

# **COMMENTS ON DRAFT CIVIL AVIATION REQUIREMENTS FOR UAS BY DGCA RELEASED IN NOV 2017**

## **INTRODUCTION**

1. Unmanned Aircraft Systems(UAS) are a new component of the aviation system, one which many different organisations across the world are trying to understand, define and ultimately integrate. These systems are based on cutting-edge developments in aerospace technologies, offering advancements which may open new and improved civil/commercial/military applications as well as improvements to the safety and efficiency of all civil aviation. The safe integration of RPAS(Remotely Piloted Aircraft-a subset of UAS) into non-segregated airspace is a long-term activity with many stakeholders.

2. Civilian use of UAS includes but not limited to agriculture, damage assessment of property and life in areas affected with natural calamities, surveys (infrastructure monitoring including power line facilities, ports, and pipelines, commercial photography, aerial mapping) etc. They are also increasingly proliferating into recreational field and are likely to be used in many other domains.

3. UAS operations present problems to the regulator in terms of ensuring safety of other users of airspace and persons on the ground. However, in view of technological advancements in UAS over the years and their increased civil applications, it has become necessary to develop regulations for operations of this activity. Various countries across the world are coming up with their own regulations in respect of Operations of RPAs in Civil Airspace.

4. In Nov 2017 DGCA released a draft Civil Aviation Requirements(CAR) for Operation of Remotely Piloted Aircraft in Indian Airspace( **Annexure A**). This CAR lays down requirements for obtaining Unique Identification Number(UIN), Unmanned Aircraft Operator Permit (UAOP) and other operational requirements for civil Remotely Piloted Aircraft System (RPAS) to operate in Indian

Airspace. Comments were requested by DGCA on this CAR by 01 Dec 17.

5. The CAR was studied by the undersigned in detail and a lot of anomalies were noticed in it. But before going through these it will be prudent to study the existing regulations in other parts of the world. These have been discussed in succeeding paragraphs.

### **A STUDY OF EXISTING UAS REGULATIONS IN OTHER PARTS OF THE WORLD**

6. India is a developing nation and we are far behind many other developed nations in terms of aviation technology. India has far less air traffic as compared to USA and most other European countries. Civil UAS Operations were becoming matter of concern in these countries as well before it rang bells of Indian Aviation Authorities.

7. These countries in western part of the world developed the regulations over a period of many years with input from many groups of experts from RPA inspectors, operators and manufacturers, pilot representatives, air navigation service providers, air traffic control representatives, accident investigation bureaus, human performance specialists, surveillance and communications experts and others. Also their regulations state that they will be subject to regular revision process that will be based on developments in the field. So in a nutshell these countries have formed their regulations after a lot of study, research and deliberations, keeping safety in mind. So it will be prudent to learn from these before formulating our own RPA regulations. The regulations being followed in the United States are discussed in succeeding paragraphs.

8. In United States there are no restrictions on flying Small UAS(<25 kg), if it is flown for recreational purposes only. Small UAS for hobby and purely recreational purpose are called model aircraft. The recreational use of Small UAS is the operation of an unmanned aircraft for personal interests and enjoyment. For example, using a SUAS to take photographs for your own personal use would be considered recreational; using the same device to take photographs

or videos for compensation or sale to another individual would be considered a commercial operation. Using SUAS for Aeromodelling Sport will be considered a recreational use. These SUAS could either be a fixed Wing, Rotary wing, Multicopter or a Hybrid Vehicle. There is no registration or licence required to fly these in USA and they must follow the rules given below:-

- a) The model aircraft is limited to not more than 55 pounds(25 Kg) unless otherwise certified through a design, construction, inspection, flight test, and operational safety program administered by a community-based organization. Such organisation in USA is AMA( Academy Of Model Aeronautics). Equivalent organisation in India is AMAI( Aero Modellers Association). AMAI is a registered NGO. Retd. Indian Chief of Air Staff, Air Chief Marshal A.Y.Tipnis has agreed to be its guide and mentor as CHIEF PATRON.
  - b) It must be flown within visual line of sight(VLOS) and Fly no higher than 400 feet above ground level and remain below any surrounding obstacles when possible.
  - c) Not fly near or over sensitive infrastructure or property such as power stations, water treatment facilities, correctional facilities, heavily travelled roadways, government facilities, etc.
  - d) If when flown within 5 miles of an airport, the operator of the aircraft provides the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport) with prior notice of the operation (model aircraft operators flying from a permanent location within 5 miles of an airport should establish a mutually-agreed upon operating procedure with the airport operator and the airport air traffic control tower (when an air traffic facility is located at the airport). In this case operations are permitted only upon prior approval by the ATC.
  - e) The aircraft is operated in a manner that does not interfere with and gives way to any manned aircraft.
9. In United States if the UAS is meant to be used for commercial purpose, the UAS pilot must follow the FAA's set of operational rules (known as "Part 107"). These rules went into effect on August 29, 2016. Commercial use could include:-

- a) Selling photos or videos taken from a UAS. For example Professional real estate or wedding photography. Professional cinema photography for a film or television production or using UAS for commercial Aerial mapping or land surveys.
  - b) Using UAS to provide contract services, such as industrial equipment or factory inspection, security or communications.
10. There are a different set of requirements for UAS that are flown commercially. These are:-
- a) The UAS must be under 55 Pounds of weight(25 kg).
  - b) Operation in Class B, C, D and E airspace are allowed with the required ATC permission. Operation in class F,G Airspace is allowed without the required ATC permission.
  - c) Must fly under 400 feet above ground level (AGL) or, if flying at an altitude higher than 400 feet AGL, stay within 400 feet of a structure.
  - d) Must keep the UAS in sight (i.e. visual line of sight), either by the remote pilot in command or a visual observer.
  - e) Must fly during daylight hours\* or civil twilight hours (30 minutes before official sunrise to 30 minutes after official sunset, local time) with appropriate anti-collision lighting(in case of civil twilight flying).
  - f) Must yield right of way to manned aircraft.
  - g) Must not fly over people and must not fly from a moving platform unless in a sparsely populated area.
  - h) No person should act as a remote pilot in command for more than one UAS at a time.
  - j) The UAS must be registered in the FAA( Federal Aviation Agency) website online. The Fee for registering is 5\$.

Upon registering a registration number is given which must be displayed on the UAS all the time.

k) If operation outside the above Envelope is required then most of the restrictions discussed above are waivable upon obtaining a written/online waiver from FAA. The waiver request should mention how the operation can be safely conducted by the Operator. For example if the operator wants to fly in night, Beyond Visual Line Of Sight or above 400 feet then he must apply for a waiver stating how is he going to do this safely. Various such waivers granted by FAA are displayed on the FAA website.

11. There are a set of requirements to be met by the remote pilot in case he wishes to fly commercially. These are:-

- a) The remote pilot must be of at least 16 Years of age.
- b) The UAS Pilot must hold a Remote Pilot Airman Certificate or be under the direct supervision of someone holding a remote pilot airman certificate.
- c) To obtain a Remote Airman Certificate the pilot must complete a free online course given in FAA website.
- d) Be vetted by the Transportation Security Agency. This is like security check of the pilot.
- e) Pass a aeronautical knowledge test for remote pilots. At present this test is outsourced in USA to two companies and is conducted at across 700 places in USA. The fee for the exam is 150\$. After passing this exam apply online to FAA to obtain the Remote Pilot Airman Certificate. This gives clearance to the remote pilot to fly for commercial purposes under the conditions given in para 10.

12. These are the current regulations that are in Vogue in United States as on date. USA formed these regulations after much deliberations and study. So it will be prudent to follow these regulations in the absence of a similar research/study in India. These would provide

a safe way for the commercial operators of UAS to conduct their operations without endangering the safety of national airspace.

13. The requirements to obtain UIN and UAOP, as mentioned in the DGCA CAR for UAS is too restrictive, and some of the technologies mentioned in it have been not achieved yet for RPA internationally. Hence it will not be possible to obtain a permit under the terms and conditions mentioned for a Civil UAS operator.

14. India has a big market for UAS both in military and the civil Domain. There are a lot of start-ups, who are venturing into development and manufacturing of UAS apart from Defence Research and Development Agencies like DRDO, ADA and ADE. But the government laboratories are not able to meet the requirements of the of various agencies as of now, due various constraints. Hence the government agencies are continuing to import UAS systems at very high cost from the western countries . This leads to loss of revenue and jobs in terms of billions of dollars to our nation. MSMEs contribute 45 percent of the industrial output and 40 percent of the total exports of India. They can play a significant role in the growth of the aerospace sector, including UAS development. Development of advanced aviation technologies, including UAVs is an unknown area, venturing into which requires a high level of research, funding and government support. The ingeniously designed UAVs are facing bureaucratic difficulties and may not become successful unless a enabling environment is provided to them. The private players have the capability to meet the domestic needs to a big extent. This will generate a lot of jobs in the UAS design and manufacturing segment in the future, and prevent outflow of foreign exchange. The present restrictive DGCA Draft CAR if finalised could mean end of Make In India in the UAS field for the private players.

15. The shortcomings in the Draft CAR that needs to be addressed are discussed in succeeding paragraphs.