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The Second African National Space Law: The Nigerian NASRDA Act and the Draft Regulations on Licensing and Supervision

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Abstract

The number of countries with more or less comprehensive national space legislation addressing in particular the authorization and supervision of private space activities continues to grow, and several more countries are currently in the process of adding themselves to that list. One of the more recent and most interesting ones among them is Nigeria, as the second African country after South Africa and — after Brazil — the second leading spacefaring nation from the developing world, to draft, further to a fairly recently established succinct framework law, a set of regulations addressing precisely those issues.

The paper briefly recaps the underlying international obligations, in particular as following from Articles VI, VII, and VIII of the Outer Space Treaty, the Liability Convention, and the Registration Convention, Nigeria being a party to all three. It then proceeds to analyze the 2010 National Space Research and Development Agency Act and the 2015 draft Regulations on the Licensing and Supervision of Space Activities from the above perspective. It will compare the Nigerian legislation as needed or helpful with other national space laws already pronounced on those issues, and in doing so will take Nigeria's role as leading African nation in outer space in this respect into consideration. This will finally allow for some conclusions as to the contribution to the further development of (international and national) space law represented by these Nigerian legislative efforts.

1. Introduction

There is little doubt that the entry of private enterprise into outer space is one of the most fundamental developments in space law, as requiring a specific form of national space legislation providing for appropriate authorization and supervision. The number of countries establishing such legislation is consistently growing, and no longer confined moreover to the Western world, which had always been attuned to an important role of private enterprise in economy and society, and the formerly communist countries led by the erstwhile Soviet Union, which at least had comprehensive experience with space activities.

Nigeria, a leading country in Africa also in terms of outer space, in 2010 established the National Space Research and Development Agency Act (NASRDA Act)¹ and is as of this writing in the process of preparing further regulations,² both relevant in the context of allowing the entry of private enterprise into outer space under the aegis of the Nigerian government. Thereby, Nigeria became the second country in Africa³ after South Africa⁴ and the second leading spacefaring nation from the developing world after Brazil⁵ to develop national legislation addressing such a role of the private sector. Already for that reason alone it is worthwhile to analyze and evaluate this new example of national space legislation.

2. Nigeria and the international space law framework for private space activities

Nigeria is a party to the first four of the space treaties developed in the bosom of UNCOPUOS: the Outer Space Treaty,⁶ the Rescue Agreement,⁷ the Liability Convention,⁸ and the Registration Convention.⁹ While the Rescue Agreement and its substantive regime may become relevant once private manned spaceflight activities in Nigeria would become feasible, at this stage it is primarily the other three treaties that are important as they provide the main structural principles for any national law dealing with private space activities. For the present purpose the three most important among those principles may be summarized as follows.

First, Nigeria is internationally responsible for “national activities in outer space” also if conducted by private entities, and is under an obligation to authorize and supervise such activities for the purpose of compliance with international space law.¹⁰ While other means would in principle exist to implement that obligation to authorize and supervise, the most comprehensive and transparent legal mechanism is by way of a national space law including a licensing system. The scope of that licensing system *ratione materiae* as well as *ratione personae* should of course encompass in particular all “national activities in outer space” referenced above. Here, however, in the absence of an authoritative interpretation on the international level, each state has to make up its own mind as to precisely which categories of space activities to license, read authorize and continuously supervise: those conducted by nationals, those conducted from national territory, and/or those involving space objects launched from national territory, or any other relevant combination.¹¹

Second, Nigeria will be held liable for damage caused by such private space activities to the extent that it might qualify as a “launching State” of the space object causing such damage in accordance with applicable definitions.¹² Thus, any national space law-*cum-*

licensing system should preferably include rules on handling—read derogating—such third-party liabilities, noting that at the international level there is no cap on them,¹³ and as needed provide for corresponding requirements regarding liability insurance.

Third, Nigeria will be required to register any space object for which it qualifies as a “launching State,” unless (an) other state(s) also qualifies as such and (one of) that/those other state(s) agrees to act as state of registration.¹⁴ This duty to register applies both on a national level and with regard to the international register maintained by the UN Office for Outer Space Affairs¹⁵ but also entails the possibility for Nigeria to exercise jurisdiction on a quasi-territorial basis on board any such space object¹⁶—for example, in order to legally control the activities undertaken by a private operator involving such a space object.

3. Nigeria, space activities, and space law

In terms of its autonomous involvement in space activities and consequent direct relevance at the domestic level of its partisanship to the Outer Space Treaty, the Liability Convention and the Registration Convention, Nigeria established its National Space Research and Development Agency (NASRDA) at the federal level already in 1999, approved the first National Space Policy and Programme in 2001, had its first (micro-)satellite launched in 2003 and its first telecom satellite, the Nigcomsat-1, in 2007.¹⁷

Following these successes, however, Nigeria has now become more ambitious and is planning *inter alia* to design, build, and launch a satellite of its own from a domestic launch site by 2030.¹⁸

This also meant the legal framework needed to be upgraded, to allow meeting the challenges imposed by such ambitions in an orderly fashion as well as remaining compliant with Nigeria’s obligations under international space law. Whereas NASRDA was originally established as a relatively small research institution under the supervision of the Federal Ministry of Science and Technology of Nigeria,¹⁹ the Agency now would have to take on a more comprehensive and proactive role in the Nigerian space effort including the involvement of private industry. Consequently, the NASRDA Act was adopted in 2010, with further Regulations on the Licensing and Supervision of Space Activities drafted in 2015 and as of this writing going through the legislative process of becoming adopted.

4. The NASRDA Act

As the full title of the Act clarifies, it serves to establish the Agency for, among other things, the encouragement of and capacity building in space science technology development and management and to develop satellite technology for various applications and for related matters. This mostly concerns typical public space agency tasks, but a few clauses stand out as being relevant for the involvement of private industry in the broader context of such policies and activities.

Notably, an explicit function of the Agency is now to “develop national strategies for the exploitation of the outer space and make these part of the overall national development strategies, and implement strategies for *promoting private sector participation in the space industry.*”²⁰

Furthering such strategies moreover, the Agency can now “grant *license* to any person of body corporate for activities stated in section 6(k) of this Act.”²¹ Section 6(k) refers to the Agency’s function to “be the repository of all satellite data over Nigeria’s territory and accordingly, all collaborations and consultation in space data related matters in Nigeria shall be carried out or undertaken by or with the Agency.” The reference to “satellite data” clarifies that the licensing clause would be (mainly) targeting satellite remote sensing operations, an area in which Nigeria is particularly interested, but might well come to include for instance positioning and navigation data generated by satellites as well.

Not surprisingly in view of the history of Nigeria as a former colony of the United Kingdom, the general conditions for being granted a license closely resemble those listed by the UK Outer Space Act²² and require lack of jeopardy of public health, safety of persons and property, consistency with the international obligations of Nigeria, and consistency with the national security of Nigeria.²³

Also the more specific conditions which can be included in any license closely mirror the ones listed by the UK Outer Space Act, among others referring to requirements to prevent contamination of outer space or interference with the space activities of others, to dispose of a payload after termination of operations, or to insure against third-party liability.²⁴ Nothing, however, was specifically provided here with regard to any specific international liabilities to be incurred under the Liability Convention and/or any derogation or indemnification mechanism *vis-à-vis* the licensee.

Finally, the NASRDA Act already provides for the obligation of the Agency to “maintain a register of Space Objects,” which shall include “particulars of such space objects as the Agency considers appropriate to comply with the international obligations of the Federal Republic of Nigeria,” referring to Nigeria’s partisanship to the Registration Convention.²⁵ Any licensee will likely be required as per his license to provide the minimum information required by the Registration Convention in that respect.²⁶

While the NASRDA Act thus established the basic competence of the Agency to issue licenses as well as the general framework for compliance with the major international obligations of Nigeria pursuant to, in particular, the Outer Space Treaty, the Liability Convention, and the Registration Convention, it still left more detailed questions in this regard unanswered.

5. The regulations on the licensing and supervision of space activities

Thus, within a few years of the adoption of the NASRDA Act the first major effort to fill the gaps left by that framework statute was initiated. As of this writing, Regulations on the Licensing and Supervision of Space Activities, drafted in a first version in 2015, are making their way through the Nigerian legislative machinery, and as the title of course clarifies, address primarily the authorization and supervision of (private) space activities somehow falling within the jurisdiction of Nigeria.

The first aspect to note is that, while the NASRDA Act focused on satellite data, presuming to mean in particular remote sensing satellite data, and hence on the licensing of private operators in the field of satellite remote sensing, the Draft Regulations define the “space activities” subject to its regime as “includ[ing] space objects and their control,”²⁷

which suggests that *any* activity in outer space involving a space object (and perhaps even if not) could now in principle become licensed by the Agency. This is corroborated by the more extended interpretation of “space activity” by the Draft Regulations as including “the operation, guidance, and re-entry of space objects into, in and from outer space and other activities essential for the launch of, operation, guidance and re-entry of space objects into, in and from outer space.”²⁸

In this respect it may further be noted that Nigeria explicitly defines “outer space,” as “anything beyond 100 km above sea level” and the launch of a space object as launching it “into an area beyond the distance of 100 km above sea level.”²⁹ By this token, Nigeria becomes effectively the fourth state to offer a distinct number as regards the altitude at which sovereign airspace should be considered to give way to the global commons of outer space, after Australia,³⁰ Kazakhstan,³¹ and Denmark.³² It thereby falls in line with a broader trend to recognize a virtual 100-km altitude line as the most appropriate lower boundary of outer space,³³ which even in the context of US legislation, the United States being the country most reticent when it comes to recognition of such a boundary (or indeed any specific boundary) of outer space, is currently creeping into the discussions.³⁴

The conditions for being granted a license reiterate those already set out by Sections 9(2) and (4) of the NASRDA Act as discussed above,³⁵ then add a number of more precise ones. For instance, the licensee is now explicitly required to comply with applicable ITU rules on frequency allocations and orbital positions.³⁶

Moreover, in addition to licensing “space activities” in general, the Agency would under the Draft Regulations also have the authority to grant various forms of authorization for launch and launch-related activities. The approach here follows very much that of Australia—another prominent spacefaring member of the Commonwealth which remained of the erstwhile British Empire.

Thus, first a “launch facility permit” “covering the construction and operation of a launch facility in Nigeria, a particular kind of launch vehicle and particular flight paths” can be granted.³⁷ Second, a “launch permit” may be issued “authorizing: (a) the launch of a particular space object; or (b) a particular series of launches of space objects that (. . .), having regard to the nature of any payloads to be carried, may appropriately be authorized by a single launch permit; from a specified launch facility in Nigeria using a specified kind of launch vehicle.”³⁸ Third, an “overseas launch certificate” may be granted for “(a) the launch of a particular space object; or (b) a particular series of launches of space objects.”³⁹ The certificate is only mandatory for Nigerian nationals—logically so, since it concerns an *overseas* launch certificate.⁴⁰

Finally, an “exemption certificate” can be obtained as replacing a launch facility permit, launch permit, or overseas launch certificate.⁴¹

In sum: the scope *ratione materiae* of the licensing regime to be established by the Draft Regulations encompasses—at least until further notice—all activities normally considered to fall within the scope of “space activities,” including the “activities in outer space” which Article VI of the Outer Space Treaty references as giving rise to international responsibility.⁴²

Ratione personae, the Draft Regulations require a license from all “[c]orporations registered in Nigeria with ownership of space object(s)” —that is, private operators with the

legal nationality of Nigeria—and from all “[o]perators (. . .) of space object(s) and launch vehicle(s) within Nigerian territory”—that is, private operators acting from Nigerian territory, including from the quasi-territory of Nigerian ships or aircraft.⁴³ In other words, “national activities in outer space” as entailing Nigerian international responsibility pursuant to Article VI of the Outer Space Treaty are interpreted as referring both to personal and territorial jurisdiction of Nigeria.⁴⁴ Interestingly, as for the second part, also manufacturers of space objects or launch vehicles are included, even as manufacturing does not formally play a role in allocating state responsibility following Article VI of the Outer Space Treaty or state liability following Article VII of the Outer Space Treaty and the Liability Convention.

6. Liability

Contrary to the NASRDA Act, the Draft Regulations provided for substantial handling of international third-party liabilities.

First, it is now specifically provided that

(1) A person to whom this Regulation applies shall indemnify the Government of the Federal Republic of Nigeria against any claim brought against the Government in respect of damage or loss arising out of activities carried on by him to which the Regulation applies. (2) The person or entity to indemnify the Government in respect to damage caused by its space activities is to pay an amount not exceeding [US]\$15,000,000.⁴⁵

Second, it is required for any licensee to provide insurance with respect to damages that may trigger the application of the Liability Convention.⁴⁶ And third, such insurance should at least cover a sum of US\$5,000,000.⁴⁷

In other words: the Nigerian government effectively establishes a three-tier system regarding international liability claims for which Nigeria qualifies as a launching state under the Liability Convention. For a first tier of at least up to US\$5,000,000, the insurance of the licensee will reimburse the government; for a second tier up to a total amount of US\$15,000,000 (the first tier included) the government will be entitled to have recourse to the funds of the licensee to the extent available; whereas for a third tier of any damage above US\$15,000,000 the government accepts up front that the state will carry such liability without recourse to the licensee or his insurance.

It is, of course, especially considering Nigeria’s status as a leading developing spacefaring country, interesting to compare this amount to the amounts quoted in other national statutes and regulations with regard to limiting the derogation of liability to a licensee. Brazil, it may already be noted, does not provide any clue as regards the limitation of liability or liability insurance.⁴⁸

In the United States, following a complex calculation of a maximum probable loss and reasonably insurable coverage, and subject to a “maximum allowable cap” of US\$500,000,000,⁴⁹ any licensee will be subjected to his own specific limit of third-party liability and related

insurance (including reimbursement of the US government to the extent claims under the Liability Convention are concerned).⁵⁰

European countries, to the extent mentioning any specific amounts, are converging on a limit to both insurance and liability of €60,000,000, roughly some US\$68,000,000.⁵¹ That amount is directly referenced in the Austrian Outer Space Act,⁵² has become the norm in France through a complicated interplay with other documents following from the French Law on Space Activities as applied to existing launch vehicles,⁵³ and as per a recent amendment was also introduced in the United Kingdom, first for the cap on insurance, then also on liability as such.⁵⁴

Finally as for South Korea, further to the Korean Space Development Act the Korean Space Liability Act calls for insurance against third-party liability up to 200 billion Won (some US\$166,000,000⁵⁵), which also represents the maximum of liability itself.⁵⁶

In sum: the Nigerian approach to international third-party liability claims resulting from space activities by licensed private operators seems to be a rather generous one, as the limits imposed are generally at the low end of the scale when compared to some major other spacefaring nations.

7. Concluding remarks

Clearly, Nigerian national space law presents another interesting addition to the growing body of national legislation handling the entry of private space activities in outer space and the realm of space activities. While the Draft Regulations are still being straightened out as they progress through the legislative machinery, it already provides considerable details on the general approach that Nigeria takes with regard to implementation of its international obligations under the four “classic” space treaties that it has signed.

Contrary to Brazil, that other major developing country already having national space legislation but focusing very much on launch activities, in the case of Nigeria a rather comprehensive approach has now been adopted. Basically all space activities would seem to be eligible (at least in principle) for a license, even as the focus to some extent still lies with launch activities—logical, in view of the major international ramifications of a country’s involvement in the launch of a space object in terms of its international liabilities. In this respect Nigeria very much follows the detailed approach of Australia, another member of the Commonwealth, whereas in some other respects it closely follows the approach taken by the mother country of that same Commonwealth, the United Kingdom.

The comprehensive approach also appears in determining the scope of the licensing obligations *ratione personae*, as encompassing both Nigerian nationals (including companies) and anyone conducting relevant space activities from Nigeria. In addition, taking care of its international registration obligations also allows the authorities to exercise jurisdiction on board relevant space objects so registered, adding another legal tool for control, authorization, and supervision to the legal toolbox.

While the comprehensive character of the Nigerian approach is to be applauded, as such it does not provide a major novelty in international space law.⁵⁷ Also the registration arrangements closely follow the international legal framework and key examples of domestic implementation thereof.

The most progressive contribution of the Nigerian legislation to international space law may thus well lie in its specific reference to a 100-km altitude “line” as presenting the lower boundary of outer space. This certainly adds new fuel to the ongoing debate about the definition and delimitation of outer space, siding in this respect with Australia (again), Kazakhstan, and Denmark, as well as with other, less clear-cut legal initiatives.

Most interestingly, from the perspective of a developing nation, is its handling of damage caused by private licensees: the Nigerian approach is to remain on the lower end of reimbursement obligations imposed upon the licensee, so as to stimulate private operators (in particular foreign ones, one would be tempted to say) to seek out Nigeria for the purpose. Where Brazil had adopted quite specific and targeted provisions allowing the country to exercise specific control over foreign investments,⁵⁸ Nigeria apparently is confident that the general conditions and competences of monitoring and enforcement would suffice for the desired level of control.

On the other hand, maybe this “leniency” is offset by the substantive licensing fee of US\$2,000,000 which the Draft Regulations would command.⁵⁹ Care should be taken to ensure that this is not going to be interpreted as if licensing is seen as more of a cash cow for the government than an instrument to balance the interests of the general public in Nigeria and compliance with its international obligations on the one hand, and the interests in stimulating private participation in space activities in a beneficial context on the other. There is a precarious balance between a high “flat” entrance fee for private entities opening the door into the outer space arena by way of a license, so as to ensure that only serious and well-equipped companies would make an effort to enter in the first place, and imposition of a relatively lenient regulatory burden upon such entrance in terms of liabilities, so as to stimulate such companies to move ahead beyond the entrance.

Ultimately, however, any “final” judgement would have to wait for, first, formal adoption and enunciation of the Regulations and, second, the experience following such adoption with actual license applications.

Notes

1. National Space Research and Development Agency Act (hereafter NASRDA Act), adopted 27 August 2010, No. 9 of 2010; Federal Republic of Nigeria Gazette No. 98 of 30 August 2010, A 1249–1268.
2. Regulations on the Licensing and Supervision of Space Activities, 2015 draft (hereafter Draft Regulations), provided courtesy of NASRDA; copy in possession of the author.
3. See for an analysis of the relatively low level of participation of African countries in COPUOS and the UN space treaties *e.g.* J. A. van Wyk, Overview of the Implementation Status of the Five United Nations Treaties on Outer Space in African Countries, 12 *African Skies/Cieux Africains* (January 2008), 20–28.
4. *Cf.* Space Affairs Act, 6 September 1993, assented to on 23 June 1993, No. 84 of 1993; Statutes of the Republic of South Africa–Trade and Industry, Issue No. 27, 21–44; *National Space Legislation of the World*, Vol. I (2001), at 413. See further *e.g.* I. Marboe & F. Hafner, Brief Overview over National Authorization Mechanisms in Implementation of the UN International Space Treaties, in *National Space Legislation in Europe* (Ed. F. G. von der Dunk)(2011), 44–45.

5. Cf. Administrative Edict No. 27 (hereafter Brazilian Administrative Edict), 20 June 2001; *National Space Legislation of the World*, Vol. II (2002), at 377. See further e.g. J. Monserrat, Regulation of Space Activities in Brazil, in *National Regulation of Space Activities* (Ed. R. S. Jakhu)(2010), 61 ff.
6. 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, done 27 January 1967, entered into force 10 October 1967; 610 UNTS 205; TIAS 6347; 18 UST 2410; UKTS 1968 No. 10; Cmnd. 3198; ATS 1967 No. 24; 6 ILM 386 (1967). Nigeria acceded to the Outer Space Treaty on 14 November 1967; see <https://treaties.un.org/Pages/showDetails.aspx?objid=0800000280128cbd>; <http://www.state.gov/t/isn/5181.htm#signatory> (last visited 9 February 2016).
7. Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (hereafter Rescue Agreement), London/Moscow/Washington, done 22 April 1968, entered into force 3 December 1968; 672 UNTS 119; TIAS 6599; 19 UST 7570; UKTS 1969 No. 56; Cmnd. 3786; ATS 1986 No. 8; 7 ILM 151 (1968). Nigeria acceded to the Rescue Agreement on 23 March 1973; see <https://treaties.un.org/Pages/showDetails.aspx?objid=080000028012504f> (last visited 9 February 2016).
8. Convention on International Liability for Damage Caused by Space Objects (hereafter Liability Convention), London/Moscow/Washington, done 29 March 1972, entered into force 1 September 1972; 961 UNTS 187; TIAS 7762; 24 UST 2389; UKTS 1974 No. 16; Cmnd. 5068; ATS 1975 No. 5; 10 ILM 965 (1971). Nigeria acceded to the Liability Convention on 29 December 2005; see <https://treaties.un.org/Pages/showDetails.aspx?objid=08000002801098c7> (last visited 9 February 2016).
9. Convention on Registration of Objects Launched into Outer Space (hereafter Registration Convention), New York, done 14 January 1975, entered into force 15 September 1976; 1023 UNTS 15; TIAS 8480; 28 UST 695; UKTS 1978 No. 70; Cmnd. 6256; ATS 1986 No. 5; 14 ILM 43 (1975). Nigeria acceded to the Registration Convention on 6 July 2009; see https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXIV-1&chapter=24&Temp=mtdsg3&lang=en (last visited 9 February 2016).
10. Art. VI, Outer Space Treaty. See further e.g. I. Marboe, National space law, in *Handbook of Space Law* (Eds. F. G. von der Dunk & F. Tronchetti)(2015), 131–35.
11. See for this issue e.g. F. G. von der Dunk, International space law, in *Handbook of Space Law* (Eds. F. G. von der Dunk & F. Tronchetti)(2015), 53–54, and references in fn. 94–96.
12. See Art. VII, Outer Space Treaty, as further elaborated by Arts. I(c), II & III, Liability Convention; further e.g. Marboe, 137–39.
13. Cf. Art. XII, Liability Convention, as generally recognized to provide for unlimited third-party liability at the international level. See further e.g. L. J. Smith & A. Kerrest de Rozavel, The 1972 Convention on International Liability for Damage Caused by Space Objects, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K. U. Schrogl), Vol. II (2013), 172–75.
14. See Arts. I(a), II, Registration Convention; further e.g. B. Schmidt-Tedd *et al.*, The 1975 Convention on Registration of Objects Launched into Outer Space, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K. U. Schrogl), Vol. II (2013), 255–59.
15. See Arts. II resp. III & IV, Registration Convention.
16. Cf. Art. VIII, Outer Space Treaty; also Art. II(2), Registration Convention. See further e.g. B. Schmidt-Tedd & S. Mick, Article VIII, in *Cologne Commentary on Space Law* (Eds. S. Hobe, B. Schmidt-Tedd & K. U. Schrogl), Vol. I (2009), 146–68.

17. See *e.g.* Van Wyk, 27; as updated by e-mail from Mrs. M. D. Fadahunsi-Banjo, Principal Legal Officer, NASRDA, of 22 March, in possession of the author. In addition, Nigeria *i.a.* joined the Disaster Monitoring Consortium Constellation, with four satellites in orbit.
18. See <http://www.ibtimes.com/nigeriasspace-program-rare-glimpse-insidewest-african-nations-satellite-operation-1411236> (last visited 9 February 2016); as updated by e-mail from Mrs. M. D. Fadahunsi-Banjo, Principal Legal Officer, NASRDA, of 22 March, in possession of the author.
19. See *e.g.* <http://www.unspider.org/links-and-resources/institutions/nigeria-national-space-research-and-development-agency-nasrda> (last visited 9 February 2016).
20. Sec. 6(e), NASRDA Act; emphasis added. *Cf.* also Sec. 6(h), referencing collaboration with “non-governmental organisations” and “industries,” and Sec. 7(b), allowing the Agency “to enter into research and production partnerships with any company, (. . .) firm or individual.”
21. Sec. 9(1), NASRDA Act; emphasis added.
22. *Cf.* Sec. 4(2), Outer Space Act (hereafter UK Outer Space Act), 18 July 1986, 1986 Chapter 38; *National Space Legislation of the World*, Vol. I (2001), at 293; *Space Law—Basic Legal Documents*, E.I; 36 *Zeitschrift für Luftund Weltraumrecht* (1987), 12.
23. See Sec. 9(2), NASRDA Act. *Cf.* also Sec. 9(3), NASRDA Act, as mirroring Sec. 5(1), UK Outer Space Act.
24. See Sec. 9(4), NASRDA Act; *cf.* Sec. 5(2), UK Outer Space Act.
25. See Sec. 10(1) resp. (2), NASRDA Act. These clauses were essentially reiterated and elaborated by Sec. 11, Draft Regulations.
26. See Sec. 9(4)(b), NASRDA Act, resp. Art. IV(1), Registration Convention.
27. Sec. 3, Draft Regulations.
28. Sec. 43, 3rd para., Draft Regulations.
29. Sec. 43, 1st resp. 6th para., Draft Regulations.
30. See Sec. 8, 16th, 21st, 33rd & 35th bullets, An act about space activities, and for related purposes (hereafter Australian Space Activities Act), No. 123 of 1998, assented to 21 December 1998; *National Space Legislation of the World*, Vol. I (2001), at 197; as amended by the Space Activities Amendment Act, An Act to amend the Space Activities Act 1998, No. 100 of 2002, assented to 10 November 2002; http://www.austlii.edu.au/au/legis/cth/num_act/saaa2002247/, which substituted “outer space” in the four clauses referred to with “an area beyond the distance of 100 km above mean sea level.”
31. See Art. 1(6), Law of the Republic of Kazakhstan on Space Activities, of 6 January 2012, 2012 No. 528-IV; http://www.unoosa.org/pdf/spacelaw/national/kazakhstan/528-IV_2012-01-06E.pdf, defining “outer space” as “a space extending beyond the airspace at an altitude of more than one hundred kilometers above the sea level.”
32. See Sec. 4(4), Law on activities in outer space (*Lov om aktiviteter i det ydre rum*), Passed by Parliament with the third treatment, 3 May 2016; Parliament Gazette, 2015-17, No. L 128, defining outer space with reference to this altitude.
33. See for a succinct analysis Von der Dunk, *International space law*, esp. 69–72.
34. Note that as of 2013, § 772.1, “Definitions of terms as used in the Export Administration Regulations (EAR),” defines “[s]pace-qualified” as “[d]esigned, manufactured, or qualified through successful testing, for operation at altitudes greater than 100 km above the surface of the Earth”; 78 Fed. Reg. 31,440 (2013).

35. See Secs. 5(2) resp. 7(2), Draft Regulations.
36. Cf. Sec. 6(h), Draft Regulations.
37. Sec. 12, as further elaborated by Secs. 13–19, Draft Regulations; cf. the “space licence” of Secs. 18 ff., Australian Space Activities Act. Note that the separation of launch site operations and actual launch services in terms of the authorization process also follows the example of the US Commercial Space Launch Act (cf. 51 U.S.C. § 50904(a)).
38. Sec. 20(1), Draft Regulations, as further elaborated by Secs. 20–26; cf. Secs. 26 ff., Australian Space Activities Act.
39. Sec. 27(1), Draft Regulations, as further elaborated by Secs. 27–33; cf. Secs. 35 ff., Australian Space Activities Act.
40. See Note 1 to Sec. 27(1), Draft Regulations.
41. See Sec. 34(1), Draft Regulations; cf. Secs. 46 ff., Australian Space Activities Act.
42. Note that several other national space laws also make a fundamental distinction between launching activities and space activities as more specifically taking place in outer space. Cf. e.g. as for Sweden Sec. 1, Act on Space Activities (1982: 963, 18 November 1982; *National Space Legislation of the World*, Vol. I (2001), at 398; *Space Law—Basic Legal Documents*, E.II.1; 36 *Zeitschrift für Luft und Weltraumrecht* (1987), 11): “In addition to activities carried on entirely in outer space, also included in space activities are the launching of objects into outer space and all measures to manoeuvre or in any other way affect objects launched into outer space.”
43. Secs. 1(a) resp. (b), also 2(1) resp. (2), Draft Regulations.
44. Cf. again Von der Dunk, International space law, 53–54.
45. Sec. 40, Draft Regulations.
46. Cf. Sec. 6(i), Draft Regulations.
47. See Sec. 39(1), Draft Regulations.
48. Cf. Art. 9(III) of the Regulation enclosed with the Brazilian Administrative Edict; see further F. G. von der Dunk, Launching Alcantara into the global space economy—The 2001 Brazilian national space law, in *Proceedings of the Forty-Fifth Colloquium on the Law of Outer Space* (2003), 313–14.
49. See 51 U.S.C. Sec. 50914(a); further e.g. Marboe, 142.
50. In actual fact, the limits to liability referenced in licenses varied between US\$3,000,000 for the Virgin Galactic flight of November 2014 (which crashed) and US\$261,000,000 for Atlas-V and Delta-IV launches (which did not).
51. Exchange rate as of February 2016.
52. See Sec. 4(4), Austrian Federal Law on the Authorisation of Space Activities and the Establishment of a National Space Registry (*Bundesgesetz über die Genehmigung von Weltraumaktivitäten und die Einrichtung eines Weltraumregisters (Weltraumgesetz)*; hereafter Austrian Outer Space Act), as adopted by Parliament on 6 December 2011; Federal Law Gazette of 27 December 2011; 61 *Zeitschrift für Luft und Weltraumrecht* (2012), 37–42, 56–61.
53. See Arts. 14–17, Law on Space Operations (*Loi relative aux opérations spatiales*; hereafter French Law on Space Operations); *Loi n° 2008-518 du 3 juin 2008*; unofficial English version 34 *Journal of Space Law* (2008), 453; *juncto* Amending Finance Law of 2008 and the Declaration on the Launchers Exploitation.
54. Originally, pursuant to Sec. 10(1) of UK Outer Space Act, indemnification by a licensee of the UK government was unlimited, whereas liability insurance as per Sec. 5(2)(f) could be

imposed upon any licensee as per the license, and in actual fact was so imposed standard-wise—with its coverage being capped at £100,000,000 (some US\$145,000,000; exchange rate as of February 2016); that cap subsequently in 2011 was lowered to €60,000,000 (some US\$68,000,000; exchange rate as of February 2016); see Marboe, 156, and fn. 151. Sec. 12(3), Deregulation Act 2015, next amended the UK Outer Space Act so as to require a cap also on the liability itself; see <http://www.legislation.gov.uk/ukpga/2015/20/section/12> (last visited 11 February 2016). As of 1 October 2015 that cap was then fixed at €60,000,000; see <http://www.ukspace.org/news-item/sfn-announces-e60m-cap-on-unlimited-indemnity-in-the-uk-outer-space-act/> (last visited 11 February 2016).

55. Exchange rate as of February 2016.
56. Art. 15, Space Development Promotion Act (hereafter Korean Space Development Promotion Act), Law No. 7538, of 31 May 2005, entered into force 1 December 2005; unofficial translation 33 *Journal of Space Law* (2007), 175; *juncto* Art. 5, Space Liability Act (hereafter Korean Space Liability Act), Law No. 8852, of 21 December 2007.
57. Such countries as the United States, the Russian Federation, Sweden, South Africa, Ukraine, France, Belgium, the Netherlands, France and Austria all have established national licensing systems in principle for the full range of space activities and by and large apply them both on a personal (national) and a territorial basis.
58. Note that *e.g.* Art. 7(V) of the Regulation enclosed with the Brazilian Administrative Edict, requires any applicant to have “legal representation in Brazil with express powers to be subpoenaed and to answer both at administrative and court levels,” so that in any dispute between the Brazilian authorities and any foreign licensee the former would have concrete competences to actually enforce any judgement against such a licensee. *Cf.* further Arts. 6–11.
59. See Sec. 6(i), Draft Regulations. The only other licensing fee readily available for public scrutiny, in the case of the United Kingdom, amounts to only £6,500, some US\$9,400; see https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/464931/Guidance_for_applicants_-_October_2015.pdf (last visited 20 February 2016).