

## MUST THE SPECIAL TYPOLOGY OF AEROSPACE PLANES LEAD TO THE SUPPLEMENTATION OF THE RULES OF THE OUTER SPACE TREATY?

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### Abstract

The plans for the realisation of the future aerospace planes lead the jurist to face interesting questions on the applicable discipline.

After having identified the different types of aerospace planes by classifying them in three groups according to similar characteristics, from the most typical ones of the aerospace plane to the more particular ones of the aircraft, the most suitable regime for the regulation of new situations will be sought.

Considering the spatialist thesis, the functionalist one and the thesis on a specific regime, the second seems to be the most suitable, albeit adapted to the different typology of aerospace plane. The crucial points over which space and air law differ are those concerning registration, with consequences over the air-worthiness certification and on the identification of the launching State, over the statute of the crew and over liability, in the three orders of liability for damages to third parties, for transportation damages and for damages due to faults of the product.

Some solutions have been suggested in order to solve the conflicting situations the aerospace plane could face. In conclusion, the solution is not to be found so much in the modification of the Treaty on Outer Space and subsequent UN Space conventions, as it is in specific co-operation agreements among the interested parties and in the increasing privatistic regulations which are already emerging in the

insurance and transport field.

### Typology of aerospace planes

The planning phase of aerospace planes, carried out by various countries, is at present suffering a slow-down, and at times an abandonment, due to political and economic reasons. The jurist, however, must consider in advance the problem concerning which discipline should apply to these new objects having the hybrid characteristics of an aircraft and of a space object, and if space law, such as it arises from the Outer Space Treaty and from the following UN. Conventions, is also suitable to regulate these new situations.

The same term "aerospace plane" has not been accepted univocally, so that, in the German answer to the first question in the unfruitful questionnaire of the COPUOS Legal Sub-Committee dated March 1996<sup>1</sup> on the possible legal issues with regard to aerospace objects, it was preferred to adopt the more generic term "space transportation system". Until the Scientific and Technological Sub-Committee has studied the different types of space planes and given a more technical definition, it is preferable to keep to a term, even "aerospace plane", which indicates both fields of operation. On the other hand, while the Chicago Convention of 1944 gives an aerodynamic definition of the air vehicle with reference to its faculty of support in the atmosphere, neither the Outer Space Treaty nor the other conventions give a precise and univocal definition of the space object<sup>2</sup>. This lack of definition is probably intentional in a field where technological evolution is so fast that standard definitions might soon become obsolete.

The Space Conventions prefer to state the discipline applicable to space objects, leaving

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the parties to agree on the connection in case of the creation of new types. This is what happened in the IGA for the International Space Station, where it was agreed that the discipline concerning the registration and control was to be applied to the single elements of the Station<sup>3</sup>.

The need to lower the cost of access to outer space has led to the planning alongside with non-recoverable launchers, of a series of reusable vehicles of transportation with different technological characteristics. These space planes have different functions and therefore they will necessarily undergo different legal treatments.

a) The first group includes those aerospace planes with characteristics closer to the space objects: vertical take-off, launch from earth launchers, placement in orbit- where their mission is carried out-, return on earth with horizontal landing at times in another State.

The first realisation of this kind of transportation vehicle was the American Space Shuttle used for the transportation into outer space of space labs which, in its return phase lands with a gliding flight, after 8300 Km navigation, on a previously planned American aerodrome. The United States have defined the Shuttle as a space object and therefore it is regulated by space law. The reason is functional: its mission is carried out mostly in outer space and the limited manoeuvrability during its return on Earth accustoms the Shuttle to the classical space capsule.

The other Shuttle, used only once in 1988 and now abandoned, is the Soviet Buran.

Among the future projects for transportation vehicles there is the optional ESA programme HERMES, made up of a transportation aerospace plane and of a resource module which disintegrates in the atmosphere, with a vertical take-off from Guyana and a horizontal landing. The HERMES project which should serve the Columbus module has been abandoned for the time being.

The Japanese HOPE project can also be classified within this group: a one-stage, reusable vehicle without crew, with a vertical take off and an automatic landing, after a descent to 80 Km altitude, in a pre-chosen

place. It can serve the Space Station and carry payloads and also be used as an un-inhabited space lab.

The United States, after having abandoned the NASP project, are studying a one-stage Reusable Launch Vehicle (RLV). Some demonstrations were carried out within the experimental programme X33. An optional vehicle could be available before 2010.

b) The second group includes projects for supersonic planes, for "Super Concorde" by the United States and also by Europe and Japan. The "Super Concorde" will take-off like a plane, it will not use a rocket launcher, it will not have the aim to be placed in orbit and if, for a few instants, it should be in a high orbit over the extra-atmospheric space, its mission will basically be for transportation from one place to another over the planet.

c) The third group of objects foresees some multi-stage hybrid aerospace systems where some of the components have the characteristics of an aircraft carrying out their mission in the air space and some others of the space object carrying out their function in orbit. The German project SANGER foresees a hyper-sonic aircraft with a liquid hydrogen aerobic engine carrying a second stage on its back which separates at approximately 40km, at mach 7 with the mission of carrying payloads for space stations into space. The first stage lands and the second returns to Europe by gliding flight.

According to the Russian concept of a transportation aircraft, the AN-225 (or Myria) could carry a second stage detaching at approximately 9 Km. A co-operation programme between Russia and Great Britain foresees the transportation on the AN-225 of a space vehicle named HOTOL. This reusable one-stage automatic flight launcher would keep smaller payloads in the lower orbit at a lower cost<sup>4</sup>.

### **Legal regime applicable to aerospace planes**

The regime of air law, prevalently based on the principle of the exercise of the sovereignty of the overflown State, and that of space law,

based instead on the principle of freedom of navigation are very different. The comparison between the international conventional rules regulating matters of liability, registration, statute of the crew, reveals a very different content between the rules applicable to the air vehicle and those applicable to the space vehicle.

The doctrine is divided over the criteria to be adopted for the identification of the applicable regime. The spatialist thesis would rather apply air law or space law to the aerospace plane according to its location.

The functionalist thesis is instead based on the function carried out by the vehicle, on its purpose: if the aerospace vehicle is designated to carry out a mission in orbit the rules of space law will be applied even when it is in air, whereas if its function is to link two points on earth, even by passing briefly through space, the rules of air law should be applied<sup>5</sup>.

A third thesis supports a specific regime such as the creation of a text among the States having such vehicles, where the existing rules of air law and space law are to be adapted to the new type of aerospace plane<sup>6</sup>.

The space approach does not seem to gather much success. First of all due to the unsolved question of the delimitation between air space and outer space lying, maybe wilfully, on the table of the legal Sub-Committee<sup>7</sup>. Furthermore, the acceptance of this theory would involve the application of different regimes for a same object, while the doctrine, the Space conventions and the States themselves tend towards a uniform regime, as it appears in the answers to questions 2 and 4 of the UNCOPUOS questionnaire.

The functional approach seems to be the most convincing, and at present a space vehicle with a double purpose of transporting passengers from one point to another of the Earth and of a mission in orbit does not seem feasible. However, the theory is to be adapted to the previously mentioned different typology of aerospace vehicles.

The Space Shuttle and the vehicles classified in the first group carry out their function in outer space, they must be considered as space objects and therefore they will be subject to the application of the rules of international space

law for registration, liability for damage, rescue and recovery of astronauts and space objects.

The most delicate point is the passage in the air space, especially during the return phase which could take place with a horizontal landing in a different State from where it was launched. For space objects the return has until now been established in the launching State and the problem concerning the passage in the air space of another State has only been for the take-off phase. This could be defined as an "inoffensive passage right" but it has however been taken into consideration either in air or space law. This passage has never been questioned by the States leading to the possibility of the creation of a common law rule. With the advent of the aerospace plane we are moving towards an opposite tendency<sup>8</sup> because the crossing of the air space of another State risks being more frequent and longer lasting. The USA Space Shuttle, the Buran and other future systems will need approximately 8,000 Km from their re-entry into Earth's atmosphere until their point of landing. Crossing the atmosphere for 14-15 minutes and flying lower than 60 Km the necessary precautions will have to be taken in order to avoid collisions with other aircraft<sup>9</sup>. The rules for the security and traffic organisation of the overflown State must be forcibly respected and the most feasible system seems to be to reach an agreement among the States involved in the carrying out of the mission of the aerospace plane.

The second group includes those supersonic aircraft with the purpose of linking and transporting in the shortest time from one point to another over the Earth. The passage in low altitude is only due to a technological necessity. This kind of vehicle has the function of an aircraft and must undergo the national laws of the overflown States and the rules, for registration and authorisations, of the Chicago Convention on Civil Aviation of December 7th 1944 and for liability of the Carrier the rules of the Warsaw Convention on Air Transportation of October 12th 1929 and the following modifying Protocols of The Hague 1955, Guadalajara 1961, and Guatemala 1971. The Rome Convention of October 7th 1952 concerning damage caused to third parties to the surface by foreign aircraft, determining an

objective responsibility of the carrier, has only obtained approximately 30 ratifications and is still missing the ones from those States which mostly carry out such air activity<sup>10</sup>.

However, the conventions on air law have not taken into consideration the liability for possible damage caused to other space objects in the albeit short period of the crossing of the space by the supersonic aircraft. On the contrary, the opposite situation, that is to say the liability for damage caused by a space object to aircraft in flight during the phase of the crossing of the air space is regulated by the 1972 UN Convention on Liability with the determination of an absolute objective liability. This will certainly be a problem to be faced, at least by those States provided with these aircraft<sup>11</sup>.

The third group includes multi-stage aerospace planes. A complex space system will involve greater difficulties in the determination of the applicable law and suitable solutions will have to be studied to regulate those special situations which will happen during the life of the aerospace plane.

Some authors state that even the first stage transporting and launching in air space the space object, or from whose back it takes off, must be considered as a "component part" and precisely the launching vehicle and therefore that it should have the status of a space object. However it is clear that it cannot be admitted that the first stage carrying out its function in the air space is infringing the sovereignty of the overflown States and that it must therefore respect all the rules concerning information, authorisation and security of the overflown State. The *status* of the astronauts/pilots is yet to be defined<sup>12</sup>. It therefore seems more appropriate to consider, in this complex system, the first stage, carrying out a function of transportation in air space and flying over the air space of other countries and landing, especially in Europe, in different States from the launch, as an aircraft and therefore subject to all the national and international rules of air law. The second stage, carrying out its function in orbit, can be considered as a space object.

The difference in the rules of air and space law on matters such as registration, certification, status of the crew and liability will involve a certain adaptation in those conflicting situations

the aerospace plane could find itself in.

### Difference in the present regulations and tendency to rapprochement

Art. 17 of the Chicago Convention obliges the nationality States to **register** the aircraft once and for all with an identification symbol. The 1975 Convention on Registration of Objects Launched into Outer Space establishes a national and an international registry, care of the Secretary of the United Nations, in which the space object is to be registered with a different number each time it is launched. The first question is if the aerospace plane, linking two points on earth by briefly passing through space, should be registered at each launch. Some Authors state that the incidental transit in space of a flight between two continents does not involve the application of the 1975 Convention<sup>13</sup>. A greater certainty of identification, with the registration even in the international registry, since the orbital parameters will be different each time, leads towards the applicability of the Convention itself<sup>14</sup>.

In order to guarantee the respect of important security measures, stated in enclosure 8 of the Chicago Convention, each aircraft must obtain an **air-worthiness certificate**. In order to maintain the air-worthiness certificate the builder must prove that the conception of the aircraft is in accordance with the established rules, that the model of the aircraft is in accordance with the certified type and that all the requirements stated in the maintenance manual are fulfilled. International space law, instead, does not require any certification even for manned flights. The American Shuttle, as a space object, does not need to obtain an air-worthiness certificate but the NASA is obliged to respect a certain number of FAA regulations, especially those concerning air circulation. On the other hand the FAA must ensure sufficient air space for the return of the Shuttle. There is therefore the question if the transportation aerospace plane, which will use the air space for a longer period and which will land in different States from the launching one, should be provided, essentially for security reasons, with a similar air-worthiness certificate. The

doctrine seems to be positively oriented suggesting a sort of domestic certification by the single States or by the European Space Agency<sup>15</sup> similar to the American regime of licences issued to those carrying out commercial launches<sup>16</sup>.

The identification of the **launching State**, could be critical, also for the purpose of registration, in the case of an aerospace plane of the third group taking off from or launched into space by a transportation aircraft. The 1975 Convention describes the launching State as the State which launches or procures the launching of a space object or a State from whose territory or facility a space object is launched. Three launching States could be identified: the one to whom the second stage going into outer space belongs, the State owning the transportation aircraft or the State of the air space if the detachment takes place in an air space under the sovereignty of a third country. The problem can be solved, once again, only with the agreement of the involved States. On the other hand article II of the 1975 Convention on registration states that "where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object .... without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object and over any personnel thereof".

Some more differences may be found in the **crew statute**. While art. 32 of the Chicago Convention establishes that the captain and the crew on board an aircraft must obtain a license according to specific conditions, in space law the 1968 Convention on the Rescue of Astronauts, despite considering them to be "envoys of mankind" and therefore enjoying specific guarantees and assistance by all the States, does not establish any particular statute<sup>17</sup>. The astronauts undergo such a selective procedure that their preparation is undoubtedly equal to an aircraft pilot, and therefore in order to render the regime more uniform it would be useful to require the personnel of the aerospace plane to obtain a special licence.

It is presumed that there will be various kinds of passengers on the aerospace plane. Those who will be part of the mission, that is to say the specialists, the engineers, the scientists, such as in the Space Shuttle, will be considered envoys of humanity, but those passengers who are only being transported may not be treated the same as the astronauts and they will be envisaged in the framework of air transportation.

The Chicago Convention establishes the captain's powers and his relationship with the other people on board. The captain of a space object enjoys a similar statute<sup>18</sup>, but it would be necessary to give a conventional definition of the position of the captain of an aerospace plane. On the other hand there are some previous rules regulating abnormal situations. The "Regulation on the security of the personnel and the powers of the captain" was created for the crew of the Space Shuttle<sup>19</sup>, and for the International Space Station the States party established, in the IGA and in the mentioned Memorandum, a "code of conduct" also concerning the command hierarchy, the powers and responsibility of the captain<sup>20</sup>.

As for the aerospace plane it will be necessary to establish the relationship between the captain on board and the personnel on ground in order to properly share the decisional powers. In fact, while the captain of an aircraft, albeit taking into consideration the opinion of the personnel on ground, makes his decisions independently, the captain of a space object obeys the orders of the mission Director on ground.

The regime of **liability** applicable to space objects is rather different from the one established for aircraft. In the case of an aircraft the Warsaw Convention on air transportation establishes in detail the liability conditions of the carrier towards passengers based on very specific principles: presumption of liability of the carrier, limitations for compensation, jurisdictional competence. The responsibility for damages caused to third parties on the surface by aircraft is regulated by the 1952 Rome Convention which establishes an objective liability of the carrier and defining maximum limits. This convention did not receive many ratifications and therefore

national law is usually applied to solve controversies and also for the cases of collisions between aircraft.

While the regime of air law is a privatistico regime centred on the physical figure of the carrier, the regime of space law is focused on the State being the subject authorised to request compensation. The 1972 space law Convention however, only establishes the liability for damages: liability for fault, in the event of a collision between space objects, and absolute objective liability in the event of damage to aircraft in flight or caused on the earth's surface, but no liability concerning transportation.

There is however a certain rapprochement between the two regimes. There is in fact a tendency to overcome the compensation limits in air regulation which is more restrictive than the space one. The 1955 Hague Protocol and the 1961 Guadalajara Protocol have already increased the maximum of the compensation for damage to persons, the United States have established derogations from the Convention and the Japanese companies have stated that they do not wish to avail of the compensation limits.

At present the Institutions of the European Union are examining, with the procedure of co-operation between Council and Parliament, a suggestion for the regulation of the Council on the liability of the air carrier in case of accidents<sup>21</sup>. Some countries have in fact considered it necessary to adapt the liability limits of their carriers in order to take into consideration the risk reduction within the framework of present transportation, the higher level of compensation for the accident victims and also of the evolution of the cost of life. The suggestion for the regulation aims to abolish the monetary limits of liability in case of gross negligence of the carrier; to establish a maximum for objective liability up to the concurrence of an amount equivalent to 100.000 "Special withdrawal rights" (approximately 120.000 ECU) even if the carrier has taken all the necessary measures to avoid the accident; to establish the dispositions for the payment of the advances to the victims; and to oblige the carriers not belonging to the Community, to inform passengers about their

conditions of transportation when purchasing the ticket.

Many of these aspects have already been accepted by a certain number of world airlines in the framework of the agreement among IATA carriers on the liability towards passengers approved in Kuala Lumpur on October 31st 1995. In order to avoid fragmentation of the ratifications the Community is introducing a regulation for the member States<sup>22</sup>.

Space law ignores liability for damages to transported people or things, caused by space transportation activities. Some cases have been taken into consideration in the jurisprudence of the United States<sup>23</sup> but it cannot be stated that a private law regime has been established on the matter. When the cases of air transportation will be more frequent with the advent of the aerospace plane a discipline for this kind of liability will be foreseen in the transportation contracts according to the model of the Warsaw Convention, the amending protocols and the eventual community regulations. This will lead to a phenomenon already taking place for naval, sea and air transportation: the uniforming of transportation with the creation of a common discipline.

The damage due to faults in the product, which could cause a liability of the maker and of his subcontractors, may also be verified. Nowadays the scheme for the contractual waiver is commonly placed in the launch contracts stipulated by the United States, in those stipulated by Arianespace and by the Chinese launching industry. The Commercial Space Launch Act, adopted by the United States Congress in 1984 and modified in 1986, states that the essential requirement to establish a regime of mutual waiver of the appeals consists in the fact that each company having obtained the concession for the launching, its clients, the Government and the relevant contractors and sub-contractors must accept to undertake the risk of each loss, material or physical damage or death consequent to the realisation of a space programme<sup>24</sup>. Because the market for launching activities and space transportation is opening to private parties, of whose activities the States are responsible (according to the Outer Space Treaty of 1967), it has become

compulsory for the companies operating in commercial launches to stipulate insurance coverage for liability towards third parties. In the United States the subject requesting the governmental licence must prove the necessary provisions for a mechanism of insurance protection for liability towards third parties<sup>25</sup> have been taken. It can therefore be remarked that, with the advent of commercialisation by private parties of the activities of launching and space transportation, the regulation of the phenomenon of liability for damages will be more and more included in the national or international contracts or in the internal legislation of the States.

### Conclusions

Some final considerations must be made in order to answer the initial question if, in view of the realisation of the aerospace plane, any changes should be made to the Treaty on Outer Space and to the subsequent UN. Conventions. Despite accepting the functional theory according to which it will be the function of the aircraft and the place where it will mainly be operating that will determine the applicable legal regime, we have seen that some measures are necessary in order to solve the conflicting situations in which the aerospace plane could find itself. However, it does not seem possible to suggest for this reason neither the revision of the present conventions of space law, nor the stipulation of an *ad hoc* multi-lateral agreement for the aerospace plane<sup>26</sup>. The amount of time necessary for the stipulation and incorporation of the changes or of the new legal instruments would be excessive.

While at the beginning of the space activities the States were more inclined to entrust the regulation of the matter to international law, this attitude has deeply changed in time. The UN. are unable to lead to the stipulation of agreements; at the most, some principles of resolutions have been produced by the General Assembly. The States do not wish to give up their exclusive competence on the subject and in order not to slow down the space activities further they prefer to regulate the situations with specific agreements between the parties, as for the International Space Station.

It is foreseeable that the over-flight and the landing of the aerospace planes in zones with a different sovereignty from the launching State will be the object of special agreements between the involved States. An example of an agreement of this kind may be the Agreement of Space Co-operation, signed on July 11th 1991, between the United States and Spain where it is established that in case of need the American Space Shuttle may fly over the Spanish air space and land in a Spanish base. In the agreement the authorised Spanish bases are specified, as are the procedures in the event of an emergency in another location of the Spanish territory, and the observance of the NOTAM and of the Spanish aeronautic services is required. The liability of the United States for damage caused on Spanish territory is also determined<sup>27</sup>.

Other national legislations, among which the German, extend the application of the rules established for aircraft also to space objects<sup>28</sup>.

In a regional framework such as the European one it could be considered to entrust the European Organisation for the Safety of Air Navigation (EUROCONTROL) with the duty to promote co-operation, for air safety, among the European countries interested in the carrying out of the mission of an aerospace plane. Recently, in the final act, dated June 27th 1997, of the Conference for the revision of the Convention on EUROCONTROL, it was stressed that the policy of the Organisation includes, among its aims, "... those of standardisation, planning, performance and safety regulations; the technical and financial selection of major framework programmes for co-operation; external relations with States and organisations and applications for accession to this Convention". Furthermore, among the duties of the Council, there is the duty to "determine the rules and procedures applicable to standards, specifications and practices for air traffic management systems and services"<sup>29</sup>.

Finally, as previously stressed, with the advent of private operators even in the field of space transportation, there is the prospect of a privatistico kind of regulation which will be included in the transportation contracts and in the insurance contracts in order to cover the different cases of liability for damage, without

neglecting the observance of internal dispositions issued *ad hoc* by the States responsible for the activities of private parties in space.

## NOTES

<sup>1</sup> Doc. ESA/IRC (96) 15.P.J. Annexes. Document de Travail. Paris, 24 April 1996. Only ten answers came from the member States among which only two from ESA countries (Italy and Germany)

<sup>2</sup>GOROVE, Toward a clarification on the term "space object", an International legal policy alternative, in *Journal of space law* 1993, p.11

<sup>3</sup>ZANGHI, Aerospace Object, in *Outlook on Space Law over the next 30 Years*, ESA, The Hague, London, Boston 1997, p. 116

<sup>4</sup>For a description of the different projects of aerospace planes see "Actes du Colloque: L'avion Spatial et le droit", in *Revue Française de Droit Aérien et Spatial*, 1991; CHRISTOL, The Aerospace Plane: its legal and political future, in *Space Policy*, 1993, vol. 9, n. 1, p. 35; HASHIMOTO, The Space Plane and International Space Law, in *Proc. of the 35th Colloquium on the Law of Outer Space*, Washington, 1992, p. 378; Doc. ESA/IRC (96) 15., see note 1

<sup>5</sup> CHRISTOL's allocative theory is slightly different, The Aerospace Plane, see note 4, states: "...that hybrid vehicles are to be examined on the basis of their purpose as construed in the light of the accompanying element of intent ... for the application in specific situations of either air law or space law."

<sup>6</sup>KAYSER, Aux confins de l'air et de l'espace d'accursius à l'avion spatial, in *Annals of Air and Space Law*, 1994, vol. XIX, p. 479

<sup>7</sup> For the problem of the boundaries see CATALANO SGROSSO, La responsabilità degli Stati per le attività svolte nello spazio extra-atmosferico, Padova, 1990, p. 23

<sup>8</sup>VERESHCHETIN, "Utilisation de l'avion spatial et droit de l'espace", in *Actes du Colloque "L'avion spatial et le droit"*, see note 4, p. 515 and p. 524

<sup>9</sup>See the German answer to question 3 of the UNCOPUOS questionnaire

<sup>10</sup> For the text of the above mentioned Conventions see BALLARINO BUSTI, *Diritto aeronautico e spaziale*, Milano 1988, pp. 769, 608, 833, 314

<sup>11</sup>ZANGHI, Aerospace object, see note 3, p. 122, asserts that in the meantime the 1972

Convention should be applied

<sup>12</sup>HASHIMOTO, The Space Plane and International Space Law, note 3, p. 379

<sup>13</sup>KRAMER, Registration of Space Objects, in *Outer Space Law*, edited by CATALANO SGROSSO, , New Developments and Prospects, Padova 1994, p. 237

<sup>14</sup>Both the Italian and the German answers to question 9 of the UNCOPUOS questionnaire seem to be oriented towards the registration of aerospace planes in accordance with the 1975 Convention

<sup>15</sup>MOTLIVAULT, Immatricolation et certification, in *Actes du Colloque*, see note 4, p. 495

<sup>16</sup>KAYSER, Au confins de l'air et de l'espace, see note 6, p. 475

<sup>17</sup>A project for the definition of a statute of the astronaut has been deposited with the United Nations Space Committee but it has yet to be discussed; in doctrine see LAFERRANDERIE, Pour une charte de l'astronaute, in *An. Air and Space Law* 1987, p.263, PEYREFITTE, *Droit de l'espace*, Paris 1993, p. 185

<sup>18</sup>VENET, Statut juridique et responsabilité du commandant de bord, in *Rev. Franç. droit aé. et spat.* 1990, p. 169

<sup>19</sup>Space Transportation System, 44 Fed. Reg. 131 (July 6, 1979) and Fed. Reg. 57 (March 7, 1980)

<sup>20</sup>Art. 11.1, Intergovernmental System, Washington, 29 Sep. 1988 and art. 11.5 MOU, see CATALANO SGROSSO, La responsabilità ... see note 7, pp. 110-116 to p.163

<sup>21</sup>COM (95) 0724-C4-0209/96, 95/0359 (SYN) in G.U.C.E. n. C 320/30 28 Oct. 1996

<sup>22</sup>See the motivation of the Parliament in the Recommendation for the second reading: DOC/IT/RR\327297 of May 21 1997

<sup>23</sup>KAYSER, Aux confins de l'air et de l'espace, see note 6, p. 478, note 35

<sup>24</sup>STRAUBEL, The Commercial Space Act; the Regulation of Private Space Transportation, in *J. of Air Law and Commerce*, 1987, p. 322; MILLER, Licencing and Regulating US Commercial Space Launches, in *J. of Law and Technology*, 1988, p. 45

<sup>25</sup>CATALANO SGROSSO, Insurance Implications about Commercial and Industrial Activities in Outer Space, in *proc. of the 36th Coll. on the Law of Outer Space*, Graz 1993, p. 187

<sup>26</sup>In this sense the German answer to the UNCOPUOS Questionnaire (question 3) is for the moment against the creation of a special regime for air transportation systems

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<sup>27</sup>BOE n. 124, p. 16104, May 25th 1994, modified in BOE n. 269. p. 34672, November 10th 1994 (R. 1994/3138); see report FARAMINAN, *Analisi giuridica del concetto di oggetto spaziale*, presented at the International Congress "The Legal Regulation of aero-space Transportation Vehicles", Rome, Feb. 28th - March 1st 1997

<sup>28</sup> Germany replied to question number 8 ("Are there any national and/or international legal norms with respect to the passage of space objects after re-entry into the Earth atmosphere?) stating: "...According to German Law, the Federal German Aviation Code is not only applicable to aircraft but also for other objects such as, for example, space craft and rockets..."

<sup>29</sup>Art. 1.2, III, IV, V and art. 7.2, m of the Final Act of the Diplomatic Conference on the Protocol consolidating the Eurocontrol International Convention relating to co-operating for the Safety of Air Navigation of December 13th 1960, as variously amended, Brussels June 27th 1997, amended version CNS/56