

Project 2001: Final Results of the Working Group Launch and Associated Services

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Abstract*

The paper is a summary of the Report of the Project 2001-Working Group on Launch and Associated Services presented at the International Colloquium on Conclusions of Project 2001 - Legal Framework on the Commercial Use of Outer Space - at Cologne, 29-31 May 2001. It will describe the scientific procedure for analysing such a legal framework with the aim to identify the regulatory needs. Further, selected legal problems will be discussed: the launching state issue, contractual aspects of launch services agreements and, finally, free trade in launch business. The paper will conclude with recommendations for the further development of a legal framework for commercial launching.

A. Scope and Objectives of the Working Group

The Working Group on Launch and Associated Services is one of six working groups within the joint research project called "Project 2001 - Legal Framework for the Commercial Use of Outer Space"¹ initiated by the Institute of Air and Space

Law of the University of Cologne and the German Aerospace Center (DLR) at the beginning of 1998. It consists of over twenty expert members in the field of space launching from all over the world and is supported and organised by the authors who act as Working Group Coordinators. The Project's aim is to explore further into the law related to outer space activities and to make proposals for the development of space and business law in order to improve legal conditions for commercial and private space activities². In this respect, the aim of the Working Group on "Launch and Associated Services" is to examine the existing legal frameworks with regard to its compatibility for commercial/private launching and to identify the regulatory needs. While in the beginning of space activities only states were involved, commercial space activities not only by private companies but also by states, state institutions and international governmental organisations have increased extensively in recent times. This is especially applicable to the launch services market, as it is the most essential part of activities relating to space: Only commercial launch providers can guarantee a dependable access to space because non-commercial services by states will always be subject to budgetary and political considerations³. Launching therefore plays a key role in space business and the Working Group's aim is to find the proper balance

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between, on the one hand, the interests of the private launch industry to have the freedom to offer its services to the market (which includes governments as customers) and, on the other hand, the need of the public to be protected against possible effects of unregulated private activities⁴.

B. Procedure

I. Workshop

We asked the Working Group to answer a questionnaire in order to identify the subjects which should be dealt with in particular. From the summary of answers received we developed a draft outline, which served as a basis for further discussions and for the workshop. At the IISL- Colloquium alongside IAF Congress in Amsterdam in October 1999 we presented a paper on the Interim Results of the Working Group on Launch and Associated Services⁵. Also, an informal meeting of the Working Group took place alongside the IAF Congress in order to discuss the program for the workshop.

Then, our workshop took place on 18 and 19 January 2000 kindly hosted and supported by DaimlerChrysler Aerospace Infrastructure (now Astrium) in Bremen. Over 50 international experts took part and 13 papers were presented concerning the four thematic fields: (1) experiences of launch providers, (2) the launch customer's point of view, (3) the view of the insurance industry and (4) regulatory requirements. Our aim was to develop recommendations. To make the workshop most effective, a book of working documents containing all the relevant legal texts⁶ were distributed amongst the participants. In the view of many participants this workshop provided an excellent forum for discussion and exchange of views in this very specialised field of space law. Afterwards a report on the workshop⁷ and the Proceedings⁸ including all presented papers and working documents were published and distributed to the workshop participants and members of the Working Group.

II. Colloquium

The present report was drafted by the Coordinators mainly based on the subjects and papers of the workshop. At the beginning of 2001, the draft report was submitted to the members of the working group and the speakers of the workshop for giving them the opportunity to comment on the report and provide further input. The finalised report was presented and discussed in the Working Group Panel "Launch and Associated Services" at the International Colloquium on Conclusions of 'Project 2001', 29-31 May 2001 in Cologne⁹. Further statements in this panel came from *Dr. Peter van Fenema* on Free Trade in Launch Services, *Prof. Armel Kerrest* on the Launching State issue, *Dr. Thomas Beer* (ESA) and *Dr. Mathias Oehm* (Eurockot) on the legal aspects of launch services agreements. The presented papers and the following discussion showed that U.S. export control laws are impeding the development of the launch industry. The question of the liability of the launching state and the relation of Article VI and VII Outer Space Treaty is another problem to be solved.

C. Substantive Issues

I. The commercial launch services market

Over the past five years, the character of space launch services has changed in a number of ways. Today there are governmental and private launch providers. Before 1980, space launches were only procured by states. For private launch customers of the western hemisphere the U.S. space agency NASA was the only space launch provider until the early 80's¹⁰. It was not until the mid-1980s, and especially after the Challenger accident in January 1986, that a commercial launch market first developed in the United States. In Europe, Arianespace began commercial launches in 1984 after several years of test and demonstration flights by the European

Space Agency (ESA)¹¹. NASA's Space Shuttle had become fully operational in 1982 and, together with ESA's Ariane family of launch vehicles, had succeeded in capturing the entire international market for satellite launches, and at rates U.S. industry said they cannot compete¹², although the legal basis was already established in 1984 with the Commercial Space Launch Act (CSLA). This commercial environment changed suddenly after the Challenger catastrophe in 1986. In August 1986 the U.S. President issued a new commercial space policy decreeing that NASA would launch only those payloads requiring the unique capabilities of the Space Shuttle¹³. After the amendment of the CSLA in 1988, McDonnell-Douglas performed the first commercial satellite launch with authorisation of the U.S. transport department in 1989¹⁴.

Second, the role of governments as the main procurers of their 'own' national launch services has been declining, and other entities, primarily national and international telecommunications companies and organisations are taking over as the main customers. The competition between international launch providers, competing for commercial customers world-wide, has rapidly increased. The consequence is that launch service providers are increasingly faced with requirements of commercial/private enterprise (-oriented) customers, and in that respect they have to adapt to the expectations of their customers like any other service industry¹⁵. Of interest to the customers and the insurance industry are the reliability 'quota' of the launch systems concerned. All established launch providers have experienced failures both with the proven and the new launch vehicles affecting the confidence of the parties concerned¹⁶. A satellite owner faced with the sudden unavailability of the launcher it contracted for, will not easily find alternative space transportation at short notice¹⁷.

II. The launching state issue

The Working Group has identified the "launching state issue" very early as a central problem. Due to the obligation of Art. VI, VII OST, that the launching state of a space object has to compensate a victim even if the damage has been caused solely by a non governmental entity, this is reason enough to regulate at least the indemnification¹⁸.

Regarding the Sea Launch case for example, there is no clear cut answer to the question of which states would be deemed a "launching state" under Article 1 of the Liability Convention. Indeed, it is possible that several states could be deemed jointly liable for third party damage resulting from a Sea Launch mishap¹⁹, or none²⁰.

Further, the case of sea launch or any other multinational ventures show the necessity to find a way to protect the private entity against over-regulation²¹: Sea launch might have to apply for a license in the USA (what it did), UK (because of the venture being registered in the Cayman Islands), Norway, Russia and Ukraine (because of the shares held at SLLP). A solution could be to harmonize national space legislation to the extent that the license issued in one country is accepted in any other country under a "one-stop"-license procedure²².

It has to be considered whether treaty revision or interpretation is worth the major efforts that will surely be required to attain it. It is at least equally important to emphasise state responsibility for licensing, continuing supervision of non-governmental entities, and ensuring that just compensation in case of liability is readily available (i.e. through insurance requirements)²³. Possible gaps in the liability system of the space treaties, can be filled by licensing procedures applicable to commercial ventures for which state responsibility may exist. However, it is recommended to induce states to implement national space legislation. Valuable examples can be found in the national space laws of the

United States, the United Kingdom, Russia, Australia, Sweden and South Africa²⁴.

III. Contractual aspects of launch services agreements in consideration of the particular interests of launch customers and providers

During the past two decades the structure of the typical launch customer has changed. Whilst the market knew public customers since the early days of space business, commercial clients entered the market when the public space transportation systems changed to allow private entities to take over the role of launch service providers²⁵. Analysing today's Launch Services Agreements (LSA) one will find certain contractual clauses pertaining to insurance, liability and the definition of a launch. These are the most crucial provisions contained in a LSA.

1. The concept of delivery

One of the core issues today is the question of whether the risk of a successful launch shall remain with the customer or if this risk shall form part of the launch provider's obligations under a Launch Services Agreement²⁶. Most launch providers do not sell a successful launch in terms of a complete satellite delivery in its final orbital position, but what is guaranteed under a contract is a launch defined as the ignition of the first stage engine. The customer could argue that the risk of a successful launch should remain with the launch provider who can control this risk in view of his technical capacities. The argument of the launch provider that the explosive force of a rocket is almost as high as or similar to force majeure cannot be upheld.

Delivery-in-orbit contracts present an interesting alternative for customers who can afford to pay for the risks related to this type of contract. Therefore, contract policies should be further elaborated in order to achieve more legal security.

2. Cross-waiver of liability - risk sharing at its best?²⁷

In every Launch Services Agreement a clause containing a cross-waiver of liability is inserted²⁸. The degree to which (gross) negligence is excluded varies from clause to clause. According to NASA the fundamental purpose of requiring cross-waivers of liability is to establish a known regime of liability limitation that will have the effect of encouraging space and aeronautical projects and other joint endeavours²⁹. Moreover cross-waivers encourage such endeavours in two ways. First, the potential for litigation is lowered because each party agrees up front to assume responsibility for specified damages it may sustain. Second, insurance costs are reduced by sharply restricting the types of legal claims that may be brought by participating entities against each other³⁰.

3. Insurance

a) More flexibility on the satellite insurance market

The importance of satellite insurance can be seen bearing in mind that purchasing full coverage of a satellite remains a satellite owner's third largest single expense after the cost of the satellite and the launch. Apart from the unique technology that is used in the satellite business, the high risk of failure is still remarkable. Moreover, insurance companies also have to take into account that a failed satellite is usually inaccessible in orbit, which makes it difficult or impossible to repair. In case of a failure it may take a couple of years to replace a satellite and thus the business of a satellite company may suffer from a loss. The U.S. Space Shuttle has been used three times in the past for in-orbit retrieval mission, but is in principle not available for commercial missions, thus preventing commercial companies from repairing satellites directly in space. In view of the discussion to prepare a space shuttle rescue/repair mission for the telecommunications satellite Orion 3, it seems not insur-

mountable anymore to put (commercial) satellites back into service³¹.

In a delivery on the ground policy the satellite manufacturer usually assumes the pre-launch and construction risks. The construction phase covers risks during assembly, testing and integration of the satellite. Usually, the coverage of the insurance terminates at the intentional ignition or lift off. This is also the point of time when the insurance coverage for the launch itself begins. The risk period originally lasted for 180 days due to the check that had been done to verify the functioning of the satellite. Today, launch packages are tailored to the extent of three to five years. In-orbit insurance covers the satellite whilst it is operational and is similar to the coverage of a launch insurance. This kind of insurance is renewable annually, though longer periods are becoming more common nowadays³².

The space insurance market is facing changes which are related to the arrival of new heavy-lift launcher generations like Ariane 5 or Delta 3 rockets as well as to a different type of satellite manufacturing. The satellite owners are looking for longer-term policies and demand reimbursement for lost business³³. One example of a policy is a 25 percent insurance premium for the coverage of a successful satellite launch combined with the refund of a portion of that premium in case no insurance claim will result from the launch³⁴. The manufacturing of satellites in a more commercial way including series production of similar spacecraft has lead insurers to provide five years of coverage. But insurers are facing the risk that they do not know how reliable the new products are. Apart from giving coverage for the replacement of a satellite, satellite owners increasingly ask for coverage to protect them against lost business resulting from a satellite or launch failure³⁵.

A recent example of a dispute arising out of a standard satellite insurance is the EchoStar 4 case showing that the industry's

realities no longer correspond with those standard policies³⁶. In a standard satellite insurance the underwriter agrees that a 50 percent loss equals a constructive total loss³⁷. This kind of policy relates to satellites, which had a seven-year operating life and took three years to be built. Today, the situation has changed. Now satellites last up to 15 years and they are delivered within one and a half to two years. This also means that the insurance policies have to be reviewed and adapted to the new market conditions.

Another new type of insurance is the coverage of a satellite de-orbiting from a Low Earth Orbit. Iridium had to buy this type of insurance in order to cover risks that third parties face on the ground. Insurance is also available for frequency interference between satellites in orbit. Furthermore, the risk of the loss or non-attribution of a licence can be insured³⁸.

Launch and in-orbit liability risks are largely written by aviation insurers whereas pre-launch risks are mainly written by marine cargo or transit insurers. The premium rates of satellite insurance vary depending on the quantum of risk inherent to a specific launch phase: whilst the pre-launch rates amount to 0.20 % to 1 % of the sum insured, the launch, commissioning and early orbit amount to 12 % to 20 %. The figures for in-orbit insurance are 1 % to 2.5 % per annum of the sum insured, and for launch liability 0.15 % of the indemnity limit³⁹. Some of the key issues of the policy wordings are the definition of a total or partial loss of the operational capability of a satellite, the policy period, a claims handling procedure and a salvage clause. This salvage clause contains provisions concerning the rights of the insurers in case of a loss. Should the satellite have failed totally, the insurer is usually entitled to take title of the satellite upon the payment of the claim. But the transfer of title is not always advantageous because it is practically impossible for the insurer to own the satellite, as he can not operate it without having a licence or a slot. The U.S

based Hughes Global Services (HGS) has proved though that even in cases where a satellite is written off as a total loss by its original owner it can still be used as a non fully functional satellite⁴⁰. To take title of the satellite HGS makes payments to insurance underwriters who paid the initial owner's insurance claim before. Nevertheless, insurers have used this kind of salvage clauses in the past to threaten the customer to invoke the right to gain title of the insured satellite. This has facilitated the negotiations for the insurance companies to negotiate their total loss claims and payments.

The California based company AssureSat Inc. offers backup protection providing a fleet of in-orbit temporary backup satellites for GEO satellite operators. In case of failure of their own satellite the satellite operators pay a fee for access to AssureSat's satellite whereas this satellite remains AssureSat's property⁴¹. Customers who have paid AssureSat premiums will have the right to lease an AssureSat satellite for a term ranging from four to thirty months⁴².

b) Political risk insurance

The latest consequence of the tougher U.S. government satellite technology export laws⁴³ is an increasing demand by satellite operators outside the United States for political risk insurance⁴⁴. This type of insurance is common in other insurance sectors but relatively new to the space insurance market. So far, it has mainly been used to cover the risks of companies launching their satellites on Russian or Chinese rockets. Political risk policies provide these companies with compensation in case their launch-service contracts are not honoured because of political instability in the nation where the launch is to occur. In this regard a cancelled export licence from the U.S. government could be a political risk policy. A risk of this type could be considered to be beyond the power of the insured company to control. As such, they would be covered similarly to the way earthquakes or other acts of nature are covered⁴⁵.

IV. Trade related topics in space launch business

Trade in space launch business is mainly characterised by government regulations covering export control policies, bilateral trade agreements and government procurement.

1. The U.S. export control regime

The U.S. export control policy has reflected the difficulties inherent in finding an appropriate balance between the need to guard U.S. national security interests and the need to promote and protect U.S. commercial interests in the international marketplace⁴⁶. For companies it is essential to develop compliance-centred export control systems with regard to the changing public policy environment⁴⁷.

Since 1999, the jurisdiction for export controls on commercial communications satellites as well as parts and components and related technical data has been transferred by Congress (National Defense Authorization Act⁴⁸) from the Commerce Department to the State Department, thus subjecting them to tighter controls⁴⁹. This transfer of jurisdiction has had a significant impact on satellite manufacturers, components and parts providers and service providers. Relevant goods or technologies, previously listed as dual-use goods, have been added to the munition list. Under the Department of Commerce regime many satellite products and services fell under exceptions and did not require licences for exports. Under the State Department regime, however, licences are required for most transaction, involving satellite products and services. Exceptions were provided by Congress calling for an expeditious treatment of export licence requests for NATO and major non-NATO allies. However, in practice this exception was not implemented with the U.S. Administration retaining a wide latitude for imposing additional export control requirements, also on NATO countries, as it sees

fit for reasons of national security⁵⁰. Section 1309(a) of the Financial Year 2000 Foreign Relations Authorization Act authorised the Department of State to establish a regulatory regime for expeditious licensing of commercial communications satellite, satellite technologies, their components, and systems to U.S. NATO and major-NATO allies, while insuring priority to "national security and U.S. obligations under the Missile Technology Control Regime" (MTCR).

The Department of State published implementing regulatory changes in the Federal Register⁵¹. Specifically, a new § 123.27 establishes a special regime for licensing commercial communication satellite components and other devices with the legislation⁵². The regime focuses on two priority areas: (1) the supply of satellite components and associated technical data; and (2) technical data for use in plant visits, responding to bids and requests for quotes, acceptance testing of equipment and the like, and for marketing complete satellites. The regime's main feature is the ability to use high volume licenses (known as 'bulk' licenses) for components and technical data for multiple shipments to any of the NATO or major non-NATO allies within the approved framework of the regime without meeting the documentary requirements of § 123.1(c)(4) and (5) (i.e. purchase orders, letters of intent, contracts and non-transfer and end use certificates), or documentary requirements of § 123.9 concerning approval of re-exports or re-transfers. Furthermore, all eligible articles for export must be confined to an approved list of foreign aerospace firms located within the territories of U.S. allies for use in an approved list of commercial communications satellite programs of U.S. allies.

In the aftermath of the Long March failure involving a U.S. manufactured satellite, the China Great Wall Industry Corporation was alleged to have received sensitive know-how about the satellite. It is in this context, that the *Nunn-Wolfowitz* task force edited its report for the Hughes Electronics

Corporation⁵³. Among the key areas that have to be improved within U.S. firms in order to achieve maximum effectiveness in applying the export controls are: the commitment of the management to pursue the goal of compliance, the edition of an export compliance and instruction manuals and the set up of standardised licence applications. In a more general way, there are voices that describe the U.S. policy concerning the conditions of pricing and capacity of foreign launch providers in the U.S. as a unilateral regulation of international competition⁵⁴.

2. U.S. bilateral launch trade agreements

The advent of new launch service providers in the international commercial launch market, beginning with China in 1988, prompted a series of bilateral launch trade agreements concluded on the initiative of the U.S. with the countries concerned, China, Russia and Ukraine. The aim of these agreements was to gradually introduce more competition, while at the same time creating safeguards against price and capacity dumping by the newcomers. The agreements therefore contained limitations on the number of satellites to be launched and on the prices that could be charged by the 'non-market economy' launch companies concerned. The agreements specifically referred to the U.S. export control regulations, which would continue to govern the export of U.S. satellites and satellite components to the countries of launch. In 2000, the agreements with Ukraine and Russia were not prolonged. The existence of U.S.-Russian (ILS) and U.S.-Ukrainian (Sea Launch) cooperative ventures and the demands of the U.S. satellite manufacturing industry played a role in the termination of these restrictions. But also the two countries' behavior in the field of missile proliferation earned them a better competitive position in the launch market. The complicated relations with China, and the national security component thereof, make a similar U.S. action with respect to the respective price and capacity restrictions unlikely for the time being (and would

anyhow not effect the tightened satellite export controls adopted by Congress in the wake of the above 'espionage' affair involving China Great Wall Industry Corporation).

3. The European Union dual-use export control system

The main principles of the EU system are stamped by the individual decisions about whether or not to approve an application to export controlled items. Those are taken at the national level by authorities, which are responsible to their national governments. The EU dual-use export control system is used by the members of the EU to help implement their national obligations with regard to non-proliferation in the context of the existing EU single market.

The regulations that establish the dual-use export control system were first developed between 1991 and 1994. In March 1995 the system, which is based on two documents⁵⁵, entered into force. In 2000, the new Council Regulation (EC) No 1334/2000, dated 22 June 2000⁵⁶, has repealed the Council Regulation (EC) No 3381/94. The items that are listed in an annex to Article 296 of the Treaty of Rome are explicitly excluded from the trade competence of the European Union, all other manufactured goods are subject to community law. This includes civilian goods, which have potential military applications.

4. Government procurement

The main principles of the Government Procurement Agreement⁵⁷ (GPA) are the introduction of national treatment, non-discrimination in purchase by government entities and more transparent detailed procedures for tendering. The WTO dispute settlement procedure (DSU) applies to the GPA. Therefore, possible controversial issues between the space faring nations can be submitted to WTO panels. In a case before the WTO Dispute Settlement Body the European Commission requested for

consultations⁵⁸ involving the tender of a Japanese navigation satellite⁵⁹. The publication of the satellite tender by the Japanese Ministry of Transport raised concerns at the European Commission that the specifications mentioned in the tender refer explicitly to the U.S. regulations. The Commission requested a more neutral formulation, which would have allowed an extended interoperability. European companies would have been discriminated against and would have been prevented from participating in the tender, if they wanted to do so⁶⁰.

The European Commission considered that the direct reference in the specifications of the tender to the U.S. system was in contravention of the general provision on non-discrimination under Article III GPA. Furthermore, the violation of Article VI (3) GPA concerning technical specifications was considered. In the end, the dispute did not end with a panel decision as the case was solved through bilateral and confidential consultations⁶¹.

D. Summary and Recommendations

I. Recommendation no. 1 concerning the launching state issue

In respect of the launching state issue, it is not necessary to change international law. Possible gaps in the liability system of the space treaties, can be filled by licensing procedures applicable to commercial ventures for which state responsibility may exist. However, it is recommended to induce states to implement national space legislation.

II. Recommendation no. 2 concerning free trade in launch services

The development of free competition in international launch services has to be put in proportion to the military and national security aspects of the technology involved. Launch technology can be used for the development of missiles. This is a valid concern. On the other hand, there is a defi-

nite and clear need for high quality competitive launch services for both commercial (communications satellites) and government purposes. Laws or policies which qualify almost all satellites as 'arms' (subject to strict export controls), discourage cooperation between launch companies in the field of safety or mix security and trade will slow down the development of safe and affordable access to space. It is therefore important to carefully monitor both national and international regulations and measures in this field to ensure that a clear distinction is made between security concerns on the one hand and trade considerations on the other hand - to the benefit of both.

III. Recommendation no. 3 concerning launch services agreements

Among the various contractual aspects that can be stipulated in Launch Services Agreements, delivery-in-orbit contracts present an interesting alternative for customers who can afford to pay for the risks related to this type of contract. Therefore, contract policies should be further elaborated in order to achieve more legal security.

¹ See *Susanne Reif*, Project 2001: Shaping a legal framework for the commercial use of outer space, in: *Space Policy* 1999, p. 109 et seq.

² *Susanne Reif*, Project 2001: A Legal Framework for the Commercial Use of Outer Space, in: *ECSL News* 1999, p. 10 et seq.

³ *Karl-Heinz Böckstiegel*, Introduction, in: Proceedings of the Project 2001-Workshop on Commercial Launch Activities, 19 January 2000, Bremen, p. 2.

⁴ *H. Peter Van Fenema*, Scope of the Workshop, presented at the Project 2001-Workshop "Commercial Launch Activities", 19 January 2000 (unpublished).

⁵ *Philip Makiol/Gerhard Gruber*, Project 2001: Status Report on the Interim Results of the Working Group on Launch and Associated Services, in: Proceedings of the 42nd Colloquium on the Law of Outer Space, IISL-99-IISL.4.01, October 1999, Amsterdam.

⁶ Can be found in: Proceedings of the Project 2001-Workshop "Commercial Launch Activities", 19 January 2000, Bremen, p. 167 et seq.

⁷ *Philip S. Makiol*, Project 2001-Workshop on Commercial Launch Activities, Report, in: *ZLW* 2000, p. 366 et seq.; see also *Ilaria Zilioli*, Future

and Past Meet at Workshop on Commercial Launch Activities, in: *ECSL News* No. 21, April 2000, p. 5; *Hermann Ersfeld*, Launch Workshop, RI aktuell, March 2000, p. 11.

⁸ The Proceedings can be requested from the Project-Coordinator's office by email: 2001-com-useous@uni-koeln.de.

⁹ See the conference report of *Susanne Reif*, *ZLW* 2001, pp. 419-426.

¹⁰ *Norbert Knittlmayer*, Der kommerzielle Startdienstleistungsvertrag (Launch Services Agreement), 1998, p. 36.

¹¹ *John B. Gantt*, Expanding Global Launch Services, Commentary Paper, in: Proceedings of the Workshop on Space Law in the 21st Century, IISL & UNOOSA, UNISPACE III, Vienna, July 1999, p. 50 (51).

¹² See *Edward Frankle/E. Jason Steptoe*, Legal Considerations Affecting Commercial Space Launches From International Territory, IISL-99-IISL.4.02, Amsterdam, p. 3, also published in: Proceedings of the Project 2001-Workshop "Commercial Launch Services", 19 January 2000, Bremen, p. 59 (61).

¹³ *Norbert Knittlmayer*, Der kommerzielle Startdienstleistungsvertrag (Launch Services Agreement), 1998, p. 37; *Bernhard Schmidt-Tedd*, Transportsysteme, in: *Böckstiegel* (ed.), *Handbuch des Weltraumrechts*, 1991, p. 485 (503); *Logsdon*, Access to Space after Challenger, in: *Space Policy* 1986, p. 106; *E. Jason Steptoe*, Commercial Space Launch Services: The U.S. Government as a Customer - Supplementary Statement, in: Proceedings of the Project 2001-Workshop "Commercial Launch Services", 19 January 2000, Bremen, p. 71 et seq.; *Stephan Hobe*, Die rechtlichen Rahmenbedingungen der wirtschaftlichen Nutzung des Weltraums, 1992, p. 32.

¹⁴ *Bernhard Schmidt-Tedd*, The Launch Customers' Point of View - Introductory Remarks, in: Proceedings of the Project 2001-Workshop "Commercial Launch Services", 19 January 2000, Bremen, p. 55.

¹⁵ *H. Peter van Fenema*, Expanding Global Launch Services, Discussion Paper, in: Proceedings of the Workshop on Space Law in the 21st Century, IISL & UNOOSA, UNISPACE III, Vienna, July 1999, p. 35 (36).

¹⁶ *H. Peter van Fenema*, Expanding Global Launch Services, Discussion Paper, in: Proceedings of the Workshop on Space Law in the 21st Century, IISL & UNOOSA, UNISPACE III, Vienna, July 1999, p. 35 (37).

¹⁷ *H. Peter van Fenema*, Expanding Global Launch Services, Discussion Paper, in: Proceedings of the Workshop on Space Law in the 21st Century, IISL & UNOOSA, UNISPACE III, Vienna, July 1999, p. 35 (39).

¹⁸ *Michael Gerhard*, Potential "building blocks of a national space legislation, in: Proceedings of the Project 2001-Workshop on National Space Legislation, Munich, 5/6 December 2000, pp. 181 (183);

Kai-Uwe Schrogl, Responsibility and Liability – Need for national regulation (incl. harmonisation), in: Proceedings of the Project 2001-Workshop on Commercial Launch Services, 19 January 2000, Bremen, p. 155 et seq.

¹⁹ See *Edward Frankle/E. Jason Steptoe*, Legal Considerations Affecting Commercial Space Launches From International Territory, IISL-99-IISL.4.02, Amsterdam, p. 3, also published in: Proceedings of the Project 2001 - Workshop “Commercial Launch Services”, 19 January 2000, Bremen, p. 59 (63).

²⁰ See *Frans von der Dunk*, Public Space Law and Private Enterprise: the Fitness of International Space Law Instruments for Private Space Activities, in: Proceedings of the Project 2001-Workshop on Privatising Space Activities, 19 July 1999, Vienna, p. 12 (20); *Frans von der Dunk*, Space Law and the Expanding Role of Private Enterprise, with particular Attention for Launching Activities, paper presented at the Space Law Conference 2001 in Singapur, March 2001.

²¹ This issue is further elaborated in *Michael Gerhard/Kai-Uwe Schrogl*, Report of the Project 2001-Working Group on National Space Legislation, pp. 18-21.

²² *Norbert Knittlmayer*, Harmonize Europe’s Space Laws, in: Space News, February 12, 2001, p. 15; *Norbert Knittlmayer*, Regulatory activities and launch contracts, in: Proceedings of the Project 2001-Workshop on Commercial Launch Activities, 19 January 2000, Bremen, Germany, pp. 97-105.

²³ See *Edward Frankle/E. Jason Steptoe*, Legal Considerations Affecting Commercial Space Launches From International Territory, IISL-99-IISL.4.02, Amsterdam, p. 3, also published in: Proceedings of the Project 2001-Workshop “Commercial Launch Services”, 19 January 2000, Bremen, p. 59 (69).

²⁴ For further details concerning national space legislation see *Michael Gerhard/Kai-Uwe Schrogl*, Report of the Project 2001-Working Group on National Space Legislation.

²⁵ *Bernhard Schmidt-Tedd*, The Launch Customers’ Point of View - Introductory Remarks, in: Proceedings of the Project 2001-Workshop “Commercial Launch Services”, 19 January 2000, Bremen, p. 55.

²⁶ *Peter Hulsroy*, The Concept of Delivery, Proceedings of the Project 2001-Workshop on Commercial Launch Activities, 19 January 2000, Bremen, p. 78.

²⁷ This subject was not dealt with in detail by the Working Group. Thus, no thorough discussion will be presented here. According to *Knittlmayer* the general use of the cross-waiver clauses in LSAs is questionable: see *Norbert Knittlmayer*, Der kommerzielle Startdienstleistungsvertrag (Launch Services Agreement), 1998, pp. 204 et seq. and *Norbert Knittlmayer*, Regulatory activities and launch contracts, in: Proceedings of the Project 2001-Workshop on Commercial Launch Activities,

19 January 2000, Bremen, Germany, pp. 97-105. For a further debate see: Valérie Kayser, Liability Risk Management for Activities Relating to the Launch of Space Objects - Today’s Environment and Tomorrow’s Prospect, Thesis submitted to the Faculty of Graduate Studies and Research of the Institute of Air and Space Law, McGill University, Montreal, March 2000 (so far, unpublished), concerning the exclusion of wilful misconduct and gross negligence see pp. 376/377; an analysis of the harmonisation of the practice of inter-participant waivers [cross-waivers] of liability is provided on pp. 369-401.

²⁸ See also *Susanne Reiff/Bernhard Schmidt-Tedd/Kathrin Wannemacher*, Report of the Working Group on Privatisation, D.II.1.b)i), pp. 29 et seq.

²⁹ NASA Space Act Agreements Manual, p. 17 (NASA Procedures and Guidelines 1050.1, 30 December 1998).

³⁰ *ibid.*

³¹ *Berger/Silverstein*, Space News, 12 March 2001, pp. 1, 19.

³² *Elson*, “An Introduction to Satellite Insurance”, paper presented at the 9th ECSL Summer Course on Space Law and Policy, Cologne, August 2000.

³³ *de Selding*, Space News No. 29/2000, 24 July 2000, p. 10.

³⁴ *ibid.*

³⁵ *ibid.*

³⁶ *de Selding*, Space News No. 27/2000, 10 July 2000, p. 27. An arbitration procedure is taking place before the American Arbitration Association.

³⁷ *cf. de Selding*, Space News No. 47/2000, 11 December 2000, p.1.

³⁸ *Elson*, “An Introduction to Satellite Insurance”, paper presented at the 9th ECSL Summer Course on Space Law and Policy, Cologne, August 2000.

³⁹ *Elson*, “An Introduction to Satellite Insurance”, paper presented at the 9th ECSL Summer Course on Space Law and Policy, Cologne, August 2000.

⁴⁰ *de Selding*, Space News, No. 47/2000, 11 December 2000, p. 1, 20.

⁴¹ *J. F. Farrell*, “Going Forward in Emerging Markets: New Regions to Serve and/or New Services to Introduce”, paper presented at the World Summit on Finance for Satellite Communication and Broadcasting, Paris, 31 August/1 September 2000.

⁴² Space News, 22 January 2001, p. 8.

⁴³ Sec. 1513 National Defense Authorization Act of 1999 (Public Law 105-261); new ITAR (International Traffic in Arms Regulations) regulations: 22 Code of Federal Regulations (C.F.R.), parts 121, 124. For an overview about the export control regime in the U.S.: *Lihani*, Shifts in U.S. Export Controls force changes upon commercial satellite manufacturers and space launch providers, paper IISL-99-IISL.3.11.

⁴⁴ *de Selding*, Space News No. 26/2000, 3 July 2000, p. 1.

⁴⁵ *ibid.*, p. 18.

⁴⁶ See e.g. *Eric Stallmer*, Some Fear Bite of U.S. Export Rules on Industry, in: *Space News*, February 26, 2001, p. 10.

⁴⁷ *Nunn-Wolfowitz* Task Force report: Industry "Best Practices" regarding export compliance programs, 25 July 2000, p. 6.

⁴⁸ Public Law 105-261, § 1513(a) 112 Stat. 2174 (1998).

⁴⁹ For further details see *Joan Johnson-Freese*, Alice in Licenseland: US satellite controls since 1990, in: *Space Policy 2000*, p. 195 et seq. A bill has been introduced to retransfer the satellite export authority from the State Department to the Department of Commerce, see *Magnuson*, *Space News*, 19 February 2001, p. 4.

⁵⁰ Report on United States barriers to trade and investment 2000, European Commission, July 2000, p. 41.

⁵¹ 22 CFR 123, Interim Final Rule dated May 16, 2000 of the Department of State coming into effect July 1, 2000. Cf. also draft guidelines for preparing license applications for exports in accordance with § 123.27 published by the Department of State, Bureau of Military Affairs - Office of Defense Trade Controls.

⁵² Federal Register, May 26, 2000 (Vol. 65; No. 103), Rules and Regulations, pp. 34089-34092.

⁵³ *Nunn-Wolfowitz* Task Force report: Industry "Best Practices" regarding export compliance programs, 25 July 2000. The task force was formed in order to review the export compliance program of Hughes Electronics Corporation and submit recommendations to ensure the program sets a "best practices" standard for complying with the letter and spirit of U.S. export control laws (Hughes Electronics Corp. Press release, 3 December 1999).

⁵⁴ *H. Peter van Fenema*, The international trade in launch services – The effects of U.S. laws, policies and practices on its development, 1999, p.368.

⁵⁵ (1) Council Regulation (EC) 3381/94 of 19 December 1994 setting up a Community Regime for the control of exports of dual-use goods; (2) Council Decision (EC) 94/942/CFSP of 19 December 1994 on the joint action adopted by the Council on the basis of Article J.3 [now Article 13] of the Treaty on the European Union concerning the control and exports of dual-use goods.

⁵⁶ Official Journal L 159, 30 June 2000, pp. 1-215, see Article 23. This regulation has been amended by Council Regulation (EC) No 2889/2000, dated 22 December 2000 (Official Journal L 336, 30 December 2000, pp. 1-14. Yet, the Commission (of the European Communities) published another proposal amending the Council Regulation (EC) No 1334/2000 with regard to the list of dual-use items and technology when exported (Doc. COM(2001)54 final, dated 31 January 2001).

⁵⁷ signed in Marrakesh on 15 April 1994, entered into force 1 January 1996.

⁵⁸ Pursuant to Art. XXII GPA and Art. 4 of the Understanding on Rules and Procedures Governing the Settlement of Disputes.

⁵⁹ WTO document WT/DS73/1 (GPA/D1/1), 1 April 1997.

⁶⁰ *ibid.*

⁶¹ *Domenico Giorgi*, WTO and Space Activities, Proceedings of the 3rd ECSL Colloquium on International Organisations and Space Law, Perugia, 6-7 May, 1999, ESA SP-442, June 1999, p. 411. See also WTO document WT/DS73/4 (GPA/D1/2), 8 August 1997 announcing a mutually agreed solution between the parties.