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भारत सरकार, रक्षामंत्रालय,
वैमानिक गुणता आश्वासन महानिदेशालय
ब्लॉक 'ए', सातवाँ तल, रक्षा कामप्लेक्स
कस्तूरबा गाँधी मार्ग, नई दिल्ली -110001
Government of India, Ministry of Defence
Directorate General of
Aeronautical Quality Assurance
'A' Block, 7th Floor, Defence Complex,
Kasturba Gandhi Marg, New Delhi-110001

सन्दर्भ संख्या REF No. 1405/Directives/DGAQA/Tech Coord

दिनांक Date : 29 March 2022

सेवा में

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अपर महानिदेशक (उ एवं मध्य) लखनऊ
ADG (N & CZ), Lucknow

अपर महानिदेशक (कोरापुट)
ADG (Koraput)

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ADG (Nasik)

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ADG (SSQAG), Hyderabad

प्रधान निदेशक (एम एस क्यू ए ए) हैदराबाद
PD (MSQAA), Hyderabad

वै गु आ मनि के सभी क्षेत्रीय स्थापना
All field establishments of DGAQA

कमांडिंग ऑफिसर, वै गु आ स्कंध (शस्त्र)
CO, AQAW, Khamariya

**RELEASE OF AQA DIRECTIVE No. 11/2022 ON QUALIFICATION TEST PROCEDURE
& ACCEPTANCE TEST PROCEDURE FOR GROUND EQUIPMENTS**

It has been decided by this HQ to issue the Aeronautical Quality Assurance Directive (AQAD) on Qualification Test Procedure & Acceptance Test Procedure for Ground Equipments. The aim of issuing AQA directive is to have continual improvements in Quality Management System in Indian Military Aviation Ground Equipments as well as to set clear-cut guidelines/requirements which need's to be adhered / ensured during discharging the respective duties by each stakeholder. This document has been prepared by GSE Group, HQ DGAQA after obtaining the feedback from all the groups at this HQrs and its Field Establishments.

2. The objective of this guideline on "Qualification Test Procedure & Acceptance Test Procedure For Ground Equipments" is to ascertain the system, meeting the desired requirements in line with latest DDPMAS / DAP / DPM, other applicable documents and set an uniform procedure.

3. It is requested to give wide publicity of the enclosed document within our organisation as well as all stake holders for awareness and compliance. To facilitate this, the document is uploaded on DGAQA website and can be accessed from website www.dgaeroqa.gov.in through Technical (main menu).

(महेश सी कलसद)

निदेशक (भू-उपस्कर एंड सूचना प्रौद्योगिकी)
कृते महानिदेशक, ए क्यू ए

संलग्नक: जैसा कि ऊपर बताया गया है
Encl: As stated above

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2	मुख्यालय में सभी तकनीकी निदेशक All Technical Directors at HQ	कृपया जानकारी और आवश्यक कार्रवाई के लिए For kind information and needful action please
3	आई टी अनुभाग IT Section	डी जी ए क्यू ए वेबसाइट पर अपलोड निर्देश का अनुरोध करें Request upload directive on DGAQA website

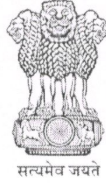
भू उपस्करों के लिये
योग्यता परीक्षा प्रक्रिया और स्वीकृति परीक्षण प्रक्रिया
पर
वैमानिक गुणवत्ता आश्वासन निर्देश

**AQA DIRECTIVE
ON
QUALIFICATION TEST PROCEDURE &
ACCEPTANCE TEST PROCEDURE
FOR
GROUND EQUIPMENTS**



वैमानिक गुणवत्ता आश्वासन महानिदेशालय
रक्षा मंत्रालय, सातवीं मंजिल, "ए" ब्लॉक, रक्षा परिसर,
कस्तूरबा गांधी मार्ग, नई दिल्ली - 110001

**DIRECTORATE GENERAL OF AERONAUTICAL QUALITY ASSURANCE
MINISTRY OF DEFENCE, 7th FLOOR, "A" BLOCK, DEFENCE COMPLEX,**



महानिदेशक, वैमानिक गुणवत्ता आश्वासन
DIRECTOR GENERAL, AQA

प्रस्तावना / PREFACE

Ground Equipments (Ground Support Equipment (GSE) and Ground Handling Equipment (GHE) refers to support/handling equipments used in operating units for upkeep / Maintenance of Aircraft and Airborne systems/stores. The main function of ground equipment is to support on-ground operations, in between flights while the aircraft is parked at the airfield/tarmac, in a hangar or at a remote area. Efficiency is key to maintaining a minimal turnaround time, i.e. the time the aircraft spends on the ground. To support safe and timely ground operations, a variety of ground support equipments are used viz. Aircraft Refuellers, Ground Power Units (GPUs), Oxygen/Nitrogen Charging Trolleys, Service Air-conditioning Trolley (SAT), Aircraft Towing Tractors, Air Inflatable Bags etc.

2. Large number of Ground Equipments have been developed by DGAQA [Erstwhile DTD & P (AIR)] and are supplied by private industry against DGAQA specifications. During the absorption of technology, the Ground Equipments are the first to be indigenised. This poses a challenge to the QA agencies in that the designer, the developer and the manufacturer of the Ground Equipments may be different and may also be manufactured by several firms at different work centers.

3. This document has been prepared to consolidate, standardize and update the methodology of preparation of Qualification Test Procedure (QTP), Acceptance Test Procedure (ATP) and Quality Assurance Plan (QAP) for Ground Equipments. The document takes into account the currently prevailing Quality Assurance Systems and Documentation. This technical QA directive has been prepared by the GSE Group, HQ-DGAQA, New Delhi. The QA directive is based on the guiding policy documents (DDPMAS/DAP/DPM etc.). Technical standards, Defence standards, experience and knowledge gained over the years in QA of GHE/GSE related to airborne stores for Defence Services – IAF (Indian Air Force), IA (Indian Army), (IN) Indian Navy and ICG (Indian Coast Guard).

4. It is hoped that this document shall facilitate faster indigenisation of Ground Equipments and also ensure standardization and better appreciation of the Test Procedure / methodologies for all stakeholders.

नई दिल्ली
दिनांक: 29 मार्च 2022

29-03-2022

(संजय चावला)
महानिदेशक, वै. गु. आ.
(S. Chawla)
Director General, AQA

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संशोधनों की सूची / LIST OF AMENDMENTS

Sl. No.	Amendment No.	Date of Amendment	Amended Page Nos	Remarks (Details of Amendment)	Signature of Competent Authority

1.0 INTRODUCTION

- 1.1 Ground Support & Ground Handling Equipments (GSE & GHE) are Non-flight systems, equipment, or devices (with a physical or functional interface with flight hardware) necessary to routinely support the operations of transporting, receiving, handling, assembly, inspection, test, checkout, servicing, launch, landing, and recovery or retrieval sites of Air System / Airborne Store.

Ground equipment's (GSE & GHE) are those equipments, which are used, by the ground/aircraft carrier/ aircrew for preparation, service, up-keep and operate / maintenance of Air System / Airborne Store during their operational use

- 1.2 Ground Equipment's (GSE & GHE) main role is to support the safe operations of the aircraft before taking off and after landing. Ground Equipment usually involve a variety of aircraft mobility, ground power operations, standard and special GE used to service the aircraft between flights. These Ground Equipments are supposed to work well under climatic conditions as per contract/user requirements such as low temperature, high temperature, altitude, high humidity and sand & dust conditions.
- 1.3 GE include Aircraft Refuellers, Hydraulic Servicing Trolley, Ground Power Units, Oxygen Charging and Distribution Vehicle, Service Air-Conditioning Trolley, Medium Recovery Vehicle (MRV), Engine Hoist, Aircraft Rapid Erect Sun Shelter (RESS), Aircraft Towing Tractor, Sudan Pump, Rapid Intervention Vehicle (RIV) etc.

2.0 OBJECTIVE

- 2.1 It is necessary to ensure that the final / product should conform to the SQRs /Tech Specifications / Mandatory requirements as per the Supply Order/ Contract of Ministry of Defence during Qualification and Acceptance Testing. This document describes Planning, Test Activity, Documentation and Guidelines for conducting Qualification Testing/ Acceptance Testing.
- 2.2 The objective and intended purpose of Qualification testing on prototype is to verify the design efficacy, performance safety life assessment and reliability thereby mitigating the risk of defects and other inadequacies of the product to the technical and user requirements. The intent of the Acceptance Testing during bulk production is to ensure conformance of the product as per governing specification before release to user service. It also enhances the assurance towards achieving the desired quality, reliability and safety standards during the defined product life. The intention of this guideline is to set a uniform procedure, based on the most professional yet pragmatic approach. This guideline should however be read in conjunction with technical specifications and general requirements for mechanical, electrical, electronic in respect of Ground Equipments.

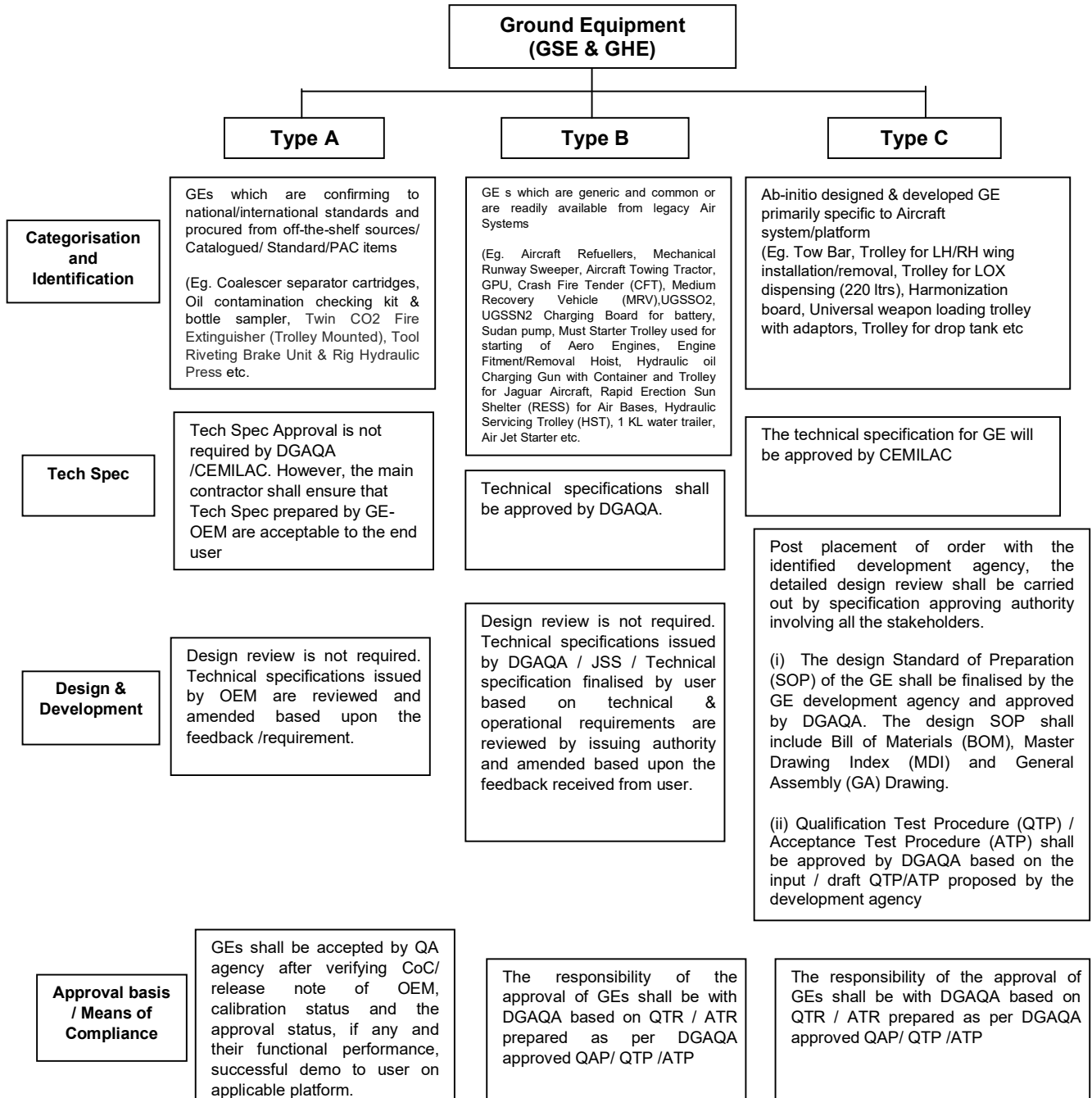
3.0 SCOPE

- 3.1 This QA directive shall be used as a guide during design, development, manufacture, repair/overhaul, testing, inspection, clearance and acceptance of Ground Equipments (GE), which include:
- (a) Ground Handling Equipment (GHE) e.g. Aircraft Towing Tractors, Jacks, Air Inflation Bags, ladders etc.

- (b) Ground Support Equipment (GSE) e.g. Hydraulic Trolley, GCS (Ground Control Station), Refuellers, Oxygen/Nitrogen/Air Charging Trolley, GPU, Engine trolley, ladders etc.
- 3.2 In this document, Qualification Testing, certification and Production level QC & QA of GE has been covered for ensuring requisite quality in every stage of development and production.

4.0 CLASSIFICATION OF GROUND EQUIPMENTS (GSE & GHE)

Categorization of classification and criticality of Ground Equipments shall be decided by QA Regulatory body and indicated in General Assembly drawing of GE

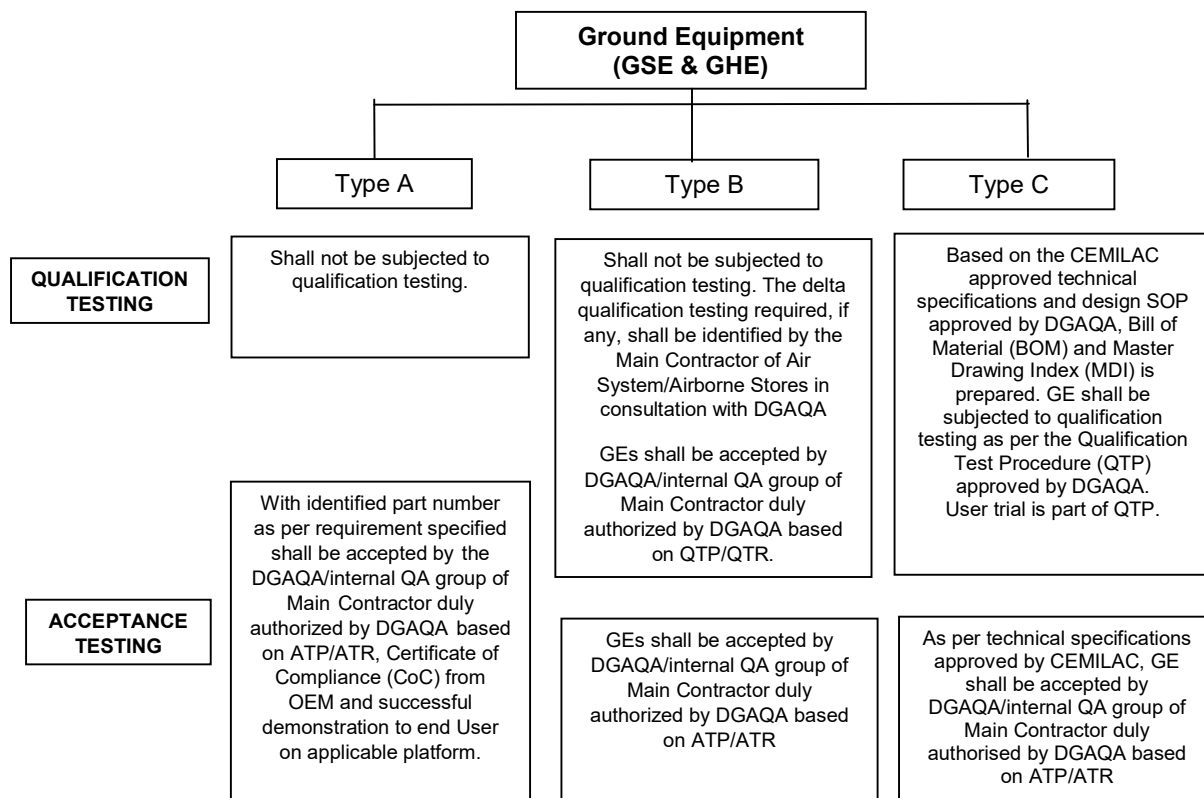


5.0 DESIGN, DEVELOPMENT AND CERTIFICATION OF GROUND EQUIPMENTS
(Acceptance means of compliance at various stages during development & certification of GEs)

A. CATEGORIZATION			
(i)	Type-A	Type-B	Type-C
	Off the shelf /standard GEs.	Adaptation of Generic / Common / readily available from legacy Air Systems	Ab-initio design & development
B. PROCUREMENT PROCESS			
(ii)	Requirement		
	Projection of Services Qualitative Requirements (SQR) by End user	Projection of Services Qualitative Requirements (SQR) by End user	Projection of Services Qualitative Requirements (SQR) by End user
(iii)	Technical Specification		
	Verify OEM Tech Spec for Compatibility wrt user requirement. Approval of technical specifications from CEMILAC & DGAQA shall not be required	Formulation of Tech Spec. based on SQR in co-ordination with user & its approval by DGAQA.	Formulation of Tech Spec. by OEM in consultation with main contractor based on SQR and one off sample provided by user, if any and its approval by CEMILAC.
(iv)	Procurement Activities		
	Involvement/inputs/vetting of DGAQA during procurement process activities i.e., Issue of RFP, sorting out issues during technical bid meetings with vendors, issue of corrigendum in RFP, scrutiny of bids, Issue of contract etc. as per DAP/DPM/ procurement procedure of DRDO or PSU	Involvement/inputs/vetting of DGAQA during procurement process activities i.e., Issue of RFP, sorting out issues during technical bid meetings with vendors, issue of corrigendum in RFP, scrutiny of bids, Issue of contract etc. as per DAP/DPM/ procurement procedure of DRDO or PSU	Involvement/inputs/vetting of DGAQA during procurement process activities i.e., Issue of RFP, sorting out issues during technical bid meetings with vendors, issue of corrigendum in RFP, scrutiny of bids, Issue of contract etc. as per DAP/DPM/ procurement procedure of DRDO or PSU
C. PRODUCT REALIZATION PROCESS			
(v)	Product realization		
	Off the shelf /standard GEs from OEM	Realization of proto type by Manufacturing/ developing agency in coordination with DGAQA	Realization of proto type by Manufacturing and developing agency in coordination with DGAQA
(vi)	Design standards		
	As per OEM catalogue / standards	Manufacturing and developing agency to prepare and freeze the SOP/BOM/MDI in co-ordination & approval of DGAQA	Preparation of design SOP/BOM/MDI by developing agency in co-ordination with main contractor and approved by DGAQA

D. QUALITY ASSURANCE PROCESS			
(vii)	QA Documents		
	Accepted after verifying their functional performance, calibration status approval status, if any. Acceptance Test Report, CoC by OEM & demo to end user	Approval of QAP/QTP/ATP indicating the various QC/QA/DGAQA stages of inspection.	Approval of QAP/QTP/ATP indicating the various QC/QA/DGAQA stages of inspection.
(viii)	Qualification testing		
	Not Applicable	Finalization of QTP ensuring the delta QT required for development of GE as per the user requirement and testing as per approved delta QTP, including user trials. (User trial is part of delta QTP)	Testing as per approved QTP including user trials. (User trial is part of QTP) JSS-55555 or its equivalent document shall be the basis for QT based on location/deployment (Class 1 to 5)
(ix)	Design review		
	Not required	Design review is Not required. However, minor modifications, improvements envisaged during proto type realization to enhance the performance & reliability is considered for implementation in consultation with all stake holders.	Design review is carried out by specification approval authority involving all the stake holders
(x)	Acceptance of GEs		
	Accepted on the basis satisfactory ATR /CoC including satisfactory user demo	Accepted on the basis satisfactory QTR as per the approved delta QTP.	Accepted on the basis satisfactory QTR as per the approved QTP
(xi)	User/operating/maintenance manual		
	Delivery of User manual, Operating manual, Maintenance & Repair manual (Including Trouble shooting) and Illustrated Spare Part List (ISPL) , Do's & Don'ts will be ensured by DGAQA as part of contractual requirement, if any.	Preparation and delivery of User manual, Operating manual, Maintenance & Repair manual (Including Trouble shooting) and Illustrated Spare Part List (ISPL) , Do's & Don'ts will be ensured by DGAQA as part of contractual requirement, if any.	Preparation and delivery of User manual, Operating manual, Maintenance & Repair manual, (Including Trouble shooting) and Illustrated Spare Part List (ISPL), Do's & Don'ts will be ensured by DGAQA as part of contractual requirement, if any.
E. CERTIFICATION			
(xii)	Bulk Production Clearance / Provision Clearance/ Type Approval		
	Bulk Production Certificate (BPC) is issued as per contractual requirement, if any after clearance of advance sample.	Bulk Production Certificate (BPC) is issued after successful completion of Qualification testing including user trials, freezing of process/SOP	Bulk Production Certificate (BPC) is issued after successful completion Qualification testing including user trials, freezing of process/SOP
	PC/ TA is not applicable	PC/ TA is issued subject to meeting all the requirements by OEM.	PC/ TA is issued subject to meeting all the requirements by OEM.

6.0 QUALIFICATION TESTING / ACCEPTANCE TESTING OF GE

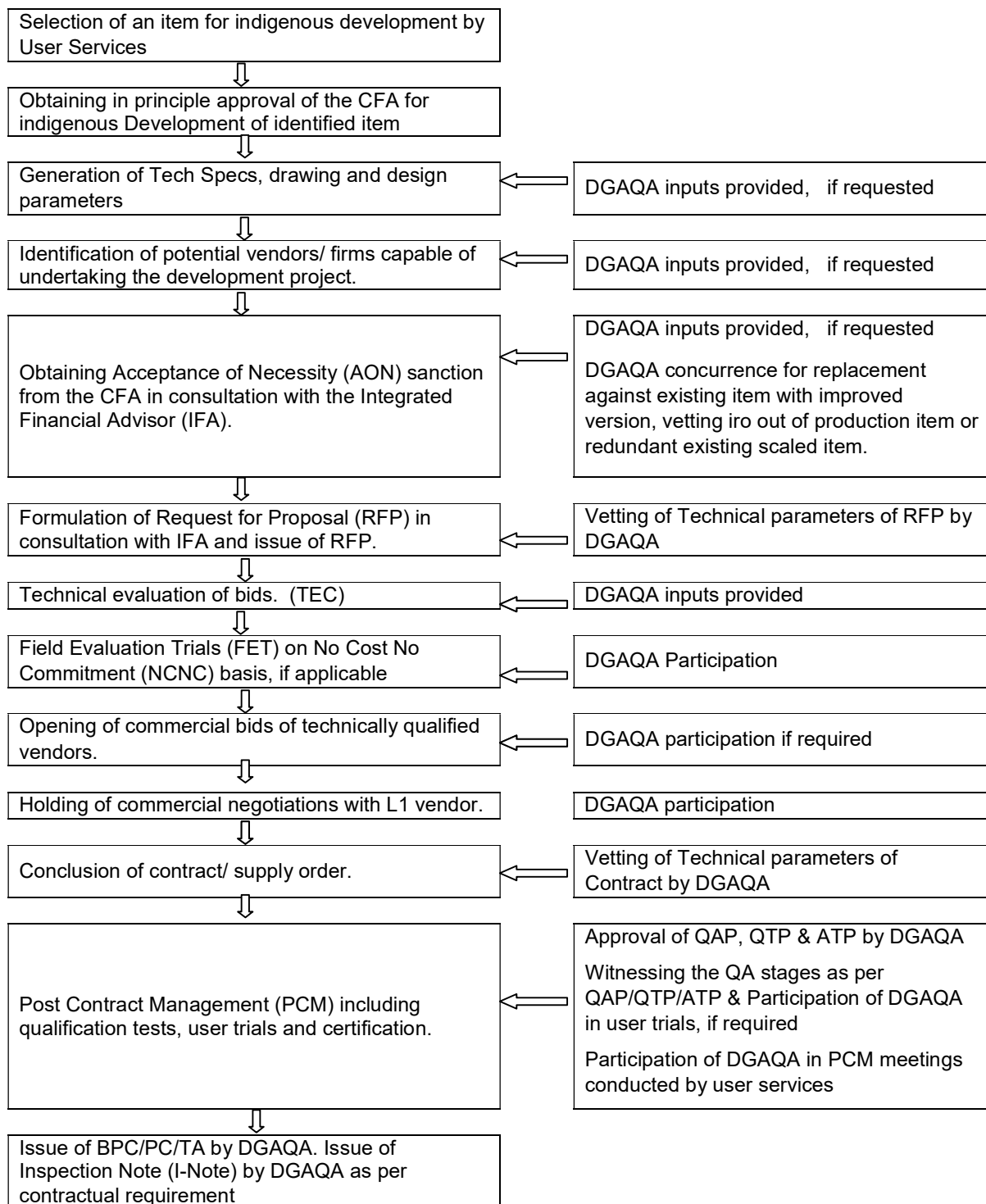


7.0 INDIGENIZATION ACTIVITIES of GEs UNDERTAKEN BY SERVICE HQrs AND ITS INDIGENISATION CELLS

DGAQA is associated in the indigenization activities of GEs by User Services e.g. Coalescer and Separator Cartages, Engine Fitment/Removal Hoist, Tool Riveting Brake Unit & Rig Hydraulic Press And Hydraulic Charging Gun with Container and Trolley for Jaguar Aircraft, Rapid Erection Sun Shelter (RESS) for Air Bases, Universal/Ground Power Unit (GPU), AIB -12 TON

DGAQA provides the required QA coverage as Government Quality Assurance (GQA) Regulatory Body and also provides technical assistance during indigenisation activities of GEs as per flow chart appended below

INDIGENIZATION FLOW CHART



(Ref: Indigenization Road map Indian Air Force (2016-2025) dated 08 April 2016)

8.0 FABRICATION OF GE

8.1 The development agency shall fabricate the GE as per the approved and base lined configuration.

8.2 Identification of GE

The GE development Agency shall provide NSN Code, Part Number & Unique Serial Number to the GE for complete traceability.

- (a) Issue of BPC by DGAQA towards acceptance of the Proto/GE shall enable the GE development agency to start regular production activities as per the approved SOP. BPC will be issued after prototype clearance and successful User trials as per the terms of contract.
- (b) The development firm for the GE undertaking regular production shall have necessary Quality Management System in place with appropriate approval from DGAQA.
- (c) During the regular production of GE as per approved SOP, DGAQA/internal QA of the Main Contractor duly authorised by DGAQA shall provide the inspection coverage.
- (d) Acceptance during production phase shall be conducted as per DGAQA approved ATP. Approval shall be obtained for any change in the ATP or SOP.
- (e) For outsourced/subcontracted stores by main contractor, the requisite QC/QA as per approved plan shall be ensured by main contractor.

9.0 MODIFICATIONS/UP-GRADATIONS OF GE

Modifications/up-gradations of the already approved GE shall be carried out by ensuring compliance to the applicable regulations, which shall be arrived at in consultation with the TAA / DGAQA responsible for the approval of the GE type and by taking into account the extent of modification/up-gradation required.

The proposal for identifying the applicable regulations towards modification/upgradation shall be prepared by the GE development Agency or any other Agency identified for modification/up-gradation and final acceptance of the same shall be done by the TAA responsible for the approval of GE type. This proposal shall also identify the extent of documentation required for the approval of modification / upgradation of the GE.

Servicing Development Organisations of User Services such as MAG (Avn) /CSDO/ NASDO shall be involved during the modification/up-gradation of GE so as to address the servicing and maintenance aspects. Modification/up-gradation can arise due to hardware/software changes required and also due to the change in the installation environment.

10.0 QUALITY ASSURANCE PLAN (QAP)

QAP is a document that details the quality assurance related activities throughout the design & development, production and maintenance of the GE with the involvement of DGAQA or the QA departments of the Main Contractor/User Services.

Quality of the product is primarily the responsibility of its manufacturer and is desirable from them to abide by Total Quality Management principles.

DGAQA performs Government Quality Assurance (GQA) function, which is a higher-level function than QA & QC function at the manufacturer's end. DGAQA will provide the QA coverage at identified CTQ (Critical to Quality) stages during the production.

DGAQA/internal QA of the development Agency duly authorized by DGAQA shall carryout necessary inspection of the units as per QAP approved by DGAQA. The QAP brings out the stages of inspection, responsibility of the stage inspection (internal QA/DGAQA), method of stage inspection (physical/document verification, review and witnessing of tests etc.), sampling size/plan etc.

11.0 DOCUMENTATION REQUIREMENTS

The GE development Agency shall have a proper mechanism for preparation, identification and configuration control of all the necessary documents required for the development, approval and end use of the GE.

The following is the broad list of documents which shall be prepared by the GE development Agency and these shall be indicated as part of deliverables in the technical specifications. This list of documents shall be used as a guideline only and shall be tailored further based on type and class of GE in consultation with all the stakeholders.

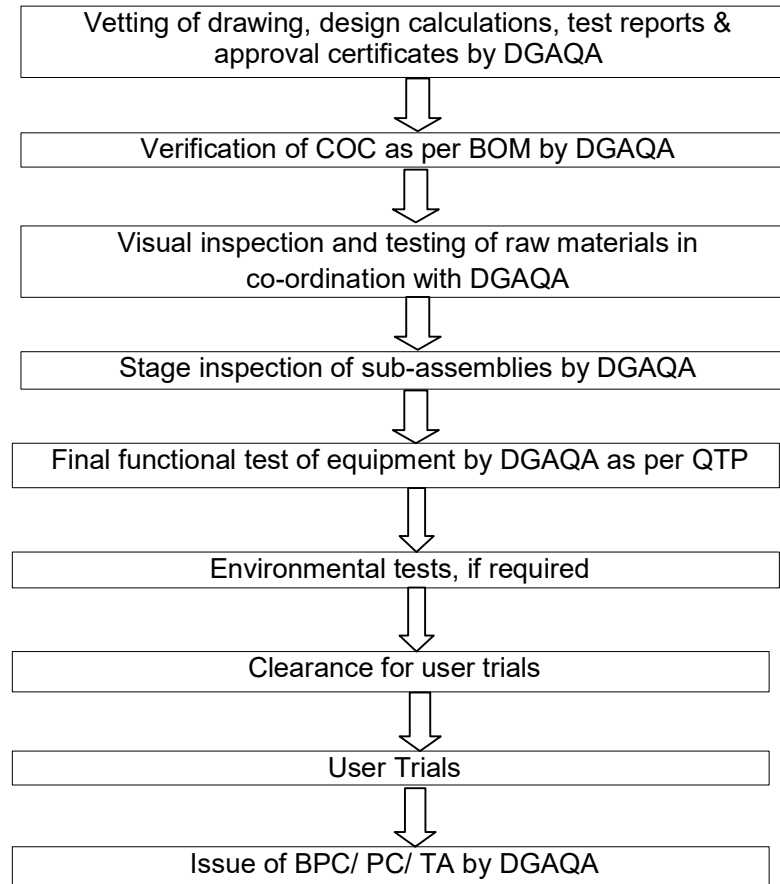
- (a) Technical Specifications
- (b) Design Document
- (c) Quality Assurance Plan (QAP). It should clearly mention the DGAQA stages including joint inspection with User like Joint Receipt Inspection and Site Acceptance Trials (if required).
- (d) All applicable drawings (Part drawings, Mechanical and Electrical assembly drawings.
- (e) Schematics drawings
- (f) Bill of Material (BOM).
- (g) Qualification Test Procedure (QTP)
- (h) Qualification Test Report (QTR)
- (i) Acceptance Test Procedure (ATP)
- (j) Acceptance Test Report (ATR)
- (k) Manuals – GE User Manual/Installation Manual/Operating Manual & Maintenance Manuals (Including Trouble shooting) and Illustrated Spare Part List (ISPL), Do's & Don'ts should include calibration requirement, product support, list of spare parts, periodic maintenance requirements etc.

12.0 QUALIFICATION TEST PROCEDURE

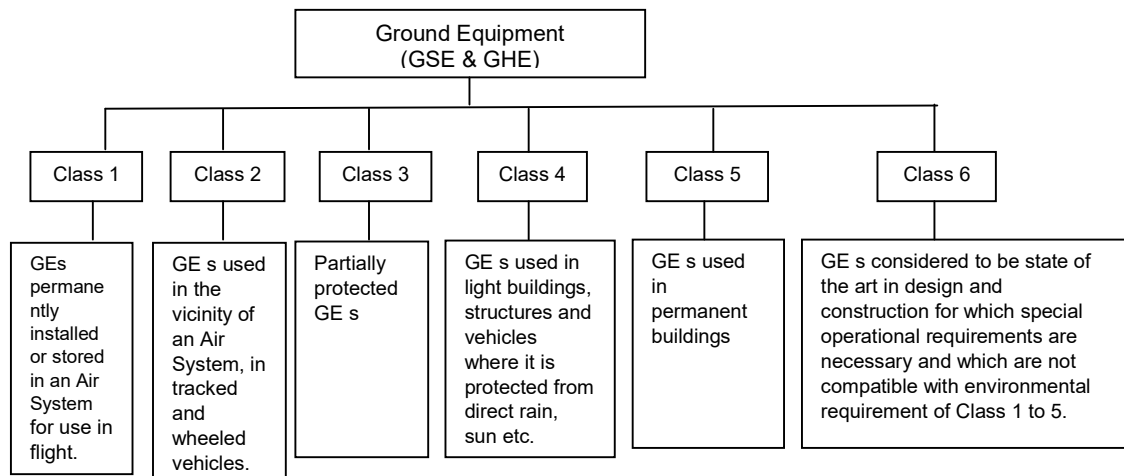
- 12.1 These Qualification Tests/Type Tests are carried out to prove conformity with the requirements of the standard. These are intended to prove the quality of design, manufacturing and workmanship standard. These tests also include climatic and endurance tests. Qualification Test/Type Test is carried out on prototype sample and it is valid for a period of three years. The Qualification Test/Type Test may be carried out again in case of change in design, material and manufacturing process.
- 12.2 Qualification Test Procedure, if applicable shall broadly include:
 - (a) Details of GE to be tested.
 - (b) Governing specification/ SQR/ Contractual requirements.
 - (c) Documentation: Stability and CG calculation, checking of BOM
 - (d) Details of applicable tests including:-

- (i) Visual, dimensional and completeness of store.
 - (ii) Test Certificate for Raw material (Chemical/Mechanical) for important/ special purpose materials like stainless steel 304/ 316/316L / specific material for gears, aluminium alloy etc to be submitted. The sample from raw material shall be taken in presence of DGAQA officer and sent to Government/ NABL accredited lab. The test report should clearly mention the mechanical properties as per governing specification like Tensile strength, Percentage elongation, hardness etc Also chemical composition of sample be given in the report.
 - (iii) Any special process like surface preparation by shot blasting, dynamic balancing, heat treatment, surface treatment.
 - (iv) NDT requirement like DPT, Radiography, MPI, Ultrasonic Testing (UT) etc.
 - (v) Functional/ Performance check as per specification/ SQR.
 - (vi) Safety/ Protection like safety relief valve operation, tripping of circuit breaker.
 - (vii) Environmental Tests as per JSS 55555 or other National/ International Military standard to ensure that design and material are meeting the specified requirements like temperature range, relative humidity, altitude etc.
 - (viii) Endurance Test to prove the ruggedness of new design of item. The duration of test is decided on the basis of duty cycle, service conditions etc. It may include the following :
 - a. Road Trials of Equipment in the terrain as per user requirements.
 - b. Weighing to check that equipment is not overloaded.
 - c. Gradeability and side slope
 - d. Type approval of main/ critical items like engine, alternator, SFC, hoses etc. if not type approved by any Government agency.
 - (e) Rain test
 - (f) Air transportability test as per User requirement.
 - (g) Noise level test.
 - (h) ESS if required and EMI/ EMC test.
 - (i) Approval of chassis/ trailer from ARAI or any Government approved institution
 - (j) Details of the test/ measuring instruments to be used and have valid calibration status.
 - (k) Test/ Measurement Record sheet(s)
 - (l) Pass/Fail criteria
- 12.3 User Trials – In cases where the equipment is required to undergo user trials, a test as per trial directives issued by the user are carried out by the user on proto type samples under actual working conditions and it becomes part of proto type qualification test. The venue for user trials may be different than the actual consignee. It is responsibility of supplier/manufacturer to position the DGAQA cleared stores for user trial at designated place identified by the user. All the feasible minor nature suggestions made by the user shall be implemented in the prototype prior to issue of BPC. The same are incorporated in bulk supply.

12.4 Qualification Testing Procedure Flow Chart (Indicative)



12.5 Since GE are deliverable to the User Services, these shall be further classified based on their role and operational environment. Approval basis shall be finalized based on this classification. The classification given below shall help in arriving at the qualification test requirements for the GE based upon their location/ deployment environment. The applicable qualification tests based on the class of GE shall be finalized from JSS 55555 or its equivalent document. These documents, however, shall be used only as guideline and shall be tailored further in consultation with all the stakeholders.



13.0 BILL OF MATERIAL (BOM) & CALIBRATION STATUS

- 13.1 BoM is verified during the Qualification as well as Acceptance Testing. During the Qualification Testing the detailed specifications of the items constituting the BoM should be verified and during the Acceptance Testing the short specifications can serve the purpose.
- 13.2 Bill of material shall have the following details in respect of each component/module:
- (a) Nomenclature/Description and Grade (as per applicable specification)
 - (b) Part Number/ Type number or Equivalent Part Number with make and model
 - (c) Version/Revision of the software (if applicable)
 - (d) Temperature Range (if applicable)
 - (e) Packaging (if applicable)
 - (f) Quantity
 - (g) Supplier/ OEM (Original Equipment Manufacturer)
 - (h) Material used as per applicable specification/ drawing (should Include consumables)

(Note: Bill of Material shall be prepared by the development Agency, the Design Agency shall do vetting and approval shall be done by DGAQA. The BoM shall be given a document no, issue no & date. The Inspecting Officer shall verify that the BOM has been duly standardized).

13.3 Calibration Status

Following Calibration details (from NABL/ Govt approved lab) of the Test and Measurement equipment shall be ascertained before carrying out the Testing activity:

- (a) Date of calibration.
- (b) Due date for calibration.
- (c) Signature of authorized personnel on the tag.
- (d) Calibration chart, mentioning periodicity and other details.
- (e) Calibration Traceability to National/International Standards.
- (f) Error chart

14.0 ACCEPTANCE TEST PROCEDURE

- 14.1 These are the tests carried out on each item for the purpose of acceptance of bulk production. The GE shall be subjected to the acceptance testing prior to its approval for intended usage.
- (a) The GE Development Agency shall prepare a GE Acceptance Test Procedure (ATP) document, which shall be approved by DGAQA.
 - (b) Standard Test Equipment shall be used to verify the correctness of the parameters of the GE. Airborne LRUs / Subsystems shall be used for verification only when other methods are not available.
 - (c) The Acceptance Testing shall be carried out by the GE development Agency and shall be witnessed by DGAQA or the internal QA group of the main contractor if authorised by DGAQA.

- (d) An Acceptance Test Report prepared by the GE development Agency and approved by DGAQA shall form one of the basis for the acceptance of all types of GE.
- (e) The GE development Agency shall prepare a Compliance Report against the approval requirements listed in the approval and also the technical specifications.
- (f) Along with the Compliance Report and all the other applicable documents, the GE development Agency shall approach DGAQA for issuing certificate viz. Provisional Clearance (PC) /Type Approval (TA) for Type 'B' and Type 'C' GE.
- (g) On satisfactory completion of all the approval activities and having satisfied itself with the correctness and the completeness of the Compliance Report and other applicable documents, DGAQA shall provide necessary certificate to the GE development Agency towards acceptance of the GE.

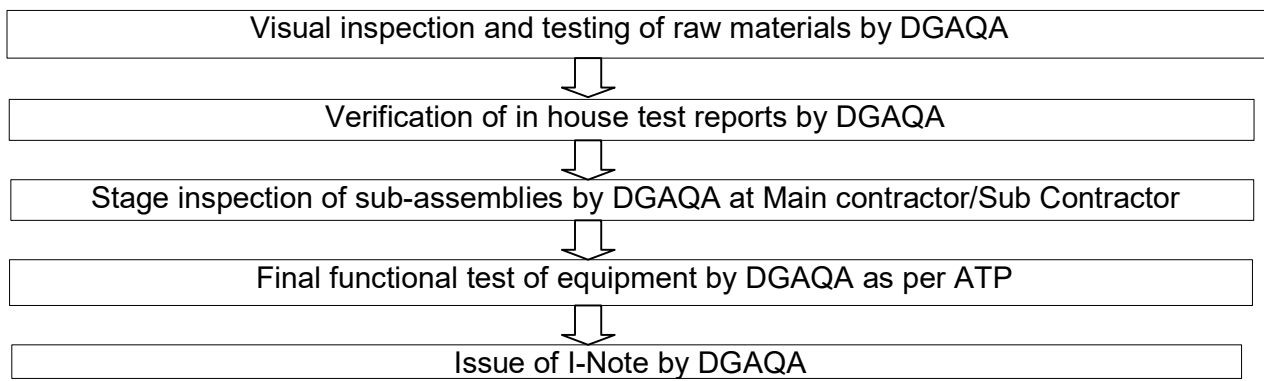
14.2 Acceptance Test Procedure shall broadly include

- (a) Details of GE to be tested
- (b) Governing specification/ SQR/ Contractual requirements.
- (c) Documentation: checking of BoM
- (d) Details of applicable tests including:-
 - (i) Visual, dimensional and completeness of store.
 - (ii) Raw material testing (Chemical/Mechanical) for important/ special purpose materials like stainless steel 304/ 316 /316L / specific material for gears, aluminium alloy etc. The sample from raw material shall be taken in presence of DGAQA officer and shall be sent to Government/ NABL accredited lab. The test report shall clearly mention the mechanical properties like Tensile Strength, Percentage Elongation, Hardness etc Also chemical composition of sample shall be given in the report, on lot basis, or as required.
 - (iii) Any special process like surface preparation by shot blasting, dynamic balancing, heat treatment, surface treatment.
 - (iv) NDT requirement like DP, Radiography, MPI, Ultra sound etc.
 - (v) Functional/ Performance check as per specification/ SQR.
 - (vi) Safety/ Protection like safety relief valve operation, tripping of circuit breaker.
 - (vii) Limited Road Trials of Equipment in the terrain as per user requirements.
 - (viii) Rain test
 - (ix) Details of the test/ measuring instruments to be used and have valid calibration status.
 - (x) Test/ Measurement Record sheet(s)
 - (xi) Pass/Fail criteria

Following details shall be obtained and studied before carrying out acceptance test procedure:

- (a) BPC issued by DGAQA
- (b) Acceptance/ Rejection criteria
- (c) Checklist for inspection
- (d) Technical Specifications.
- (e) Approved Drawings.
- (f) Bill of Materials.
- (g) Details of Equipment used for testing with calibration status.
- (h) Status of the Test and Measurement equipment.

14.4 **ACCEPTANCE TEST PROCEDURE FLOW CHART (indicative)**
(Ref: Standard Template for ATP issued by HQ-DGAQA No.590/1/DGAQA/Armt/Std dated 09 July 2019)



15.0 GENERAL GUIDELINES FOR ISSUING PROVISIONAL ACCEPTANCE / APPROVAL CERTIFICATE

The following amendments and guidelines are to be followed for granting of Provisional Clearance/ Type Approval certificate of GE:

- (a) The Ground Equipment will be cleared under “Provisional Clearance” and “Type Approval” category.
- (b) In the beginning, after satisfactory qualification testing of equipment, Provisional Clearance will be issued for one year. All associated documents like MDI, BoM & drawings will be approved by DGAQA.
- (c) After satisfactory performance of equipment at user end, Type Approval may be accorded for 3 years’ period for same SOP as defined in Provisional Clearance.
- (d) There may be occasions where in due course of time technology might have been upgraded and supplier may be in position to offer better equipment. In such cases, Head of Field establishment should satisfy himself that such up gradations can be permitted or not. Judicious decisions for conducting additional LQT tests or Qualification Tests review for such changes should be taken by the Head of Field Establishment.

- (e) There should be a proper record of Issue of Provisional Clearance and Type Approval. Technical Coordination section of concerned Field Establishment shall maintain a register of records of issue of such approvals. Only Head of Field Establishment shall issue subject document by signing the document himself. A copy of issue of such approvals shall be communicated to this Headquarter as well as to be indicated in Quarterly Progress Reports.

नोट - नवीनतम अद्यतन मानकों, प्रौद्योगिकी आदि के आधार पर दस्तावेज़ में सुधार के लिए सुझाव, यदि कोई हो, निम्न को प्रेषित किया जा सकता है

Note: Suggestion, if any, to improve the document with latest updated standards, technology etc. may be forwarded to:

निदेशक (भू उपस्कर) वैमानिक गुणवत्ता आश्वासन महानिदेशालय, रक्षा मंत्रालय, सातवीं मंजिल, "ए" ब्लॉक, रक्षा परिसर, कस्तूरबा गांधी मार्ग, नई दिल्ली -110001 ईमेल - dirgse.dgaqa@gov.in	Director (GSE), Directorate General of Aeronautical Quality Assurance, MoD, 7 th Floor, 'A' Block, Defence Complex, Kasturba Gandhi Marg, New Delhi-110001 Email ID: dirgse.dgaqa@gov.in
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**FORMAT FOR ISSUING OF PROVISIONAL ACCEPTANCE/ APPROVAL
CERTIFICATE**

Certificate Sl.No.....

DIRECTORATE GENERAL OF AERONAUTICAL QUALITY ASSURANCE



MINISTRY OF DEFENCE

**BULK PRODUCTION CLEARANCE / PROVISIONAL CLEARANCE/
TYPE APPROVAL CERTIFICATE**

NAME OF THE FIRM:.....
ITEM DESCRIPTION:.....(PART NO.).....COMPLIED TO CATEGORY (TYPE A/B/C).....

This is to certify that under mentioned item designed and developed by M/s.....
.....has been tested & found satisfactory based on following documents referred in type record.

- (i) Technical specifications of.....(Equipment Name) Doc No.....Issue No.....Dated.....
- (ii) QTP Doc No.:..... Issue No.....Dated.....
- (iii) QTR Doc No.:.....Issue No.....Dated.....
- (iv) BOM/SOP/ Master Drawing Index(MDI) Doc No.: Issue No.....Dated.....

The (name of the equipment) has been cleared by.....(concerned Field Establishment Head) subjected to the following limitations detailed in the type record.

1. The purpose of.....(name of unit) is to function as
2. The approval serial number quoted above must be reflected on all relevant drawings, contracts and release notes.
3. This Bulk Production Clearance /Provisional Clearance/ Type Approval is contingent upon fulfillment of quality assurance aspects of DGAQA during bulk production acceptance.
4. Validity:(Indicate whichever is applicable)
 - (a) Provisional Clearance: One year from the date of Issue
 - (b) Type Approval: Three years from the date of issue
5. Special Conditions If any.....

File Reference No:
Date:.....

(Head of Field Establishment)
Signature & Stamp

संदर्भ / REFERENCES

DPM	Defence Procurement Manual
DAP	Defence Acquisition Procedure
DDPMAS 2021	Framework & Procedure for Design, Development and Production of Military Air Systems and Airborne Stores (DDPMAS) Version 1.0, IMTAR-21 and Forms dated 3.2.2021
AFQMS	Approval of a Firm and its Quality Management Systems
AQA directives	AQA Directive 02/01/2015 dated Feb 2015 (Guidelines for qualification test procedure & acceptance test procedure of ground equipments/test equipments (jigs) for airborne items (electrical & electronic) (issue 02 – January 2015)
ATP	Standard Template for ATP issued by HQ-DGAQA No.590/1/DGAQA/Armt/Std dated 09 July 2019
Air Force Document	Indigenization Road map Indian Air Force (2016-2025) dated 08 April 2016
IS 2102	General Tolerances
IS 2500	Sampling procedure for inspection by attributes
ISO:20683	General requirements for ground support equipment
JSS-55555	Environmental Testing
MIL 810	Environmental Testing
ISO 1825	Rubber hose and hose assemblies for aircraft ground fuelling and de-fuelling
EI 1529	Aviation fuelling hose and hose assemblies
IS 636	Specification for Non-percolating flexible fire fighting delivery hose
IS 951	Functional requirements for Crash Fire Tender for Air Fields
Navy Document	Naval Aviation Indigenisation Guide Book-A Primer for Industries
NFPA 414	Standard for aircraft rescue and fire fighting vehicle
JSS 4210-13	Crash Fire Tender 6500 Litres
IS 956	Functional requirement for rescue tender for air fields
IS 8706	Safety features for alternating current ground power units for aircraft servicing
IS 4759	Hot dip zinc coatings on structural steel and other allied products
IS 8149	Functional requirements for Twin CO ₂ fire extinguisher (Trolley Mounted)
IS 4573	Specification for power driven mobile cranes
IS 13259	Aircraft Tow Tractors – Performance Requirements
ISO 1540	Characteristics of aircraft electrical system
IS 2026	Power transformers
IS 4722	Rotating Electrical Machines
IS 816	Code of practice for use of metal arc welding for general construction in mild steel
IS 822	Code of procedure for inspection of welds

संकेताक्षर / ABBREVIATIONS

AON	Acceptance Of Necessity
API	American Petroleum Institute
ATP	Acceptance Test Procedure
ATR	Acceptance Test Report
BOM	Bill of Material
BPC	Bulk Production Clearance
CEMILAC	Centre for Military Airworthiness and Certification
CFA	Competent Financial Authority
CG	Centre of Gravity
CoC	Certificate of Conformance/Certificate of Compliance
CSDO	Central Servicing Development Organisation
DAL	Drawing Applicability List
DDPMAS	Design, Development and Production of Military Aircraft and Airborne Stores
DP	Delivery Period
DPT	Dye Penetrant test
DRDO	Defence Research and Development Organisation
EI Spec	Energy Institute Specification
EMI/EMC	Electro Magnetic Interference/Electro Magnetic Compatibility
FET	Field Evaluation Trials
GE	Ground Equipments
GHE	Ground Handling Equipments
GSE	Ground Support Equipments
GQA	Government Quality Assurance
ICG	Indian Coast Guard
IS	Indian Standards
IFA	Integrated Financial Advisor
I-Note	Inspection Note
LQT	Limited Qualification Test
MAG Aviation	Maintainability Advisory Group (Aviation)
MDI	Master Drawing Index
MPI	Magnetic Particle Inspection
NABL	National Accreditation Board for Testing and Calibration Laboratories
NASDO	Naval Aircraft Servicing Development Organisation
NCNC	No Cost No Commitment
NDT	Non Destructive Testing
OEM	Original Equipment Manufacturer
PAC	Proprietary Article Certificate
PC	Provisional Clearance
PCM	Post Contract Management
QTP	Qualification Test Procedure
QTR	Qualification Test Report
RESS	Rapid Erection Sun Shelter
RFP	Request For Proposal
SFC	Static Frequency Converter
SOP	Standard Of Preparation
SQR	Services Qualitative Requirement
TA	Type Approval
TAA	Type Approval Authority
TEC	Technical Evaluation Committee
TOT	Transfer of Technology
TTGE	Tool Testers and Ground Equipments
UT	Ultrasonic Testing
WLT	Weapon Loading Trolley