Centre for Air Power Studies (CAPS)
Forum for National Security Studies (FNSS)

UNREGULATED PROLIFERATION OF DRONES IN INDIA

Wg Cdr RK Narang
Research Fellow, CAPS

Introduction

Unmanned Aerial Vehicle (UAV) or popularly known as Drone, is a powered unmanned aircraft, which is flown by a remote control pilot or onboard computers. The Oxford dictionary defines drone as "a continuous low humming sound or a remote-controlled pilotless aircraft or missile. The drones participated in various wars since World War-II but did not become a platform of choice. The use of drones in Global War on Terror in the last decade and half, improvements in technology and the wide publicity brought them into limelight. This led to rapid development of drones and greater employability in civil and military roles. The miniaturisation and reduced cost of manufacture have made them a household name in the world. The smaller drones are now easily available in local markets as well as through online vendors.

These developments have also thrown up new challenges for their integration in the air space. In addition, there is a reluctance to integrate unmanned aerial vehicles in the airspace due to uncertainty about the reliability of existing technology to ensure separation from manned aircraft and react to situations in dense air traffic environment. There are no regulations for certification of pilots and drones in India as of now. Many countries have been supporting design and development of drones through favourable policies. However, the drone development in India is yet to take off due to absence of favourable policies and regulations to encourage indigenous design, development and manufacture. In addition, the absence of security guidelines and lack of suitable mechanism to enforce them is resulting in unregulated proliferation of drones in India, which could become a security hazard.

Drones: Opportunities and Challenges

The recent developments in drone technology have offered new opportunities to industry for their employment in various fields. The drones

can remain airborne for long durations and do not suffer from limitations associated with having humans in the cockpit like long working hours and fatigue. Drones proved extremely useful in identifying and locating people stranded in buildings, assessing damages and in planning of relief operations during Nepal earthquake and Uttarakhand tragedy. They can be employed as airborne cell towers to provide emergency communication during disasters. UAVs equipped with suitable Chemical, Biological, Radiological and Nuclear detection equipment could be employed during CBRN disasters. The Japanese successfully used UAVs in detecting radiation leaks post Fukushima Nuclear disaster [1]. The UAVs are being increasingly used for aerial photography by Film Industry and Television industry, wedding celebrations, advertising, etc. The power lines and associated infrastructure is increasing at a rapid pace and UAVs provide ability to carry out surveys of huge web of power infrastructure and their maintenance at much lesser cost. The Forest Department of India with its depleting manpower could benefit from UAVs for surveillance of forest lands, identification of fire hazard prone areas and survey of wild life. The orthomapping[2] UAVs capable of carrying out 3D mapping could be employed to identify and predict land slide prone areas. The medical professionals see a huge potential in utilisation of drones in providing medical facilities to people in hilly and inaccessible areas of the country. The drones could also be used for the movement of blood and other samples to/ from laboratory, transportation of medical supplies in inaccessible/ inhospitable areas of the hilly states grappling with shortage of medical professionals. They are being increasingly used by the armed forces and Para-military forces.

Drone Regulation

The aerospace research company Taal Group estimates that the sale of military and civilian drones is likely to reach $89 billion by 2023. The countries like China, US, Israel, Brazil, have developed various UAVs. The civil aviation agencies worldwide have been conscious of the need for providing favourable environment for indigenous research and development and did not put a blanket ban on their use. The indigenous manufacturers were permitted to develop and fly drones with suitable security instructions/ guidelines by using exceptions clauses of the civil aviation rules. Brazil's National Civil Aviation Agency (ANAC) came up with draft drone policy in September 2015, which covers issues related to certification, medical, safety, security, minimum age and air space management[3]. The progress made by China, USA and Canada is covered in succeeding paragraphs for better understanding of the urgent need for drone regulations.

China: China has a flourishing drone industry with companies like DJI Innovations, XAircraft, and Ehang Technology Co. leading the production and sale of civilian drones.[4] It is

formulating a policy with the support of Aeroplane and Vehicle Modelling Association of Shanghai for issuing of licences to drones pilots[5]. No licence is required for drones less than 7 Kgs and for flying below 120 meters[6]. The new policy requires that the aspirants pass written test followed by drone control test to be qualified to get a drone pilot certificate for flying drones weighing between 7 Kg and 116 Kg[7]. The Aircraft Owners and Pilots Association (AOPA) estimated that there were about 10,000 UAV operators in China in 2014. The SF Express, China's mail courier service delivers about 500 light weight packages per day through drones indicate expanding use of drones, [8]

USA: The Federation of Aviation Administration (FAA) Modernisation and Reform Act of2012 authorised FAA to issue licences for drones. US Transport department and FAA have launched a drive to register commercial users of the drones and they have come up with Do's and Don'ts for the people flying small drones for hobby[9]. FAA has an interim policy for exemptions from Section 333 by granting Certificate of Waiver or Authorisation (COA) for UAV flights below 200 ft, weight less than 55 lbs and operate during day time in Visual Flight Rules (VFR) conditions within visual line of sight (VLOS) for commercial purposes. US has a launched a public awareness campaign named "know before you fly" to educate the public about guidelines and responsibilities of operators. FAA came up with a draft policy for small UAVs and put it in public domain in February 2015 for views/ comments[10]. It has divided UAS Operations into Public (Government), Civil (Non-Governmental) and Model Aircraft (Hobby or Recreation only) operations[11].

Canada: Canada has drone safety regulations in place since 1996.[12] The operation of UAVs weighing up to 25 Kgs is allowed up to visual line of sight for recreational, and research purposes.[13] It places UAVs in 2 Kg and less, 2.1 Kg to 25 Kg and above 25 Kg categories and prohibit flying closer than 9 Km from airport/ heliport higher than 90 metres Above Ground Level (AGL), closer than 150 metres from people, populated areas, restricted airspace, military bases, forest fires, where it may interfere with transponders etc. The policy makes it mandatory to have Special Flight Operations Certificate (SFOC) for UAVs weighing more than 25 Kg and can impose fines for violation of rules. [14] Transport Canada had issued 1672 SFOCs for UAVs in 2014.[15]

Sharing the Airspace

The Unmanned Aerial Vehicles have made rapid technological advances in the last decade and half. The X-47 and F-18 taking off and landing together from a carrier in August 2014 [16] indicates bright future for joint operations by manned and unmanned vehicles. Military drones are already flying world over and have been partially integrated into the airspace by introducing additional safety margins. The

drones are also being increasingly used for logistics, surveys and surveillance tasks by the industry. However, the employment of unmanned aerial vehicles for civil aviation would take some time depending upon maturing of technology, improvements in artificial intelligences/cognitive capability and reliability.

Some countries have developed procedures for joint operation of manned and unmanned aircraft, which provide separation from manned aircraft by earmarking areas and/ or airspace to encourage research and development in this critical area as well as to exploit the unique capabilities of unmanned flying machines [17] . The formulation of regulations/ instructions and issue of licences for small drones for hobby and research by the FAA in US, Transport Canada and China have shown that it is feasible for drones to coexist with manned aircraft. The favourable regulations on drones have allowed research, development and growth of drone industry in these countries.

Drones in India

India is a late comer in the development of drones and its indigenous UAV industry is at a nascent stage. The Draft National Civil Aviation Policy-2015 (NCAP-2015) could provide a level playing field to aviation sub-sectors like Maintenance Repair and Overhaul services, Airlines, Airport, Cargo, Aerospace manufacturing, Skill Development among others. [18] However, it does not include guidelines/ regulations for certification of drones, licensing of drone pilots, guidelines/ instructions for research and development of drones, their operations and air space management. DGCA earlier vide public notice 05-13/2014-AED dated October 07, 2014 had banned the use of drones Unmanned Aerial Systems (UAS) by non-government agencies, organisations or individuals for any purpose.[19]

There are many challenges associated with the proliferation of drones. There are no instructions/ guidelines for vendors for procurement and sale of drones as a result mini and small drones are easily available in markets and through online vendors in India. They could become a security hazard in sensitive areas and pose a threat of collision to the manned flights. These drones could endanger life, property, power lines and other infrastructure due to uncertainty about the technology and reliability of safety equipment. The International Civil Aviation Organisation (ICAO) has not formulated drone regulations and is yet to come up with Standard and Recommended Practices (SARP). However, this has not prevented leading drone design and manufacturing countries from coming up with their own regulations. The research and development of drones is moving at a slow pace in India and it would have to depend on foreign suppliers in the long run if indigenous drone industry is not provided regulatory support and favourable environment.

Conclusion

The drones have been one of the focus areas of development for most countries. The ability of the drones to undertake reconnaissance, strike targets without endangering human lives, provide assistance during disasters, act as airborne communication relay platform etc is making them an essential part of most militaries as well as civil industry. The drone development in India is primarily limited to PSUs and the participation of private sector has been limited. The DGCA notification of October 2014 could restrict research and development of drone in the long run. There is a need expedite formulation of regulations on classification and registration of drones, certification of pilots and their operations. In the interim, companies and education institutes should be allowed to undertake research and development of small drones under exception clause of civil aviation rules subject to following security instructions. The terrorism and insurgency in India is a real threat, which necessitate that the drone manufacturers as well as drones may have to be registered and suitable guidelines issued to ensure security of the country, safety of vital areas and protect the privacy of people. The civil agencies like civil police may have to be involved in implementation and enforcement of drone security measures in the long run. The delay in issuing suitable guidelines, regulations for licensing of drone pilots, drones equipment and their operations could adversely impact research, development and indigenisation of drones and Make in India.

(Disclaimer: The views and opinions expressed in this article are those of the author and do not necessarily reflect the position of the Centre for Air Power Studies [CAPS])

Notes

[1] Maan Pamintuan-Lamorena, Drones used to measure radiation in Fukushima nuclear plant, January 27, 2014, http://japandailypress.com/drones-used-to-measure-radiation-in-fukushima-nuclear-plant-2743074/, accessed on November 23, 2015.

[2] Orthomapping is a geometrically corrected aerial photograph with a uniform map.

[3] ANAC proposes rules for RPA and model airplanes, September 02, 2015, http://www.anac.gov.br/Noticia.aspx?ttCD_CHAVE=1914, accessed on November 23, 2015

[4] The Rise of China's Drones, July 23, 2015, http://www.slate.com/articles/technology/caixin/2015/07/drones_in_china_can_the_country_s_industry_for_uavs_bloom.html, accessed on November 11, 2015.

[5] Wu Yan, Shanghai to require a pilot license to fly mini-drones, July 21, 2015, http://www.chinadaily.com.cn/china/2015-07/21/content_21371545.htm, accessed on November 11, 2015.

[6] http://english.jschina.com.cn/20322/201507/t2290073.shtml, accessed on November 17, 2015

[7] Emile Orzea, China's UAS Regulation: An interesting precedent, November 04, 2014, http://www.suasnews.com/2014/11/32433/chinas-uas-regulation-an-interesting-precedent/, accessed on November 17, 2015.

[8] Carl Engelking, Drone Delivery Services Are Booming In China, March 27, 2015, http://blogs.discovermagazine.com/drone360/2015/03/27/drone-delivery-china/#.Vkq7j3YrLIU, accessed on November 17, 2015

[9] Seung Lee, Drone Users: Get Ready to Register With the Government,October 19, 2015,http://www.newsweek.com/drone-users-register-government-christmas-384815?source=email-story?source=email, accessed on November 17, 2015

[10] Operation and Certification of Small Unmanned Aircraft Systems, http://www.regulations.gov/#!documentDetail;D=FAA-2015-0150-0017, accessed on November 17, 2015

[11] Unmanned Aircraft Systems, http://www.faa.gov/uas/, accessed on November 17, 2015.

[12] Transport Canada makes it easier to fly small UAVs for work and pleasure, November 5, 2014, http://news.gc.ca/web/article-en.do?nid=900449, accessed on November 16, 2015.

[13] http://wwwapps.tc.gc.ca/Saf-Sec-Sur/2/NPA-APM/actr.aspx?id=17&aType=1&lang=eng, accessed on November 16, 2015

[14] Transport Canada makes it easier to fly small UAVs for work and pleasure, November 5, 2014, http://news.gc.ca/web/article-en.do?nid=900449, accessed on November 16, 2015.

[15] Proposed options focus on smaller, lower-risk unmanned aircraft activities, May 28, 2015, http://news.gc.ca/web/article-en.do?nid=981029, accessed on November 16, 2015

[16] SYDNEY J. FREEDBERG JR , X-47B Drone & Manned F-18 Take Off & Land Together In Historic Test, August 17, 2014, http://breakingdefense.com/2014/08/x-47b-drone-manned-f-18-take-off-land-together-in-historic-test/, accessed on November 26, 2015

[17] Unmanned Aircraft Systems,

https://www.faa.gov/uas/, accessed on November 26, 2015.

[18] Revised Draft National Civil Aviation Policy, 2015, October 30, 2015, http://www.civilaviation.gov.in/infocus/revised-draft-national-civil-aviation-policy-2015, accessed on November 11, 2015

[19] http://dgca.nic.in/public_notice/PN_UAS.pdf, accessed on November 11, 2015