**CHANGE**

**U.S. DEPARTMENT OF TRANSPORTATION**
FEDERAL AVIATION ADMINISTRATION

ORDER
8110.4C
CHG 6

National Policy

Effective Date:
03/06/2017

## SUBJ: Type Certification

**1. Purpose.** This change transmits revised pages to Order 8110.4C, *Type Certification*. This change is issued to remove outdated forms and the corresponding instructions for Type Certificates (TCs), Supplemental Type Certificates (STCs), Type Inspection Authorization (TIAs), and Type Inspection Reports (TIRs). All of these forms are now available at https://employees.faa.gov/tools_resources/forms. In addition, this change removes policy related to procedures for non-technical standard order (TSO) function data submitted with an application for TSO authorization (TSOA). This policy is now available in the FAA Order 8150.1, *Technical Standard Order Program*. This change also includes several revisions to policy and procedures throughout the whole order necessary to keep affected topics up to date.

**2. Who this change affects.** The Washington headquarters branch level of the Aircraft Certification Service; branch levels of the aircraft certification directorates; and all certification field offices.

**3. Effective Date.** The provisions of this change for this directive become effective on the date of signature.

**4. Where to Find This Order.** You can find this order at the MYFAA Employee website (https://employees.faa.gov/tools_resources/orders_notices) and at the Regulatory and Guidance Library (RGL) website (http://rgl.faa.gov).

**5. Disposition of Transmittal.** Retain this transmittal sheet until this directive is cancelled by a new directive.

Susan J. M. Cabler
Acting Manager, Design, Manufacturing, & Airworthiness
Division
Aircraft Certification Service

**PAGE CHANGE CONTROL CHART**

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| 150 | 03/15/2010 | 150 | 03/06/2017 |
| Appendix 1, pages A1-1 thru A1-3 | 03/28/2007 | Appendix 1, pages A1-1 and A1-2. | 03/06/2017 |
| Appendix 2, pages A2-1 thru A2-8 | 10/26/2005 | None | |
| Appendix 3 | 10/26/2005 | Appendix 3 | 03/06/2017 |
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| Appendix 12 | 03/24/2011 | None | |
| Appendix 13 | 12/20/2011 | Appendix 13 | 03/06/2017 |
| Appendix 16 | 03/15/2010 | None | |
| Directive Feedback Information | 12/10/2011 | Directive Feedback Information | 03/06/2017 |

## FOREWORD

This order sets procedures for evaluating and approving aircraft, engine, and propeller type design data and changes to approved type design data. It applies to Aircraft Certification Service personnel, Flight Standards Service personnel, Aircraft Evaluation Groups, and persons and organizations designated by the Administrator associated with the certification processes required by Title 14 of the Code of Federal Regulations part 21. Because it is impractical to cover all situations or conditions, supplement these instructions with good judgment to handle problems that may arise.

If you find any deficiencies, need clarification, or want to suggest improvements on this order, send a copy of FAA Form 1320-19, Directive Feedback Information (written or electronically), to the Aircraft Certification Service, Attention: Directives Management Officer at 9-AWA-AVS-AIR-DMO@faa.gov. Form 1320-19 is on the last page of this order. You may also send a copy to the Design, Manufacturing, & Airworthiness Division (AIR-100), Attention: Comments to Order 8110.4C. If you urgently need an interpretation, contact the Certification Procedures Branch, AIR-110 at (202) 267-1575. Always use Form 1320-19 to follow up each verbal conversation.

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### CHAPTER 1. GENERAL



### CHAPTER 2. TYPE CERTIFICATION PROCESS



### CHAPTER 3. TYPE CERTIFICATES

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§§ 21.135, 21.137, and 21.138.

**n. Project ACO (PACO)** – the ACO working a certification or validation project. The PACO may need to coordinate with the CMACO, if the project is a follow-up certification activity, such as an STC or PMA.

**o. Project Specific Certification Plan (PSCP) –** an integrated planning and project management tool combining the information from the applicant's certification plan, the FAA's CPP, and other information recommended in *The FAA and Industry Guide to Product Certification.*

**p. Provisional Type Certificate** – a time and operationally limited design approval that the FAA issues, upon request. Even though the FAA has not completed its findings of compliance to issue a TC, the FAA issues a provisional type certificate after the applicant has completed the necessary tests, analyses, and computations to show that the product complies with the applicable regulations. See 14 CFR part 21 subpart C.

**q. Significant Change** – as defined in Order 8110.48, *How to Establish the Certification Basis for Changed Aeronautical Products*, a change to the TC is significant to the extent it changes one or more of the following: general configuration, principles of construction, or the assumptions used for certification. The change is not extensive enough to be considered a substantial change. See Order 8110.48 for more information.

**r. Supplemental Type Certificate (STC)** – a TC that the FAA issues to an applicant who alters a product by introducing a major change in type design (as defined by § 21.93(a)). The STC process is essentially the same as the TC process; differences are discussed in chapter 4 below.

**(1) One-Only STC** – a special case of limiting the change to a specific serial numbered aircraft, the FAA does not require the STC data to be sufficient for accurate reproducibility.

**(2) Multiple STC** – any STC that is not "One-Only."

**(3) Approved Model List (AML) STC** – a special case of multiple STC using an AML to control installation eligibility, such that adding new make and model products does not require amendment of the STC.

**(4) Non-Interference STC** – a special case of STC approving a product modification that provides a convenience or function that is not required by the applicable operating rules or airworthiness standards applicable to the aircraft's intended operations.

**s. Type Certificate (TC)** – a design approval issued by the FAA when the applicant demonstrates that a product complies with the applicable regulations. As defined by § 21.41, the TC includes the type design, the operating limitations, the TCDS, the applicable regulations, and other conditions or limitations prescribed by the Administrator. The TC is the foundation for other FAA approvals, including production and airworthiness approvals.

**(2)** FAA Order 1270.1, *Freedom of Information Act Program. (FOIA)*

**(3)** FAA Order 1350.14, *Records Management*

**(4)** FAA Order 4040.26, *Aircraft Certification Service Flight Risk Management Program*

**(5)** FAA Order JO 7110.65, *Air Traffic Control*

**(6)** FAA Order 8000.79, *Use of Electronic Technology and Storage of Data*

**(7)** FAA Order 8000.95, *Designee Management Policy*

**(8)** FAA Order 8100.5, *Aircraft Certification Service – Mission, Vision, Organizational Structure and Functions*

**(9)** FAA Order 8100.8, *Designee Management Handbook*

**(10)** FAA Order 8100.11, *Requirements for Finding Undue Burden and No Undue Burden Under 14 CFR Part 21*

**(11)** FAA Order 8110.37, *Designated Engineering Representative (DER) Guidance Handbook*

**(12)** FAA Order 8110.42, *Parts Manufacturer Approval Procedures*

**(13)** FAA Order 8110.48, *How to Establish the Certification Basis for Changed Aeronautical Products*

**(14)** FAA Order 8110.49, *Software Approval Guidelines*

**(15)** FAA Order 8110.52, *Type Validation and Post-Type Validation Procedures*

**(16)** FAA Order 8110.54, *Instructions for Continued Airworthiness Responsibilities, Requirements, and Contents*

**(17)** FAA Order 8110.56, *Restricted Category Type Certification*

**(18)** FAA Order 8110.112, *Standardized Procedures for Usage of Issue Papers and Development of Equivalent Levels of Safety Memorandums*

**(19)** FAA Order 8110.115, *Certification Project Initiation and Certification Project Notification*

**(20)** FAA Order 8120.22, *Production Approval Procedures*

**(21)** FAA Order 8120.23, *Certificate Management of Production Approval Holders*
**(22)** FAA Order 8130.2, *Airworthiness Certification of Products and Articles*
**(23)** FAA Order 8150.1, *Technical Standard Order Program*
**(24)** FAA Order 8300.16, *Major Repair and Alteration Data Approval*
**(25)** FAA Order 8900.1, *Flight Standards Information Management System (FSIMS)*

**c. FAA Advisory Circulars (AC).**

**(1)** AC 20-135, *Powerplant Installation and Propulsion System Component Fire Protection Test Methods, Standards, and Criteria*
**(2)** AC 20-166, *Issue Paper Process*
**(3)** AC 21.17-1, *Type Certification – Airships*
**(4)** AC 21.17-2, *Type Certification-Fixed Wing Gliders (Sailplanes), Including Powered Gliders*
**(5)** AC 21.17-3, *Type Certification of Very Light Airplanes Under FAR 21.17(b)*
**(6)** AC 21-23, *Airworthiness Certification of Civil Aircraft, Engines, Propellers, and Related Products Imported into the United States*
**(7)** AC 21-24, *Extending a Production Certificate to a Facility Located in a Bilateral Airworthiness Agreement Country*
**(8)** AC 21-40, *Guide for Obtaining a Supplemental Type Certificate*
**(9)** AC 23-8, *Flight Test Guide for Certification of Part 23 Airplanes*
**(10)** AC 25-7, *Flight Test Guide for Certification of Transport Category Airplanes*
**(11)** AC 25-19, *Certification Maintenance Requirements*
**(12)** AC 25.571-1, *Damage Tolerance and Fatigue Evaluation of Structure*
**(13)** AC 27-1, *Certification of Normal Category Rotorcraft*
**(14)** AC 29-2, *Certification of Transport Category Rotorcraft*
**(15)** AC 33-2, *General Type Certification Guidelines for Turbine Engines*
**(16)** AC 36-4, *Noise Standards: Aircraft Type and Airworthiness Certification*
**(17)** AC 121-22, *Maintenance Review Boards, Maintenance Type Boards, and OEM/TCH Recommended Maintenance Procedures*

**d. National Aeronautics and Space Administration (NASA) documents.**

**(1)** Burk, Sanger M. Jr., *Summary of Design Considerations for Airplane Spin-Recovery Parachute Systems*; NASA TN D-6866, August 1972.

**(2)** Bradshaw, Charles F., *A Spin-Recovery System for Light General Aviation Airplanes*; NASA CP-2127, 14th Aerospace Mechanics Symposium, May 1980.

**(3)** Stough, Paul H. III, *A Summary of Spin-Recovery Parachute Experience on Light Airplanes*; AIAA Paper Number 90-1317, AIAA/SFTE/DGLR/SETP Fifth Biannual Flight Test Conference, May 1990.

**1-10. RECORDS MANAGEMENT.** For guidance on keeping or disposing of records, see FAA Orders 0000.1, FAA Standard Subject Classification System; and 1350.14, Records Management. Or, see your office Records Management Officer or Directives Management Officer.

(a) When submitting a TC application for design approval of a new model aircraft (e.g., airplane, glider, rotorcraft, balloon, or airship), aircraft engine, or propeller (see §§ 21.15 and 21.19), or for extensions of time according to § 21.17(d);

(b) When submitting an amended TC application for approval of a change in model designation, for adding new models before original issuance of the TC, and for approving a follow-on model after the initial issuance of the TC (see §§ 21.91 through 21.101) (the applicant must check Type Certificate in block 2, then, in block 4a, specify that the application is for an amendment and include the TC number; applicants may apply for any other amendments to the TC by a letter or other written notification);

(c) When submitting an application for a provisional TC (class I or II) or changes to a provisional TC (class I or II) that is desired before the standard TC is issued (see §§ 21.75, 21.81, and 21.83);

(d) When submitting an application for a provisional amendment to a TC for a follow-on model (see § 21.85); or

(e) When submitting an application for a change in category to a type certificated model.

**(2) PC Application.** Application for a PC is made on FAA Form 8110-12 (refer to http://www.faa.gov/forms). Application for a PC may be made at the same time application is made for a TC, an amended TC, STC, or an Amended STC. However, the applicant cannot get a PC before a TC or STC is issued. The applicant must submit the application, accompanied by a document describing the organization in accordance with § 21.135 and one copy of their Quality Control (QC) procedures showing compliance with §21.137, to the manager of the manufacturing inspection office (MIO) in the directorate in which the applicant's principal manufacturing facility is located (refer to Order 8120.22).

**b. The establishment of a TC Project.** The ACO assigns a project number, a project manager, and specialists as required. For the determination of directorate involvement, the accountable directorate assigns a project officer.

**(1) Project Number.** The ACO or ODA holder assigns a project number to each certification project. See Appendix A of Order 8110.115 for numbering system details for FAA assigned project numbers. You must use the assigned project number in all correspondence, reports, and other documents pertaining to the project. If the project is either cancelled or closed before completion, then the ACO must close or cancel the assigned project number within 90 days.

**(2) Assignments and Duties of the Project Manager.**

(a) The project manager is the assigned focal point in the ACO who plans, reviews, evaluates, and coordinates all aspects of a certification project according to the CPP. When the project is small, generally involving a single ACO engineer, the duties of project manager may be filled by that engineer. In this case, the engineer is called project engineer. For the purpose of this order, the term project manager includes project engineer. The applicant should be instructed to direct all project correspondence to the project manager at the ACO where the application was submitted. See paragraph 2-4e of this order for further details on CPP development.

minimal further development (see paragraph 5-5 of this order). Applicants should consider the conformity requirements elsewhere in this and other orders and present a plan that supports their showing of compliance for a TC and the FAA's finding of compliance for the TC and PC. While applicant involvement in the conformity plan is strongly encouraged (only the supporting data listed in paragraph 2-3d of this order are required), the FAA must retain the discretion to make the inspections necessary to determine compliance with the applicable 14 CFR requirements. Therefore, the FAA is responsible for the final content of the plan.

**(3) Using Parts Produced by Technical Standard Order (TSO) Authorization or PMA in Certification Testing.**

(a) Either of these approvals indicates that the production system has determined that the part produced conforms to a specifically defined FAA-approved design, and that any deviations from that approved design have been dispositioned and found to have no effect on form, fit, or function of the article. In accordance with § 21.601(b)(4), an article manufactured under a TSO authorization is an FAA-approved article. For parts produced under a Parts Manufacture Approval (PMA), the corresponding regulatory definition for the quality control system is § 21.307. Marking of the part in accordance with § 45.15 conveys the same indication that a part meets the FAA-approved design.

(b) Because of a part's approval by TSO or PMA, a part conformity may not be necessary for its use in a certification project. ACO engineering should consider whether the testing to be accomplished requires a test article definition more specific than the "form, fit, or function" of the part provided by the TSO or PMA. For example, the engineer may be concerned about a test article having features biased to one or the other end of a tolerance. If ACO engineering wants to ensure the part does not have a bias that may affect the outcome of the test, the engineer may ask the inspector to review any MRB action for deviations to the test article referencing the characteristic the engineer identifies. Indicate this in the "Special Instructions" section of the Request for Conformity Inspection. For the purpose of this order, a deviation is a non-conformance that is found and accepted by means of ACO engineering evaluation or MRB action.

(c) ACO engineering may determine that an installation inspection is adequate for its needs. The installation conformity inspection, which follows the ACO review of the substantiating data, is performed to verify the installation was accomplished in accordance with the approved data, with all or any discrepancies noted, before official FAA testing. It is during the installation conformity inspection that the article's TSO number, part number, serial number, software part number or version, and so forth, as referenced in the installation data, are verified and recorded.

**d. Completed [Project Specific] Certification Plan.** By this point in the project, the details of the applicant's plan for showing compliance, including the remaining elements outlined in paragraph 2-3d above should be captured in the certification plan or PSCP. From this information, the certification team should be able to determine that, if the plan was successfully executed, its results would show compliance. The amount of detail necessary to avoid ambiguity will vary from finding to finding, but, in general, it decreases when the applicant chooses common means of compliance such as those described in ACs. The certification team should find the plan agreeable before processing conformity requests, approving test plans, witnessing or observing certification tests, or performing any other certification project activities, to ensure the certification team and the applicant are working with the same fundamental understanding of the certification data.

**i. Applicant's Flight Tests.** To comply with § 21.35(a)(4), the applicant conducts flight tests and inspections before the TIA for research and development. The research and development flight test results are not part of the type certification process. The applicant's flight tests, conducted to satisfy § 21.35(a)(4), are not explicitly part of the FAA's flight test program, unless the FAA agrees to conduct concurrent testing with the applicant and issues a TIA for the test. Official FAA flight testing begins only after the FAA issues a TIA. However, the applicant conducts the tests and inspections to demonstrate that the test article to be submitted for FAA certification ground and flight tests meets the minimum requirements for quality, conforms to the design data, and is safe for the planned tests. The applicant will report the data generated in these tests to the FAA for review of its acceptability. Since the validity of flight test data generated with test articles that don't represent the type design is indeterminable, ensure the applicant understands the importance of controlling the configuration and recording the conformity of the test article for each flight.

**FIGURE 2-11. IMPLEMENTATION PHASE – COMPLIANCE SUBSTANTIATION ACTIVITIES**



**j. Compliance Substantiation – General.**

**(1) Applicant Flight Test Data and Report.** Paragraph 2-6l below discusses the certification process involving tests and inspections. This process needs to be successfully accomplished by the applicant before presentation to the FAA. Title §§ 21.33 and 21.35 provide criteria for making that determination. The compliance substantiation data generated during these tests are reported to the FAA in the applicant's flight test report. In the event the FAA agrees to conduct testing concurrently with the applicant, it is understood that the report will not contain compliance substantiation for those specific tests. All other tests are accomplished in the presence of the FAA, and applicants submit their data for approval as discussed in paragraph 2-6k, Data Submitted for Approval, and paragraph 2-6m, Compliance Reports. In either case, the applicant has the following responsibilities:

**(2) Applicant Responsibility.** Applicants are responsible for complying with the regulations that apply to the specific product or operation. They must:

(a) Submit the necessary type design and substantiating data to show that the product being certificated meets the applicable airworthiness, aircraft noise, and emissions requirements of the regulations, and any special conditions prescribed by the FAA (see 14 CFR§ 21.21). The FAA does not give a specific format for submitting technical data (if it is an original paper copy). However, if data are submitted in any form other than an original paper copy or photocopies, the format must be acceptable to the FAA (refer to Order 8000.79).

(b) Submit a statement of conformity to the FAA for each aircraft, engine, and propeller presented for type certification, and each aircraft or part thereof presented for testing (see § 21.53).

**(e)** Has sufficient descriptive data to produce detail parts and installations if multiple STC approval is requested.

**(1) FAA Discretion and Subsequent Applicants.** For a particular modification, FAA experience with previous applicants may permit the FAA to conclude that subsequent applicants need not conduct all the same tests formerly required. This would be a judgment by the FAA that the product has adequate margins so that a demonstration by test would not produce different results from previous experience with the particular modification. While needless duplication of testing and data gathering should be avoided, the FAA's primary responsibility is to determine the airworthiness of the aircraft with the modification. The FAA will not supply a subsequent applicant with information submitted by a previous applicant, either directly or indirectly. If the FAA minimizes or waives the need for an applicant to provide substantiating data for specific requirements based on prior FAA knowledge, a brief rationale explaining these findings will be made by the FAA and included in the project file. Substantiating data from a previous project file will not be copied and put in the subsequent project file.

**l. Applicant Flight Test Data and Report.** During this period, the applicant collects flight test data, analyzes it, and reports it to the FAA for review. The applicant prepares a test report (§ 21.35(a)(4)) detailing the data with an explanation of the calculations (§ 21.39(a)) necessary to evaluate the data. The test report should also show compliance to 14 CFR part 21, Subpart B or other appropriate flight regulations in the certification basis. The flight test report should be signed by the applicant's test pilot, if the aircraft will be certificated under 14 CFR part 25.

**m. Compliance Reports.** A claim to have a compliant type design is not the only requirement of § 21.21(b). Applicants are entitled to a TC after they show compliance, the FAA finds compliance, and the FAA finds that the type design has no unsafe features. It is the FAA who determines whether or not the applicant has shown compliance. Compliance reports are the applicant's way of proving compliance (that is, showing compliance). Adequate compliance reports present appropriate evidence to convince the FAA of the overwhelming likelihood of the claim. The claim is a declaration that the type design meets a particular airworthiness, aircraft noise, fuel venting, or exhaust requirement levied by regulations identified in the certification basis. The substantiation case presents and explains the inter-relationship of the evidence in a logical order leading from the requirement to the claim. Evidence is certification data collected from FAA publications, certification testing, analysis, engineering examinations, similarity, and software design assurance, and any other data deemed acceptable by the FAA standards staffs. The FAA will make the final finding of compliance and indicate that by issuing the certificate or approval. The applicant is also responsible to provide a statement of compliance in accordance with § 21.20. The statement is subject to the falsification provisions in § 21.2, *Falsification of applications, reports, or records*. Unless the applicant has a data retention agreement that preserves FAA access to all data used to show compliance at any time in the future, the deliverables necessary to show compliance must be documented in the applicant's statement of compliance and submitted to the FAA. Further, although the FAA may elect to not review any type design or substantiating data submitted by the applicant, we always have the authority to do so at any time.

FIGURE 2-12. IMPLEMENTATION PHASE – COMPLIANCE FINDING ACTIVITIES



**n. FAA Review of Compliance Data.** During this review, the FAA finds compliance with specific paragraphs of applicable airworthiness standards and aircraft noise and emissions requirements. The data are approved after all inspections, analyses, and necessary tests are accomplished with satisfactory results.

**(1) Discontinuance Letter.** The TCB will notify the applicant by letter when it becomes necessary to discontinue official FAA type certification inspections or tests for any reason. The letter should cite the applicable regulations and advise the applicant to notify the ACO when the cause of the discontinuance has been corrected and a resumption of the type certification testing is desired.

**(2) Notification of Non-Compliance, including projects that do not warrant a TCB.** The TCB, or the project manager for projects that do not warrant a TCB, notifies the applicant (in writing) when a non-compliant item is found during FAA ground or flight tests and it does not necessitate discontinuing type certification tests. The written notification must identify the non-compliant item and cite applicable regulations. The applicant must satisfactorily resolve all non-compliances before the FAA issues the TC.

**o. The Review of Applicant's Flight Test Results.** The FAA reviews the applicant's flight test report to determine that the airplane conforms with the type design and identifies the specific flight tests that will be reevaluated by the FAA's test pilot. The project may proceed after a satisfactory examination of the applicant's technical data.

**p. The Flight Test Risk Management Process.** The TIA will reflect adherence with the PACO/accountable directorate's established flight test risk management process following Order 4040.26, *Aircraft Certification Service Flight Test Risk Management Program*. This ensures the acceptability of flight test risks. Risk assessment is normally done by a safety review process where project and non-project personnel review a flight test plan. This determines potential hazards and recommended mitigating (or minimizing) procedures. In the risk management process:

**(1)** Hazards are identified,

**(2)** An assessment is made of the risks involved,

**(3)** Mitigating procedures are established to reduce or eliminate the risks, and

**(4)** A conscious decision is made at the appropriate level to accept residual risks.

**q. The Pre-Flight TCB Meeting.** The pre-flight TCB meeting is held to discuss and clarify any questions the applicant may have about required FAA flight testing of aircraft. For engine and propeller certification projects, the pre-flight TCB meeting is referred to as the pre-type inspection authorization (pre-TIA) meeting. These meetings also identify any outstanding conformity inspection issues and engineering compliance determinations. Normally the TCB chairman, or the individual's representative, issues the TIA after all issues are resolved. Either the TCB or the applicant may request this meeting. Include a MIDO representative for the coordination of conformity inspections required for compliance flight testing.

**r. Type Inspection Authorization (TIA).** The TIA is issued after the FAA reviews the applicant's test results package and determines its acceptability. The ACO prepares the TIA on FAA Form 8110-1 (refer to https://employees.faa.gov/tools_resources/forms). It also authorizes official conformity, airworthiness inspections, and ground and flight tests necessary to fulfill TC certification requirements. In addition, if there are operational and airworthiness requirements to be addressed, include AEG operational evaluations in the TIA. If it has been found that 14 CFR part 33 and/or part 35 certification requirements are not completed at the time of issuing TIA, the PACO must coordinate with the ACO(s) responsible for the engine and/or propeller for concurrence or comments.

**(1) Preparing and Issuing the TIA.** The TIA is not prepared until coordination is accomplished with each appropriate engineering discipline and, when appropriate, the AEG, so that all required information for each disciplines' portion of the inspection or authorization is included. The TIA is issued when examination of technical data required for type certification is completed or has reached a point where it appears the aircraft or component being examined is expected to meet the applicable regulations. The TIA may be phased or issued in increments to ensure basic airworthiness and that flight test safety has been established before proceeding to the next phase.

**NOTE:** To assist the manufacturing inspector, the following information should be included in block 12, part 1, of FAA Form 8110-1.

**Point of contact at conformity site:** _____

**Phone number of point of contact:** _____

**Location of aircraft/conformity site:** _____

**DAR requested by the applicant:** _____**(**as applicable**)**_____

**(2) Coordination.** Coordinate the TIA with the PACO, the project MIDO, and when requested, the accountable directorate. Also, coordinate with the AEG when appropriate.

**(3) Notification.** Notify and provide the applicant with a copy of the TIA after it is issued.

(a) Review all outstanding items, the AFM, ICA, and items where there may be some question of compliance with the established airworthiness standard,

(b) Determine the status of any outstanding technical data, and

(c) Formalize the decision to issue the TC and TCDS.

**(2)** The meeting is also held to issue the TC and TCDS. The TC is signed when the applicant has complied with § 21.20 requirements, including submitting a statement of compliance, and the ACO and the accountable directorate concur that all items have been resolved. Each TC includes the type design, operating limitations, the TCDS, applicable regulations with which the FAA records compliance, and any other conditions or limitations prescribed for the product (Refer to § 21.41). The type design consists of the drawings, specifications, and information on the dimensions, materials, and processes necessary to define the product. The TCDS documents the conditions and limitations necessary to meet the airworthiness requirements of the certification basis. Sample of a TCDS can be found in Appendix 2 of this order.

> **NOTE:** In addition to the noise requirements of 14 CFR part 36, the FAA must make a Noise Control Act finding before issuing an original TC (see chapter 7 of this order).

## 2-7. POST-CERTIFICATION ACTIVITIES

FIGURE 2-13. TASKS DURING THE POST-CERTIFICATION ACTIVITIES PHASE



### a. Certification Summary Report.

**(1)** The Certification Summary Report should be tailored to the complexity and significance of the project and should be an executive summary containing a high-level description of major issues and their resolution. The report should be used as a means for retaining corporate knowledge and lessons learned that could be beneficial for future type certification projects involving the same or similar type design. Another benefit of this summary report is in a non-concurrent validation type certification project, it serves as a useful tool for a foreign CAA to learn what FAA concerns surfaced during the type certification project.

**(2)** The FAA project manager prepares the certification summary report. The accountable directorate determines which projects warrant a summary report since not all projects will require one. Summary reports should generally be prepared for the following:

(a) All new airplane models over 75,000 pounds maximum gross weight and new transport category rotorcraft (and their significant modifications),

(b) Aircraft which involve significant technology issues, aircraft with unusual or novel features, or aircraft that are of controversial design, or

(c) Projects with the potential for unusual public interest.

**(3)** The certification summary report, if required, should be in an acceptable "draft" form when the TC is issued.

**b. Type Inspection Report (TIR).**

**(1) General.** The TIR provides a record of the inspections and ground and flight tests conducted as authorized on the TIA, to show compliance with applicable regulations (§§ 21.33 and 21.35). Both manufacturing inspection and flight test personnel complete the TIR. The TIR also provides a record of other information identifying the test article and FAA certification activities applicable to each project with an issued TIA. Use FAA TIR form 8110-31, located at https://employees.faa.gov/tools_resources/forms. Detailed instructions on how to complete the TIR is now included in the form. The TIR must:

(a) Be completed within 90 days after certificate issuance,

(b) Contain all of the TIA inspection and test results,

(c) Contain a chronological list of all changes made to the prototype product during the test program and identified as "made by the applicant" or "required by FAA as a result of type certification tests showing noncompliance,"

(d) Be approved by appropriate supervisors,

(e) Be retained by the certifying ACO for reference purposes (unless the certificate and control of the project is transferred to another ACO), and

(f) Be provided to the certificate holder (courtesy copy).

**(2)** FAA Form 8110-26, Supplemental Type Inspection Report (STIR), provides a way for the manufacturing inspector to record the inspection and test results conducted on modified products presented for supplemental type certification. Use the STIR Form 8110-26, located at https://employees.faa.gov/tools_resources/forms, and complete the report in a similar manner as the TIR.

**c. Continued Airworthiness.** Continued airworthiness is the preservation of the product's level of safety as defined at the time of certification (or its approved altered condition) throughout the end of the product life cycle. It is applied to the product design/production and its operation, maintenance, modification, and repair.

**(1)** AIR is responsible for overseeing the design approval holder and production approval holder (PAH) to preserve the safety of the approved product, part, or article. AIR preserves safety by identifying and evaluating safety concerns and by developing and implementing corrective action.

**(2)** AIR is also responsible for interfacing with operating environments through a proactive collaboration with AFS and others involved in the operations, maintenance, and alteration of in-service products.

**(3)** Data such as stress analysis, damage tolerance assessment, or process specifications used to substantiate a major repair to primary structure can only be approved by:

an ACO, a DER with specific authorization for major repairs and/or alterations in the necessary engineering discipline, and Organization Designation Authorization (ODA) holders.

**d. Changes to Instructions for Continued Airworthiness (ICA).** The rule, § 21.50(b), requires ICA changes to be made available to any person who must comply with them. The design approval holder should provide these changes according to a plan that was accepted by both the ACO/ECO and AEG. The changes should be formatted to directly supplement the original ICA and should clearly say what's being changed.

**e. Post-Certification Evaluations.**

**(1) Special Certification Review (SCR).**

(a) An SCR is a way to evaluate the type certification project and potentially unsafe design features of previously approved products. The accountable directorate may initiate an SCR after the certification project or as service experience dictates (§ 13.19).

(b) Potential safety problem areas for which an SCR may be appropriate include:

1. Complex or unique design features,

2. Advanced state-of-the-art concepts in design and manufacturing,

3. Potentially unsafe features used on similar previous designs requiring further analysis and evaluation,

4. Compliance areas critical to safety and operational suitability that require evaluations,

5. Unsafe operational or maintainability characteristics,

6. ELOS determinations with potential major effects on safety, and

7. Complicated interrelationships of unusual features.

(c) Results of an SCR include a detailed review and evaluation of a product's applicable airworthiness and operational certification requirements, recommendations for revisions, if appropriate, and improvement in achieving uniform application of certification rules throughout the FAA.

(d) The accountable directorate establishes the SCR team. The team may be comprised of FAA personnel from the CMACO, the PACO, the accountable directorate, AEG personnel, MIDO personnel, or other FAA personnel, as appropriate. The team may use governmental agencies, outside consultant firms, and industry to get technical expertise to do a thorough evaluation. If an SCR is deemed necessary for an imported product, then representatives of the original certifying CAA must also be invited.

(e) Evaluation procedures used during the SCR include examination of the applicant's or certificate holder's data, discussions with FAA personnel and the applicant's or certificate holder's personnel, inspection of the prototype or production articles, and any other way for the team to perform a complete and comprehensive evaluation consistent with the purpose of the review.

(f) Thoroughly explore every significant aspect and ramification of the potential safety problem in question. Consider the adequacy of the applicable regulations and policy material.

(g) The SCR chairperson prepares a report of the team's findings and recommendations. The accountable directorate may use the report to develop regulatory changes or guidance material.

(h) The certifying ACO is responsible for appropriate action on the SCR team's findings and recommendations.

**(2) Fact-Finding Investigations.**

(a) Fact-finding investigations are authorized under 49 U.S.C. 46104 and conducted pursuant to 14 CFR part 13, subpart F. This is an investigation where the compulsory processes of the Federal Aviation Act of 1958, Section 1004, are used to assist the FAA in finding material facts to support the performance of FAA functions. This procedure is not used either as a substitute for a routine investigation or as an investigation of violations that constitute felonies under Federal law.

(b) Reports or allegations of certification basis noncompliance may be received after a TC is issued. Complainants should furnish full facts to support all allegations of noncompliance. Depending on the circumstances and the extent of factual substantiation of the allegations, it may be necessary to develop evidence through a fact-finding investigation. The objective of a fact-finding investigation is to get the information necessary to decide what FAA action, if any, should be taken. The FAA may determine that this type of investigation is necessary even without an external complaint.

**f. Data Retention.**

**(1) Project.** The ACO or the MIDO maintains the project file for each type certification project at a federal facility. The project file must contain records associated with the project. Records are defined as documents showing a decision or action taken by the FAA on the project. The project file must contain the documents listed in Appendix 10, Figure 1.

**(2) Type Design and Substantiation Data.** The FAA maintains data critical to type certification, such as type design and substantiation data (see Appendix 10 of this order). "All information received, created, or compiled by the officers and employees of the Federal Government for the use of the Government is official Government record material and is, therefore, property of the U.S." (see Order 1350.14, *Records Management*). The applicant/TC holder, at the ACO manager's discretion, may maintain portions of these data on behalf of the FAA. In either case, it must be recognized that type design records, including all substantiating data, are permanent and must not be destroyed. Data maintained by the applicant/TC holder must be made available to the FAA for such routine activities as production inspection, surveillance, design change reviews, or any other reasons deemed necessary by the FAA. An appropriate and coordinated MOA between the FAA and the applicant/TC holder must be established before entering into such an arrangement. Data that are required to be maintained by the applicant/TC holder under these conditions are listed in Appendix 10, Figure 2 of this order. Refer to FAA AC 20-179, *Certification Data Retention Agreements and Government Records*, for detailed guidance related to data retention agreements.

**(3) Working Papers.** Other information such as personal notes, correspondence, or issue papers that do not document an FAA decision, action, or position, or schedules are considered working papers. Those documents may be retained after the TC is issued at the ACO manager's discretion. This information is considered "corporate memory" and no longer part of

the project. Information that falls into this category is listed in Appendix 10, Figure 3 of this order.

**g. Required Documents.** The holder of a TC or STC, or the licensee of a TC, must supply the following documents at the time of aircraft delivery:

**(1)** A current approved Airplane or Rotorcraft Flight Manual,

**(2)** A current weight and balance statement,

**(3)** An ICA,

**(4)** Compliance status of ADs (see § 21.183 and 14 CFR part 39), and

**(5)** Other appropriate documents as necessary.

# CHAPTER 3. TYPE CERTIFICATES

**3-1. GENERAL.** Chapter 3 provides guidance for preparing the Type Certificate Data Sheet (TCDS). The TCDS is a part of the TC, providing a concise definition of the configuration of a type-certificated product. Therefore, a standard format for the TCDS is necessary to enable any person to easily find information about a specific product.

**3-2. TYPE CERTIFICATE.**

**a. Issuing a TC.**

**(1)** The certifying ACO issues a TC when the applicant completes the 14 CFR airworthiness requirements. Refer to https://employees.faa.gov/tools_resources/forms for FAA Form 8110-9, Type Certificate, in a pdf-fillable format.

**(2)** Only one name can be identified as the TC holder, consisting of an individual, a partnership, or a corporation. This ensures the FAA has a single point of contact responsible for continued airworthiness of the type certificated product.

**b. TC Numbers.** The certifying ACO assigns a TC number, reflecting the issuing ACO and the type of product. See FAA Order 8110.115, *Certification Project Initiation and Certification Project Notification*, for details on the numbering system.

**c. Amendment to a TC.**

**(1)** A TC holder who wants to change a product's type design may apply for either an STC or an amendment of the original TC. Any other applicant must apply for an STC.

**(2)** Some design changes may not require alteration of the TC or TCDS. Use an FAA approval letter, ODA, or DER approval for these changes. For minor changes in type design, the TC or TCDS will not be affected (see §§ 21.93 and 21.95). Also, some major changes in type design may be indicated in the Airplane Flight Manual or Rotorcraft Flight Manual rather than on the TCDS, e.g., different cockpit equipment configurations for the same model aircraft.

**(3)** To amend a TC, applicants must send an FAA Form 8110-12 to the appropriate ACO. Refer to https://employees.faa.gov/to ols_resources/forms, for FAA Form 8110-12, in pdf-fillable format.

**(4)** The ACO sends the completed amendment to the applicant and publishes the revised TCDS, if required, as soon as possible.

**d. Notification of TC Approval.** The manager of the PACO is responsible for sending a notice to the accountable directorate after issuing, reissuing, or amending a TC. There is no standard form for this notification, a memorandum to the accountable directorate is acceptable. The manager of the PACO also sends a copy of the TC to the Design, Manufacturing, & Airworthiness Division, Attention: Operational Oversight Policy Branch, AIR-140.

**e. Record Requirements.** The issuing ACO keeps a copy of the TC or STC with an original signature for official record purposes.

**f. Reissuing Duplicate TC.** A TC holder who cannot find the original TC may obtain a duplicate by sending a written request to the CMACO. They must submit an affidavit attesting that the original TC is lost, misplaced, or destroyed. The FAA will reissue a duplicate TC with the following statement under the TC number: "Reissued on (date) to supersede the original TC, which has been lost or misplaced." The FAA will put a note in its records to show the original TC is null and void. If the TC holder later finds the original, then the TC holder should give the original to the FAA.

**g. Transferring a TC**.

**(1) Assuming TC Holder Privileges and Responsibilities.** The transfer of a TC (and STC) is the process of changing the holder of a TC (and STC). After receiving a TC through a transfer, the TC holder agrees to all privileges of a TC holder as authorized in § 21.45. The TC holder also agrees to all responsibilities, including the continued airworthiness responsibilities for all aircraft produced under that TC, inclusive of those aircraft produced by previous TC/PC holders.

**(2) Certificate Transfer to a New Certificate Holder Located in the US, Including Transfer to Another Geographic Area.** When a TC holder transfers a TC to a new certificate holder located in the U.S., the receiving ACO must reissue the TC only after verifying the complete set of the FAA files for the certificate has been transferred from the previous CMACO to the receiving ACO, which is now the new CMACO. The TC holder submits the original TC to the CMACO after completing and signing the transfer endorsement on the reverse side of the TC. This changes the TC holder, and the effective date is the date of the TC holder's signature. The signature must be that of the individual shown as the TC holder. For a TC issued to an organization, the former TC holder must submit an affidavit (with the corporate seal if the holder is a corporation) signed by an officer of the grantor organization. The affidavit certifies that the grantor organization's officer has authority to sign the transfer endorsement on the organization's behalf. To reissue or transfer a TC to a holder in another geographic area, the CMACO must prepare a new TC in the new holder's name. When a TC holder transfers its TC, the complete TC files must also transferred to the geographic ACO for the new holder. The TC holder must send all correspondence to the receiving ACO, which is now the CMACO. Under "Date of Issuance," the ACO will enter the date of the TC holder's signature on the transfer endorsement. All other items on the TC remain the same as on the original. Reissuance of a TC requires the TCDS to be revised to show the new holder and the record of previous holders.

**(3) Transferring when the Original TC is Missing.** The normal process is for the TC holder to complete the transfer endorsement on the reverse side of the original TC; however, in some cases the original TC may be missing. In that case the TC holder must submit an affidavit attesting that: the original TC is lost or destroyed; include a statement that the TC holder is transferring the TC to a new holder; and provide the new holder's company name and address. When this transfer information is provided as part of the affidavit then the FAA can forego the step of reissuing a duplicate TC and issue an original TC directly to the new TC holder in the new holder's name.

**(4) Maintaining FAA Data File.** If the TC holder maintains the FAA data file, the FAA must not reissue the TC until the FAA and the new TC holder reach an agreement on how to maintain and store the FAA data file.

**(5) A Holder's Name Change** requires reissuing the TC.

**(6) Certificate Transfer to a Foreign Holder.** Transfers to or from a non-U.S. entity require special coordination with the foreign CAA and the International Division, AIR-400.

**h. Cancelling a TC.**

**(1)** A TC is effective until revoked or suspended (see § 21.51).

**(2)** Revocation of a TC is a legal action canceling the TC. For example, the FAA will revoke a TC when the TC holder is unwilling or unable to ensure the continued airworthiness of the product. Suspension of a TC is a temporary revocation of the TC. The revocation or suspension of a TC may be a basis for invalidating the airworthiness certificates of all the products certificated under that TC.

**(3)** When the FAA begins the process to revoke a certificate, it should request all data used to substantiate the basis for issuing the TC. This action may also be appropriate when the FAA is suspending a TC, if it is likely that a TC revocation will follow.

**(4)** Upon revocation or suspension of a TC, the holder must provide the original TC to the FAA. The accountable directorate cancels the TC. The word "canceled" is stamped or typed on the body of the original TC, and the manager of the accountable directorate signs and dates the TC. The "canceled" original TC is then returned to the holder. The ACO manager also records the TC cancellation on the ACO file copy of the TC. For suspended TCs, when the suspension ends, the TC should be reissued to the holder.

**(5)** A note is added to the TCDS documenting the cancellation date of the TC, stating this TCDS is not valid for aircraft manufactured after the cancellation date. Changes to the TCDS are forwarded to the Operational Oversight Policy Branch (AIR-140) in Oklahoma City.

**i. Surrendering a TC.** Refer to FAA Order 8110.120, *Processing Surrendered, Abandoned, and Historical Aircraft Type Certificate,* for the most current policy and procedures for processing type certificates (TC) or supplemental type certificate (STC) surrendered by a design approval holder (DAH).

**j. Procedures When Certificate Holders Cannot Be Located.** Refer to FAA Order 8110.120, *Processing Surrendered, Abandoned, and Historical Aircraft Type Certificate,* for the most current policy and procedures when the certificate holder cannot be located.

**k. No Splitting a TC.**

**(1)** The FAA receives requests from TC holders to "split out" one or more models (aircraft, engines, or propellers) from a TC, to allow the TC holder to transfer the type design approval of the specific model(s) to another party without transferring the complete TC. The FAA does **not** allow this practice. Splitting out models would require the issuance of a new TC to the transferee and the airworthiness requirements of 14 CFR part 21 would prevail. In particular, the airworthiness requirements specified by § 21.17(a)(1) must be met. If petitions for exemptions from the requirements of § 21.17(a)(1) were allowed, new

families of aircraft, engines, or propellers could be developed without showing compliance to the latest airworthiness standards.

**(2)** A TC holder may still sell or otherwise make its design data available to another party. If the transferee (receiving party) wants to produce aircraft, engines, or propellers and the designs are eligible for FAA airworthiness certification or acceptance, several alternatives are available. The receiving party may:

(a) Produce the product under license to the extent allowed under 14 CFR part 21, Subparts F or G without becoming the TC holder.

(b) Produce the product under license following a program outlined in AC 21-24, *Extending a Production Certificate to a Facility Located in a Bilateral Airworthiness Agreement Country*, and complying with the requirements of § 21.139.

(c) Apply for a new TC for the aircraft, engine, or propeller under 14 CFR part 21, Subpart B.

**(3)** If the receiving party selects the option in paragraph 3-2k(2)(a) or 3-2k(2)(b) above, then the original TC holder remains responsible for the continued integrity of the approved type design. Also, the original TC holder continues to be the FAA's contact point for resolving safety issues requiring corrective action (for example, ADs).

**(4)** If the receiving party selects the option in paragraph 3-2k(2)(c) above, then the certification basis is effective on the date of the new application. The FAA allows the new applicant as much credit for previously approved design data and tests as is practicable in showing compliance with the later requirements. In determining the aircraft certification basis, consideration of the original special conditions, ELOS findings, and exemptions must be addressed. Applicants must give clearly documented evidence showing their product meets the objectives of the later regulatory requirements.

**(5)** Under the option in paragraph 3-2k(2)(c) above, when the applicant for the new TC is located outside the U.S., the FAA must not issue a new TC unless the applicant is located in a country having a bilateral airworthiness agreement with the U.S. In these cases, the applicant should seek a new FAA TC through the airworthiness authority of their country. The FAA will work through that country's aviation authority to agree on special conditions, equivalent safety findings, and exemptions associated with the product.

**l. Provisional TC.** The FAA uses FAA Form 8110-9 to issue a provisional TC (see chapter 6, paragraph 6-1 of this order). The FAA uses the same TC number for both the provisional and the final TC. Type the word "PROVISIONAL" above the line "TYPE CERTIFICATE." Delete or mark through the line (near the bottom of the form) on how to transfer the certificate, since a provisional TC is not transferable. Provisional TC are issued for the following:

**(1)** Flight crew training;

**(2)** Demonstration flights by the manufacturer for prospective purchasers;

**(3)** Market surveys by the manufacturer;

**(4)** Flight checking of instruments, accessories, and equipment; and

**(5)** Service testing of the aircraft (see 14 CFR part 21, Subpart C; §§ 91.317 and 121.207 for regulations on issuing provisional TCs and limitations for operating provisionally certificated aircraft).

**3-3. TYPE CERTIFICATE DATA SHEET (TCDS**).

**a. What is a TCDS?** The TCDS is the part of the TC documenting the conditions and limitations necessary to meet certification airworthiness requirements.

**b. Approving the TCDS.** The ACO manager approves the TC and the ACO publishes the TCDS as required by § 21.41, after it is prepared in Microsoft Word (or equivalent) format by the project manager. The TC approval may be a written notification or an email to the applicant. The TCDS must also be electronically sent to AIR-140 for processing. The contents of the TCDS are described in this chapter.

**c. Completing the TCDS.** The TCDS can be partially completed when the TIA is issued. However, the TCDS must be completed within two weeks after issuance of the TC. The CMACO must send an informational copy of the TCDS to the accountable directorate and to AIR-140 within two weeks after the issuance of the TC.

**d. Formatting the TCDS.** The format of the TCDS should be consistent for all type-certificated products, containing only the information applying to the particular product.

**(1)** Include the following information (in the order listed) in the TCDS title box in the upper right-hand corner of page 1:

(a) The TCDS number (which is the same as the TC number),

(b) The revision number,

(c) The name of the TC holder in abbreviated form (for military surplus aircraft, do not use the original manufacturer's name; use only the current TC holder's name),

(d) All approved models listed in alphabetical or numerical order for convenience in filing, and

(e) The issue date.

**(2)** The ACO updates the TCDS to reflect the name of the new TC holder when a TC is transferred or when a company name changes. The ACO changes the name in the title box on the TCDS and opposite the item "TC Holder" and adds the old TC holder's name into the Type Certificate Holder Record. The ACO will transmit the updated TCDS to AIR-140 for posting on the RGL website within 30 calendar days of the transfer to the new TC holder.

**(3)** The title of the document appears in the center of the page as "TYPE CERTIFICATE DATA SHEET NO. XXX."

**(4)** Insert the applicant's name and address opposite the words "TC Holder." The name and address should be the same as shown on the application for TC.

**(5)** The paragraph titled "Type Certificate Holder Record" identifies the original holder and any subsequent holders of the TC. This is a cumulative record; each revision will

show all previous holders. Provide information in the following form: "ABC Corporation transferred TC 123 to XYZ Corporation on January 1, 1999." Add all known transfers to the Holder Record paragraph when a TCDS is revised for any reason. See an example of the first page of a TCDS with the Holder Record in Appendix 2, figure 6 of this order.

**(6)** One or more sections follow the identification of the TC holder and holder record. Each section addresses an individual model of the general type covered by the TC.

**(a)** Start each model's section with a Roman numeral, followed by the model designation, copied from the application for TC.

**NOTE:** Do not include unofficial common, popular, or marketing nomenclature in the TCDS.

**(b)** Include the category or categories in which the aircraft is certificated, in parenthesis following the model designation. Next is the approval date, which is the date on the TC. Also, see Appendix 2, figure 7 of this order for the product codes (designations) used for some small airplanes, rotorcraft, and engines.

**(c)** Immediately below the heading for the new model, show the differences between the new model added to the TCDS and a previously approved model. This information helps in determining the eligibility of a conversion from one model to another.

**b. Information Required for Each Model Aircraft TCDS.** The TCDS contains each item listed below, under the same headings shown. If several models are included under the same TC, a section covers each model and items are repeated under each section with the exception of the datum, mean aerodynamic chord, leveling means, control surface movements, and production basis. If these items are common to all models, list them under "Data Pertinent to All Models." Include a reference to detailed information for each item, if that information is in an approved FAA document and is readily available. For example, information in the aircraft flight manual could be referenced via the TCDS if copying that information into the TCDS would be voluminous. The following are instructions for completing the TCDS.

**(1) Engine.** Show the abbreviated name of the engine manufacturer, the number of engines installed the engine TC number, and the complete model designation for all engines for which the manufacturer has obtained approval under this certificate.

**(2) Fuel.** Show the minimum fuel grade and approved alternate fuels for the basic engine and any optional engines approved for the aircraft.

**(3) Engine Limits.** Show the installed maximum continuous and takeoff ratings of the engines, including power setting parameters (for example, manifold pressure, and engine pressure ratio), revolutions per minute (rpm), and power or thrust output. The limits may be less than, but must never exceed, the rating for the engine shown on the applicable engine TCDS. Any reduction may be dictated by structural, vibration, performance, or other requirements. For altitude engines, that is, supercharged engines, the limits are shown for sea level and for the critical altitude or altitudes. Include a statement about variation between altitudes such as "straight line manifold pressure variation with altitude from sea level to 10,000 feet."

"Service bulletins, structural repair manuals, vendor manuals, AFMs, and overhaul and maintenance manuals, which contain a statement that the document is approved by the [NAME OF THE FOREIGN CIVIL AVIATION AUTHORITY], are accepted by the FAA and are considered FAA approved. (These approvals pertain to the design data only)."

**(26) Notes.** Refer to FAA Order 8110.121, *Type Certificate Data Sheet (TCDS) Notes*, for additional guidance and instructions in the preparation of TCDS notes.

(a) Do not use a lot of notes, if possible. Include applicable explanatory material with the item to which the note refers. Do this even if you must repeat the information several times. If it is impractical to include the explanatory material with the item to which it refers because of its length or complexity, then the information may be included in a separate note. In this case, the applicable items would include a reference to the note.

(b) When referring to a note, explain what the note discusses. The following note is an example of a cross-reference inserted after the fuel capacity:

See NOTE 1 for data on weight and balance.

(c) Use extreme care in choosing the language in a note. Many difficulties have arisen in the past because of misinterpreted notes. Examine material carefully to ensure the meaning is unmistakable.

1. Reserve NOTE 1 for the "weight and balance note." Use this note for weight and balance data, equipment lists, and loading instructions. This note is standardized, except for special considerations about weight and balance (such as information on unusable fuel, system fuel and oil, variations in center of gravity (CG) ranges, or removable ballast). The standardized part of this note is as follows:

"*A current weight and balance report, including a list of equipment included in the certificated empty weight, and loading instructions when necessary must be provided for each aircraft at the time of original certification. This requirement is in accordance with 14 CFR xx.xx."*

2. Reserve NOTE 2 for information pertaining to the required placards.

a. Include the following statement:

*"All placards required by either the FAA-approved [Aircraft] Flight Manual, the applicable operating rules, or the Certification Basis must be installed as specified."*

b. Make reference to the appropriate regulation, as applicable.

c. If the aircraft was certified prior to the requirement for a flight manual and does not have a flight manual with placards, then list the placards that were required by the aircraft's certification basis in NOTE 2. The listing should contain both the exact language of the placard and the placard's location.

3. Reserve NOTE 3 for reference to the Instructions for Continued Airworthiness (ICA).

a. The note related to the ICA (see §§ 23.1529, 25.1529, 25.1729, 27.1529, and 29.1529) should address methodology; avoid referring to a specific facility or company. Avoid language promoting a TC holder or their suppliers as the sole source for maintenance or overhaul.

b. It is contrary to 14 CFR parts 43 and 21 to include a note that all repairs or modification schemes must be approved by the TC holder prior to FAA approval.

c. For import products only, add a statement in NOTE 3 to reflect how service information will be handled, including a reference to where the service information can be found (e.g., a manual service document or a service bulletin). Do not reference a specific facility or company.

**(27) Restricted Category Aircraft.** When the applicant has developed advisory information for restricted category operation of aircraft, include the following information in a note on the TCDS (Refer to Order 8110.56, *Restricted Category Type Certification*):

**(a)** Restricted category weights, speeds, ranges, and altitudes at which the applicant has shown compliance with § 21.25.

**(b)** Additional operating restrictions for the special operations approved under § 21.25(b).

**(c)** A statement that applicants did not necessarily comply with standard category airworthiness design and airworthiness standards, under restricted category certification.

**(28) Information on Spare or Surplus Parts.** If the applicant for an airworthiness certificate is building aircraft to another person's TC from spare or surplus parts, then the builder must provide written evidence of permission from the TC holder. This is to ensure the applicant has all the data necessary to establish conformity to the type design. For these types of aircraft, the aircraft make is that of the builder, not the PAH. For these aircraft, enter the serial number assigned by the builder. That number should not be confused with the serial number assigned by the original PAH who builds the same type of aircraft under a production approval. It is suggested that a letter prefix or suffix, such as the builder's name or initials, be used with the serial number for positive identification. Add the following note:

> **NOTE:** (PAH's name) did not produce the following aircraft. The FAA lists them by the builder's name and serial numbers.

**f. Information Required for an Engine TCDS.** See AC 33-2, *General Type Certification Guidelines for Turbine Engines*, for details of engine TCDS. Also, refer to FAA Order 8110.121, *Type Certificate Data Sheet (TCDS) Notes*, for standardized TCDS notes for engines.

**g. Information Required for a Propeller TCDS.**

**(1) Type.** Briefly describe the propeller (e.g., ground adjustable, manually controllable, mechanical, two-position hydraulic, constant speed, electrical). Describe pitch control in Note 3, and feathering and reversing in Note 4. Refer to these notes when applicable.

**(2) Engine Mounting.** Describe the type of engine mounting necessary for the propeller, (e.g., SAE No. 50, SAE No. 60, SAE No. 2 flange, or Special flange 6.75-inch bolt circle). Refer to Note 1 when applicable.

**(3) Hub Material.** Describe the basic material used for fabrication of the hub.

**(4) Blade Material.** Describe the basic material for fabrication of the blades.

**(5) Number of Blades.** List the number of blades.

**(6) Hub Models or Propeller Model Designations.** List hub model, propeller model, or designations. Refer to Note 1 when applicable. Add suffixes to the basic hub model designation to show hub drillings or special design features. For instance, an "L" may mean one size bolt circle and a "K" another, or add a "60" to show that the propeller fits an SAE No. 60 shaft, and a "50" to show it fits an SAE No. 50 shaft. Explain what the suffixes mean here or in a Note on the TCDS.

**(7) Blades.**

(a) The blades approved for use in the hub or hubs listed are shown on the data sheet in tabular form as follows:

| Blades (see Note 2) | Maximum Continuous HP RPM | Takeoff HP RPM | Diameter Limits (see Note 2) | Approximate Propeller Weight | Notes |
|---|---|---|---|---|---|

(b) If the blades listed have been approved at different ratings in more than one hub model, separate tabulations should be made under each applicable hub model. Under each heading list the following information:

1. Approved propeller blade in the column marked "Blades." First, list the model designation of the blade resulting in a propeller of the largest diameter approved with that particular blade. Next, list the model designation of the blade resulting in a propeller of the smallest diameter approved with that particular blade. The preposition "to" should be inserted in between the two dimensions. The method used by the applicant to denote a reduction in diameter is explained in Note 2. Therefore, this note is referenced by placing "(see Note 2)" below "Blades".

2. Maximum continuous horsepower and revolutions per minute (rpm) ratings for which the FAA approved the propeller under the appropriate headings.

3. Takeoff ratings under the appropriate headings.

4. Maximum and minimum propeller diameters as shown by the corresponding blade model designations. An applicant may use the same blade model in several propeller models. In each case, check the resulting propeller diameter because the FAA cannot assume that the resulting propeller diameters are identical. This is because the blade socket of one hub may be further from the hub centerline than the blade socket of another hub. The diameter limits are nominal limits as explained in Note 2. Therefore, Note 2 should be

referenced under the heading of "Diameter Limits." Do not include nominal propeller diameter limits in an aircraft data sheet or specification. Instead, the appropriate manufacturing tolerances are added to the maximum permissible diameter and subtracted from the minimum permissible diameter.

5. Total weight of the propeller under the column heading "Approximate Propeller Weight." Include hub, blade, and spinner weight, and refer to appropriate notes.

6. Number of any appropriate note in the "Notes" column.

**(8) Certification Basis.** List the following:

(a) 14 CFR part number and date (including latest amendment) at the time the application was submitted,

(b) Any special conditions, ELOS findings, or exemptions,

(c) The foreign certification basis for imported propellers,

(d) The TC number and date issued, and

(e) The date of application for TC.

**(9) Approval Basis for Import Propellers.** Title § 21.500 gives information on the airworthiness acceptance of aircraft propellers manufactured outside of the U.S. These propellers must have a U.S. TC. The FAA offers more guidance in AC 21-23.

**(10) Include the following sample statement on the TCDS:**

"To be considered eligible for installation on U.S.-registered aircraft, each propeller imported into the U.S. must be accompanied by a certificate of airworthiness for export or a certifying statement endorsed by the exporting cognizant civil airworthiness authority. Include the following language in the certifying statement:

(1) "This propeller conforms to its U.S. type design (Type Certificate Number_____ ) and is in a condition for safe operation; and

(2) The manufacturer has performed a final operation check on this propeller and it is in a proper state of airworthiness."

**(11) Production Basis.** List the PC number.

**(12) Notes.** Use the same numbering system and subject heading for Notes 1 through 12 on propeller data sheets. If a particular subject does not apply, insert "not applicable." The explanation for Notes 1 through 12 is as follows:

(a) NOTE 1. Hub Model Designation or Propeller Model Designation. Describe the hub or propeller model, whichever applies. The FAA usually uses numerals or letters in the hub or propeller model to identify features such as basic design, number of blades, blade shank size, or the size of the engine flange or spline required for mounting the propeller. Use suffixes for minor changes that do not affect eligibility or involve major design features. Use a diagram to define each numeral or letter in the model designation. Sometimes, when military agencies also use the propeller, identify the propeller by adding a suffix to the hub model designation. In such a case, the FAA gives Note 1 the title "Propeller Model Designation" and explains the suffix. Add the propeller blade model to this designation, if the FAA included it in the

applicable aircraft data sheet. Otherwise, include a parts list to determine the blade model and propeller diameter involved.

(b) NOTE 2. Blade Model Designation. Use a diagram similar to that used for the hub model designation to define any numerals or letters and to describe the system for showing propeller diameter reductions. When applicable, below the diagram, describe the system the applicant used to identify telescoped blades or blades with square cutoffs. Include the following sample note to explain "Diameter Limits" in the "Blades" table:

> "Diameter limits are nominal diameters of the assembled propeller. They do not include the + or - 1/8-inch manufacturing tolerance the FAA allows for propellers with a basic diameter of less than 14 feet. They also do not include the + or - 1/4-inch the FAA allows for propellers with a basic diameter of 14 feet or larger."

(c) NOTE 3. Pitch Control. Describe the pitch control components substantiated by the applicant. Indicate whether the applicant included the pitch control components in the propeller type design. The applicant should have identified the pitch control components by name and model. For integrated control systems, add the following sample statement to show the relationship between the propeller manufacturer and engine manufacturer (the engine TCDS should have a similar statement):

> "The propeller model xxx complies with the propeller airworthiness requirements when used with yyy engine only. If you change the engine or its control system, then you must show that the propeller – as integrated with the changed engine and its control system – still complies with the propeller certification basis. Also, if a change to the propeller changes the engine, then show that the engine still complies with the engine certification basis."

(d) NOTE 4. Feathering and Reversing. Identify any models that feather and/or reverse and show any special control that the FAA approved.

(e) NOTE 5. Left-Hand Models. Show the approval status of the left-hand blade model of an approved right-hand blade model. When applicable, refer to Note 5 in the "Blade." The following sample note may be used rather than repeating the ratings and diameter limits for the left-hand model: The left-hand version of an approved propeller model is eligible at the same rating and diameter limitations as listed for the right-hand model."

(f) NOTE 6. Interchangeable Blades. Include all information about limitations associated with interchangeability, such as interchangeability in one direction only, aerodynamic similarity, and structural similarity.

(g) NOTE 7. Accessories. Describe the accessories that the applicant substantiated, such as spinners, governors, and de-icing and anti-icing equipment. Show whether the applicant included the substantiated accessories in the propeller type design. The propeller manufacturer must show that accessories not included in the propeller type design, but included in the propeller approved parts list, comply.

(h) NOTE 8. Shank Fairings. Show when a blade has been modified to include shank fairings or cuffs. If the blade model included shank fairings or cuffs when originally certificated, then you don't need Note 8 because the blade model designation is enough.

(i) NOTE 9. Special Limits. List the propeller-engine combinations approved considering vibration for use on normal category, single reciprocating engine tractor aircraft or approved installations of propellers approved under § 21.21.

1. A conventional aluminum-bladed propeller model is eligible vibration-wise in any normal category, single reciprocating engine tractor installation when it is installed on the same engine model used for the vibration approval of the particular propeller-engine combination. If the propeller vibration stress survey was conducted on a multi-engine or pusher installation, then any placard found applicable in such a survey is applied to the single reciprocating engine tractor installation until a vibration re-survey shows that the placard is not required on the single reciprocating engine tractor application. Approvals of this type should be listed under Note 9 as follows:

Table of Propeller-Engine Combinations
Approved for Use on Normal Category
Single-Reciprocating Engine Tractor Aircraft

Below are the maximum and minimum propeller diameters you may use from a vibration standpoint. The FAA does not allow any measurements below the minimum diameter listed, since this figure includes the smallest diameter that the FAA will allow for repair purposes.

| Hub Model | Blade Model | Engine Model | Max. Diameter. (inches) | Min. Diameter. (inches) | Placards |
|---|---|---|---|---|---|

2. The approval of most import propellers (see § 21.29) includes the vibration and performance approval of the propeller for use on a particular engine-airplane combination. List these approvals under Note 9. The format should be appropriate to the data on the TC from the country of origin or as follows:

Approved Installations

The FAA approves propellers in this data sheet for use only in the engine-aircraft combinations listed below:

| Propeller Model | Aircraft Model | Engine Model | Maximum Takeoff Weight | FAA Data Sheet Aircraft Engine |
|---|---|---|---|---|

(j) NOTE 10. As part of the propeller TC, engine TC, or aircraft TC, the FAA may approve some components required to operate the propeller system. These components typically include governors, spinners, and de-icing systems. To complete the approval process, these components may require additional compliance with the applicable engine and airplane airworthiness requirements. Include the following statement:

"The propeller installation must be approved as part of the aircraft type certificate to demonstrate compliance with the applicable aircraft airworthiness standards."

(k) NOTE 11. Special Limits. List, or include by appropriate reference, all propeller life limits and airworthiness limitations identified in Appendix A – Instructions for

Continued Airworthiness, A35.4 Airworthiness Limitations Section. Include the following statement:

> "The propeller CMACO must evaluate the propeller installation for each new aircraft installation to assess possible changes in airworthiness limitations."

(l) NOTE 12. Special Notes. Use when a special note applies. For example, the FAA may occasionally grant the TC before the applicant has completed the required service manual. Use Note 11 when that happens to show that the propeller is not eligible for installation until a manual becomes available. Upon approval of a manual, delete that portion of Note 11 from the data sheet.

**c. Information Required for Fixed-Pitch Propellers.** Data sheets for fixed-pitch propellers are similar to those for propellers with detachable blades except as follows:

**(1)** Type – Fixed-Pitch (Single-Piece).

**(2)** Engine Shaft – Omit.

**(3)** Material – Describe the basic material and fabrication of the propeller.

**(4)** Number of Blades.

**(5)** Hub Models Applicable – Omit.

**(6)** Instead of the table of "blades," the following table of models should be used:

| Model | Takeoff Max. Cont. | | | Standard | Hub Drilling | | | Diameter Pilot | Hub Dimensions | | Weight (lb.) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | No. | Diameter | Diameter Bolt Circle | | | | |
| (see NOTE 2) | HP | RPM | Diameter | Pitch | Holes | Holes | | Hole | Diameter | Thickness | (Max. Diameter) |

**(7) NOTES.** Use the following examples of typical notes:

(a) NOTE 1. Installation. These models are for installation on flanged propeller shaft ends (see NOTE 2). Do NOT use the front plate supplied by the engine manufacturer. Use the special steel bolts that the propeller manufacturer provides or specifies.

(b) NOTE 2. Model Designation. Use a diagram to show what the digits and letters in the propeller model designation represent. This diagram includes the data in Notes 1 and 2 for detachable blade propellers.

(c) NOTES 3, 4, 5, 6, 7, and 8. Mark "Not applicable" on the data sheet.

(d) NOTE 9. Special Limits. In the table of propeller-engine combinations, replace the "hub model" and "blade model" columns with a "propeller model" column. The table applies only to fixed-pitch metal propellers. List or include by appropriate reference all propeller life limits and airworthiness limitations identified in Appendix A, Instructions for Continued Airworthiness, A35.4 Airworthiness Limitations Section. Include the following statement:

"The propeller CMACO for each new aircraft installation must assess how the propeller installation could change the airworthiness limitations."

## 3-4. PREPARATION OF TCDS AND SPECIFICATIONS FOR PRINTING

**a. TCDS Master.** Within two weeks after issuance of a TC, the ACO prepares the TCDS and transmits it electronically to the Delegation and Airworthiness Programs Branch, AIR-140. AIR-140 posts it in RGL and prepares a monthly publication, which is forwarded to the Government Printing Office for distribution to paid subscribers in paper format.

**(1) Printed Version Format.** The TCDS are prepared on an 8-1/2 by 11 page using a universally accepted font of size 9 or 10. Margins should be 1 inch top to bottom and left to right.

**(2) Page Numbering.** The first page does not have a page number. Succeeding pages are numbered in a consecutive sequence indicating the total number of pages, as "2 of 34." The headers should be used for page numbering with the 0.5 default spacing (1/2-inch) from the top of page. Type in the TCDS number and page number as shown below:

Page number example:

A97CE 3 of 47

**(3)** The page grid at the bottom of the first page (optional) should reflect what pages have been changed in the latest revision.

| **Page No.** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| **Rev. No.** | **8** | **4** | **5** | **8** |

***Assumes this is Rev. 8 and only pages 1 and 4 were affected.***

**b. TCDS Revision.** When a TCDS is revised, the revision number should be shown in the upper right-hand corner block of the first page. The date should also be revised to reflect the status. Indicate where text changes or additions have occurred by placing a vertical black line along the border margin.

A97CE
Revision 8
Smith Aviation
AA-11
BB-22
CC-33
August 16, 2004

## 3-5. CHANGING A SPECIFICATION DOCUMENT TO A TCDS

**a. Aircraft Specification Documents.** Before the FAA started to use the TCDS, the Civil Aeronautics Administration (CAA) (the FAA's predecessor) published a "specification" document after approval of an aircraft, engine, or propeller type design.

**b. Including an Equipment List.** Although the FAA can change aircraft specification documents to a TCDS, the conversion is complicated because a TCDS must include an equipment list. The FAA should convert specification documents only if:

**(1)** The TC holder provides an equipment list to be referenced in the TCDS or

**(2)** The equipment in the specification document is compatible with the TCDS concept.

**c. Engine and Propeller Specifications.** When the TC holder adds new models of engines and propellers to the TC, the FAA should change the specification document to a TCDS.

**d. Changing a Specification Document to a TCDS.** Pay particular attention to the information required under "Certification Basis," such as the applicable regulations, the date the FAA issued the TC, and the date of application for the TC. If the regulations applicable to a new model differ from those under which the FAA approved the original model, then the FAA needs to add the date of application for the new model to the TCDS under the "Certification Basis."

**c.** The ACO engineer will indicate on the TIA if an experimental certificate for showing compliance with the regulations is required. Indicate this in the instructions to the Manufacturing Inspector on the supplemental page for Block 12.

**4-7. REVISIONS TO PERFORMANCE DATA.** The applicant must review existing published performance data for the TC'd product to determine if the change to the aircraft adversely affects performance. Applicants must correct performance data that could mislead the operator (due to changes in performance caused by the STC) in their proposed AFM supplement. If the data that is adversely affected by the STC is not data of the type requiring FAA approval, then the AFM supplement must contain a note stating that the STC makes the published data invalid. The ACO may approve the continued use of the performance data that remain correct or become more conservative as a result of the change. The ACO does not issue the STC until it approves the AFM supplement.

**4-8. SUPPLEMENTAL TYPE INSPECTION REPORT (STIR).** Manufacturing inspectors should use FAA Form 8110-26 to record results of inspections and tests conducted on a modified product. These inspections and test results are part of the STC project. For STCs resulting in extensive structural or mechanical changes to a certificated product, use the appropriate TIR form as a guide for inspections to identify if the STC makes existing product features non-compliant. Engineering personnel and the manufacturing inspector should discuss if this will be done when planning the conformity inspection. The manufacturing inspector should complete the STIR in the same manner as the TIR (refer to https://employees.faa.gov/tools_resources/forms). See paragraph 5-3 of this order for more information on factors that manufacturing inspectors should employ to determine an appropriate level of inspection and evaluation, based on the complexity of the modification.

**4-9. WHEN WILL THE FAA ISSUE STCs?**

**a.** The FAA will issue an STC for a major change to type design of a type-certificated product when the change is not great enough to require a new TC (§ 21.113). Any person may apply for an STC; however, TC holders may apply for an amendment to their original TC.

**b.** STCs are not normally issued for replacement parts; PMAs are issued instead. Only in unique circumstances where the installation of the replacement part represents a major change in type design would an STC be issued. This STC would then be the design approval basis for the subsequent approval of a PMA so that replacement parts for that STC design can be manufactured and supplied as such.

**c.** The FAA will issue an STC for the installation of an article approved by a TSO when the addition of the TSO-approved article is a major change in type design for the product on which it is being installed. Persons other than the TSO authorization holder may get approval for design changes to the TSO article as part of the approval for a change to the TC'd product under 14 CFR part 43 or under the applicable airworthiness regulations. In any case, the STC must address installation requirements of the changed TSO article on the certificated product.

**4-10. WHEN WILL THE FAA NOT ISSUE AN STC?** The FAA will not issue an STC to manufacturers or applicants outside of the United States except under the terms of a bilateral agreement. Also, the FAA will **not** issue an STC to do the following:

**a.** Approve minor changes in type design,

**b.** Approve replacement or modification parts, unless the installation of the replacement or modification part represents a major change in type design for the product,

**c.** Approve design changes to TSO articles,

**d.** Combine two or more STCs without additional showing of compliance,

**e.** Modify foreign-registered aircraft without the involvement of the CAA of the state of registry, as described in paragraph 4-15 of this order, or

**f.** Approve a one-only modification of a foreign-registered aircraft, unless the particular conditions listed in paragraph 4-15c of this order are satisfied.

**4-11. TECHNICAL REQUIREMENTS FOR AN STC.**

**a.** The applicant must comply with the requirements of § 21.115, including the submittal of the data to show compliance with the applicable certification basis (See paragraph 2-6 of this order).

**b.** The applicant must ensure that the changes to the product comply with the latest amendments to the regulations when the FAA considers the change to be significant (see § 21.101 and Order 8110.48).

**c.** The applicant must comply with § 21.20 requirements and submit a statement of compliance.

**d.** The FAA issues an STC after it:

**(1)** Completes all necessary tests and compliance inspections,

**(2)** Finds that the applicant's technical data meet the applicable regulations, and

**(3)** Finds no feature or characteristic makes the changed product unsafe.

**e. STCs for "Multiple" or "One-Only" Installations.** For multiple STCs, all drawings or other data must be adequate to produce the parts approved under the STC and to install the STC on other serial numbers of the same model TC product identified on the STC certificate. For one-only STCs, submitted drawings or other descriptive data only need to be sufficient for one modification. The descriptive data may consist of marked photographs, sketches, and word descriptions. As with multiple STCs, the data supporting a one-only STC must show that the aircraft complies with applicable airworthiness regulations. A one-only STC cannot be amended and the holder is not eligible for an FAA production approval (e.g., PMA).

## 4-12. COMPATIBILITY EXAMINATION.

**a.** A new design change should be compatible with previous design changes. This insures that the changed product continues to comply with its certificated airworthiness requirements. The PACO should ensure the STC is specific in identifying the productfor which the change is approved. The PACO does this by ensuring that the applicant determines that previously approved modifications are compatible with the design change.

**b. Changes Requiring Coordination with the CMACO.** Appendix C of Order 8110.115 lists product changes requiring the PACO coordination with the CMACO during the project and to get concurrence from the CMACO before issuing the STC. See paragraph 4-18 of this order for information on establishing CMACO participation on the project. For PMA projects, see Order 8110.42 for information on coordination with the CMACO.

> **NOTE:** The PACO will coordinate installation eligibility determination with the CMACO for projects making extensive structural or mechanical changes to the certification product.

**c. Changes Affecting Existing ADs.** Appendix C of Order 8110.115 requires the PACO to coordinate with the CMACO for proposed modifications involving any part affected by an AD. The applicant must evaluate the proposed design change's effect on compliance with ADs that apply to the product. If the design change affects AD compliance, then applicants must get approval for alternative methods of compliance (AMOC) per the AD. The PACO should coordinate this with the CMACO to verify that the applicant's review of applicable ADs is complete and accurate before issuing the STC. If an applicant must get approval for AMOCs, indicate on the STC a reference to the AMOC approval letter issued by the CMACO. Before concurring, the CMACO will issue the AMOC letter to the PACO. The PACO then issues the STC.

**d. Discretionary CMACO Project Participation.** Aside from the changes listed in Appendix 1, Figure 6 of this order, the PACO may request CMACO participation at the beginning of the project. The PACO may indicate this in the CPN data. Alternatively, the PACO may communicate informally with the CMACO on any project to explore whether the proposed modification may affect any specific design features requiring special consideration, tests, or analyses during the certification program. The accountable directorate may also be able to provide the PACO information on relevant experience from the product's original certification program. For projects not involving the changes listed in Appendix C of Order 8110.115, the CMACO's concurrence is not required for issuance of the STC.

## 4-13. APPROVED MODEL LIST (AML) STCs.

**a.** An AML STC is a multi-model approval method that allows a set of compliance data (i.e., type design data and substantiating data) to be designated as "baseline data" that is applicable to various aircraft models. This method of approval may apply to multiple aircraft on the same type certificate data sheet (TCDS) or multiple aircraft on various TCDSs. Refer to FAA AC 20-180, *Approved Model List Supplemental Type Certificate (AML-STC)*, for detailed guidance related to AML STCs.

**b.** Administering the AML STC.

**(1)** The ACO lists the eligible TC'd products and FAA-approved documents on a special page and attaches the page to the STC. This list is known as the AML. Whenever the ACO adds a TC'd product or amends, deletes, or adds a document to the STC package, the ACO also amends and approves the AML—not the STC.

**(2)** The ACO must issue an AD to remove a product from an AML. This occurs unless the STC holder can show no completed installations were accomplished or that the product was mistakenly listed on the AML.

**(3)** STC holders can transfer an STC with an AML in its entirety to a new holder. However, they cannot split it into more than one STC.

**4-14. NON-INTERFERENCE STCs.** A non-interference STC is a modification to a product that may provide a convenience or function that is not required by operating rules or airworthiness standards applicable to the aircraft's intended operation. Examples include searchlights, low-light vision equipment for ground observation, or air-ground radio communications equipment for emergency medical services.

**a.** These non-interference STCs offer no relief from airworthiness standards or from the product's operating limitations. Evaluating a non-interference STC requires a determination that operating the equipment will not result in the aircraft becoming noncompliant with its certification basis. The non-interference STC may impose limitations or operational procedures in the AFM supplement to ensure the equipment is used in a manner that keeps the aircraft compliant with its certification basis.

**b.** When the ACO approves non-interference STCs, the ACO requires an explicit disclaimer in the "Limitations and Conditions" section of the STC (FAA Form 8110-2). The disclaimer must indicate that the modification has not been evaluated to check its proper operations for its intended function.

**4-15. STC PROJECTS INVOLVING FOREIGN-REGISTERED AIRCRAFT AND IMPORT PRODUCTS.** Applicants who want to modify foreign-registered aircraft or develop modifications for import products (the United States is not the original state of design) should notify the ACO as soon as possible. This will help minimize delays in the completion of the project.

**a. Import Products.** The FAA may need to consult the foreign CAA (the product's original certificating authority) on proposed STCs to import products. The PACO should determine if the STC's complexity requires consultation with the foreign CAA. The PACO should coordinate the CAA's involvement through the appropriate CMACO/standards staff.

**b. Foreign-Registered Aircraft.**

**(1)** An applicant may develop an STC using aircraft registered outside of the United States. The FAA allows this if the applicant modifies the aircraft per the airworthiness requirements of the country of registry (See ICAO Annex 6). The FAA encourages applicants to present U.S.-registered aircraft for modification. Applicants may not present a foreign-registered aircraft for inspection or test unless the State of Registry agrees and identifies its requirements for acceptance of the modification (See ICAO Annex 6).

**(2)** If the applicant does not offer evidence showing that the CAA of the country of registry agrees to the proposed modification, then the PACO notifies the CAA and invites them to participate in the project. The PACO must get written authorization from the CAA stating they concur with the modification before accepting an application and initiating a project.

**(3)** ACOs may accept applications for an STC when the CAA of the State of Registry requests FAA support to modify a U.S. type designed aircraft. Many foreign airworthiness authorities rely on FAA approvals as bases for accepting modifications to U.S. type-designed aircraft that are registered in their country.

**(4)** When using a foreign-registered aircraft as a test article to validate the modification's compliance to U.S. requirements, the applicant must ensure the aircraft conforms to its FAA-approved type design. This defines an appropriate baseline aircraft for the U.S. STC. Review the CAA differences (if any) on the foreign-registered aircraft to ensure those differences would have no effect on the STC.

**(5)** The FAA does not issue experimental airworthiness certificates for the flight testing of foreign-registered aircraft but may issue a special flight authorization. This requirement should be discussed with the CAA and the owner/operator of the aircraft to address any unique procedural requirements of the country of registry. The CAA will

decide whether, under their system, a change to the CAA's airworthiness certificate is necessary. Order 8130.2, *Airworthiness Certification of Products and Articles*, guides ASIs on the issuance of special flight authorizations for foreign-registered aircraft. If the flight testing is not conducted in U.S. airspace, coordinate with the local CAA responsible for issuing the appropriate airspace authorization.

**c. Considerations for One-Only STCs on Foreign-Registered Aircraft.** ACOs may accept applications for one-only STCs involving non-U.S. registered aircraft when the United States is the state of design and one or more of the following conditions are present:

**(1)** Mandated safety enhancements such as Traffic Collision Avoidance Systems (TCAS II), Enhanced Ground Proximity Warning Systems (EGPWS), and Reduced Vertical Separation Minimum (RVSM) equipment;

**(2)** Diplomatic aircraft;

**(3)** Aircraft owned by Heads of State;

**(4)** The response to a CAA request for support as described in subparagraph 4-15.b.(3) above; and

**(5)** U.S. Manufactured aircraft that receive their final outfitting as one-only STC out of "completion centers." The completion centers can be either inside or outside the United States (e.g., Executive Aircraft Interiors or Boeing Business Jets (BBJ)), if the aircraft is completed under U.S. control.

> **NOTE:** An ACO can authorize an ODA holder to develop an STC applicable to a foreign-registered, U.S. state-of-design aircraft as long as one of the above conditions is met. The ACO and the ODA must follow the procedures in Order 8100.15, *Organization Designation Authorization Procedures.*

## 4-16. STC AND AMENDED STC APPLICATIONS.

**a. Using the Application Form.** The applicant must submit the STC application, FAA Form 8110-12 (refer to http://www.faa.gov/forms/index.cfm/go/document.list), to the geographic ACO, as listed in Appendix 7 of this order. The geographic ACO contacts other ACOs, if it needs their technical support. Applicants must complete FAA Form 8110-12, Blocks 1, 2, 3, 6, and 7 when the following occurs:

**(1)** They introduce a major change in the type design (to be accomplished per §§ 21.111 through 21.119); or

**(2)** They intend to make major changes to the type design of an STC they hold (amended STC). Applicants must check Supplemental Type Certificate in block 2. Then, in block 6b, they must specify that the application is for an amendment and give the STC number. Examples of cases when the STC should be amended are:

(a) An STC holder wants to add product models to the STC, unless the FAA has given the STC holder an AML STC as discussed in paragraph 4-13 above.

**4-19. PREPARING FAA FORM 8110-2, SUPPLEMENTAL TYPE CERTIFICATE.**

**STC Numbers.** The certifying ACO assigns an STC number that identifies the type of product and the location of the issuing ACO. See Order 8110.115, *Certification Project Initiation and Certification Project Notification,* for details on how to number an STC. Use FAA Form 8110-2, located at https://employees.faa.gov/tools_resources/forms, in order to prepare the certificate.

**4-20. ACO REPORT OF STC.**

**a. Information Required for the RGL Website.**

**(1)** All ACOs must send pdf copies of STCs, with certification basis continuation sheets, to the Operational Oversight Policy Branch (AIR-140) within 2 weeks of STC issuance. AIR-140 will publish the STC and its continuation sheets on the RGL website so they will be available to the public. However, the published STCs will not have the ACO manager's signature. It is important to indicate that the two week time limit does not apply to STCs issued by ODAs and that ODAs are to follow procedures from Order 8100.15.

**(2)** The STC data on the RGL website are for informational purposes only. Possession of the STC document does not constitute rights to the design data or installation of the modification. The STC and its supporting data (drawings, instructions, specifications, and so forth) are the property of the STC holder. Anyone using the STC must contact the STC holder for rights to use the STC and the associated design data.

**b. Availability of STC Data.** ACOs must make copies of STCs, including the continuation sheets, available to anyone who requests them. The ACO must answer the requestor in writing, identifying the STC by number, and attach a copy of the STC to the correspondence. In the correspondence, the ACO must state, "Possession of the supplemental type certificate (STC) does not constitute rights to the installation of the modification or its design data. The STC and related information (drawings, data, specifications, and so forth) are the property of the STC holder. The FAA will not release proprietary data without authorization from the holder. The user must get installation approval or data rights from the STC holder."

**4-21. OTHER FOREIGN STCs.** When a product is exported to another country, the CA supports their acceptance by the importing country. To minimize duplicate certifications, the CA acts for the importing authority. The CA, therefore, makes compliance findings to their own airworthiness standards and, when agreed in a bilateral agreement, makes compliance determinations to the importing country's airworthiness standards. Note, however, that bilateral agreements are not required for exporting a product. The U.S. can export a product to a foreign country even though we do not have a bilateral agreement with that country. Applications to non-bilateral countries for their STCs approvals or import acceptance are still transmitted from the FAA to the other aviation authority. Once a determination has been made that the STC holder may apply, a project manager must follow Order 8110.52. If a CAA seeks to issue its own approval for a design change based on a U.S. STC, and the agreement makes no provisions for validation, then a project manager should support the CAA by ensuring that the applicant provides them the information that the CAA will need to act as state of design for its issued approval.

If the CAA does not communicate any specific data needs, the list of information required by Transport Canada is a good example of useful supporting data (See appendix 5 of this order for the list of information).

**4-22. FAA VALIDATION OF A CAA STC UNDER BILATERAL AGREEMENTS.**

**a. IPA with STC provisions.** A foreign holder of an STC may apply for U.S. validation of the STC when there is an established Bilateral Aviation Safety Agreement, Implementation Procedures for Airworthiness (BASA IPA) that includes STCs in its scope. The specific procedures are covered in each individual BASA IPA agreement and Order 8110.52.

**b. IPA with no STC Provisions.** If there are no provisions for § 21.29 validation in the IPA, then the ACO must consider whether undue burden provisions (§§ 21.43 and 21.137) apply. When an undue burden provision applies, the ACO should not accept the application. For more information on guidance on undue burden decision papers refer to Order 8100.11, *Requirements for finding Undue Burden and No Undue Burden Under 14 CFR part 21*.

**4-23. OBTAINING A CANADIAN STC BY VALIDATION OF A U.S. STC.**

**a. Request for Canadian STC.** A U.S. resident and holder of a U.S. STC may apply for a Canadian STC under the United States/Canada BASA IPA.

**b. Applicability of Canadian STC.** Transport Canada's CAA only issues a Canadian STC to an aeronautical product that has either a Canadian Type Approval, an FAA TC accepted by Canada, or an equivalent approval document recognized by Transport Canada.

**c. Canadian STC Application Procedures.**

**(1)** A Canadian STC applicant applies through the FAA ACO that certified the STC. See Appendix 5, Figure 1 of this order for the Canadian STC application request format. This is a multi-purpose form for U.S. and Canadian applicants to use. The granting authority fills in the STC number and issue date.

**(2)** The PACO sends the Canadian STC application to the Transport Canada regional managers (See Appendix 5, Figure 2 of this order for the address list) in the Canadian region where the aeronautical product is to be modified. The applicant should identify the location of the aeronautical product. The PACO sends this information to the regional manager.

**(3)** The application is sent to Transport Canada headquarters in Ottawa, Canada, if a product is not being presently modified (e.g., there is no current Canadian customer for the modification).

**(4)** Typically, the Canadian STC applicant must submit the following documents with the application to Transport Canada (see Appendix 5, Figure 3 for a sample letter):

(a) A Canadian STC application,

(b) A copy of an FAA STC,

(c) A compliance checklist, include any special conditions, ELOS findings, or exemptions applicable to the FAA STC,

(d) A copy of the AFM supplement,

(e) A copy of the master drawing list,

(f) A copy of the manufacturing and installation instruction drawings,

(g) An ICA,

(h) Weight and balance data,

(i) Maintenance or repair manual supplements, and so forth, and

(j) A required statement from the ACO stating that it found compliance to the applicable Transport Canada regulations.

**d. Document Review.** After Transport Canada reviews the documents, it may request additional reports and documents or request a familiarization meeting with the applicant to assist in processing the STC application. Transport Canada may also require special conditions, additional airworthiness requirements, or familiarization flights for the modified aircraft. If this happens, then the PACO must cooperate fully with Transport Canada and provide all documents and assistance consistent with the United States/Canada BASA IPA.

**e. Issuance of Canadian STC.** After satisfactory completion of the familiarization flights, Transport Canada issues an STC to the applicant. Transport Canada then sends the STC original to the applicant and a copy to the PACO.

**b. Submitting the Statement of Conformity.**

**(1)** The FAA encourages applicants to submit FAA Form 8130-9 (see Appendix 4, Figure 5, of this order), as early as possible. This prevents delays in the type certification approval process. Except for in-process evaluations, such as process reviews, hidden inspections (that is, parts buried in assemblies), etc., a Statement of Conformity should be submitted to the FAA before the FAA begins its conformity inspections. The FAA and the applicant should discuss how they will handle in-process inspections during the conformity planning.

**(2)** The applicant or an authorized individual who holds a responsible position in the manufacturing organization must sign the statement of conformity.

**(3)** When the conformity inspection is conducted away from the applicant's manufacturing facility, the applicant may use one of the following procedures for signing the statement of conformity:

(a) Procedure #1 – The applicant may send an authorized representative to the manufacturer's facility to inspect the prototype article and sign the statement of conformity, or

(b) Procedure #2 – The applicant may delegate, in a written document, a representative at the supplier to complete the FAA Form 8130-9. This representative is an agent of the applicant and acts on the applicant's behalf. In this case, the agent must submit a copy of the agent's letter with the FAA Form 8130-9.

**c. Conformity Determination.**

**(1)** The applicant's policies, quality control procedures, experience, inspection personnel, equipment, and facilities dictate the degree of witnessing and the level of scrutiny an FAA manufacturing inspector must determine when verifying the applicant's conformity inspections. The manufacturing inspector should adjust the conformity plan (also known as the conformity verification plan) to fit the differences between applicants. For example:

(a) When applicants are inexperienced, their abilities are unknown. They may need to conduct several conformity inspection verifications until they are confident that they can safely rely on the company inspectors. Manufacturing inspectors may then gradually reduce their own level of involvement.

(b) Manufacturing inspectors should have greater confidence in applicants who have quality control systems that have been found acceptable in the past and who subject their prototypes to these controls. For these applicants, the manufacturing inspector may reduce the scrutiny needed to determine conformity by inspecting a sampling of products and records. If using sampling procedures, the manufacturing inspector should base them on nationally recognized standards that establish a confidence level of 90 percent or greater. The FAA files should include a complete description of the procedure used.

(c) Some applicants subject experimental and prototype parts through inspection channels that are distinct from the normal quality control system for production articles. In these cases, the applicant should provide the manufacturing inspector with detailed information on this

(8) If the designated inspection representative determines unsatisfactory findings, they should contact the DER as soon as possible. The ACO project manager or DER will address unsatisfactory findings as agreed to in the conformity plan. On FAA Form 8100-1, the ACO project manager or authorized DER must disposition any non-conformities found during the conformity inspection. Periodically, the ACO project manager and MIDO must review unsatisfactory findings identified by the designated inspection representative, and how the DER addresses those findings.

(9) After the ACO project manager or DER closes all unsatisfactory findings, they send the conformity paperwork, including FAA Form 8100-1, to the appropriate office (the designee's MIDO/MISO, ACO, or DER coordinator) per the conformity plan. Finally, they send the paperwork to the organization responsible for tracking FAA Form 8120-10 for closure.

**e. Non-Local Conformity Request.**

(1) Applicants use this procedure when the conformity inspection will be outside the project MIDO's geographic area. The project MIDO may authorize a designated inspection representative to perform these types of conformity inspections on a trip-by-trip basis, or for a specific time, as defined in Order 8100.8.

(2) The DER coordinator or ACO project manager, depending on who performed the FAA Form 8120-10 final review, sends the form to the project MIDO within 2 business days of final review.

(3) The project MIDO coordinates with the geographic MIDO where the inspection will be performed and, if authorized by the geographic MIDO, sends FAA Form 8120-10 to the designated inspection representative within 4 business days. The designated inspection representative is now authorized to travel, and do the conformity inspection.

> **NOTE:** Any designated inspection representative planning to perform a conformity inspection in another geographic area must comply with the requirements in Order 8100.8 before traveling.

(4) After satisfactorily completing the conformity inspection, the designated inspection representative sends the complete conformity package, including or consisting of the FAA Form 8100-1, to the project MIDO's manufacturing specialist or MIDO/MISO PI for review. The project manufacturing specialist or MIDO/MISO PI sends the package to the appropriate office (the ACO or DER coordinator) as defined in the conformity plan. Finally, the ACO project manager or DER coordinator sends the package to the organization responsible for tracking the FAA Form 8120-10 for closure.

**f. Conformity Discrepancies**. A part that does not conform to its descriptive design data is considered a nonconforming part. This situation is known as a discrepancy. If manufacturing inspectors find discrepancies, they can request a complete re-inspection by the applicant. The ACO project manager does not intend nor recommend that manufacturing

perform no work on the aircraft after completion of the Phase II inspection, unless the manufacturing inspector agrees.

**NOTE:** FAA personnel or designees are not authorized to perform any mechanical work on the aircraft.

(c) The manufacturing inspector can witness the inspection using the following:

1 The TIR form 8110-31, as a guide,

2 Title 14 CFR or Civil Air Regulations (CAR) as a basic reference, and

3 Applicable TIA instructions.

(d) If the inspection reveals unsatisfactory conditions, then the manufacturing inspector should discuss them with the applicant's representatives. The manufacturing inspector should make every reasonable effort to communicate and coordinate with the applicant and the ACO. The manufacturing inspector should witness all ground operable systems as required by the TIA. Only the applicant's personnel should operate the particular system. Manufacturing inspectors should also witness the weighing of the aircraft and verify scale accuracy as required by the TIA. During each flight test, they should verify equipment installed, including test equipment, to determine flight loadings. They should also verify the weight and balance report. The report should show the actual empty weight center of gravity and the list of equipment installed. The manufacturing inspector and flight test engineer should keep a copy of the report.

**NOTE:** During this phase, it may be necessary to verify weights and moment arms of equipment items.

(e) Almost invariably, there will be inspection items left over that cannot be determined at this time, such as instrument markings, placards, unusable fuel, and so forth. These inspections can be completed during Phase III when an opportunity arises and before type certification.

**(3) Phase III – Coordinated Ground-Flight Inspection.**

(a) **Return to Flight Status.** When aircraft has been returned to flight status after completing Phase II, the manufacturing inspector must ensure that the aircraft is airworthy and ready for flight testing. Manufacturing inspectors must also determine that the applicant corrected all unsatisfactory items before the FAA flight test. They also should coordinate all nonconformities with the ACO project manager before releasing aircraft for a FAA flight test. It is important that the assigned manufacturing inspector be knowledgeable of the TIA requirements and the operation of the aircraft and its systems. This ensures the safe completion of TIA-mandated flight test. The MIDO manager determines that the manufacturing inspector has the appropriate knowledge, experience, skills, and proficiency to assess the aircraft's condition before flight testing. Initially, manufacturing inspectors decide if test aircraft is ready for FAA flight testing. They base their decision on whether they find that the aircraft is in safe operating condition for testing to be conducted. The manufacturing inspector and flight test personnel should mutually agree on a system for informing the ACO

testing, all requirements of § 21.33 (b)(2) through (b)(4) and § 21.35 (a)(1) through (a)(4) must be met (see an explanation of (a)(4) (Applicant's Flight Test Report) below. Concurrent flight testing is not the same as conducting research and development with the applicant prior to TIA. The main concern in the development of these regulations has been to prevent FAA crews from being exposed to undue hazards during flight tests. Since the advent of FAA Order 4040.26, this concern has been mitigated by the mandatory Risk Management Process imposed by the Order. This is a requirement prior to any FAA flight test (regardless of its risk level) and with a corresponding TIA or LOA.

**(2)** Applicant's Flight Test Report. The applicant's flight test report described in §21.35(a)(4) should detail the results of the applicant's company or developmental testing, completed for the purpose of showing compliance with the applicable regulations. In the event concurrent testing (described in Paragraph 5-19(e)(1) above) is agreed by the FAA, it is recognized that reporting cannot be accomplished for tests the applicant has not previously completed. Before testing is conducted concurrently with the FAA under TIA, the applicant's flight test report should sufficiently document that the aircraft has flown previously, is airworthy, and that it is in safe operating condition.

**f. Hazardous Flight Tests.** FAA flight test personnel are not authorized to participate in or conduct potentially hazardous flight tests until the flight test risk management process has been completed by the ACO or the ACO has reviewed and accepted the risk mitigation procedures proposed by an applicant with an FAA-approved risk management process.

**g. Certification Flight Hours.**

**(1)** As part of the TIR, the flight test crew (pilot and/or engineer) records certification flight test time. The TIR may also include all flights during which an FAA crew member is conducting required evaluations, including flight to and from local test areas, flight in the traffic pattern, and so forth. The TIR also includes the time required to conduct or witness systems evaluations and other certification tests, regardless of whether an FAA pilot is at the controls. Initial pilot familiarization may be considered official test time even though no specific tests are conducted.**(2)** Certification flight time does not include ferrying to remote areas or tests conducted for purposes other than for determining compliance, regardless of whether an FAA pilot is at the controls.

## 5-20. FUNCTION AND RELIABILITY TESTING.

**a. Responsibility**. All technical specialties on the TCB may have some involvement in the function and reliability testing program.

**b. Monitoring and Evaluation**. The manufacturing inspector monitors the functioning of all cabin installations, evaluation of maintenance, and refueling at each stop. The manufacturing inspector should:

**(1)** Check critical parts and components as much as possible at each landing.

**(2)** Ensure the accuracy of the weight and balance, and the loading schedule

**(3)** Determine that the product being tested conforms to approved data.

**(4)** Perform other duties and inspections assigned by the TCB.

**(5)** Maintain a record of all demonstrations witnessed and all inspections conducted. Also, the manufacturing inspector should obtain records from the applicant of all maintenance performed.

**(6)** Report all information obtained during function and reliability testing on the applicable FAA Form 8110-31, TIR, and provide a copy to a FAA flight test engineer for inclusion in the consolidated report of the test.

**(7)** Advise the FAA flight test pilot/specialist, or the alternate, of any special inspections or observations that are to be made.

# CHAPTER 6. ADDITIONAL INFORMATION ON SELECTED TOPICS

## 6-1. PROVISIONAL TCs.

**a. Showing Compliance with Regulations.** Applicants are entitled to a Class I or Class II provisional TC if they show compliance with §§ 21.81 or 21.83. Also, the Administrator must find no feature, characteristic, or condition that would make the aircraft unsafe when operated under established limitations. The FAA has found that the most reliable way to determine an aircraft satisfies the regulatory airworthiness requirements for obtaining a provisional TC is to have the applicant certify compliance with the minimum applicable airworthiness requirements. Therefore, it is essential for the applicant to establish compliance with the regulations as required by §§ 21.81 and 21.83.

**b. Learning from Past Experience.** The FAA's past experience with issuing provisional TCs shows that, at a minimum, their involvement was the issuance of a TIA for conformity purposes. The FAA's experience also shows that applicants had started the official FAA flight test program before the ACO considered issuing them a TC. For a Class I or Class II provisional TC, applicants must certify that the aircraft has been designed and constructed per the airworthiness requirements that apply to the TC they seek. The aircraft also must substantially meet the applicable flight characteristics requirements.

**c.** Before the ACO will issue or amend a Class I provisional TC, an applicant must be an aircraft manufacturer within the United States (US), a US citizen, and:

**(1)** Show compliance with § 21.81 (the Administrator must find that there is no feature, characteristic, or condition that would make the aircraft unsafe when operated under the limitations in 14 CFR §§ 21.81(e) and 91.317);

**(2)** Apply for a TC for the aircraft;

**(3)** Certify to the FAA that the aircraft;

(a) Has been designed and constructed per the airworthiness requirements applicable to the TC they seek;

(b) Substantially meets the applicable flight characteristic requirements for the TC they seek; and

(c) Can be operated safely under the requirements specified in § 21.81(a).

**(4)** Submit a report showing the aircraft had been flown in all maneuvers required to show compliance with the flight requirements for a TC;

**(5)** Set limitations for getting the TC they seek (this includes limitations on weights, speeds, flight maneuvers, loading, and operation of controls and equipment (See § 21.81(e)), unless applicants set operating restrictions for each limitation not established);

**NOTE:** For military surplus aircraft, the fatigue and load assessment can be based on a comparison of the special-purpose, mission operating environment with the aircraft's previous military operating environment. Nevertheless, the applicant must still comply with any other requirements necessary to ensure it is safe for its intended use.

**e. Level of Safety.** The level of safety for restricted category aircraft can be lower than the level for a standard category aircraft. However, to maintain an equivalent level of safety for the public, the FAA imposes certain operating restrictions (see § 91.313). This policy is not intended to eliminate any type certification procedural requirements, such as the need to address continued airworthiness.

**f. Noise Compliance.** Restricted category aircraft must comply with the applicable noise requirements of 14 CFR part 36 (see Chapter 7, Noise Certification, of this order for more guidance).

**g. Coordination with AIR-110.** Coordinate all military-derived, restricted category, aircraft certification projects with AIR-110. This coordination is in addition to any other coordination and review activity with ACOs and directorates. Provide a copy of CPNs to AIR-110. Also, coordinate all issue papers and TCDSs with AIR-110 before issuing them.

**h. Refer to Order 8110.56**, for additional policy regarding restricted category type certification.

**6-3. TYPE CERTIFICATION OF CIVIL-DERIVED AIRCRAFT (RESTRICTED CATEGORY), § 21.25(a)(1). [RESERVED]**

**6-4. TYPE CERTIFICATION OF MILITARY-DERIVED AIRCRAFT (RESTRICTED CATEGORY), § 21.25(a)(2). [RESERVED]**

**6-5. ESTABLISHING NEW RESTRICTED CATEGORY SPECIAL PURPOSES, § 21.25(b)(7). [RESERVED]**

**6-6. TYPE CERTIFICATION OF SURPLUS MILITARY AIRCRAFT IN NORMAL, UTILITY, ACROBATIC, COMMUTER AND TRANSPORT CATEGORIES, § 21.27.** Aircraft designed and constructed in the United States, accepted for operational use, and declared surplus by an Armed Force of the United States may receive type certification in normal, utility,

acrobatic, commuter, or transport categories.

**d.** Coordinate all "aerial dispensing of liquids" certification projects with AIR-110. This includes providing a copy of the CPN, and coordinating issue papers, TCDSs, and STCs, as appropriate, before their issuance.

**6-9. [RESERVED]**

**6.10. [RESERVED]**

**7-11. STANDARD AIRWORTHINESS CERTIFICATES.** In addition to the requirements in paragraphs (a), (b), (c), and (d) of § 21.183, the following – as required by § 21.183(e) – must comply with the original issuance of a standard airworthiness certificate:

**a.** For transport category large airplanes and turbojet-powered airplanes without flight time before the dates in § 36.1(d), the type design must comply with the noise requirements of § 36.1(d) and applicable airworthiness requirements.

**b.** For primary, normal, utility, acrobatic, commuter, or transport category propeller-driven small airplanes without flight time before January 1, 1980, the type design must comply with 14 CFR part 36 and applicable airworthiness requirements.

**c.** For import airplanes, the country in which the airplane was manufactured must certify and the FAA must find that 14 CFR part 36 or the applicable airplane noise requirements of the country of manufacture and any other FAA requirements provide noise levels no greater than those provided by compliance with 14 CFR part 36.

**7-12. AIRWORTHINESS CERTIFICATES FOR RESTRICTED CATEGORY AIRCRAFT.** Before the FAA can issue a restricted category airworthiness certificate, aircraft must meet requirements in paragraphs 7-12a and 7-12b below:

**a.** For propeller-driven small airplanes, § 21.185(d) specifies that the type design must comply with applicable 14 CFR part 36 noise requirements and airworthiness requirements. These airplanes do not include those designed for agricultural use, as defined in § 137.3, or those that dispense firefighting materials. They also must not have had any flight time before January 1, 1980.

**b.** For import airplanes, § 21.185(d) specifies that the country in which the airplane was manufactured must certify – and the FAA must find – that 14 CFR part 36 or the applicable airplane noise requirements of the country of manufacture and any other FAA requirements provide noise levels no greater than those provided by compliance with 14 CFR part 36.

# APPENDIX 1. FORMS AND GUIDANCE FOR CERTIFICATION PROJECTS

## FIGURE 1. ACOS PROJECT, TC, AND STC NUMBERING SYSTEM

### PROJECT NUMBERING SYSTEM

**Project Number = AA nnnnn YY-X**

Where:

**AA =** Two alpha digits to identify the type of project; i.e.,
- **TC** = New Type Certificate (TC)
- **ST** = New Supplemental Type Certificate (STC)
- **AT** = Amended Type Certificate
- **SA** = Amended Supplemental Type Certificate
- **TD** = Type Design Change
- **SP** = Special Project
- **PM** = Parts Manufacturer Approval (PMA)

**nnnnn** = ACOS assigned number; e.g., 00146

**YY** = Two alpha digits to identify the project Aircraft Certification Office (ACO); that is,
- **AC** = ASW-140, Ft. Worth Airplane Certification Office
- **AK** = ACE-115N, Anchorage Aircraft Certification Office
- **AT** = ACE-115A, Atlanta Aircraft Certification Office
- **BO** = ANE-150, Boston Aircraft Certification Office
- **CE** = ACE-112, Small Airplane Directorate
- **CH** = ACE-115C, Chicago Aircraft Certification Office
- **DE** = ANM-100D, Denver Aircraft Certification Office
- **DS** = ASW-130, Delegation Systems Certification Office
- **EN** = ANE-140, Engine Certification Office, Boston
- **LA** = ANM-100L, Los Angeles Aircraft Certification Office
- **MC** = ACE-115M, Military Certification Office
- **NY** = ANE-170, New York Aircraft Certification Office
- **SE** = ANM-100S, Seattle Aircraft Certification Office
- **WI** = ACE-115W, Wichita Aircraft Certification Office

**X** = An alpha digit to identify the type of product; that is,
- **A** = Small Airplane
- **B** = Balloon
- **E** = Engine
- **G** = Glider
- **P** = Propeller
- **R** = Rotorcraft
- **S** = Airship
- **T** = Transport Airplane
- **I** = Experimental
- **Q** = Other, or not product

As an example, TC00125AT-A would be a TC project assigned by the Atlanta ACO on a small airplane with the assigned number 00125.

# APPENDIX 1. FORMS AND GUIDANCE FOR CERTIFICATION PROJECTS (CONTINUED)

## FIGURE 1. ACOS PROJECT, TC, AND STC NUMBERING SYSTEM (CONTINUED)

**TYPE CERTIFICATE NUMBERING SYSTEM**

**Certificate Number = SX nnnnn YY-D**

Where:

**S** indicates a supplemental type certificate (blank if a type certificate)
**X** = An alpha digit to identify the type of product; that is,

- **A** = Small Airplane
- **B** = Balloon
- **E** = Engine
- **G** = Glider
- **P** = Propeller
- **R** = Rotorcraft
- **S** = Airship
- **T** = Transport Airplane

**nnnnn** = assigned number automatically generated by ACOS; for example, 00146.

**YY** = Two alpha digits to identify the issuing Aircraft Certification Office (ACO)

- **AC** = ASW-140, Ft. Worth Airplane Certification Office
- **AK** = ACE-115N, Anchorage Aircraft Certification Office
- **AT** = ACE-115A, Atlanta Aircraft Certification Office
- **BO** = ANE-150, Boston Aircraft Certification Office
- **CE** = ACE-112, Small Airplane Directorate
- **CH** = ACE-115C, Chicago Aircraft Certification Office
- **DE** = ANM-100D, Denver Aircraft Certification Office
- **DS** = ASW-130, Delegation Systems Certification Office
- **EN** = ANE-140, Engine Certification Office, Boston
- **LA** = ANM-100L, Los Angeles Aircraft Certification Office
- **MC** = ACE-100M, Military Certification Office
- **NY** = ANE-170, New York Aircraft Certification Office
- **SE** = ANM-100S, Seattle Aircraft Certification Office
- **WI** = ACE-115W, Wichita Aircraft Certification Office

**D =** Indicates Delegation Organization (Delegated Alteration Station (DAS)) and early Organization Delegation Authorization (ODA)) issued STC.

As an example, SA00125AT would be an STC issued by the Atlanta ACO on a small airplane with the assigned number 00125.

# APPENDIX 3. LIST OF FAA FORMS

**1.** FAA Form 337, Major Repair and Alteration (Airframe, Powerplant, Propeller, or Appliance)

**2.** FAA Form 8000-4, Air Agency Certificate

**3.** FAA Form 8000-5, Certificate of Designation

**4.** FAA Form 8100-1, Conformity Inspection Record

**5.** FAA Form 8110-1, Type Inspection Authorization

**6.** FAA Form 8110-2, Supplemental Type Certificate

**7.** FAA Form 8110-3, Statement of Compliance with Airworthiness Standards

**8.** FAA Form 8110-9, Type Certificate

**9.** FAA Form 8110-12, Application for Type Certificate, Production Certificate, or Supplemental Type Certificate

**10.** FAA Form 8110-14, Statement of Qualifications (DAR - DMIR - DER)

**11.** FAA Form 8110-26, Supplemental Type Inspection Report

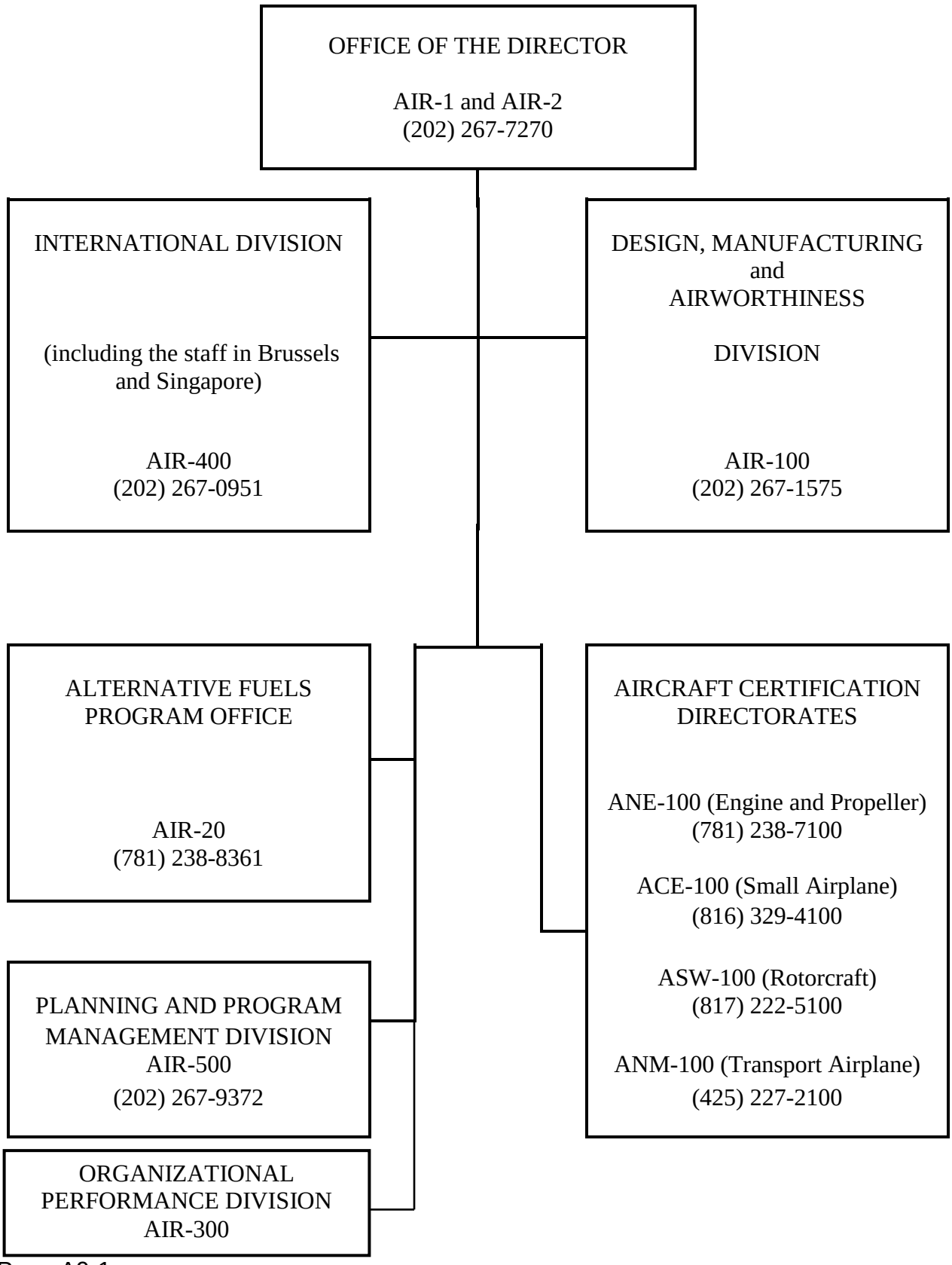
**12.** FAA Form 8110-31, Type Inspection Report

**13.** FAA Form 8120-10, Request for Conformity

**14.** FAA Form 8130-3, Airworthiness Approval Tag

**15.** FAA Form 8130-9, Statement of Conformity

# APPENDIX 9. AIRCRAFT CERTIFICATION SERVICE



# APPENDIX 10. DATA RETENTION

## FIGURE 1. PROJECT RECORDS

**(The ACO or MIDO must maintain these records, at an FAA facility, unless there is a data retention agreement in place.)**

- Type certificate (TC) application (FAA Form 8110-12), including all preliminary data or drawings and cover letter
- Certification Project Notification (CPN)
- Minutes of Type Certification Board (TCB) meetings (familiarization, preliminary, interim, pre-flight, and final)
- Certification Project Plan (CPP)
- Equivalent Level of Safety findings
- Special conditions
- Exemptions
- Findings of Compliance (FAA Form 8110-3s) and approval letters
- Requests for Conformity (FAA Form 8120-10) and Statements of Conformity (FAA Form 8130-9)
- Conformity Inspection Record (FAA Form 8100-1)
- Airworthiness approval tags (FAA Form 8130-3) issued for conformity
- Certification Plan
- Completed compliance checklist
- Type Inspection Authorization form (FAA Form 8110-1)
- Type Inspection Report (FAA Form 8110-31) and Supplemental Type Inspection Reports (FAA Form 8110-26)
- Application for Airworthiness Certificate (FAA Form 8130-6)
- Special Airworthiness Certificate and Operating Limitations
- Aircraft Evaluation Group’s correspondence
- Chief Scientist and Technical Advisors’ correspondence
- Significant correspondence with the CMACO
- FAA approval of test and analysis reports
- Flight manual approval page
- Approval letter for Airworthiness Limitations Section
- Approval of referenced Master Drawing List
- Type Certificate Data Sheet (TCDS)
- Copy of TC (FAA Form 8110-9) or STC (FAA Form 8110-2)
- Certification Summary Report (CSR)
- Statement(s) of Compliance
- For import products, FCAA compliance statements as well as all required import product records.

# APPENDIX 13. ADMINISTRATIVE INFORMATION

**1. Distribution**. Distribute this order to the branch level in Washington headquarters, branch levels of the Aircraft Certification Service; the branch levels of the regional aircraft certification directorates; branch level of International Division; all aircraft certification offices (ACO); aircraft evaluation groups, and chief scientific and technical advisors.

**2. Authority to Change This Order.** The issuance, revision, or cancellation of the material in this order is the responsibility of the Certification Procedures Branch (AIR–110).

**3. Suggestions for Improvement.** If you find deficiencies, need clarification, or want to suggest improvements to this order, send FAA Form 1320-19, Directive Feedback Information to the Directives Management Officer at 9-AWA-AVS-AIR-DMO@faa.gov or complete the form online at https://ksn2.faa.gov/avs/dfs/Pages/Home.aspx . You can also send a copy to the Design, Manufacturing, & Airworthiness Division, AIR-100, Attention: Comments to Order 8110.4C. If you urgently need an interpretation, contact the Certification Procedures Branch, AIR-110, at 202-267-1575. Always use Form 1320-19 to follow up each verbal conversation.

**4. Records Management.** Refer to Orders 0000.1, FAA Standard Subject Classification System; and 1350.14, Records Management or your office Records Management Officer or Directives Management Officer for guidance regarding retention or disposition of records.

U.S. Department
of Transportation

**Federal Aviation
Administration**

**Directive Feedback Information**

Please submit any written comments or recommendations for improving this directive or suggest new items or subjects that should be added to it. If you find an error, please tell us about it.

Subject: Order 8110.4C, Change 6

To: Directive Management Officer, at 9-AWA-AVS-AIR-DMO@faa.gov or complete the form online at https://ksn2.faa.gov/avs/dfs/Pages/Home.aspx .

(*Please check all appropriate line items)*

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ I recommend paragraph _____ on page _____ be changed as follows:
*(attach separate sheet if necessary)*

☐ In a future change to this directive, please include coverage on the following subject:
*(briefly describe what you want added)*

☐ Other comments:

☐ I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____

FTS Telephone Number: _____ Routing Symbol: _____

**FAA Form 1320–19** (dated 10/98)