1. OBJECTIVE

1.1. The objective of this procedure is to outline:

1.1.1. The CFT (Certification Flight Test) process, including:

1.1.1.1 Required **actions prior** to the Certification Flight Tests, including: Flight Test personnel qualifications, Ground Inspections, Type Inspection Authorization (TIA) and Emergency provisions.

1.1.1.2 **Actions during** the Certification Flight Test period, including flight planning, participation in hazardous flight tests, Certification Flight Test hours recording, Multiple-Expert Opinion evaluations, Functional and Reliability Testing, etc.

1.1.1.3 **Post-test actions**, i.e. the Type Inspection Report (TIR).

1.1.2. CAAI Flight Test personnel responsibilities.

2. GENERAL

2.1. According to the Israeli Air Navigation Regulations (Procedures for Documentation of Aircraft and Aircraft Parts) (**hereinafter-ANR.DOC**) 15 (c) and 16 (equivalent to FAA 14CFR §21.33 and §21.35), the applicant for a TC, STC or Amended TC should perform the necessary Flight Tests to show compliance with the applicable airworthiness requirements.

2.2. In addition, according to regulation 15(a) of ANR.DOC the applicant should allow the CAAI to perform any Flight Test deemed necessary to determine compliance with the applicable airworthiness requirements, as defined by the regulations.

2.3. This document's purpose is to define the CAAI methodology for managing the certification flight test process, and to inform the applicant of the process.

3. Referenced Documents

3.1. Regulatory material

3.1.1. Regulations 15, 16 of the Air Navigation Regulations (Procedures for Documentation of Aircraft and Aircraft Parts), 1977.

3.2. Reference

3.2.1. FAA Order 4040.26B Aircraft Certification Service Flight Test Risk Management Program.

3.2.2. FAA AC 25-7C Flight Test Guide for Certification of Transport Category Airplanes.

3.2.3. US 14 CFR Parts 23 to 29.

3.3. Forms

3.3.1. TIA form CAAI Form 8110-1

4. The Certification Flight Test Process

4.1. General –

4.1.1. Process Flow is described in chart #1 in the appendix.

4.1.2. CAAI flight test personnel are assigned to a type certification project in accordance with CAAI procedure 1.4.029 (type certification). CAAI Flight Test Personnel Responsibilities:

4.1.2.1 CAAI Flight Test Personnel assigned to the certification program will cooperate with the applicant's personnel in all appropriate activities in regards to flight tests.

4.1.2.2 General Responsibilities

4.1.2.2.1. Flight Test Personnel are responsible for accomplishment of certification flight tests and evaluation of engineering data on all new or modified aircraft, pertaining to performance, flight characteristics, operational qualities, equipment, special kinds of operations, and the determination of compliance with regulations and of operational limitations, procedures, and information. Particular attention and emphasis are to be given to the entire

environment in which an airman and his aircraft must operate. The environment includes not only the airman and the aircraft but also airports, air navigation facilities, the air traffic system, the safety rules and operating procedures as well as environmental factors, such as weather.

4.1.2.3 Specific Responsibilities

CAAI Flight Test Personnel are responsible for:

4.1.2.3.1. Based on the TC CCL (Compliance Check List) – preparing (with the aid of the applicant's) the Certification Flight Test Plan (CFTP) to assure that determination of compliance will be possible;

4.1.2.3.2. Reviewing test instrumentation and equipment including: flight crew safety equipment, emergency egress provisions, aircraft test configuration, anemometry instrumentation, and spin chute installation as to their acceptability for the proposed certification and associated development flight tests.

4.1.2.3.3. Participating in the TC Board (refer to CAAI procedure 1.4.029) presentations and discussions related to the subjects defined in the CFTP for certification flight tests requirement review.

4.1.2.3.4. Determining the extent of specific tasks and responsibilities regarding flight tests and analysis delegated to DERs.

4.1.2.3.5. Participating in the certification tests' preflight briefings in order to -

(i) finalize test methods, procedures and sequence;

(ii) assure that the aircraft is ready for certification flight test; and

(iii) determine that the test environment parameters (including weather considerations and A/C configuration) are satisfactory for the required flight test.

4.1.2.3.6. Preparing the TIA, witnessing and/or performing certification flight tests in accordance with the TIA.

4.1.2.3.7. Participating in post-flight debriefings.

4.1.2.3.8. Reviewing and approving the flight test data and certification flight test report, through determining compliance with certification requirements.

4.1.2.4 Reviewing, coordinating and approving the Flight Test AFM or revisions to the AFM and determining limitations and procedures in accordance with CAAI procedure 1.4.015 AFM approval.

4.2. Actions Prior to CAAI Type Certification Testing:

4.2.1. CAAI Flight Test Personnel Qualifications

4.2.1.1 Qualification on Test Aircraft

4.2.1.1.1. For Type Certification Testing of prototypes, the CAAI personnel will coordinate with the applicant, as part of the Flight Test Program, an adequate and agreed upon checkout on the applicant's aircraft for the CAAI Flight Test Crew assigned to the project. The checkout(s) should be accomplished prior to the any official flight tests requiring their actual piloting.

4.2.1.2 Familiarization Flight Time on New Models

4.2.1.2.1. At later stages of the certification flight test plan, CAAI test personnel not involved in the early stages of the certification flight test program (and thus may not have undergone a full checkout as per 4.2.1.1. above) may need familiarization training with the manufacturer's prototype or first production models. CAAI certification project manager shall make such arrangements with the applicant.

4.2.1.2.2. This familiarization flying must be arranged for CAAI Flight Test Crew prior to the CAAI Pilot(s) conducting any official flight tests requiring his actual piloting. Such flying may be conducted as a part of low-risk test flights such as F & R (Function & reliability) testing, production testing, or during type testing.

4.3. Type Inspection Authorization (TIA)

4.3.1. General

4.3.1.1 The TIA is prepared on CAAI Form 8110-1 and is used to define and authorize official conformity of the aircraft and test equipment to approved design, airworthiness inspections, and flight tests necessary to fulfill the requirements for TC, STC, and amended TC Certification.

4.3.1.2 In addition, the TIA may contain a section (Operational and Maintenance Requirements) that provides certain other operational evaluations identified by CAAI Flight Test Personnel.

4.3.1.3 TIA Process Flow is described in chart #2 in the appendix.

4.3.2. Preparation of TIA.

4.3.2.1 The TIA is not prepared until the CAAI certification project leader (refer to CAAI procedure 1.4.029 Type certification) accomplishes coordination with all appropriate CAAI engineering discipline engineers such that all required information relative to the engineering discipline portion of the inspection or authorization is included.

4.3.2.2 The TIA may be phased or issued in increments to ensure basic airworthiness and system safety has been established before proceeding to the next phase.

4.3.3. TIA revisions - The first revision of the TIA will be issued when the examination of the technical data required for Type Certification is complete or has reached a point where it appears that the aircraft or article being examined will meet the pertinent regulations, i.e.:

4.3.3.1 Most substantiation data is approved, excluding data whose approval is by flight or ground test, or final fatigue data.

4.3.3.2 All ground tests and inspections were agreed upon with the applicant as defined in the Compliance Check List (CCL).

4.3.3.3 The TIA should instruct CAAI flight test personnel to perform the Certification Flight Test when-

4.3.3.3.1. all ground tests and inspections are performed and approved;

4.3.3.3.2. the applicant's flight tests were successfully completed; and

4.3.3.3.3. The CAAI has witnessed the applicant's certification flight tests or reviewed their results.

4.3.3.4 In most cases the CAAI testing, based on the Certification Flight Test Plan should duplicate the applicant’s tests. For some specific testing the CAAI may agree to concurrent testing. The decision about tests being subject to duplication or concurrent testing should be agreed at the beginning of the Flight Test campaign.

4.3.4. TIA document main parts:

i. TIA form.

ii. General part – includes the prototype aircraft data, name of applicant, place for performing the ground, flight test and conformity inspections in Israel and abroad. This part also includes the main POC data at each location where testing shall take place.

iii. Part I: Ground Tests: A comprehensive list of required Ground Tests based on the Compliance Check List (CCL) and the Engineering Product Acceptance Specification (EPAS) list, which should be performed and approved before Flight Tests. This part defines the responsibility and authority of the CAAI inspectors and of the DERs/DMIR. It defines the manufacturing inspector responsibilities in relation to Flight Test preparations. It also defines who and when will issue the TIR (Type Inspection Report) and who will integrate the data.

iv. Part II: Flight Tests: this part defines the prerequisites, responsibilities, and flight tests required for showing compliance with the applicable regulations. It defines also the Certificates of Airworthiness which need to be obtained before

flight tests shall commence, for each aircraft if more than one aircraft is involved in the flight tests.

v. Part III: Flight Test Risk Assessment and Mitigating Procedures. If not included in the Certification Flight Test Plan (CFTP) submitted by the applicant, this part will summarize the main risks resulting from the CFTP and proposes mitigation procedures.

4.3.5. Risk Assessment - The TIA should include an assessment of the level of risk for the certification flight test. Guidance may be found in FAA Order 4040.26B. Risk Assessment may also be part of the CFTP.

4.3.6. Letter of Notification - At the time the TIA is prepared a letter of notification to the applicant should also be prepared. The CAAI letter of notification informs the applicant that Authorization for Type Inspection has been issued and includes a copy of the TIA for their information.

4.3.7. Coordination - The TIA and the letter of notification should be coordinated with the accountable CAAI engineering experts, departments, and any other persons concerned (including the CAAI Flight Standards Division when appropriate).

4.3.8. Outside Israel Requests - If the TIA conformity and/or tests are to be conducted abroad, the applicant should coordinate with the appropriate foreign certificating agency, as required.

4.4. Ground Inspections

4.4.1. Prior to starting any certification flight tests, the responsible CAAI Test Pilot for the project and Manufacturing Inspection Personnel should verify that a Conformity Inspection has been performed to assure that the airplane conforms to its type design and is in satisfactory airworthiness condition. The inspections can

be accomplished either by CAAI Manufacturing Inspection Personnel or by CAAI designees as defined in the TIA. Any nonconformities will be documented on CAAI Form 8100-1 and flight tests will not begin until completion of this Form and notification of the CAAI Flight Test Pilot accordingly.

4.4.2. Refer to CAAI MFG 1.4.002 – conformity Inspections for additional information.

4.5. Certification Flight Tests Plan (CFTP)

4.5.1. Based on the TC or STC G1 issue paper (summing up the certification basis) and the CCL, a Certification Flight Test plan should be prepared by the CAAI (the applicant may aid in preparation of the plan). It is advisable to use the guidance of the FAA AC for certification flight tests and if necessary the parallel European Guidance (AMC).

4.5.2. The CFTP will be reviewed and approved by CAAI specialists.

4.5.3. For specific systems and/or operational requirements (e.g.: TAWS, TCAS, Icing etc.), the applicability of the flight tests requirements included in the relevant ACs should be considered.

4.5.4. In addition to strictly TC-related subjects, the CFTP should include the following subjects when necessary:

4.5.4.1 Definition of flying procedures

4.5.4.2 Definition of requirements and competency tests for airmen type rating

4.5.4.3 IFR and Landing procedures certification tests;

4.5.4.4 MMEL validation flights;

4.5.4.5 Human factors and CRM related tests

4.5.5. TSO items should be flight tested to demonstrate that the installation on the aircraft does not degrade the system or the aircraft performance.

4.5.6. The CFTP should typically include the following paragraphs: abstract, list of abbreviations, introduction, applicable documents, test article description, safety (including assessment), test plan (which defines the test procedures performed to show compliance). Detailed guidelines can be found in the CAAI's AP- certification Test Flight (currently in CAAI-internal Draft version).

4.5.7. Requirement for Airman Rating Qualification

4.5.7.1 For new aircraft TC or after a major STC, there may be a phase of the certification process, when the authority(ies) defines the competency tests and maneuvers required to rate an airman to the new aircraft, including training requirements and program.

4.5.7.2 When the above phase is required in a CAAI certification process, flight tests to verify that the applicant's proposed airman competency tests and maneuvers plan is comprehensive enough to achieve its goals may be included in the CFTP. This phase may be performed in parallel to determining compliance with the general controllability and maneuverability requirements..

4.6. Emergency Provisions

4.6.1. General Preparation

4.6.1.1 The CAAI Project Test Crew should verify that the necessary safety equipment is provided and that all crew members and test participants are briefed in the use of this equipment. The Crew should perform Hazards Assessment and Risk Mitigation processes for all flight test phases and define crew duties in the event of an emergency. if judged necessary by the Project test pilot, a training of the emergency procedures will be performed. Further details can be found in FAA Order 4040.26B.

4.6.1.2

4.6.2. Spin Recovery Systems

4.6.2.1 Spin recovery parachutes or other recovery devices should be installed on all aircraft requiring spin testing for certification, and should also be considered for other high angle of attack tests..

Further details can be found in FAA Order 4040.26B.

4.7. Actions during the Certification Test Period

4.7.1. General

4.7.1.1 The certification flight tests generally include two main phases: certification flight tests for showing compliance to airworthiness regulations (14 CFR Parts 23, 25, 27, 29, 33 etc.) and Functional and Reliability (F&R) testing. The former should be performed on prototype flight test instrumented aircraft, and the latter are generally performed on serial production configured aircraft.

4.7.1.2 CAAI flight tests, including those conducted or witnessed by a CAAI DER, will not be commenced or witnessed until the applicant has complied with regulation 16(a) of ANR.DOC and a TIA or an Equivalent Flight Test Authorization has been issued.

4.7.1.3 In certain flight test programs, data from applicant's flights conducted prior to issuance of the TIA or to receiving the applicant's flight test report per regulation 16(a)(2) of ANR.DOC, may be conditionally accepted for certification purposes, provided that:

4.7.1.3.1. CAAI Flight Test Personnel have been notified by the applicant and by a DER, and have approved in advance that the data to be generated may be submitted for certification.

4.7.1.3.2. Such tests are witnessed or flown by a DER.

4.7.1.3.3. DER has verified reasonable compliance with regulation 16(a)(1-4), prior to conduction of the tests.

4.7.1.4 The CAAI Flight Test Pilot shall not fly a test aircraft without coordinating and checking its conformity with the assigned Manufacturing Inspector.

4.7.1.5 All official tests will be conducted in accordance with the restrictions and/or limitations stated in the relevant TIA and Certificate of Airworthiness.

4.7.2. Test Flight Planning

4.7.2.1 Each test flight should be carefully planned prior to actual flight, including attention to the airworthiness requirement complied by the specific flight tests.

4.7.2.2 Testing schedule within the flight should be agreed on by the applicant and CAAI Flight Test Personnel.

4.7.3. Hazardous Flight Tests

4.7.3.1 CAAI Flight Test Personnel are not authorized to participate in or conduct flight tests classified by the hazards assessment of the CFTP (see 4.6.1.1 above) as hazardous until the applicant has successfully performed these tests and submitted a written report.

4.7.4. Pilot-in-Command

4.7.4.1 For flight tests having CAAI pilot participation the pilot-in-command (PIC) will be the applicant's pilot (except in single seat aircraft). The CAAI Pilot should emphasize the pilot-in-command responsibility as part of the preflight briefing.

4.7.5. Functional and Reliability (F&R) Testing

4.7.5.1 Responsibility

4.7.5.1.1. F & R testing is the responsibility shared by CAAI's relevant specialist.

4.7.5.1.2. The objectives and methods for F & R testing are detailed in FAA AC 25-7C.

4.7.5.1.3. The CAAI Flight Test Pilot/Engineer assigned to the Certification Program will be in charge of and coordinate all Type Certification Board matters pertaining to official F & R testing. He, or a properly designated alternate will participate in all flights. Other CAAI personnel may board F & R airplane(s) as assigned. He will coordinate all appropriate activities with the applicant's pilots, particularly regarding flight plans and procedures. The applicant's pilots should be in command of all flights, but CAAI pilots will fly the airplane sufficiently to ascertain the proper F & R of the airplane, its components and equipment.

4.7.5.1.4. The F&R flight test program will include operations of the kind(s) of (Ref. FAR 25.1525) to be approved.

4.7.5.1.5. The CAAI Flight Standards Division Pilots will participate in the F & R flight tests to the extent necessary to evaluate operational requirements.

4.7.5.1.6. Other CAAI specialists may participate in the F&R flight test program when appropriate.

4.7.5.1.7. All participants will advise the Flight Test Pilot/Engineer in charge of any required special inspections or relevant observations. The results of these inspections or observations should be made available to the CAAI's Flight Test Representative in charge.

4.7.5.2 Monitoring and Evaluation

4.7.5.2.1. During F & R testing, the applicant is responsible for monitoring the functioning of all cabin installations, and the evaluation of maintenance and refueling activities.

4.7.5.2.2. The applicants' DER should:

i. Determine that the system or product being tested conforms to the approved data;

ii. Perform other duties and inspection according with test plan(s);

iii. At each landing - conduct a Post Test Flight Inspection in accordance with a specific CAAI approved procedure;

iv. Maintain a record of all demonstrations witnessed and all inspections conducted;

v. Report all information obtained during F&R testing on the pertinent forms, and include a copy in the consolidated certification flight test report; and advise the CAAI Flight Test Pilot/Engineer (or the alternate) of any required special inspections or observations.

5. Task Outcomes

5.1. Type Inspection Report (TIR)

5.1.1. General

5.1.1.1 The TIR provides an official record of the inspections and tests conducted, as authorized by the TIA, to show compliance with the applicable regulations. The TIR also provides a record of other information pertinent to each project for which a TIA has been issued. The TIR should:

5.1.1.1.1. Be completed within 90 days after Certification;

5.1.1.1.2. Contain at least a summary of the results of each TIA part I inspection and the certification flight test report.

5.1.1.1.3. Be approved by the appropriate CAAI personnel;

5.1.1.1.4. Be retained by CAAI for reference purposes; and be provided to the Certificate Holder.

5.1.2. Type Inspection Report (TIR), Part I, Ground Inspection

5.1.2.1 Manufacturing Inspection Personnel are responsible for preparing the TIR, Part I, Ground Inspection Part I provides a means of recording and reporting the configuration of the product and reporting all significant unsatisfactory conditions found as a result of the inspector and designee activities during the Type Inspection.

5.1.2.2 All unsatisfactory items will normally be resolved prior to preparation of Part II, Flight Test Report, of the TIR. Part I of the TIR should be completed as soon as possible after accomplishing all TIA inspections.

5.1.2.3 The original TIR is filed in the project file.

5.1.3. Type Inspection Report, Part II, Flight Test Report

5.1.3.1 Flight Test Personnel are responsible for preparing the Flight Test Report (the applicant may aid in preparation of the report). The CAAI Engineering and Flight Test Personnel will review the TIR. In addition to test documentation, the following information should be presented:

5.1.3.1.1. Cover Page - The cover page should include, as a minimum, the following information:

(i) Aircraft Make and Model; Applicant; Type Certificate number and date; TIA number and date;

(ii) List of supporting documents/reports, unless the list is too extensive for inclusion on the cover page, in which case it should be listed in the administration portion of the TIR; and

(iii) Name and signature of person(s) preparing, reviewing, and approving the TIR.

5.1.3.1.2. Administrative Information - Sufficient administrative or general flight test information should be presented to show compliance with the requirements of relevant regulations. The information should include, but not be limited to, the following:

(i) Serial number and data sheet number (if applicable) of aircraft tested;

(ii) Where and when the aircraft was tested;

(iii) Details of alterations made during CAAI flight testing

(iv) Flight Test Log; and

(v) Total number of flight hours of F&R testing.

5.1.3.2 Certification Information - Sufficient information should be presented to indicate:

5.1.3.2.1. Operation limitations including category normal, utility, acrobatic and type operations (visual flight rules, instrument flight rules, day, night, icing, etc.). Approved maneuvers may be presented if appropriate;

5.1.3.2.2. Equipment required for each type operation. This should agree with the Limitation Section of the Flight Manual.

5.1.3.2.3. Limitations for weight, center-of-gravity, airspeeds, powerplant operations, etc., and

Recommended airspeeds for climbs, descents, approaches, etc.

5.1.3.3 Compliance Information - Sufficient information should be presented to show compliance with the requirements of the relevant regulations.

5.1.3.3.1. If the procedures deviate from an approved test plan or established test methods, the procedures used to show compliance should be documented.

5.1.3.3.2. For Type Certification or extensive STC projects, the Flight Test Report may be divided into sections, such as:

(i) Equipment and flight operation;

(ii) Powerplant operation; Performance; and

(iii) Handling qualities.

5.1.3.4 Additional information - Information necessary to show compliance with Regulations or CAAI Requirements should be presented as appendices or attachments to the TIR and referenced on the TIR Table of Contents. The supporting information may include, but not be limited to, the following:

5.1.3.4.1. Flight test data;

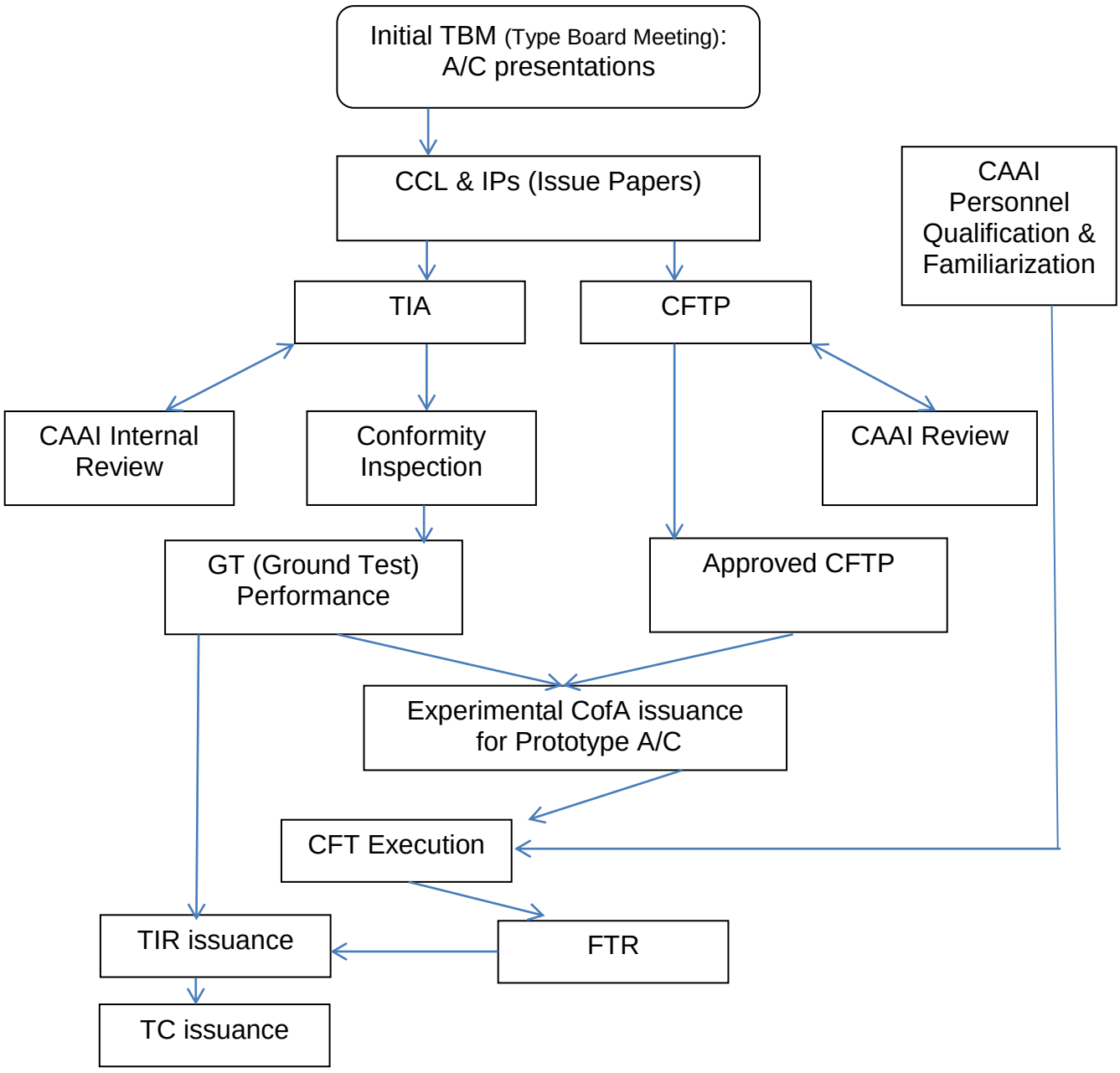
5.1.3.4.2. Approved test plans;

5.1.3.4.3. Flight Manual or Supplement; and

5.1.3.4.4. TIA.

Appendix A (charts)

CFT Process Flow –Chart #1



TIA Preparation procedure Flow –Chart #2