

Launching Spacecraft from the Sea and the Outer Space Treaty: The Sea Launch Project.

Armel Kerrest

Professor of International Law
Faculty of Law, University of Western Brittany.
Centre de Droit et d'Économie de la Mer (CEDEM)
IISL ECSL

Abstract :

During 1998 we may witness an important innovation in the field of launching spacecraft: the Sea Launch Project. Directed by Boeing, this new technique will challenge the existing parameters of the law of the sea and space law. It furthers the trend towards private activities in space. This evolution may be increased by the fact that the launch is scheduled to be take place from the High Sea, i.e. outside the territorial jurisdiction of any state. Until now, launching spacecraft was either a State activity or State controlled activity. On the whole the launch installations were State owned or in any case closely State controlled.

Two main questions are to be highlighted. The first is the definition of "launching state" and such State's potential liability for a launch from the high sea. The second is the question of control by the "appropriate state" of spacecraft launched from the sea.

In the case of the Sea Launch project, the US Commercial Launch Act will be applicable in accordance with the US-Ukraine agreement on commercial launches. The legal status of the operation is obviously more complicated but will be governed on a similar basis to those rules applicable to land launches. In a more prospective way it is possible to notice a trend to deregulation in Spacecraft launching activities if a space port is

located in the High Sea.

When defining the launching state, the Outer Space Treaty, confirmed by the Liability convention, gives a very special status to the State whose territory is used for launching spacecraft. Every other criteria, such as "State that launches", "States that procures the launch", or the nationality of installations being used, may easily be chosen by a private Company.

The possible threat is a move to a situation similar to that experienced under the law of the sea regime where an international consortium wishes to avoid the control of capable states and, in doing so, benefit economically. As such, the rationale for existing space law will be hindered, jeopardising the liability of a real and fully responsible launching state, and thus the control of the state of registration which, in accordance with the registration convention, must be one of the launching states.

Introduction

There are some technical innovations which open the way to major juridical changes. The Sea Launch project seems to be one such instance. It is a private commercial programme which intends to launch satellites into orbit from a semi-submersible launch platform positioned on the Equator.

The three stage rocket is composed of the well known Soviet, now Ukrainian, two stage Zenit Rocket, and the Russian Bock DM Upper third stage. Both are very reliable and successful pieces of technology. The Zenit rocket is one of the most automated launch

Email: Armel.Kerrest@univ-brest.fr

Copyright © 1997 by Armel Kerrest.
Published by the American Institute of Aeronautics and Astronautics, Inc. With permission. Released to AIAA to publish in all forms.

vehicles. It has an important capacity in that it has the ability to send into orbit a payload similar to Ariane 5, the very new European launcher.

A self propelled former North Sea oil drilling platform being modified in Stavanger shipyard will serve as a launch pad. It has an empty displacement of 31000 tons. An Assembly and Command Ship is being built at the Kvaerner Govan shipyard in Glasgow Scotland which will displace more than 30000 tons, and provide accommodation for a crew of up to 250. It will be used both to transport the rockets and satellites from the home port to the launch site, to assemble the three stages of the rocket and to serve as the mission control and communication centre.

The home port is located in Long Beach, California. The platform and the Assembly and Command ship will be docked there during the inter-launch period. The home port will also shelter the administrative and commercial services.

Launch operations are to be conducted in a very rationally organised way. The platform is to be positioned at the Equator in the Pacific Ocean about 1000 miles south of Hawaii. The rocket and payload are assembled within and transported to the launch site by the Assembly and Command Ship (ACS). An automated transporter and erector equipment is used to erect the launcher on the launch pad. The rocket is automatically fuelled and made ready for launch. During the launch phase, everything is conducted from the ACS located a few miles away. After the launch, or the launches in the case of multiple launch, the platform and the ACS sail back to the home port. As we can see these procedures seem to be fully integrated and much more economical than the huge launch pad used today.

The Programme aims to take advantage of two main advantages: launching from the Equator by the mobile platform, and the use of the former Soviet Union's space industry whose rockets are reliable and value for money.

The Sea Launch Co is a limited duration company incorporated in the Cayman Islands which is a British Crown colony. It is owned by several international companies including Boeing Commercial Space Company (40%), a subsidiary of the Seattle-based Boeing Company, and Kvaerner a.s. of Oslo, Norway, an important company involved inter alia in shipbuilding and which will provide the platform and the ACS (20%). In addition RSC Energia of Moscow, Russia (25%), supplies the third stage and some parts of the first and second, and conducts the launch, and NPO Yuzhnoye of Ukraine (15%) supplies the Zenit rocket used as first and second stage (this rocket has the facility of being self erecting which is very useful here). Boeing leads the team, furnishes the home port, some parts of the launcher and payload accommodation, and commercialises the launches.

The Sea Launch project already has significant orders from the satellite manufacturing companies Hughes (10 launches with an option for more), and Space Systems/Loral of Palo Alto California (5 launches). The programme is already underway, the first launch being scheduled for the end of 1998.¹

This new programme poses some interesting juridical problems:

I The legality of launching from a territory outside any State's sovereignty.

A The freedom principle

As far as Space law is concerned,² the

¹ Information may be found on the Internet Web on the Sea Launch project specially on the sites of the companies member of the consortium.:

Boeing: (<http://www.boeing.com/sealaunch.html>)

Kvaerner: (<http://www.kvaerner/pr/pre-fnd.html>)

See also: Monte Enbysk: "*Boeing To Reach New Heights With Commercial Satellite Venture. Sea Launch's international partners will be the first to launch satellites from sea.* at:

<http://fivash.com/ceo/ceo.network/ceomain.htm>

² Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer

territory of the launching state is in fact one of the criteria determining the launching liable state, but even if the territory of launch is a major point specifically quoted in the liability convention article V (3), there is no obligation that states launch from their territories. There is also no such restriction in Outer Space Treaty (1967) (OST) article 1(2) which deals with the freedom of use of the outer space.

Issue concerning the freedom of the high sea is not so evident but may also be recognised as of relevance. The Montego Bay Convention states that "*Freedom of the high sea (...) comprises inter alia (...) a) freedom of navigation, and b) freedom of overflight*". As such it does not cover either the freedom to launch spacecraft or a freedom for aircraft to land or take off. However, as stated by the words "inter alia", the list is not exhaustive, and launching spacecraft is not directly prohibited.

B The use of the high sea for launch activities.

The main problem in this respect may arise from the need to install a platform, and to establish limitations on other uses of the high sea.

Article 87 of The Montego Bay convention includes within the freedom of the sea: the "*freedom to construct artificial islands and other installations permitted under international law.*"³ Even with the restriction in the last part of the sentence, this disposition seems clear on the question of the legality of installing a platform. The real question centres

Space, Including the Moon and Other Celestial Bodies, opened for signature January 27, 1967, 610 U.N.T.S. 205 18 UST. 2410 (1967) 6 ILM 386 (hereinafter referred to as OST).

Convention on International Liability for Damage Caused by Space Objects oct 9 1973 961 U.N.T.S. 2389 (hereinafter referred to as "Liability Convention")

³ United Nations Convention on the Law of the Sea open for signature on 10 December 1982 in Montego Bay Jamaica (hereinafter referred to as "Montego Bay Convention")

on whether any platform may be used for any purpose. At the time of the Third United Nations Conference for the Law of the Sea, the question of installing platforms in the high sea was not pertinent because of the creation of the Exclusive Economic Zone within which it was envisaged that such installations would be installed.

What is the meaning of the words: "installations permitted under international law" ? Do such installations have to be expressly permitted or just not prohibited ? Is not the installation of a large platform in the high sea a kind of occupation of such area with possible legal significance under the high sea regime? How is this installation connected with the legal status of the International sea bed (the Zone as qualified in part XI of the Montego Bay Convention) ?⁴ Would the rules set in force by Article 147 (1), (2) and (3) "Accommodation of activities in the Area and in the marine environment" be applicable ?⁵

Utilisation of the high sea in this way is unknown at present and, as such, some difficulties may arise if such potentially dangerous activities are to take place in the high sea. Projects involving the installation of non-environmentally friendly industries such as smelters or nuclear plants have already taken place.⁶

⁴ Montego Bay Convention: Article 137 (Legal status of the Area and its resources) and Article 139 (Responsibility to ensure compliance and liability for damage)

⁵ See: Armel Kerrest: "Les aspects juridiques du projet Sea Launch de lancement de satellites depuis la haute mer" revue Droit et défense n°97/1 Paris. And more generally: A. Kerrest "The Launch of Spacecraft from the Sea" in: "An Outlook on Outer Space Law in the Coming Thirty Years". Lafferranderie et Crowther edit. (Kluwer 1997).

⁶ Even if the launch of such a powerful rocket is always rather dangerous because of the quantity of energy involved, Sea Launch does not seem to be excessively harmful for the marine environment

However the main question should be the limitation on the freedom of navigation. The platform itself, but also more importantly the need to prohibit navigation in a very large area during the launching periods around the launch site impose a significant limitation on navigation. The zone to be used by Sea Launch is far way from the main maritime zones, but, nevertheless, this issue is not strictly dealt with by the Law of the Sea Convention which, within the high sea, deals only with platforms used for mineral resources exploitation and scientific research. The first must be authorised by the Sea Bed Authority, and the second may be established but cannot create a security zone of more than 500 meters. It seems rather difficult to recognise that a private commercial project should be able to limit freedom of navigation to a greater extent than those involved in scientific research, a well respected activity, are allowed to do.

II The consequences in space law of a High Sea launch.

A) Definition of the launching state.

One of the major difficulties regarding the Sea Launch project is in connection with the notion of "launching state" which, as every body knows, gives a prominent place to the launching activity for purposes of identifying liability and responsibility.

First of all, with regard to private launch activities, it is necessary to keep in mind that, in accordance with OST article VII and VI, activities carried out by private entities are deemed to be carried out by the liable state. This State is not only responsible, i.e. obliged to authorise and control any space activity conducted by a non governmental entity having its nationality, but also the "launching State" is, as such, directly liable for any damage cause by the space object as if it were launching it itself. The fact that the launching authority could be a private company is a new situation which has to be taken into consideration. The

existence of the Commercial Space Launch Act in the United States legal system is of course of great help. It should certainly not be possible in other countries where the domestic laws are either too general or non-existent.

Such a situation raises the question as to which state or states are the launching states in the case of a launch from the high sea by a private entity. Because of the consequences of liability in case of damage, this point is of major interest and concern. If we use the criteria of OST and Liability Convention, we have: "a) the State which launches". Here, no state launches but rather a private company. From the rule before mentioned, the nationality of the juridical person (in this situation the Sea Launch Co.) renders the state of such nationality the "Launching State". The issue whether the effective control of the company should be considered instead of the legal personality of the such company is unclear in international law.

The Sea Launch Co. being a registered company of limited duration under the law of Grand Cayman Island, a British Crown colony, the UK could be regarded as a launching state⁷. But if we look at the real management of this company, we can see that the project is being carried out by Boeing Commercial Space Co., a subsidiary of the US Boeing Company. Thus the United States should be also regarded as a launching state.

Issues relating to the other parties are not so clear.⁸ As far as RSC Energia is concerned,

⁷ The introduction of the British "Outer Space Act" in this Crown Colony is unclear. But it is a domestic question not modifying the situation in international law (the possible liability of the UK).

⁸ The discussion after the oral presentation of this paper showed that the notion of launching state is not clear especially as far as the amount of participation in the launching activity is concerned. Some lawyers having a wide conception including any participation and others thinking that the participation must be of some special importance in order to qualify the State as a "launching state".

it plays an important role in the Company, furnishes some main parts and is in charge of the technical direction of the launch. As such, Russia should also be considered as a launching state. In this situation both the US and Russia should be considered as launching states either as the "states that launch" or as "the states whose facilities are used".

The Ukrainian company NPO Yuzhnoye supplies the Zenit rocket. As to whether this is enough to consider the Ukraine as a state which launches, this remains a matter for discussion. As this Company takes only a 15% of the shares, the point is not certain. The same situation applies to the Norwegian company Kvaerner, especially if, as seems to be the case, the ship and platform even though provided by Kwaerner, does not fly the Norwegian flag.

The second criterion: "the state that procures the launch" cannot be considered here as it depends on the payload. Taking into account the commercial purpose of Sea Launch, the entity procuring the launch may be either a state or a private company qualifying its national state as a launching state.

The two last criteria which determine the launching states are the territory and the facilities from which the space object is launched. The territory is high sea, i.e. a territory where no state exercises its sovereignty⁹. We therefore have to consider the "state from whose facility a space object is launched", here in fact the nationality of the company whose "facilities" are used. The facilities must first of all include the platform and ACS, both of which fly a flag of convenience, perhaps Liberia's. In this respect, Liberia should be a launching State.

We must then ask the question whether the home port installations are "a facility" in that sense. It would be a good solution to link the space activity to a state's territory. But, is it really a "facility from which the launch is

⁹ The theory of the quasi-territoriality of the ships is no more recognised in international law. The nationality of the facility is the only criterion to be taken into consideration here.

done" ? It is difficult to support this wide interpretation of the text, especially due to the consequences of such an interpretation on the issue of liability.

B) The United States as one of the launching states

The application of the US Commercial Space Launch act (1984) (US CSLA)¹⁰ embraces a lot of people. The application of the various national space acts is always very wide and, in most cases, extraterritorial. States want to avoid being liable as launching state in situations where they are unable to control the space activity through a licensing procedure. It is one of the positive side-effects of the objective liability rule in space law. The US CSLA distinguishes between activities carried out by "citizens of the United States" defined in paragraph USC 2603 (11) A and B as "natural or legal persons of American nationality", on the one hand, and, on the other hand, activities carried on by "citizens of the United States" defined in paragraph C of the same provision as legal persons of foreign nationality controlled by a natural or legal person of the United States.

In the case of Sea Launch, there is a special point which must be highlighted : the project is using the former Soviet Union's technology which is very reliable and rather

¹⁰ United States Commercial Space Launch Act 1984, amended 1988 at 49 U.S.C. app. §§ 2601-2623 (hereinafter referred to as CSLA: (USC §2303)

(11) "United States citizen" means-

(A) Any individual who is a citizen of the United States;

(B) any corporation, partnership, joint venture association, or other entity organized or existing under the laws of the United States or any State; and

(C) any corporation, partnership, joint venture, association, or other entity which is organized or exists under the laws of a foreign nation, if the controlling interest (as defined by the Secretary in regulations) in such entity is held by an individual or entity described in subparagraph (A) or (B)

cost effective. As you know, fearing some abuse, the United States have imposed on the states which have not yet an established market economy, agreements concerning the selling of commercial launches. Such states include China, Russia and the Ukraine.¹¹ These agreements limit the sale of launches from those countries, but special provisions apply in situations involving co-operation between US companies and the foreign rocket manufacturers. In that case, the consortium must be led by the US Company and has to obtain a licence from the US government and to be established within the structure set up by the US Commercial Launch Space Act 1984. The consequence of such a rule is that the US should be a launching state. The launching consortium has no interest in avoiding the application of the US law in this way. The potential victims of an accident have the great advantage of such US liability.

III The possible trend

It seems that the commercialisation of

¹¹ Agreement Between the Government of the United States of America and the Government of Ukraine Regarding International Trade in Commercial Space Launch Services signed : 15 Oct. 1995 in force : 21 Feb. 1996. In Journal of Space Law 24 1996 -2 (hereinafter referred to as US-Ukraine agreement) The « integrated space launch services provider » is defined in Article II.3 : *"a joint venture that includes Ukrainian and U.S. companies and provides commercial space launch services or commercial space launch vehicles through implementation of joint projects in the field of rockets and space technology where financing for such projects comes from investments, commercial loans, and other means. In this joint venture : a) the venture receives a commercial launch licence issued by the U.S. Department of Transportation ; b) the US partner maintain a significant equity interest in, and control in fact of the joint venture and the United States is a source of a significant share of the goods and services employed by the joint venture in any space launch ;c) a majority of the goods and services employed by the joint venture in any space launch have their origin in market economy countries.... »*

the launching activity, and especially the launch from an international located pad, will change dramatically the application of one of the most important rules of Space law. The territory of launch is, at the moment, a "lock" in the system. As space-crafts are launched from the territory of a technically and economically powerful country,¹² those countries are volens nolens liable launching states. The potential victims have good chances to obtain compensation¹³. If the territory criterion is left aside because of a launch from international domain, this lock is being abandoned, the only criteria left are those connected with nationality which may be chosen by the launching private companies. When they choose their nationality, the entrepreneurs can choose the launching state and thus the registration state¹⁴-as this state has to be one of the launching states- and the "appropriate state"¹⁵ responsible for the control of the space activity. We are not very far from the situation in the high sea where the companies can -in fact if not in law- choose the flags of their ships and thus the applicable law, the domestic law or even the international one. We all know the very detrimental effect of such "anarchy": the great difficulty to set any efficient rule in those international territories.

Moreover, the situation should be more catastrophic in space than it is on the high sea. A ship is used to link two harbours in two land territories. If they want, the states may intervene at each end. As far as Space activities are concerned, as soon as the spacecraft is

¹² This country may be a "developed" or a "developing" country such as India, Brazil or China.

¹³ Even if the system of settlement of dispute is not efficient enough in the liability convention as in the international society in general.

¹⁴ Convention on Registration of Objects Launched into Outer Space:

article 1: *"The term "State of registry" means a launching State on whose registry a space object is carried in accordance with article II." (emphasis added)*

¹⁵ In the meaning of article VI of the OST 1967

launched, until it falls down to earth, it has no more physical contact with any territory. It remains for ever in an international location, and is linked for ever to a certain or some launching state(s).

Some very talented authors suggest that the present system of the launching state liability should be modified¹⁶ and that the burden on the launching state should be removed. This does not seem to be the case. Of course, the commercialisation of space activities must be taken into consideration, the liability of the private companies acting in space have to be made certain, but the safety net which is the absolute liability of one or some launching states must be maintained. This protection has been set in force as a distinction between the space activity which is by nature highly risky on the one hand and potential victims, not directly involved in space activity who are protected through the absolute liability set by the convention on the other hand. This rule has two advantages: the first is to give a guarantee to victims, and the second, of more interest, is to ensure that a state will control the whole activity. This obligation to control is already established in article VI of the OST but the fulfilment of this obligation is only a matter of international responsibility which is certainly not as efficient as absolute liability. Incurring liability, this state will make sure that the activity is conducted with care. The victim can sue the real actor, but, as we know, it may be very difficult either to obtain a decision proving fault or even to obtain a

proper indemnity from the company. Beyond that possibility it is good to maintain the safety net of the launching state's liability. So much the better if it is not used as the insurance system works well, but, if it is not the case, the victim can sue the launching state, either directly before a domestic judge or through the state he or she is a national of in accordance with application of the liability convention.

Conclusion.

Sea Launch launches from the high sea. To comply with the Ukraine-US agreement, it must act under the US law and be licensed by the US authorities, making the US a liable launching state. Were this particular situation not to exist, another company, more affected by commercial competition, may have chosen to escape from any real control, choosing a flag of convenience for the ship, a nationality of convenience for the company...etc.

If, as it is already the case at sea, competition become fierce in space launch activity or even in any space activity, it will be useful to avoid strong controls. By launching from an international territory, it is much easier to choose the connecting links with the "launching", "appropriate" or "registration" state. We have to keep in mind that choosing a state is also choosing the law, either national or international, applicable to the operation and choosing the authority in charge of the control. Difficulties would arise if states without any space capacity were chosen for this very reason, as unique launching state. If we want to maintain a high level of security and a control over space activities, such a mess is to be avoided. This is quite possible, as the main users of space activities are powerful countries either "developed" or not. Even if the largest freedom of use has to be respected and private enterprise encouraged, in outer space like elsewhere, we have no long term interest in opening the Pandora box of a total deregulation of fast growing activities in Outer Space or connected with it.

¹⁶ See Henri A. Wassenbergh *A launch and a transportation law separate from outer space law? It is time to legally unburden the "launching state"* Air and space law 21 1996 1 p. 28-32. and: Frans von der Dunk: *Commercial space activities: an Inventory of Liability, an inventory of Problems*, Proceedings of the thirty-seventh Colloquium in the law of Outer Space (1992) 161-71. And: *Loopholes in Liability? Aspects of Liability for Damages Sustained in the Course of Satellite Telecommunications Activities*. 2 Telecommunications & Space Journal (1995) 153-74.