

THE SPACE PLANE AND INTERNATIONAL SPACE LAW

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Abstract

Some countries including the United States of America, the United Kingdom, Germany and Japan are now developing space planes for their future transportation system. The space plane has several concepts in one technology and it is rather difficult to apply one legal regime to it. Space planes are categorized into surface to surface (STS) type and surface to outer space (STO) type according to the purposes of their usage. These two types have different purposes while both are based upon the same technology. Therefore, different laws of space and air are applicable. Additionally, the emergence of this new transportation system brings problems which are not covered by present laws and regulations. This paper will briefly describe some of these problems.

Introduction

The space plane which is in the research and development stage in some countries will drastically change the future transportation system. The emergence of the space plane enables us to fly to the opposite side of the earth within a few hours and bring a large number of persons and amount of goods to the low orbit of the earth. However, this kind of new transportation system creates various legal problems that need to be solved because of its dual concepts.

Definition and Classification of Space Plane

The space plane as a future transportation measure is not a technology system with only one concept, but a technology with dual concepts. Therefore, it does not seem appropriate to apply one legal regime to solve all the problems related to the space plane.

The space plane can be classified into two categories as follows:

1. Surface to surface type space plane (STS type space plane)

The new orient express which was announced by President Reagan of the U.S. A. in his 1986 State of the Union Message is a good example of this type of space plane by which we can arrive at any place on the earth within a couple of hours. The most important purpose of this STS type space plane is to bring something to the destination in minimum time. Though the STS type space plane goes through the low altitude outer space in the flying route between two points, this passage is required only from the technological needs. The STS type space plane is thought of as a future style of supersonic transporter like the Concorde developed jointly by UK and France.

2. Surface to outer space type space plane (STO type space plane)

This type of space plane aims to put persons and/or goods into the low orbit from the surface. The STO type has almost the same role as a space shuttle which is planned to be used for transporting to the space station the 'Freedom' that will be constructed by U. S.A., ESA, Canada and Japan. However, while the space shuttle is launched as a rocket with some disposable parts including boosters and a fuel tank and lands as a glider without any power, the STO type space plane is entirely reusable, will take off and land horizontally in the same way as an airplane.

The very feature of the above space planes are that two different purposes can be realized by one common technology. And this hybrid character presents us several matters to be considered including applicable laws.

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Applicable Law of Space Plane

After the classification of space planes, the applicable law of each type space plane should be considered according to the definition of airplanes and space objects. Fundamentally, the STS type space plane will be recognized as one kind of airplane and the STO type space plane will be one style of space object.

The definitions of airplane and space object are used tentatively as follows:

An airplane is the craft that can derive support in the atmosphere from the reaction of the air fundamentally with a purpose of flying to a place on the earth.

A space object is the body that is able to reach the first cosmic speed or circular speed and more, with the intention of launching that body into the earth orbit or beyond, including a series of activities related to that launching as well as an attempted launching.

According to these standards, while the STS type space plane should be recognized as an airplane, the STO type is classified as a space object because of its ability and intention, and space law is applied to its operation in general. The launching state must register the STO type space plane, retain jurisdiction and control over it, and bear international responsibility under the space law system.

With regard to the STO type space plane, there also might be a problem as to whether the first stage component of the two stage type STO space plane is a space object or not. The example of this kind of STO space plane is Sanger II of Germany. In the case of Sanger II, the two stage concept is employed in which the first stage is used in the airspace to reach a certain speed and altitude and the second stage places the vehicle in the earth orbit. This first stage flies in Mach 4 to 6 at the altitude of 20 km to 30 km and returns to the airport after detaching the second stage. It seems almost unavoidable for this first stage not to fly over other countries' airspace especially in Europe.

This first stage of the space plane is a necessary component to reach earth orbit. In conventional launch rockets, it is natural that the first stage is

treated as a space object because the term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof.¹ It is appropriate for the first stage of Sanger II type STO space planes to invoke the same clause. To change the status of this first stage from a space object to an airplane at the time of detachment may create confusion in some cases.

Provided that a first stage infringes the sovereignty of subjacent countries, certain reasonable regulations are needed, i.e., to inform the related countries in advance of the its flight schedule and route, to observe the air traffic control for the flight safety and national security, etc.

Further, the status of pilots/astronauts of the first stage is also uncertain. Although they do not go to outer space in fact nor is this their purpose, they should be treated as astronauts if the first stage is recognized as a space object.

The STO type space plane is to be treated as a space object in general. At the same time, however, there may be some exceptions because of its hybrid character. As mentioned above, the space plane will take off and land horizontally and will use airports along with other airplanes etc. The space plane uses a jet engine (SCRAMJET: a supersonic combustion ramjet) unlike a space shuttle which lands without any engines. In this case, for taking off and landing, all STO type space planes also have to be guided by the air traffic controller in the same way as airplanes whilst keeping the status of space objects. Of course, this control and observance of air traffic rules are required from a realistic point of view, for flight safety and do not mean that the STO type space plane has the status of an airplane. The STO type fundamentally retains the status of a space object which is regulated by space law.

Other Legal Problem

Though the space law system can regulate most of the problems originated from the STO type space plane, there remain some points which are not covered or envisioned by the present system. The followings are some of them.

Firstly, there is the problem of liability for damage. There was a convention on international liability for damage caused by space objects in 1972, but coverage is not enough for the damage related to the space plane. The problem is due to the fact that only states and international intergovernmental organizations can seek compensation under this convention. Article 6 of the outer space treaty of 1967 provides that states parties shall bear international responsibility for national activities in outer space when such activities are carried out by governmental agencies or non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present treaty. Further, the activities of non-governmental entities in outer space shall require authorization and continuing supervision by the appropriate state party.² According to this article, all commercial operations of the STO type space plane are carried under the control of the related state and such state is internationally liable for damages.³ The rules in the liability convention of 1972 are almost the same as the outer space treaty. The provisions that all related states have the right to present a claim and that the local remedies rule can be avoided should be evaluated.⁴ However, because there are some provisions in which, for example, the nationals of the launching state are excluded from this convention system, the present liability regime cannot cover all the persons damaged directly in an accident of the STO type space plane.⁵

In the near future when the STO type space plane will emerge, this new transportation system operated by private carriers will move large numbers of people and amounts of goods from the earth to outer space. Taking a space plane will be like taking an airplane for the travellers, although the destinations are different. In this situation, a new legal system which can cover all the passengers, goods and related natural and legal persons directly will be essential, particularly when claims for damages arise.

Secondly, the status of astronauts will be reconsidered. Though the present

space law treaties call them by some various words (astronaut, personnel, etc.), it is a common understanding that space exploration and exploitation activities are in the interest of all mankind and these astronauts are regarded as envoys of mankind in outer space.⁶

Actually, in the pioneer era, all astronauts were recognized as selected persons who were strong and well-trained physically and mentally and were proud of being representatives of their nations and all mankind as well.

In the case of the space plane, various kinds of passengers are imaginable. If the passengers are the same as mission specialists of the present space shuttle, like space engineers or scientists, there may not be much dispute about regarding them as envoys. On the other hand, when they are the sightseers, they also have the purpose to reach outer space. However, it is rather difficult to see them as envoys of mankind, because such tourists are not thought to be engaged in the public development or social welfare of the earth, but are keen on their own pleasure in outer space.

Conclusion

As space utilization increases, the outer space, especially a low orbit in outer space will become inhabited. Naturally, it is impossible to solve all the problems of outer space by the existing space law system dating from the 1960's. The STO type space plane can show us such defects of the present space law. In the future, the new regime which can deal with people's "normal" activities in outer space will be necessary.

Note

1. Convention on International Liability for Damage Caused by Space Objects (Liability Convention), 1972, 961 UNTS 187, Art.1(d).
2. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty), 1967, 610 UNTS 206, Art.6.
3. *ibid.*, Art.7.
4. Liability Convention, 1972, Art.8.
5. *ibid.*, Art.7.

6. Outer Space Treaty, 1967, Art.5.