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LEGAL ASPECTS OF LAUNCHING SPACE OBJECTS FROM NON-TERRESTRIAL SITES

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Abstract

In the field of space activities, the launch is certainly the most important and delicate phase not only from a technical point of view but, first of all, from a juridical one so that it makes necessary an examine of typologies of space object launch, different from the terrestrial ones.

Nowadays a space object can be launched no more uniquely from the traditional launch sites located in some recognised areas of the earth and so it creates some different juridical situations.

The use of platforms placed in the sea can realise various situations of launch and related problems: the launch from fixed or mobile platforms placed in the Economic Exclusive Zone creates some clashing interests among the States' jurisdictions; the launch from fixed or mobile platforms placed in international sea needs some rules to individuate the national jurisdiction that must be applicable.

The formulation of possible proposals makes necessary a compared analysis among the Montego Bay Convention, Space Law Conventions and the bilateral Agreements that are already in force.

Many problems arise for the individuation of the launching State and the related liability in the case of launch of space object from aeroplanes situated in the air space or even in the outer space.

The aerospace plane represents, with all its variants, the next testing bench.

Also the International Space Station and its developments produce many problems of jurisdiction and liability both for the launch carried out from there towards the outer space for research and for the launch towards the earth for the return of astronauts.

The methodology applicable at this kind of juridical problems is the individuation of critical points to make a comparison among the different regimes for the identification of possible solutions.

Introduction

In the last years the launches of space objects were conducted exclusively by launching sites located on the surface of the earth therefore belonging to a State's jurisdiction. The increase in the launching of space objects, and first of all in launching the satellites of communications, the remote sensing and transmission determined more and more the need to reduce to a minimum the costs linked to the launching phase.

The evolution in the field of technology permitted, therefore, the States and the organisations that

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operate in the space activities to conduct, sometimes, the launch of space objects from bases located in sea on the equatorial line so to maximise the saving of fuel.

The possible evolutions of the aerospace plane can, in short time, conduct to realise launches from aircraft in flight with the related problems due to the need in individuating the States or the subject obliged to the registration.

The setting up of the International Space Station and the related research activity will need some missions that will take place outside the Space Station that could be conducted through the launch of space probes or shuttle directly from the Space.

It is clear that the juridical cases that arise from the evolution of space practices need a clear regulation realised, if it is not possible by some convention, at least, through some agreements between some States Parties.

The greatest problems that emerge for the launches from sites not earthlings are connected to the individuation of the subjects that must undergo registration and in case there are damages can be called to answer as responsible.

Territory, State of launch and Responsibility

The evolution of the practices and the methods of launching space objects inevitably entails that the terms such as "Launching State" assume, in the next years, an even more less univocal meaning.

The term of "Launching State" has also, for a long time, animated the discussions of jurists in space law because of the equivocality of the definition we can find in the *corpus iuris spatialis*[1].

Only the analysis of the art.1 of the Liability Convention of 1972 and the art.1 of Registration Convention of 1975[2] give a definition of the term of Launching State and it individuates the three subjects that can be considered liable: the State which launches or procures the launching of space object and the State from whose territory or facility a space object is launched.

The individualisation of the launching State is an hinge in the field of international liability and has a great importance since according to l'art.2.1[3] because when a space object is launched it is really the launching State, that must register it in a special registry.

For example the art. 8 of the OST[4] states that the only duty for the State, which owns the territory used for the launches, is to register and exert its jurisdiction on the space objects.

The importance, therefore, in establishing who the launching State is, resides in the strong correlation between the regime of the registration and liability[5].

In relation to the launching State there is an explicit reference to the place and it is, therefore, clear that the physical-geographical position assumes a remarkable importance.

The territory in fact is one of the criterions for the determination of the launching State because it has allowed us, till now, to establish with certainty the territory from which the launch took place and, therefore, the launching State or, at least, one of launching States.

There is no obligation for the State that promotes space activity to launch from its own territory. The same art.2.2 of the Registration Convention of 1975[6] foresees that if there is two or

more launching States these can establish to whom the registration of the space object is due to.

It's more and more frequent in the routine that the States loan their own installations to other States for the launches and, therefore, the aforesaid rules have found a wide application.

However, the territory of launch today seems not to be a sufficient criterion since, in the case of the new practices of launch, we can face the possibility of launches that take place from bases set in international waters, from the air space as well as from the outer space or from celestial bodies.

It is necessary, therefore, to be able to face such cases of launch with safety in order to check in an effective and juridical approach the operations of launch. It could be necessary to force States to proceed to specific fulfilment in a preventive way with the purpose to avoid the rising of possible exceptions –for example the declaration of assumption of responsibility for the possible damages that can be verified on the territory of another State caused by the launch of an object of the space launch -.

States may not recognise their own responsibility for the launch promoted but carried out from places located not in the territory subject to their own sovereignty.

States may invoke the absolute exclusion of responsibility for the launch carried out by their own territory but promoted from other States or non-governmental entities

It is necessary, besides, to also succeed in foreseeing a guardianship for States third to coverage of the possible damages that these could suffer directly, on the proper territory or indirectly, like damages caused to the Common Heritage of humanity – go to international sea or outer space[7]-.

The continuous evolution of space activities and their more and more frequent commercialisation will, then, involve a progressive growth of activity in a private way especially in the sector of the exploitation of outer space for the telecommunication activities (in some cases, this tendency brings the States to delegate specialised Organisations in the realisation of space activities).

This is an another problem in relation to the individualisation of responsibility.

The *Corpus Iuris Spatialis* considers as the promoting subjects of space activity not only the States but also governmental and non-governmental entities but also for them the State of affiliation has to be considered liable for damages (art.6 OST)[8].

In the perspective of the growth of the launching sector as a commercial activity it is necessary to think about the possible solutions that allow States not to be liable for the possible and frequent damages caused by private agencies.

For the regime of responsibility in Space law the States are the sole subjects actors but we think an adjustment of such regime is necessary to make it more flexible to the demands of the space sector. It would be necessary to individualise tools - agreements inter-partes, insurance policies - in order to make the iter of reimbursement of the damage a little bit more slender.

Launch from located sites in sea

In the case of launching from the sea we can have three typologies:

- ✓ Launching from platforms located in the territorial sea;

- ✓ Launching from platforms located in Economic Exclusive Zone (EEZ) and Continental Platform
- ✓ Launching from platforms located in international sea

The territorial sea is not certainly one of the most desired places for launching.

The launches carried out by platforms located in the territorial sea involve some problems linked to the security of the population, of the natural environment as well as the navigation.

From a substantial point of view – routes security and environmental protection- there is not a clear difference between a launching from the territorial sea and a dry land one, on the contrary it is certainly less expensive to manage a launching site on dry land rather than off the coasts.

From a juridical point of view when a launch is carried out by platforms located in the territorial sea there are no differences as to the dry land because the territorial sea has to be considered under the sovereignty of coastal State as well as the dry land[9].

For the launches carried out by platform located in the terrestrial sea therefore the coastal States have the jurisdiction on so they are liable according to the definition of "launching State" of art. 1 of Liability Convention of 1972 and art. 1 of Registration Convention of 1975.

For the launches carried out by platforms located in EEZ or Continental Platform, the Montego Bay Convention[10] does not forbid to launch space objects from these waters because the juridical regime in force defends the exclusive right of a single State to the exploitation of resources.

There is not a clear definition of what we have to consider as resources and we are inclined, through an extensive interpretation of the term, to consider as a resource for the scientific and economic development of the States also the possibility of launching space objects from their EEZ or Continental Platform[11].

Art. 56.1.b of Montego Bay Convention of 1982[12] indeed acknowledges the jurisdiction of the coastal States in order to install or utilise artificial isles, structures and systems.

Art.60 of Montego Bay Convention[13] recognises the exclusive right of coastal State to realise and authorise the realisation of these structures in the EEZ, therefore the Coastal State has on these structures a full right in possessing and controlling. If it has authorised some one else to build an installation it maintains, at the same time, a full and exclusive right of control on it.

The art. 60, then makes provision for the possibility of the coastal State to have around the installation some security zones to defend them and the navigation.

The only limit to the construction of installations derives from the art. 60.7 because it sanctions the respect of the corridors recognised for the international navigation.

It is clear that if a launch is promoted by the Coastal State and it is carried out by its installations located in its own EEZ it is responsible for the eventual damages that emerge.

Damages of different nature can occur: there may be damages to the EEZ and its resources or to the interests of third State and in both case the coastal State has to be considered responsible.

In case a coastal State authorises another State to realise an installation for the launching of space objects we

have to consider the States jointly liable.

In fact in the case in which there are damages connected to the launching phase it has to be considered liable both the State that realised the installation, as owner, and the coastal State that has exclusive jurisdiction on these installations with regard to the law and regulations in the field of security, health, immigration and customs according to the art. 60.2[14] of Montego Bay Convention.

This depends on the fact that the definition of "launching State" of art. 1 of Liability Convention of 1972 and art. 1 of Registration Convention of 1975 does not allow to distinguish between the State that programs the launch and the State on whose territory or facility a space object is launched.

A particular example of co-operation in launching activities is the agreement between Italy and Kenya about the installation San Marco in Malindi.

When the installation was built in 1964, at 6 miles off the coast, it was in international sea because the limit of territorial sea of Kenya was 3 miles off the coasts.

In 1982 the Montego Bay Convention establish the limit of territorial sea at 12 miles and besides the Kenya claimed the area as historical bay so that Italy and Kenya had to negotiate again the agreement.

There were then two agreements, one on 1.4.1987 and the other one on 14.3.95.

With these agreements the co-operation between the States growth in the direction to realise projects linked also to the development of Kenya and in particular in the field of remote sensing on resources and climate.

The installation could be considered as a military bases[15] or as a part of territory rented but we think it is better to consider the installation as a location of material property.

It is interesting to observe that according to these new agreements Kenya has to authorise the operation carried out by Italy and Italy has to inform the Kenya about all the activities of the installation[16].

When the activities are carried out by "non governmental" entities the national States are liable for the damages that emerge from these kind of activities.

As regard to the launches carried out by platforms located in the international sea, the Montego Bay Convention does not expressly refer to the possibility of launching space objects from international waters, but the list of freedom that are in force in the international sea is not exhaustive and therefore the possibility to carry out space launches could also be included inter alia.

According to art. 87 of Montego Bay Convention[17], which defines the States' freedom in building artificial isles or other installations authorised by international law, the positioning of platforms for launching space objects from international waters is possible, with the only limit of art. 88 of Montego Bay Convention[18] that imposes the use of International Sea only for peaceful purpose.

In the case of the use of international waters for the launch of space object we consider an enlargement of power of International Authority for Sea Bed desiderable, with the aim to defend the environment, to protect the interest of single States in the equal use of international sea and the prevention of dangers emerging from these activities.

In analogy to what we have just said, in the international sea we will

have to consider a jointly responsibility when in a single space activity there are two different subjects, one that promotes and the other one that executes the launch.

The launching of space objects from mobile platforms towed by support ships needs another kind of consideration.

In these cases the installation has to be considered in every respect as a ship so we have to apply the jurisdiction of State of Flag.

Wherever the launching site is, EEZ, Continental Platform and International Sea, it represents a part of the territory of a State of Flag so that it is liable for the eventual damages.

When the subjects involved in an operation are different there is a subject that promotes – the State of Flag- and a subject that executes; Both States have to be considered liable jointly for the damages emerging to the third States from the carried out activities.

If the coastal State authorises these activities it can be called to answer jointly for the damages caused by mobile platforms in the EEZ and Continental Platform that is under its jurisdiction.

Even if located in the international sea the platforms from where the launches are carried out, remain under the jurisdiction of national States that are to be considered launching states as liable in the case of damages because of their co-operation in the launching through the installations[19].

Launches carried out from aircraft in flight

With the advent of the Aerospace plane and particularly with the typologies dual stages - Hotol TSTO, Buran - we could have the necessity to control the launch from aircraft in flight[20].

In the case in which the launch takes place from the outer Space through a space object, it is clear that juridical problems do not arise because we can apply the principle of freedom in use and exploitation so that we could have to front the only problems related to safety in the execution of the launch[21].

In the case of damages caused in the phase of launch to other present space objects in the outer space the launching State or launching States will be liable if whoever promotes and who executes the launch are two different subjects.

A problem could arise in the case in which the launch carried out from an aircraft from the air Space.

If the air space, from which the launch takes places, is under the control and the jurisdiction of the State that carries out the launch we will not have any problems, because the only responsible can be considered the launching State.

In the case in which, for reasons of opportunity - saving of fuel, more convenient and sure routes - the launch is carried out from the air space of another State, it must foresee some rules that protect the rights of the third State.

It is clear that, in this case, a preventive authorisation and the possible exclusion of responsibility could be necessary for the State that does not participate in the launch but from whose air space the launch takes place - for example think of the equatorial States whose air space is one of the more desired ones for their favourable advantage in positioning the satellites in orbit

If we would apply the norms of the Liability Convention of the 1972 to

these new techniques of launches the matter would be controversial because, we can not speak so much of launching State of launch but at least, of launching mean and of the air space in which the operation has unwound.

From this it is evident that the definition of "launching State" given by art.1 of the Liability Convention of 1972 and the Registration Convention of 1975 is no longer exhaustive to control such juridical cases.

However the responsible State will be certainly individualised in the State of belongings of the vehicle from which the launch of the space object will take place.

In the hypotheses that the object launched and the mean of launch do not belong to the same subject, we will have a jointly responsibility.

According to art.1 of the Liability Convention the State from whose territory, in this case the air space, a space object is launched could be considered the launching State. In cases more and more frequent launches will be carried out by air spaces of States third, it will be necessary to have inter-partes agreements in order to protect the safety of the places and populations and the possible exclusion of responsibility for the third States.

We think that the State that allows the launch of a space object from the own air space but does not participate directly in the program of launch is not to be considered launching State. It could be considered as a third State and it has the right to get the reimbursement for the possible damages. In this case the responsibility burdens exclusively on the subjects that participates in the program. Such approach would allow, besides, the protection of the rights of poor equatorial States.

With the commercialisation[22] of space activities we could also face the possibility to rent the launching means from specialised corporate agencies. It is clear that who rents must assume the responsibility jointly with the chartered agencies for the possible damages to States third, connected to the launching phase[23]

Launches from installations located in the space

With the setting up of the International Space Station we could face the possibility to realise some launches directly from the Space Station and from installations located on celestial bodies.

In the first case it is clear that, previous to the due precautions connected to the safety matters there are no particular problems in relation to the territory from which the space object is launched.

In such cases we do not have a territory like the definition of launching State intends, but a launching mean which belongs to different States.

The different operations will revert in the planning of the activities of the Space Station already object of particular agreements. The States promoters of the action will be individualised previously and for this they will be considered responsible for the activities carried out.

From the juridical point of view, the most problematic case could be the launches from installations located on celestial bodies. As in the case of international sea also the celestial bodies are Common Heritage of the humanity and they have to be preserved from the unconditional exploitation of the States.

Considering the positive impact of discoveries done through the

researches realised thanks to operations started in the outer space and for the outer space it would not be possible to deny the use of the celestial bodies to launch soundings and others.

As we have just said for the installations located in the International Sea, in the case of launches from platforms located on celestial bodies the State owner of the installation can be considered responsible because it has the jurisdiction as well as the State that promotes the operation if they are different. The territory not being owned by any State can not be assumed as criterion for the individualisation of the launching State according to the art.1 of the Liability Convention of 1972 establishes[24].

Because of the riskiness and the complexity in the management of a launch from celestial sites, all the operations should be guaranteed through a specific form of insurance against the possible damages caused to the Common Heritage of the humanity, and therefore to third States and, in a most distant future, to installations and objects already present in the outer space.

It is clear that in limiting the negative impact on the resources present in the outer space that could derive from speculative activities, it is necessary to control the use of launching bases on the celestial bodies.

In this case it could also be important the attribution to structures as the United Nation Commission for Peaceful Use of Outer Space (UNCOPUOS) of great powers of verification, control and of veto on the activities of launches from celestial sites proposed by single States or private corporate bodies.

Conclusions

Until today the *Corpus Iuris Spatialis* seems not to be appropriate to provide the necessities of regulation of the new juridical cases arising from the development of technology and operational formality.

Considered that the launch is not necessarily carried out by the territory of a State but it can be carried out by an object in motion in an air space or from bases located in international areas, it is necessary to foresee special rules so to control specific responsibility for the damages connected to the phase of launch.

To this purpose it would be necessary to oblige the launching States or the agencies which use the installation and the launching means to declare the share to the mission and the respective quotas so that, in case of damages, we are able to determine responsibilities. Every mission, therefore, could be equipped by a detailed document from which the paternity of the launch results clearly.

Then we should develop some specific regulations in the field of responsibility and the consequent insurance forms of the more and more probable developments of the practices in the rental of new launching systems.

It could be necessary to foresee a form of responsibility of use for the charters or managers and a form of responsibility of control for the State on which a duty of supervision should burden on the activities of launch developed by national enterprises.

Even if destined to lose the position of predominance practised today because of the increasing private reality in future aerospace activity, the State should maintain an important role in the phase of control, with the purpose avoiding that the search of profit and the speculation of private subjects can cause prejudice to

international safety and the guardianship of the environment.

It is necessary to work in avoiding that situations like the incident of Challenger and Titanic can threaten the life of populations.

Certainly the fittest tool to furnish a suitable regulation of the aerospace sector results to be the formation of inter-partes agreements and, because it appears the most elastic and, therefore, the fittest to follow the physiological changes related to the continuous technological evolution of space activities.

At the present the International Community does not seem very receptive to the appeal to discuss about new international agreement for this new field of industrial development of but this practical necessity can not be ignored.

It will result, perhaps, more simple to start some procedures of regulation functional to different activities in fieri so to undertake possible processes of co-ordination between these, or to promote the process of regulation through the declarations of principles, as it has already happened in the field of space law, that, even if it is not binding, it could be used as guidelines.

We think that a sector that must know a good development is the insurance one in relation to the growth of the private sector. In case of damages to a third party today the private societies that operate in the aerospace sector have limited ability of exposure in relation to the insurance guarantee and therefore the State is forced then to intervene to cover the surplus damages.

The Commercial Space Launch Act is an existing example of concrete attention to the spatial industry that operate in the USA in the field of launching of space object carried out by non-governmental entities.

The Launch Act of 1984 foresaw an unlimited responsibility of non-governmental entities for the damages to the State third but in the 1988 an amendment changes the situation because established the State's support for the reimbursement of damages[25].

We would be able, therefore, to fill in the evident gaps only through the wish of the States to delegate the special international entity, as UNCOPUOS, not only in promoting conventions and agreements but also to intervene, as guarantor, to guardianship of the collective and individual interest as to prevent the undiscriminated exploitation of the Common Heritage of the humanity.

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[1] CHRISTOL, *"The "Launching State" in International Space Law"* in Proc.of the 37th Colloquium on the Law of Outer Space, Jerusalem 1994 WIRIN *"Practical Implication of Launching State – Appropriate State Definition"*, in Proc. of the 37th Colloquium on the Law of Outer Space, Jerusalem 1994, p.109

[2] See Art.1.c." *The term "launching State" means:*

(i)A State which launches or procures the launching of a space object;

(ii)A State from whose territory or facility a space object is launched;

[3] See art. 2.1 "*When a space object is launched into earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain...*"

[4] See Art.8 "*A State Party on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object...*"

[5] VON DER DUNK, "*The illogical link: Launching, Liability and Leasing,* in Proc.of the 36th Colloquium on the Law of Outer Space, Graz 1993, p.36 – KRAMER, "*Registration of Space object*" in Catalano Sgrosso " Diritto dello Spazio. Recenti sviluppi e prospettive", Padova 1994

[6] See Art.2.2 "*Where 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 in accordance with paragraph 1 of this article...*"

[7]CATALANO SGROSSO, "*La responsabilità degli Stati per le attività svolte nello spazio extra-atmosferico*", Padova, 1990, p.45

[8] See Art.6 "*State Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on 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, The activities of non- governmental entities in outer space,...,shall require authorisation and continuing supervision by the appropriate State Party to the Treaty...*"

[9]CONFORTI, "*Diritto Internazionale*", Napoli 1997, p.254

[10] United Nation Convention of the Law of The Sea 12.10.1982 see CASTANEDA "*La conference des Nation Unies sur le droit de la Mer et l'avenir de la Diplomatie Multilateral" in* Le Droit International a l'heure de sa Codification, Etudes en Honneur de Roberto Ago, Milano 1977

[11] SPADA, "*Isole artificiali ed installazioni in mare per il lancio di veicoli spaziali*" in Prospettive del Diritto del mare all'alba del XXI secolo, Convegno Internazionale 12/13 Novembre 1998, Roma 1999, p.213

[12] See Art.56.1.b *"Jurisdiction, conformément aux dispositions pertinentes de la Convention, en ce qui concerne:*

(i) la mise in place et l'utilisation d'île artificielles. D'installations et d'ouvrages....."

[13] See Art.60.1.b " *Dans la zone économique exclusive, l'Etat côtier a le droit axclusif de procéder à la construction et d'authoriser et réglement la construction, ...*

b) d'installations et d'ouvrages effectés aux fins prévues à l'article 56 o à d'autre fins économiques;

c) d'installations et d'ouvrages pouvant entraver l'exercise des droits l'Etat côtier dans la zone... »

[14] See Art.60.2 " *L'Etat côtier a Jurisdiction exclusive sur ces île artificielles, installations et ouvrages, y compris en matière de lois et règlements douaniers, fiscaux, sanitaires, de sécurité et d'immigration*

[15] MARCHISIO *"Le basi militari nel diritto internazionale"* MILANO 1994

[16] FERRAIOLO "*San Marco-Malindi. La base italiana in Kenya"* in Rivista di Diritto internazionale, Giuffrè 1995, p.907

[17] See Art. 87.d " *Le haute Mer est ouverte a tous les Etats, qu'ils soient côtiers ou sans littoral. La liberté de la haute mer s'exerce dans les conditions prévues par les dipsositions de la Convention et les autre règles du droit international. Elle comporte notamment pour les Etats, qu'ils soient côtiers ou sans littoral :...*

d) la liberté de construire des île artificielles et autre installations autorisées par le droit international, sous réserve de la partie VI »

[18] See Art 88 *"La haute mer est affectée des fins pacifiques"*

[19]STARACE,"*La protezione dell'ambiente marino nella Convenzione delle Nazioni Unite sul diritto del mare*" in Diritto internazionale e protezione dell'ambiente marino, Giuffrè, 1983

[20] Revue Française De Droit Aérien Et Spatial, Vol 180, N.4 Oct- Dec.1991., Pedone Paris

[21] STOCKFISH "*Space transportation and the need for a new international legal ad institutional regime*" Annal of Air and Space Law, 1992 Vol XVII-II, p.323

[22] CHENG, "*The commercial development of Space: the need for new treaties, in Journal of space law*, vol.19, n.1 1991; VON DER DUNK, "*Commercial Space activities: an inventory of liability-an inventory of problems*" in in Proc.of the 37th Colloquium on the Law of Outer Space, Jerusalem 1994, p.161

[23] CATALANO SGROSSO, "*Must the special typology of aerospace planes lead to the supplementation of the rules of the OST?*", in Proc.of the 40th Colloquium on the Law of Outer Space, Turin 1997, p.402 NESGOS, "*Commercial space transportation: a new industry emerges*" in Annal of Air and Space Law 1991, Mc Gill, ed. Lavoiser, Vol 16

[24] KERREST "*Launching Spacecraft from the Sea and the Outer Space Treaty:The Sea Launch Project*"In Annal of Air and Space Law, Vol XXIII, 1998, p.16

[25] SPADA, "*Isole artificiali...*" *see note 11*