

24. Section 11.4 of the CAR requires the GPS tracking system to be tamper/spoofing proof in order to work in case of a RPA accident. While this is desirable but no equipment is ultimately crash proof. Even the full size aircraft do not have such fail safe equipment. Had there been such equipment then the missing Malaysian Airline(MH 370) would have been located by now. So this requirement should be deleted.

25. Section 12.2 of the CAR requires Flight Plan to be filed except for Nano RPA below 50 feet and Micro RPA below 200 feet. Part 107 of FAA rules in USA clear operation without Flight Plan till 400 feet for Upto Mini RPA for VLOS Operation. It is imperative that we follow similar rule which has been arrived to after much research. **So section 12.2 of the CAR should be amended to read- Flight Plan, ADC and information to nearest ATC unit is necessary when any RPA is flown above 400 feet or BVLOS. For upto Mini category RPA when flown within VLOS and less than 400 feet AGL, filing Flight, ADC and information to nearest ATC unit not mandatory. For RPA above Mini category these three requirements are mandatory in all cases.** Section 12.3 of CAR should be deleted as the issue will be addressed in 12.2.

26. Section 12.6 States that operation will be in daylight only and within VLOS. However certain operations requirements may be beyond this limitation. Such requirements should be met by obtaining a written waiver from DGCA. This is the procedure which has been laid out in Part 107 of FAA rules, in USA, for obtaining waiver, for Operations beyond the scope of the part 107 rules. So **section 12.6 of CAR should be amended to read -In case the Operator requires to fly beyond daylight, or BVLOS or beyond the restrictions of DGCA CAR, he may do so by obtaining a DGCA waiver. In the waiver application the Operator should specify how he intends to conduct his operations safely. Based on the justification DGCA will grant a waiver. After obtaining such waiver, the Flight Plan in should clearly mention such operation beyond the CAR rules. Such operations will be conducted in segregated airspace till such time credible technology becomes available to conduct such operations in non segregated operations.**

27. Section 12.21(a) of the CAR says no RPA shall be flown within 5 km from Aerodrome Reference Point of a Operational Airport. There may be requirement to fly near a Airport in exceptional

circumstances. Such operations can be cleared under the explicit clearance of the ATC. So **section 12.21 should be amended to read- No RPA should be flown with 5 Km of Aerodrome Reference Point of a Operational Airport. Any deviation from this will permitted only after obtaining clearance from the Airport ATC.**

28. Section 12.21(c) states no RPA should be flown within permanent or temporary Prohibited, Restricted and Danger Areas. There maybe requirement to operate under exceptional circumstances within these areas after obtaining clearance from the regulators of these areas. So **section 12.21(c) should be amended to read- no RPA will operate within temporary, Restricted and Danger Areas including TRA and TSA as notified by AAI in AIP. Deviations from this permitted only on obtaining clearance from the regulators of these areas.**

29. Section 12.21(f) states that no RPA shall be flown beyond 500 m(horizontal) into sea from coast provided location of ground station is on fixed platform over land. It may be required for certain R&D purposes or due the nature of the operation to fly beyond this. Such deviations can be allowed provided area of operation is specified in Flight Plan and the the Flight Plan is approved. So **section 12.2(f) should be amended to read no RPA shall be flown beyond 500m(horizontal) into sea from coast provided location of ground station is on fixed platform over land. Any deviations to this will be subject to approved Flight Plan.**

30. Section 12.21(i) states no RPA shall be flown within 500 m from the perimeter of military installations/facilities. This can be allowed subject to approval by the military installation/facility. So **section 12.21(i) should be ammedned to read no RPA shall be flown within 500m from the perimeter of military installation/facilities unless clearance is obtained from the military installation/facility.**

31. Section 12.24 should be amended to read -to encourage new technology, Indian organisations involved in R&D related activity of RPAS, having obtained industrial licence from DIPP, shall use the test sites indicated in Annexure-VIII for testing/demonstration purpose. If any other area is to be used, permission should be obtained for the same from concerned ATC unit.

32. Section 14.1 requires all civil RPA operators shall have insurance with the liability that they might incur for any damage to third party resulting from accident/incident. RPA is a emerging technology and as of now there are no such insurance policies available. If the Indian Civil UAS market grows, Insurance companies may start providing the same. Hence **section 14.1 should be amended to-all civil RPA operators shall have insurance with the liability that they might incur for any damage to third party resulting from accident/incident. In case such insurance is not available then a Non Availability Certificate should be obtained from a leading General Insurance provider.**

### **CONCLUSION**

33. UAS is a emerging technology which has capability to change the future of Aviation. It is often said by critics that United States has already produced the last manned fighter aircraft, and the future belongs to UAS. With time we will see the rise of UAS and ultimately there may come a time, where most of the air operations are performed by unmanned aircraft including commercial and cargo.

34. Indian armed forces reportedly came out with a blueprint in early 2016 for the procurement of over 5,000 UAVs in the next 10 years, which is likely to cost US \$3 billion. India's government R&D organisations have been trying to develop UAVs for its armed forces amid various limitations and challenges. However they have not been to develop many successful UAVs for the defence and civil industry. This field is mostly dominated by private players in western countries. There is an increasing perception that private sector, which thrives on its efficiency in production and applied research, would be able to transform India's aviation sector. It present draft CAR, severe restrictions have imposed on private operators and the government operators have been exempted from most requirements. Placing unnecessary and over demanding restrictions on private players in this field will mean a end of private players in this field. The reduced domestic availability may mean that, the armed forces continue importing to meet their requirements, thereby causing loss of revenue to the country.

35. The Indigenous development of manned and unmanned aircraft faces enormous technological, regulatory and other challenges in India, which impede indigenisation. The persistent challenge for India has been to transform from being a net importer to a indigenous developer and exporter of various aviation products, including UAVs.

36. The imposition of ban on operations of civil UAS by the DGCA in October 2014 has stagnated the growth of civil UAV industry. Most of the Civil UAV companies in India are start-ups which have been badly hit by the ban and are unable to conduct R&D, testing and trials of UAVs. The delay in releasing the guidelines has adversely impacted the eco-system in terms of funding the start-ups for UAV development. The start-ups, which had developed UAVs indigenously prior to the ban, were unable to commercialise them and move to the next level. This is demotivating the private investors to invest in this domain. The requirements to Operate UAS and UAOP in the present CAR are next to impossible to achieve as of now. Such technologies listed are not available yet for RPA. The government agencies have been exempted off all the requirements. The present Draft CAR if finalised will make civil UAV operations impossible in India and have a adverse impact on the private sector's participation in R&D as well as on the growth of the Civil UAV industry. This could mean a end of Make In India in this field for the private players.

37. It is suggested that in the absence of credible study in the Integration of UAS in Civil Airspace we derive our own regulations based on the western countries. Though it is important to prevent the misuse of this technology, unnecessary restrictions will hinder India's indigenous growth in this field. Various enabling technologies are being developed for RPA so as to integrate them safely into the Civil Airspace. In the interim it will be prudent to open up the airspace for RPA in a gradual manner over time, with relaxations of restrictions in tranches as technology progresses and matures

38. It is recommended that there be no restrictions upto Mini RPA when flown within VLOS and less than 400 feet for recreational purpose(Model Aircraft). Commercial operations within VLOS and less than 400 feet AGL upto mini category RPA to be cleared on obtaining UAOP and UIN. For above mini category RPA, beyond VLOS operations and operation beyond the laid rules, the operator to obtain a waiver from DGCA. Section 8,9,10 and 11 of this document to be

referred for the detailed descriptions of these. Also there should be no restrictions on import of Model aircraft used for recreational purpose.

39. It is requested that these recommendations be considered before finalising the UAS rules else the indigenous UAS market can be seriously hit and we may remain a net importer.