The Relationship between National Space Law and International Space Law*

Dr. Frans G. von der Dunk
Director, Space Law Research
International Institute of Air and Space Law

1. Introduction

Within the relationship between national and international space law, the most important issue today is the *de facto* dichotomy that has arisen between, on the one hand, international space law which is public and, on the other hand, the increasing participation of the private sector in space activities.

Public international space law – from the current perspective and for the present purpose – essentially concerns the United Nations treaties on outer space, that is the Outer Space Treaty[1], the Rescue Agreement[2], the Liability Convention[3], the Registration Convention[4] and (even whilst taking into consideration its rather limited level of ratification) the Moon Agreement[5]. In addition, it comprises some important UN Resolutions to the extent these may be seen to represent customary law, such as the Resolutions in particular on remote sensing[6] respectively the benefits of space exploration and use[7]. It further encompasses, to the extent relevant, law developed in other, often broader frameworks such as that of the International Telecommunication Union (ITU)[8]. Finally, it may be

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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, 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).

[2]. 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).

[3]. 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).

[4]. 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).

[5]. Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, New York, done 18 December 1979, entered into force 11 July 1984; 1363 UNTS 3; ATS 1986 No. 14; 18 ILM 1434 (1979). Currently, only 12 states are parties to this Agreement, amongst which are none of the major spacefaring nations.

[6]. Principles Relating to Remote Sensing of the Earth from Outer Space, UNGA Res. 41/65, of 3 December 1986; UN Doc. A/AC.105/572/Rev.1, at 43; 25 ILM 1334 (1986).

[7]. Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, Taking into Particular Account the Needs of Developing Countries, UNGA Res. 51/122, of 13 December 1996; XXII-I Annals of Air and Space Law (1997), at 556; 46 ZLW (1997), at 236.

[8]. See e.g. Constitution of the International Telecommunication Union, Geneva, done 22 December 1992, entered into force 1 July 1994; 1825 UNTS 1; UKTS 1996 No. 24; Cm. 2539; ATS 1994 No. 28; Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992 (1993), at 1; and Convention of the International Telecommunication Union, Geneva, done 22 December 1992, entered into force 1 July 1994; 1825 UNTS 1; UKTS 1996 No. 24; Cm. 2539; ATS 1994 No. 28; Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992 (1993), at 71.

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seen to comprise, as appropriate, more particular international treaty-based arrangements on such varying issues as the establishment of an international space station[9] or an intergovernmental organisation such as the European Space Agency (ESA)[10].

Increasingly, the participation over the last decades of private enterprise in space and space-related activities, most notably in the satellite communication and launch service sectors but to varying extents also in areas such as remote sensing, satellite navigation and space tourism, runs counter to this body of public international space law as it has developed and is still developing. It became evident that the latter had almost exclusively focused on dealing with states as actors in the space arena. This has raised two major questions on the debates amongst the experts over the last decade or so.

On the one hand, it has become important to analyse to what extent the existing body of international space law is able to ensure the adherence by any private parties to the regime established by the aforementioned UN treaties and other rules of international (space) law, in view of the clear focus of the latter on states' rights and obligations, and where found to be inadequate, what should and could be done about that. In other words: how to monitor and control such private activities, in the absence of those private actors being directly addressed by public international space law?

On the other hand, since the premise that private enterprise could play a positive role in outer space and space activities has now been more or less generally accepted, the mirror-side question arose as to what extent any *bona fide* interests of private enterprise are, can be and/or should be taken into account by current public international space law. In short: how could those interests be protected and their participation be stimulated, wherever beneficial?

It is this important dichotomy underlying the current 'spacescape' which also gives rise to the desirability or even need to establish national space law, that is – in the definition preferred for the present purpose – national law dedicated very specifically to space activities and the proper role of private enterprise in that context.

2. The need for national space law

Further to the above general conclusion, the desirability, or indeed practical or legal need to establish national space law effectively arises at three levels, in the sense of dealing with private involvement in space activities by means of a system of authorisation (licensing) of, supervision of, and if necessary interference with, private space activities. Whilst a number of states do have national space legislation in place dealing for instance with the development of national space programmes, competences of various government organs in the context of space and the establishment of a national space agency, such legislation will not be taken into account in the present paper, since it does not offer any such fundamental regulation of private space activities.

The first – and for the present international discussion most important – level concerns the international one. Here, a few key clauses in international space law already set out

[9]. As per the Agreement among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America concerning Cooperation on the Civil International Space Station, Washington, done 29 January 1998, entered into force 27 March 2001; Space Law – Basic Legal Documents, D.II.4.

[10]. See Convention for the Establishment of a European Space Agency, Paris, done 30 May 1975, entered into force 30 October 1980; 14 ILM 864 (1975).

the appropriate context in this regard. Notably this concerns the concepts of state responsibility and state liability, both as applying to private space activities, as well as that of state jurisdiction over private space activities.

Thus, to begin with Article VI of the Outer Space Treaty *obliges* authorisation and continuous supervision of national activities conducted by private entities.[11] This does not so much oblige but *suggest* to do so by means of a national space law, as the most comprehensive, fair and transparent means. Other legal constructions, such as an all-powerful space agency involved in all national private space activities, or an *ad hoc*-licensing approach once the concrete occasion of a private company interested in conducting a space activity arises, may also be able to fulfil this specific requirement of authorisation and continuing supervision, but they lack such comprehensiveness, inherent fairness and *a priori* transparency.

Along similar lines, Article VII of the Outer Space Treaty[12], as further elaborated by the Liability Convention, *suggests* dealing with liability consequences by means of a national space law. This, in order to make sure that the state concerned, wherever it may be or is held liable as a "launching State" under the Liability Convention at the international level,[13] can derogate the material consequences – the actual payment of compensation for the damage at issue – to the actual private operator causing that damage.

Then, the Registration Convention, in further elaboration of Article VIII of the Outer Space Treaty, *obliges* the proper registration of space objects[14], in particularly including some parameters as provided by Article IV of the Registration Convention[15]. Article VIII of the Outer Space Treaty itself[16], furthermore, *suggests* to apply available jurisdiction for the purpose.

Secondly, a need for national space law would likely arise concurrently at the national *legal* level as soon as private space activities become an issue. Obviously, such activities

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[11]. In relevant part, Art. VI, Outer Space Treaty, reads: "States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty."

[12]. Art. VII, Outer Space Treaty, reads: "Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air or in outer space, including the moon and other celestial bodies."

The determination of the state(s) to be held liable in a particular instance, for example, has been formalized by the introduction of the concept of the 'launching State' by means of Art. I(c), Liability Convention, which reiterates the four criteria already offered by Art. VII, Outer Space Treaty.

[13]. Art. I(c), Liability Convention; cf. also Art. VII, Outer Space Treaty.

[14]. See in particular Art. II, Registration Convention, which obliges the 'launching State' of a space object to register that space object (if there is one state qualifying as such), respectively one of the 'launching States' to do that (in case there is more than one state qualifying as such).

[15]. Art. IV, Registration Convention, in this respect lists the following pieces of information: "(*a*) Name of launching State or States; (*b*) An appropriate designator of the space object or its registration number; (*c*) Date and territory or location of launch; (*d*) Basic orbital parameters, including: (i) Nodal period; (ii) Inclination; (iii) Apogee; (iv) Perigee; (*e*) General function of the space object."

[16]. In relevant part, Art. VIII, Outer Space Treaty, reads: "A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body."

could entail domestic consequences such as relating to damage occurring in a domestic context and the domestic liability questions resulting therefrom. They would require national law to deal with them appropriately, whether by means of a dedicated space law or by means of using other legislative, regulatory or enforcement instruments.
Thirdly, a (non-legal) need for national space law might well arise simply in order to implement and elaborate national interests at the *policy* level. National space law may be used to implement national policies of various sorts, such as expressing preferences for satellite communications, earth observation or other specific sectors of activities. This is important for those countries which are not able or willing to support or allow a complete range of private space activities to be undertaken from within their jurisdiction. Developing countries in particular may want to ensure that scarce economic resources are channelled only towards those space activities that can contribute directly towards further economic and social development. National space law from this perspective presents an instrument to offer tax incentives, liability waivers and suchlike in support of the desired activities.

3. A case study on liability

The present paper does not intend to go into all aspects of national law, either as they devolved from international space law or as induced by other incentives at other levels, but will merely try to illustrate the process by way of a case study concentrating on only one aspect. There would be many issues where the obligations arising from private space activities resting upon a state under international space law would call for that state to ensure its own interests are duly protected, but the most directly quantifiable one amongst them is clearly that of liability (in particular third-party liability as it arises from Article VII of the Outer Space Treaty and the ensuing Liability Convention) and the intertwined issue of insurance.
Those states that have established national space legislation including a system for licensing and controlling private space activities in doing so have, indeed, all chosen to deal with liability and insurance at least to some extent – albeit in rather varying fashion, as will be seen.

3.1. The United States

To start with the United States, as not only the largest spacefaring nation of today but also the state where private involvement in space activities has developed earliest and furthest: it has chosen to deal with the issue of liability by means of acts focusing exclusively on *launching* – in view *inter alia* of the focus of the international liability regime on the launch of the space object causing the damage leading to the liability at issue, as decisive for determining the liable state(s).
The original version of the Commercial Space Launch Act[17] as it was enunciated in 1984 was rather succinct on liability issues, and anyhow within four years superseded by an amended version which has set the standards since as to how liability and insurance is being dealt with in the US context[18].

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[17]. Commercial Space Launch Act, Public Law 98-575, 98th Congress, H.R. 3942, 30 October 1984; 98 Stat. 3055; Space Law – Basic Legal Documents, E.III.3.
[18]. 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; Space Law – Basic Legal Documents, E.III.3, 13 ff.

Under the legislation as it stands now, prospective licensees are obliged to either show insurance, or financial responsibility (in other words, the capacity to pay from the licensee's own pockets), up to a cap to be provided by the license, with the US government named as possible recipient. As to this cap, the legislation firstly provides for a 'maximum maximum' of US$ 500,000,000, secondly for a lower maximum if either the maximum liability insurance cover available on the world market against reasonable premiums, or the maximum probable loss (MPL) as calculated by the license authorities, is less than that amount. In case both these latter 'maxima' are less than US$ 500,000,000, the lesser of them will be the cap actually quoted in the license as the maximum coverage mandatory in terms of insurance alternatively financial responsibility.[19]

For completeness' sake, it requires mentioning that this construction does not only apply to international third-party liability claims against the US government in respect of activities of the licensee causing damage to occur, but also to any private liability claims against the licensee either in US courts or, barring other obstacles interfering therewith, even in foreign courts. That also applies to the commitment of the US government in case of any claims honoured which go beyond the maximum thus quoted, to contribute to the payment of the compensation due up to a maximum of US$ 1,500,000,000 above and beyond the amount of compensation to be carried by the licensee (or its insurer).[20]

In the unlikely event of claims for compensation running beyond the combined total of the maximum reimbursement obligation for the licensee (the first tier) and the US government 'guarantee' of US$ 1,500,000,000 (the second tier), however, the situations diverge. The Act pronounces in this respect that US governmental contributions are not offered beyond such a total.

While it is up to the US government to limit its potential contribution to any private claim, certainly if asserted before a US court, this can never apply to any international liability claim under the Liability Convention. Whether the US government would then (still) seek indemnification from the licensee beyond the first tier, and whether it would have the legal means to do so, would again be a matter of national discretion. The international liability regime offered by the Liability Convention is, essentially, indifferent on that point – it would simply hold the United States liable without limit.

Finally, recognising the fact that until recently all private launches required the use of US government-owned launch facilities, the legislation already in its original version also dealt with the issue of inter-party liability of the licensee *vis-à-vis* the US government. In the version as amended in 1988, a similar construction was chosen as with respect to third-party liability. Insurance cover alternatively financial responsibility is required up to a 'maximum maximum' of US$ 100,000,000, unless either the maximum coverage available against reasonable rates at the world market or the MPL would amount to less,

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The amended version is now codified as 49 U.S.C. 70101 *et seq*. The Commercial Space Act in its 1988-iteration in turn has been amended since *inter alia* by the Commercial Space Act, Public Law 105-303, 105th Congress, H.R. 1702, 27 January 1998; 42 U.S.C. 14731, so as to include re-entry within the scope of relevant licensing and liability obligations, as well as the Commercial Space Launch Amendments Act, Public Law 108-492, 108th Congress, 23 December 2004, 49 U.S.C.; 118 Stat. 3974, so as to include private commercial spaceflight – at least on a temporary basis – within such scope.

[19]. See 49 U.S.C., Sec 70112(a).

[20]. See 49 U.S.C., Sec 70113(a).

in which case the lesser amount of those would actually be included as a cap on inter-party liability in the license.[21]

3.2. Norway

Most other countries having a national space law in the sense alluded to are considerably less elaborate than the United States. The least elaborate of them is no doubt the Norwegian Act, as the oldest one dating back to 1969 comprising a mere three Articles.[22] It is focused on launching only[23], but nevertheless includes no specific reference to liability.

The succinctness of the text is due, no doubt, to the fact that in 1969 only the Outer Space Treaty and the Rescue Agreement had come about; in particular the Liability Convention, which contained the detailed elaboration of liabilities on the international level to be implemented domestically, was still a few years away. The Act, however, has not been elaborated and amended since – and anyway has been used only to license one, properly speaking not even *private* entity, the Norwegian Space Centre, for launching from Andøya.

3.3. Sweden

Chronologically speaking the next country to enunciate proper national space legislation-*cum*-licensing system was Sweden, by means of an Act and concurrent Decree of 1982.[24] The Act and Decree deal with more or less all space activities, only the launch of sounding rockets so far has been excluded from the scope of the licensing obligations established under it.[25] The Act, in terms of liability for licensees specifically, calls for full reimbursement of the Swedish government in any case of international liability claims having to be honoured by it, although if "special reasons tell against this", the Swedish government, read the National Board of Space Activities entrusted with the applicable licensing competencies, may, *ex ante* or *ex post*, decide to waive this right to unlimited recourse.[26]

Neither Act nor Decree, however, include any obligation for insurance. This effectively means that, whilst the Swedish government has the right in principle to be reimbursed in applicable cases by the licensees, it does not have any guarantee that in a catastrophic case such a reimbursement obligation would result in the coverage of any substantive part of the compensation due. This would leave the Swedish Treasury *de facto* exposed to the risk of having to contribute a major part of the liability claim at stake after all.

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[21]. See 49 U.S.C., Sec 70112(a).

[22]. Act on launching objects from Norwegian territory into outer space, No. 38, 13 June 1969; National Space Legislation of the World, Vol. I (2001), at 286.

[23]. See already the title of the Norwegian Act – "Act on launching objects etc."; further para. 1 of the Act.

[24]. 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), at 11; resp. Decree on Space Activities, 1982: 1069; National Space Legislation of the World, Vol. I (2001), at 399; Space Law – Basic Legal Documents, E.II.2; 36 Zeitschrift für Luft- und Weltraumrecht (1987), at 11.

[25]. See Sec. 1, last sent., Act on Space Activities.

[26]. Sec. 6, Act on Space Activities.

Of course, Act and Decree still leave the possibility open for the licensing authority to include an insurance obligation in any license in a particular case, but the obligation is not there at the highest, legislative level.

3.4. The United Kingdom

The third European country to enunciate a national space law was the United Kingdom, which in 1986 enacted the Outer Space Act[27] dealing, in principle, with all space activities that could be envisaged, and providing a licensing requirement for those if conducted by private entities[28].

As a matter of fact, the scope of activities requiring a license is rather broad. In interpreting the criteria for becoming a 'launching State' under the Liability Convention, the Outer Space Act defines "carrying on an activity in outer space" as "caus[ing] it to occur or [being] responsible for its continuing".[29] Thus, an entity or individual involved anywhere down the chain of causation or responsibility could find himself included in the scope of the Act. Even UK nationals being shareholders in a foreign company undertaking space activities, or a UK bank financing a foreign satellite project might be obliged to refund the UK government for any international liability claims awarded.

In terms of dealing with liability, like the Swedish Act the Outer Space Act requires full reimbursement of the government in case of international liability claims against the latter[30]. Yet unlike the Swedish case, it follows up with an obligation to take out proper insurance against such liability[31]. Later implementing regulation provided for a cap to such mandatory insurance of the UK government of £ 100,000,000.[32]

The result is, effectively, yet another approach to the liability risks for a government resulting from licensed activities. In any case of an international liability claim addressed to the United Kingdom which its government has to honour, it will be assured that the licensee will be able to reimburse the UK government at least up to that amount of £ 100,000,000; only beyond that amount actual indemnification will depend upon the particular assets or other potential of the licensee to indemnify – the principled obligation to reimburse exists.

3.5. The Russian Federation

The downfall of communism complementing the dissolution of the Soviet Union resulted in the need to both build a legal system taking into account private economic activities and to ensure that the huge Soviet heritage of space hardware, software, technological know-how and other expertise was dealt with in appropriate ways. As part of that overall

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[27]. 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 Luft- und Weltraumrecht (1987), at 12.

[28]. See Secc. 1-3, Outer Space Act.

[29]. Sec. 13, Outer Space Act.

[30]. See Sec. 10(1), Outer Space Act.

[31]. See Sec. 5(2)(f), Outer Space Act, providing that insurance should be taken out "against liability incurred in respect of damage or loss suffered by third parties, in the United Kingdom or elsewhere, as a result of the activities authorized by the license".

[32]. See R. Close, *Outer Space Act 1986: Scope and Implementation*, in Needs and Prospects for National Space Legislation, Proceedings of the Project 2001-Workshop on National Space Legislation, 5/6 December 2000, Munich, p. 159.

context, Russia in 1993 announced its national space law,[33] which principally dealt with all space activities and even with a major amount of space-related yet completely terrestrial activities, such as the development of space technology.[34] The Law was amended in 1996,[35] whereas in 2002 further regulation was issued detailing the licensing requirements.[36]

It is difficult to distil from the texts the precise situation pertaining to how cases of liability arising under the regime of the Liability Convention are dealt with, including the issues pertinent to this 'case study' regarding limitation of liabilities and reimbursement of the government, and insurance to be taken out to cover such liabilities and reimbursement obligations.

The Law contains, as a starting point, a number of general requirements related to the safety of space activities. From there, to some extent a general duty of arranging for potential liability of the licensees could already be deduced. The Law in its 1996-version (which is the one scrutinised here) provides in addition that "organizations and citizens which use (exploit) space technology (...) shall have insurance (…) to cover the harm caused to the life, health or property of other individuals in the manner and under terms established by law"[37], thus *inter alia* covering third party damage. The further wording of this provision is not unambiguous as to whether *other kinds* of third-party damage are included, particularly international third-party damage caused to third states, but, at least logically speaking, this should probably be already inferred.[38]

By way of complementary provision, the "compensation of the harm caused in the full amount shall be charged to the organization or the citizen owning the space object which caused the harm"[39], which would equally, under logical analysis, include international third-party damage caused by the licensee. The same applies to the next clause, providing that "the harm caused to the person or property of a citizen, as well as the harm caused to the property of a juridical person by a space object of the Russian Federation (…) beyond its borders, is subject to compensation by an organization or citizen that has taken out an insurance policy for its liability for causing harm, in the amount and in the manner stipulated by the Civil Code of the Russian Federation"[40].

In other words, if the damage was the result of accidents caused by private entities, compensation for such damage shall be paid by those entities – presumably to the Russian government in the case of international third-party damage. The clause also provides for cases of damage not involving international space law, for example private entities licensed by the Russian Federation causing damage to the latter's facilities or within Russia itself.

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[33]. Law of the Russian Federation on Space Activities, No. 5663-1, 20 August 1993, effective 6 October 1993; National Space Legislation of the World, Vol. I (2001), at 101.

[34]. See Art. 2(2), Law of the Russian Federation on Space Activities.

[35]. By means of Federal Law No. 147-FZ, of 29 November 1996.

[36]. Order of the Government of the Russian Federation On Approval of the Regulation on Licensing of Space Activity, 14 June 2002; National Space Legislation of the World, Vol. II (2002), at 302.

[37]. Art. 25(1), Law of the Russian Federation on Space Activities.

[38]. For example, elsewhere the Law of the Russian Federation on Space Activities refers explicitly to the fulfillment of the international obligations of Russia in respect of space activities, including the Outer Space Treaty. See Art. 26(3).

[39]. Art. 30(2), Law of the Russian Federation on Space Activities.

[40]. Art. 30(3), Law of the Russian Federation on Space Activities.

As to the amount of this indemnification and the obligatory insurance required, the possibility is left open to provide for a ceiling on the latter, but this is not mentioned expressly in the Law.[41] Any such ceiling would then, logically speaking, also constitute the maximum indemnification of the Russian Federation to be provided by the private entity so insured. In view of the many uncertainties surrounding these provisions, however, private enterprise applying for licenses should not be overly optimistic at the outset in expecting workable limits, if they are indeed to expect any limits at all.

On the other hand, experience has shown that these uncertainties have not prevented a number of licensed space activities in the Russian context from being duly insured, so that apparently in those number of cases some workable agreement with the Russian authorities has been arrived at, either through the licenses themselves or through other agreements, explicit or implicit. For example, the Russian insurance group-with-international-participation Megaruss in 2000, based on eight years worth of experience, could quote third-party liability insurance coverage deals for launch vehicles as follows: Proton US$ 300,000,000; Soyuz US$ 100,000,000-300,000,000; Molniya US$ 150,000,000; Zenith US$ 150,000,000-500,000,000; Dnepr US$ 100,000,000-150,000,000; Tsyklon US$ 100,000,000; Rockot US$ 100,000,000; Cosmos US$ 100,000,000-150,000,000; Strela US$ 100,000,000; and Start US$ 80,000,000.[42]

3.6. South Africa

South Africa, having liberated itself from the shackles of the *Apartheid*-regime and the resulting international isolation, decide in the early 90's that its embryonic space program and capacity should be subject to a transparent legal regime as well as open to private interests and participation, including international ones. This resulted in the enunciation in 1993 of the Space Affairs Act,[43] which encompasses all space activities, defined as "activities directly contributing to the launching of spacecraft and the operation of such craft in outer space"[44].

The Space Affairs Act has a rather complicated way of dealing with liability issues, partly following from a slightly different approach to launching activities on the one hand and all other space activities on the other hand in terms of scoping the licensing obligations, in spite of the inclusion of all within the Act's scope as such.[45]

Analysis however would seem to allow the conclusion that a requirement for full reimbursement is rather likely to be included in the license, with another requirement for insurance to back up any such reimbursement. Whilst references to South African's

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[41]. See Art. 25(1), Law of the Russian Federation on Space Activities; relevant organizations and citizens "shall have insurance (…) to cover the harm caused to the life, health or property of other individuals in the manner and under terms established by law".

[42]. See Y. Toshchenkova, *The insurance group Megaruss*, in Needs and Prospects for National Space Legislation, Proceedings of the Project 2001-Workshop on National Space Legislation, 5/6 December 2000, Munich, p. 56.

[43]. 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.

[44]. Sec. 1, 19th def., Space Affairs Act. This seems to exclude the last part of a return to earth, namely that after re-entry into the earth's airspaces.

[45]. See for this issue in some more detail, the author's Private Enterprise and Public Interest in the European 'Spacescape' (1998), pp. 149-51, 154.

responsibilities under international (space) law[46] would generally speaking call for requiring the licensee to reimburse the South African government for any international third-party liability claim to the full,[47] the governmental discretion provided for certainly allows for only partial reimbursement or non-reimbursement, if the South African interest would so require. Still, private entities requiring a South African license for their space (or space-related) activities should probably be prepared to accept the obligation of full reimbursement of the South African government for relevant cases of international third-party damage.[48]

Next to this international third-party liability following from the Liability Convention, in principle all other liability issues could be dealt with under the Act. Conditions may be inserted into the license as to the licensee's domestic liability for any damages occurring, and the financial security to be provided with respect thereto – in other words, essentially the obligation to take out appropriate insurance if the company's own assets would not suffice for the purpose of coverage.[49]

3.7. The Ukraine

Apart from Russia, the break-up of the Soviet Union also saw the rise of some other main inheritors of the Soviet space conglomerate, notably Kazakhstan (with the Baikonour launch complex on its territory) and the Ukraine. The latter established, for basically the same reasons as did Russia, a national space law in 1996, the Law of the Ukraine on Space Activities.[50] For obvious reasons the Law also follows, generally speaking, the same approach as the Russian Law, such as in encompassing all space activities as well as a considerable number of space-related activities, as well as in the manner in which it implements a licensing regime.[51]

In essence, the issues of reimbursement and insurance are not conclusively dealt with at the level of the Ukrainian Law. It provides that liability for damage caused during space activities is to be regulated by further legislation of the Ukraine; the lack of reference to any limitation on reimbursement seems to indicate that such a limitation would not be the point of departure for any particular license.[52] Also, applicable separate Ukrainian laws will apply to issues of settlement of disputes arising from such damage.

Finally, the Law merely provides for the future arrangement of obligations for licensees to insure their activities, in order to actually give substance to any reimbursement obligation to be included in future licenses.[53] It may be noted here also, that Article 25 of the Law delegates the issue of whether any limit would be imposed upon the possibility for the Ukrainian government to be reimbursed by a licensee in appropriate cases to future legislation.

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[46]. Cf. e.g. Sec. 11(d)(i), Space Affairs Act; also Sec. 2(1)(a).

[47]. See Sec. 14(1)(b), Space Affairs Act; which leaves actual inclusion of such an obligation however to the discretion of the Council.

[48]. Cf. further, by way of *a contrario* argument, Sec. 14(2)(a), Space Affairs Act.

[49]. See Sec. 14(1)(a), (i) and (ii), Space Affairs Act.

[50]. Law of the Ukraine on Space Activities, No. 502/96-VR, 15 November 1996: National Space Legislation of the World, Vol. I (2001), at 36.

[51]. See Artt. 1, 2, resp. Art. 10, Law of the Ukraine on Space Activities.

[52]. See Art. 25, Law of the Ukraine on Space Activities.

[53]. See Art. 24, Law of the Ukraine on Space Activities.

3.8. Hong Kong

Strictly speaking, of course, the case of Hong Kong does not represent a case of a 'national' space law since Hong Kong was not and is not a state in the international legal sense of the word. Until its transfer to the People's Republic of China in 1997, Hong Kong for international law purposes formed part of the United Kingdom – and hence for purposes of space activities in addition fell under the Outer Space Act enunciated by the latter in 1986. Actually, a few licenses had already been granted to satellite operators operating from Hong Kong under the UK Outer Space Act by 1997.[54]

The transfer of Hong Kong to China obviously required a change to this situation. Rather than simply making sure Hong Kong would henceforth be carved out from any private space markets, the Chinese government decided to maintain the Special Administrative Region-status also in the area of space, allowing Hong Kong to serve as an experimental field for possible eventual liberalisation or even privatisation of some parts of the space sector in the rest of the People's Republic.

In order to ensure proper implementation of the international obligations of the People's Republic in respect of Hong Kong – for which it was now internationally responsible – as well as to ensure a desired measure of control over this experimental field, in 1997 an Ordinance was issued that for all practical purposes may be equated with a proper national space law.[55] It is fairly reminiscent of the UK Outer Space Act, in order not to change the legal regime more than was considered strictly necessary.

The Ordinance called for full indemnification of the government of the People's Republic of China by a licensee in case the latter's activities would lead to international claims addressed to the former.[56] Interestingly enough, in view of the traditional hesitation of the government of the People's Republic to accept private involvement in any important strategic economic sector (and in contrast to the UK Outer Space Act) insurance is not mandatory – at least under the Ordinance. The licensing authorities, however, still may include an obligation to insure in any particular case: "a licence may in particular contain conditions (…) requiring the licensee to insure himself against liability incurred in respect of damage or loss suffered by third parties, in Hong Kong or elsewhere, as a result of the activities authorized by the licence"[57].

3.9. Australia

The relatively thinly-populated Australia became interested in possibilities to make good use of its large outback also for space activities, in particular launching and re-entry of space vehicles, in the mid-90's, which resulted in an Australian Act in 1998 essentially dealing only with these two types of activities.[58] The Act was amended twice, in 2001

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[54]. See e.g. S.U. Reif, *Space Law in the People's Republic of China – Hong Kong Special Administrative Region (HKSAR) Government: Outer Space Ordinance*, in 51 ZLW (2002), p. 51.

[55]. Outer Space Ordinance, An Ordinance to confer licensing and other powers on the Chief Executive to secure compliance with the international obligations of the People's Republic of China with respect to the launching and operation of space objects and the carrying on of other activities in outer space, 13 June 1997, as amended 1999, Chapter 523; National Space Legislation of the World, Vol. II (2002), at 403; 51 Zeitschrift für Luft- und Weltraumrecht (2002), at 50.

[56]. See Sec. 12(1), Outer Space Ordinance.

[57]. Sec. 6(2)(f), Outer Space Ordinance.

[58]. An act about space activities, and for related purposes, No. 123 of 1998, assented to 21 December 1998; National Space Legislation of the World, Vol. I (2001), at 197.

and 2002 (and it is the version of 2002 which will be referenced to in this section),[59] whilst in 2001 a set of implementing regulations regarding licensing was issued.[60]
The Act took a complicated approach to the licensing issue in, effectively, providing for four types of licenses: a 'launch permit' for any launch of space objects from Australian territory and/or the return to Australia of such a space object launched from Australia[61]; an 'overseas launch certificate' for any launch by Australian nationals, including companies, from outside Australia[62]; an 'authorisation' for the return to Australia of space objects not launched from Australia[63]; and a 'space license' for the operation of a launch facility on Australian territory[64]. Each type of license effectively carries its own set of parameters and conditions.
Nevertheless, it may be summarised that in dealing with the issue of reimbursement of liability, the Australian government essentially followed the US approach. With respect to the launch permit in particular, as the most important type of license from the current perspective, the Act provides for a principled limit to such reimbursement with the help of the Maximum Probable Loss-concept (unless "a different method of determining a minimum amount" is set out by applicable regulations), and by limiting the requirement for insurance to that amount.[65] Also for the overseas launch certificates the reimbursement obligation is limited to the insured sum.[66]

3.10. Brazil

Brazil represents a particularly interesting example of a state having drafted a national space law, since it is the first developing country to do so. Interested in allowing foreign launch operators, including private ones, to use the Alcantara launch site the Brazilian government enunciated in 2001 an Edict including a Regulation dealing only with such launching activities.[67]
The Regulation focuses on licensing of launch activities in Brazil.[68] In this regard, whilst insurance is made obligatory, it is left open whether reimbursement is actually required. Article 4(V) of the Regulation starts with a requirement to assess liabilities involved in any particular prospective licensee's activities; Article 6(III) follows up on this with the requirement of an appropriate economic and financial qualification for the activities for which the license is to be granted; but then Article 9(III) only results in a *possibility* for

[59]. Space Activities Amendment (Bilateral Agreement) Act 2001; resp. Space Activities Amendment Act 2002,
[60]. Space Activities Regulations, Statutory Rules 2001 No. 186, 28 June 2001; National Space Legislation of the World, Vol. II (2002), at 307.
[61]. See Secc. 11, 13, An act about space activities, and for related purposes.
[62]. See Sec. 12, An act about space activities, and for related purposes.
[63]. See Sec. 14, An act about space activities, and for related purposes.
[64]. See Sec. 15, An act about space activities, and for related purposes.
[65]. Sec. 48(3), see also Sec. 69(3), An act about space activities, and for related purposes.
[66]. See Sec. 69(3), An act about space activities, and for related purposes.
[67]. Administrative Edict No. 27, 20 June 2001; National Space Legislation of the World, Vol. II (2002), at 377. It includes the Regulation on Procedures and on Definition of Necessary Requirements for the Request, Evaluation, Issuance, Follow-up and Supervision of Licenses for Carrying out Launching Space Activities on Brazilian Territory.
[68]. See Art. 2, Regulation on Procedures and on Definition of Necessary Requirements for the Request, Evaluation, Issuance, Follow-up and Supervision of Licenses for Carrying out Launching Space Activities on Brazilian Territory.

reimbursement to be capped, in view of the likelihood of the insurance obligation of being capped. In the license itself then proper reference to reimbursement of Brazil is to be expected.[69]

3.11. South Korea

South Korea promulgated its Space Development Promotion Act in 2005, dealing in principle with all possible sorts of space activities – research and development, launching and operation of spacecraft, and more generally the use and exploration of outer space.[70]
The liability for a licensee in regard of damage caused by licensed activities is in principle unlimited, and any limits would have to be prescribed by a separate Act.[71]
Furthermore, it is obligatory under the Act to take out insurance for relevant third-party liability claims addressed to the South-Korean government, up to a limit to be prescribed – and hence potentially applicable also in case the reimbursement obligation will be unlimited, alternatively determined at a lower level than any cap on reimbursement.[72]

3.12. Belgium

The latest one amongst the countries having established a proper national space legislation, also Belgium in the course of 2005 enunciated a Law on the activities of launching, flight operations or guidance of space objects – in other words, dealing in principle with all space activities and providing for a licensing obligation in respect of such activities if undertaken from its territory and/or by its nationals.[73]
Under the Belgian Law, there is no obligation for insurance as such, though the King "may determine conditions for granting authorisations" amongst others with a view to "protecting the strategic, economic and financial interests of the Belgian State"[74] – which could well entail an insurance obligation inserted in any particular license; similarly the Minister responsible for space research and its applications "may attach to any authorisation such specific conditions that he may deem useful for the accomplishment of the same objectives, on a case-by-case basis".[75] Such "financial interests of the Belgian State" automatically evolve from the obligatory reimbursement by the licensee of any international liability claims addressed to the Belgian government, which reimbursement is – in principle – unlimited.[76]

4. Concluding remarks

The development of private involvement in space activities is ongoing, perhaps haphazardly so and in some sectors with more success than in others, but still generally

[69]. Reference is made here to Artt. 4, 9(2)(VI), Administrative Edict No. 5, II/2002.
[70]. See in particular Art. 2, Space Development Promotion Act, promulgated 31 May 2005, entered into force 30 November 2005. The author is in the possession of an unofficial translation from Korean in English by Y. Lee, dated August 2005. See in particular Art. 2.
[71]. See Art. 14, Space Development Promotion Act.
[72]. See Art. 15, Space Development Promotion Act.
[73]. Law on the activities of launching, flight operations or guidance of space objects, adopted 28 June 2005; see http://www.belspo.be/belspo/res/rech/spatres/loispat_en.stm for the English translation. See further Art. 2.
[74]. Art. 5(1), Law on the activities of launching, flight operations or guidance of space objects.
[75]. Art. 5(2), Law on the activities of launching, flight operations or guidance of space objects; also Art. 1 sub 6°.
[76]. See Art. 15(1)-(3), Law on the activities of launching, flight operations or guidance of space objects.

speaking in the direction of *more* of such involvement. New concepts such as Public-Private Partnerships (PPP's) – a prime example being the European satellite navigation programme Galileo – or a bi-national company (Alcantara Tsyklon Space, combining Brazilian launch site operations with Ukrainian launch vehicle expertise) are essentially interesting new venues from this perspective of drawing private funds and expertise into space activities.

These developments almost automatically will also cause the promulgation of new national space laws with licensing systems in the future. As a matter of fact, in countries such as the Netherlands, Germany, India, the People's Republic of China, Malaysia, Japan and France – some of which have already dedicated national legislation on space, only not a comprehensive and transparent licensing system for private space activities – the drafting of national space laws which do include such a licensing system has advanced sometimes quite far at this point in time.

France offers a particularly interesting example, in that the focus of international liability on the launch has for a long time caused it to provide for *ad hoc*-arrangements in regard of Arianespace launches, taking into account also the involvement of both the European Space Agency and its (other) member states in the Ariane programme and operations at the Kourou launch base. These arrangements effectively substituted for a proper licensing regime, but for example in terms of liability provided for an obligation of Arianespace to reimburse France for an amount of (currently) up to € 60,000,000 per launch in case of international liability claims addressed to France for damage caused by space objects launched by Arianespace.[77] Yet, also France has now also decided to develop a more comprehensive and transparent licensing regime by means of a national space law.

Such an increasing number of states already endowed with, respectively soon to be endowed with, a full-fledged national space law-*cum*-licensing system, also raises the issue of whether it would not be preferable to harmonise certain key features in this regard, in order to avoid the spectre of license shopping with cheap flags of convenience from haunting the space sector as it did and still does the maritime sector.

There may be many key differences between the maritime and space sector, as well as major political problems related to any effort to try and harmonise certain elements of what is, ultimately, still a sovereign issue of licensing private companies to undertake activities for which the state concerned may be held internationally responsible and/or liable under the applicable rules of international space law, but the summary 'case study' on liability and insurance contained in the present paper illustrates that there are, indeed, major differences between the approaches taken by individual states *re* licensing, liability and insurance – not to mention the absence of any such national space law in what is still a large majority of states.

Hence, the very least that could and should be done now is a serious effort to map such differences and see where and whether states could come to an agreement to, as far as politically and practically feasible and desirable, converge certain key elements (to be) contained in any national space law. If this paper and this conference can contribute to that, we have already achieved some measure of success.

[77]. See further the author's Private Enterprise and Public Interest in the European 'Spacescape' (1998), pp. 155-6, 159-61.