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THE REGULATION OF COMMERCIAL SPACE LAUNCHES: THE DIFFERENCES BETWEEN THE NATIONAL SYSTEMS

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Abstract

The commercial space industry is entering a phase of increased competition as new providers arrive to challenge the market share of the well-established launch service providers. To comply with international treaty obligations, legislators and regulators in traditional launch States and proposed launch States have responded with a range of laws and regulations. One of the important considerations for commercial launch customers will be the regulatory implication of choosing a particular launch provider in a particular country. Therefore differences in the requirements imposed under national regulatory systems will increasingly become a competitive issue between launch providers. There are some common elements in the approaches of individual States to the licensing, liability, insurance, and a safety standard required for commercial space launches but there are also some important differences. This reflects the diversity in constitutional processes, legal systems, geographical features, administrative systems, industrial framework, foreign policies and economic goals of different countries or trading blocks. This paper compares a number of regulatory systems and analyses some of the similarities and differences from the perspective of potential launch customers.

Introduction

Statistics reveal that the number of commercial space launches worldwide tripled from an average of 12 launches a year between 1990 and 1994, to between 36 and 37 commercial launches between 1997 and 1999[1]. Current forecasts[2] are that there will be an average of 32 commercial space launches worldwide until 2010[3]. Apart from a small reduction in demand, the industry is also becoming more competitive because of the number of new launch projects, involving both existing and new launch vehicles that are currently being developed or proposed.[4]

Commercial space launches are activities conducted within the broader

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scope of international Treaties, Conventions, Principles or Recommendations ("Instruments") to which States and international organisations may be parties.[5] States Parties to these Instruments, as subjects of international law, are either legally, politically or morally bound to honour these obligations[6].

Changing conditions and the ever growing participation of non-governmental entities in space activities, including commercial space launches, have increased the focus on the need for national laws and other appropriate internal measures[7]. The content and operation of national laws and consequent internal regulations and procedures constitute one of several important considerations for commercial launch customers. Therefore differences in the requirements imposed under national regulatory systems will increasingly become a competitive issue between launch providers and prospective customers. The varying obligations and structure of existing national regimes are therefore at the crux of this paper.

Section 2 of this paper briefly considers the provisions of the international instruments from which national legislation, as applicable to commercial space launch services, stems. The paper also discusses the relationship between a commercial launch provider and a supervising State. This is followed by a comparative examination of salient provisions contained in existing national regimes including those of the United States of America, the Russian Federation, South Africa, Sweden, the United Kingdom and Australia.

Legal basis and implications for commercial space launches within National Regimes

The international instruments[8] that constitute the basis upon which national laws rest, as applicable to commercial space launches, impose an obligation on States Parties to authorize and continually supervise[9] the activities of non-governmental entities under their jurisdiction and control. Furthermore, a State is potentially liable for damage caused by its activities to another State Party in air space or outer space[10]. Such liability may be deemed as strict or based on the establishment of fault depending on where the damage is caused[11]. These treaty based binding obligations on States to authorize and continually supervise non-governmental entities, combined with the need to create a mechanism that caters for the possible financial exposure to claims from other countries,[12] has resulted in the promulgation of appropriate national laws within a number of jurisdictions.

The following analysis considers the national systems within the context of the two main issues of concern to a potential launch customer: Licensing and Contractual Conditions (including liability, risk allocation, insurance and indemnification arrangements) as well as a possible third issue concerning export control regulations.

United States of America

Within the U.S. a commercial space launch licensing process involves: a pre-application consultation; policy review and approval; safety review and

approval; payload review and determination; financial responsibility determination and environmental review. The Federal Aviation Administration's Associate Administrator for Commercial Space Transportation supervises this process.[13] License applications are evaluated on an individual basis and issued upon a satisfactory finding that an applicant's proposal to operate a launch site does not jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests or international obligations of the U.S. Licenses may be launch[14] specific or issued to an identified launch operator[15].

With regard to risk allocation, the practice established by the Commercial Space Launch Act obliges commercial parties to purchase US$500 million in insurance for third party liability. This excludes insurance covering the commercial entity itself and the government. The government undertakes to indemnify claims between US$500 million and US$1.5 billion[16]. Within the U.S. regulatory system for commercial space launches, the issue that has been perhaps most critical in recent times is the application of export controls imposed under the terms of the 1998 National Defence Authorization Act ("NDAA").[17] Furthermore the U.S. is party to a number of bilateral agreements with Russia[18], and China[19]. The application of the NDAA and bilateral agreements has seen the introduction of foreign policy objectives into the traditional licensing process with an attendant effect on the choice of launch service providers vis-à-vis U.S. manufactured satellites, by commercial space launch customers.

Russian Federation[20]

The regulatory regime of the Russian Federation concerning space activities is set forth in a variety of national laws and regulations rather than a single instrument. These include the Constitution of the Russian Federation, Federal Laws, Government Resolutions and Orders as well as normative legal acts of Federal executive bodies.[21] For the purposes of licensing commercial space launches, pertinent national instruments are the Russian Federation Law on Space Activity of 1993[22] ("Federal Law") and the Statute on Licensing Space Operations – No. 104 of 1996. However the statutes do not stipulate a clear-cut mechanism but subject space activities, of national or foreign citizens and organizations involved *inter alia* in launching, to licensing requirements. In other words, the types, forms and terms of licenses, conditions and procedures for their issue, withholding, suspension or termination are deemed to be generally regulated by the legislation of the Russian Federation.

Although the Federal Law[23] provides that State bodies and other organizations[24] including their officials, as well as citizens, may assume liability in accordance with the laws of the Russian Federation, the requirements concerning risk allocation, insurance and indemnification arrangements are somewhat unclear. This is because the Federal Law[25] imposes an obligation to take out compulsory insurance coverage regarding cosmonauts, space infrastructure workers as well as third parties, while insurance coverage

regarding the risks associated with loss, insufficiency or failure of space technology is optional.[26] The Russian Federation's Civil Code is intended to establish the procedures and conditions establishing possible compensation to be paid pursuant to insurance cover.[27] However, it is contended that in practice, the lack of coherence in the aforementioned statutes have necessitated resort to local norms and legal acts by which the Russian Federation as a launching country, represented by Rosaviacosmos, assumes liability for possible damage caused by commercial launch related activity. This is achieved by inserting specific conditions into individual launch service contracts.[28]

South Africa

The Federal Republic of South Africa is not, at the time of writing this paper, a player in the provision of commercial launch services. However, the Space Affairs Act, No. 84, 1993 ("the Act") provides for the licensing of commercial space launches[29]. The Act's provisions address launches conducted from South Africa, overseas launches involving legal personalities incorporated or registered in South Africa and the operation of launch facilities. It elaborates on the conditions for grant; mandatory notifications; amendments, suspension and revocation of licenses. With regards to risk allocation and insurance requirements, the Act generally requests that a licensee provide security to the South African Council for Space Affairs, to meet obligations that may be incurred by the said licensee resulting from the cause of damages[30].

Sweden

Swedish regulation applicable to commercial space launches is contained in the Act on Space Activities (1982:963) ("the Act") and the Decree on Space Activities (1982:1069)[31] ("the Decree") respectively. The Act sets forth the jurisdictional structure for national space activities, thereby providing the basis for authorisation procedure. In particular licenses are obtained after analysis and approval by the government based on the recommendation of the Swedish National Space Board. Licenses may also be revoked under specific circumstances. However with regard to risk allocation it is contended that the provisions of international conventions regarding strict liability have been incorporated into Swedish Legislation by special statutes. These statutes provide for reimbursement of liability incurred by the State.[32]

United Kingdom[33]

Although the UK Outer Space Act of 1986 ("the Act") describes the activities to which it applies as including, *inter alia*, launching or procuring the launch of a space object, the Act was drafted with satellite operators and suppliers in mind, rather than launch service providers. It was intended that the Act should be applicable to activities whether carried on in the UK or elsewhere, and governs UK nationals, as well as firms and bodies incorporated under any law of any part of the UK. Pursuant to the Act, licenses are granted at the discretion of the Secretary of State after satisfaction of specified conditions and breach of which may attract criminal penalties.

On matters related to liability and indemnification by commercial parties, a third party insurance policy must be taken out to the sum of £100 million for each stage of the mission and the policy must also insure the UK Government. Should any third party damage occur, the launch operator is obliged to indemnify the UK Government with respect to any international claim arising under the Liability Convention. The Act does not specifically require the launch operator to have insurance with respect to this liability.

Australia

When the Space Activities Act of 1998 ("the Act") was introduced, the government placed emphasis on setting out the legislative framework necessary to facilitate commercial space launches from Australia[34] and launches of Australian payloads from overseas sites. In broad terms, the two primary objectives of the Act are to ensure public safety and for Australia to meet its international obligations, including its obligations under the Liability Convention by requiring all launch activities to be insured to cover any damage that may be caused during the launch and the period following the launch[35]. In particular, the Act creates various categories of approvals including: space licenses[36]; launch permits[37]; overseas launch certificates[38]; approvals for the return of overseas-launched space objects and exemption certificates[39]. Because the Act aims to ensure that parties potentially liable[40] for damages caused by a launch, mitigate the risks involved in commercial space launches, which are inherently hazardous by nature, the approvals attract attendant insurance and safety requirements.

In order to satisfy insurance requirements under the Act, parties must insure against or otherwise prove financial capacity to pay compensation for damage to third parties that the launch or return causes, as well as the Australian Government's liability under international law (including under the liability Convention) to pay compensation for such damage. The amount of insurance required is determined by reference to a pre-estimate of the probable total monetary compensation payable arising from each launch (known as the Maximum Probable Loss).[41] The Australian domestic licensing regime can thus be described as benefiting all parties involved in commercial launches because it provides a predictable, transparent regulatory environment for launch operators and investors; it allays concerns about public safety and compensation for damage under domestic law; and it ensures that the government is indemnified for possible international claims.

Conclusions

Not all space-faring nations with existing commercial launch capabilities have domestic legislation specifically intended to regulate commercial launches.[42] Of the countries currently providing commercial launch services, only the United States and the Russian Federation can be said to have addressed the issue of the licensing and contractual responsibilities of the parties in national legislation. Some countries that have no

plans to establish commercial launch services have nevertheless enacted laws to establish mechanisms for the regulation of space activities by nationals, including the launch and operation of spacecraft. As an emerging launch nation, Australia has adopted the US model for the licensing and contractual aspects of commercial launch operations.

Constitutional processes, national legal systems, geographical features, administrative systems, industrial framework, foreign policies and economic goals influence each country's laws, regulations and protocols. However the policy goals of the protection of public safety and the need to ensure that launch operators have the financial ability to compensate victims in the event of launch accidents are consistent themes. Another consistent theme is the desire of governments to be indemnified against international claims brought by other governments on behalf of their citizens.

Although compliance with national launch regulatory systems is primarily a problem for launch providers, issues such as the cost of insurance and the complexity of the detailed licensing requirements of each country influence the cost of launch services. Thus, a country's regulatory system can have a direct impact on the competitiveness of its launch services. Other legal constraints, such as the export control of another country, can have an even more direct effect on the choice of launch country.

There are indications that more countries are considering legislation to regulate space activities, including launches. It will be interesting to observe how these countries will implement domestic licensing systems that achieve an appropriate balance between, on the one hand, protecting public safety and their own liability for international claims and, on the other, promoting the competitiveness of their national launch industries.

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1 Smith P: *Commercial space Transportation: Recent Trends and Projections for 2000-2010* (The Space Transportation Market: Evolution or Revolution, edited by M. Rycroft, Space Studies Volume 5, Kluwer Academic Publishers, 2000, (" ed. Rycroft") at page 12

2 U.S. Federal Aviation Administration and the Commercial Space Transportation Advisory Committee: 2001 Commercial Space Transportation Forecasts, May 2001

3 Id., This indicates a downtown of over 22 percent from statistics for the year 2000, which projected an average of 41.4 launches per year from an 11-year period (2000- 2010). This downturn in expectations is the result of continued funding difficulties encountered by NGSO systems in the wake of bankruptcies and market uncertainties

4 Mace, C., Christensen, C., Lucas, G: *The Space Launch Services Industry: Indicators and Trends*, ed. Rycroft at page 295

5 Including *inter alia*, Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space 1967, including the Moon and Other Celestial Bodies 1967; Convention on International Liability for Damage Caused by Space Objects 1972; Convention on Registration of Objects Launched into Outer Space 1975

6 Kopal, V.: *International and National Space Law*, Need and Prospects for National Space Legislation (Proceedings of the Project 2001-Workshop on National Space Legislation), 5/6 December 200, Munich, Germany, at 185

7 *Id.*,

8 *Supra* at note 5

9 Article VI of the Outer Space Treaty (1967)

10 Article VII of the Outer Space Treaty (1967)

11 Article II of the Liability Convention (1972)

12 Articles XI, XII and XIII of the Liability Convention (1972) provide general guidelines for establishing the extent to which a State, deemed to be liable for damage, may indemnify other States parties who have suffered damage.

13 Pursuant to the provisions of the Public Law 105-303: Commercial Space Act 1998; 49 USC Chapter 701: Commercial Space Launch Activities 1998 and

Title 14 US Code of Federal Regulations (Aeronautics and Space) Chapter III: Commercial Space Transportation Federal Aviation Administration Department of Transportation (Parts 400-499).

[14] This sort of license authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site. The license identifies, by name or mission, each launch authorized under the license. The license lapses upon completion of all launches it authorizes or by a stated expiry date.

[15] The license granted to a launch operator authorizes the licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads

[16] See generally: Stalmer E.: *A brief Overview of the US Space transportation Industry and Issues impeding Future Success*, Legal Framework for Commercial Launch and Associated Services, Proceedings of the Project 2001 Workshop on Commercial Launch Activities, 19 January 2000, Bremen, Germany, at 31 to 37

[17] This follows on Allegations of transfer of sensitive technology to China, leading to the tightening of the export licensing process and transferring the authority for licensing the export of satellites from the Department of Commerce to the Department of State

[18] See note 23 *supra*

[19] Memorandum of Agreement between the Government of the United States of America and the Government of the ,Peoples Republic of China regarding international trade in launch services, 1995 and the Amendment dated October 1997

20 The Russian Federation is also a signatory to a bilateral agreement with the Government of the United States of America regarding international trade in commercial space launch services, 2 September 1993. The terms of this agreement (Article IV) impose restrictions/launch quotas on the number of commercial space launches that may be conducted by Russian space launch services on behalf of international customers

21 Gubarev V.A. *et al*: *Civil liability to third Parties in the Course of Russia's International Co-operation in Outer Space: Legal Regulation Issues*, Legal Framework for Commercial Launch and Associated Services, Proceedings of Project 2001 – Workshop on Commercial Launch Activities, 19 January 2000, Bremen, Germany ("Gubarev et al") at 159

22 Article 9 subjects the activities of national/foreign, citizens/organizations involving *inter alia* launching to licensing

23 Articles 29 and 30 respectively

24 It is contended that these State bodies or organizations include: The Russian Aviation and Space Agency (Rosaviacosmos) and the Russian Federations Ministry of Defence. See: Gubarev V.A. *et al* at 163

25 Article 25

26 Article 25 (2)

27 Article 30

28 Gubarev V.A. *et al*, supra at 165 to 166

29 Section 11

30 Section 14

31 The provisions of the Decree are more related to defining the role of the Swedish National Space Board regarding the authorisation and supervision of licensed space activities and setting forth the national requirements for the registration of space objects

32 Hedman N.: *Presentation of the Swedish legislation on space activities*, Need and Prospects for National Space Legislation, Proceedings of the Project 2001 Workshop on National Space Legislation 5/6 December 2000, Munich Germany, 136 to 137

33 See generally Close R. :*Outer Space Act 1986: Scope and Implementation*, Need and Prospects for National Space Legislation, Proceedings of the Project 2001 Workshop on National Space Legislation 5/6 December 2000, Munich Germany, 141 to 147

34Davis M: *Establishing a Space Launch Industry: The Political and Regulatory Considerations*, ed. Rycroft at page 209

35 See: *Statement by the Delegation of Australia*, Review of the Concept of Launching State, U.N. Document. A/AC.105/C.2/2001/CRP.10, 11 April 2001. See Also Part I § 3 of the Space Activities Act of 1998.

36 See: Part III Division 1 §15 and Part III Division 2 of the Act state the requirement of a space license to cover particular launch facilities and launch vehicles. They set forth the criteria for grant, terms and conditions, procedures for transfer, terms for suspension and possible civil penalties in the event of infringement pursuant to the Acts Part 6

37 See: Part III Division 1 § 11 and Division 3 of the Act state that launches in and connected returns to Australia require a launch permit or exemption certificate. They set forth criteria for grant, terms and conditions, procedures for transfer, terms for suspension and possible criminal penalties for their infringement under the Australian Criminal Code and Crimes Act of 1914 ("Criminal Statutes").

38 See: Part III Division 1 §12 and Division 4 of the Act state that where an Australian national is a responsible party for an overseas launch, an overseas launch certificate is required, contravention of which may attract criminal penalties under the Criminal Statutes

39 See: Part III Division 1 §13, 14 and Division 5 of the Act state that the return of over-seas launched space objects must be authorised, contravention of which may attract criminal penalties under the Criminal Statutes

40 See Part 4 Division 1 & 2 of the Act which set out rules applicable to damage caused by a space object if the object is launched from or returned to Australia or if Australia is a launching State in relation to the

object. The provisions are applicable during the liability period for the launch (liability commencing at the time of the launch and continuing for 30 days) or return (commencing when the relevant re-entry manoeuvre begins and ends when the object comes to rest on the Earth)

41 The proposed methodology by which this will be calculated (subject to future regulations) would involve: ascertaining the probable area of impact; preparing a risk analysis to identify the possible modes of failure, vehicle debris area and effective casualty area; determining the probability of damage to third parties and third – party casualty; super-imposing the effective casualty area on the densest population area under the flight path; multiplying the number of potential casualties by an assumed value of A$5 million per person to determine the value of loss of life; adding the value of third – party property losses (estimated at 50% of the value of loss of life); adding a fixed sum of A$100,000 for short term environmental damage to the above. See Davis M.: Space Legislation: *The Australian Experience*, Need and Prospects for National Space Legislation, Proceedings of the Project 2001 Workshop on National Space Legislation, 5/6 December 2000, Munich Germany

42 For instance the Government of France backs the Arianespace launcher with 57.06% shareholding of the 12 European countries participating in the Ariane program. At the time of writing this paper, it is establishing the modalities for the eventual promulgation of a French regulation for space activities. Since 1956 China has operated the Long March launch vehicle group containing 12 types of launch vehicles, but to date the Government is still in the process of issuing a licensing regime for commercial launch services. See: *Chinese Statement on the Concept of Launching State*, U.N. Document. A/AC.105/C.2/2001/CRP.10, 11 April 2001. Similarly, although Japan operates the H-II and HII-A launch vehicles, the national legislation titled "Law Concerning the National Space Development Agency of Japan" does not address or make provisions for commercial space launches.