ADVISORY CIRCULAR

SUBJECT:	DATE:	AC NUMBER:	VERSION:
ALTERATIONS AND REPAIRS	2016-06-15	021-07	1.0

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NOTE: THIS ADVISORY CIRCULAR IS PUBLISHED TO PROVIDE REGULATORY INFORMATION AND DESCRIBE ACCEPTABLE MEANS OF COMPLIANCE WITH THE GENERAL AUTHORITY OF CIVIL AVIATION REGULATIONS (GACAR).

CHAPTER 1 – INTRODUCTION

1.1 Purpose.

The purpose of this advisory circular (AC) is to provide information on the procedures and general practices when carrying out alterations and repairs on Saudi Arabian registered aircraft. This advisory circular represents an acceptable means of compliance with the applicable requirements prescribed in GACAR Part 21 Subpart C for changes to type certificates that use Saudi Arabian registered aircraft as the prototype and Subpart D for obtaining a GACA supplemental type certificate (STC) or a GACA repair design approval (RDA) and for properly executing the approval for return to service after incorporating an STC or RDA. This advisory circular also provides guidance for owners/operators of Saudi Arabian registered aircraft which are used as the prototype for STCs issued by the Federal Aviation Administration (FAA) or other foreign civil aviation authorities.

1.2 Applicability.

This advisory circular is applicable to aircraft owners, operators, repair stations and aircraft maintenance personnel for aircraft on the Saudi National Aircraft Register.

1.3 Cancellation.

This is the first official version of this advisory circular and it cancels no other advisory circulars. This AC is the replacement of GACA Airworthiness Guide No. 7 (AG-7).

1.4 Related Regulatory Provisions.

GACAR Parts 1, 11, 21, 43, 91, 121, 125, 135 and 183 and the Implementing Regulations of the Civil Aviation Tariff Act.

1.5 Related Reading Material.

(a) GACA AC 000-02 Applicability and Use of FAA Advisory Circulars.
(b) GACA AC 000-05 Payment of Fees and Charges.
(c) GACA AC 011-01 Petitioning for Exemption.
(d) GACA AC 021-003 Types of Approved Data for Alterations and Repairs on Saudi Arabian Registered Aircraft.
(e) FAA AC 21-40 () Application Guide for Obtaining a Supplemental Type Certificate.
(f) FAA Order 8110.4() Type Certification.
(g) FAA Order 4040.26(), Aircraft Certification Service Flight Test Risk Management Program.
(h) Working Arrangement between EASA & GACA.

1.6 Definitions of Terms Used in this Advisory Circular.

Affected parties should refer to Subpart A of GACAR Part 1 for a full listing of defined terms used in the GACAR. In addition to the defined terms in GACAR Part 1, this advisory circular introduces the following additional term:

Organization means an air carrier, air operator or repair station certificated and operating under the GACAR or any aircraft owner/operator who has engineering resources or can obtain engineering services under contract.

1.7 Approval.

This advisory circular has been approved for publication by the Assistant President, Safety, Security and Air Transport Sector of the General Authority of Civil Aviation.

CHAPTER 2 – GACA SUPPLEMENTAL TYPE CERTIFICATION PROCEDURES

2.1 General.

(a) The GACA STC is used by GACA to signify an approval of a major change in type design (i.e. an installation data approval of a major alteration on a KSA registered aircraft). The GACA STC process is based on the FAA STC process. Accordingly, FAA AC 21-40( ) should be read in conjunction with the procedures provided in this chapter. In case of conflict between the two, the procedures in this chapter are to prevail.

(b) Major changes in type design may be GACA approved only after the applicant has shown, and the GACA has found, that the changed product complies with the applicable airworthiness requirements of paragraphs (a) and (b) of GACAR § 21.67 and the aircraft has no feature or characteristic that makes it unsafe for the category in which certification is requested.

(c) A GACA STC will not be issued to:

(1) Approve alterations to TSO approved articles unless the TSO is invalidated for the altered article. A GACA STC which alters a TSO article must provide for installation; or

(2) Combine two or more GACA STCs or other foreign approvals accepted by the GACA without additional showing of compliance.

(d) In general, the process for GACA STCs follows the process described in FAA AC 21-40( ) and FAAO 8110.4( ), except as identified in this AC. The following sections describe a generic four phase certification process for a GACA STC project. The sequencing of these phases and their associated steps and activities as described in this AC is representative of the ideal sequence of events but it is understood that many of these steps and activities will overlap or may follow a different chronological order.

(e) It is essential to understand that the GACA STC process described herein is flexible in the sense that some of the procedures may be simplified or omitted on a case-by-case basis, as determined by the GACA. The GACA will advise the applicant of all the applicable procedural steps or simplification thereof at the time the project is accepted. The degree of customization of the GACA STC procedures will be a function of the project scope (number of alteration packages and number of aircraft affected) and of the nature (complexity and criticality) of the alterations. This merely means that the rigor in finding compliance may vary; however, the minimum level of safety of any alteration remains the same. Notwithstanding the inherent flexibility permitted by the GACA STC process, some of the steps are required and/or cannot be substantially simplified regardless of the project. These steps include: letter of application, GACA acceptance of the project, fee payment, applicant showing conformity and

compliance, certification data, STC issuance and project closure.

(f) Applicants are strongly encouraged to obtain the services of GACA designees for certification services for GACA STC projects. The appointment and certification activities of GACA designees must be in accordance with the regulatory requirements of GACAR Part 183 – Representatives of The President and the policies and procedures of GACA eBook Volume 14 Designees – Appointment & Management.

(g) Alternatively, aircraft owners may seek GACA STCs through the use of EASA Design Organizations in accordance with the provisions of the GACA/EASA working arrangement.

(h) An air carrier operating under GACAR Part 121 is to follow the same steps and activities described in this chapter.

(i) The GACA may use the technical assistance from other CAAs. Such technical assistance could be with respect to conformity inspections, test witnessing, finding of compliance, etc. and will be documented in the GACA project file.

(j) The application for an STC may be subject to a sequencing process due to work load which may impact the initiation of the project.

2.2 Phase 1 – Project Initiation.

Phase 1 of the certification process involves all activities commencing with notification by the applicant that they intend to seek certification of a major alteration through the formal acceptance of the certification plan by the GACA and the issuance of a GACA project authorization number.

2.2.1 Letter of Intent.

(a) Applications for a GACA STC should normally be initiated by an Organization in the form of a letter of intent sent to the GACA. The letter of intent should be of sufficient detail to allow the GACA to determine GACA resource requirements necessary to support the GACA STC process and to assess whether nominated persons (i.e. already appointed GACA-DERs, GACA-DARs, FAA DERs or other foreign delegated individuals) would have sufficient scope of delegation to address the required compliance aspects of the project. A letter of intent is not a mandatory step in the process. However, it is an excellent means to ensure that the Organization does not expend resources to produce the documents required with the letter of application for a project that the GACA might decline thereafter.

(b) A letter of intent must shows project information including:

(1) Identification of aircraft make, model, serial number(s) and registration mark(s);

(2) Description of the alteration(s) - highlight novel and unusual design features;

(3) Location of the aircraft and the certification activities;

(4) Use of existing approvals as a basis for the GACA STC (e.g., FAA STC), if applicable;

Information Note 2.1: An installation data approval (e.g., FAA STC) that an Organization would wish to use with a deviation that would constitute a major change in itself would need further approval. However, the Organization would only need to obtain additional findings of compliance for those requirements that are affected by the deviation. A GACA STC would still be required as the installation data approval but such an approach would be more efficient (than a full GACA STC project, for example) from both the Organization's and GACA's point of view.

(5) Project schedule including major milestones , and

(6) As required, the names and expected roles of each already appointed GACA-DERs and GACA-DARs, or FAA DERs and other foreign delegated individuals and organizations, to be authorized for the project if known, or the identification of areas of specialties (e.g., avionics, conformity inspections) to be covered by GACA-DERs, GACA-DARs, FAA DERs and other foreign delegated individuals yet to be nominated and/or authorized.

(c) The owner/operator of the aircraft is to be copied on the letter of intent.

2.2.2 GACA response to the Letter of Intent.

The GACA will respond to the letter of intent by advising whether the project described therein can be supported or not. This response by GACA does not signify formal acceptance of the project but rather indicates that the Organization is invited to submit a formal letter of application along with the applicable fee.

2.2.3 Letter of Application.

(a) The letter of application is a mandatory step in the GACA STC process and it must contain the following:

(1) A request for project authorization number.

(2) Copy of Preliminary Certification plan including basis of certification for each alteration package.

(3) Copy of Preliminary Compliance Checklist.

(4) The nomination of individuals and/or authorization request for the use of specific

GACA-DERs, GACA-DARs, FAA DERs and other foreign delegated individuals or organizations, if applicable.

(5) Supporting documents of existing approvals to be used.

Information Note 2.2: After the letter of application has been submitted, it is possible that the GACA will require additional clarifications or corrections before formally accepting the project.

(b) An application for STC (GACA Form 8110-12) must be filled out and submitted to the GACA along with the letter of application.

(c) Already appointed GACA-DERs and GACA-DARs still need to be authorized for each project, and the request needs to specify exactly what roles each will play. If the Organization nominates an individual for appointment as a GACA-DER or GACA-DAR so that the individual may work on the project, all required documents must be submitted with the application letter (see eBook Volume 14. Designees – Appointment & Management).

Information Note 2.3: It is GACA policy that GACA-DER and GACA-DAR authorizations for a particular project remain valid until the end of the project, even if the designee's Certificate of Designation expires during the course of the project activities.

2.2.4 Fees and Charges.

There are administration fees for a GACA STC. There is a fixed fee due at time of application and then hourly charges based on the number of hours that GACA inspectors/engineers dedicate to the project. Proof of payment of the application fee is due at the time of application. Hourly charges will be invoiced either at the end of the project or at periodic intervals for long duration projects. Proof of Payment of the hourly charges has to be submitted to GACA before the STC is issued. Inspector/engineer charges and travel expenses incurred by the GACA during the STC process are the responsibility of the Organization. Refer to GACA AC 000-05 Payment of Fees and Charges.

2.2.5 GACA Project Acceptance and Project Docket.

(a) The GACA acceptance is a mandatory step in the GACA STC project. Once satisfied that the letter of application is complete GACA will issue a letter of acceptance. This letter will provide the project authorization number, authorize the GACA-DERs and GACA-DARs for the project if applicable, and specify which steps of the GACA STC process are applicable or simplified by specifying paragraphs of Chapter 2 of this AC.

(b) Furthermore, if applicable, the GACA will specify whether test plans approval and witnessing is delegated. In exceptional cases, GACA will conditionally accept the project and specify the conditions to be met (e.g., additional GACA-DER). Finally, the letter will provide the name and

contact information of the GACA Certification Project Manager (CPM) and, when necessary, the other airworthiness engineer(s) assigned to the project.

(c) If required, the GACA will appoint new GACA-DERs and GACA-DARs as requested based on the supporting documents provided by the Organization. This will be done in correspondence separate from the acceptance letter as per the procedures of eBook Volume 14.

(d) At this point the assigned GACA CPM will also open a project docket where all relevant documentation concerning the STC project will be kept.

2.2.6 GACA Project Authorization Number.

(a) A project authorization number will be assigned by GACA for each GACA STC project, STC validation project or a GACA STC amendment project. The unique number is used by the GACA to track and control all documentation associated with each unique project. A project authorization number is assigned whether GACA-DERs and GACA-DARs are employed on the project or not.

(b) The project authorization number is to appear on all GACA forms and correspondence related to the project.

(c) The project authorization number is issued by the GACA to the Organization in the acceptance letter in response to the application letter, and will also ultimately be used as the basis for the GACA STC number.

(d) GACA project authorization numbers are composed of two elements an Organization identifier number and a sequential counter. As an example, STC project GACA/008-023 was assigned to a GACA STC project that had GACA AMO#008 as the applicant and it was the 23rd project in the project register.

2.2.7 Certification Plan.

(a) Certification plans are important documents because, once agreed upon, they constitute the basic certification agreement among all parties (Organization (i.e. applicant), delegated individuals, owner/operator, GACA). A certification plan may vary from a few to dozens of pages, depending on the alteration package. Each alteration package (i.e., an alteration that is complete on its own and does not rely on other alterations for proper functions and operations) is to have its own certification plan. Each certification plan should have as a minimum the same content as the letter of intent (except that the description of the alterations needs to be more detailed), plus the basis of certification, a compliance checklist, and additional information such as a proposed conformity inspection verification program and, if applicable, a certification test program. Each element is discussed below. Furthermore, refer to FAA AC 21-40( ), chapter 2 for additional details.

(b) Certification plans are dynamic documents that will be revised as the project progresses. Before they are submitted to the GACA, they must be signed off by all the GACA-DERs, FAA DERs and other foreign delegated individuals and organizations that have been authorized for the project. Sign-off must be effected formally either by signature block in the certification plan document, GACA form 8110-3 recommendation for approval, letter, or other means.

2.2.8 Basis of Certification.

(a) The basis of certification must be established as per GACAR § 21.67. Further guidance on this very important step can be found in FAA AC 21.101-1( ), Establishing the Certification Basis of Changed Aeronautical Products.

(b) A basis of certification normally consists of the following elements:

(1) The basic regulatory basis which is composed of the design, environmental and continued airworthiness requirements (e.g., GACAR/FAR Part 25 at amendment 25-72, GACAR Part 34,, GACAR Part 36 at amendment 36-1 and GACAR Part 26);

(2) Special conditions;

(3) Findings of equivalent safety;

(4) Exemptions; and

(5) Elections by the applicant to comply with later amendments.

(c) The applicant must provide sufficient evidence to the GACA to support any requests for reversion to earlier design standards in accordance with the provisions of GACAR § 21.67.

(d) Exemptions to specific design standards must be petitioned for in accordance with the procedures specified in GACAR Part 11. The related form GACA S&ER 1001 shall be used by the petitioner. Consult GACA AC 011-01 for further information on how to petition for an exemption.

Information Note 2.4: Design requirements stated in operational rules (e.g., GACAR Part 121) should also be included in the basis of certification because the aircraft owner/operator is likely to be required to show that the altered aircraft meets these requirements in order to be eligible to operate under the provisions of the applicable requirements of GACAR Part 91, 121, 125 or 135 as applicable.

2.2.9 Compliance Checklist.

(a) Compliance checklists are required to be submitted by Organizations for all GACA STC projects. Compliance checklists are normally in a table format but need not to be for small alteration packages

where only a few requirements are affected. The compliance checklist shall include, as a minimum, the following information:

(b) List of all affected airworthiness requirements contained in the basis of certification (including amendment level).

(c) For each requirement noted above; the means of compliance, the form of proof, and the GACA-DER (if applicable) who will be making a finding of compliance. Each is discussed in the following paragraphs.

(d) The list of all affected airworthiness requirements should include the paragraph number (e.g., 25.853(a)) and the identification of the amendment that last changed the paragraph as agreed in the basis of certification. Paragraphs should be broken down into sub-paragraphs as required to ensure that the corresponding information across the columns is appropriate. If AFMS and ICA are planned, XX.1581 and XX.1529 respectively are to be listed.

Information Note 2.5: Information about the amendments that last changed paragraphs can be obtained by consulting the FAA Regulatory Guidance Library (RGL) web site.

(e) The means of compliance describes how compliance with the requirement will be shown (e.g., drawing review, analysis, ground test, laboratory test, inspection, flight test). Using a pre-defined coding to identify the different means of compliance is acceptable.

(f) The form of proof identifies in what certification document the showing of compliance will be documented. This is different than the descriptive data whose purpose is to define the design. Reliance on existing equipment approvals (TSOA, PMA, etc.) should be clearly identified.

Information Note 2.6: For very simple alterations a separate certification document might not be justified for providing the details of how compliance was shown for each specific requirement. Instead, it would be acceptable to provide a short narrative explaining how compliance was shown in a Remarks column of the compliance checklist.

(g) The GACA-DERs authorized to participate in the project will have their specific involvement indicated in the compliance checklist against each requirement for which they will be making a finding of compliance or a recommendation of a finding of compliance. Information Note 2.7: FAA AC 21-40( ) provides additional information and sample formats for compliance checklists.

2.2.10 Additional Information.

The supporting documents of existing approvals to be used must be provided and should clearly show that the approval is applicable to the aircraft. Any deviation from the existing approvals must be identified to the GACA. FAA STC documents need to be accompanied by a letter of permission

from the STC holder.

2.2.11 Changes in Project Scope.
(a) A change in project scope is defined as either an addition of an independent alteration package unrelated to the other alteration packages already accepted under the given project authorization number, and/or a change in the scope of an accepted alteration package to a point where the compliance checklist must be revised, or the GACA-DER or the foreign delegated individuals authorized activities are exceeded.

(b) When there is a change in scope, the Organization, the GACA-DER or the foreign delegated individual must report the situation to GACA and wait for GACA determination before the Organization and the GACA-DER or foreign delegated individual completes the project activities. The GACA will acknowledge changes in project scope and authorize or deny GACA-DER or foreign delegated individual involvement by way of written response to the Organization.

(c) The certification plan must be updated to reflect any change in the project scope.

2.2.12 Project Coordination Meetings.
(a) A GACA STC project coordination meeting should take place as early as possible in the project, but only after the GACA has accepted the project. The participants in this meeting generally include the GACA CPM, the applicant's certification engineer and engineering specialists and delegated individuals. The purpose of the project initiation meeting is to:

(1) Ensure the applicant's understanding of the GACA STC process.

(2) Ensure the GACA's understanding of the nature and scope of the alterations.

(3) Discuss the details of the certification plans (including but not limited to certification basis, delegated individuals, compliance checklists, conformity program, test program and schedule); and (4) Identify and discuss any novel or unique design features, materials, processes, and methods of compliance.

(b) Subsequent meetings are held on an as required basis. They could be to resolve particular problems, prepare complex flight testing, etc. The need for a final meeting is based on the complexity of the alterations and the progress with respect to the schedule. Participants in these subsequent meetings are as required.

(c) The meetings normally take place at the applicant's facilities. The applicant is responsible for producing the meeting minutes.

2.3 Phase 2 – Developing Data, Ensuring Conformity, Showing Compliance.

Phase 2 of the certification process includes the activities performed by the applicant to generate the descriptive data to identify the design change and to show that the changed product complies with all applicable requirements identified in Phase 1 using the means of compliance agreed to with the GACA. In addition, Phase 2 includes the activities performed by the applicant to show that the final altered product conforms to the changed type design by performing ground/flight testing. Finally, Phase 2 includes the development of the operating and maintenance data required to support the in-service use of the changed product.

Information Note 2.8: The activities performed in Phase 2 are often performed in parallel with the activities performed in Phase 3. Phase 2 represents those activities performed by the applicant and Phase 3 represents those activities performed by the GACA and its designees.

Information Note 2.9: Document Control is critical and the Organization must ensure that it is done in a systematic manner, using a different document revision level and date every time data is re- submitted to the GACA.

2.3.1 Developing Data.

2.3.1.1 Descriptive Data.

(a) Descriptive data which completely describes the change in type design must be developed by the Organization during the GACA STC process. Descriptive data includes, but is not limited to:

(1) Engineering drawings (often through a Master Drawing List (MDL))

(2) Engineering Order (EO) or similar.

(b) The descriptive data must fully describe the dimensions, materials, specifications, processes, tolerances, surface finishes, etc. that define the critical elements of the type design.

2.3.1.2 Certification data.

(a) Certification data is data used to substantiate that the design as defined by the descriptive data meets the airworthiness requirements as defined in the basis of certification using the means of compliance as identified in the compliance checklist.

(b) Certification data must be submitted by the Organization to the GACA during the GACA STC process for review and acceptance. Certification data will normally refer to the descriptive data. Only the top level descriptive data such as MDL or top EO should be initially submitted with the certification data. Other descriptive data might be requested thereafter by the GACA to assist in the review of the certification data. Certification data includes, but is not limited to: • Ground/Flight Test plans and reports • Analyses (e.g. Electrical Load Analysis (ELA), Structural Analysis, System

Safety Analysis, etc.)

(c) Certification data review and acceptance is often an iterative process involving revisions to the certification documents (and sometimes to the descriptive documents) by the Organization before acceptance by the GACA.

(d) The submission of certification data needs to be progressive and start as early as possible in the project, starting with the certification plans. Delaying submission of the data to the GACA may result in delays in the GACA review and approval, and in the return to service of the aircraft by the Organization.

2.3.1.3 Required Operating Data.
Data required to support the operation of the changed product in service must be developed by the Organization during the GACA STC process. Operating data includes, but is not limited to: Mass/Weight and Balance (W&B) change data, Electrical Load change data, MMEL supplement, Aircraft Flight Manual Supplement, and Continued Airworthiness Data.

(a) Aircraft Flight Manual Supplement (AFMS)

(1) AFMS is required as per GACAR/FAR §§ 23.1581, §5.1581, 27.1581 and 29.1581 when the original AFM is no longer applicable because of the alteration to the aircraft. The Organization should consult FAA Advisory Circulars 23-8( ) or 25.1581-1( ) for guidance which are not repeated here. In addition, the following best practices should be used:

(i). Use recognized formats (follow the format of AFM for the aircraft requiring the new supplement);

(ii). Distinguish “approved” from “unapproved” sections (as defined in GACAR/FAR § XX.1581);

(iii). Make reference to “Pilot’s Guides” for equipment operating procedures if these are available instead of repeating this information in the AFMS; and

(iv). Use challenge and response type layout in the procedures section.

(2) AFMS can only be approved by the GACA, specifically by one of the GACA POIs upon written recommendation from an airworthiness engineer. AFMS are to be recommended for approval by the flight test GACA-DER authorized for the project using GACA form 8110-3.

(3) AFMS, along with GACA forms 8110-3 as applicable, are to be submitted to the GACA

prior to any flight test, at which time they will be preliminarily approved for the purpose of the flight test. At this time, they will not be signed by the GACA as approved. The preliminary approval will be in the form of a letter. Final approval, including signing and dating of the AFMS, will take place upon satisfactory validation of AFMS during flight testing, successful completion of the flight tests, and satisfactory review of all certification data. Copies of the GACA approved AFMS will be provided by the GACA to the Organization at the same time as the GACA STC.

2.3.1.4 Continued Airworthiness Data.

Data required to support the continued airworthiness of the changed product in service must be developed by the Organization during the GACA STC process. Continued airworthiness data includes, but is not limited to:

(a) Instructions for Continued Airworthiness

(b) Airworthiness Limitations

(c) Electrical Wiring Interconnection System (EWIS) Instructions

(d) Maintenance Manual Supplements

(e) Certification Maintenance Requirements

(f) Illustrated Parts Catalog supplements

(g) Wiring diagrams.

2.3.1.5 Instructions for Continued Airworthiness (ICA).

(a) ICAs are required as per GACAR/FAR §§ 23.1529, 25.1529, 27.1529 and 29.1529 (and related appendices) when the original ICAs are no longer applicable or when new information is required for maintenance personnel because of the alteration to the aircraft. The level of detail should reflect the complexity of the system/installation/component being installed and maintained. The appendix to each GACAR/FAR mentioned above as well as FAA AC 21-40( ) provide additional guidance on the preparation of ICAs.

(b) ICAs must be submitted to the GACA for acceptance (by one of the PMIs upon recommendation from the CPM, except for the Airworthiness Limitations and the EWIS section which are GACA approved. ICAs are formally indicated as being accepted by the GACA by being listed directly on the GACA STC certificate as required maintenance data.

2.3.1.6 Airworthiness Limitations.
(a) Airworthiness limitations can only be approved by the GACA Manager of Airworthiness, upon written recommendation from the CPM.

(b) Airworthiness limitations are to be recommended for approval by the relevant GACA-DER(s) using GACA form 8110-3. Final approval, including signing and dating of the Airworthiness Limitations will take place upon satisfactory review of all certification data. Copies of the GACA approved Airworthiness Limitations will be provided by the GACA to the Organization at the same time as the GACA STC.

2.3.1.7 EWIS ICA.
(a) Guidance on the development of EWIS ICAs can be found in FAA AC 25-27( ).

(b) EWIS ICAs are to be recommended for approval by the relevant GACA-DER(s) using GACA form 8110-3.

(c) EWIS ICAs can only be approved by the GACA Manager of Airworthiness, upon written recommendation from the CPM. 2.3.2 Parts Fabrication Parts may be fabricated by an Organization (including its approved vendors) that was granted a GACA STC with the intent of installing those parts on an eligible aircraft for which they are responsible for return to service. Fabrication of such a part is authorized in accordance with GACAR § 21.15(a)(5). Such parts may not be offered for sale as separate items for installation and return to service by another Organization. In the absence of a TSO or PMA parts/equipment approval, the owner/operator or an approved organization performing maintenance, major alterations, or major repairs may manufacture parts/equipment according to approved drawings and specification as part of this activity. Sufficient qualification testing has to be performed to approve these parts as required by the approved data. The installation approval for such parts into the aircraft will be part of the STC or RDA approval. The owner/operator or the design approval holder may manufacture replacement parts/equipment or delegate another organization to manufacture the replacement parts under his quality control system, after the STC or the RDA has been issued and the return of the aircraft to service. Each part manufactured under this provision shall be inspected at every stage of manufacturing and testing for conformity to the approved engineering drawings and specifications. An authorized person shall issue an airworthiness release certificate (GACA Form 8130-3) for the part upon completion. An authorized person may be an approved repair station under GACA/FAR 145, or a person holding inspection authorization within the approved organization.

2.3.3 Ensuring Conformity "Conformity Inspection Program".
(a) In accordance with GACAR § 21.89, for all STC projects the Organization is responsible for ensuring 100% conformity on all materials, parts, processes, construction and assembly to the type

design drawings and specifications.

(b) The GACA will identify features, attributes, and components critical to the design and certification program and will request GACA conformity on these test articles with special instructions as necessary. GACA conformity is a validation of the organization conformity. Paragraph 2.4 describes the GACA conformity verification program in further detail.

(c) Organizations are encouraged to submit GACA form 8130-9, Statement of Conformity, as early as possible in the program to prevent delays in the type certification approval process. Except for in-process evaluations, such as process review, hidden inspections, etc., a Statement of Conformity should be submitted to the GACA prior to the start of GACA conformity verification inspections. By signing GACA form 8130-9, the Organization signifies to the GACA that the Organization has fabricated, installed and inspected the parts as per its GACA approved procedures to the latest revision of the descriptive data, except for the deviations noted, and that the Organization is ready to receive the GACA for its conformity verification inspection. The Organization or an authorized individual who holds a responsible position in the manufacturing/maintenance organization should sign the Statement of Conformity. In cases where the conformity inspection is conducted away from the Organization's facility, the Organization may choose to utilize one of the following procedures for signing the Statement of Conformity:

(1) The Organization may send an authorized representative to the facility to inspect the prototype article and sign the Statement of Conformity; or

(2) The Organization may delegate, in writing, a representative who holds a responsible position in the organization of the supplier to act as her/his agent. In this case, a copy of the authorization letter will be attached to GACA form 8130-9 when it is submitted.

2.3.4 Showing Compliance.

2.3.4.1 Certification Testing Program.

(a) Certification testing is a key activity in alteration projects. Certification testing includes, but is not limited to, structural tests (static, fatigue, vibration, pressurization, bird strike), ground functional tests, electro-magnetic compatibility tests, and flight tests.

(b) From the Organization’s perspective, certification testing needs to be planned, carried out and reported in accordance with a certification test program. The certification test program is to be documented in the certification plans and agreed upon between the Organization and GACA as early as possible. The certification test program should address all of the elements discussed in this paragraph.

(c) The GACA strongly advises all Organizations not to perform any certification testing without prior notification and concurrence (including test plan approval) from GACA.

(d) From the GACA perspective, normally all certification tests involving ground testing, flight testing, critical systems or structure, subjective pass/fail criteria, complex test apparatus, significant risk, and/or significant cost will be subjected to a GACA conformity verification inspection prior to testing. Depending on complexity, the use of the Type Inspection Authorization (TIA) process might be required.

(e) Design testing carried out outside of the certification testing program cannot be credited towards certification testing.

(f) Certification ground and flight testing must be witnessed by GACA or GACA designees.

2.3.4.2 Test Plans.
All certification testing must be performed in accordance with a test plan that has been approved by the GACA. Test plans are normally stand-alone documents although it is acceptable that they be part of another document (e.g., Engineering Order) as long as all the required test plan information is clearly identified and segregated. The test plan must include a description of the test apparatus, test procedure and detailed pass/fail criteria. The test plan should also include instructions for ensuring test safety. All test plans must be recommended for approval by the relevant GACA-DERs or foreign delegated individuals (using GACA form 8110-3 or equivalent). The GACA test plan approval is normally signified by letter from the GACA prior to certification testing actually taking place. In specific instances, GACA-DERs may be authorized to approve test plans on behalf of the GACA.

2.3.4.3 Type Inspection Authorization (TIA).
The TIA details and authorizes the required conformity and airworthiness inspections, and ground and flight tests necessary to fulfill the requirements for the certification process as discussed in paragraph 2.4.1. It may also contain an operational and maintenance requirements section. The TIA is prepared by the GACA CPM with coordination as required with the appropriate GACA inspection and flight test resources, including GACA-DERs and GACA-DARs. Issuance of the TIA will occur when the examination of the technical data required for the certification is completed or has reached a point where the aircraft or component will meet the pertinent regulations. Prior to final TIA approval and GACA certification ground and flight tests, the Organization should participate in a flight safety board meeting. GACA certification flight testing commences only after the Organization has successfully completed the organization flight tests, the TIA has been issued, and section 18A of the TIA have been completed. See FAA Order 8110.4( ) and AC 21-40(0) for further details.

(a) GACA-Form 8110-1, TIA This TIA form is the cover page which provides basic information about

the name of the Organization, aircraft type, certification basis, nature of the alteration, certification project number, and internal GACA coordination. The second page contains general information, including a description of the alteration and unique features or special interfaces. This section may list the applicable GACAR/FAR and/or any GACA policy in which compliance will be shown.

(1) TIA Section 18, Part I This section contains conformity instructions requesting GACA inspection to verify that the aircraft or component conforms to the Organization's approved design data. This section may outline any other required ground inspections required by the GACA airworthiness engineering. It may also define and specify the type of airworthiness certificate required.

(2) TIA Section 18, Part II This section contains a set of instructions requesting GACA or its GACA-DERs to perform specific flight tests to demonstrate that the aircraft alteration complies with the GACAR /FARs. The flight test plan submitted for GACA approval is typically referenced or embodied in this section of the TIA. The flight test plan should contain clear, detailed procedures allowing the flight test crew to conduct the flight test and make a determination of pass or fail.

(3) TIA Section 18, Part III This section typically contains the GACA instructions and/or test sets that require the aircraft alteration compliance to operational regulations. This section also is needed when the nature of the alteration may affect the pilot type rating, procedures, pilot training program, Master Minimum Equipment List (MMEL), or the aircraft maintenance procedures.

2.3.4.4 Test Results.

(a) Test results should be reported either as a revision to the test plan or as a stand- alone document. In addition to the test data itself, these results should include interpretation of the data, an assessment of the relationship between the alteration and any snags encountered during the flight(s), and an overall assessment of its success or failure.

(b) A copy of a test plan with the hand-written data collected during the test is not, by itself, an acceptable test report.

2.3.5 Flight Testing.

(a) Fitness for Test Flight.

(1) In some projects, flight testing will be required to show compliance with the applicable requirements. In these cases an Experimental Airworthiness Certificate will be required as per GACAR § 21.173. Before making the request for the Experimental Airworthiness Certificate, the

Organization is to carry out an assessment of the fitness for test flight.

(2) Fitness for test flight is to include a risk assessment (refer to FAA Order 4040.26(), Aircraft Certification Service Flight Test Risk Management Program) of the test flight to be performed referring to the flight test plan(s) and the engineering documents defining the aircraft configuration for that test, sign-off by all GACA-DERs involved in the project, and an assessment/statement by the Organization Quality Assurance section that the aircraft is fit and safe for the intended flight. All of these activities should normally take place towards the end of the project, once the GACA review of the technical data is completed or has reached a point where it appears that the aircraft being altered will meet the pertinent design requirements. The assessments and statements are to be documented in a letter from the Organization, with the GACA-DER signatures as an appendix. Such a letter supports the request for Experimental Airworthiness Certificate which is to be made using GACA form 201, for a Special Airworthiness Certificate, Experimental, to show compliance with the GACAR/FARs. GACA form 201 is to be signed by the owner/operator but submitted by the Organization.

(b) Special Airworthiness Certificate – Experimental.

(1) The Special Airworthiness Certificate – Experimental must be carried onboard the aircraft in lieu of the Standard Certificate of Airworthiness. Note that such an Experimental Certificate will not constitute a permit for any ferry flight, which must be addressed separately. The experimental C of A is normally issued by the GACA Principal Maintenance Inspector in accordance to the requirements of GACAR § 21.173.

(2) When the flight test is to take place outside the KSA airspace, the Organization is responsible for obtaining any additional authorities from the CAA responsible for that airspace. Furthermore, when the test flight will result in the aircraft being operated outside its certified flight envelope (speed, altitude, weight, center of gravity), the GACA will copy that CAA on the covering letter providing the Experimental Airworthiness Certificate to the Organization.

(3) In order to apply for a Special Airworthiness Certificate – Experimental, the applicant shall submit the following items:

(i) Application for Experimental C of A (Form 201)

(ii) Proof of payment of application fee

(iii) Risk assessment

(iv) Flight test plan(s)

(v) Draft Aircraft Flight Manual-Supplement (AFMS).

(vi) Safe for flight statements (Fitness for Flight)

(vii) Statement of successful completion of all relevant ground tests

(viii) Required effective dates for the certificate

(ix) Proposed aerodromes of operation

(x) Operation limitations anticipated or necessary for the intended flight tests

(xi) Mass/Weight & Balance Report/Supplement (If Applicable)

(xii) Cabin and/or Systems De-Activation Engineering Order (If Applicable)

2.4 Phase 3 – GACA Verifying Conformity and Finding Compliance.

Phase 3 of the certification process includes the activities performed by the GACA and its designees to ensure that the applicant has successfully completed all of their activities required in Phase 2. NOTE 2.10: The activities performed in Phase 2 are often performed in parallel with the activities performed in Phase 3. Phase 2 represents those activities performed by the applicant and Phase 3 represents those activities performed by the GACA and its designees.

2.4.1 Conformity Verification Procedures.

The STC certification process includes the requirement that the authority verify, with a high degree of confidence, the Organization's compliance with the applicable airworthiness and environmental requirements and conformity of the materials, parts, processes, construction and assembly to the type design drawings and specifications. Prior to any conformity verification inspection by the GACA, the Organization must submit a completed GACA form 8130-9, Statement of Conformity, to the GACA. The GACA Certification Project Manager responsible for the project will then liaise with the GACA inspector assigned to or GACA-DAR authorized for the project to coordinate conformity verification inspection activities. This liaison will be initiated on GACA form 8120-10, Request for Conformity Verification and shall include the provision of the completed GACA form 8130-9, location and contact information for inspection activity, references to alteration descriptive data, description of specific inspection items being requested.

2.4.1.1 Request for Conformity Verification.

GACA form 8120-10, Request for Conformity Verification is the internal GACA document which is used by the GACA CPM to request conformity verification inspections by the GACA inspector

and/or GACA-DAR. The GACA inspector/GACA-DAR should not conduct a conformity verification inspection without receiving proper documentation from the CPM and Organization. GACA personnel eligible to perform conformity verification inspections include GACA airworthiness inspectors, GACA-DAR, and inspectors from foreign CAA with which the GACA has a bilateral agreement that contains the appropriate provisions for that purpose.

2.4.1.2 GACA Conformity Verification Inspection Types and Reasons.

(a) To optimize efficiency between the GACA CPM and the GACA inspectors or GACA-DARs, GACA conformity verification inspections have been broken down into types and codes. These will be used to identify what conformity verification inspection activities need to be carried out on a given project.

GACA Conformity Verification Inspections	
Types	Reason Codes
Parts/Assemblies	1,2,3,5,6
Processes	1,2,3,6
Installations	1,2,3,4,5,6
Certification Test Apparatus	1,5,6
Software	See FAAO 8110.4( ), Chapter 5

(b) The reason codes for performing GACA conformity verification inspections have the following meanings:

(1) Conformance to type design:

(i) Ensuring conformity to descriptive data

(ii) Ensuring continuity between certification test articles and production articles

(2) Effectiveness of configuration definition data:

(i) Ensuring configuration definition data is capable of producing parts that have consistent (i.e. repeatable) qualities affecting airworthiness

(ii) Absence of ambiguity

(iii) Information on fits, tolerances, finishes, etc.

(iv) Material and hardware specifications

(v) Test specifications

(vi) Drawing change control (e.g. revision status)

(3) Workmanship:

(i) Ensuring the workmanship contribute to the quality of the product

(ii) Ensuring the workmanship can be duplicated under production conditions

(iii) Ensuring criteria have been established to identify workmanship practices

(4) Compatibility:

(i) Ensuring no interference or adverse interactions with existing aircraft systems

(ii) Ensuring no interference or adverse interactions with previously installed alterations and/or repairs

(5) Identification of unsafe and/or undesirable design features:

(i) Ensuring adequate drainage

(ii) Ensuring adequate ventilation

(iii) Ensuring adequate protection of structure and systems

(iv) Ensuring adequate accessibility provisions

(v) Ensuring appropriate use of hardware

(vi) Ensuring smoothness of operation of mechanical systems

(vii) Ensuring adequate padding of projecting objects that could injure

(6) Calibration of measurement equipment:

2.4.1.3 Conformity Verification Inspection Record.
The GACA inspector/GACA-DAR must document conformity verification inspection activities including findings of non-conformance on GACA form 8100-1 for all conformity verification requests submitted by the GACA CPM. If the GACA inspector/GACA-DAR finds discrepancies, he may be justified in requesting a complete re-inspection by the Organization.

2.4.1.4 Disposition of Discrepancies.
Any non-conformity found as a result of the GACA conformity verification inspection require GACA CPM or authorized GACA-DER disposition on GACA form 8100-1. The Organization is responsible for the rectification of all non-conformances identified by the GACA.

2.4.2 Compliance Inspections.
(a) An engineering compliance inspection should be done by GACA airworthiness engineers or designees for any aspect of product design and installation where compliance with the certification requirements cannot be determined through the review of drawings or reports.

(b) An engineering compliance inspection is performed to verify compliance to the airworthiness requirements and it provides an opportunity to review an installation and its relationship to other installations on a product. The most common situations where compliance inspections are performed are outlined below:

(1) Cabin interiors to ensure compliance with the many occupant safety and crashworthiness requirements.

(2) Electrical wiring to ensure compliance with EWIS requirements.

(3) Control systems to ensure compliance with ease of control, interferences, etc.

(4) Fire protection measures to ensure compliance with separation and isolation requirements

(5) System routing of hydraulic and electrical components to ensure proper separation and support. GACA Form 8130-9, Statement of Conformity should be submitted to the GACA before conducting the engineering compliance inspection.

2.4.3 Test Witnessing.
(a) Normally, all certification tests involving flight critical systems or structure, subjective pass/fail criteria, complex test apparatus, significant risk to personnel, and/or significant cost will be witnessed by the GACA. GACA personnel eligible to witness certification tests include GACA airworthiness engineers, GACA inspectors, GACA-DER (when specifically authorized by the GACA) and foreign CAA employees as agreed through bilateral agreements or working arrangements

between the GACA and that CAA. The GACA may permit responsible individuals at an Organization to witness simple certification tests on a case-by-case basis. This could include Organization individuals from the Quality Assurance section or pilots from the Organization or other.

(b) Except for flight test GACA-DER, GACA personnel or designees should not participate in tests. Their task is rather to observe and ensure that the test is carried out as per the approved test plan. Note that flight test pilots who actually fly the aircraft must hold an appropriate and valid GACA pilot certificate and medical certificate. 2.4.4 Reports Compliance Inspection, Ground Test and Flight Test Reports must be prepared to document the results upon satisfactory completion of all inspections and tests. These results must be reported by the authorized individuals who performed the inspections and tests. A report that is prepared by a GACA-DER/DAR, must be submitted to the GACA for review and approval.

2.4.5 Findings of Compliance.
Findings of compliance against specific applicable requirements are to be made by the individuals listed in the compliance checklist. Such findings of compliance are to be made in a form and manner as described in the relevant paragraph of Chapter 4. All Statements of Compliance made by GACA DER must be submitted to the GACA by the Organization.

2.5 Phase 4 – STC Issuance.

2.5.1 GACA Certification Project Manager's Recommendation for GACA STC Issuance.
For projects involving more than one engineering discipline, it is important that the GACA CPM consults with the appropriate airworthiness engineers in all affected engineering disciplines within the GACA. Once he has reviewed all the engineering and certification data and is satisfied that compliance has been shown against all the applicable requirements for the project and that no feature or characteristic makes it unsafe for its intended use, he will make a recommendation to the Manager of Airworthiness by internal memorandum for the issuance of the GACA STC.

2.5.2 Approval of certain required operating data.
(a) According to regulation, certain required operating and maintenance documents developed by the applicant must be approved by the GACA. These include the following:

1. Approved sections of the Flight Manual Supplement

2. Airworthiness Limitations

3. Certification Maintenance Requirements

4. EWIS Instructions for Continued Airworthiness

5. MMEL Supplement

(b) The GACA CPM will coordinate with the applicable divisions and approval authorities within GACA to obtain the required approvals. The approved documents will not be released to the applicant until the STC has been issued.

2.5.3 Issuance of the GACA STC Certificate.

(a) The GACA STC will be approved by the GACA authorized individual and will specify the holder, the regulations, the aircraft make and model, the description of the type design change (including identification of the MDL, top EO or other similar engineering document describing the change), the limitations (including serial number applicability) and conditions (including reference to any AFMS or MMS). In addition, the GACA STC will state the certification basis for the design change.

(b) The GACA STC number will be based on the project authorization number (i.e., project authorization number GACA/008-23 will result in GACA STC no. 008-023).

(c) The original copy of the GACA STC, along with any GACA approved operating data (e.g. AFMS, Airworthiness Limitations, etc.) will then be sent to the holder. The holder must ensure that the original or a copy of it is put into the aircraft records. A copy of the GACA STC will be kept in the aircraft file as well as in the airworthiness engineering project file at the GACA.

(d) The issuance of the GACA STC only signifies that the engineering data has been approved for installation. However, the STC does not constitute closure of the alteration project as it does not approve the aircraft for return to service.

(e) The engineering hourly charges for the project must be collected from the STC applicant before the STC is released.

2.5.4 Closure and Filing of Project Docket.

(a) The signing of block 7 for the return of the aircraft to service constitutes project closure. An air carrier operating under GACAR Part 121 may provide an alternate form provided it is approved by the GACA and is described in the air carrier’s maintenance manual. Of course, continued airworthiness still needs to be addressed thereafter;

(b) The issuance of the GACA STC marks the end of the GACA STC project. At this point the assigned GACA CPM will ensure that all relevant certification documents and project correspondence are contained in the project docket and the docket is stored for safe keeping in the

GACA records system in accordance with established GACA processes.

(c) The GACA utilizes a document checklist to ensure that all relevant certification documents are contained in the project docket.

2.5.5 Data retention.
(a) The GACA is to keep an airworthiness engineering project file containing, at the minimum, the records showing engineering decisions or actions taken by the GACA and all associated documents.

(b) Under GACAR § 21.107 the Organization is to keep all of the descriptive data, certification data and required operating data at the latest revision status approved/accepted by the GACA.

(c) These data records are permanent and may not be destroyed. They must be kept until the aircraft is retired from service. The data must be made available to the GACA when requested during regulatory activities (e.g., audit, design review). The data may be kept as hard copies or electronically.

2.6 Post Certification Activities.
(a) *Further changes to the approved data:*

(1) Any further changes to the type design after the GACA STC has been issued must be assessed as a new alteration.

(2) If the Organization is the GACA STC holder, then an amended GACA STC will be issued and will refer to the new data. The same GACA STC process is to be used to get an amended GACA STC, although due regards and credits is to be given for all previous applicable submissions. If the changes are editorial in nature and do not affect the technical content of the STC a revision may be issued to record such changes.

(3) If the Organization is not the GACA STC holder, then a new GACA STC or other forms of approved data are required. Consult GACA AC 021-03 for additional information of the types of approved data acceptable for Saudi Arabian registered aircraft.

(b) *Transfer of an STC:* Until specific GACA guidance concerning the transfer of an STC is developed, holders wishing to transfer a GACA STC should consult FAA AC 21-40( ) for details as the GACA STC transfer process will be similar.

CHAPTER 3 – PERFORMANCE AND RECORDING OF ALTERATIONS AND REPAIRS

3.1 General.

All alterations and repairs, whether minor or major, are to be performed and recorded as per GACAR Parts 43, 66, 91, 121, 125 and 135 as applicable. All alterations and repairs, whether minor or major, must be recorded as an entry in the aircraft records.

3.2 GACA Form 8320-1, Major Alterations & Repairs.

(a) Major alterations and repairs, in addition to the aircraft record entry, must also be recorded using GACA form 8320-1, Major Alterations and Repairs. Air carriers operating in accordance with GACAR Part 121 may use alternate procedures and forms provided that they are approved by GACA and are described in the air carrier's maintenance manual.

(b) If a GACA STC is being used as the approved data, a single GACA form 8320-1 is to be used to address all the major alterations that are authorized by the same project authorization number. Furthermore, no work other than the work authorized by the project authorization number is to be recorded on that GACA form 8320-1. The same applies regarding major repairs when a GACA RDA is being used as the approved data.

(c) The form is to be completed as per GACAR Part 43 appendix B (GACA form 8320-1 is the equivalent of the FAA form 337) and the additional guidelines contained in FAA AC 43.9-1( ) and the following paragraphs in the chronological order presented. In addition to Blocks 6 and 8, Blocks 1, 2, 4 and 5 must also be completed.

3.2.1 Block 8 - Description of Work.

(a) The first line is to indicate, as a minimum, the aircraft registration mark, model and serial number, and GACA project number if applicable (GACA STC or RDA).

(b) Then, a clear, concise, and legible statement is to be made describing the work accomplished the sources of approved data and required operating and maintenance data.

(c) With respect to the work accomplished, it is important that the configuration and location of the repair or alteration be fully described. The amount of detail of this description should be such that a conformity inspection of the entire installation could be performed based on the descriptive data.

Information Note 3.1: It is important that the descriptive data include details of applicable process specifications and wire routing and mounting. In addition, if reference is made to standard practices in FAA AC 43.13 () then reference must be made to the specific amendment and paragraphs of that document.

(d) Data used as a basis for approving major repairs or alterations for return to service must be listed in block 8. Sources of data for major alterations and repairs may not be other than those listed in GACA AC 021-03 and are to be identified by document number, revision numbers, paragraphs as applicable, dates, etc. And shall also include a reference to the specific paragraph in GACA AC 021-03 that provides for the GACA acceptance of this data.

(e) Deviations from these documents which would by themselves constitute a major alteration or repair must be documented in some form of Approved Data which must also be listed. Deviations from these documents which would constitute a minor alteration or repair should also be documented in block 8 and should be indicated in the aircraft record entry. Notwithstanding, any deviations (minor or major) from an airworthiness directive (AD) must be approved by the GACA as per GACAR § 39.13.

(f) Required Operating and Maintenance Data such as AFMS, pilot's guides, MMS, MMEL supplements, etc. should be listed including document numbers and revision levels as appropriate. Any new airworthiness limitations must also be indicated and the resultant life limit identified in terms of flight cycles, flight hours, etc..

(g) In cases where mass/weight and balance of the aircraft are affected, the changes should be entered in the aircraft mass/weight and balance records with the date, signature, and reference to the work performed on the GACA Form 8320-1 that required the changes.

(h) If additional space is needed to describe the repair or alteration, attach sheets bearing the aircraft nationality and registration mark and the date work was completed.

3.2.2 Block 6 - Conformity Statement.

Conformity statement must be made by the certificated repair station. The conformity statement in block 6 serves the purpose of formally stating that the major alteration or repair as installed conforms to the installation data as noted in block 8. This block should be completed as follows:

"A" - Agency's Name and Address:

Enter name of the mechanic, Organization, or manufacturer accomplishing the alteration or repair. Mechanics should enter their name and permanent mailing address. Manufacturers and Organizations should enter the name and address under which they do business.

"B" - Kind of Agency:

Check the appropriate box to indicate the type of person or organization who performed the work.

"C" - Certificate Number:

Mechanics should enter their mechanic certificate number in this block. Organizations should enter their air agency certificate number and the rating or ratings under which the work was performed or, if it is an Organization which is the subject of a one-time approval, the one-time approval authorization number.

"D" - Conformity Statement:

This space is used to certify that the repair or alteration was made in accordance with the data listed in Block 8. When work was performed or supervised by certificated mechanics not employed by an Organization, they should enter the date the alteration or repair was completed and sign their full name. Organizations are permitted to authorize persons in their employment to date and sign this conformity statement.

3.2.3 Block 7 - Approval for Return to Service.

(a) For major repairs performed using data approved under a GACA RDA, block 7 cannot be signed and the aircraft cannot be returned to service before block 3 is signed by the GACA. See Chapter 4, GACA RDA procedures.

(b) GACAR Part 43 establishes the conditions under which major alterations or repairs to airframes, powerplants, propellers, and/or appliances may be approved for return to service following major alteration or repair. Block 7 of the form is used to indicate approval or rejection of the alteration or repair of the unit involved and to identify the person or agency making the airworthiness inspection.

(c) The "approved" or “rejected" box is used to indicate the finding. Additionally, check the appropriate box to indicate who made the finding. Use the box labeled "other" to indicate a finding by a person other than those listed. Enter the date the finding was made. The authorized person who made the finding should sign the form and enter the appropriate certificate or designation number.

(d) In accordance with GACAR Part 43, Appendix B, forward a copy of the form to the GACA within 48 hours after the aircraft, airframe, aircraft engine, propeller, or appliance is approved for return to service.

3.2.4 Retention of GACA Form 8320-1.

In addition to the requirements of GACAR Part 43, Appendix B, GACA forms 8320-1 are to be retained in the repair station files for at least two years as per GACAR § 145.101. Air operators are to keep them as per GACAR § 91.457 or § 121.699 as applicable. Notwithstanding the above, GACA forms 8320-1 used to record a GACA RDA (Block 3) must be kept in the repair station files up to

two years after the aircraft has been deregistered. Furthermore, a copy of the same GACA form 8320-1 must be kept by the owner or operator.

CHAPTER 4 – GACA REPAIR DESIGN APPROVAL PROCEDURES

4.1 General.

The GACA repair design approval (RDA) is the instrument used to approve major repairs. The GACA RDA process essentially follows the same steps as the GACA STC process. Accordingly, the same kind of documentation for major repairs is to be presented as for major alterations. Therefore, all the relevant guidelines provided in Chapter 2 are also to be used for a GACA RDA, replacing the words "alteration" and "STC" by "repair" and "RDA" respectively. There are a few specific provisions for the RDA process and they are indicated in the paragraphs below in this chapter.

4.2 Specific provisions for the GACA RDA process.

(a) There will not be a number assigned to the RDA the same way there is one for the STC. However, a project authorization number is still to be issued and used to track the project.

(b) For the basis of certification, the regulatory basis is not required to be the amendment in effect at the time of the application, but rather the amendment in the original basis of certification. Operational requirements may impose additional requirements, such as the damage tolerance assessments (DTA) of GACAR Part 26. These requirements should also be complied with.

(c) It is understood that in most cases the need will be minimized for GACA test witnessing and approval of the AFMS. Regardless, the need for these activities or documents must be assessed by the Organization and reviewed by the GACA.

(d) It is very possible that Airworthiness Limitations will result as a consequence of the major repair (e.g., additional structural inspection requirements).

(e) In addition to the information identified in paragraph 4.2, Block 8 of the GACA form 8320-1 is also to identify any limitations or conditions related to the major repair, as well as the certification basis used if different than the one used for the type certificate.

(f) Of course, paragraph 2.5.3, STC issuance, is never applicable to GACA RDAs. Instead, paragraph below describes the particular steps for the recording of the GACA RDA that are to be used.

(g) Repairs affecting fatigue critical structure may be subject to a three stage approval process as described in FAA AC 120-93( ) Appendix 5.

4.3 Issuance of the GACA RDA.

(a) All GACA RDA projects must be recommended for approval by a GACA Certification Project Manager (CPM). Once the CPM responsible for the project has reviewed all the certification data and

is satisfied that compliance has been shown against all the applicable requirements for the project, he will write a memorandum to the Manager of Airworthiness. The recommendation for approval should indicate that the major repair has been found to comply with all applicable airworthiness requirements. For projects involving more than one engineering discipline it is important that the airworthiness engineer responsible for the project has consulted with the appropriate airworthiness engineers in all affected engineering disciplines.

(b) The RDA is a GACA statement and signature by the GACA authorized individual in block 3 of the same GACA form 8320-1 that is being used to record the major repair and return that aircraft to service.

(c) The Organization is first to complete blocks 1, 2, 4, 5, 6 and 8 of the GACA form 8320-1. It is to enter the GACA project number in both blocks 3 and block 8 to ensure traceability when the two-sided GACA form 8320-1 is photocopied or faxed. It is also to ensure that both the descriptive and certification data (including GACA forms 8110-3) is listed in block 8 and is in agreement (including revision level). A disagreement between the two constitutes a change from the approved type design and results in the unapproved data going through the approval process again or finding access to other approved data that addresses the change.

(d) Next, the Organization must send a copy by facsimile or email it to the GACA. The GACA will stamp and sign block 3 after it is satisfied that blocks 8 and 6 have been properly filled out and that the aircraft is in compliance with all applicable regulations. This copy with the original GACA stamp and signature will then be sent back by mail to the Organization for its aircraft records, although a copy can be sent back by facsimile or email in advance. The GACA will also keep a copy of the RDA in its aircraft file. (e) After, and only after, the Organization has received the original or the facsimile copy of the RDA can it sign block 7 and return the aircraft to service as per Chapter 3. It is acceptable to the GACA for the aircraft to be returned to service on the basis of a facsimile copy of the GACA form 8320-1 but the original is to be inserted in the aircraft file upon receipt; it is not necessary to sign off block 7 on the original if the aircraft was released by signing block 7 of the facsimile copy.

CHAPTER 5 – FOREIGN DESIGN APPROVALS USING A SAUDI ARABIAN REGISTERED AIRCRAFT AS THE PROTOTYPE

5.1 General.

(a) Foreign CAAs periodically initiate projects for STC (or equivalent foreign installation data approvals) which use, as the prototype, an aircraft that is not on their registry. When such an aircraft is registered in the KSA, the provisions herein apply. If the project concerns a foreign STC (e.g. FAA STC or EASA STC) the procedures described in this chapter apply.

(b) If the project is initiated by an EASA DOA, the EASA STC validation procedure detailed in the GACA/EASA working arrangement will be used along with paragraphs 5.3 – 5.5 of this chapter as applicable.

(c) The provisions of this chapter do not apply to projects on aircraft that are to be imported into the KSA but that are not yet registered in the KSA.

5.2 Procedure for an FAA STC project.

(a) The GACA philosophy regarding FAA STC projects using an aircraft registered in the KSA is to minimize its involvement in the STC process. However, because of its responsibility as the State of registry for the aircraft being used as the prototype, the GACA must understand the nature of the alteration and might therefore need to participate in some of the activities of the FAA STC process to the extent required to secure that understanding on a case-by-case basis. This could include participation in meetings, requests for clarifications following review of design or certification documents, and participation in certification inspections and tests as an observer.

(b) It is to note that the GACA cost recovery policies and procedures also apply for the FAA STC activities for which the GACA staff must travel. The Organization – not the FAA STC applicant - will be responsible to the GACA for the expenses and charges, and associated terms and conditions.

(c) As a minimum, the activities described in the following paragraphs will involve the GACA. This information below assumes that the FAA will follow its process described in FAAO 8110.4( ) and FAA AC 21-40( ).

5.2.1 Notification by the Organization.

The Organization should notify the GACA as soon as possible of their intent to work with the FAA for an FAA STC using an aircraft registered in the KSA as a prototype. Early notification will allow

the GACA to plan properly and prevent the Organization expending resources on an FAA STC project that, for some reason, the GACA concludes that it cannot support.

Note 5.1: Only GACA certificated repair stations may perform actual work on Saudi registered aircraft.

5.2.2 Notification by the FAA.

The FAA STC process using foreign registered aircraft as prototypes requires the FAA to officially advise the CAA of the State of registry of the up-coming project and seek concurrence. Therefore, the manager of the FAA ACO concerned will send such a notification in writing to the GACA Manager of Airworthiness, normally during the FAA undue burden process before the actual FAA STC project is officially initiated. This notification may be received from the FAA through the applicant, in accordance with the FAA Order 8110.4 procedures. The FAA notification will usually contain the following information:

(1) FAA STC applicant name and normal place of business;

(2) Brief description of the alteration project;

(3) Aircraft type, serial number and KSA registration marks;

(4) Organization that will be responsible for performing the alteration on the aircraft;

(5) Location of the aircraft during the FAA STC project;

(6) Starting date and duration of the FAA STC project;

(7) Whether flight testing will be conducted;

(8) Concurrent activities on the aircraft;

(9) Request for GACA concurrence for the use an aircraft registered in the KSA;

(10) Request for GACA concurrence for the use of FAA Designees if applicable. Also, identification of FAA Designees that are also employed by the FAA STC applicant to allow the GACA to better identify potential conflicts of interest;

(11) Request for any specific information required in support of the FAA undue burden process;

(12) Invitation for GACA participation; and

(13) Identification of the FAA ACO project manager, including their contact coordinates.

5.2.3 GACA response to the FAA notification.

The GACA will respond to the FAA notification in a timely manner so as to not delay the FAA undue burden process and subsequent FAA STC project. As a minimum, the GACA response will contain the following information:

(1) Responses to the FAA requests;

(2) Identification of any additional requirements;

(3) Request for copies of specific design and certification documents as they become available (i.e., formally submitted to or by the FAA). As a minimum, these will consist in the certification plan (including schedule) and, if applicable, any TIA, exemptions, special conditions and/or Issue Papers;

(4) Emphasize on the criticality of timely STC issuance if the prototype aircraft is to immediately be used for revenue service after the certification inspection and testing; and

(5) Identification of the GACA focal point for the project, including telephone number, fax number and e-mail address.

(6) A GACA project number will be issued for the FAA STC for tracking purposes. No GACA STC will be issued but a copy of the FAA STC will be kept in the engineering files as well as in the affected aircraft file.

5.2.4 FAA STC Project Initiation Meeting.

Normally, a project initiation meeting will take place early in the project. The GACA focal point will attend this meeting. Attendance to subsequent meetings is likely to be limited to critical design review meetings, as decided on a case-by-case basis.

5.3 Performance of work on the aircraft.

Only a GACA certificated repair station is permitted to work on a Saudi registered aircraft for the incorporation of any alteration or repair in accordance with GACAR Part 43.

5.4 Flight testing.

(a) If the foreign certificate projects includes flight testing as means of compliance a GACA Special Airworthiness Certificate – Experimental, must be issued because the GACA standard Airworthiness Certificate is not valid during the certification process. In these situations the GACA must get involved because only it, as the CAA of the State of registry, can legally issue that Special Airworthiness Certificate.

(b) The procedure to request and issue a GACA Special Airworthiness Certificate – Experimental. The request and the supporting documents (including for FAA STC projects the FAA Type Inspection Authorization) and the risk assessment are to be submitted to the GACA by the Organization in conjunction with the aircraft owner. After satisfactory review, the GACA will issue the GACA Special Airworthiness Certificate – Experimental after which the test flight(s) may proceed.

(c) Note that all non-GACA flight test pilots who will fly the Saudi registered aircraft for compliance flight testing must hold a GACA pilot certificate and medical certificate or the GACA must render as valid the foreign flight crew licenses.

(d) Note that if the flight testing takes place outside of the KSA, the Special Airworthiness Certificate must be validated before flight by the CAA of the territory over which the aircraft will fly.

5.5 Return of aircraft to service prior to foreign STC issuance.

(a) If the Organization wishes to return the aircraft to service prior to the issuance of the foreign STC, the Organization may use one of the following options:

(1) Return the aircraft to its original configuration, exactly as it was prior to the foreign STC project;

(2) Receive temporary authorization from the GACA to release the aircraft to service pending the foreign STC issuance. In order to receive temporary GACA authorization the Organization/ the CAA must show to the GACA that compliance has been found with all applicable design requirements. Any foreign STC project where the foreign CAA has retained findings of compliance for design requirements other than GACAR/FAR §§ XX.1529 [Instructions for Continued Airworthiness] and XX.1581 [Aircraft Flight Manual] will limit the feasibility of this option. The following documents must be provided to the GACA:

(i) STC compliance checklist showing all applicable design requirements and the authority to make the findings of compliance for each;

(ii). Applicable Airworthiness Limitations; and

(iii). Applicable AFMS.

GACA will review the documents and, if satisfied, will issue a letter to the Organization providing provisional approval of the alteration data and allowing the aircraft to be returned to service. Normally, the GACA will request that the foreign STC applicant obtain a letter from their CAA to formally:

(i) Specify the reference, including proper revision level, to the top document or drawing defining the alteration;

(ii) State that compliance has been found against all applicable regulations (design requirements); and

(iii) State that only administrative actions are required on their part to actually issue the foreign STC itself.

(3) Deactivate the system but leave the provisions installed until the foreign STC is issued. In this situation the GACA will issue a letter of authorization to allow the aircraft to be returned to service with the provisions installed and the system deactivated. In order for GACA to issue a letter of authorization, the Organization must submit the following documents to GACA:

(i) The certification plan and checklist showing all applicable design requirements and outlining any designees authority to make the findings of compliance;

(ii) Deactivation instructions approved by the relevant foreign designees;

(iii) GACA form 8130-9 signed by the authorized person in the Organization and listing all the installation and deactivation data;

(iv) Airworthiness Limitations (if any); and

(v) AFMS.

(b) To help alleviate delays in the issuance of the foreign STC, the Organization and the foreign STC applicant should ensure that adequate milestones (including early submission of certification data by the foreign STC applicant to the foreign CAA) are included in the schedule contained in the certification plan, and respected by all stakeholders.

CHAPTER 6 – CONTINUED AIRWORTHINESS

6.1 Responsibilities.

The responsibility for continued airworthiness for alterations and repairs approved by way of GACA STC or RDA rests with the Organization that was granted the STC or RDA, and to the aircraft owner/operator, as follows:

(a) Report deficiencies as per GACAR § 21.5 or GACAR §§ 121.259, , 125.539, 135.695, 145.103;

(b) Correct deficiencies as per GACAR § 21.17 and GACAR § 91.443;

(c) Develop and maintain instructions for continued airworthiness as per FAAO 8110.54A;

(d) Maintain the aircraft in airworthy conditions as per GACAR § 91.443;

(e) Perform maintenance and alteration in accordance with GACAR Parts 43 and 91.

(f) Keep records as per GACAR Parts 43, 91, 121, 125 and 135; and

(g) Allow GACA inspections as per GACAR §§ 119.107and 145.105.

6.2 Reporting Format.

GACA form 8330-2, Malfunction or Defect Report can be used to report these conditions, however, the GACA will accept any format of form provided that the required information contained within GACA form 8330-2 is provided.

Air carriers (GACAR Part 121 and 135) report to the GACA IAW GACAR §§ 121.1553, 135.695 and GACAR Part 125 holder report IAW GACAR § 125.539.

CHAPTER 7 – FOR FURTHER INFORMATION

7.1 Responsible Department(s).

The Airworthiness Section of the Aviation Safety Standards Department of the GACA Safety, Security and Air Transport Sector is the department responsible for the approval of alterations and repairs to Saudi Arabian registered aircraft.

7.2 Contact Details.

The Airworthiness Section can be contacted at the following coordinates:

In person:
General Authority of Civil Aviation
Airworthiness Section, Aviation Safety Standards Department
Safety, Security and Air Transport Sector Building
KAIA, Jeddah

By mail:
General Authority of Civil Aviation
Airworthiness Section, Aviation Safety Standards Department
Safety, Security and Air Transport Sector
P.O. Box 887
Jeddah, 21421