

QCI - DGCA Initiative

Certification Scheme for

Remotely Piloted Aircraft Systems (RPAS)

INTRODUCTION

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Drones are technology platforms with wide-ranging applications, from photography to agriculture, from infrastructure asset maintenance to insurance. Drones can vary in size from very small to those that can carry a high payload.

The Ministry of Civil Aviation, Government of India, has been working to establish a world-leading drone ecosystem in India, which will create the physical and digital infrastructure to support safe, efficient and secure access to the Indian airspace by millions of UAVs.

The advent of Drone Regulations 1.0 has indeed made it possible to establish a global standard on drone regulations that would permit, with appropriate safeguards, the commercial application of various drone technologies.

The Directorate General of Civil Aviation has issued the Civil Aviation Requirements (CAR) to ensure airworthiness and seamlessly operate privately owned Remotely Piloted Aircraft System (RPAS) for civil purposes.

Instead of simply digitizing a paper-based process for registering and operating drones, India has formulated the Digital Sky Platform with an all-digital process. This is a national, first-of-its-kind, unmanned traffic management (UTM) platform which implements a “no permission, no take-off” (NPNT) framework. The users are required to complete a one-time registration for their drones, pilots and owners. For every flight that a user wishes to embark on (exempted for the nano category), they request permission to fly online and if found acceptable, a digital permit is given online. To prevent unauthorized flights and to ensure public safety, any drone without a digital permit to fly cannot take-off. The compliance to No permission no take off is ensured through Registered Flight Module which allows RPAS to arm for flight only if a valid digital permit is fed to the RPAS

As per the regulation, there are five categories of RPAS categorized by weight, namely,

- (i) Nano: Less than or equal to 250 grams
- (ii) Micro: Greater than 250 grams and less than or equal to 2 kg
- (iii) Small: Greater than 2 kg and less than or equal to 25 kg
- (iv) Medium: Greater than 25 kg and less than or equal to 150 kg
- (v) Large: Greater than 150 kg.

The DGCA has signed a Memorandum to establish a mechanism for cooperation with the Quality Council of India (QCI), to develop and operate a Certification scheme for Remotely Piloted Aircraft Systems for Digital Sky as per the Technical Standards defined by DGCA for RPAS and Registered Flight Modules, with procedures and required standards and specifications for Third Party Conformity Assessment systems under the scheme, as the Scheme owner.

The certification of RPAS will be as per technical standards defined by the DGCA for RPAS, Registered Flight Modules (RFM) and adherence to the requirements of NPNT. The process

will ensure that the RPAS meet applicable regulatory requirements and secure international acceptability.

The system of certification herewith is based on guidelines provided in the international standard ISO/IEC 17067:2013, which guides the development of product certification schemes worldwide. The certification bodies approved under the scheme would eventually be accredited as per the international standard ISO 17065, by the National Accreditation Board for Certification Bodies (NABCB), a constituent Board of QCI. Since the NABCB has achieved international equivalence for its accreditation program for product certification bodies by signing the multilateral mutual recognition arrangement of the International Accreditation Forum (IAF), it forms the basis for international recognition and acceptance of certified products. The presence of Certification Mark and Logo facilitates marketing and in turn leads to the free flow of certified goods among countries through bilateral or regional free trade agreements, in general, and is expected to enhance exports of India in the world market, in particular.

The RPAS Scheme comprises of various documents which prescribe the Governing Structure for the scheme, the Certification Criteria based on technical standards and regulations, the Certification Process, Requirements for Certification Bodies and the Rules for Use of Certification Mark to align the scheme as per ISO 17065, the international standard for product/process certification.

A Multi-Stakeholder Steering Committee (MSC) chaired by a seasoned professional, who is well respected by Government and Industry alike, will oversee the scheme, along with a QCI secretariat. This MSC will also be supported by a Technical Committee and a Certification Committee that will be constituted by QCI.

Scheme Documents

The QCI has designed the RPAS scheme comprising the following documents:

Section 1: Introduction

Section 2: Governing Structure

Section 3: Certification Criteria

Section 4: Certification Process

Section 5: Requirements for Certification Bodies

Section 6: Rules for Use of Certification Mark

1.1 Acronyms

AAI	Airports Authority of India
ADC	Air Defence Clearance
ADS-B	Automatic Dependent Surveillance-Broadcast
AGL	Above Ground Level
AIP	Aeronautical Information Publication
ATC	Air Traffic Control

ATS	Air Traffic Service
ARC	Aviation Research Centre
ARP	Aerodrome Reference Point (published in AIP)
BCAS	Bureau of Civil Aviation Security
BVLOS	Beyond Visual Line-Of-Sight
CAR	Civil Aviation Requirements
DGCA	Directorate General of Civil Aviation
DGFT	Directorate General of Foreign Trade
DIPP	Department of Industrial Policy & Promotion
DoT	Department of Telecommunication
ETA	Equipment Type Approval
FIR	Flight Information Region
FRTOL	Flight Radio Telephone Operator's License
FTO	Flying Training Organization
Gol	Government of India
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
IAF	Indian Air Force
ICAO	International Civil Aviation Organization
IEC	International Electrotechnical Commission
IFR	Instrument Flight Rules
IPC	Indian Penal Code
ISO	International Organization for Standardization
MHA	Ministry of Home Affairs
MoCA	Ministry of Civil Aviation
MoD	Ministry of Defence
NABL	National Accreditation Board of Testing and Calibration Laboratories
NABCB	National Accreditation Board for Certification Bodies
NOTAM	Notice to Airmen
NPNT	No Permission-No Takeoff

NTRO	National Technical Research Organization
OEM	Original Equipment Manufacturer
PPL	Private Pilot License
QCI	Quality Council of India
RF-ID	Radio Frequency Identification
RPA	Remotely Piloted Aircraft
RPAS	Remotely Piloted Aircraft System(s)
RPS	Remote Pilot Station(s)
SARPs	Standards and Recommended Practices
SIM	Subscriber Identity Module
SOP	Standard Operating Procedure
TSA	Temporary Segregated Areas
TRA	Temporary Reserved Areas
UA	Unmanned Aircraft
UAOP	Unmanned Aircraft Operator Permit
UAS	Unmanned Aircraft System(s)
UIN	Unique Identification Number
VFR	Visual Flight Rules
VLOS	Visual Line-Of-Sight
VMC	Visual Meteorological Conditions
WPC	Wireless Planning and Coordination Wing, Department of Telecommunication, Government of India

1.2 Definitions

Battery	A generic term for one or more cells electrically connected in series and/or parallel with or without monitoring and protection circuitry for charging and discharging.
Battery Pack	Batteries that are ready for use in a RPA, contained in a protective enclosure, with protective devices, with a battery management system, and monitoring circuitry and that may be removable by the user for charging separately from the RPA.
Battery System	Battery system includes the battery, charger and monitoring and protection circuit for charging and discharging of the battery.

Capacity, Rated	The total number of ampere-hours that can be withdrawn from a fully charged battery at a specific discharge rate to a specific end-of-discharge voltage (EODV) at a specified temperature as declared by the manufacturer.
Cell	The basic functional electrochemical unit (sometimes referred to as a battery) containing an electrode assembly, electrolyte, separators, container, and terminals. It is a source of electrical energy by direct conversion of chemical energy.
Certification	Certification is the provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements. Certification is also known as third party conformity assessment.
Charging	The application of electric current to battery terminals, which results in a Faradic reaction that takes place within the battery that leads to stored electro-chemical energy.
Charging, Constant Current (Cc)	Charging mode where current is held constant while charging voltage is allowed to vary.
Command and Control (C2) Link	The data link between the UA and the remote pilot station for the purpose of managing the flight.
Controlled Airspace	Airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification. Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E as described in ICAO Annex 11, Para 2.6
Danger Area	Airspace of defined dimensions within which activities dangerous to the flight of aircraft exist at specified times. Such timings are notified through NOTAMs.
Electric Shock Hazard	A potential for exposure of persons to hazardous voltage circuit through direct contact from openings in protective enclosures and/or insufficient insulation between hazardous voltage circuits and accessible parts.
Electrical System	The system of components, circuits, and related elements of the RPA. The system comprises the battery system, motors and motor controllers, protection/safety circuits addressing electrical, fire and explosion hazards, and associated on board electronics.
Enclosure	That part of the RPA that renders inaccessible all or any parts of the equipment that may otherwise present a risk of electric shock and or retards propagation of flame initiated by electrical disturbances occurring within.
Explosion	A violent release of energy that produces projectiles or an energy wave from the RPA and results in the RPA's contents being forcibly expelled through a rupture in the

	enclosure or casing.
Fire	The sustained combustion of the RPA's contents as evidenced by flame, heat and charring or other damage of materials.
Flight Test	Actual flying of RPAS for verification of certain parameters as mentioned in the CS - RPAS Scheme
Fully Charged	A battery that has been charged per the manufacturer's specifications to its full state of charge (SOC).
Fully Discharged	A battery, which has been discharged, according to the manufacturer's specifications, to its specified end of discharge voltage (EODV).
Geo-fencing	Feature in a software program that uses the global positioning system or radio frequency identification to define geographical boundaries.
Ground Test	The verification of parameters by operating RPAS and its components on ground (without actual flight)
Inspection	Inspection describes the regular checking of a product to make sure it meets specified criteria. Fire extinguishers, for example, need regular inspections to ensure they are safe for use. Examination of a product, process, service, or installation or their design and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements.
Laboratory Test	The verification of the parameters that are to be conducted in the approved/accredited laboratory as per the CS-RPAS requirements by authorised personnel.
Operator	A person, organization or enterprise engaged in or offering to engage in an aircraft operation.
Owner	A natural or legal person who owns a remotely piloted aircraft and its remote pilot station.
Payload	All components of equipment on board the unmanned aircraft that are not needed for the flight or its control. Its transport aims exclusively to fulfill a specific mission.
Prohibited Area	Airspace of defined dimensions, above the land areas or territorial waters of India within which the flights are not permitted at any time under any circumstances.
Remote Pilot	A person charged by the operator with duties essential to the operation of a remotely piloted aircraft and who manipulates the flight controls, as appropriate, during flight time.
Remote Pilot Station	The component of a remotely piloted aircraft system

(RPS)	containing the equipment used to pilot the remotely piloted aircraft.
Remotely Piloted Aircraft (RPA)	An unmanned aircraft, which is piloted from a remote pilot station.
Remotely Piloted Aircraft System (RPAS)	A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components, as specified in the type design.
Restricted Area	The airspace of defined dimensions above the land areas or territorial waters of India within which the flight of aircraft is restricted.
RPA observer	A trained and competent person designated by the operator who, by visual observation of the remotely piloted aircraft, assists the remote pilot in the safe conduct of the flight.
Segregated Airspace	The airspace of specified dimensions allocated for exclusive use to a specific user(s).
Testing	Testing is the determination of one or more of an object or product's characteristics and is usually performed by a laboratory. For example, testing of components for parameters such as safety, performance etc. which involves analysing against a number of characteristics to determine compliance to the CS RPAS Scheme.
Unmanned Aircraft (UA)	An aircraft, which is intended to operate with no pilot on board.
Unmanned Aircraft System (UAS)	An aircraft and its associated elements, which are operated with no pilot on board.
Visual line-of-sight (VLOS) operation	Operation in which the remote pilot or RPA observer maintains direct unaided visual contact with the remotely piloted aircraft.