

CRIMINAL AND DISCIPLINARY ISSUES PERTAINING TO SUBORBITAL SPACE TOURISM FLIGHTS

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Abstract

The advent of space tourism suborbital flights raises questions about the applicable law on board space tourism vehicles. As such vehicles are mostly of hybrid nature, it is uncertain (a) whether air law or space law applies and (b) which State has jurisdiction. Another issue is the possible content of such law. The present paper discusses these problems *de lege lata* and *de lege ferenda* from the view of criminal law. *De lege lata* both air law and space law regimes apply during different stages of flight. It can be observed that neither of them is 100% appropriate for application to suborbital flights. It is submitted that the present legal regime is inadequate, and that a new uniform system of rules should be developed *de lege ferenda* combining elements from both air law and space law. The main characteristics of such system should be: (i) the extraterritorial criminal jurisdiction of the State of registry; (ii) the disciplinary authority of the commander on board; (iii) the penalization of acts jeopardizing the safety of the flight and the discipline on board; (iv) the obligation of operators to adopt effective security measures.

1) THE NEED TO INTRODUCE PENAL PROVISIONS ON SUBORBITAL FLIGHTS

Commercial suborbital flights will be soon a reality. However, only some very general rules on criminal issues are applicable to them at present. Nonetheless, detailed penal provisions on suborbital flights are needed for a series of reasons. On the one hand, criminal behavior can also occur during such flights. If special laws have not been enacted, there may be a vacuum of law. On the other hand, those flights could be an excellent target for terrorists. International terrorism has shown a preference for high-profile attacks, as the attacks in New York, in Madrid and in London indicate. An attack against a suborbital flight might not produce so many victims, but it would be spectacular for two reasons. First, suborbital space flights are something new and attract a lot of publicity. Second, the attack could take place in outer space, or at

least at a very high altitude in the airspace, thus delivering the message that there is no place where one could be safe. Moreover, the fact that commercial suborbital flight is new and not regulated may create security gaps, therefore rendering suborbital vehicles an easy target.

2) APPLICABLE LEGAL REGIME IN GENERAL

a. Space law or air law?

The first question is which set of rules governs suborbital flights. The problem pertains to the old dispute on the delimitation of outer space. There are mainly two theories: spatialism and functionalism.¹

According to the spatial theory, a boundary has to be fixed to determine where airspace ends and where outer space begins. In each space applicable is the respective law.

Pursuant to the functional theory, space

law governs the legal relations of space activities, wherever they may be conducted. Decisive are the function and the objective of the activity. If these consider the exploration and utilization of outer space, then space law applies. Guidance could also provide the technical configuration and the capabilities of the vehicle. Rocket propulsion instead of air-breathing engines and capability of circular velocity strongly indicate the application of space law. Furthermore, the medium where the activities mainly occur can also be a useful factor. If the activities take place mainly in the air, then air law will apply.

Spatialism provides legal certainty, but leads to the application of two different legal regimes to the same flight. Moreover, most air law provisions apply only to aircraft.² Consequently, consideration of functional criteria is necessary too.

The functional theory has the merit of applying a single regime throughout the flight. In addition, it corresponds better to the provisions of the Space Treaties, which refer to the exploration and utilization of outer space, without mentioning any spatial delineation.³ On the other hand, functionalism is incompatible with State sovereignty in the airspace,⁴ because it applies therein the freedom of use and exploration of outer space.⁵ Furthermore, there are not any clear definitions of the terms “*space activity*”⁶ and “*space object*”. At the same time, the functional theory is inconsistent, because, if there is a need to determine the focal point of the undertaken activity, then there is also a need for spatial delimitation.

Consequently, we have to combine the advantages of these theories. Spatial delimitation is necessary as well as the application of a single regime. The technical specifications of the flying vehicles should also be considered.

Therefore, we need to define the notion of the “*aircraft*” and the “*space object*”.

b. Aircraft or space object?

According to the definition of the International Civil Aviation Organization (ICAO), an “*aircraft*” is “*any machine that can derive support in the atmosphere from the reactions of the air*”.⁷

The Space Treaties do not contain any definition of “*space object*”, apart from clarifying that “*the term space object includes the space object and the component parts thereof*”.⁸ Many definitions of the notion of space object have been suggested. Although these definitions are not identical, they do have a common core: Space object is an object launched or intended to be launched into outer space and designed to move and operate therein.⁹

This definition makes obvious that space objects are launched. According to NASA Aerospace Dictionary,¹⁰ “*launch*” means “*to send off a rocket vehicle under its own rocket power*”. Thus, space objects are rocket propelled vehicles.

The question is whether space tourism vehicles should be seen as aircraft or space objects. There are types that use rocket engines throughout the flight.¹¹ These are clearly space objects, and the application of air law would be very difficult. There are also types that have combined characteristics. One form is that of an aircraft equipped with rocket engines as well.¹² Such vehicles take off and fly as an aircraft using jet engines until they reach the desired altitude, and then they activate rocket engines to fly into outer space. The other form is of a two-staged system consisting of a carrier vehicle, which has all the characteristics of an aircraft, and a passenger vehicle, which is released at a specific altitude and then travels to space

using rocket propulsion.¹³

From a technical view, vehicles with combined characteristics have hybrid nature. Until the ignition of the rocket engines or the separation from the carrier vehicle they are aircraft, because they derive support from the reactions of the air. After that point they are space objects. To accept something different from a legal point of view, i.e. consider them as space objects throughout the flight, would lead to logical inconsistencies.¹⁴

The combination of the hybrid nature of suborbital vehicles with the spatial and the functional theories leads to a duality of the applicable legal regime. Under both theories both air law and space law applies. Only in the case of fully rocket-propelled vehicles would the functional theory result in the pure application of space law. Nevertheless, it would be inappropriate to apply different rules to vehicles serving exactly the same purpose, only because they have different specifications. That would adversely affect legal certainty and technical innovation. Therefore, it is necessary to abandon the old concepts and create a new legal regime applicable to suborbital vehicles. Such regime should constructively combine elements from both air law and space law.

c. The UNCOPUOS questionnaire on legal issues of aerospace planes

The need for a new legal regime has also become obvious from the answers of States to a UNCOPUOS questionnaire concerning legal issues of hybrid vehicles or aerospace planes.¹⁵

Among other things States were asked if the applicable legal regime depends on the location of the vehicle in airspace or outer space (Question 2) and if a single unified regime should be developed for such vehicle (Question 3). The answers on the

applicable legal regime under current status of law (*de lege lata*) are divided: out of 35 replies, 18 States favor the spatial approach and 17 prefer the functional approach. A significant number of States (12) have noted the need of combining elements from both theories and of further elaborating the current rules of international law. Moreover, the majority of the replying States (24) believe that a new unified international legal regime for hybrid vehicles would be necessary to have optimal regulation (*de lege ferenda*).

Consequently, the establishment of a new regime corresponds to the will of States too. In the following, we will examine the penal provisions of current air law and space law, as well as their applicability to suborbital flights *de lege lata* and *de lege ferenda*.

3) PRINCIPLES OF CRIMINAL JURISDICTION IN PUBLIC INTERNATIONAL LAW

In order to understand better some aspects of penal law, a brief review of the principles governing criminal jurisdiction in international law is needed. These principles enable a State to exercise jurisdiction over criminal offences that may be linked with another State. They are mostly determined by national law, which often lacks uniformity. In addition, there are international conventions conferring jurisdiction to a number of States in certain cases.

The most applied principles are following:¹⁶

- a) the territoriality principle: a State may exercise criminal jurisdiction over crimes committed in its territory. Closely connected to that principle is the quasi-territoriality principle, according to which a State may exercise criminal jurisdiction over

crimes committed on board ships, aircraft, or space objects bearing its nationality.¹⁷

- b) the active nationality principle: jurisdiction over crimes committed abroad is conferred to the national State of the alleged offender.
- c) the passive nationality principle: the national State of the victim may assert criminal jurisdiction.
- d) the protective or security principle: a State may exercise jurisdiction over aliens for acts committed abroad, if these acts affect its security.
- e) the universality principle: every State can try particular offences, because they are deemed especially offensive to the international community as a whole, e.g. crimes against humanity, war crimes.

Closely related with the exercise of criminal jurisdiction is extradition.¹⁸ Extradition enables one State to hand over to another State a suspected or convicted criminal who has fled abroad. It is mostly regulated through bilateral treaties. Such treaties define specific crimes for which extradition can be asked.

4) CRIMINAL ISSUES REGARDING AIRCRAFT

Criminal issues regarding aircraft are regulated by various international instruments. The Chicago Convention contains some general provisions. Then, there are international conventions on aviation penal law: the Tokyo Convention of 1963, The Hague Convention of 1970, and the Montreal Convention of 1971, which is supplemented by the Montreal Protocol of 1988. Those are complemented by the ICAO Assembly Resolution on unruly passengers. Moreover, detailed technical provisions on aviation security can be found in Annex 17 to the Chicago

Convention. As all these instruments have been more or less transformed into national laws, special mention to domestic legislations is not necessary.

a. Chicago Convention

The Chicago Convention¹⁹ stipulates that aircraft have the nationality of the State in which they are registered (Art. 17). The Chicago Convention implies the right of the State of registration to exercise criminal jurisdiction over crimes committed on board aircraft.²⁰ Such jurisdiction requires, however, the enactment of special provisions in domestic law.

b. Tokyo Convention

The Tokyo Convention²¹ was drafted to solve the problem of commission of crimes on board aircraft.²²

The Tokyo Convention clarifies that the State of registration of the aircraft may exercise criminal jurisdiction over offences and acts committed on board [Art. 3 (1)], even if they occur during the flight in foreign airspace.²³ The contracting States are obliged to establish jurisdiction over aircraft registered in their registry [Art. 3 (2)]. However, each State is free to decide on the precise offences that its jurisdiction regards, and whether it will enforce such jurisdiction at all.²⁴ Criminal jurisdiction on the basis of national laws remains unaffected [Art. 3 (3)]. Thus, a priority system among the different jurisdictional bases is not established.

The jurisdictional rules of the Tokyo Convention apply in respect of, first, criminal offences and, second, other acts that may or do jeopardize the safety of the flight or endanger the good order and discipline on board the aircraft. Such offences or jeopardizing acts need to occur while the aircraft is “*in flight*”, i.e. from the moment when power is applied for the purpose of take-off until the moment when

the landing run ends [Art. 1 (3)].

Furthermore, the Tokyo Convention establishes the authority of the aircraft commander on board the aircraft. His/her powers extend from the moment when all its external doors are closed following embarkation until the moment when any such door is opened for disembarkation [Art. 5 (2) (1)]. If the aircraft commander has reasonable reasons to believe that a person on board has committed or is about to commit a criminal offence or a jeopardizing act, he/she can impose reasonable measures on this person including restraint [Art. 6 (1)]. To this end the commander can ask the help of the crew members and passengers. [Art. 6 (2) (1)] These measures are only of preventive nature and must not be seen as judicial or corrective.²⁵ Art. 10 provides immunity to the aircraft commander, the crew members, the passengers and the owner or operator of the aircraft for any measure received against the alleged offender in accordance with the Convention.

c. The Hague Convention

The Hague Convention²⁶ deals specifically with the problem of unlawful seizure of aircraft or hijacking. It came as a response to the dramatic increase of aircraft hijacking in the late 1960's.²⁷

According to Art. 1 unlawful seizure of aircraft is committed by any person who on board aircraft in flight unlawfully, by force or threat thereof, or by any other form of intimidation, seizes, or exercises control of, that aircraft. The contracting States undertake to make this offence punishable under severe penalties (Art. 2). Thus, the Convention serves as a model for individual national legislation.²⁸

The provisions of the Convention apply to international flights and domestic flights in States other than the State of registration [Art. 3 (3)]. The aircraft needs to be “*in flight*”, which is the period from

the moment when all its external doors are closed following embarkation until the moment when any such door is opened for disembarkation [Art. 3 (1)(1)].

Art. 4 (1) obliges the contracting States to also establish jurisdiction over any other act of violence against passengers or crew members committed by the alleged offender in connection with hijacking. Such obligation is imposed upon (a) the State of registry of the aircraft, (b) the State of landing, if the offender is still on board the aircraft, and (c) in case of wet leasing, the State of the principal place of business or the permanent residence of the lessee. Moreover, Art. 4 (2) obliges any other State to establish jurisdiction over the act of hijacking, if the alleged offender is found within its territory. Provisions of national legislations remain valid [Art. 4 (3)]. Nevertheless, Art. 4 only requires of the contracting States to assume jurisdiction– it does not oblige them to actually prosecute the alleged offender.²⁹

An obligation is imposed, however, by Art. 7 pursuant to the principle *aut dedere aut judicare*. If the alleged offender is found in the territory of a contracting State, that State is obliged to either extradite him, or submit the case to its competent authorities, which must handle the case as any serious offence under domestic law. Concerning extradition, Art. 8 makes aircraft hijacking an extraditable offence, even if there is no extradition treaty between the States concerned.

c. Montreal Convention and Montreal Protocol

The Montreal Convention³⁰ was drafted to cover acts of sabotage against aircraft committed on the ground, and acts of unlawful interference against air navigation facilities and services.³¹ It was meant to complement The Hague Convention, which explains the commonality of provisions between the

two instruments, including jurisdictional rules.

The 1988 Montreal Protocol³² extended the provisions of the Montreal Convention to cover acts of sabotage against airports.

d. ICAO Assembly Resolution on Unruly Passengers

The ICAO Assembly Resolution on unruly passengers³³ refers to passengers who fail to respect the rules of conduct on board aircraft and thereby disturb the good order and discipline on board aircraft.³⁴ The purpose of the Resolution is the creation of a model law to cover cases not foreseen by the existing international conventions.

The Resolution contains a list of offences. They include physical violence, assault, intimidation or threat against other persons on board, refusal to follow lawful instruction of the aircraft commander or of a crew member, intentional damage to property, consumption of alcoholic beverages or drugs resulting in intoxication, and other acts that could endanger the safety of the flight.

Concerning jurisdiction, there are instances where the State of landing has custody over the alleged offender, but it can not establish jurisdiction pursuant to known jurisdictional principles. Therefore, the Resolution contains a special clause, which adds two new elements: the jurisdiction of the State of landing and the jurisdiction of the State of the aircraft operator in long-term leasing situations.

e. Annex 17 to the Chicago Convention

Annex 17 to the Chicago Convention³⁵ was also the result of violent crimes against civil aviation in the late 1960's. It was drafted to safeguard civil aviation and its facilities against acts of unlawful interference.³⁶

Of special interest is Chapter 4 of Annex 17, which prescribes preventive

security measures. Their objective is to prevent the introduction of dangerous and prohibited devices on board the aircraft (para. 4.1). Security checks of originating aircraft must be performed (para. 4.2.1), and unauthorized persons must not be able to enter the flight crew compartment (para. 4.2.3). Furthermore, passengers and cabin baggage must be screened before entering the aircraft (para. 4.3.1). In addition, States have to ensure the establishment of security restricted areas at each airport and relevant identification for persons and vehicles (para. 4.7.1). Persons other than passengers who are granted unescorted access to security restricted areas are subject to background tests (para. 4.7.2).

f. Applicability of air law provisions to suborbital flights

The international instruments of aviation penal law complement each other and aim at covering all observed cases of criminal or disruptive behavior on board aircraft. Their existence is the result of experienced problems in the law of international air transport.

De lege lata, international aviation penal law is not applicable to suborbital flights. Suborbital space tourism flights are going to start and end at the same State - they are not international. If suborbital vehicles are used in the future for international transports, aviation penal law might be applicable; however, it could not provide reliable solutions, because it pertains to aircraft. It would apply only to hybrid vehicles and only to a part of the flight, which would be highly impracticable. In addition, it would be illogical: vehicles that do not fulfill at all the definition of aircraft would be governed entirely by space law, although they perform exactly the same mission. Besides, the sophisticated air law provisions may not be totally appropriate for the young suborbital flight industry.

De lege ferenda, it would be very useful to adopt some provisions of aviation penal law in domestic legislations on suborbital flights. First, States should make clear that suborbital vehicles registered in their registry are subject to their penal laws. As to other principles of jurisdiction, the establishment of jurisdiction of the State of landing could provide solutions in situations comparable to that envisaged in international air transport. Furthermore, acts that do or may jeopardize the safety of the flight should be made punishable. The provisions of aviation penal law could serve here as an example. Another useful set of measures regards the authority of the vehicle commander. Provisions similar to the rules of the Tokyo Convention would be appropriate. The rules contained in Annex 17 to the Chicago Convention could also be helpful to the suborbital flight industry.

5) CRIMINAL ISSUES REGARDING SPACE OBJECTS

Criminal issues regarding space objects are regulated by the general provisions of the OST, the special rules developed for U.S. and Russian manned operations, and the special provisions on the International Space Station (ISS).

a. Outer Space Treaty

Art. VIII OST attributes the right to exercise jurisdiction and control over the space object to the State of registry.

i) Criminal jurisdiction and Command authority

The general jurisdictional rule of Art. VIII OST includes criminal issues. Consequently, the penal law of the State of registry will normally apply. It has been accepted that the State of registry has primary, but not exclusive, jurisdiction.³⁷ The exercise of criminal jurisdiction may be based on other principles too.

Another corollary of the jurisdiction of the State of registry is the disciplinary authority of the spacecraft commander. The commander is accepted as the representative of the State of registry, to whom that State's jurisdiction has been delegated.³⁸

ii) Applicability to suborbital flights

The provisions of the OST are not applicable to suborbital flights *ipso jure*. The OST as an international convention is effective only between States. National implementing measures are required to enable the actual establishment of jurisdiction over crimes committed in outer space.

b. U.S. law

The U.S.A. is the only State having enacted rules expressly comprising suborbital flights. Furthermore, the U.S. legislation contains provisions on U.S. criminal jurisdiction in outer space and on the disciplinary authority of the Space Shuttle commander.

i) Human Spaceflight Requirements

The Federal Aviation Administration (FAA) has released legislative requirements for crew and passengers of commercial human spaceflights, including security provisions.³⁹ §460.53 of Title 14 Code of Federal Regulations (14 CFR) obliges operators to implement security requirements to prevent spaceflight participants from jeopardizing the safety of the flight crew or the public, and from carrying on board any explosives, firearms, knives, or other weapons.

These provisions are generic and the FAA has left the operators decide on the exact implementing security measures. Useful guidance could provide Annex 17 to the Chicago Convention. The operators of suborbital vehicles could adopt the security measures foreseen in that Annex

in a manner adjusted to the particularities of the present status of suborbital flight industry.

ii) U.S. criminal jurisdiction in outer space

Section 7 of Title 18 U.S. Code (18 USC 7) defines the special maritime and territorial jurisdiction of the U.S. Paragraph 6 subjects to the U.S. extraterritorial jurisdiction any space vehicle that has been registered in the registry of the U.S. pursuant to the OST and the RC. Such jurisdiction is extended from the moment when all external doors are closed on Earth following embarkation until the moment when any such door is opened on Earth for disembarkation. This provision is actually a copy of Art. 5 (2) of the Tokyo Convention.

Paragraph 7 adds that the U.S. has jurisdiction over any offence committed by or against a U.S. national, if such offence occurred in any place outside the jurisdiction of any nation. Thus, the U.S. has also adopted the active and passive personality principles with regard to crimes in outer space.

The provisions of the U.S. legislation on criminal jurisdiction in outer space are only partly applicable to suborbital flights. The U.S. extraterritorial jurisdiction over vehicles registered in the U.S. registry does not include suborbital vehicles, because it refers explicitly to vehicles registered in accordance with the OST **and** the RC. The latter concerns only space objects launched into Earth orbit and beyond.⁴⁰

On the contrary, U.S. extraterritorial jurisdiction pursuant to the active and passive personality principles should be accepted. 18 USC 7 (7) mentions “any place outside the jurisdiction of any nation”. Outer space is such place.⁴¹ The provision covers U.S. legal entities as well, for the law mentions “a national of the United States” in general. Therefore, the U.S. will have jurisdiction in cases

involving attacks against the facilities and the vehicles of a U.S. operator.

iii) Authority of the Space Shuttle commander

§ 1214.702 of 14 CFR⁴² establishes the authority of the Space Shuttle commander to enforce order and discipline during all phases of a Shuttle flight and to take whatever action in his/her judgment is necessary for the protection and safety of all persons and equipment on board. The commander has authority throughout the flight to use any reasonable and necessary means, including the use of physical force, to achieve this end. § 1214.704 makes any willful violation of the commander's orders and directions punishable with a fine of no more than 5.000 \$ or imprisonment up to 1 year or both.⁴³ Here too, the influence of the Tokyo Convention on U.S. law is obvious.

The provisions on the authority of the Space Shuttle commander refer specifically to Shuttle operations. Therefore, they are not applicable to suborbital flights. An application by analogy would not be possible owing to their penal nature, as the penalties at § 1214.704 indicate. In penal law, an analogy of criminal provisions against the defendant is prohibited. This is induced from the fundamental principle of criminal law *nullum crimen sine lege*, which means that an act or omission can only be a crime, if there is a previous law foreseeing such act or omission as crime.⁴⁴ Since the criminal behavior needs to be exactly defined in the penal provision, an analogy can not be accepted. Nevertheless, the rules on the command authority on board the Space Shuttle could serve as an example to the enactment of similar rules concerning suborbital flights.

c. Russian law

Provisions on jurisdiction of the

Russian Federation over space objects and on the authority of the commander can be found in Art. 20 of the law of the Russian Federation “*About Space Activity*”.⁴⁵

i) Criminal jurisdiction and command authority

Art. 20 (4) of the Russian law on space activity states that the Russian Federation shall retain at all times jurisdiction and control over any crew of a piloted space object registered in it. Foreign citizens participating in the flight are also subject to Russian laws [Art. 20 (5)]. Although these provisions do not mention explicitly criminal jurisdiction, their generic wording can be interpreted as comprising criminal jurisdiction.

Art. 20 (3) makes the spacecraft commander responsible for the safety of the space object and all persons and property on board. The commander is vested with all necessary powers to conduct the flight and command the persons on board.

ii) Applicability to suborbital flights

The Russian provisions do not distinguish between orbital and suborbital flights. Neither do they refer to any specific category of operations. Therefore, they apply to suborbital flights too.

d. ISS Operations

As to criminal and disciplinary matters of operations on board the ISS, there are special provisions in the Intergovernmental Agreement (IGA) and in the ISS Crew Code of Conduct (CCOC).

i) Criminal jurisdiction

Criminal jurisdiction on board the ISS is regulated in Art. 22 IGA. The main principle endorsed is the active nationality principle.⁴⁶ The rationale of the provision lies also in the fact that the European partner States work together in the

European Space Agency (ESA), which owns a flight element, although it is not a State.⁴⁷ Adopting the quasi-territoriality principle would create serious jurisdictional problems in case a crime was committed on board the European flight element. It would be very difficult to determine which national law of the ESA Member States should apply in the particular case.

Art. 22 (2) IGA lays down the passive personality and the quasi-territoriality principle as secondary jurisdictional principles. Nevertheless, such jurisdiction can only be claimed, after consultations with the national State of the alleged offender have failed.

For the purpose of extradition, Art. 22(3) IGA provides the necessary legal basis if an extradition treaty has not been signed between the States concerned.

The aforementioned provisions, however, are only valid for nationals of the five partner States of the IGA. Nationals of third States on board the ISS are subject to the general jurisdictional rules of Art. VIII OST.⁴⁸

ii) Authority of the commander

Pursuant to Part III (A) CCOC, the ISS commander is responsible on board for the safety and well-being of all persons, and for maintaining good order and discipline. He/she has the ultimate authority on board the ISS and has the right to use any reasonable and necessary means to fulfill his/her duties. The right to use proportionate force or restrain a person, although not expressly mentioned, must be assumed, because it is justified by the need to ensure the immediate safety of the crew members and the ISS itself.⁴⁹

Furthermore, the ISS commander has to promote a harmonious and cohesive relationship among the ISS crew members and assure an appropriate level of mutual confidence and respect, which takes into

consideration the international and multicultural elements of the ISS missions. The idea behind this provision is to deal with interpersonal or group harassment.⁵⁰

iii) Applicability to suborbital flights

The provisions on the ISS are not applicable to suborbital flights. These rules regard explicitly ISS operations, and have been drafted taking into account the special characteristics of the ISS.

The latter fact is also the reason why the rules on ISS operations can not serve as an example to future regulation of suborbital flights. Suborbital flights will be conducted in a totally different manner. There will probably not be any elements registered in different States, the crew and the passengers will not stay in outer space for a prolonged period, and private entities rather than governments will be involved. The only exception is the disciplinary authority of the commander. The essence of the relevant rules, however, is the same with the general provisions applicable to all space operations.

CONCLUSION

De lege lata both air law and space law are applicable to suborbital flights, with the exception of vehicles using exclusively rocket propulsion. This creates legal inconsistencies, which result in legal insecurity and hinder innovation. Therefore, a new uniform legal regime specifically for suborbital vehicles is necessary.

Air law contains much more elaborated provisions than space law, which is due to the long experience of commercial human

air flights. Both systems share, however, two elements: the criminal jurisdiction of the State of registry and the disciplinary authority of the commander. In addition, the development of space law rules in human transportation tends to follow the example of air law. Consequently, the regulators of human spaceflights could use the experience of air law.

Nonetheless, commercial human spaceflight has not reached the stage of development of air law. Commercial human spaceflight is far from being a routine, and serves mainly leisure purposes, not international transports. Therefore, it would be inappropriate to copy at once all air law provisions into the new regime.

The best way to start would be to create national legislation. Such legislation should, first, establish criminal jurisdiction over suborbital vehicles registered in that State. Second, it should vest the vehicle commander with disciplinary powers at the example of the Tokyo Convention. Third, it should penalize acts endangering the safety of the flight and jeopardizing the good order and discipline on board, following the provisions of international air law. Fourth, it should foresee the adoption of security measures by operators in the vein of Annex 17 to the Chicago Convention. International regulation, including extradition issues, would be premature at present. The future development of human spaceflight will show whether an international initiative is necessary and what additional measures are needed. In any case, prevention is better than cure.

¹ See details on these theories and other related theories in Goedhart, Robert F.A. *The never ending dispute: Delimitation of air space and outer space*, Cedex 1999.

² See e.g. Art. 3(a) of the Convention on International Civil Aviation, signed at Chicago, on 7 December 1944 (Chicago Convention).

³ e.g. liability for damages on the surface of the Earth or

to an aircraft in flight - Art. 7 Outer Space Treaty (OST) in combination with Art. 2 Liability Convention (LC).

⁴ According to Art. 1 Chicago Convention "States shall have exclusive sovereignty in the airspace above their territory".

⁵ Art. I OST.

⁶ e.g. it is unclear whether we should consider space activity the collection of scientific data by an airborne

telescope, like the SOFIA system.

⁷ Annex 2 to the Chicago Convention, *Rules of the Air*, 10th ed. 2005, definitions.

⁸ Art. I (d) LC and Art. I (b) RC.

⁹ Cheng, Bin *Studies in International Space Law*, Oxford 1997, p. 557; Hintz, Manfred *Weltraumgegenstände in: Böckstiegel, Karl-Heinz (ed.) Handbuch des Weltraumrechts*, Cologne et al. 1991, p. 157 (163); Gorove, Stephen *The Space Shuttle and Some of its Legal Implications*, in: Gorove, Stephen (ed.) *The Space Shuttle and the Law*, Mississippi 1980, p. 1 (4).

¹⁰ NASA Dictionary of Technical Terms for Aerospace Use, available at <http://roland.lerc.nasa.gov/~dglover/dictionary//content.html> (last visited on 29.8.2007)

¹¹ e.g. Blue Origin Goddard.

¹² e.g. Rocketplane XP or the EADS space tourism vehicle.

¹³ e.g. Virgin Galactic SpaceShipTwo.

¹⁴ These inconsistencies become most obvious when examining the legal nature of the carrier vehicle after separation. To consider it a space object would be illogical, because it derives support from the reactions of the air – it fulfils the definition of the aircraft. To deem it an aircraft would also be absurd, for it would mean that a space object, or at least a component thereof, is “transformed” into an aircraft, although its flight specifications remain unchanged.

¹⁵ The text of the questionnaire and the answers received so far can be found at <http://www.unoosa.org/oosa/en/SpaceLaw/aero/index.html> (last visited on 29.8.2006).

¹⁶ See details in: Brownlie, Ian *Principles of public international law*, 5th ed., Oxford 1998, p. 299 et seq.; Shaw, Malcolm *International Law*, 4th ed., Cambridge 1997, p. 579 et seq.

¹⁷ Cheng (*supra* note 9), p. 387

¹⁸ See details on extradition in: Hobe, Stephan / Kimminich, Otto *Einführung in das Völkerrecht*, 8. ed., Tübingen-Basel 2004, p. 91; Shaw (*supra* note 14), pp. 610-611.

¹⁹ *Supra* note 2.

²⁰ See Cheng (*supra* note 9), p. 387.

²¹ Convention on Offences and Certain Other Acts Committed on Board Aircraft, signed at Tokyo, on 14 September 1963.

²² Abeyratne, Ruwantissa *Aviation Security-Legal and regulatory aspects*, Aldershot-Brookfield et al. 1998, p. 140 et seq.; Mateesco-Matte, Nicholas *Treatise on Air-Aeronautical Law*, Montreal-Toronto 1981, p. 325 et seq.

²³ Boyle, Robert B. / Pulsifer, Roy *The Tokyo Convention on offences and other acts committed on board aircraft*, 30 JALC (1964), p. 305 (333).

²⁴ Boyle/Pulsifer (*supra* note 23), pp. 334-336.

²⁵ Mateesco-Matte (*supra* note 22), p. 341.

²⁶ Convention for the Suppression of Unlawful Seizure of Aircraft, signed at The Hague, on 16 September 1970.

²⁷ Abeyratne (*supra* note 22), p. 152; Mateesco-Matte (*supra* note 22), p. 355.

²⁸ Abeyratne (*supra* note 22), pp. 153-154; Mateesco-Matte (*supra* note 22), p. 357.

²⁹ Abeyratne (*supra* note 22), p. 157.

³⁰ Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, signed at Montreal, on 23 September 1971.

³¹ Abeyratne (*supra* note 22), p. 161; Mateesco-Matte (*supra* note 22), p. 367.

³² Protocol for the Suppression of Unlawful Acts of violence at airports serving international civil aviation, supplementary to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, done at Montreal, on 23 September 1971, signed at Montreal on 24 February 1988.

³³ Resolution A33-4 *Adoption of national legislation on certain offences committed on board civil aircraft (unruly/disruptive passengers)*, 2001.

³⁴ E.g. cases of physical aggression towards other persons on board, general disobedience to safety instructions, vandalizing of airline seats - see ICAO Circular 288 LE/1 *Guidance Material on unruly/disruptive passengers*, June 2002, paras 1.1-1.3.

³⁵ *Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference*, 8th ed., 2006.

³⁶ ICAO Annexes 1-18 Booklet, Annex 17.

³⁷ Gorove, Stephan *Criminal jurisdiction in Outer Space*, 6 Int'l Lawyer (1972), p. 313 (316-317); Jenks, Wilfred C. *Space Law*, London 1965, p. 294.

³⁸ Jenks (*supra* note 37), p. 238; Sloup, George Paul *Legal regime of international space flights: Criminal jurisdiction and command authority aboard the Space Shuttle/Spacelab* in: Gorove, Stephan (ed.) *The Space Shuttle and the Law*, 1980, p. 77 (86).

³⁹ *Human Spaceflight Requirements for Crew and Space Flight Participants*, Final Rule, 71 FR 75616, 15 December 2006.

⁴⁰ Art. II (1) RC.

⁴¹ Art. II OST.

⁴² 45 FR 14845, 7 March 1980, as amended at 56 FR 27900, 18 June 1991.

⁴³ *Ibid.*

⁴⁴ This principle is also contained in the Rome Statute of the International Criminal Court [Art. 22 (1)]. Besides, it has been internationally recognized as a human right, e.g. in Art. 15 (1) (1) of the International Covenant on Civil and Political Rights, and in Art. 7 (1) of the European Convention of Human Rights.

⁴⁵ Decree No. 5663-1 of the Russian House of Soviets, 20 August 1993.

⁴⁶ Art. 22 (1) IGA.

⁴⁷ de Roos, T.A. *Disciplinary and Criminal Law in Space* in: von der Dunk, Frans G. / Brus M.M.T.A. *The International Space Station*, Leiden-Boston 2006, p. 115 (121).

⁴⁸ de Roos (*supra* note 47), pp. 122-123; Farand, André *Astronauts' behaviour on board the International Space Station: regulatory framework* in: UNESCO *Legal and ethical framework for astronauts in space sojourns, Conference Proceedings*, Paris 2004, p. 70 (77).

⁴⁹ de Roos (*supra* note 47), p. 119; Farand (*supra* note 48) p. 75.

⁵⁰ Farand (*supra* note 48), p. 74.