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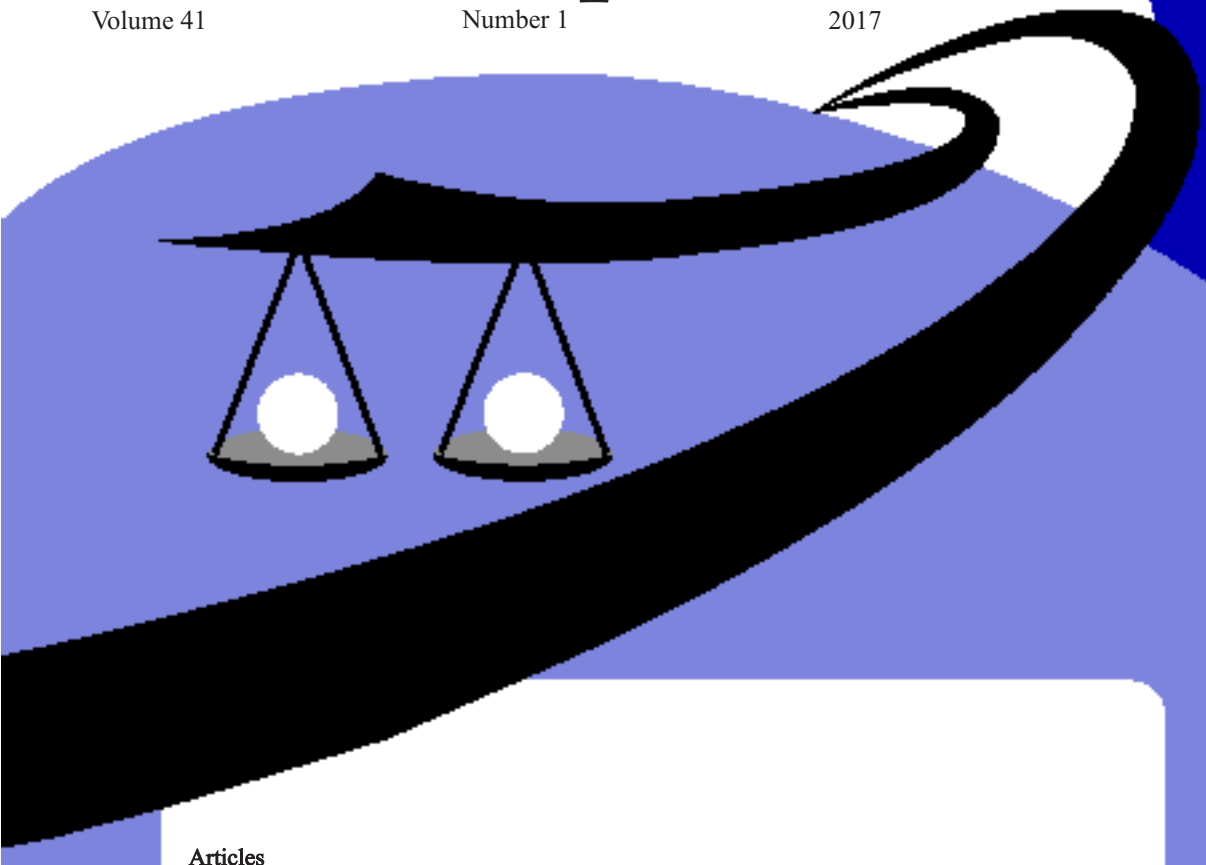

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ARTICLES

A DISCOURSE ON THE REMODELING OF ILA MODEL LAW ON NATIONAL SPACE LEGISLATION

Sandeepa Bhat B.[*]*& Arthad Kurlekar*[**]

I. INTRODUCTION

Nandasiri Jaysantuliyana has credited the success of the evolution of the five constitutive treaties of space law to the United Nations.[1] Undoubtedly, the United Nations' contributions in outer space law-making are praiseworthy, and but for its efforts, outer space would have been the central area of conflict in the modern era of technology. Yet after 1979, the United Nations has failed to adopt a single binding legal instrument governing outer space. Though this is due to the absence of political consensus amongst the member States, the consequences are far-reaching in today's world, wherein the technology has transformed the nature and scope of space activities.[2] Empirically, thus, it is evident that the

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This article is a part of broader endeavor of drafting a viable model of national space legislation for India undertaken by the Society for Studies in Outer Space Law, The WB National University of Juridical Sciences, Kolkata.

[1] NANDASIRI JAYSANTULIYANA, SPACE LAW: DEVELOPMENT AND SCOPE, 4 (1992).

[2] *See* Claudia Pastorius, *Law and Policy in the Global Space Industry's Lift-Off*, 19(1) BARRY L. REV. 201, 204-20 (2013).

evolution of space law, especially in creating binding norms upon the diverse and increasing number of space actors, has become somewhat stagnant on the international level.

It is important to note that the space treaties were entered into during the period when states were the only actors in space activities. The rise in space activities by private space actors has occurred primarily after the drafting of the Moon Agreement[3] in 1979.[4] Thus, space treaties have become somewhat anachronous primarily due to their focus on only inter-state relations. This gross deficiency must be addressed in order to regulate private space activities within the four corners of the law before it is too late. Moreover, the space treaties simply provide for generic rules that often lack enforceability or suffer due to ambiguous phrasing, resulting in conflicting interpretations.[5] Thus, national space legislation would aid significantly in detailing out the procedures and rules required for the purpose of engaging private space actors. As an illustration, a significant need for private space legislation is felt upon analysis of Article VI of the Outer Space Treaty[6] and Article XIV of the Moon Agreement, which provide for supervision and authorization of national space actors.[7] The provisions impose

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[3] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 UNTS 3 (entry into force July 11, 1984) (hereinafter the Moon Agreement).

[4] Fabio Tronchetti, Fundamentals of Space Law And Policy, 13 (2013).

[5] One illustration of the same is the province of all mankind principle, which was dismissed as unenforceable by the United States and the USSR. (*See* J.I. Gabrynowicz, *The Province and Heritage of Mankind Reconsidered*, *in* Proceedings Of The Second Conference on Lunar Bases And Space Activities of The 21st Century, 691, 694-95 (W. W. Mendell ed., 1988)).

[6] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 UNTS 205, 18 UST 2410, TIAS No 6347, 6 ILM 386 (entry into force Oct. 10, 1967) (hereinafter the Outer Space Treaty).

[7] Outer Space Treaty, Art. VI states: "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. When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization." Moon Agreement,

an obligation upon states to supervise and also be responsible for the activities of national and non-governmental private space actors. However, the means and mechanisms of this supervision and authorization have not been established by the treaties. Thus, national space legislation is required to address these concerns.

Stephan Hobe suggested that to alleviate this shortcoming, draft legislation should be annexed in the form of a Protocol to the Outer Space Treaty, whereby States would be mandated to enact harmonized legislation.[8] Such a view is tenable, as it would prevent excessive diversification of norms in various jurisdictions. Although there is the potential that this suggestion may raise a question of interference with state sovereignty in its domestic affairs, it has given rise to the formulation of the Sofia Guidelines of 2012, which presented a draft of the ILA Model Law on National Space Legislation.[9] This draft of the ILA Model Law has been further fine-tuned in the 52nd Session of the Legal Subcommittee of the United Nations Committee on Peaceful Uses of Outer Space (UNCOPOUS).[10] The Model Law seeks to serve as an instrument of harmonizing and developing space law. In this article, the authors start with a critical analysis of the provisions of the Model Law by addressing its loopholes in detail. The next part of the article points out the specific aspects that need to find due recognition in the Model Law to comprehensively regulate the space activities at the national level. Finally, the article concludes with the

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Article XIV states: "States Parties to this Agreement shall bear international responsibility for national activities on the Moon, 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 this Agreement. States Parties shall ensure that non-governmental entities under their jurisdiction shall engage in activities on the Moon only under the authority and continuing supervision of the appropriate State Party."

[8] *See* Maureen Williams (Report), '*Review of Space Law Treaties in view of Commercial Space Activities*,' Report of The Sixty-Ninth Conference of International Law Association 571, 573 (July 25–29, 2000).

[9] Res. No. 6/2012, 75th Conference of International Law Association.

[10] United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Legal Sub-Committee, 52nd Session April 2013, Information on the activities of international intergovernmental and non-governmental organizations relating to space law, A/AC.105/C.2/2013/CRP.6, Mar. 26, 2013 (hereinafter 'ILA Model Law'/ 'Model Law'). The Model Law also incorporates explanatory notes in the form of comments by Stephan Hobe (hereinafter 'comment').

summation of arguments, and suggestions for remodeling the ILA Model Law.

II. CONCERNS IN THE SCOPE OF APPLICATION AND DEFINITIONS

A. Scope of Application

Article 1 of the Model Law defines its scope of application.[11] Commentary on the Model Law argues that the jurisdiction *rationaemateriae* is defined by the term 'space activity.'[12] It is interesting to note however, that the term 'space activity' has not been defined in any of the space treaties. At present, various states have diverse definitions of what constitutes space activities; the array ranging from a narrow construction where the launch is the starting point, to a significantly broad scope where the allied ground activities are also considered to be a part of a 'space activity.' Moreover, no scientific or legal criteria have been developed for defining 'space activity' since the beginning of space ventures. This is why the functionalist approach to define outer space and to demarcate it from airspace has also failed.[13] Consequently, a provision that is based on such an ambiguous phrase would have the effect of making the scope of application unclear. Though attempts have been made to provide a definition of 'space activity' under the

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[11] ILA Model Law, Art 1. "The present law applies to space activities carried out by citizens of XY or legal persons incorporated in XY and space activities carried out within the territory of XY or on ships or aircraft registered in XY."

[12] Stephan Hobe, Et Al. (Eds), Cologne Commentary on Space Law, Vol. III, 579 (2015).

[13] There are two approaches to define and demarcate 'outer space'; spatialist approach and functionalist approach. The spatialist approach tries to use different criteria like atmosphere, gravitational force of the earth, lowest satellite orbit, security of the states, ability of the states to have effective control, Karman line, etc. as different criteria for the demarcation of outer space from airspace. Unfortunately, none of these criteria succeed in establishing a precise line of demarcation between the outer space and airspace. (*See* Stanley B. Rosenfield, *Where Airspace Ends and Outer Space Begins*, 7(2) J. SPACE L. 137, 137-48 (1979)); (*See also* He Qizhi, *The Problem of Definition and Delimitation of Outer Space*, 10(2) J. SPACE L. 157, 157-63 (1982)). The functionalist approach, in contrast with the spatialist approach, tries to define outer space in terms of the nature of activity. However, it has been found that defining 'space activity' is as difficult as defining 'outer space' itself. (*See* M. J. Peterson, International Regime for the Final Frontier, 60 (2005)).

Model Law, it is still ambiguous as demonstrated below in the definitional concerns of 'space activity.'

Further, the scope of application encompasses three aspects in relation to a state; space activities conducted from within its territory, space activities conducted outside its territory by its citizens or legal persons, and space activities conducted by its nationals. The commentary further elaborates by stating the need for an effective connecting factor, which in turn hints at the requirement of delineating the jurisdiction of one state *vis-a-vis* other states particularly in situations where there is more than one launching state. However, such a scope of application creates several ambiguities in the interpretation.

The first problem with the phrasing relates to the broad ambit covered within the scope of Article 1. In particular the disjunctive 'or' creates ambiguities. As an illustration, hypothetically assuming that all states have adhered to the Model Law, there may arise a situation where one space activity with a space vehicle registered in the United Kingdom with American nationals on board and launched from a facility located in Australia, may be governed by all three laws; namely that of the United Kingdom, United States, and Australia. Thus, it envisages a situation where there could be more than one law applicable to a particular launch. Assuming that supervision and authorization are the two most important features obligated under Article VI of the Outer Space Treaty, the operation of multiple laws can create problems regarding supervision authority and the states that would supervise or authorize the launch.

The second problem with this is that the scope of application provision is not entirely in synchronization with that of the parameters for a 'launching State' under the space treaties.[14] Article 1 of Model Law does not speak about the use of facility as a crite-

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[14] Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 961 UNTS 187; 24 UST 2389; 10 ILM 965 (1971) (entry into force Sept. 1, 1972) [hereinafter the Liability Convention] and Convention on Registration of Objects Launched into Outer Space, June 6, 1975, 28 UST 695, 1023 UNTS 15 (entry into force Sept. 15, 1976) [hereinafter theRegistration Convention] provide the definition of 'launching State'. Art. I(c) of the Liability Convention and Art. I(a) of the Registration Convention state that "The term "launching State" means: (i) A State which launches or procures the launching of a space object; (ii) A State from whose territory or facility a space object is launched."

rion for the application of Model Law, which is a departure from the definition of 'launching State'. Hence, for example, if the facility of State 'A' located in State 'B' is used by State 'C,' to launch a space object of Y, a private space actor from State 'D' (assuming that all States have adopted the Model Law), the laws of State 'A' would not be applicable even though it falls squarely under the definition of 'launching State.' However, the laws of B, C, and D would be applicable to the launch and thus, it poses further ambiguities.

The commentary states, "it is notable that the recommendation does not include 'facilities' of a State as representing one of the four criteria for a launching State."[15] It goes on to argue that this absence does not pose a problem as 'facilities' are *per se* not required and that even without a facility of launch the definition has no gaps. However, as demonstrated above, 'facilities of a State' form an important part of the definition of a launching State and create several obligations, particularly so with its inclusion in the Liability Convention and Registration Convention. Moreover, since such a possibility is not merely a speculation but also found in practical terms,[16] the exclusion of 'facilities' from the provision has far-reaching consequences.

The commentary has envisaged an overlap of applicable laws, but it states that the mere possibility of the overlap is not sufficient and the actual overlap needs to be addressed.[17] However, this does not seem to be a correct proposition and addressing potential overlap is equally necessary. It is only after foreseeing the existence of such an overlap that a State Party may enter into a bilateral or multilateral agreement at the outset to determine the laws applicable in case of an overlap. The commentary also states that there is a need to draft a provision in the national legislation itself, to determine the law applicable during the overlap. No such provision has been addressed in the Model Law.[18]

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[15] Hobe, *supra* note 12, at 567.

[16] Russia owns the Baikonur facility inside Kazakhstan. *See* Roland Oliphant, *Inside Baikonur, the Space Station that will Send Major Tim Peake into Space* (Dec. 13, 2015), *at* http://www.telegraph.co.uk/news/worldnews/asia/kazakhstan/12047437/Inside-Baikonur-the-space-station-that-will-send-Major-Tim-Peake-into-space.html.

[17] Hobe, *supra* note 12, at 575.

[18] *Id.*, at 575, 576.

B. Definitions

Article 2 of the Model Law enlists an illustrative list of important definitions that need to be included in the national space legislation. As noted before, it is pertinent to define 'space activities' under Article VI of the Outer Space Treaty, as supervision and authorization are two important requirements for any space activity. Hence, the definitions part of the Model Law starts with an inclusive definition of 'space activity.'[19] There are two issues pertaining to its definition. First, the definition includes "other activities essential for the launch, operation, guidance and re-entry of space objects into, in and from outer space." Thus, the line between those launch-support activities that would fall into the category of space activities and those that would fall outside that scope is blurred and ambiguous. The second issue pertains to the inclusion of aerospace vehicles within the definition. By their very nature, aerospace vehicles pose a question as to whether they should be governed by air law or by the law of outer space. The Commentary says that the international practice is reflected in the provision.[20] However, it is pertinent to note here that there is no such accepted international practice in this regard. Several theories are proposed by scholars on the applicable law for aerospace objects, but without any consensus.[21]

This issue is further compounded by the fact that the Commentary uses the Karman line as the legitimate threshold for the definition of the space object.[22] First and foremost, this is conflicted by the provisions of the Model Law which is silent with respect to the agreement with the Karman line and thus no presumption in its favor can be made. Second, aerospace vehicles with the capacity to use airlift as well as gravitation for the purpose of motion create a problem in the operation of the definition. Admittedly, the Karman line has been compromisingly accepted as the threshold, but the enforceability concerns in municipal jurisdictions due to

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[19] ILA Model Law, Art 2. "The term 'space activity' includes the launch, operation, guidance, and re-entry of space objects into, in and from outer space and other activities essential for the launch, operation, guidance and re-entry of space objects into, in and from outer space."

[20] Hobe, *supra* note 12, at 575 & 576.

[21] YanalAbulFailat, *Space Tourism: A Synopsis on its Legal Challenges*, 1 IRISH L. J. 120, 147-51 (2012).

[22] Hobe, *supra* note 12, at 575 & 576.

the varying 'content' as interpreted by states of the Karman line would make it even more pressing to have a non-conflicted definition of a 'space object.' The idea of a case-to-case determination of what constitutes a space activity, although *prima facie* problematic in light of possible arbitrariness in decision-making, appears more attractive on deeper examination. This is especially true if the authorization procured demarcates a venture as a space activity after receiving the full proposal from the concerned parties.

Shifting the focus to the definition of 'space object,' the definition of what constitutes a space object becomes pertinent, especially in light of the obligation of registration under Article 10 of the Model Law.[23] With the inclusion of 'component parts' of space object and its launch vehicle, and without a line between whether and to what degree the component parts of the space object would have to be registered, it becomes cumbersome to comply with the obligation of registration in the proper sense. On the one hand, although registration of every component part is advisable, it would not be pragmatic, but on the other hand, the non-registration of component parts would fall afoul of the legislation. Under international law, the meaning of component parts as well as the requirement of registration could be left open to be decided by the state practice.[24] However, under a municipal law this cannot be the case. The sovereign imposition of a state would mandate all actors undertaking activities under the sovereignty of the enacting state to adhere to all provisions of the sovereign. With an ambiguous definition of space object, compliance may become a problem, reducing transparency and safety of space ventures, and increasing the chance of litigation. Litigation, in turn, would dissuade private space actors from undertaking space activities under that state's jurisdiction.

The provisions on scope of application, and definitions of 'space activity' and 'space object' also bank on the determination and demarcation of 'outer space', since they make either explicit or

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[23] ILA Model Law, Art. 2. "The term 'space object' refers to any object launched or intended to be launched into outer space, including its component parts as well as its launch vehicle and parts thereof."

[24] As per the present practice, the one of the States makes a single registration of the space object as a whole with respect to each launch. Zhao Yun, *Revisiting the 1975 Registration Convention: Time for Revision?*, 11 AUSTRALIAN J. INT'L L. 106, 115 (2004).

implicit reference to 'outer space' in the text. However, the Model Law fails to provide any decisive criterion or guideline for the determination of outer space. Current practices at the international level are also divided between the spatialist and functionalist approaches,[25] as well as case-by-case determinations of applicable law.[26] In the wake of this, the provisions on scope of application and the definition of 'space activity' and 'space object' suffer from lack of clarity.

III. SUPERVISION AND AUTHORIZATION

Articles 3 to 6 of the Model Law pertain to the authorization, conditions of licensing, supervision, and the revocation of the license. The commentary states that the Model Law leaves it open for states to decide the structure, organization, and mandate of the National Space Authority.[27] However, it argues that other states are interested to know the internal setup of a state in question, and therefore, states should have the regulatory powers of the authorizing body within the ambit of the legislation.[28]

Article 3 states that "[a]ll space activities are subject to authorization. Authorization shall be granted by the minister (e.g. the competent minister or authority)." Article 4 goes on to elaborate the conditions of authorization.[29] The problem with such a

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[25] *Supra* note 13.

[26] Australia follows spatialist approach in its national legislation by providing a minimum limit of 100 km from the mean sea level for the application of its space law. *See* Art. 8 of Space Activities Act 1998. UNCOPUOS has resolved that the application of space law has to be determined on case-by-case basis instead of trying to find a solution to the problem of demarcation of outer space from airspace. M. Rothblatt, *Are Stratospheric Platforms in Airspace or Outer Space*, 24(2) J. SPACE L. 107, 109 & 110 (1996).

[27] Hobe, *supra* note 12, at 578.

[28] *Id*., at 579.

[29] ILA Model Law, Art. 4. "(1) Authorization shall be granted under the following conditions:
(a) The operator is in a financial position to undertake space activities;
(b) The operator has proven to be reliable and to have the required technical knowledge;
(c) The space activity does not cause environmental damage to the Earth and outer space in accordance with article 7;
(d) The space activity is undertaken in such a manner as to mitigate to the greatest possible extent any potential space debris in accordance with article 8;
(e) The space activity is compatible with public safety standards;
(f) The space activity does not run counter to national security interests;

blanket provision of authorization of all space activities can be demonstrated by an illustration. There is a launch, where the launching States are 'A' and 'B,' both presumably have adopted the Model Law. Assuming that the facility is owned by one state and the launch is procured by another state, then authorization may have to be taken from both states. Continuing the same analogy as used above to Articles 3 and 4, the regulations and stipulations of one authorizing state may vary from one authorizing state to another, creating conflict. Particularly, concerns of national security could be problematic in this circumstance. Conflicting regimes may lead not only to a frustration of the activity, but also dis-incentivize private space actors from conducting space activities at all. Varying compliance standards may also increase the cost of undertaking a venture, cutting down on the profit any private space actor would earn.

The multiplicity of jurisdictions also poses a problem with respect to the power of supervision provided for in Article 5.[30] Sensitive issues associated with space activities— trade secrets, technological knowhow, etc.—have always been kept confidential by the states as well as private players involved in space ventures. In the event of a multiplicity of jurisdictions to supervise space activities, the efforts of space actors to retain confidentiality could pose significant disputes. The power to supervise could also bring to the fore the question of liability apportionment between the launching States *inter se*. It is amply clear under the Liability Convention that all launching States would jointly and severally be liable for any damage resulting from the space activity.[31] The Liability Con-

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(g) The space activity does not run counter to international obligations and foreign policy interests of XY;
(h) The operator has complied with ITU Regulations with regard to frequency allocations and orbital positions;
(i) The operator complies with insurance requirements as determined in article 12.
(2) In order to prove fulfillment of the conditions mentioned in paragraph (1), the operator should submit appropriate documentation and evidence (as specified in an implementing decree/regulation).
(3) The authorization may contain conditions and requirements."

[30] Id. at Art. 5. "All space activities are subject to continuing supervision by the ministerial authority. Details of such shall be laid down in an implementing decree/regulation."

[31] Liability Convention, Art. V(1). "Whenever two or more States jointly launch a space object, they shall be jointly and severally liable for any damage caused."

vention also provides for apportionment of liability between the launching States without affecting the rights of victim states.[32] However, the interplay between the provision on supervision under the Model Law and the apportionment of liability under the Liability Convention may result in conflicting arguments. On the one hand, it may be argued that between the launching states, the supervising state would have to bear a significantly higher burden of liability. On the contrary, the supervising state may argue that it did not have exclusive supervision and control over the private space actor, since other states are also exercizing/entitled to exercise supervisory powers under Article 5. This potential for conflict would mandate the inclusion of a provision within national law, stipulating that the state should negotiate *a priori* a liability-sharing regime with other states in case of any launch falling within the ambit of joint launching.

Significant problems exist even with the power to revoke licenses,[33] since Article 6 of the Model Law does not provide for the consequences of such revocation. If the noncompliance of the licensee with certain conditions is post-facto discovered, failure to account for the consequences under the Model Law brings forward several critical questions: (a) Would the revocation of a license force the licensee to transfer the space object? (b) If the space actor is carrying on an activity of national interest, how would the cessation of the activity be undertaken? (c) In a case of revocation, would the state be liable to compensate the private actor? (d) In a situation wherein authorization is granted from multiple states, whether the state that has revoked the license is bound to compensate other states? Would such a foreign state be entitled to claim compensation from the state of nationality and territory (assuming they are the same) of the private space actor? There-

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[32] Id. at Art. V(2). "A launching State which has paid compensation for damage shall have the right to present a claim for indemnification to other participants in the joint launching. The participants in a joint launching may conclude agreements regarding the apportioning among themselves of the financial obligation in respect of which they are jointly and severally liable. Such agreements shall be without prejudice to the right of a State sustaining damage to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable."

[33] ILA Model Law, Art. 6. "The respective authority may withdraw, suspend or amend the authorization, when either the conditions of article 4, paragraph 1, or the specific requirements of article 4, paragraph 3, are not observed."

fore, in the absence of clarity on these counts, the revocation of licenses would produce impractical results.

IV. ISSUES RELATING TO ENVIRONMENTAL OBLIGATIONS

The next issue pertains to Articles 7 and 8, which deal with environmental protection and mitigation of debris. Article 7[34] poses two problems. The first problem relates to the definition of environmental damage.[35] It would be up to the state to determine the threshold of environmental damage by providing it in the definition section. The second problem concerns the sphere of application of Article 7, which expressly mentions the Earth and outer space as well as any parts thereof without providing the threshold of environmental damage. The over-arching question is that, if there are only limited environmental obligations under Article IX of the Outer Space Treaty[36] and Article 7 of the Moon Agreement,[37] should the state adopt more stringent norms than those required under the treaty provisions?

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[34] ILA Model Law, Art. 7. "(1) Space activities shall not cause environmental damage to the Earth and outer space or parts thereof, either directly or indirectly.
(2) An environmental impact assessment is required before the beginning of a space activity.
(3) Details of the environmental impact assessment shall be laid down in an implementing decree/regulation.

[35] Threshold of environmental damage differs from State to State depending on the level of awareness, economic developments, technological factors etc."

[36] Outer Space Treaty, Art. IX. "In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States Parties to the Treaty. States Parties to the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose."

[37] The Moon Agreement, Art. 7(1). "In exploring and using the moon, States Parties shall take measures to prevent the disruption of the existing balance of its environment, whether by introducing adverse changes in that environment, by its harmful contamination through the introduction of extra-environmental matter or otherwise. States Parties shall also take measures to avoid harmfully affecting the environment of the earth through the introduction of extraterrestrial matter or otherwise."

Moreover, Article 7 of the Model Law mandates the requirement of an environmental impact assessment before the beginning of any space activity. However, it leaves the details of the environmental impact assessment to be developed by the concerned state in the form of a separate regulation. On a negative note, in the absence of uniformity in the environmental impact assessment procedures in different parts of the world, the true purpose for requiring an environmental impact assessment may be lost in the present era of commercialization. Any space actor could simply go in search of a state with less rigorous requirements for environmental impact assessments to carry out its space activities. Reciprocally, some states would likely try to adopt a minimalist approach to its environmental impact assessment requirement in order to promote more and more commercial space activities.

Towards the mitigation of space debris, Article 8 of the Model Law attempts to provide a best efforts clause.[38] However, Article 8 leaves the efforts undertaken by any private space actor contentious. What threshold would be applied to adjudge these best efforts? Would it be based on the capacity of the private space actors? If that is the case, it would be unfair for those private space actors who have the capacity to do so, seeing as they would incur significantly more costs than smaller entities. Furthermore, Article 8 refers to the existence of particular international standards for the mitigation of space debris. However, there is no such international standard available to which the applicable states have consented. Though the UNCOPUOS and the Inter-Agency Space Debris Coordination Committee (IADC) have developed debris mitigation guidelines,[39] they are not binding on the states. Failing

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[38] ILA Model Law, Art. 8. "(1)Space activities should be carried out in such a manner as to mitigate to the greatest possible extent any potential space debris in accordance with article 4(d).
(2) The obligation under paragraph 1 includes the obligation to limit debris released during normal operations, to minimize the potential for in-orbit break-ups, to prepare for post-mission disposal, and to avoid in-orbit collisions in accordance with international space debris mitigation standards."

[39] The most recent UNCOPUOS Space Debris Mitigation Guidelines are that of 2010. *See* UNCOPUOS Space Debris Mitigation Guidelines, *available at* http://orbitaldebris.jsc.nasa.gov/library/Space%20Debris%20Mitigation%20Guidelines_COPUOS.pdf (visited Mar. 27, 2016). IADC's most recent Space Debris Mitigation Guidelines are that of 2007. *See* IADC Space Debris Mitigation Guidelines 2007, *available at*

the existence of an accepted standard on debris mitigation, Article 8 is rendered ambiguous.

On the other hand, there exist some solutions for addressing issues raised by Articles 7 and 8. First of all, the states must realize that the provisions on environmental protection are very weak under the space treaties. With an ambitious plan to expand space activities, the issue of environmental protection cannot be kept in isolation. Such neglect on the part of the states would cost dearly in terms of our future. Hence, a direct obligation to protect the environment must be entrenched in the Model Law with clarity concerning its scope and definition. Though such an effort may result in going beyond the obligations under the current space treaties, it is absolutely essential in light of the context and magnitude of the problem. Vague provisions creating a mere moral obligation to conduct environmental impact assessments for the protection of the environment are grossly insufficient. Further, specific technical standards may be prescribed in the Model Law as minimum standards to be adopted by the states to ensure that space debris is mitigated. In case the private space actor fails to mitigate or subsequently clean up the debris it creates, the state concerned should be compelled to accumulate the required funds for the purpose of cleaning the debris. These funds could be gathered in the form of operational taxes imposed upon private space actors as well as from the fines collected under Article 14 of the Model Law.[40] Such a model in relation to nuclear liability has been successful in the United States.[41]

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http://orbitaldebris.jsc.nasa.gov/library/IADC_Mitigation_Guidelines_Rev_1_Sep07.pdf (visited Mar. 27 2016).

[40] ILA Model Law, Art. 14. "Any breach of the obligations set out in the present law is punishable with a fine of ##,####. The carrying out of space activities and the transfer of space activities without authorization from the authority, granted pursuant to articles 3 and 9, is punishable with an amount not lower than #,###."

[41] The nuclear liability fund in the United States, which is known as Price-Anderson Fund, is created by the contribution of nuclear operators under the Price-Anderson Act 1957. *See* Elizabeth J. Wilson and Sara Bergan, *Managing Liability: Comparing Radioactive Waste Disposal and Carbon Dioxide Storage*, *in* Geological Disposal of Carbon Dioxide And Radioactive Waste: A Comparative Assessment 263, 279 (Frence L. Toth ed., 2011).

V. REGISTRATION AND TRANSFER OF SPACE ACTIVITY/OBJECT

Articles 9 and 10 of the Model Law deal with the transfer of a space activity/object[42] and registration of the space object,[43] respectively. The first problem that arises here is that the law is unclear as to who would furnish the necessary information to the national registry; and therefore, who has the obligation to register. The Commentary states "respective information from the operators" must be provided, which leaves the question of what information has to be provided subject to the discretion of each operator connected with single space activity.[44] Moreover, the term operator has not been used in any of the space treaties and therefore, there is a lack of international consensus about the meaning of "operator of a private space activity." Though the Model Law vaguely defines "operator" as "a natural or legal person carrying

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[42] ILA Model Law, Art. 9. "The transfer of a space activity and/or a space object to another operator is subject to prior authorization by the competent authority. Authorization will be granted under the conditions laid down in article 4."

[43] Id. at Art. 10. "(1) A national register is hereby established for the registration of space objects. The authority (namely the competent minister, preferably the same as in article 3) shall maintain the national space register.
(2) Subject to paragraph 3 of this article all space objects for which XY is the launching State according to article 1 of the Convention on Registration of Objects Launched into Outer Space of 1974 shall be registered in the national register.
(3) If there are two or more launching States in respect of any such space object, the agreement among them according to article II, paragraph 2 of the Convention on Registration of Objects Launched into Outer Space shall determine which is to be the State of registry for that particular space object.
(4) The following information should be entered into the national register:
- Name of the launching state or states (name of a private launching entity: natural or legal person),
- Registration number of the space object,
- Date and territory or location of the launch,
- Basic orbital parameters including nodal period, inclination, apogee and perigee,
- General function of the space object.
(5) Additional information and information in accordance with the Registration Convention and/or the United Nations Registration Practice Resolution as specified in an implementing decree/regulation shall also be included in the national register.
(6) The information contained in paragraph 1 shall be made available to the Secretary-General of the United Nations as soon as possible.
(7) Any relevant change with regard to the information mentioned in paragraph 1 should be registered in the national register. The Secretary-General of the United Nations shall be informed accordingly."

[44] Hobe, *supra* note 12, at 588-91.

out space activities," it fails to identify the person responsible for the registration of space objects, seeing as the term "space activity" includes a plethora of activities. Thus, the ultimate result with regard to the registration of space objects is chaos.

The problem with a multiplicity of jurisdictions also plays a role in this issue. Unlike launching States, there can only be one state of registration under Article VIII of the Outer Space Treaty and Article II of the Registration Convention. Though Article 10(3) of the Model Law, while reinforcing Article II of the Registration Convention, does contemplate the situation of how one determines the state of registry amongst two or more joint launching States, it may only be useful in cases concerning state sponsored space activities. In the case of private space activities, the possibility of achieving such an agreement to determine the state of registry cannot always be expected. Hence, operators may have difficulty in identifying which is the appropriate state for registration. Because space activities involve sensitive technology as well as national security interests, it becomes all the more pertinent for operators to identify the appropriate state that can receive information about their space activities.

In addition to concerns regarding registration, the transfer of space objects under Article 9 poses some practical difficulties. The provision stipulates the requirement of prior authorization by the '*competent authority*;'[45] however, in the cross-border transfer of a space object, it is not clear as to which state's competent authority must issue prior authorization. Would it be from the state of transferor or that of transferee? Clarification on this is absolutely required in the wake of Article 14 of the Model Law, which imposes fines on the transfer of space activities without authorization by the competent authority. Moreover, Article 9 stipulates the conditions laid down under Article 4 are a prerequisite for authorization. This only serves to further confuse the nature of these conditions and additional requirements[46] upon which the initial authorization was granted to the transferor. If those conditions and additional requirements continue, questions would arise as to

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[45] Emphasis added.

[46] Additional requirements may be imposed by the authorizing state under Article 4 (3).

the enforceability of them in the transferee's state in case of cross-border transfers.

It is also pertinent to note here that the Model Law imposes minimum restrictions on the transfer of space activity. Understandably, this approach is used to incentivize the private players to increasingly resort to commercial space activities. However, such an unbridled discretion on transfer may be detrimental to national interests. Due to the significance of certain commercial space ventures in rendering some essential public services or security in the states, the transfer of such space activities to other states might cause serious prejudice to the public in general. Therefore, transfer of space activities needs to be properly weighed and balanced by taking into consideration public and private interests. This is why the UNIDROIT Space Protocol,[47] in the exercise of remedies under its provisions, imposes restrictions on the transfer of satellites contrary to the interests of national security and public services under Articles XXVI and XXVII, respectively.

Transfer of the space object/space activity also brings forward some important questions under the space treaties. As per Article VIII of the Outer Space Treaty, the state of registry shall exercise jurisdiction and control over the space object and the personnel thereof.[48] In the event of transfer of a satellite from the state of registry to another state, the debate arises as to which among the two shall exercise jurisdiction and control after the transfer.[49] This situation would be further complicated in the cases wherein the transferee's state does not fall within the definition of 'launching State' and thereby, is not entitled to register the space object.[50]

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[47] Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets 2012, *available at* http://www.unidroit.org/english/conventions/mobile-equipment/spaceassets-protocol-e.pdf (visited Mar. 27, 2016).

[48] Art. VIII: "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."

[49] It is important to note here that the wording of Art. VIII of the Outer Space Treaty, "…*shall retain jurisdiction and control*…" shows that exercise of jurisdiction and control is not only a right but also a duty of the state of registration.

[50] 'State of registry' as defined under Art. I(c) of the Registration Convention is "… a launching State on whose registry space object is carried in accordance with Article II." Therefore, the state of registry must essentially be a launching state.

In addition to the problems in terms of exercise of jurisdiction and control, similar kinds of problems can also be seen in terms of liability of the state(s) after the transfer. Since under the Outer Space Treaty and Liability Convention, the launching State is liable to pay compensation for any damage caused by the space activity, blame attribution between the transferor's state and transferee's state would be a common phenomenon in the cases wherein the damage is caused by the space objects after transfer.

To resolve the conundrum, Article 9 needs to be revised and the foreign player should be asked to enter into a contract with the transferor's state undertaking to adhere to the conditions stipulated in the initial authorization. An alternate method would be to insert a clause for agreement between the transferor's state and transferee's state to authorize the transferee's state to impose new conditions and requirements after the transfer. In such a case, a clear hierarchy of operation of law is created and hence there arises no problem of enforcement of conditions and requirements. This would also help in taking into consideration the national security and public service interests of the transferor's state in cases of cross-border transfer of space activities. Moreover, every transfer of the space object/activity should be made conditional upon the clarifications on jurisdiction and control as well as liability issues arising after the transfer.

VI. LIABILITY, RECOURSE AND INSURANCE

Articles 11 and 12 of the Model Law address the aspects of liability, recourse, and insurance. Though Article 11[51] indirectly recognizes the liability of the launching state(s) under the Liability Convention, it provides the state(s) with the right of recourse against the operator of space activity. It also suggests the possibility of right of recourse be limited to a certain amount. The Commentary stipulates the need for a balance between the objectives of incentivization of the private space actors as well as the public

[51] ILA Model Law, Art. 11. "(1) When XY has paid compensation to third parties for damage caused by a space activity in fulfillment of its international obligations, the Government is entitled to recourse against the operator.
(2) The recourse of the Government against the operator may be limited to a certain amount."

purpose of the state.[52] Towards this, it considers the limitations on liability of private space actors as desirable. Although such a move might be suitable for governments of developed states that are capable of withstanding such residual financial liability, it might not be a just proposition from the perspective of developing countries. Undoubtedly, the developing countries would find difficulty in limiting the liability of the operator, as it would burden their limited state funds. Consequently, the developed states that are in a position to afford such privilege may have an unfair advantage to attract/divert private space investments.

At the 2012 IISL conference, Hamid Kazemi, HadiMahmoudi, and Ali Akbar Golroo presented a paper titled "Towards a new international space liability regime alongside the Liability Convention 1971."[53] The authors argued that a new treaty on private international space law should be modeled on private international air law. Thus, it would always be desirable to shift the liability for the damage caused by the private space activities to the concerned private player under suitable mechanism. Requiring a state to incur the burden of liability, either fully or partially, for private space activities is not appropriate since it would amount to a situation of compromising the public good in order to uplift the private good.[54]

Article 12 of the Model Law requires private space actors to procure insurance up to a certain financial limit.[55] However, this provision is not applicable with respect to governmental space

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[52] Hobe, *supra* note 12, at 594 & 595.

[53] Hamid Kazemi, HadiMahmoudi and Ali Akbar Golroo, *Towards a New International Space Liability Regime Alongside the Liability Convention 1971*, *in*PROCEEDINGS OF THE FIFTY-FIFTH COLLOQUIUM ON THE LAW OF OUTER SPACE 263-73 (2012).

[54] Sandeepa Bhat B. and P. Ishwara Bhat, *Legal Framework of State Responsibility and Liability for Private Space Activities*, *in*SPACE LAW IN THE ERA OF COMMERCIALISATION 131, 146 (Sandeepa Bhat B. ed., 2010).

[55] ILA Model Law, Art. 12. "(1) The operator carrying out a space activity should be insured to cover damage caused to third parties up to the amount of… (to be established by national law).
(2) The obligation of paragraph 1 does not apply when the Government, as such, carries out a space activity.
(3) The authority may waive the obligation to insure when
(a) The operator has sufficient equity capital to cover the amount of his/her liability;
(b) The space activity is not a commercial space activity and is in the public interest.
(4) The details of the content and conditions of the insurance shall be laid down in implementing a decree/regulation to that effect."

activities carried on under sovereign functions. Further, the provision provides for the waiver of the requirement to procure insurance in two specific occasions: (a) when the operator has sufficient equity capital to cover the amount of their liability; and (b) when the space activity is not a commercial space activity and is in the public interest. However, both the conditions of waiver have their own limitations. First, in case of equity capital, what can be done if the equity capital, which is based on the market conditions, depreciates over the period of time is not answered by the provision. Second, neither 'commercial space activity' nor 'public interest' can be defined in precise terms. Though there is an attempt to define 'commercial space activity' in the Model Law,[56] the definition fails to clarify if the 'revenue' or 'profit' mentioned therein is confined to direct monetary benefits or whether it would also extend to other benefits. Thus, the insurance provision needs to be refined to remove these ambiguities.

In addition to the above-discussed concerns in the provisions, the Model Law has also failed to address several issues, which it should have addressed. These issues are presented in the following section of this article.

VI. ISSUES UNADDRESSED IN THE MODEL LAW

A. De-militarization

An important aspect that has not found a place in the Model Law is a provision requiring and mandating private space actors to carry on activities in accordance with the objective of peaceful purposes. Article IV of the Outer Space Treaty prohibits weaponization of outer space, establishment of military bases, installations, and fortifications, testing of weapons, and conduct of military maneuvers on the Moon and other celestial bodies.[57] The pro-

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[56] ILA Model Law, Art. 2. "Commercial space activity: A space activity for the purpose of generating revenue or profit whether conducted by a governmental or by a non-governmental entity."

[57] Outer Space Treaty, Art. IV. "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner.

The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations

vision also requires the use of the Moon and other celestial bodies exclusively for peaceful purposes. However, the vague wordings of Article IV of the Outer Space Treaty open up several questions concerning the demilitarization of outer space. These questions relate to the determination of the meaning of peaceful purposes, the application of such a norm to outer space, the possibility of testing weapons in outer space, the permissibility of placing conventional weapons in outer space, and so on.[58] Considering the fact that demilitarization has been a crucial element of several General Assembly resolutions, it is imperative that national space legislation must ensure that the peaceful purposes provision is reflected and clarified in it. The added importance of deweaponization mandates a separate provision warranting not only cancellation of licenses, but also penalties for breach.

In 2009, in the Fourth Committee Report dealing with demilitarization, the delegate of Sweden on behalf of the European Union stated "[w]hile additional legally binding multilateral commitments had been proposed against military threats, finding ways of making progress in the short term, and against all types of threats, was essential."[59] The delegate of Pakistan also agreed with this statement.[60] The Cuban delegate stated that "[t]he current space legislation was insufficient to prevent an arms race in space. The World Disarmament Conference, as the only international forum on disarmament, must play the main role in a multilateral agreement on the prevention of an arms race in space, in all forms."[61] Among other notable contributors, the Kazakhstan delegate supported the draft resolution on International Coopera-

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and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the Moon and other celestial bodies shall also not be prohibited."

[58] *See generally* John B. Gantt, *The Concept of "Peaceful Purposes"/"Peaceful Uses" in the Exploration and Use of Outer Space – Some Practical Examples*, *in* Proceedings of Forty-Sixth Colloquium on The Law of Outer Space 107, 107-12 (2004); (*See also* Jonathan Halpern, *Anti-Satellite Weaponry: High Road to Destruction*, 3 B. U. INT'L L. J.167-208 (1985)).

[59] Debating Outer Space Cooperation, Fourth Committee Hears Growing Number of Actors in Outer Space Could Risk Security of Space Assets, Limit Scope of Peaceful Uses (Oct. 21, 2009), *available at* http://www.un.org/press/en/2009/gaspd433.doc.htm.

[60] *Id*.

[61] *Id*.