1. OBJECTIVE

The objectives of this procedure are:

1.1. To outline the process, procedures, and responsibilities for issuing a Supplemental Type Certificate (STC) by the CAAI.

1.2. To prescribe the responsibilities and procedures for CAAI aircraft certification personnel for the issuance of a Supplemental Type Certificate in accordance with the Air Navigation Law, 2011 and Chapter 5 of the Air Navigation Regulations (Procedures for Documentation of Aircraft and Aircraft Parts), 1977 (**hereinafter** – **ANR.DOC**).

2. GENERAL

2.1. The issuing of a Supplemental Type Certificate is performed by the CAAI Engineering Department, which is part of the CAAI Airworthiness Division.

2.2. The methods used by CAAI concerning the type certification activities are based on FAA Order 8110.4, as adapted to Israeli law and to the CAAI organization.

2.3. This procedure describes procedures for typical modification projects. Unusual or complex projects may require deviations from these procedures, as determined on a case by case basis.

2.4. Early and frequent coordination of the applicant for certification with the CAAI is critical on all projects.

2.5. Applicability

2.5.1 The relevant type of design approval for certification purposes is determined by the magnitude and complexity of the proposed change to the certified type design. Changes are categorized as minor or major per regulation 34 of ANR.DOC.

2.5.1.1 **Minor changes** are those that do not appreciably affect weight, balance, structural strength, reliability, operational characteristics, airworthiness characteristics, or emissions [1].

2.5.1.2 **Major changes** are those that are not minor.

2.5.2 Changes to type design are processed in two possible routes:

2.5.2.1 A TC holder may apply for an amendment to the the approved TC, following the requirements of chapter 4 of ANR.DOC and the process detailed in CAAI directive ENG 1.4.016 (Introduction of Design Changes to Type Certificated Aircraft).

2.5.2.2 Any person (not necessarily the holder of an approved Type certificate) wishing to gain approval for design changes to a type certificated aircraft may apply for an STC following the

[1] While emissions certification of aircraft in the type certification process is implemented in Israeli Air Navigation Regulations through adoption of FAR title 14 part 34 as the part of the airworthiness requirements (see regulation 1 of ANR.DOC), the specific requirement for regulating emissions changes to type design proposed by the applicant is not currently directly implemented in ANR.DOC. The CAAI is acting to amend the regulations to reflect the changing requirements for STC applicants.

requirements of chapter 5 of ANR.DOC and the process detailed in this document.

2.5.3 The type of CAAI approval is applicable to a specific modification. Supplemental Type Certificates (STC) are required for most major changes to existing Type Certificated (TC) products affected by the modification or installation, when the change is not so extensive as to require a new TC (as defined in regulation 7 of ANR.DOC). A STC will probably be required if a significant amount of analysis or flight tests are required, or if extensive flight manual changes are necessary.

2.5.4 A STC will normally be required to authorize the installation of identical self-manufactured replacement and modification parts as specified in regulation 95 (b)(2) of ANR.DOC only if the installation represents a major change to type design. However, even for installation of replacement parts not constituting a major change, a STC may be deemed necessary because of the existence of unique circumstance. One example of this is a when special instructions are deemed necessary for the installation of a replacement part.

2.5.5 An STC will <u>not</u> be issued to:

2.5.5.1 Approve minor changes, or for approval of self-manufactured replacement and modification parts (unless the installation of such parts itself constitutes a major change to the type design).

2.5.5.2 Approve design changes to Aeronautical Product Approval (ITSOA, equivalent to FAA TSO) approved articles unless the ITSOA is invalidated for the modified article. A STC which includes installation of an ITSOA article must encompass installation requirements.

2.5.5.3 Combine two or more approved STCs, provided that the combination does not require additional showings of compliance with airworthiness requirements.

2.5.6 The need for A STC involving an import product will be addressed on a case-by-case basis, depending on the extent of airworthiness agreements in place and the available assistance provided by the State of Design.

2.5.7 More than one STC may be necessary for a given modification. For example: one STC may be required to approve a change to an engine or propeller, while a second STC may be necessary to approve the aircraft installation of the modified engine or propeller.

2.6. STCs are classified as either a “one-only” STC (aircraft/engine/propeller) or a “multiple” STC (aircraft/engine/propeller):

2.6.1 **One-only STC** apply to only one aircraft/engine/propeller serial number as designated on the STC.

2.6.2 **Multiple STC** is necessary if two or more aircraft/engine/propellers are to be modified. Eligibility for a multiple STC requires the additional demonstration that the modification can be duplicated.

2.7. Certain types of STCs may limit or change the aircraft classification to Restricted Category.

2.8. KEY ASPECTS OF THE STC APPLICATION PROCESS

2.8.1 The applicant's responsibility for substantiating the modification is accomplished by showing the CAAI that the modified aircraft/engine/propeller complies with the applicable regulations and certification airworthiness requirements.

2.8.2 Certification airworthiness requirements are specified in regulation 1 of the Regulations. Those regulations relevant to a particular STC are determined in accordance with regulation 38 of ANR.DOC. For additional guidance regarding determining the applicable regulations regarding a particular STC certification project, refer to para. 5.3.2 of this document.

2.8.3 Timing/scheduling needs necessary for obtaining CAAI approval varies with the complexity of each modification. The project schedule should be submitted and coordinated with CAAI as early as possible, in order to allow for appropriate resource allocation and coordination.

2.8.4 The scheduling of flight tests has the added complication of weather. Proposed changes to the schedule should be kept to a minimum and provided to the CAAI immediately, for concurrence.

2.8.5 At the CAAI discretion, authorized designees may be empowered to approve data, conduct inspections, witness tests, etc., in order to expedite the approval of a modification.

2.9. Privileges associated with the issuance of an STC

2.9.1 A Standard Airworthiness Certificate may be granted to an aircraft modified in accordance with the STC.

2.9.2 Multiple installations may be achieved on any certificated aircraft, in accordance with the STC.

2.9.3 Parts Manufacturer Approval (PMA) may be obtained by the STC holder to manufacture and sell parts/kits, when the applicant has demonstrated to the CAAI that he has established a Fabrication Inspection System which complies with the requirements of chapter 10 of the ANR.DOC.

NOTE: For Parts Manufacturer Approval the STC must be a Multiple Installation type STC (see Para. 2.6.2).

2.10. **Responsibilities of the STC holder** - an STC holder is required to

2.10.1 - accomplish the modification or installation only in accordance with the STC, and the reporting of any failures, malfunctions, or defects to the CAAI per regulations 64 and 66 of ANR.DOC.

2.10.2 - for as long as the STC certification is valid, maintain an updated design data file.

3. Reference Material & Forms

3.1. Regulations:

3.1.1 Paragraphs 50, 51 and 54 of the Air Navigation Law, 2011;

3.1.2 Chapters 4 and 5 of the Air Navigation Regulations (Procedures for Documentation of Aircraft and Aircraft Parts), 1977;

3.1.3 Regulations 7, 64, 66, and 84 of the Air Navigation Regulations (Procedures for Documentation of Aircraft and Aircraft Parts), 1977;

3.1.4 Air Navigation Regulations (Aircraft Noise), 1977;

3.1.5 US 14CFR (FAR) Parts 23 to 35;

3.2. CAAI procedures:

3.2.1 CAAI Procedure MFG 1.4.002– Conformity Inspection;

3.2.2 CAAI Procedure MFG 1.4.001 – Certification of Production Approval Holders

3.2.3 CAAI Procedure ENG 1.4.012 – Continued Airworthiness;

3.2.4 CAAI Procedure MFG 1.4.005– Initial Airworthiness Determination

3.2.5 CAAI Procedure ENG 1.4.014 – Type Certification Flight Tests

3.2.6 CAAI Procedure ENG 1.4.029 – Type Certification;

3.3. Additional guidance:

3.3.1 SAE CMH-17 – Composites Materials Handbook;

3.3.2 FAA AC 21-40 – Guide for Obtaining a Supplemental Type Certificate;

3.3.3 FAA AC 23-8C - Flight Test Guide for Certification of Part 23 Airplanes;

3.3.4 FAA AC 25–7, Flight Test Guide for Certification of Transport Category Airplanes;

3.3.5 FAA AC 29-2C - Certification of Transport Category Rotorcraft;

3.3.6 FAA AC 43.13-1B - Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair;

3.3.7 FAA AC 43.13-2B - Acceptable Methods, Techniques and Practices - Aircraft Alterations;

3.3.8 FAA Order 8110.4 - Type Certification;

3.3.9 FAA MMPDS - Metallic Materials Properties Development and Standardization;

3.3.10 RTCA DO-178 - Software Considerations in Airborne Systems and Equipment Certification;

3.4. Forms:

3.4.1 CAAI Form 312 Application for Type Certificate, Production Certificate, or Supplemental Type Certificate,

3.4.2 CAAI Form 8100-1 - Conformity Inspection Record.

3.4.3 CAAI Form 8110-1 - Type Inspection Authorization.

3.4.4 CAAI Form 8120-10 - Request for Conformity Inspection.

3.4.5 CAAI Form 8130-9 - Statement of Conformity.

4. METHOD

5. THE STC PROCESS

5.1. GENERAL

5.1.1 The STC issuing process includes four basic steps:

(1) CAAI evaluation of the submitted application and design data;

(2) Inspection and testing of parts, components, and subassemblies;

(3) Inspection and testing of the complete assembly, modification and installation; and

(4) Issuance of the STC.

NOTE: for a detailed STC Application Process Outline and a flowchart describing the process, refer to Appendices 1 & 2 of this document.

5.1.2 The design feasibility should be discussed with the CAAI Engineering Department prior to initiating aircraft modification , to determine if the proposed modification design is feasible for approval. An unapproved modified aircraft may be subject to grounding and Airworthiness Certificate revocation.

5.1.3 The following paragraphs describe the STC issuing process for an aircraft. The process would be similar for an engine or a propeller.

5.2. SUBMITTAL AND EVALUATION OF APPLICATION AND DATA

5.2.1 Data submittals are to contain sufficient descriptive and substantiating/compliance data to completely describe the design of the modification or installation, and demonstrate that the design complies with the applicable regulations. For additional guidance on data types and their submittal requirements, refer to appendix 5, part 1 of this document.

5.2.2 CAAI Form 312 should be submitted to the CAAI Engineering Department Manager along with an accompanying letter that includes:

5.2.2.1 A description of the project;

5.2.2.2 The type of aircraft involved;

5.2.2.3 A tentative schedule for completion of the project;

5.2.2.4 Planned locations of the design and installation;

5.2.2.5 A letter from the applicant authorizing use of specific agents to represent the applicant (when applicable);

5.2.2.6 A statement that a project initiation meeting is needed or desired, if the applicant deems such a meeting necessary.

5.2.3 Along with form 312, the applicant should submit a Certification Plan to the CAAI for approval, containing the following information:

5.2.3.1 "General Information", including –

5.2.3.1.1. Identification of the applicant, application date, aircraft model designation, etc.;

5.2.3.1.2. The certification basis, such as the applicable 14CFR (FAR) Part 23-35 sections, and any relevant amendments thereof , applications for exemptions, and special conditions;

NOTE: Identification of the applicable regulations may require assistance from the CAAI Project Manager, and is not expected to be approved at this stage. For further guidance regarding the determination of the applicable regulations, see article 5.3.2 of this Procedure.

5.2.3.1.3. For each requirement in the certification basis - the compliance method to be demonstrated (by test, analysis, similarity, etc.), including what data will be submitted in order to show compliance.

5.2.3.2 A "Project Schedule", identifying the planned dates of:

5.2.3.2.1. Major milestones;

5.2.3.2.2. Data and test plan submittals;

5.2.3.2.3. Conformity inspections;

5.2.3.2.4. Installations;

5.2.3.2.5. Tests; and

5.2.3.2.6. Project completion.

5.2.3.3 Identification of company employed Designated Engineering Representatives (DER) and Designated Manufacturing Inspection Representatives (DMIR), including their specialties and authority, who will be employed for the project[2].

NOTE: The approved certification plan can and often will be revised during the program duration.

5.3. Subsequent change to the original substantiating data should be submitted for approval and inclusion in the CAAI data files.

5.3.1 **Application processing:**

5.3.1.1 CAAI Engineering Department will establish a project identified by a unique project number, assign a project manager and establish a team (i.e. engineer(s), flight test personnel and manufacturing inspectors).

5.3.1.2 Within 10 working days after receipt of the application and certification plan, a letter of acknowledgment will be transmitted to the applicant, identifying the CAAI project number, project manager and project team, and the date of the project initiating meeting as appropriate.

5.3.1.3 The project manager and his team will review the Certification Plan and provide concurrence or comments to the plan on a Document Approval Status Report (DASR), as required.

5.3.1.4 Appendix 3 of this procedure contains a checklist aimed at easing the early stages of the certification project. Early use and communication of the checklist between the major project stakeholders (the applicant, the

[2] The purpose of the designee system is to provide CAAI assistance by designating applicant employees to act as representatives of the Administrator during the certification process. This may include examining, inspecting, and testing of aircraft, engines, or propellers, and approving or recommending approval of certain types of data, etc., for compliance with the requirements of the applicable regulations.

CAAI engineering department manager project manager and engineers, and the CAAI manufacturing inspector) is recommended.

5.3.2 Establishing Certification Basis:

5.3.2.1 An applicant for a change to a type certificate or for an STC must show that the change and areas affected by the change comply with the airworthiness requirements applicable to the category of the product in effect on the date of the application. As an exception, the CAAI may allow the applicant to show compliance with earlier amendments of the airworthiness requirements for changes that the CAAI deems not significant, for areas unaffected by the proposed STC, or in cases where CAAI engineering finds that compliance with the more updated amendment would not contribute materially to the level of safety of the product or would be impractical[3].

5.3.2.2 The certification basis as described is established in an iterative process between the applicant and CAAI, documented on successive revisions of the project certification basis document, and concluded on the "G-1 Certification Basis" issue paper.

5.3.2.3 Any Exemptions and Special Conditions applied during the project are an integral part of the project certification basis.

5.3.3 Design Data Evaluation:

5.3.3.1 The applicant should submit all required data to the CAAI project manager for review and approval. If data is modified or updated during the course of the project, the applicant should immediately contact the project manager and establish a time frame for formal submittal of the change(s) to the CAAI.

5.3.3.2 Test plans need prior approval by the CAAI Engineering Department and should include all necessary details such as test fixture, test articles (parts, components or subassemblies), final modification or installation tests, etc.

NOTE: Components and/or assemblies (including the test fixture and equipment) requiring conformity inspection should be identified in the test plan.

5.3.3.3 Throughout this stage, CAAI coordination will only be with the applicant or agent Identified on CAAI Form 312, unless otherwise indicated in a specific authorization by the applicant.

NOTE: The applicant is responsible for coordinating any CAAI requirements with the applicant's vendors and subcontractors.

5.3.3.4 CAAI will review the data for compliance with the applicable regulations, and the project manager will notify the applicant of the

[3] Regulations 40 and 38 of ANR.DOC detail the process of determining the applicable airworthiness requirements for a change to a TC and an STC, respectively. According to Regulation 40 of ANR.DOC (which refers the applicant for an STC to the applicable airworthiness requirements listed in regulation 38 of ANR.DOC), the applicable airworthiness regulations a proposed STC must show compliance with are the airworthiness regulations at the date of application for the original TC, as amended on that date. However, for those areas where CAAI finds that the TC regulations amendment level does not assure a high enough level of safety – the amendment level at the date of STC application apply. Regulation 38 is based on a previous version of the corresponding FAR 21.101. The FAA has since updated its policy and text of the far 21.101 regarding establishing the certification basis, and the CAAI has adopted the change. (see appendix 6 for the new text of FAR 21.101).

data approval status (In review, Approved, Not approved, etc.) and any relevant comments on an appropriate DASR.

5.3.4 **Initial Airworthiness Determination**

5.3.4.1 The CAAI has full responsibility for ensuring that each aircraft, for which an airworthiness certificate is issued, conforms to its type design and is in a condition for safe operation.

5.3.4.2 Therefore, sufficient CAAI inspections of each aircraft must be conducted by the certificating inspector or authorized designee, prior to commencing any STC modification to ensure traceability from the manufacturer's initial Export Certificate of Airworthiness, or the original Standard Airworthiness Certificate, to the present time.

5.3.4.3 Determination of initial airworthiness of the aircraft shall be initiated by the STC certification project engineer, and shall be performed by CAAI manufacturing department in accordance with CAAI procedure MFG 1.4.005.

5.4. INSPECTION AND TESTING OF COMPONENTS AND SUBASSEMBLIES

5.4.1.1 Prior to completion of the modification or installation, it may be necessary to inspect and/or test detail parts, components, and/or subassemblies to verify conformity to the design data and compliance with applicable regulations. This is especially true when the item will be inaccessible for inspection after installation is complete. For additional guidance regarding inspections and tests, refer to appendix 5 parts 2 and 3, respectively, of this procedure.

5.4.2 Conformity inspection

5.4.2.1 The CAAI project manager will issue requests for conformity inspections to the Head of the CAAI Manufacturing Department (on CAAI Form 8120-10) for individual articles (i.e. detail parts, components, subassemblies, test articles, etc.) as necessary.

NOTE: The conformity inspection request should only be issued after the design data has been approved by the CAAI Engineering Department.

5.4.2.2 The applicant should submit a Statement of Conformity on a CAAI Form 8130-9, after performing his own conformity inspections and complying with regulation 15(c) of ANR.DOC. The applicant should concurrently arrange for CAAI conformity inspection, and CAAI witnessing of certification testing.

NOTE: Submission of this form is called out on the Type Inspection Authorization.

5.4.3 The CAAI Manufacturing engineer or designee will conduct all necessary conformity inspections in accordance with CAAI procedure CAAI 1.4.002 Conformity Inspections.

5.4.4 Compliance Testing

5.4.4.1 Upon completion of the conformity inspections the applicant will conduct the test per the pre-approved test plan. The CAAI engineer or authorized DER shall witness all tests and conduct any necessary compliance inspections.

5.4.4.2 The applicant should submit test reports and substantiating data for all certification testing, as well as any further data necessary to demonstrate compliance with ANR.DOC.

5.4.4.3 The CAAI engineering certification team will evaluate the test reports and substantiating data for compliance with the applicable regulations. When it is determined that these reports and data comply, approval will be granted and reported by DASR.

5.4.4.4 In addition to the design data, CAAI approval is also required for any proposed revision of the aircraft Instructions for Continued Airworthiness and Airworthiness Limitation Section (ALS) of the Aircraft Flight Manual (in accordance with procedure ENG 1.4.015 AFM Approval.

5.5. INSPECTION AND TESTING OF COMPLETE ASSEMBLY AND INSTALLATION

5.5.1 When the modification or installation is complete and all data has been approved, all required inspections and tests should be performed on the final article. These inspections and tests will be called out on the Type Inspection Authorization (TIA) (CAAI Form 8110-1), and must be satisfactorily completed before the STC can be issued.

NOTE: In the event of a non-complex project, where a TIA is not required, a request for installation conformity on CAAI Form 8120-10 will be issued by the CAAI project manager to the CAAI production department manager.

5.5.2 Inspections are performed for conformity and compliance. Compliance Inspections verify that the modification complies with applicable regulations, and Conformity Inspections verify that the modification conforms to the approved design data and are performed as described above in subchapter 5.4 (Applicant submittal of statement of conformity, project manager requesting conformity inspection, and conformity report by manufacturing inspector). For additional guidance regarding inspections and tests, refer to appendix 5 parts 2 and 3, respectively, of this procedure.

5.5.3 Component or Certification Tests may be required to demonstrate that the modification complies with applicable regulations. For this purpose, testing of parts, components or subassemblies may be required.

5.5.4 Ground and flight tests are also required in order to demonstrate that the completed modification or installation complies with regulations.

5.6. Compatibility determination:

5.6.1 A new design change must be shown to be compatible with related previous design changes, to assure continuing compliance with applicable

airworthiness requirements. Reliance on previously approved changes should be described in the submitted design data.

5.6.2 Relevant engineering department specialists should be consulted when a proposed major design change is likely to affect critical aircraft characteristics (i.e., stall characteristics, aft C.G. limits, etc.).

5.6.3 If the STC is on an imported product and the change is likely to affect critical characteristics, the CAAI may contact the original Type Certificating Authority for assistance.

5.6.4 The applicant should submit proposed Aircraft/Rotorcraft Flight Manual Supplement (AFMS/RFMS) and flight test plan to the CAAI for evaluation by the CAAI Test Pilot.

5.6.5 The applicant should conduct company and certification flight tests according to the CAAI approved flight test plan.

NOTE: Company and certification flight tests should be performed after the aircraft has been issued a Certificate of airworthiness in the Experimental Category for the purpose of "Research and Development" as per regulation 84(1) of ANR.DOC.

5.6.6 The applicant should complete all company flight testing prior to direct CAAI flight test involvement, to assure the design change complies with the applicable regulations.

5.6.7 The applicant should submit a flight test report to the CAAI for review after successful completion of his flight tests.

5.6.8 The applicant should submit a statement of conformity (CAAI Form 8130-9) and coordinate with the CAAI manufacturing department an installation conformity inspection.

5.6.9 CAAI will evaluate the applicant’s flight test report for compliance with regulation 15 of ANR.DOC and other relevant regulations. Upon approval of the report, CAAI certification testing, as requested in the TIA, may begin.

5.6.10 CAAI flight tests engineer will prepare and issue the TIA after coordination with each appropriate engineering discipline, manufacturing inspector and, if applicable, operations personnel, and after finding that the technical data required for STC approval is complete or has reached a point where the aircraft's compliance with the applicable regulations has been shown.

5.6.11 All required installation conformity inspections will be conducted by the CAAI (or authorized designees) as called out in the TIA or Request for Conformity. Satisfactory completion of these inspections is necessary for TIA testing to begin. Conformity Inspection results are recorded on a Conformity Inspection Record (CAAI Form 8100-1).

5.6.12 The applicant should coordinate final CAAI compliance inspections and TIA ground and flight testing, as applicable, with the CAAI.

5.6.13 The final compliance inspections and testing (ground and flight), are conducted by the CAAI /applicant as called out in the TIA.

NOTE: Final Compliance Flight tests should be performed after the aircraft has been issued a Certificate of Airworthiness in the Experimental Category for the purpose of "Showing Compliance" as per regulation 84(2) of ANR.DOC.

5.6.14 The applicant should submit all final data upon completion of the CAAI final compliance inspections and testing to the CAAI project manager for review and approval. This data should include (but not be limited to) AFMS/RFMS, test reports, life limited parts etc.

CAAI will evaluate the final submitted data for compliance with ANR.DOC. If the modification involves a foreign manufactured aircraft and the CAAI does not have all the background data available to approve the modification, CAAI will approach the NAA of the State of Design and request assistance for approval of data. When it is determined that the data demonstrates compliance with ANR.DOC, final CAAI approval of the modification or installation will be granted.

5.7. ISSUANCE OF THE STC.

5.7.1 When all data, TIA required tests and the required inspections have been completed satisfactorily and approved by CAAI, an STC will be issued to the applicant.

Note: All appropriate project data will be kept by the applicant for the duration of the STC validity.

5.7.2 The CAAI, a CAAI designee, or the applicant will prepare the Supplemental Type Inspection Report (STIR), compiling results of the completed TIA inspections, tests, and evaluations. The Supplemental Type Inspection Report (STIR) should be completed within 90 days of certification issuance.

5.7.3

NOTE: If a CAAI designee or the applicant prepares the STIR, the CAAI must review and approve the report.

5.7.4 The STC will be signed by the CAAI engineering department manager.

NOTE: In many cases, the applicant may be informally notified of the final approval and STC number before the STC is officially signed by the engineering department manager.

5.8. RETURN TO SERVICE

The applicant's AMO must prepare a certificate of “release to service” of a product that has been altered, tested and approved as per an STC, in accordance with the applicable regulations of Air Navigation Regulations (Approved Maintenance Organization), 2013.

6. ADMINISTRATIVE ACTIONS

6.1. CANCELLATION OF PROJECT

Projects that are inactive for more than 6 months may be subject to CAAI notification of cancellation and returning of all submitted data, but may be pursued by resubmitting the application and data.

6.2. TRANSFERRING OWNERSHIP OF AN STC

In all cases of STC transfer the owner or authorized agent should endorse the back of the original STC, and submit it to the CAAI Engineering Department Manager or CAAI Project Manager. In the case of an STC issued to an organization, an affidavit certifying authorization to execute the transfer on behalf of the STC holder should be attached (Ref. CAAI Procedure ENG 1.4.029). Upon reception of the endorsed STC the CAAI will:

6.2.1 Cancel the endorsed STC and file it in the STC data file.

6.2.2 Reissue the certificate in the name of the new owner, retaining the same STC number, the original application data, and the new reissue data.

6.3. USE OF AN AVAILABLE STC

6.3.1 If the STC holder agrees to permit another person to use the STC to modify an aircraft, aircraft engine, or propeller, the holder must issue a statement of permission, in a form acceptable to the CAAI Engineering Department Manager, for each entity permitted to use the STC.

6.3.2 The permission statement should as a minimum contain the following:

6.3.2.1 A written statement of the agreement specifying product(s) to be altered;

6.3.2.2 The STC number;

6.3.2.3 The entity being given consent to use the STC.

Other information may be listed if the STC holder so desires such as; the effective date, how many times the STC may be used for fleets of aircraft, etc.

6.3.3 The installer, mechanic or repair station which has obtained permission from the STC holder to use the STC shall furnish a copy of the STC holder's permission statement to the modified product owner/operator before completion of the alteration.

6.3.4 A copy of each permission statement should be retained by the STC holders, installers or repair stations, and the owner/operator of the product on which an STC alteration is installed.

6.3.5 The following notification statement should be located on the front page of the STC under the "Limitations and Conditions" section, directly ahead of the statement "*This certificate and supporting data…*":

"*If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission*".

6.4. AMENDMENTS TO AN STC

6.4.1 "Multiple" STC's may be amended to add new models, revise data, etc. In these cases the certificate will be amended with the original STC number and date of amendment (recorded in the "Date of Amendment" field). A certificate will not be amended to add different modifications to the same type design.

6.4.2 "One-only" STC's will not be amended to become a "multiple" STC and new "One-only" STC's will not be issued for an identical modification. If the STC owner/applicant desires a "multiple" STC for the same type of "one-only" STC, he should upgrade the design and make application for a separate new "multiple" STC with a new STC number. As with any other "multiple" STC application, sufficient data should be submitted to verify that manufacturing and installation of the design may be duplicated on the additional aircraft, engines or propellers. See FAA Order 8110.4.

6.5. DURATION OF VALIDITY OF AN STC

An STC is effective until surrendered, suspended, revoked, or a termination date is otherwise established by the CAAI.

6.6. LOSS OF AN STC

CAAI should be immediately notified in writing by the STC owner of the circumstances of the loss of an STC. A duplicate STC will be issued retaining the original number. A statement on the face of the STC will identify it as a replacement. If the original certificate is later found, it should be returned to the CAAI for processing and retention in the STC records. Under no circumstances should two original certificates exist with the same STC number.

APPENDIX 1: STC APPLICATION PROCESS OUTLINE

Phase I SUBMITTAL AND CAAI EVALUATION OF APPLICATION AND DATA

- Applicant submits application;
- Applicant submits certification plan including certification basis (as required by CAAI);
- CAAI establishes project;
- CAAI reviews and approves certification plan;
- Applicant submits data;
- CAAI reviews data, grants exemptions and issues special conditions as required..

Phase II INSPECTION AND TESTING OF COMPONENTS AND SUBASSEMBLIES

- CAAI issues individual requests for conformity inspection;
- Applicant makes arrangements and coordinates inspections and tests;
- CAAI conducts/delegates conformity inspection;
- Applicant conducts/CAAI witnesses certification data;
- CAAI evaluates test reports and substantiating data.

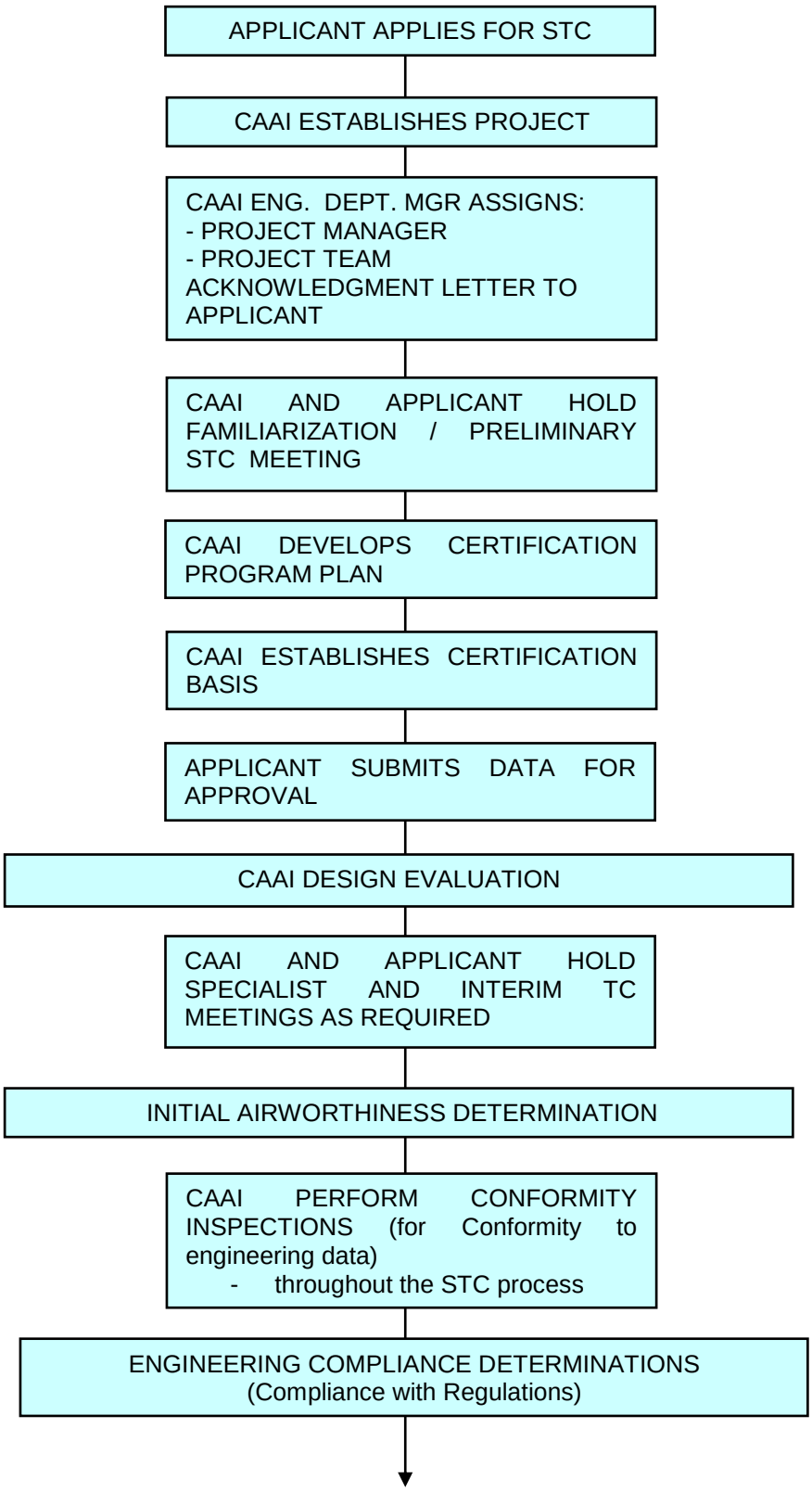
Phase III INSPECTION AND TESTING OF COMPLETE ASSEMBLY AND INSTALLATION

- Applicant submits proposed AFM/RFMS and flight test proposal;
- CAAI evaluates proposed AFM/RFMS and flight test proposal;
- CAAI prepares TIA/request for Conformity (installation);
- Applicant makes arrangements for installation conformity inspection;
- CAAI conducts installation conformity inspection;
- Applicant completes company development flight tests;
- Applicant submits flight test report;
- CAAI evaluates flight test report;
- Applicant makes arrangements for final inspections and tests per the TIA;
- Applicant submits all final data;
- CAAI evaluates final data.

Phase IV ISSUANCE OF THE STC

- CAAI prepares STIR;
- CAAI issues STC;
- CAAI finalizes STIR;
- STC data kept by applicant under agreement with CAAI;
- Project closed.

APPENDIX 2: FLOWCHART OF THE STC PROCESS



(Continued on next page)

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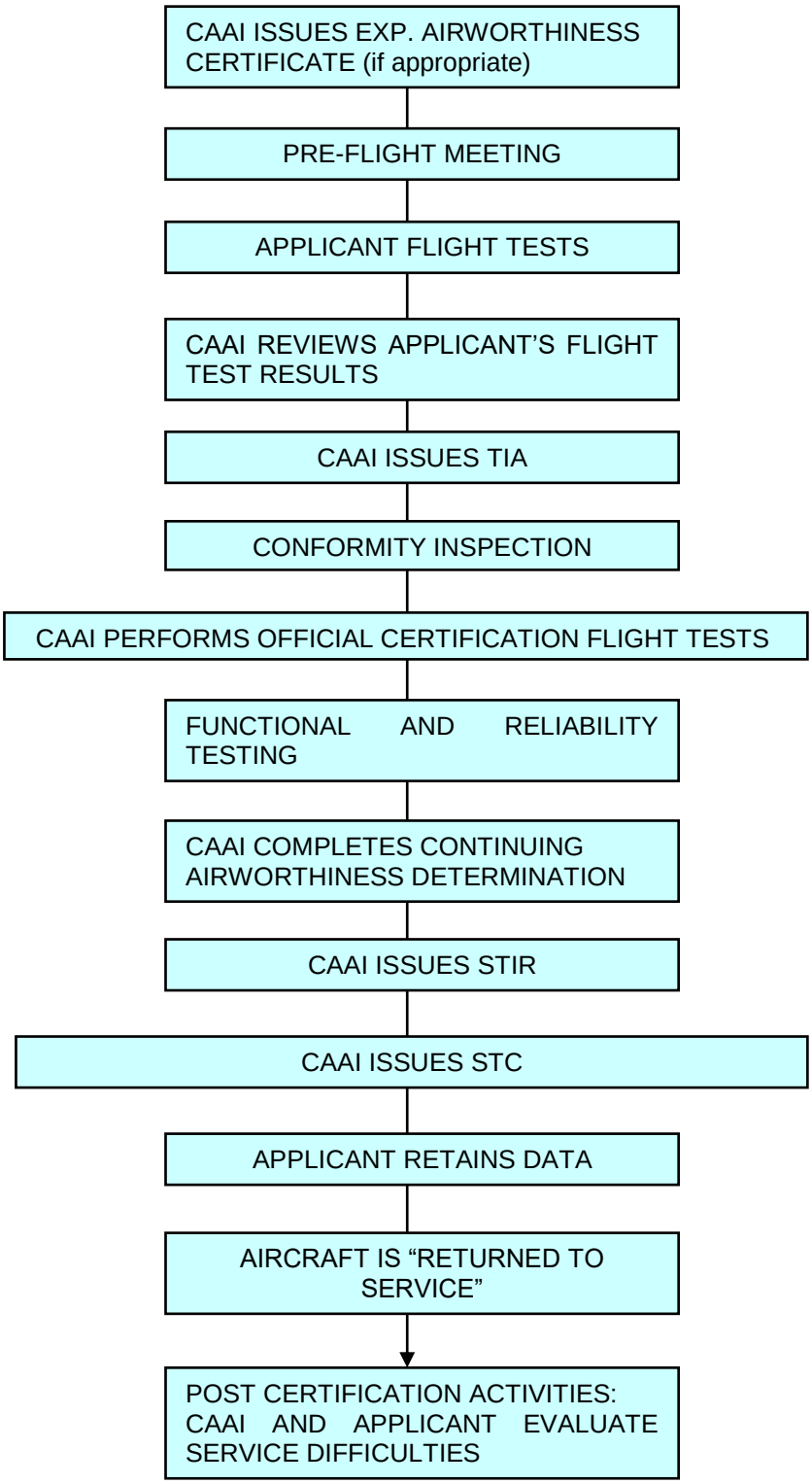
CAAI ISSUES EXP. AIRWORTHINESS CERTIFICATE (if appropriate)
PRE-FLIGHT MEETING
APPLICANT FLIGHT TESTS
CAAI REVIEWS APPLICANT'S FLIGHT TEST RESULTS
CAAI ISSUES TIA
CONFORMITY INSPECTION
CAAI PERFORMS OFFICIAL CERTIFICATION FLIGHT TESTS
FUNCTIONAL AND RELIABILITY TESTING
CAAI COMPLETES CONTINUING AIRWORTHINESS DETERMINATION
CAAI ISSUES STIR
CAAI ISSUES STC
APPLICANT RETAINS DATA
AIRCRAFT IS "RETURNED TO SERVICE"
POST CERTIFICATION ACTIVITIES: CAAI AND APPLICANT EVALUATE SERVICE DIFFICULTIES

APPENDIX 3: STC APPLICANT/CAAI PROJECT INITIATION CHECKLIST

The purpose for this checklist is to clearly communicate early in the certification process the requirements that must be fulfilled for an STC to be issued. The contents of this checklist should be communicated between the applicant and the CAAI Engineering Department Manager, the project manager and engineers, and the CAAI Manufacturing inspector at the minimum:

1.1. Is the application complete?

1.2. Is there anticipation of expanding the model applicability of the STC? If so is there anything that can be done on the initial certification that will make expansion of the STC easier at a later date?

1.3. Is the STC going to be “multiple” or will it be a “one-only”? If the STC is a “one-only” the aircraft make, model, and serial number should be provided.

1.4. Will the kits be for sale? If so, installation instructions will be necessary so that anyone obtaining a kit will have enough information for installation. What is the manufacturing inspection system?

1.5. Is there a requirement for generating instructions for continued airworthiness?

1.6. Is there an existing STC that could be used instead of going to the trouble of applying for a new one?

1.7. What is the Applicant’s/CAAI schedule?

1.8. Where will modification of the aircraft take place?

1.9. Will any parts be fabricated outside of the applicant’s facility? If so, what kind, where and when will they be made? Qualification and conformity will be required.

1.10. What is required for the conformity inspection process? The applicant has the responsibility to properly record their conformity inspection on CAAI Form 8100-1 prior to CAAI conformity inspection. It is necessary to submit of CAAI Forms 8130-9 and 8120-10 as early as the project progress allows. Drawings must be CAAI/DER approved prior to requesting conformity inspection.

1.11. What kind of drawing system will be used? The drawing system used should: contain a drawing list; provide information required for the various types of drawings (i.e. detail component, assembly, and installation); completely describe the modification; list the materials and applicable specifications for processes such as heat treatment, protective coatings etc. used; and provide the dimensions in enough detail to accomplish the modification. Any special process specifications (composite materials, etc.) used should be documented reviewed and approved by the CAAI. New processes may require demonstration to a CAAI inspector. Materials used, material specification and suppliers of materials should be listed.

1.12. Will designees be used on the program? Identify the name, number and type of designees to be used. Explain the purpose of utilizing designees.

1.13. What types of tests are anticipated? Test plans, conformities for setups and witnessing of tests, applicant versus CAAI tests, and (if applicable) certifying the aircraft in the experimental category.

1.14. Will special instructions be necessary to tell the pilot how the modified aircraft will now operate? If so, an AFMS/RFMS will need to be prepared.

1.15. It is the applicant's responsibility to establish a certification test plan and compliance check list, and to determine that the modification meets all applicable airworthiness standards.

1.16. Is the project significant? Are issue papers, technical meetings required? What is the certification basis for the modification? Are any special conditions anticipated? (e.g. High Intensity Radiated Fields - HIRF)

1.17. What data must be submitted prior to issuance of, and how is the TIA and STIR used.

1.18. What guidance material is available? (i.e. guides, AC's, Orders, Notices, handouts, etc.).

1.19. What can be done to the aircraft while in modification/conformity process?

1.20. What is the potential for the alteration impacting noise requirements and what are resources required to show compliance with noise requirements?

1.21. Is a document list, with revision levels and approval dates, consisting of safety analysis, test reports and software documents, etc., submitted?

APPENDIX 4: SAMPLE CERTIFICATION PLAN

I. Introduction.

II. System Description.

III. Certification Requirements:

- ANR and 14CFR parts;
- System special requirements, unique or novel aspects;
- Compliance checklist.

IV. Method of Compliance:

- Analyses – failure, safety, performance, etc.;
- Tests – qualification, flammability, laboratory, simulator, ground, flight, etc.;
- Software compliance;
- Design.

V. Functional Hazard Assessment Summary:

- System criticality;
- Software criticality;
- Functional failure conditions summary.

VI. Operational Considerations (if required):

- MMEL – Master Minimum Equipment List;
- FCOM – Flight Crew Operating Manual.

VII. Certification Documentation.

VIII. Certification Schedule:

- Descriptive data submittal;
- Substantiating data submittal;
- Test schedule, including TIA;
- Conformity inspection schedule;
- Compliance inspection schedule;
- Final approval.

IX. Use of Designees and Identification of individual DER.

Appendix 5 – Additional Guidance

1. DATA

1.1. Data submitted to the CAAI should demonstrate that the modification to a TC aircraft, engine, or propeller complies with the appropriate regulations. This data should be obtained, organized and submitted by the applicant to the CAAI for review and approval.

1.2. The required design data can be divided into two major categories: descriptive data, and compliance (or substantiation) data.

Descriptive data defines the design of the modification.

Compliance data substantiates that the design meets the applicable regulations.

1.3. All submitted data must be identified in an appropriate manner. This includes the document title, drawing or report number, revision level, date of issue, and applicant's name. Each page of a report should contain enough of this information for complete identification. Preferably, the CAAI project number should also be identified.

1.4. Descriptive data requirements for "one-only" STC's might differ from those for "multiple" STC's. However, the SAME LEVEL OF SAFETY IS REQUIRED for either type of modification.

1.5. Data to be submitted to the CAAI should comply with the following requirements, in accordance with regulation 13(2) of the ANR:

1.5.1 All descriptive and substantiating data is checked for completeness and accuracy of information.

1.5.2 The design data and the modified aircraft comply with the applicable regulations; this will be verified by the CAAI.

1.5.3 The descriptive data conforms to the actual configuration of the modification, and all stress analyses, test proposals, and test results are based on the descriptive data.

1.5.4 The data describing and substantiating the modification is properly identified, presented in an orderly fashion, and clearly states the manner in which it contributes to the finding of compliance.

1.6. DESCRIPTIVE DATA

1.6.1 In general, descriptive data should completely define, or describe, a given design. The data may include drawings, sketches, marked photographs, process specifications, or any other form necessary for this purpose. The data will be verified by the CAAI for compliance with the applicable airworthiness regulations.

1.6.2 A "one-only" STC descriptive data package is applicable to one installation/modification on a single product (aircraft, engine or propeller) Serial Number. The relevant data package may consist of marked-up photographs, sketches with written descriptions, marked-up excerpts from

manufacturer's parts catalogs and maintenance manuals, and similar document excerpts. If descriptive data, other than engineering drawings are submitted, such data must be of sufficient quantity and quality to properly ascertain the nature of the modification. This includes positive definition of all critical equipment, parts, and attachments, including any components of the original aircraft that have been removed.

NOTE: Since part catalogs are not CAAI approved documents, standalone excerpts from these are not sufficient as proof of compliance with regulations.

1.6.3 A "multiple" STC descriptive data package should completely and accurately describe the fabrication, assembly, and installation of the modification. The data package should include: engineering drawings; material and manufacturing processes (incl. specifications and tolerances); data necessary for fabrication of all parts and assemblies; and installation drawings and instructions. In addition, the descriptive data must be adequate for reproduction of parts and/or installation of subsequent modifications on other serial numbers of the same model TC product.

1.6.4 Technical information should include the following, when applicable:

(1) Identification (title, drawing or report number, aircraft applicability, document revision level, date and applicant's name).

NOTE: When purchased Original Equipment Manufacturer or supplier parts, accessories and equipment are involved, whether new or used, the applicant should retain purchase orders or other acceptable documentation for traceability. This may include name plate identification, part number, revision letter, serial number, etc.;

(2) Materials used, identified by material specification or material test criteria and procedures;

(3) Fasteners used and their location. Rivets, bolts, nuts, screws or other fasteners identified by specifications or standard part numbers, such as Air Force or Navy Aeronautical Standard (AN), National Aerospace Standard (NAS), or Military Standard (MS), are acceptable;

(4) Dimensions including tolerances;

(5) Manufacturer and part number of purchased parts (i.e. vendor data);

(6) Process specifications;

(7) Ratings and power requirements of electrical equipment;

(8) Electrical load analysis of the installation;

(9) Weight and balance data of assemblies and equipment items to be installed and/or of the complete modification. This should include a complete list of parts added and/or removed and an updated aircraft equipment list;

(10) Installed placards;

(11) Changed or added instrument markings;

(12) Flight manual changes or supplements;

(13) New or amended Instructions for Continued Airworthiness (ICA);

(14) EMI/EMC, HIRF, Light Protection Reports;

(15) Qualification test procedures and reports;

(16) Software documentation;

(17) Analysis reports;

(18) Test plans; and

(19) Test reports.

1.6.5 The design of equipment or components to be installed, purchased and/or furnished, should be completely and positively defined. If the item is TSO or iTSO approved, the nameplate data may be adequate. Other equipment may require a source-control drawing identifying the equipment by manufacturer, part number, revision level, or any other necessary data. Installation instructions for the modification should include all pertinent information provided by the equipment's manufacturer.

1.6.6 The applicant should submit a Qualification Plan for CAAI approval. The plan should contain a list of all purchased equipment for each system of the product, and contain, as a minimum, the following information for each component:

(1) Drawing and/or part number;

(2) Description;

(3) Manufacturer;

(4) Requirement for Conformity Inspection;

(5) Acceptance Test Procedure (ATP);

(6) Qualification Test Procedure (QTP); and

(7) Qualification Test Results (QTR).

The need and level of qualification should be in accordance with the Functional Hazard Assessment (FHA) report that should be previously approved by CAAI. The FHA establishes the criticality level of each system and is reflected in each system's safety analysis.

NOTE: When a multiple STC kit is sold, it should contain an inventory of ALL parts and installation instructions.

1.6.7 Process specifications necessary for production of parts should be included in the descriptive data package. These specifications should include all materials, fabrication, and assembly procedures.

1.6.7.1 Industry standards and specifications include the latest revisions of AC 43.13-1 (Acceptable Methods, Techniques and Practices – Aircraft Inspection and Repair) and AC 43.13-2 (Acceptable Methods, Techniques and Practices - Aircraft Alterations); various Society of Automotive Engineers (SAE) aerospace standards; AN, MS and NAS specifications; and various military handbooks. If required by CAAI a copy of each standard and specification should be supplied as part of

the descriptive data package. Certain industry standard specifications may be developed.

1.6.7.2 Nonstandard specifications should include a complete and unambiguous definition of the materials to be used, detailed procedures, critical processes (e.g. temperatures, times, etc.), inspection criteria, rework limits, etc. The CAAI will review any nonstandard specification.

1.6.7.3 Installation instructions should be adequately identified with a document number and original issue/revision date, and should be complete enough to allow the installer to accurately duplicate the installation. Each page of the instructions should contain enough of this information for complete identification

1.6.7.4 A Flight Manual Supplement should be provided to the CAAI pilot if required by the modification, regardless of the method used to provide operating instructions to flight crew of the original aircraft.

1.7. SUBSTANTIATING/COMPLIANCE DATA

1.7.1 All appropriate project data will be retained by the applicant for the duration of the STC validity.

1.7.2 In general, substantiating and compliance data are intended to show compliance with applicable regulations. The data may include: compliance checklists; analyses; test plans and reports; and Instructions for Continued Airworthiness and operations.

An existing STC may be applied as part of the current STC project used, provided a letter of authorization from the original STC holder is obtained. A copy of this data and authorization letter should be submitted to the CAAI if relevant.

NOTE: If the CAAI engineering department has relevant tests or other engineering data available from previous approvals, it may waive the requirement for an applicant to conduct such tests or submit duplicate data for the STC application. The engineering department may use the relevant data for comparison purposes, but shall not disclose the data or its source to the current applicant. If the applicant uses data approved by a foreign authority, CAAI may approach the foreign authority to request support in verifying the authenticity of the data.

1.7.3 The compliance checklist specifies each applicable regulation and amendment and the method by which compliance will be shown (e.g. analysis, ground test, flight test, etc.). It provides a concise, easily reviewed program outline which assures that all pertinent certification regulations and their means of compliance are addressed. The compliance checklist should be prepared by the applicant after the certification basis is established. Each regulation should be evaluated for applicability to the proposed modification along with a method of showing compliance. The checklist can be updated later to identify the report, test, etc. used to show compliance. The identification of appropriate certification regulations may require assistance from the CAAI project team.

1.7.4 A basic loads analysis is necessary when the structure is modified or structural loads are changed. This establishes the applied loads (flight, ground, landing, etc.) determined from weight, center of gravity, power, and aircraft aerodynamic characteristics using design speeds, and load and safety factors specified in the certification basis. These loads, together with structural analyses and/or tests, can form the foundation used to provide the required structural substantiation only if experience has shown this method to be reliable. Ultimate load testing may be required in cases where limit load tests are deemed insufficient by the applicant or CAAI.

NOTE: Structural loads should be approved by the Engineering Department prior to stress analysis or test.

1.7.5 Structural analyses are employed to mathematically establish that the appropriate structural strength requirements have been met. These analyses are built on the basic loads and material allowable data and may include: static stress, fatigue behavior, fail safe or damage tolerance evaluations, etc. The applicant should assure that the analytical methods and assumptions used are applicable, that all pertinent loading conditions have been addressed, and that appropriate margins of safety have been shown for all structural elements.

1.7.6 Allowable material strength properties are established for the materials used in substantiating primary aircraft structure and the properties must be CAAI approved.

1.7.6.1 For metallic materials, the use of MMPDS handbook (formerly MIL-HDBK-5) data does not require CAAI approval, and is recommended. Other data may be acceptable.

1.7.6.2 For Nonmetallic materials, CMH-17 (formerly MIL-HDBK-17) Volume 2 data is recommended, but other established data may be acceptable or the development of data may be required. CAAI acceptance of CMH-17 data will often require proof of equivalency of the manufacturing process products to the quoted data.

1.7.7 Numerical analyses of structure may be performed with CAAI approval, by using computer programs that define and validate each computerized structural model based upon analysis routines and limit load tests.

NOTE: All computer programs used in any tests or analysis should be validated or previously approved by CAAI. Both stress and deflection

test results should match analysis predictions. Other validation methods may be employed when agreed to by CAAI.

1.7.8 Safety assessments evaluate the effects of foreseeable failures of the aircraft structure and/or systems. The depth and level of the assessment detail is dependent on the severity of the failure conditions, functions performed, and the complexity and novelty of the aircraft and/or modification or installation. Faults that are undetectable are presumed to exist at the same time as each other single fault. Any necessary action should be taken (system redesign, aircraft flight manual procedure changes, etc.) to correct unsafe conditions found as a result of the safety assessment. A safety assessment may also be required for individual aircraft systems.

1.7.9 Test plans and reports should be prepared for each required structural, component, ground, and flight test. Test plans should include conformity inspection requirements and should be submitted to the CAAI for approval prior to assembly and testing of test articles.

1.7.10 Instructions for Continued Airworthiness (ICA) describe any maintenance requirements necessary to maintain aircraft airworthiness and are provided in accordance with the applicable 14CFR part regulations for the aircraft category in question (i.e. sections XX.1529 of parts 23, 25, 27, and 29, sections 31.82, 33.4, or 35.4). Airworthiness Limitations Instructions (ALI) should also be provided.

NOTE: Instructions for Continued Airworthiness should be prepared and approved by CAAI in accordance with CAAI Procedure ENG 1.4.12.

1.7.11 The weight and balance manual, or Airplane/Rotorcraft Flight Manual (AFM/RFM) for the original type design, should be revised accordingly when modifications change the aircraft weight and balance properties and/or the operating limitations, procedures, performance, or loading instructions for the modified aircraft. The applicable weight and balance data should be CAAI approved and documented in a supplement to the original weight and balance report. The aircraft equipment list should be updated in the same manner.

1.7.12 Structural life limits are established based on fatigue test data with adequate safety factors applied. New structural life limits may be required when modifications change an aircraft designed according to the safe–life structural philosophy.

1.8. DRAWINGS

Drawings are a major portion of the descriptive data required for a multiple type STC. All drawings must be CAAI approved prior to acceptance and conformity inspections (Ref. regulation 14 of the ANR). For guidelines regarding the construction of a drawing package and checking the drawings prior to submission to CAAI see FAA AC 21-40, Section 5.

2. INSPECTIONS

2.1. GENERAL

Conformity and compliance inspections are required during STC projects.

2.2. CONFORMITY INSPECTIONS

These are performed by CAAI manufacturing inspectors according to CAAI Procedure MFG 1.4.005.

2.3. COMPLIANCE INSPECTIONS

These are required to verify that a particular component of a modification to an existing certificated design meets the requirements of the applicable regulations through a combination of specification review and physical inspection of the component, installation or aircraft. The CAAI Engineering Department coordinates and conducts these inspections, in accordance with CAAI Procedure ENG 1.4.029 para. 4.10.7.

2.3.1 PART MANUFACTURING APPROVAL (PMA) AND PRODUCTION INSPECTIONS

Performed by CAAI manufacturing inspectors according to CAAI Procedure MFG (?) 1.4.032.

2.3.2 TYPE INSPECTION AUTHORIZATION

According to CAAI Procedures ENG 1.4.014 and 1.4.029.

3. TESTS

3.1. GENERAL

Depending on the complexity of the project, several types of testing may be required for an STC. Prior to any certification testing the test plan must have been approved by the CAAI and the test article must have been the subject of a complete part and installation conformity inspection as described in previous paragraphs.

3.2. COMPONENT TESTS

Prior to completion of the modification or installation, testing may be necessary to verify that certain detail parts, components, or subassemblies comply with applicable regulations. Test plans for each certification test should be submitted to the CAAI for approval to preclude unnecessary or unacceptable tests. Upon approval of the test proposal, the CAAI project engineer will issue a Request for Conformity Inspection (CAAI Form 8120-10) for the test fixture and test article(s). The CAAI Manufacturing Department Manager will assign a manufacturing inspector to conduct the conformity inspection. The tests should then be witnessed by either the CAAI engineer or an authorized DER.

3.3. GROUND TESTS

3.3.1 Electromagnetic Interference (EMI), environmental, fuel flow, structural or similar ground tests may be necessary when the modification or installation is complete. A test plan for all tests should be submitted to the CAAI for review and approval prior to testing.

3.3.2 Aircraft that employ electronic engine controls (Full Authority Digital Engine Controls - FADEC) are recognized to be more susceptible to EMI than aircraft that have only mechanical (non-electronic) controls. For this reason, acceptable system performance should be attained by demonstrating that the critical function components of the system under consideration perform their intended function during and after exposure to required electromagnetic fields. Deviations from full system specifications may be acceptable, but these must be independently assessed and approved by the CAAI on a case by case basis.

3.4. FLIGHT TESTS

See CAAI Procedure 1.4.014.

3.4.1 Applicant flight tests precede issuance of the TIA. The CAAI will review the applicants flight test reports and may repeat some or all of the tests as necessary. These repeated tests will be identified and performed per the CAAI issued TIA.

3.4.2 CAAI will perform flight tests for modifications which could affect the aircraft's performance, flight characteristics, powerplant operation and/or overall handling qualities. Changes to systems, equipment, instrumentation, and flight manuals may also require flight tests. Any modification which may affect the noise signature and/or navigational abilities of the aircraft (including performance changes) will usually require flight testing.

The CAAI project flight test engineer can provide general information on the types of tests which may be required.

NOTE: Successful completion of the TIA required tests by the CAAI is one of the final steps to STC issuance.

3.4.3 Applicant testing

3.4.3.1 Research and development flight tests are performed to ensure that the design changes comply with the applicable regulations. The CAAI will not participate in or witness these tests. However, CAAI will discuss and provide general guidance so that such tests can be meaningful and safe.

3.4.3.2 Flight test plans are based on knowledge of the modification and development tests performed. The plan should be based on the certification basis and include a list of tests, instrumentation, safety equipment, data acquisition, and reduction methods. Upon approval of the descriptive and compliance data, the test plan, and after establishing conformity to the data, the CAAI will issue a TIA. CAAI flight test personnel should then be contacted to assure that potential hazards are recognized and that the required test methods and criteria are mutually understood.

NOTE: An applicant's flight test report should be submitted to CAAI for review upon successful completion of the inspection and test requirements equivalent to those required in the TIA.

3.4.4 CAAI testing may include repeating of tests, partially or in their entirety, to verify compliance with certification requirements. CAAI flight testing may be accomplished by a CAAI test pilot or an authorized DER flight test pilot.

3.4.5 Installation conformity inspection of the modified aircraft to be used for flight tests will be performed by the CAAI or CAAI designee prior to CAAI flight tests. If discrepancies are found they should be corrected, and any test which could have been influenced may require repetition before further CAAI tests.

3.4.6 Accuracy of the aircraft weight and center of gravity (CG) location is extremely important to assure the modified aircraft can be loaded to the critical weight and CG limits for flight testing. The aircraft to be used for flight tests should be weighed and witnessed by a CAAI representative before testing begins. The resulting weight and balance determination will be carefully checked by the CAAI and when found to be accurate will be used for all subsequent flight test weight and CG calculations.

3.4.7 Ballast necessary for flight testing should be securely restrained in such a manner as to withstand the inertial loads resulting from a survivable emergency landing. The preferred form of ballast is as small, solid pieces of a high density metal fixed to the structure or in a suitable container that is fixed. Using passengers as ballast is not acceptable.

3.4.8 Instrument calibration, when required, should be accomplished by an approved instrument repair inspector employed by an appropriately rated certified repair station, prior to the CAAI flight test program, with calibration cards provided. Instruments to be calibrated may include: altimeters, tachometers, temperature gauges, airspeed indicators, etc.

3.4.9 Calibrations should be performed within 3 months prior to the test. On critical items, this requirement may be reduced to 30 days.

NOTE: Typically, the entire airspeed system is calibrated before flight testing.

3.4.10 Rapid emergency egress provisions will be demonstrated to the CAAI inspector and test pilot for acceptability prior to CAAI flight tests. Parachutes will be provided to the CAAI if so required.

3.4.11 Experimental airworthiness certificates are issued before operation of any aircraft which does not have a valid TC, or does not conform to its TC. Although the operations may eventually lead to a TC they may be conducted only under provisions of research and development or in order to show compliance to the appropriate regulations.

3.4.12 Experimental airworthiness certificates required for flight tests are issued by the CAAI Engineering Department Manager in accordance with regulation 84 of the ANR.

3.4.13 Flight manual supplements, or if a CAAI approved aircraft flight manual (AFM) does not exist, a supplemental flight manual if required, will be provided to the pilot. A draft flight manual should be provided to the CAAI for review prior to any flight tests. After CAAI flight testing, the draft manual

should be finalized and submitted for final CAAI review and approval. A guide for the format and preparing of a supplemental flight manual is provided in FAA AC 23-8, AC 25-7 and AC 29-2.

NOTE: The aircraft TCDS should be checked for identification of the CAAI approved Aircraft Flight Manual or Supplement, if appropriate. The TCDS of many older aircraft list required placards and markings in lieu of a flight manual. Manufacturer owner's manuals may not be CAAI approved.

3.5. SIMULATOR TESTS

Simulator tests may be required for certain projects. All relevant test plans should be submitted to the CAAI for review and approval.

Appendix 6 – Establishing the Certification basis

1.1. The following is the new wording of FAR 21.101, which details the FAA's updated policy for designating the applicable airworthiness requirements for a proposed change in a TC or for an STC.

1.2. As provided in article 5.3.2 of this document, the CAAI intends to follow the same policy with regards to STC presented for its approval.

§21.101 Designation of applicable regulations.

(a) An applicant for a change to a type certificate must show that the change and areas affected by the change comply with the airworthiness requirements applicable to the category of the product in effect on the date of the application for the change and with parts 34 and 36 of this chapter. Exceptions are detailed in paragraphs (b) and (c) of this section.

(b) Except as provided in paragraph (g) of this section, if paragraphs (b)(1), (2), or (3) of this section apply, an applicant may show that the change and areas affected by the change comply with an earlier amendment of a regulation required by paragraph (a) of this section, and of any other regulation the FAA finds is directly related. However, the earlier amended regulation may not precede either the corresponding regulation incorporated by reference in the type certificate, or any regulation in §§23.2, 25.2, 27.2, or 29.2 of this subchapter that is related to the change. The applicant may show compliance with an earlier amendment of a regulation for any of the following:

(1) A change that the FAA finds not to be significant. In determining whether a specific change is significant, the FAA considers the change in context with all previous relevant design changes and all related revisions to the applicable regulations incorporated in the type certificate for the product. Changes that meet one of the following criteria are automatically considered significant:

(i) The general configuration or the principles of construction are not retained.

(ii) The assumptions used for certification of the product to be changed do not remain valid.

(2) Each area, system, component, equipment, or appliance that the FAA finds is not affected by the change.

(3) Each area, system, component, equipment, or appliance that is affected by the change, for which the FAA finds that compliance with a regulation described in paragraph (a) of this section would not contribute materially to the level of safety of the product or would be impractical.

(c) An applicant for a change to an aircraft (other than a rotorcraft) of 6,000 pounds or less maximum weight, or to a non-turbine rotorcraft of 3,000 pounds or less maximum weight may show that the change and areas affected by the change comply with the regulations incorporated by reference in the type certificate. However, if the FAA finds that the change is significant in an area, the FAA may designate compliance with an amendment to the regulation incorporated by reference in the type certificate that applies to the change and any regulation that the FAA finds is directly related, unless the FAA also finds that compliance with that amendment or regulation would not contribute materially to the level of safety of the product or would be impractical.

(d) If the FAA finds that the regulations in effect on the date of the application for the change do not provide adequate standards with respect to the proposed change because of a novel or unusual design feature, the applicant must also comply with special conditions, and amendments to those special conditions, prescribed under the provisions of §21.16, to provide a level of safety equal to that established by the regulations in effect on the date of the application for the change.

(e) An application for a change to a type certificate for a transport category aircraft is effective for 5 years, and an application for a change to any other type certificate is effective for 3 years. If the change has not been approved, or if it is clear that it will not be approved under the time limit established under this paragraph, the applicant may do either of the following:

(1) File a new application for a change to the type certificate and comply with all the provisions of paragraph (a) of this section applicable to an original application for a change.

(2) File for an extension of the original application and comply with the provisions of paragraph (a) of this section. The applicant must then select a new application date. The new application date may not precede the date the change is approved by more than the time period established under this paragraph (e).

(f) For aircraft certificated under §§21.17(b), 21.24, 21.25, and 21.27 the airworthiness requirements applicable to the category of the product in effect on the date of the application for the change include each airworthiness requirement that the FAA finds to be appropriate for the type certification of the aircraft in accordance with those sections.

(g) Notwithstanding paragraph (b) of this section, for transport category airplanes, the applicant must show compliance with each applicable provision of part 26 of this chapter, unless the applicant has elected or was required to comply with a corresponding amendment to part 25 of this chapter that was issued on or after the date of the applicable part 26 provision.