Study on Civil UAV Legislation Regulation

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ABSTRACT

With the widespread use of UAV and the frequent illegal flight of UAV in the existing legal system, China should establish a set of laws, regulations, standards, and systems conducive to the sustained and healthy development of the UAV industry based on foreign advanced management experience, and establish and improve the practical operation and management mechanism of civil UAV.

KEYWORDS
Civil Aircraft, Unmanned Aerial Vehicle, Legislation, Regulation.

INTRODUCTION

Civil UAV has been widely used in remote sensing aerial photography, logistics industry, agricultural operations, medical disaster relief, and other fields. In recent years, the UAV manufacturing industry in China has developed rapidly, and DJI UAV has occupied 70% [3] of the global small UAV Market. With the widespread use of UAV, illegal flight events affecting public safety and even national security are increasing gradually. Whether in the field of UAV applications or the manufacturing industry, it is urgent to build a set of laws, regulations, standards, and systems to promote the sustained and healthy development of the civil UAV industry, and establish and improve the practical operation and management mechanism of civil UAV.

THE MANAGEMENT STATUS OF CIVIL UAV IN CHINA

Illegal flights of civil UAV are on the rise

In December 28, 2013, under the circumstances that the company does not have the qualification of aerial surveying and mapping and has not applied for airspace, the flight leader of a company in Beijing Hao, as well as employees Joe and Lee, aerial surveyed and mapped Hebei Sanhe business airport project undertaken by a company in Hebei. The illegal aerial photography led to more than one flight of civil aviation flight affected, Beijing Air Force aircraft takeoff and intercept urgently. Qiao and Li and other three operators were prosecuted by prosecutors of negligent crime of endangering public safety, and bring a suit to the people's Court of Pinggu district. After the trial, the court found that the 3 defendants violated the civil aviation management regulations of the black flight has been endangering public security, constitute a crime of endangering public security by dangerous means, sentenced to 1 years and 6 months, suspended for 2 years [4]. This is the first time that UAV "black fly"
was investigated for criminal responsibility in China. Because of the low threshold for the purchase and use of civil UAVs, individuals can be registered without registration in all kinds of electronic shopping platforms or specialized markets (stores). In addition, the operation of the UAV is relatively simple, the buyer can learn the UAV flight without learning, and the UAV owner is also more widely, the UAV flight demand is more and more. Due to the lack of relevant regulations, management procedures and restrictions on the legal flight of UAVs, there has not established consciousness of legitimate flight of UAVs in the public groups. The public is not familiar with the legal provisions of UAV management, and is not aware of the possible harm to the public safety caused by illegal flight activities, lack of basic safety awareness, and carry out unmanned aerial vehicle flight activities with great blindness and randomness. At the same time, due to the current flight rules based on manned aircraft is not suitable for UAV flight, in recent years, there are more and more incidents of illegal flight of UAVs. Civil aviation units have reported a number of UAV incidents affecting safe operation. According to the actual evaluation situation, the air traffic control departments take the emergency measures of starting, replacing, using and running direction, increasing the flight departure interval, changing the runway operation module, changing the arrival and departure procedures, and adjusting the approach. UAV incidents have caused adverse effects on the airspace and airport flight safety and normal operation.

**The management mechanism is not perfect, and the boundary of management authority is unclear**

Civil UAV has the dual attributes of ordinary goods and special aircraft, and its management runs through the whole life cycle of development, sales, use, maintenance, scrap and so on. China's UAV management implement inter-ministerial joint working mechanism, and has set up an office composed of the civil aviation bureau, the Ministry of industry, the Ministry of Commerce, the Ministry of public security, the customs and the three major armed services, located in the National Space Administration committee. At present, the actual operation and management of civil UAV is mainly the three departments: the military, Civil Aviation Administration and the State General Administration of sports. The Civil Aviation Administration is responsible for the management of civil airspace and civilian UAVs. The military is responsible for managing airspace, and the sports department is responsible for the management of the aviation model. There are various departments to perform their own duties, the management of the situation, has not yet established a systematic management system, and the formation of mechanisms. Management departments include governments at all levels and public security organs. On the protection of various important activities, in order to prevent the illegal flight of UAVs from disrupting the public order, special supervision can be carried out on the holding, trading, flight and other aspects of the UAV, and at the same time, the UAV take off measures, such as take-off, landing and air flight, temporary control, etc. Local public security departments will also intervene in the invasion of UAVs into the forbidden area, infringement of citizens' legitimate rights, damage and other situations, and in accordance with the criminal law and public security management laws and regulations for punishment. Other relevant departments can also manage UAVs, such as the use of UAVs in express delivery, by the postal sector management; in the power
inspection, by the national grid management; in plant protection, by the agricultural sector management. This is the case of multi head disorder in management. At the same time, due to the emergence of UAVs with various types, different sizes and different functions in recent years, coupled with the absence of clear legal division of UAVs and aviation movement models, the management authority of UAVs has become increasingly blurred. For example, there is a cross license management between unmanned aircraft and air movement models, and there are Chinese private aircraft owners and Pilots Association and China Air Sports association.

**The means of operation supervision are not complete and lack of cooperative management mechanism**

The management mechanism is not perfect, and the boundary of management authority is vague, which will inevitably lead to incomplete operation supervision means and unsmooth coordination management. The management of each link has no orderly undertaking, the coordination is difficult, and it is difficult to realize the orderly management of the whole life cycle, which is likely to cause confusion in management work. In civil aviation, the traffic control departments and local government departments can't master the flight dynamics of UAVs in real time, and there is not enough means to take coercive measures for illegal flying of UAVs. The UAV management involves manufacturing, sales, personnel training, operation management, illegal investigation and other links, corresponding to several management subjects. At present, the coordination mechanism between the management entities is imperfect, the information of each link is difficult to share in time, the action response is not timely, and it is difficult to form the effective control of the whole process. Taking civil aircraft illegal flight events as an example, airlines, Airport Inc, civil aviation air traffic control department, civil aviation industry government, military air traffic control department, local government and public security departments can realize the counterpart report or notification according to the existing procedures. However, due to the wide range of illegal flight investigation and timeliness requirements, the existing mechanism is difficult to meet, and the events in recent years are difficult to be effectively investigated and punished.

**LACK OF LEGAL REGULATION OF CIVIL UAV MANAGEMENT IN CHINA**

**Lack of high-level legislation, object dislocation of the current laws and regulations**

On the level of national legislation, the laws and regulations concerning UAVs are promulgated by the civil aviation act of 1995 and the general aviation control regulations promulgated in 2003. Among them, the civil aviation law only in the tenth part of the six is on the provisions of general aviation, and is only the principle of regulation, and the general aviation control regulations only stipulates that the UAV for civilian business flight, to be treated as a general aviation aircraft. This has resulted in no specific provisions governing the management of civilian UAVs, and it is just by analogy with the general aviation rules. As UAVs are used more and more widely, some can be applied to the category of general aviation, and most of them are beyond
the scope of general aviation management, and the specifications of the models are not exactly the same. The original aircraft management regulations are difficult to control the rapid development. This makes the light and small UAV that should be convenient to fly in the flight process is very cumbersome, and the management of unmanned aerial vehicles (UAVs) has no high order law in many respects, and has no specific rules to follow. And the current civil aviation law and other civil aviation regulations are basically formulated for manned aircraft. If the civil aviation laws and regulations enacted by the manned aircraft are copied and applied to the manufacture and use of UAVs, the UAV industry and market will be severely restricted.

Supporting policies lag far behind the demand of industrial development

China has not yet promulgated the top regulations on the management of civil drones, and the laws and regulations on the development, sale, use, maintenance and scrapping are imperfect. In the development process, due to the lack of qualification review, and the technology, capital threshold is relatively low, a large number of lack of qualified enterprises into the market, engaged in R & D and production. In the link of UAV use, in recent years, the Civil Aviation Administration has issued the "civil air traffic control measures for unmanned aerial vehicles", "interim provisions on issues concerning the management of civil unmanned aerial vehicles"," regulations for the management of unmanned aerial vehicle pilots ","regulations for the operation of light and small unmanned aerial vehicles "and" measures for the administration of air traffic in civil unmanned aircraft systems". Airworthiness requirements are required for UAVs to obtain evidence, I class chartered flight certificate, except for model aircraft; except for class I and class II UAV drivers, and the others should obtain evidence. According to the level of UAV and the operation area, they are managed by industry association or civil aviation management department respectively; air traffic control requires UAVs to operate in civil airspace, must be operated in isolation areas, but also by the civil aviation authority of the region review. These Regulations are loose and vague, and the airworthiness regulations used for unmanned aerial vehicle approval are temporarily blank. The management of aviation operation model is relatively loose in the State General Administration of sport, and only in the "air sports management measures" mentioned that "when the aircraft model flight altitude and airspace are related to the flight activities of other aircraft, the units or individuals who are responsible for the activities of the aviation model should be contacted with the airport authorities or local flight control departments to delimit the flight height and area of the aircraft model." On the local level, there are only sporadic management practices, such as remote aviation model flight management method of Shanghai. The management method puts forward clear requirements for the remote-control aviation model to be certified in the open area; illegal driving is also punishable by 5-10 days of administrative detention. China has not yet formed a perfect UAV laws and regulations and management document system, the policy formulation lags far behind the UAV industry development.

Current laws and regulations pay attention to regulation, but despise protection

Remote aviation model flight management method of Shanghai pays attention to regulation, but despises protection. For example, the outdoor flight of the remote control aircraft model should be certified. But many UAV drivers in the actual
operation is only in the line of sight for aerial entertainment, neither flying high, not too far away, does not affect the takeoff and landing aircraft. That is to say, although the "one size fits all" local regulations have prevented the "disorderly" flight, but also violated the low altitude, small UAV, model pilots legitimate rights and interests. National legislation also has the same problems, such as the Provisional Regulations of Civil Aviation Administration of China on civil UAV management issues, the provisions of the civil UAV before flight should receive I class charter flight certificate, but also for temporary registration. Because the charter flight certification cycle and procedures are relatively long, and the development cycle of many consumer drones is short, and some production cycle is even shorter than the certificate of flight permit cycle. This has caused the manufacturers not willing to apply for a special flight permit and the interim provisions has become a mere scrap of paper.

STATUS AND PRACTICE OF CIVIL UAV MANAGEMENT IN THE WORLD

UAV management in the United States is relatively successful, both in management mode and legislation. UAV management in the United States is based on model aircraft management. The United States has a clear definition of UAVs and model aircraft. UAVs refer to aircraft that are not piloted by aircraft and their related elements, including remotely piloted aircraft, autonomous aircraft and model aircraft. Model aircraft is a kind of unmanned aerial vehicle (UAV), which can support itself flying in the air, running within the line of sight, and noncommercial UAV for hobby and entertainment.

The United States implements club management for model aircraft. The club shall comply with the relevant safety management standards and require the aircraft to be no more than 55 lbs. If it exceeds, it should pass the safety certification of the club. It is prohibited to fly within 5 miles of the airport, strictly abide by all temporary flight restrictions (TFR), and be approved by relevant departments in the corresponding area. The United States has increased the ban on flying in densely populated areas and prohibiting the operation of more than 400 feet. For UAVs other than model aircraft, the United States uses classified management according to use, and belongs to model aircraft management for recreational purposes. It increases the limit of registration within sight distance and greater than 0.55 pounds of aircraft. For commercial purposes, they fall into two categories: below 55 pounds and over 55 pounds. Below 55 pounds, drones are required to be more than 16 years old. They are required to apply for a license and register for two years. At the same time, they should be tested by aviation safety laws and regulations. For the total weight of aircraft over 0.55 pounds to be registered online, it requires the driver before each flight to check the aircraft, to ensure the safety of take-off. For the operating environment requirements, you can fly in the G class airspace, but must inform the relevant air traffic control units, must fly in the daytime visual range, cannot fly over densely populated areas, flight height cannot exceed 400 feet, the speed cannot exceed 100 miles per hour. More than 55 pounds refer to manned aircraft management, but there are many exemptions and restrictions on operating conditions, which are related to the nature of specific operations. In recent years, the Federal Aviation Administration (FAA) has issued new regulations on the use of UAVs. In 2016, the FAA issued 107 regulations
for the use of small UAV systems. The regulations focus on the commercial use of UAVs, covering aerial photography, agriculture, architecture and rescue and other aspects, relax the access threshold. FAA proposed the following requirements on the use of drones: weight, not more than 25 kg, and not more than 120 meters, the flight speed, not more than 160 kilometers; only fly in the daytime, and in the visible range of the operator, the operator age also put forward not less than 16 years old, at least 7.5 kilometers away from the airport.

In terms of privacy protection, the United States has enacted its own regional laws and regulations. For example, in Texas, it is illegal to fly drones up to 8 feet; it is illegal to photograph private property without the consent of the owner.

LEGAL REGULATION AND LEGISLATIVE PROPOSALS OF CIVIL UAV MANAGEMENT IN CHINA

According to the safety risk level, the legislative principle of moderate restriction should be adopted

In terms of legislation, it should implement hierarchical management accordance with the assessment of the risks brought by UAVs to the third people and national security in terms of the size, flight height, endurance and airspace of UAVs. On the basis of safety risk assessment, it should adopt appropriate legislative principles and formulate different regulatory requirements. It should maximize the freedom of the manufacture and use of UAVs, and minimize the impact of government control, in promoting the development of UAV industry, while ensuring the ground third people and national security.

Improving legislative hierarchy, the perfection of laws and regulations needs both systematic and prospective

It should improve the national legislation, distinguish the relevant provisions of general aviation and UAVs in the revision of the civil aviation law, and increase the guidelines and the guiding ideology of UAV management. In the aspect of administrative regulations, the principle of Civil Aviation Law should be embodied. It should establish specific principles, formulate and revise special UAV laws and regulations, carry out systematic legislative norms of UAV production, sales, pilots, flight airspace, flight behavior, flight rules and supervision, and build a perfect administrative law system. Various regulations and local regulations of UAV management should be revised. The formulation of laws and regulations should take into account the foresight, and on the basis of the rational planning of UAV development, a series of policies and regulations should be formulated to protect and guide the sound development of the related industries of UAVs. A good legal ecology should form gradually. That is, the management of UAVs has a high level of legal basis, and all links of the industrial chain have laws to follow, and there are specific rules to follow.
Establishment of multi sectorial coordinated supervision mechanism

At present, UAV management is chaotic, there is a multi-management situation, in the process of legislation, management departments and law enforcement forces should be defined, and coordination among departments should be taken into account. First of all, the management departments and law enforcement departments should be clearly defined. UAV airspace integration management should be managed by CAAC. The illegal activities of UAV owners and users can be taken to revoke the business license of aircraft and UAVs driving license penalty. Management of UAVs in isolated airspace should take territorial management and control by public security organizations. In addition, local governments and relevant functional departments, civil aviation and military should strengthen communication and coordination, implement provincial or city level UAV collaborative supervision implementation measures, optimize regulatory information sharing and rapid response process, and build a clear responsibility, coordinated and smooth, timely response, investigate and deal with powerful regulatory new pattern. A unified platform for collaborative supervision should be established. It should strengthen the application of new technologies in safety supervision, and realize the UAV manufacturing, sales, personnel training, operation and management, illegal investigation and effective supervision of the whole process, in order to safeguard the safe operation of civil aviation, and better protect and promote the development of UAV industry.

Perfect monitoring measures and strengthen source control

In view of the current management situation of paying attention to regulation, but despising protection, it is suggested to improve monitoring measures, strengthen source governance, and provide management efficiency. The first is to further improve the real name registration system of UAV sales and purchase links, on the basis of the existing registration system, establish UAV owners’ database, and to enhance the accuracy and intensity of control. The number, type and identity information of UAVs in outdoor flight should be effectively controlled and registered by special agencies and routine maintenance. The UAV flight should be effectively tracked and supervised. Once the illegal flight event occurs, the public security organs can find the owner and the driver of the UAV as soon as possible. The second is to establish unmanned aerial vehicle sales review system. A discriminating censorship should be formulated according to the different types of UAV buyers. For example, the purchase of segregated airspace UAV buyers, a natural person must provide true identity information, address information, purchase application, the company is required to provide a business license and corporate identity certificate, and shall submit the relevant information into the public security organs real-time UAV database, and accept the audit. Buyers of integrated airspace UAVs, the company or organization must obtain the qualifications of civil aviation regulations, with the ATC flight authorization, as well as the possession of the driver level of proof, and at the same time in the air traffic control department and the public security department for the record.
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