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LAUNCHING ALCANTARA INTO THE GLOBAL SPACE ECONOMY - THE 2001 BRAZILIAN NATIONAL SPACE LAW

The Continuing Story Of National Implementation
Of International Responsibility And Liability, Part II

Frans G. von der Dunk*
International Institute of Air and Space Law, Leiden - The Netherlands
F.G.vonderDunk@law.leidenuniv.nl

Abstract

In the summer of 2001, with the Administrative Edict No. 27, Brazil became the ninth nation world-wide to establish a national space law in the narrow sense of the word – an act focusing exclusively on space activities and prominently including a system for encapsulating private participation in such activities within the state's jurisdiction, international responsibilities and international liabilities. After five Western states, two former communist nations and the special case of South Africa, Brazil may pride itself on being the first proper developing state taking such a fundamental step.

No doubt, the prospect of opening up the Alcantara launch base to international or even foreign launch operations in a manner beneficial to Brazil constituted a major reason behind the enunciation of the Brazilian Edict. Recently, Brazil has concluded the first international agreement – with the Ukraine – to this end, whilst discussions with the United States and the Russian Federation are ongoing.

The paper will address the international (legal) background to the enunciation of the Edict, in particular taking into consideration the fact that Brazil is the first proper developing state creating a national space law. It will also describe and analyse its contents, and evaluate the possibilities offered by it, as well as the obstacles still present. Finally, it will briefly touch upon the relationship between the Edict and the international negotiations referred to above.

1. Introduction

It is by now beyond doubt, that a major consequence of the Outer Space Treaty's[1] Articles VI, VII and VIII, of the Liability Convention[2] and of the Registration Convention[3] is the requirement for an increasing number of states to regulate private space activities by means of national legislation largely or exclusively dedicated to space and space activities.

This is not the place to go into the details of these provisions, or even into the major uncertainties and the absence of clarity still surrounding some of the key concepts concerned. Much attention has been devoted to these issues by experts, but for the present purpose the following summary should suffice.[4]

Firstly, Article VI of the Outer Space Treaty calls upon states to authorise and continuously supervise "national activities in outer space", if conducted by private entities, as they would anyhow be

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held responsible for them at the international level. Secondly, Article VII of the Outer Space Treaty provides for liability for damage caused by space objects in such a fashion that states are made liable also if the damage should actually be attributed to a private space activity. This fundamental liability-clause is, of course, considerably elaborated and expanded by the Liability Convention. Thirdly, Article VIII of the Outer Space Treaty, reinforced by the Registration Convention, offers states an additional means of actually exercising authorisation and supervision over private space activities, at least to the extent these involve nationally registered space objects.

As has also been reflected in many expert opinions, as a result of the gradually increasing involvement of private entities in space activities over the last decades a growing number of states have enacted national space-dedicated legislation to deal with such involvement.[5] At present, still more states seriously consider the need or desirability to follow those examples.[6]

2. The Brazilian Edict and Regulation

The most recent addition to the list is Brazil, where in 2001 an Administrative Edict was issued dealing with the most prominent aspects of private participation in outer space activities.[7] In doing so, Brazil became the first developing nation with proper national space legislation. Thus, it is of special interest from the perspective of globalisation and 'normalisation' of space activities to analyse this Edict, and to evaluate how it fits into international space law as briefly sketched above, in comparison with the few non-developing states with national space legislation.

In doing so, the paper will focus on four elements which are of major importance. The first element is that of the licensing obligation as such, and the general aspects as to scope and extent. The second concerns the subject of liability, in particular with a view to obligations to compensate damage occurring in view of the potentially enormous financial consequences. The third focuses on a problem of special importance for developing states: the need to find a balance between the desirability to attract foreign capital (especially from developed nations) whilst maintaining the (economic) sovereignty required to ensure that Brazil would also benefit sufficiently from any space activities under the Edict. Finally, another topic of special importance for developing nations concerns international co-operation, at this point mainly at the intergovernmental level. This concerns the various co-operation schemes of Brazil with the Ukraine, the United States and Russia.

The Administrative Edict of 20 June 2001, which was issued by the Brazilian Space Agency (AEB) under the authority of the Ministry of Science and Technology, actually consists of two parts. Even if the name 'Edict' may perhaps suggest otherwise to some readers, it is a binding piece of law under the Brazilian legal system, and may for example be directly invoked before a court.

The Edict proper contains four operative Articles, of which the first one is the most important. It provides for approval of the Regulation which is enclosed and which in turn deals with the substance of private involvement in space activities.[8]

Further to the Edict, the Office for Standards and Licensing may enact implementing regulation on technical and administrative actions related to the licensing procedures.[9] The Edict itself revokes a previous Administrative Edict which dealt with the Brazilian Space Agency's role *vis-à-vis* possible private participation in space activities[10], whilst the enclosed Regulation enters into force upon publication in the Brazilian Union's Official Gazette.[11]

It is thus the Regulation which provides for the substantive issues related to the licensing of private space activities, arguably the most important element of any national space law in the narrow sense of the word.[12]

3. General Aspects: the Licensing Obligation

The first aspect which draws attention when scrutinising the Regulation is that it focuses exclusively on *launching* activities.[13] In this respect it follows the same road as Norway[14] and Australia[15], and to some extent also the United States where originally separate Acts were established for launch activities.[16] In addition, it may be noted that as far as satellite communications as a space activity is concerned, in general terms it would fall within the scope of authority of the Brazilian Ministry of Communications, and within the scope of applicable Brazilian legislation on telecommunications.[17]

The intention of Edict and Regulation, in short, clearly is to focus on the possibilities offered by Brazil's operating launch site Alcantara[18] in Maranhão (and possibly also the launch site at Barreira do Inferno in Natal) to attract and generate interesting economic activities and the related economic development.

More to the point, the Regulation focuses on private participation in such activities explicitly: it does *not* apply "to space launching activities that could be carried out by Brazilian governmental organisations or bodies".[19] Whilst of course this means that *foreign* governmental launch activities from Alcantara would in principle also fall under the regime provided for by the Regulation, it is rather hypothetical such a case would arise without a specific state-to-state agreement superseding the Regulation's provisions on relevant points.

The obligation for any private entity interested in carrying out launching activities in Brazil to obtain a license provides the basis for governmental control over the ensuing activities. The Brazilian Space Agency AEB, an autonomous but federal organisation with a civil nature, is entrusted with the competence to issue such licenses, as well as controlling and supervising them, and if necessary, taking enforcement action with respect to them.[20] Such actions are further specified already to a considerable extent in the Regulation[21], whilst other aspects of the licensing process are also spelled out in quite some detail. This concerns the documentation to be produced,[22] enabling procedures for licensing,[23] and administrative sanctions and appeals.[24]

In short, the AEB avails of competencies and mechanisms to assert supervision and control which seem quite sufficient at this stage to fulfil the requirements of Article VI of the Outer Space Treaty.

As has already arisen from the previous reflections, the scope of Edict plus Regulation and the ensuing licensing obligations is confined to launching activities from Brazilian territory[25]. One might perhaps read from this that Brazil interprets the phrase "national activities" as relevant for Article VI of the Outer Space Treaty as referring to "activities conducted from national territory", although it is more likely that for merely practical reasons – the focus on Alcantara – the possibility of Brazilian (private) companies becoming decisively involved in launch activities *outside* Brazil has simply not been taken into consideration. Legally speaking, however, arguably under Article VI of the Outer Space Treaty international responsibility of Brazil may arise for such activities as well.

The license itself is defined as "the administrative deed (...) granted to a juridical person, single, an association or consortium, for the purpose of carrying

out space launching activities on Brazilian territory".[26]

It may be noted further, that licenses shall "only be granted to juridical persons, single as well as associations or consortia, having headquarters or a representation in Brazil".[27] The first category – having headquarters in Brazil – actually reflects the traditional general international law-criterion for the nationality of a private juridical entity.[28] In other words: the Regulation refers here to Brazilian private entities recognised as such under international law.

The second category – having a representation in Brazil – refers consequently and by contrast to non-Brazilian private companies, and will therefore be dealt with further below.

4. Licensing and Liability

One of the major issues of importance to deal with in the context of the license concerns the consequence of state liability as determined at the international level. Under the Liability Convention Brazil qualifies as a "launching state" – and hence as a liable state – in respect of every space object launched from Brazilian territory.[29] This, irrespective of whether Brazil itself has also procured the launch, i.e. of whether a Brazilian space object is being launched into outer space, and more importantly, also irrespective of whether private entities are involved in, or even conducting the launch.

The consequences of such international liability of Brazil in respect of every launch, including private ones, from Alcantara is obvious.

For damage caused to another space object thus launched Brazil would be held liable to the extent the claimant could prove fault on the part of Brazil (or the entity actually in charge).[30] When the damage caused by such space object would be inflicted upon the earth's surface (or to aircraft in flight) Brazil would not even be allowed to plead absence of fault, since absolute liability applies to such cases.[31] It may be noted that the Regulation defines relevant cases of damage closely following the terms of the Liability Convention.[32]

Once liability has been established, moreover, the compensation which Brazil would have to provide to the claimant, would be in principle without limit, since it has to result effectively in *restitutio in integrum*.[33]

It is obvious – as is clear also from the other existing national space laws to the extent dealing with launches – that in any given case the license offers an excellent option to deal with these issues.

Firstly, in the license a derogation clause may be inserted, essentially obliging the licensee in applicable cases to reimburse any international third-party liability claim which the government concerned would be obliged to honour under the Liability Convention. So far, two general approaches to the derogation issue can be distilled from the existing examples of states which have established some form of national space legislation.

Either reimbursement is statutorily comprehensive, allowing at best for the option on the part of the government to *ad hoc* desist from claiming full reimbursement, or a statutory limit to compensation is provided for.[34] In the latter case, the clear intention of the governments is to stimulate private launch activities by offering launch service providers a realistic possibility to either self-insure or obtain commercial insurance, and consequently accepting that in catastrophic cases quite likely the national treasury will have to be called upon to bear the part of the claim over and above the maximum.

Secondly, the license may provide for obligatory insurance – usually up to a maximum amount – in order to ensure that in any real-life case financial resources are there to actually reimburse the government – at least to the extent of the maximum insurance. This approach is

followed by some if not all of the national space laws so far enacted.[35]

In the case of Brazil, where the reimbursement and insurance obligations are dealt with together, there seems to be room for granting a cap to the reimbursement obligation in a given case. The AEB, the authority granting the licenses, may "assess liabilities" in case of an application for a license.[36] Also, the "economic and financial qualification" of a particular license applicant will be considered in the licensing process.[37] In this context finally the "purchase of insurance to cover possible damages to third parties, according to the degree of risk of the activities to be carried out by the applicant, where appropriate, in the value previously established by the AEB" has to be proven.[38]

Whilst nowhere a direct provision may be found in the Regulation that such insurance coverage includes the reimbursement of possible claims which the Brazilian government may face under the Liability Convention as a consequence of the licensee's activities, a later Regulation ensured that in the license proper such reference will be included.[39]

Following from this, then, the phrasing of "in the value previously established by the AEB" indicates that somehow such liability, respectively reimbursement obligation, will, or at least in individual cases may, be subjected to an – as of yet unspecified – maximum. For proper juridical certainty, however, one would have to wait for a new and broader law currently under discussion, where the tendency seems to be towards adopting the 'maximum probable loss' approach known from United States and Australian national space legislation.

5. Foreign Participation in Brazilian Launches

In particular for a developing country like Brazil, in order to develop the economy in such a highly technological and expensive sector as the space industry, notwithstanding the impressive home-grown capabilities in this area substantial participation in one way or another of foreign capital – in particular of a private nature – and know-how is evidently desirable, if not plainly necessary.

Developing countries are in such a situation always confronted with a dilemma, however: the best way to attract foreign capital and foreign participants is to allow them a large measure of freedom and discretion in handling their business affairs, yet the larger such freedom and discretion is, the more the country concerned runs the risk of loosing not only control over, but also major benefits from the economic activities thus generated.[40] Moreover, also wider issues of sovereignty, e.g. as to national security, may be at stake.

How this balance is going to be realised in the case of Brazil is not yet fully elaborated. The Regulation provides the first general parameters: for a start, in principle it allows – as mentioned – foreign juridical entities to be granted a license in case of representation of such an entity in Brazil.[41] 'Representation' in this context refers to physical presence through a local office; by contrast, e.g. the presence of a person empowered to represent a company in contractual negotiations, or of a bank account of the company with a Brazilian bank is not sufficient.

This provision is further elaborated in that alongside other relevant documentation a decree of authorisation has to be shown in order for a license application to be successful,[42] and even more concretely, "documentary evidence that the applicant has legal representation in Brazil with express powers to be subpoenaed and to answer both at administrative and court levels".[43]

More particular controls in regard of foreign applicants to protect Brazilian sovereign interests are also to be found. The applicant has to confirm being

informed about "local conditions, including the Security Regulations and Procedures established by the AEB or by the Launch Center".[44] He has to commit himself to safeguarding applicable technology transfer regulations, "as determined by the pertinent authority of the Brazilian Government".[45] The AEB reserves its right to consult in the course of the licensing process *inter alia* with Brazilian governmental bodies on security and foreign policy interests of Brazil, and how these should be reflected in a particular license.[46]

Article 14 of the Regulation furthermore is exclusively dedicated to foreign licensing applicants. It obliges such entities to present proper documents from their respective home states "as to their being licensed to perform the launching activities intended."[47] An interesting issue would arise wherever such home state does *not* itself have a relevant licensing system in place, but apparently such cases are for the time being left to be dealt with in a pragmatic *ad hoc* manner.

Also, the AEB is expressly authorised to make grant of a license dependent upon the existence of safeguard agreements relating to technology transfer between the home state of the foreign enterprise and the Brazilian government,[48] which amongst others fulfils Brazilian obligations under international law to ensure non-proliferation of particular military or dual-use goods for example under the Missile Technology Control Regime (MTCR).[49]

Thus, the Regulation seems to provide in particular the AEB with sufficient competencies and instruments to ensure that Brazil's interests – not just of an economic nature, but certainly including those as well – can be duly protected in the course of licensing foreign launch service providers interested in Alcantara. Whilst these provisions seem fair and reasonable – for example, no specific economic or financial restraints in terms of capital transfers are provided for by the regulation – the proof of the pudding is in the eating: whether foreign entities involved in launch service provision will come to a similar conclusion will probably depend on the way the first few licenses will turn out to deal in detail with these issues.

6. International Co-operation

From an abstract perspective, the development of international co-operation schemes has been mentioned as another important approach for a developing country to develop a sector of the economy of such knowledge- and capital-intensive nature as the space business.

And indeed, Brazil has entered into bilateral co-operation agreements with the United States as a participating entity to the International Space Station[50] and on participation of US launch companies in launches from Alcantara, and with the Ukraine equally on launches from Alcantara, whereas discussions with the United States, Russia, Germany, France and India on further co-operative agreements are taking place.[51] The bottom line of all these international co-operation efforts, however, is that they concern *intergovernmental* agreements, with the accompanying political overtones.

In January 2002 Brazil and the Ukraine signed a Technological Safeguard Agreement and a related Memorandum of Understanding relating to the commercial use of the Zyklon-4 launch vehicle from Alcantara. Consequently, the Ukrainian government announced its willingness to invest the money needed to construct a special launch pad at Alcantara suitable for the Zyklon-4.

Both agreements together also are generally envisaged to help convincing the Brazilian National Congress to approve a similar Safeguard Agreement between the United States and Brazil of April 2000 relating to participation of US launch companies in launch operations at Alcantara.[52]

As mentioned, in view of the rather exclusive focus of the Regulation on private launch activities and the licensing thereof,[53] the Regulation does not refer to such international co-operative efforts at all. And indeed, it is quite unlikely that any foreign government, interested in launching from Alcantara under a multilateral or bilateral co-operation agreement, will accept to enter itself the licensing process as provided for by the Regulation. In the event of such an interest, it will rather be dealt with directly in the agreement, or in elaboration of it, which agreement will then replace the licensing process proper.
Private launches under such bilateral agreements however would be another matter, nothing in principle precluding application of the licensing process under Edict and Regulation.
Of course, this is largely a matter of conjecture, and it remains to be seen how the Edict and the Regulation either directly or indirectly might relate to the intergovernmental arrangements alluded to.

7. Concluding Remark

With a view to the international legal background to the Brazilian national space legislation as discussed, one final remark is due here. Whilst registration of space objects as such, in line with the requirements of Article VIII of the Outer Space Treaty and the Registration Convention, is not provided for by the current Edict and Regulation, a later Regulation did provide therefore.[54] Brazil clearly qualifies as a launching state in respect of any space object launched from Alcantara, and hence qualifies as potential state of registration.[55]
However, Edict and Regulation do provide for the registration by AEB "of licenses for carrying out space launching activities on Brazilian territory".[56] In view of the close link between the licenses and the launch phases of space objects, and the many details to be collected by the AEB for the purpose of granting a license, in effect this provision comes quite close to materially fulfilling the obligations under the Registration Convention – provided at least that the relevant elements of the registration will be openly accessible.
In sum, the Brazilian Edict and ensuing Regulation form a first coherent effort to establish a transparent, fair and balanced legal framework for private space launches from Alcantara. The waiting is for private license applicants, whether Brazilian or foreign, whether under the umbrella of a bilateral agreement such as the Brazil-Ukraine one or on their own account, but the basis is there: from a legal perspective Alcantara is ready to be launched into the global space economy.

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[1]. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (hereafter Outer Space Treaty), London/Moscow/ Washington, adopted 19 December 1966, opened for signature 27 January 1967, entered into force 10 October 1967; 6 ILM 386 (1967); 18 UST 2410; TIAS 6347; 610 UNTS 205.

[2]. Convention on International Liability for Damage Caused by Space Objects (hereafter Liability Convention), London/ Moscow/Washington, adopted 29 November 1971, opened for signature 29 March 1972, entered into force 1 September 1972; 10 ILM 965 (1971); 24 UST 2389; TIAS 7762; 961 UNTS 187.

[3]. Convention on Registration of Objects Launched into Outer Space (hereafter Registration Convention), New York, adopted 12 November 1974, opened for signature 14 January 1975, entered into force 15 September 1976; 14 ILM 43 (1975); 28 UST 695; TIAS 8480; 1023 UNTS 15.

[4]. For those interested in the author's personal views, reference may be had to Private Enterprise and Public Interest in the European 'Spacescape' (1998), pp. 17-38, which also contains references to a considerable body of expert opinion. See further e.g. M. Uchitomi, *State Responsibility/Liability for "National" Space Activities*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 51-60; G. Gal, *State responsibility, jurisdiction and private space activities*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 61-4; L.F. Castillo Argañarás, *Some Thoughts on State Responsibility and Commercial Space Activities*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 65-70.

[5]. Arguably, in 1969 Norway was the first state to enunciate a proper national space law dedicated primarily to dealing with private involvement in space activities, closely followed by the United States when in 1970 it declared its licensing system under the 1934 Communications Act to be applicable to private operators undertaking space communications activities. Apart from Brazil, to date the following further states have chosen to develop such national space laws: Sweden (1982), the United Kingdom (1986), Russia (1993), South Africa (1993), the Ukraine (1996), and Australia (1998). In addition, the People's Republic of China's Special Administrative Region of Hongkong has its own Space Ordinance since 1999.

[6]. Cf. e.g. on the case of Germany: K.F. Nagel, *Current Plans for National Space Laws – Germany*, in 'Project 2001' – Legal Framework for the Commercial Use of Outer Space (2002), pp. 565-9; on the case of France: P. Clerc, *French Current Plans for a National Space Legal Framework*, in 'Project 2001' – Legal Framework for the Commercial Use of Outer Space (2002), pp. 591-9.

[7]. Administrative Edict No. 27 (hereafter Edict), of 20 June 2001, entered into force 21 June 2001, Ministry of Science and Technology.

[8]. Regulation on Procedures and on Definition of Necessary Requirements for the Request, Evaluation, Issuance, Follow-up and Supervision of License for Carrying out Space Launching Activities on Brazilian Territory (hereafter Regulation). See Art. 1, Edict.

[9]. See Art. 2, Edict.

[10]. Administrative Edict No. 8/AEB, of 14 February 2001; see Art. 3, Edict.

[11]. Art. 4, Edict. As mentioned, the Edict entered into force 21 June 2001.

[12]. See on this discussion also e.g. F.G. von der Dunk & S.A. Negoda, *Ukrainian national space law from an international perspective*, 18 Space Policy (2002), p. 15; F.G. von der Dunk & A. Nikolaisen, *Vikings First in National Space Law; Other Europeans to Follow*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 111-2.

[13]. Cf. already the full title of the Regulation. Art. 1(1), Regulation, defines "space launching activities" for the purpose of the Regulation.

[14]. Act on launching objects from Norwegian territory into outer space, No. 38, 13 June 1969.

[15]. An act about space activities, and for related purposes (hereafter Australian Act), No. 123 of 1998, assented to 21 December 1998; despite the fact that the title suggests otherwise, the Act exclusively deals with launching and re-entry of spacecraft, as

opposed to e.g. satellite communications or remote sensing.

[16]. Commercial Space Launch Act, Public Law 98-575, 98th Congress, H.R. 3942, 30 October 1984; 98 Stat. 3055; as amended by the Commercial Space Launch Act Amendments, Public Law 100-657, 100th Congress, H.R. 4399, 15 November 1988; 49 U.S.C. App. 2615; 102 Stat. 3900; and by Commercial Space Transportation – Commercial Space Launch Activities, 49 U.S.C. Subtitle IX – Commercial Space Transportation, Ch. 701, Commercial Space Launch Activities, 49 U.S.C. 70101-70119 (1994). The Commercial Space Act of 1998 *inter alia* amended these acts, whilst effectively incorporating them.

[17]. E.g. General Law on Telecommunications No. 9.472, of 16 July 1997, in particular Chapter III on the organisation of telecommunications services, including those provided by satellite.

[18]. See on the history of the Alcantara launch base e.g. J. Monserrat Filho & V. Leister, *Brazil-USA Agreement on Alcanatar Launching Center*, in Proceedings of the Forty-Third Colloquium on the Law of Outer Space (2001), p. 329.

[19]. Art. 1(2), Regulation.

[20]. Art. 1, Regulation. The AEB itself had been established by Law No. 8854 of 10 February 1994. See further Art. 3, mandating the AEB to enter into agreements with or hire public and private bodies in order to carry out the necessary supervision and controlling activities.
Further details of the licensing process were provided later by means of Administrative Edict, No. 5, of 21 February 2002.

[21]. See Art. 4, Regulation.

[22]. See Artt. 6-14, Regulation.

[23]. See Artt. 15-19, Regulation.

[24]. See Artt. 20-24, Regulation.

[25]. Cf. title of the Regulation itself, as well as Art. 1.

[26]. Art. 2, Regulation.

[27]. Art. 6, Regulation.

[28]. To be exact, traditionally public international law has used the double criterion of state of incorporation and state of location of headquarters. In practice of course normally both criteria will point to the same state, and even if not, one might well argue that the actual location of headquarters, more akin to such concepts as 'effective link' than mere legal incorporation, should weigh more in determining a company's nationality under international law. Cf. the famous Barcelona Traction case: Case Concerning the Barcelona Traction Light and Power Company, Limited (Second Phase)(Belgium v. Spain), International Court of Justice, 5 February 1970, I.C.J. Rep. 1970, 4.

[29]. Cf. Art. I(c)(ii), Liability Convention. In respect of Alcantara furthermore, at least also under the criterion of the ownership of the launch facility Brazil qualifies as launching, hence liable state.

[30]. See Art. III, Liability Convention.

[31]. See Art. II, Liability Convention.

[32]. Cf. resp. Art. 5, Regulation, further referring to a Resolution of the AEB, CSP/AEB/No. 51 of 26 January 2001, on liability and the international conventions to which Brazil is a party, and (in particular) Art. I(a), Liability Convention.

[33]. Cf. Art. XII, Liability Convention.

[34]. The latter is the case only in the United States, where a maximum limit to reimbursement of US$ 500 million is provided for; cf. Sec. 16(a)(1) & (2), Commercial Space Launch Act as amended; and Australia, where no amounts however have been provided statutorily, only the concept of calculating 'maximum probable loss' is invoked to cap the reimbursement liability in a given case; cf. Sec. 48(3), Australian Act. Though not a case of national space legislation proper, capped reimbursement applies also to Arianespace, where the part of any international third-party liability claim over FF 400 million will be born by France without an obligation resting upon Arianespace to reimburse that part; Artt. 3(9), 4(1), Declaration by Certain Governments Relating to the Ariane Launcher Production Phase, original version of 14 January 1980, repeatedly updated later. See e.g. V. Kayser, Launching Space Objects: Issues of Liability and Future Prospects (2001), p. 142.

[35]. See e.g. for the United Kingdom Sec. 5(2)(f), Outer Space Act, 18 July 1986, 1986 Chapter 38; also R. Close, *UK Outer Space Act 1986: Scope and Implementation*, in 'Project 2001' – Legal Framework for the Commercial Use of Outer Space (2002), pp. 587-9; for the Russian Federation Art. 25(1), Law of the Russian Federation on Space Activities, 20 August 1993, effective 6 October 1993 (and amended 1996).

[36]. Art. 4(V), Regulation.

[37]. Cf. Art. 6(III), Regulation; further Art. 9.

[38]. Art. 9(III), Regulation.

[39]. See Art. 4, also Art. 9(2) sub VI, of the Regulation under Administrative Edict No. 5 (*supra*, note 20).

[40]. Cf. e.g. in detail J. Monserrat Filho & V. Leister, *The Discussion in the Brazilian National Congress of the Brazil-USA Agreement on Technology Safeguards Relating to the Use of Alcantara Spaceport*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 377-9.

[41]. Art. 6, Regulation.

[42]. See Art. 7(IV), Regulation.

[43]. Art. 7(V), Regulation.

[44]. Art. 8(IV), Regulation.

[45]. Art. 8(V), Regulation.

[46]. Cf. Art. 12, Regulation.

[47]. Art. 14(1), Regulation.

[48]. Cf. Art. 14(3), Regulation.

[49]. Brazil became a member of the MTCR in 1995; cf. H.P. van Fenema, The International Trade in Launch Services (1999), pp. 153-4; Monserrat Filho & Leister, *The Discussion in the Brazilian National Congress*, 378, 381-2.

[50]. See e.g. M.H. Fonseca de Souza Rolim, *The USA-Brazil Implementing Arrangement on the International Space Station: Interpretation and Application*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 87-96.

[51]. With Germany, actually an interesting project on micro-gravity experiments on sounding rockets launched from Alcantara is being executed.

[52]. Agreement between the Government of the Federative Republic of Brazil and the Government of the United States of America on Technology Safeguards

associated with the US participation in launches from the Alcantara Spaceport, of 18 April 2000; see further Monserrat Filho & Leister, *The Discussion in the Brazilian National Congress*, pp. 377 ff.; Monserrat Filho & Leister, *Brazil-USA Agreement*, pp. 328-34.

[53]. Cf. Art. 1(2), Regulation; further Artt. 2 & 6.

[54]. See Art. 19 of the Regulation under Administrative Edict No. 5 (*supra*, note 20).

[55]. It may be noted that so far Brazil is not a party to the Registration Convention, though currently in the process of becoming one; cf. A. Fabricio dos Santos, *Brazil and the Registration Convention*, in Proceedings of the Forty-Fourth Colloquium on the Law of Outer Space (2002), pp. 78-85.

[56]. Art. 27, Regulation.