Aircraft Evaluation Group (MKC-AEG), with engineering assistance from the Small Airplane Directorate, ACE-100, will review and accept or reject all other primary category aircraft preventive maintenance programs.

d. Any specific type certification data required by the ACO, including the preventive maintenance program data, must be submitted to the ACO to which the applicant has made application for a TC. All type certification data must be retained by the applicant and be available to the FAA on demand. If the applicant terminates operation while aircraft are still in service, it shall submit the complete TC data file to the FAA.

9. <u>§ 21.31 Type Design</u>. Section 21.31(d) includes the preventive maintenance program as part of the type design.

10. <u>§ 21.35 Flight Tests</u>. Flight tests must show that the aircraft complies with all applicable airworthiness requirements. In accordance with § 21.24(a)(2)(i) the applicant must submit a statement, in a form and manner acceptable to the Administrator, certifying that the applicant has conducted the necessary and appropriate flight tests that show that the aircraft, its components, and its equipment are reliable and function properly.

11. § 21.93 Classification of Changes in Type Design. For the purpose of complying with FAR part 36, Noise Standards: Aircraft Type and Airworthiness Certification, any voluntary change in the type design of a primary category aircraft that may increase the noise level of that aircraft is an "acoustical change." There are certain clearly defined exceptions which are listed in § 21.93(b)(3) for primary category airplanes and § 21.93(b)(4) for helicopters.

12. § 21.163 Privileges. A production certificate holder may conduct a training course for pilot-owners who want to perform the preventive maintenance program approved as part of the aircraft's type design under § 21.24(b). The course must be approved by the FAA, specifically the Flight Standards Service. The actual training must be accomplished by a person holding a mechanic certificate with an appropriate rating issued under FAR Part 65. The production holder may issue a certificate of competency to persons successfully completing the approved course. The certificate must specify the aircraft make and model to which the training applies.

13. § 21.165 Responsibility of Holder. Section 21.165(b) allows a production certificate holder to supervise and take responsibility for the assembly of any of its kits. The kit aircraft must be type certificated as a primary category aircraft. The assembly may take place at a location other than the holder's facility, provided that the holder can accomplish the necessary supervision. The assembler does not have to be employed by the holder; for example, the assembler may be an individual who purchased a kit from the holder. If these conditions are met, the aircraft may qualify for a special airworthiness certificate. However, the FAA emphasizes that to qualify for a special airworthiness certificate under § 21.184, the aircraft must have been assembled under the supervision and quality control of the production certificate holder.

14. § 21.175 Airworthiness Certificates: Classification. Section 21.175(b) includes primary category aircraft in the special airworthiness certificate classification.

15. § 21.181 Duration. In accordance with § 21.181(a)(1), a primary category aircraft special airworthiness certificate is effective as long as the maintenance, preventive maintenance, and alterations are performed in accordance with FAR parts 43 and 91 and the aircraft is registered in the United States.

16. § 21.182 Aircraft Identification. Section 21.182(b) is not applicable to kit-built aircraft that are built under the supervision and responsibility of the production holder. The aircraft must be identified as required by § 45.11 to be issued a special airworthiness certificate.

17. <u>§ 21.184 Issue of Special Airworthiness Certificate for Primary Category Aircraft</u>.

a. Section 21.184(a) allows an applicant to obtain a special airworthiness certificate-primary category when the applicable provisions of FAR part 21 are met. Primary category aircraft are not eligible for multiple category airworthiness certificates, as stated in paragraph 21.184(e). Organizational designated airworthiness representatives (ODAR) and designated manufacturing inspection representatives (DMIR) may issue airworthiness certificates for aircraft manufactured under their organization's production approval.

b. Section 21.184(b) allows an applicant to obtain a special airworthiness certificate-primary category for an imported aircraft type certificated under § 21.29, if the civil airworthiness authority of the country in which the aircraft was manufactured certifies, and the Administrator finds after inspection, that the aircraft meets the criteria of § 21.24(a)(1) and is in a condition for safe operation. Only an FAA inspector may issue airworthiness certificates under this rule.

c. Section 21.184(c) allows an applicant to exchange a standard airworthiness certificate for a special airworthiness certificate-primary category. The conversion will be made through the normal supplemental type certificate (STC) process. Only an FAA inspector may issue airworthiness certificates under this rule. The principal reason for making this conversion is to allow the pilot-owner to perform preventive maintenance beyond what already is allowed under part 43, appendix A. Prior to making the conversion, the applicant should consider the following:

(1) There must be an FAA-approved preventive maintenance program for the specific aircraft model being converted. If there is not an already approved program or if any additional preventive maintenance items are to be added, the applicant must submit the program or additional items as part of the STC design data to be approved by the FAA.

(2) Only a properly qualified pilot-owner may perform the additional preventive maintenance items listed in the preventive maintenance program. To be properly qualified, a pilot-owner must successfully complete an FAA-approved course given by either an FAA-approved aviation maintenance technician school, by the holder of the production certificate for the pilot-owner's aircraft, or by another entity approved by the Administrator.

(3) The FAA cautions that once an aircraft is converted to primary category, the same aircraft cannot be returned to the standard category without a showing that it meets all the

criteria for a standard airworthiness certificate as prescribed by § 21.183(d). Such showing historically has been difficult when an aircraft has remained in a different classification or category for a prolonged period. To facilitate the return to a standard airworthiness certificate, among other requirements, the aircraft records should indicate that the aircraft has been maintained according to the manufacturer's instructions and that any modifications to the aircraft were either removed or approved by the FAA.

18. § 21.187 Issue of Multiple Airworthiness Certification. In accordance with § 21.187(a), a primary category aircraft is not eligible for an airworthiness certificate in the restricted category. A primary category aircraft is eligible for a special airworthiness certificate-primary category under § 21.184 or an experimental certificate under § 21.191.

19. § 21. 191 Experimental Certificates. If a primary category aircraft kit is assembled without the benefit of the production certificate holder's supervision, the aircraft may qualify for an experimental certificate under paragraph 21.191(h). The purchaser or owner of the kit is neither required to assemble nor fabricate any specific portion of the kit; assistance for some or all of the work may be obtained from other sources, such as the production holder or some other fabricator. The kit, however, must have been manufactured by the holder of the production certificate for that kit.

20. FAR Part 36 - Noise Standards: Aircraft Type and Airworthiness Certification.

a. In the case of a primary category TC application:

(1) For an airplane that previously was not certificated under Appendix F of FAR part 36, that airplane must comply with Appendix G of FAR part 36.

(2) For a helicopter that previously was not certificated under Appendix H of FAR part 36, that helicopter must comply with appendix H or J of part 36.

b. In the case of a STC application for converting an existing type certificated aircraft to a primary category aircraft:

(1) An airplane does not have to show compliance with FAR part 36 if it previously has not been certificated under appendix F or G and has not undergone an acoustical change.

(2) A helicopter does not have to show compliance with FAR part 36 if it previously has not been certificated under appendix H and has not undergone an acoustical change.

(3) If the aircraft has been certificated under part 36, no further showing is necessary unless the STC involves an acoustical change (see § 21.93(b) for a definition of acoustical change).

c. A primary category aircraft with an existing type certificate that is undergoing an acoustical change (see § 21.93(b) for a definition of acoustical change) must comply with §36.9 in the case of an airplane or with §36.11 in the case of a helicopter.

21. FAR Part 43 - Maintenance, Preventive Maintenance, Rebuilding, and Alteration.

a. Primary category terms and their relationship to the preventive maintenance regulations of part 43, appendix A, paragraph (c)(30):

(1) Primary category aircraft: From a preventive maintenance perspective, an aircraft with a Special Airworthiness Certificate-Primary Category.

(2) Primary category preventive maintenance: A defined list of maintenance tasks identified on the type certificate data sheet (TCDS) or listed in the STC of a primary category aircraft. These tasks are in addition to the preventive maintenance list in appendix A of FAR 43 that may be performed by the holder of a pilot certificate issued under part 61. The additional maintenance tasks listed on the TCDS or STC may be performed by a pilot-owner who has been trained by and received a certificate of competency from an FAA-approved source to perform those items on a specific make, model, or similar type primary category aircraft (e.g., Cessna 120, 140, 150, 152, etc.).

(3) Pilot-owner: A person holding at least a private pilot certificate who is the registered owner/co-owner of the primary category aircraft, or in the case of a corporate-owned aircraft, one of the pilot-stockholders of the corporation.

(4) FAA-approved course: A structured course that will provide the pilot-owner with the general knowledge and manipulative skills to perform the additional tasks listed in the TC or STC as preventive maintenance for a specific make/model primary category aircraft. The course will consist of a minimum of 24 hours of instruction and be taught to Level 1, as defined in FAR part 147 for the applicable preventive maintenance items specified in FAR part 43, appendix A, and to Level 2 for the more complex items listed in the preventive maintenance program specified in the TCDS or STC.

Note: The Level 1 instruction requirement for FAR part 43, appendix A, preventive maintenance items is intended to create a measurable baseline of knowledge, skills, and abilities for the student and help to ensure that students have the basic knowledge and skills to perform the more complex preventive maintenance items specified in the TCDS or STC.

b. The performance rules of § 43.13 apply to each person performing this preventive maintenance. They will use the methods, techniques, and practices prescribed in the current manufacturer's manual and instructions for continued airworthiness, or other methods, techniques, and practices acceptable to the Administrator. The individual shall use the tools, equipment, and test apparatus necessary to ensure completion of the work in accordance with accepted industry practices. The work shall be done in such a manner that the aircraft worked on will be at least equal to its original or properly altered condition.

c. Each person who performs this preventive maintenance shall make an entry in the aircraft maintenance records containing the following information:

(1) The date of completion of the preventive maintenance work and aircraft total time-in-service.

(2) A description of the work performed and identified as preventive maintenance.

(3) The name, signature, certificate number, and kind of certificate held.

d. The following list of primary category aircraft preventive maintenance tasks may be added to a primary category aircraft TCDS or may be included in the STC that is used to exchange a standard airworthiness certificate for a special airworthiness certificate-primary category:

(1) Replacement of flexible air ducting.

(2) Replacement of static discharge wicks.

(3) Replacement of fuel quick-drain valves and filler cap gaskets and seals.

(4) Replacement of hour/hobbs meters.

(5) Replacement of wheel brake pads, discs, and drums.

(6) Removal/installation of fixed landing gear.

(7) Replacement of propellers.

(8) Perform cylinder compression check.

(9) Replacement of engine accessory drive belts.

(10) Replacement of tail wheel centering springs.

(11) Engine oil change.

(12) Replacement of navigation and communications radios where alterations to electrical circuitry are not involved.

(13) Removal of exhaust manifolds for gasket replacement as long as removal of other components is not required.

(14) Replacement of starters.

(15) Replacement of alternators.

(16) Replacement of generators.

(17) Replacement of vacuum pumps.

(18) Fabrication/replacement of 1/2-inch diameter or less hard lines, regardless of their use (i.e., fuel, electrical, hydraulic, vent, vacuum, etc.).

(19) Check control cable condition and tension (rigging or adjustment is not permissible).

(20) Windshield scratch removal.

(21) Sheet metal repair of aircraft skin damage of less than 2 inches.

(22) Any other items that the Administrator may find appropriate and applicable to the specific design and intended use of the aircraft.

22. FAR Part 91 - General Operating and Flight Rules.

a. Section 91.325 lists operating limitations unique to primary category aircraft. No person may operate a primary category aircraft carrying persons or property for compensation or hire. If maintained by an FAA-certificated mechanic or appropriately rated repair station, a primary category aircraft may be rented for personal use as well as rented for flight instruction.

b. Section 91.325(b) permits a person other than the pilot-owner to operate a primary category aircraft maintained by the pilot-owner as long as the pilot-owner is not compensated for use of the aircraft. For example, this allows a pilot-owner to lend the aircraft to a pilot friend or to demonstrate the aircraft to a prospective buyer. It also allows a pilot-owner whose certificate is not current to regain currency using a certificated flight instructor in the pilot-owner's self-maintained primary category aircraft.

c. The 12-month annual inspection required by § 91.409(a) is required for primary category aircraft that have been issued an airworthiness certificate under § 21.184. In addition, the 100-hour inspection required by § 91.409(b) is required if the aircraft is used for rental or flight instruction. Pilot-owners that do not also hold airframe and powerplant mechanic ratings and/or inspection authorizations are not authorized to perform the inspections.

23. FAR Part 147 - Aviation Maintenance Technician Schools. Aviation maintenance technician schools may conduct training programs for primary category preventive maintenance programs. Training programs must be specific to aircraft makes and models. The school submits its training program(s) for FAA approval to the local Flight Standards District Office, not to the ACO. The school also may issue certificates of competency to persons who successfully complete the training programs. A certificate of competency must specify the aircraft make and model to which the certificate applies.

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