

## LAUNCH SERVICES

by

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On 12 March 2000 a launch vehicle operated by the Sea Launch Partnership from a mobile launch platform in the Pacific Ocean malfunctioned, resulting in the loss of the vehicle as well as its payload, a mobile communications satellite.

The Boeing Company's press release of the same day (see attachment) and supporting documentation on that company's web site contain information on the project and on some ramifications of the accident which provide an interesting starting point for a review of some of the regulatory aspects of the launch services business.

The following aspects will be dealt with:

1. the Sea Launch Partnership, its competitors and the customers
2. licensing/jurisdiction
3. the US-Ukrainian and other launch trade agreements
  1. export controls on satellites and launch vehicles
  2. concluding remarks

### 1. The Sea Launch Partnership, its competitors and the customers

Sea Launch Co. is a corporation registered and incorporated in the Cayman Islands, a territory/dependency of the United Kingdom. It has a home port facility in Long Beach, California.

The company is co-owned by the following companies:

- Boeing Commercial Space Co. of Seattle, USA (40%)
- RSC-Energia of Moscow, Russia (25%)
- KB Yuznoye/PO Yuzmash of Dnepropetrovsk, Ukraine (15%), and
- Kvaerner Group of Oslo, Norway (20%)

The partners' contributions to the project are roughly:

*Boeing*: payload fairing, spacecraft integration and mission operations;

*Yuznoye*: the first two stages of the Zenit-3SL rocket, launch vehicle integration support and mission operations;

*Energia*: the Block-DM-SL upper stage of the Zenit rocket launch vehicle integration and mission operations;

*Kvaerner*: operational services of the launch platform *Odyssey* and the assembly and command ship *Sea Launch Commander*.

The platform and the command ship are registered in Liberia.

Hughes Space and Communications designed and built the satellite and contracted for the launch. The owner and prospective user of the satellite was ICO Global Communications of

London, a five year old company which is planning a global satellite-based mobile communications system consisting of ten operational satellites in medium earth orbit (MEO) to provide services (digital voice, data, messaging and fax) to cellular phones anywhere in the world, at a cost of about USD 7 billion.

ICO is not the only private company planning such a constellation. In fact, there is an impressive number of (impressive) projects involving varying numbers of communications satellites, mostly destined for low earth orbit (LEO).

All these –private- undertakings, such as Globalstar, Orbcomm and Teledesic, which are part of a global telecom industry valued at USD 600 billion, require launch services. As a result, the worldwide launch industry will, according to some estimates, have to orbit some 100 of these commercial communications satellites per year for years to come.

The main players which compete for these payloads are European Arianespace and the American companies Boeing and Lockheed Martin. Additionally, Orbital Sciences, another, smaller U.S. launch company is active in this field.

Russia, China, Ukraine, Japan, India and Israel all have launch service providers offering their services in the commercial market, though the latter three have barely ‘scratched the surface’. Brazil, finally, is also aspiring to operate commercial launch services.

In 1999, these launch companies together performed 78 launches, for commercial, civil and military purposes. The 36 commercial launches (commercial in this connection means: open to international competition) produced approximately USD 2.2 billion in revenues. (Commercial space transportation: 1999 Year in review, FAA-Associate Administrator for Commercial Space Transportation, January 2000; see list of all 1999 launch events in attachment)

## 2. Licensing/jurisdiction

The U.S. Commercial Space Launch Act (49 USC Chapter 701 “Commercial Space Launch Activities”) defines, for the purposes of the application of the Act, a “citizen of the United States” as follows:

“(A) an individual who is a citizen of the United States;  
(B) an entity organized or existing under the laws of the United States or a State; or  
(C) an entity organized or existing under the laws of a foreign country if the controlling interest (as defined by the Secretary of Transportation is held by an individual or entity described in subclause (A) or (B) of this clause.” (Sec. 70102)

The Act requires a launch license for the following:

- “(1) for a person to launch a launch vehicle or to operate a launch site **in** the United States.
- (2) for a citizen of the United States [as defined in A or B above] to launch a launch vehicle or to operate a launch site **outside** the United States.
- (3) for a citizen of the United States [as defined in C above] to launch a launch vehicle or to operate a launch site **outside** the United States and **outside** the territory of a foreign country unless there is an agreement between the United States Government and the government of the foreign country providing that the government of the foreign country has jurisdiction over the launch or operation.
- (4) for a citizen of the United States [as defined in C above] to launch a launch vehicle or to operate a launch site **in the territory of a foreign country** if there is an agreement between the United States Government and the government of the foreign country providing that the

United States Government has jurisdiction over the launch or operation.” (Sec. 70104) (emph.added)

The U.K. Outer Space Act 1986 applies to the following activities whether carried on in the U.K. or elsewhere:

- “(a) launching or procuring the launch of a space object,
- (b) operating a space object,
- (c) any activity in outer space.”

The Act requires a license for such activities, to be granted by the Secretary of State, if performed by “United Kingdom nationals, Scottish firms and bodies incorporated under the law of any part of the United Kingdom.” And the application of the Act may be extended to “bodies incorporated under the law of ... any dependent territory.” Cayman Islands may be considered as such.

The U.S. FAA’s Associate Administrator for Commercial Space Transportation (FAA-AST) in view of the degree of actual control of Boeing, did require Sea Launch to obtain a launch license for its first test launch in March 1999.

And, after consultation with the British National Space Center on the question of both countries’ jurisdiction (in May 1999), FAA-AST also licensed the second launch of this multi-partner venture, and has done so again for the launch of 12 March.

(Interestingly, in its 1999 Year in Review, FAA-AST labels the Sea Launch launch as an “international” and not as a “U.S.” launch event)

The above jurisdiction and licensing issues should of course be distinguished from the question of possible liability for any damage resulting from the launch. The Space Treaty and the Liability Convention and the obligations they may entail –directly or indirectly- for any or all of the Sea Launch partners and the licensing or launching states behind these companies, warrant separate treatment going beyond the scope of this review.

But with the advent of more international launch ventures, such as German-Russian *Eurockot* and French-Russian *Starsem*, the question of which country does or should supervise and license the launches (and the legal consequences thereof) becomes more and more important.

### **3. The U.S. – Ukrainian and other launch trade agreements**

On 21 February 1996, the governments of the U.S. and Ukraine signed an agreement “regarding international trade in commercial space launch services”.

It was the third of its kind, preceded by similar arrangements concluded by the U.S. with the People’s Republic of China in 1989 (amended in 1995 and 1997) and with the Russian Federation in 1993 (amended in 1996)..

The Ukrainian agreement shares with its ‘colleagues’ a number of provisions which regulate the entry of these countries’ launch industries into the international commercial launch market. Thus, the agreements affirm as a general principle that the contracting parties support the

“application of market principles to international competition among providers of commercial launch services, including the avoidance of below-cost pricing, government inducements, and unfair trade practices.”

This basic provision, to be found in the Chinese agreement (and in comparable wording in the other

agreements) was introduced to create a regulatory environment which would prevent the launch companies of the 'non-market economy' countries concerned from disrupting and undermining the viability of the U.S. launch companies, something that, particularly when the agreement with China was being negotiated, at the end of 1988, was a serious concern on the part of the U.S. government.

On the other hand, the space transportation needs of the U.S. satellite manufacturers and their clients required the availability of an adequate supply of launch services, irrespective of the nationality of the companies concerned; in other words, in the absence of sufficient U.S. launch capacity at a decent price, competition between launch providers worldwide was to increase both quantity and quality and, hopefully, lower the price.

These conflicting interests have resulted in launch trade agreements which, taking the above general principle as a starting point, prescribe in some detail the competitive behavior of the parties concerned.

In this connection, two provisions, appearing in all of the above agreements in their present form, should be singled out, one containing **capacity restrictions** (in the sense of maximum number of payloads to be launched), the other dealing with the **pricing** of the launch services offered in the international commercial launch market.

For example, the present U.S.-Ukraine agreement, which remains in force until 31 December 2001,

- applies to commercial space launch services for an international customer for launches to geosynchronous earth orbit (GSO), to geosynchronous transfer orbit (GTO) and to low earth orbit (LEO);

- covers commercial launches using the Ukrainian *Zenit* and *Tsyklon* launch vehicles and their upgrades; and, as far as capacity is concerned,

- allows the Ukrainian launch company to offer its services to international customers for up to **five** telecommunications satellites or other spacecraft destined for GEO/GTO during the term of the agreement, and

- permits the Ukrainians to launch **eleven** additional satellites for international customers provided that the launches are performed with Ukrainian launch vehicles by *an integrated space launch services provider*, i.e. **Sea Launch**.

The interesting aspect is here that the U.S.-Ukrainian partnership in Sea Launch, and in particular the sizeable commercial interest of Boeing in that company has resulted in a capacity regime which is considerably less restrictive than Ukraine would have obtained on its own. This provision thus offers a clear incentive for both partners to make their alliance work and gives the Ukrainian company a powerful ally in the U.S. when it comes to further expanding its launch possibilities through amendments of the agreement.

In one way, the launch trade relationship U.S.-Russia has a comparable benefit and effect for the companies concerned. The other major U.S. launch company, Lockheed Martin, has concluded an alliance with the Russian firm Khrunichev which produces the powerful *Proton* launch vehicle. The resulting company *ILS* (International Launch Services), incorporated in the U.S., offers launch services to the market using both the American Atlas and Titan launchers and the Russian Proton. Obviously, also here, there is an interest on both sides to make the cooperation work, financially and strategically.

Another aspect to be noted is that, where originally in the U.S. the launch companies and the

satellite manufacturing industry were in principle on opposite sides when it came to allowing foreign launch companies into the market, that picture has now become less clearcut due to the fact that domestic mergers and take-overs in the past five to seven years have resulted in a number of aerospace conglomerates which combine satellite manufacturing, satellite services and launch services. Launch capacity restrictions may thus, presumably promote one activity of the company while hurting another one.

Recent examples of such take-overs are Lockheed Martin's planned acquisition of Comsat Corporation and Boeing's similar plans for Hughes Space and Communications.

This phenomenon also affects the U.S. companies' attitude towards the **pricing** provisions in the agreements.

In general, the prices for GEO and LEO launches offered by Russian, Chinese and Ukrainian launch companies must be comparable to those offered by the so-called 'market economy' launch service providers, such as European Arianespace and the U.S. companies. Prices which are more than **15%** below this market economy standard may trigger special consultations on the request of the U.S. which are aimed at comparing the services and analyzing the reasons for the lower price.

Obviously, a launch customer, whether domestic or foreign, looking for the most convenient launch at the lowest price will not be particularly happy with controls which result in higher prices than the launch company selected was originally prepared to bid.

#### The future of the bilateral launch trade agreements

The U.S.-Russian agreement permits a total of 16 commercial launches, plus a possible additional 4 if the market expands sufficiently; it expires on 30 December 2000.

The U.S.-China agreement permits a total of 11 commercial launches; it expires on 31 December 2001.

The U.S.-Ukrainian agreement permits a total of 16 commercial launches (5 Ukrainian and 11 Sea Launch), plus a possible additional 4 (1 Ukrainian and 4 Sea Launch) if the market expands sufficiently; it expires on 31 December 2001.

The prospects of the permanent termination of the above agreements, *i.e.* their non-renewal after the above dates, are not very promising at this stage.

On the one hand, a majority of the U.S. space launch and satellite manufacturing industry consider these restrictions on free competition amongst the international launch companies a thing of the past. And they refer, *inter alia*, to the U.S. National Space Policy issued by President Clinton in September 1996:

"Free and fair trade in commercial launch services is a goal of the United States. In support of this goal, the United States will implement, at the expiration of the current launch agreements, a strategy for transitioning from negotiated trade in launch services toward a trade environment characterized by the free and open interaction of market economies."

The competitive strength of the U.S. launch companies of today, both in their own right and through their partnerships with foreign companies, would make this a relatively harmless undertaking, though some rules on fair competition, including subsidization, 'rules of the road', would probably be maintained to maintain or promote a 'level playing field'. (The latter has, in the past, been the subject of discussions between the U.S. and Europe, though without any appreciable

results so far).

There are, however, a number of other factors which will determine not only the fate of the above agreements but also the extent to which the eventual termination of the agreements would actually result in 'free and fair trade in commercial launch services'.

One aspect is the fact that the protection of the U.S. launch companies and promotion of the interests of the U.S. satellite manufacturing industries were not the only reasons for concluding these agreements.

Other considerations in the field of U.S. national security and foreign policy also played an important role.

For example, the U.S. administration's 1988 decision to allow China's entry into the launch market was also based on the premise that a policy of 'engagement' with that country, *inter alia* through increased trade relations, would assist in normalizing overall relations between China and the Western world.

And the agreement with Russia was not only meant to promote economic stability and employment to ease its transition toward a market-based economic system, but also to provide hard currency to a country which might otherwise seek to earn revenue by selling missile technology to 'rogue' countries.

In fact, national security and foreign policy considerations continue to play an important role in the perception of and decisions on (the application of) the above agreements. This does not only affect the U.S. and its industry and the three bilateral partners concerned, but also other countries and, most important, the launchcustomers worldwide.

At this stage, it is fair to say that the launch industry, though it provides vital services to the evergrowing global telecom industry, is still hampered in its development by the fact that it is not seen and treated as a normal transport industry supporting international trade, but as an activity which – also - creates security concerns. This is so because neither the launch vehicles nor their payloads are considered 'neutral' from a military and security point of view.

The ramifications thereof will be discussed briefly hereafter.

#### **4. export controls on launch vehicles and satellites**

##### Launch vehicles

Missiles and missile technology are weapons or arms, and so are, at least in principle, launch vehicles and launcher technology. Since 1987, an increasing number of countries which possess missile/launcher equipment and technology have enacted rules which severely restrict the export thereof.

Basis for these national export controls is an internationally agreed set of guidelines called the Missile Technology Control Regime (MTCR) of 1987, revised in 1993. The aim of MTCR is to restrict the proliferation of missiles and related technology.

The inclusion of launch vehicles makes sense: technical assistance to a nation's space launch program is potentially as 'proliferatory' as selling ballistic missiles to its military establishment.

It is important to realize that even *among* the approximately 30 members of the MTCR group the export restrictions apply, so joining the group does not result in launcher technology or other related assistance becoming available to the newcomer concerned.

MTCR states that its “Guidelines are not designed to impede national space programs or international cooperation in such programs as long as such programs could not contribute to nuclear weapons delivery systems.”

In practice, the Regime and the national export regulations based thereon, have not only been successful in preventing countries from acquiring missiles and missile technology, they have also slowed down the entry of new launch nations into the market and discouraged legitimate space launch cooperation for peaceful (commercial) purposes. And they have come to stand in the way of an exchange of technical data between launch companies worldwide which could enhance the safety of operations of the launch vehicles concerned.

The latter is a matter of concern not only to the customers, who are faced with a launch failure roughly once every twenty launches, but it is, understandably, also worrying the space insurance industry.

### Satellites

In many national legislations, communication satellites are considered ‘dual-use goods’, meaning goods which have civilian applications but can also be used for military purposes. Electronics, computers, precision machinery and other ‘high tech’ goods and services may come under this heading. This results in export controls becoming applicable which, depending on the country of destination, the intended use and the sophistication of the goods concerned, may be relaxed or very strict.

Except for the period 1996 to March 1999, the U.S. has treated commercial communications satellites not as dual-use goods, but as arms or weapons systems, subject, like launch vehicles, to the strict provisions of the Arms Export Control Act which is enforced by the State Department. Obviously, the idea is not to export arms to ‘enemies’ or to other countries which should not receive sophisticated material.

As a result, varying and changing considerations of national security and foreign policy on the part of the State Department may at any time stand in the way of an export license for a satellite to a specific country.

On the other hand, the U.S. government could not, and did not ignore the interest of the U.S. satellite manufacturing industry in selling and exporting –and arranging for the foreign launch of- its satellites.

In practice, the above export interest and the demands of the domestic and international telecom industry have, through the years, resulted in export licenses for these U.S. satellites to Russia, China and Ukraine for launch from these foreign territories, though not without interruptions and delays whenever one of these countries became subject to U.S. sanctions based on weapon proliferation activities or other behavior inviting U.S. sanctions.

(The respective launch trade agreements specifically refer to the application of these export controls to all satellite launches covered by the agreements)

Recent Congressional legislation has in the meantime resulted in a considerable tightening of U.S. export controls on satellites, satellite components and the respective technology.

Background for these measures is a Congressional investigation started in 1998 and the resulting

report produced by the so-called Cox Committee, which accuses U.S. satellite manufacturers of having transferred sensitive satellite-launcher interface know-how to China Great Wall Industry Corporation in the course of an analysis of a Long March failure involving U.S. satellites. This know-how was considered suitable to assist in improving the performance of Chinese ballistic missiles.

The above legislation and the ensuing special export controls are primarily though not exclusively directed at China, and subject any Chinese acquisition or launch of U.S. satellites to a set of conditions which are political, trade and security-related.

The effects however go beyond the changed competitive position of the Chinese launch service provider. In fact, the result of these measures and of the atmosphere they have created is, for example, that:

- . U.S. satellite companies face difficulties in the international market to sell their satellites, and are strongly discouraged from concluding launch contracts with the Chinese launch company; they are also more hesitant to use the services of any other foreign launch company because of the regulatory scrutiny and ensuing delays this entails;
- . European space insurance companies have difficulty getting technical information on U.S. satellites in sufficient detail –and in time- for insuring a launch involving such satellites;
- . Cooperation between U.S. and foreign satellite companies and even technical contacts have been discouraged, resulting in foreign customers and (potential) partners looking elsewhere for such activities; this includes foreign companies ‘designing out’ U.S. components from their own satellites for fear that they will be subject to strict controls and concomitant delays in delivery;
- . Contacts and cooperative arrangements between U.S. and foreign launch companies have been affected both by the increased controls and by the atmosphere created as a result; this will also have a delaying effect on the multilateral investigation into the recent Sea Launch failure: a special Technical Assistance Agreement will have to be approved by the State Department before any exchange of information can take place.

The above, it is assumed, will not fail to also affect the pace and the extent of liberalization of the bilateral launch trade agreements.

## 5. Concluding remarks

In the preceding paragraphs some facts and developments have been discussed which present a dilemma:

On the one hand, commercial space activities have been expanding rapidly and the trade interests have increased tremendously. We talk about billion dollar industries which more and more dictate the pace of developments. These industries behave like any other industry and have basically the same requirements vis-a-vis their contractual partners and vis-a-vis the governments, the regulators. They want quality, choice, predictability, certainty etc.

But to what extent can and will these requirements be met if military, national security and foreign policy aspects bring, possibly equally valid but conflicting, requirements on the part of the governments concerned?

This is, it should be emphasized, not a dilemma which can be solved through legal means. One



could even pose the question whether this has anything to do with space law. But fact is that manufacturing, selling, launching and operating satellites is a vital part of today's space activities, and the unilateral, bilateral and multilateral regulatory framework within which these activities take place is of crucial importance for their continued growth and the benefits this entails.