

An Enabler or a Barrier?

“NewSpace” and Japan’s Two National Space Acts of 2016

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Abstract

On 16 November 2016, two new national space acts were promulgated in Japan mainly for promoting space business. One is the Space Activities Act (SAA) which provides for the authorization and supervision for the launch and operation of a satellite. The other is the Remote Sensing Data Act to strike a balance between international and national security concerns and the promotion of the remote sensing data business. This article studies as to whether these two acts can appropriately authorize and supervise “NewSpace” activities, such as the operation of the big constellation of satellites, active debris removal, producing artificial shooting stars (space entertainment), the moon exploration as a first step for the future space resource utilization, all of which have been engaged by Japanese private corporations. First, the background of the two space acts is touched upon, which is to be followed by the summary of the two acts. Emphasis is placed on the SAA, for this is more directly related to the promotion of space business. Survey of the two acts leads to the conclusion as follows. Active debris removal and producing artificial shooting stars would be appropriately authorized and supervised under the SAA, Space Activities Regulations (SAR) and satellite guidelines. So will be the Moon exploration. However, once such exploration is developed into an exploitation phase, should the Government deem it appropriate to advance the private space resource mining, clear conditions for carrying out such activities shall be made in the form of legally-binding norm in accordance with international space law. Such norm will be formed either as the amendment of the SAA or the making of a new independent act. For the operation of the big constellation of small satellites, the amendment of the SAA to provide the obligatory on-orbit TPL insurance for such a satellite operator may be preferable. In that case, governmental indemnification in case the damages is beyond the insured amount shall be provided as is the case with the launch operator.

I. Introduction

This article studies as to whether Japan’s “NewSpace”¹ activities will flourish under the newly enacted Japanese space acts, or *Act on Launch of Artificial*

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Satellites and Launch Vehicles and Control of Artificial Satellites (hereinafter referred to as “Space Activities Act” or “SAA”)² and *Act on Ensuring Appropriate Handling of Artificial Satellite Remote Sensing Data* (hereinafter referred to as “Remote Sensing Data Act” or “RSDA”).³ The United Nations General Assembly (UNGA) Resolution on the recommendations on national legislation relevant to the peaceful exploration and use of outer space⁴ suggests that national space acts to be made in the second decade of the 21st century should include regulations on the transfer of ownership or control of a space object in orbit⁵ as a new phenomenon. It may suggest that other emerging activities such as suborbital space tourism, active space debris removal, on-orbit servicing of satellites, space resource exploration as a first step to the future exploitation should also be regulated if such activities are planned by private persons of a country which intends to make a national space act.⁶ Title IV (Space Resource Exploration and Utilization) of the US Commercial Space Launch Competitiveness Act⁷ and Luxembourg Law on the Exploration and Use of Space Resources⁸ could be evaluated in terms of newly emerging activities to be supervised.

While some cases of on-orbit transfer of control of satellites are regulated under the Space Activities Act of Japan,⁹ no regulations have been made otherwise relating to NewSpace activities in the Japanese Acts. Yet, companies categorized in NewSpace have been emerging recent years including Astroscale (debris removal),¹⁰ ispace (moon exploration aiming at the future space resource utilization),¹¹ ALE (production of artificial shooting stars: space entertainment),¹² and Axelspace (constellation of small satellites).¹³ It is certain that the Japanese Acts will be beneficial for the traditional private space activities, e.g., the launch of a big company’s rocket to place a big company’s satellite in the geostationary orbit. But, does it also work for the NewSpace activities? If not, is it preferable that Japanese Acts,

1 See, e.g., Saadia M. Pekkanen, “What Does It Take To Compete in NewSpace?”, <https://www.forbes.com/sites/saadiampekkannen/2016/06/28/what-does-it-take-to-compete-in-newspace/>.

2 Act No. 76 of 2016, Official Gazette (special edition, No. 252), pp. 3-10.

3 Act No. 77 of 2016, *ibid.*, pp. 11-16.

4 A/RES/68/74 (16 December 2013).

5 *Ibid.*, para. 8.

6 See, e.g., A/AC.105/C.2/2011/CRP.4 (24 March 2011), paras. 26-27.

7 P.L.114-90, 25 November 2015, Section 401 *et seq.*

8 Dossier, No. 7093, adopted on 13 July 2017 and became effective as of 1 August 2017.

9 SAA, Art. 26.

10 <http://astroscale.com/>.

11 <https://ispace-inc.com/>.

12 <http://star-ale.com/en/>.

13 <https://www.axelspace.com/en/>.

especially the Space Activities Act be amended or an additional act on NewSpace activities be considered?

First, this article touches upon the background of the national space law-making, which is to be followed by the study of the characteristics of the two acts. As the Space Activities Act to authorize and supervise the launch and operation of satellites is by far more directly relevant to promote space business, emphasis is placed on the SAA. Finally, the evaluation will be made as to whether these two acts, especially the Space Activities Act and its licensing regulations, may appropriately authorize and supervise emerging space activities envisioned until 2030 or an early amendment or an additional act would be preferable.

II. Path to the Two National Space Acts

16 November 2016, Space Activities Act and Remote Sensing Data Act were promulgated. More than eight years had already elapsed since the entering into force of the *Space Basic Act* of 2008.¹⁴ Space Basic Act explicitly requested that the Government should enact a new space act to contribute to the promotion of space development and use by the private sector.¹⁵ Likewise, the two supplementary resolutions adopted by the House of Representatives (Lower House) and the House of Counsellors (Upper House) on 13 May and 20 May in 2008 respectively requested in the identical text that such space activities act should be enacted within two years from the date on which the Space Basic Act would come into effect.¹⁶ Space Basic Act was entered into force on 27 August 2008.

It was not that the Government did not make an effort. The working group to study a new space activities act, established on 1 October 2008,¹⁷ under the expert advisory commission to the Strategic Headquarters for Space Development (SHSD), chaired by the Prime Minister,¹⁸ completed its draft

14 Act No. 43 of 2008. It was promulgated on 28 May 2008.

15 Space Basic Act, Art. 35, para. 2.

16 Cabinet Committee, House of Representatives, *Supplementary Resolution on Space Basic Act on the Promotion of the Space Development and Use* (13 May 2008), para. 6; Cabinet Committee, House of Chancellors, *Supplementary Resolution on the Space Basic Bill* (20 May 2008), para. 6.

17 www.kantei.go.jp/jp/singi/utyuu/housei/dai1/siryuu1.pdf.

18 See, Space Basic Act, Arts. 25-34. Art. 32 was amended on 11 September 2015 (Act No. 66 of 2015). Previously, it was provided that affairs concerning the SHSD shall be conducted within the Cabinet Secretariat and administered by the Assistant Chief Cabinet Secretary. The current Article 32 provides that affairs concerning the SHSD shall be conducted within the Cabinet Office. This organizational change had been decided by Art. 2 of the supplementary provisions to the Space Basic Act.

working group report on 24 August 2009.¹⁹ After some modifications had been made based on the public comments, a final report was published on the internet on 5 March 2010²⁰ and by that time, a draft space activities bill had been prepared by the Secretariat of the SHSD in the Cabinet Secretariat.²¹ In the summer of 2009, when the draft working group report had been almost finalized, it seemed that a space activities act would have been made into a full-fledged act in the next and 2010 regular session of the Japanese Parliament (Diet). However, the historic change of the Government brought about by the general election held on 30 August 2009 changed the whole picture. For the first time in about half a century, the conservative Liberal Democratic Party (LDP) lost the status to run a cabinet. Yet, as Space Basic Act was a bi-partisan production, there was an expectation that a space activities act could be discussed in the Diet. It did not happen. The biggest earthquake and accompanying tsunami in about ten centuries hit Japan on 11 March 2011. That changed the priorities for the Diet to discuss the various bills. The bill on space activities had never been submitted to the Diet.

It was not until January 2015 when the idea of the enactment of the space activities act was officially resurrected. That was referred to in the third *Space Basic Plan* (hereinafter referred to as “SBP”) decided by the SHSD.²² Concerned with the rapidly worsening security ramification for Japan since the adoption of the second SBP in 2013²³ and continuously declining Japan’s space industry base essential to enhance national space capability,²⁴ the SHSD replaced the second SBP which had been planned to be effective until 2018²⁵ with the third SBP in 2015. One of the three pillars of the third SBP is the strengthening of the space industry and science and technology bases,²⁶ and

19 www.kantei.go.jp/jp/singi/utyuu/housei/dai6/gijiyoushi.pdf. Six meetings were held for the completion of the draft working group report: 19 November 2008, 26 January 2009, 12 March 2009, 25 May 2009, 6 July 2009 and 24 August 2009.

20 The contents of the public comments and the processes taken on the draft working group report are found: www.kantei.go.jp/jp/singi/utyuu/katudo/bosyu.html; the final report is: www.kantei.go.jp/jp/singi/utyuu/katudo/houkokusho.pdf.

21 There are two ways to draft and submit a bill to the Japanese Parliament (Diet): the first is that a bill is drafted by members of the Diet; and the second and more often conducted is that a bill is drafted by governmental officers in a responsible ministry, often in line with the expert advisory commission’s report such as mentioned-above.

22 SHSD, Space Basic Plan (9 January 2015) [hereinafter referred to as “SBP3”], www8.cao.go.jp/space/plan/plan2/plan2.pdf.

23 SHSD, Space Basic Plan (25 January 2013) [hereinafter referred to as “SBP2”]. www.kantei.go.jp/jp/singi/utyuu/pdf/250125/keikaku.pdf.

24 SBP3, *supra* note 22, p. 3.

25 SBP2, *supra* note 23, p. 4.

26 SBP3, *supra* note 22, pp. 9-10. Other two pillars are securing space security and promoting civil space utilization. For the first time in Japan’s space policies and guidelines, use of space for national security was explicitly stated. *Ibid.*, p. 9.

making national space acts was specified as one of the concrete measures to contribute to accomplishing this goal.²⁷

During the 2008-2010 processes of preparing for the national space act, one comprehensive space activities act had been pursued. In the third BSP, however, making two different space acts have been requested in view of the different purposes between the act regulating the launch and operation of satellites and the act distributing sensitive remote sensing data. The main purpose of the former is to provide for authorization and supervision systems to abide by the UN treaties on outer space to which Japan is a party (hereinafter referred to as “four of the UN space treaties”),²⁸ and that of the latter is to promote private space remote sensing business while at the same time vigilant in ensuring international security and security for Japan and its ally and friendly nations.²⁹ The third SBP stated that the purposes of the space activities act to be drafted were, in addition to the compliance with international obligations, to assist private sectors to promote their business including, e.g., getting more commercial space launch contracts from the foreign satellite operators.³⁰ The third SBP declared that the two space bills should be submitted to the regular session of the Diet in 2016,³¹ and tasked four ministries to study and draft two bills.³²

Making simultaneously two national space acts is one of the characteristics of Japan’s national space legislation. Not that there is not a precedent. More than three decades ago, the United States enacted two space activities acts the same year. In 1984, *Land Remote Sensing Commercialization Act*³³ and the *Commercial Space Launch Act*³⁴ were enacted as one of the earliest examples of national space acts. However, this seemed to be restricted only to the States which had a robust space industry. Even France, which has been maintaining enormously successful remote sensing satellite data business, did not enact a different remote sensing data act; instead, provisions on the

27 *Ibid.*, p. 24.

28 Japan is an original member of the 1967 Outer Space Treaty and acceded to the other three treaties, the 1968 Rescue and Return Agreement, the 1972 Liability Convention and the 1975 Registration Convention in 1983.

29 SBP3, *supra* note 22, p. 24.

30 *Ibid.*

31 *Ibid.*

32 Those are Cabinet Office, Ministry of Foreign Affairs (MOFA), Ministry of Education, Culture, Sports, Science and Technology (MEXT), and Ministry of Economy, Trade and Industry (METI). *Ibid.*

33 *Land Remote Sensing Commercialization Act* (17 July 1984). P.L. 98-365, 15 USC, Section 4201 *et seq.* This Act was replaced with the current Land Remote Sensing Policy Act (28 October 1992). P.L. 102-555, 15 USC, Section 5601, *et seq.* This Act has been incorporated in 2010, in 51 USC, Section 60101 *et seq.*

34 *Commercial Space Launch Act* (30 October 1984). P.L. 98-575, 49 USC, Section 2601 *et seq.* Since in December 2010, CSLA has been incorporated with the necessary modifications in 51 USC, Section 50901 *et seq.*

remote sensing data distribution were set forth in the 2008 comprehensive French *Space Operations Act*³⁵ and the detailed rules on data distribution were later determined on the regulation level.³⁶ This shows the ambition of Japan for promoting space commercialization which had never been so successful compared with other spacefaring nations.

III. The Summary and Characteristics of the Space Activities Act of Japan

III.1 The Licensing Schemes of the Launch of a Satellite, etc.

Space Activities Act provides for two kinds of licensing schemes. The first is the launch of a rocket with a satellite and the second is the operation of a satellite.

For the purposes of this Act, “satellite” is defined as artificial object which is launched into Earth orbit or beyond, or placed on the celestial bodies other than the Earth,³⁷ and a “satellite” and its launch vehicle (rocket) is termed as “satellite, etc.”³⁸ If a person intends to launch a “satellite, etc.” from a launch site within the Japanese territory or from the ships or aircraft granted Japanese nationality, that person must obtain a license per launch from the Prime Minister.³⁹ As the license is needed for the “launch of a satellite, etc.”,⁴⁰ the launch of a sounding rocket or other artificial objects to navigate suborbital trajectories is outside the licensing scheme of the Space Activities Act. This automatically excludes the human suborbital flights from the licensing system as well, which is one of the new form of space businesses.⁴¹ No provision is found with respect to on-orbit human space tourism in the SAA. While no reference in the SAA does not necessarily mean that such an activity is prohibited, the permission will not be given today as the

35 *LOI no 2008-518 du 3 juin 2008 relative aux opérations spatiales* (hereinafter referred as “French Space Operations Act”).

36 Decree No 2009-640 du 9 juin 2009.

37 SAA, Art. 2, item 2.

38 SAA, Art.2, item 3.

39 SAA, Art.4, para. 1.

40 “Launch of a satellite, etc.” is defined as “to launch a launch vehicle with a satellite on board from the launch facility that is controlled and operated by the launch operator or other persons, and to separate a satellite from a launch vehicle after accelerating the launch vehicle to a certain speed and an altitude”. SAA, Art. 2, item 5. “Launch facility” is defined as “the facility that has the function from which a rocket to launch a satellite may be launched.” SAA, Art. 2, item 4. These definitions indicate that to be qualified as a “launch” under the licensing systems of the SAA, a satellite must be on board a rocket.

41 Unmanned suborbital space flights conducted by JAXA have been subject to a series of acts regulating highly dangerous acts, e.g., *Gunpowder, etc. Control Act* (Act No. 149 of 1950 as amended), and this situation will continue. Human suborbital space flights will not be authorized by the Government based on the relevant acts as such technology has been so immature that tourists (consumers) cannot be duly protected.

technology to place a human space vehicle into Earth orbit is not in the hands of neither private persons nor the Japanese Government. Once space technology has matured to the extent that a human space flight seems safe enough and the standards of launch permission can be prescribed, then the SAA will be amended.⁴²

A person who intends to launch a satellite, etc. outside the Japanese territory does not have to obtain a license under the SAA, as the drafters thought this should be subject to the authorization and supervision of the country from whose territory the launch concerned is carried out, and double licensing should be avoided for the expeditious procedures of the launch business.

No license of the launch shall be granted to an applicant unless i) safe rocket will be launched (rocket safety standards), ii) from a safe launch facility (type-based facility safety standards), iii) based on the safe launch plan not to cause any risks to the local people and environment, and iv) the purposes and methods of the satellite operation is in conformity with the four of the UN space treaties, basic principles of the Space Basic Act (Arts. 2-7 thereof), and will not compromise public safety.⁴³ No consideration is given to an individual mission success probability, for the purpose of the SAA licensing system is to ensure the public safety. If a new type rocket was designed and manufactured, a thorough safety review must be conducted in accordance with the *Regulation for Enforcement of the Act on Launch of Artificial Satellites and Launch Vehicles and Control of Artificial Satellites* (hereinafter referred to as “Space Activities Regulations” or “SAR”) adopted on 15 November 2017.⁴⁴ That will require four to six months according to the Appendix of the SAA Review Standards and Standard Licensing Periods made in line with the *Administrative Procedure Act*.⁴⁵ In majority of the cases, the same type of rockets are repeatedly used in the same launch facility. Thus, provided that a “rocket type certificate” certifying the rocket concerned meets the rocket safety standards has been already obtained either by the person who applies for a launch license or a person who developed this particular rocket,⁴⁶ and provided also that a “launch facility conformity certificate”, which proves that a particular facility meets the type-based

42 Minutes of the 4th legal subcommittee of the Section of Space Industry and Science and Technology Bases, the National Committee on Space Policy (23 June 2015), pp. 1-3. www8.cao.go.jp/space/comitee/27-housei/housei-dai4/gijiroku.pdf.

43 SAA, Art. 6, items 1-4; *Regulation for Enforcement of the Act on Launch of Artificial Satellites and Launch Vehicles and Control of Artificial Satellites* [hereinafter referred to as “SAR”], *infra* note 44, Arts. 7-8.

44 SAR, Cabinet Office Order No. 50 of 15 November 2017, Art. 7.

45 Appendix of the SAA Review Standards and Standard Licensing Periods made in line with Art. 5, para. 1 and Art. 6 of the Administrative Procedure Act of 12 November 1993, Act No. 88 of 1993 [hereinafter referred to as “Appendix”], p. 1. This Appendix was published on 15 November 2017.

46 SAA, Arts. 13-15.

facility safety standards, has been obtained by its manager,⁴⁷ the review of a launch application will be limited to iii) and iv) mentioned above, thus substantially shortening the review process. In that case, standard review period will be about one to three months.⁴⁸

Japan Aerospace Exploration Agency (JAXA) is not a governmental entity, and as such it needs a license to launch a satellite, etc. However, considering the expertise of JAXA, the simplified processes will be applied to JAXA in obtaining a rocket type certificate and launch facility conformity certificate.⁴⁹ Thus, a new burden will not be imposed to JAXA under the SAA.⁵⁰

III.2 Third Party Liability of the Launch of a Satellite, etc.

When a launch license is issued having met the conditions mentioned above, the licensee – termed a “launch operator”⁵¹ shall obtain third party liability (TPL) insurance or deposit with an official depository in amounts sufficient to compensate the maximum probable loss as determined by the Cabinet Office Order.⁵² After the launch a satellite, etc.,⁵³ if a rocket falls, collides or explodes, either with all or part of a satellite or after the successful separation of a satellite, and if such an event causes the loss of life, personal injury, or damage to property on the Earth or to aircraft in flight or other flying objects,⁵⁴ non-fault liability is imposed to the launch operator to pay compensation for damage caused by the rocket.⁵⁵ This channeling of liability is applied to obtain more launch contracts from foreign satellite operators. French Space Operations Act and Korean Space Liability Act also explicitly adopt such channeling of liability system.⁵⁶ In order to support the launch industry which is yet fragile, if the damages is more than the amount of insurance or the deposit with an official depository required by the Cabinet Office Order, the Government may indemnify to the victims until a certain cap amount decided annually by the Diet. If the damages is more than this cap amount, then the launch operator shall compensate the balance.⁵⁷ This is similar in content with the US and Korean TPL regime in that the

47 SAA, Arts. 16-18.

48 Appendix, *supra* note 45, p. 1.

49 SAA, Art.19.

50 JAXA has developed all the rockets, whereas Mitsubishi Heavy Industry (MHI) has been participating in part in developing new rockets in the 21st centuries and JAXA operates two established launch facilities in Tanegashima, Kagoshima prefecture.

51 SAA, Art. 7, para. 1.

52 SAA, Art. 9.

53 SAA, Art. 2, item 5.

54 This is called “damage caused by the fall, etc. of a rocket”, which is defined in SAA, Art. 2, item 8.

55 SAA, Arts. 35-36.

56 French Space Operations Act, Art. 13; *Korean Space Liability Act* (21 December 2007), Art. 4, para. 1.

57 SAA, Arts. 40-43.

governmental support in compensation has a certain ceiling.⁵⁸ French Space Operations Act does not have the cap amount in governmental indemnification.⁵⁹

III.3 The Licensing Schemes of the Operation of a Satellite and NewSpace Activities

A person who intends to control a satellite using a “ground station for telemetry, tracking and control (TT&C)” located in the territory of Japan must obtain a license per satellite from the Prime Minister.⁶⁰ No license shall be issued unless: i) the purposes and methods of the satellite operation is in conformity with the four of the UN space treaties, basic principles of the Space

Basic Act (Arts. 2-7 thereof), and will not compromise public safety;⁶¹ ii) a satellite is designed and manufactured in the manner that would appropriately prevent the release of space debris and avoid the harmful contamination and potentially harmful interference with activities of other States in outer space including the Moon and other celestial bodies under Article IX of the Outer Space Treaty, and that would ensure public safety in accordance with the standards of the SAR;⁶² iii) it is evaluated that a satellite is capable of avoiding collision with other satellites and harmful contamination of outer space in the operation phase;⁶³ and iv) any one of the termination measures specified in the SAA, Article 22, item 4 (i)-(iv) is planned to be taken.⁶⁴ Those termination measures include, various means of de-orbit, placing a satellite/debris in the orbit of the celestial bodies other than the Earth or placing a satellite/debris on the surface of such celestial bodies without causing substantial damage to the environment thereon pursuant to the SAR. These end-of-the-mission measures specified in the SAR are in accordance with the space debris mitigation guidelines adopted both in the Committee on the Peaceful Uses of Outer Space (COPUOS) in 2007 and Inter-Agency Space Debris Coordination Committee (IADC) in 2002 (as updated), but not limited to them. Other international rules and standards such as the Planetary Protection Policy (PPP) made in the COSPAR are included.⁶⁵

The business plan of Astrosclae (debris removal), ispace (moon exploration) and ALE (production of artificial shooting stars from a microsatellite) are all

58 51 USC, Section 50915 (a) (1); Korean Space Liability Act, Art. 7, paras. 2-3.

59 French Space Operations Act, Arts. 14-17.

60 SAA, Art. 20, para. 1. “Ground station for TT&C” is defined in Art. 2, item 6.

61 SAA, Arts. 22, item 1.

62 *Ibid.*, item 2.

63 *Ibid.*, item 3.

64 *Ibid.*, item 4 (i)-(iv).

65 *Ibid.* Specific measures in the debris mitigation guidelines and PPP are provided in the Satellite Guidelines. See, *infra* note 67.

categorized in the operation of a satellite for the purposes of the SAA, and will be licensed pursuant to the conditions in Article 22 of the SAA mentioned above and corresponding SAR provisions⁶⁶ as well as the Guidelines for the Review of the Satellite Operation License (hereinafter referred to as “Satellite Guidelines”, or “Guidelines”).⁶⁷ Satellite Guidelines 6.2.2 sets out detailed technical conditions for the prevention of harmful interference with the operation of other satellites in the case of separation of a satellite or attachment to other satellites, including the cases of active space debris removal. While not in the SAA or even not in the SAR, but yet one of the guidelines of the SAA/SAR⁶⁸ explicitly provides for the conditions of active debris removal, and the business by Astroscale will be adequately licensed and supervised under this standards. The same applies to the business of ALE, for the separation of a satellite provided in Satellite Guidelines 6.2.2 covers its business plan to produce artificial shooting stars by projecting particles from a microsatellite. It seems that ALE’s business has to be reviewed also in view of the purposes of the satellite operation pursuant to SAA, Article 22, item 1 and Satellite Guidelines 6.1 (the purposes and methods of the satellite operation).

In the case of ispace business, however, SAA/SAR and Satellite Guidelines provide only partial solution. The first mission of ispace is to place and move a rover on the Moon and send the images taken by the rover to the Earth. Granting that the ground station for TT& C for the rover is located in Japan, ispace must obtain a license to operate that rover = a satellite.⁶⁹ Satellite Guidelines provisions pertaining to the license of ispace activity include Guidelines 6.2.6 (preventive measures for the environmental pollution on the celestial bodies pursuant to the COSPAR/PPP), Guidelines 6.2.1 (preventive measures of the accidental release of the parts/components of a satellite), Guidelines 6.2.2 (prevention of harmful interference with the operation of other satellites in the case of separation of a satellite or attachment to other satellites), and Guidelines 6.2.3 (prevention of break-ups in case of the abnormality). In addition, the purpose of the operation of an ispace’s probe will be carefully reviewed under Guidelines 6.1. While the present SAA/SAR and Satellite Guidelines may suffice to authorize and supervise the ispace activity until the early 2020s, in the case where ispace is to start mining space resources for the economic purposes, the provision of the SAA, Article 22, item1 (the purposes and methods of the operation of a satellite) should be supplemented by the concrete and clear standards to review the application

66 SAR, Arts. 22-24 specify the measures and standards to apply SAA, Art. 22.

67 Satellite Guidelines pursuant to SAA/SAR, 6.1-6.4.

68 Other three Guidelines are relating to rocket type certificate, type-based launch facility certificate, and safe launch plan.

69 That rover is planned to be launched from India, and not subject to the license for the launch of a satellite, etc. under the SAA.

for a license, which inevitably requires the clear position of the Japanese Government as to whether a private person can possess, transport, use, exchange, etc. space resources for the commercial purposes. Standards for the review need a variety of substantive and procedural rules for the concrete mining activities, which cannot be dealt with by SAR, a mere Cabinet Office Order. It is likely that the amendment of the SAA or another act to regulate the exploitation and utilization of space resources is needed, taking note of the compatibility with the four of the UN space treaties including the Outer Space Treaty (especially Arts. I- III thereof), other international space law and diplomatic policy of Japan.

III.4 Third Party Liability for the Satellite Operation and NewSpace Activities

If a satellite falls or explodes after the separation from a rocket, and it causes the loss of life, personal injury, or damage to property on the Earth or to aircraft in flight or other flying objects,⁷⁰ the satellite operator must pay compensation to the victims based on non-fault liability principle.⁷¹

No reference is made on the indemnification procedures to the Japanese Government if the Government pays compensation to the damaged State as a launching State. Nor does the SAA provide for the case if a damage is caused to other satellites in outer space. In this case, it is presumed that a satellite operator is under the normal fault-based liability obligation under Article 709 of Japan's Civil Code.⁷² That obligation is almost the same in content with that provided for in the 1972 Liability Convention. However, as the liability imposed to a non-governmental entity by the national law is not directly linked with that imposed by the international treaty, the liability of a satellite operator when the damage is caused in outer space should have been clearly prescribed in the SAA. Another element added to this uncertainty for a satellite operator is the no reference to the SAA on the indemnification procedures to the Government as a launching State.

Different from a launch operator, a satellite operator is not required for obtaining TPL insurance. There seems two reasons for this: first, it is evaluated by the drafters that the fall of a satellite on the Earth, or collision with other satellites in outer space to cause damage is unlikely; and second, without the obligatory TPL insurance, the operational cost of a satellite is decreased, which helps start-up companies. However, at the same time, without the obligatory insurance, there is not the governmental indemnification which is provided to the launch operator. In the age of the big constellation of small satellites combined with better space situational awareness (SSA) capabilities which helps to identify the satellite off the intended orbit and to determine the fault of the operator, non-obligation of

⁷⁰ SAA, Art. 2, item 11 defines "damage by the fall, etc. of a satellite".

⁷¹ SAA, Art. 53.

⁷² Civil Code, promulgated on 27 April 1896 (Act No. 89 of 1896 as amended).

the TPL insurance might not necessarily promote satellite operation business. This seems to apply to Axelspace, which plans to manufacture and operate 50 of the 2.5 meter resolution small satellites.⁷³

Currently, it is only the UK Outer Space Act which obligates a satellite operator to prepare for the TPL.⁷⁴ In case of Japan, if this makes obligatory, a satellite operator is to be provided a governmental support as with a launch operator in case the damages is beyond the insured amount in view of the equal treatment of private operators. However, as there are a variety of satellite operation businesses and various operators from a large corporation which operates about 20 geostationary satellites such as SKY Perfect JSAT Corporation⁷⁵ to a small company operating no satellite yet with only a business plan such as ALE Co., Ltd.,⁷⁶ one TPL obligation clause to all companies may cause more harm than good. In the future, it may be preferable that SAA be amended to obligate a certain category of satellite operators to demonstrate financial measures such as TPL insurance. A company planning to operate a big constellation of satellites should be included in the person who shall obtain the TPL insurance.⁷⁷

III.5 On-Orbit Transfer of Satellites

When a satellite operator intends to transfer the operation of a satellite to a person whose ground station for TT&C is located in Japan, both the satellite operator (transferor) and transferee must obtain authorization from the Prime Minister.⁷⁸ Both Transferor and Transferee could be a foreign person as the link with the SAA is the place of the ground station for TT&C. Different from Article 3 of the French Space Operations Act, or Article 8 of the Austrian Outer Space Act,⁷⁹ not a license but an only authorization is required. When the operation of a satellite is transferred to a person who intends to send a TT&C signal using a ground station located outside Japan, the satellite operator (transferor) shall only make a notification to the Prime Minister to that effect.⁸⁰ The following cases are outside the SAA while a Japanese national is related for the transaction: a Japanese national becomes

⁷³ See, *supra* note 13.

⁷⁴ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/. Also, French Space Operations Act does not exclude the possibility to require the TPL insurance for a satellite operator and it is said that some countries including the Netherlands are considering such obligatory TPL.

⁷⁵ www.jsat.net/en/index.html.

⁷⁶ See, *supra* note 12.

⁷⁷ What makes “a big constellation” is to be addressed in the Satellite Guidelines.

⁷⁸ SAA, Art. 26, para. 1; SAR, Art. 27, para. 1.

⁷⁹ Austrian Outer Space Act, entered into force on 28 December 2011. www.unoosa.org/documents/pdf/spacelaw/national/austria/austrian-outer-space-actE.pdf.

⁸⁰ SAA, Art. 26, para. 2; SAR, Art. 27, para. 2.

a transferee of a satellite commanded by a TT&C ground station outside Japan and such station will remain outside Japan after the transfer: and a Japanese transferor's TT&C station had been outside Japan and a transferee (foreign or Japanese) will keep it outside Japan after the transfer.⁸¹

The reason that personal jurisdiction is not applied on-orbit transfer of the satellite control and as a result, less strict control has been taken in comparison with Austria or France will be explained in the next section, III.6.

III.6 Characteristics of the SAA of Japan

Different from many space acts in the same category, the restriction of the national jurisdiction is the most conspicuous characteristics of the Japan's SAA. That is strictly in line with territorial principle. Launch from outside Japan, and the operating a ground station for TT&C outside Japan, are not within the scope of the SAA. In most of the about 25 national space acts,⁸² the combination of territorial and personal jurisdiction is used with a few exceptions including the Belgian Law⁸³ and Dutch Act,⁸⁴ both restricting the scope of the act within their territorial jurisdiction. Yet, both Belgian Law and Dutch Act provide the cases where the personal jurisdiction is applied,⁸⁵ but the SAA does not contain such provisions. Japan's SAA is the strictest in the territorial principle among the all national space acts as of 2017.

The personal jurisdiction is excluded from the SAA mainly for the two reasons. The first is to facilitate the licensing process. Asking a license for a Japanese national whose business is located outside Japan may make them under the double licensing obligation, which slows the space business. The other reason is enforceability. It is thought by the law makers that jurisdiction to prescribe could be just symbolic and less significant than the jurisdiction to enforce which enables full exercises of the national law concerning the person, property, event and fact. As enforcement jurisdiction is restricted within the territory of a State, it is concluded by the drafters that the restriction of the national jurisdiction is a reasonable way to pursue. Needless to say, it does not exempt Japan from international responsibility for "national activities in outer space"⁸⁶ where only personal jurisdiction is included.

81 SAA, Arts. 4, 26.

82 www.unoosa.org/oosa/en/ourwork/spacelaw/nationalspacelaw/index.html.

83 Law on the Activities of Launching, Flight Operation or Guidance of Space, 17 September 2005 (amended on 1 December 2013) (Belgian Law), Art. 2 (1).

84 Order of the Minister of Economic Affairs containing rules governing license applications for the performance of space activities and the registration of space objects (7 February 2008) (Dutch Act), Section 2 (1).

85 Belgian Law, Art. 2(2); Dutch Act, Section 2(2).

86 Outer Space Treaty, Art. VI.

IV. Remote Sensing Data Act: Summary

The primary purpose of the Remote Sensing Data Act is to strike a fine balance between international and national security concerns and the promotion of the remote sensing data business. In order to fulfill the latter, the scope of the person who needs a license is considerably limited. A person who intends to conduct the “use of satellite remote sensing instrument”⁸⁷ through the “ground radio station for command and control”⁸⁸ located in Japan must obtain a license from the Prime Minister per satellite instrument as long as data obtained from the instrument exceeds the threshold precision of discerning the movement of vehicles, ships, aircraft and other moving facilities⁸⁹. It follows that a private person who intends to use a satellite remote sensing instrument whose distinguishing accuracy of target is less than the said quality does not have to obtain a license. The details of such distinguishing accuracy of target is prescribed in the Cabinet Office Order decided on 9 August 2017, titled *Regulation for Enforcement on the Act on Ensuring Appropriate Handling of Satellite Remote Sensing Data* (hereinafter referred to as “RSDR”).⁹⁰

If the same person intends to operate a satellite and use the satellite remote sensing instrument capable of receiving sensitive data decided by the RSDR, that person needs two licenses: a license to operate a satellite based on the SAA⁹¹ and a license to use the remote sensing instrument based on the RSDA.⁹² The license is granted if appropriate safety measures are taken by the instrument user to prevent the data received and processed will not be disseminated to the inappropriate persons including international terrorists.⁹³ A satellite remote sensing instrument user (licensee) becomes a “satellite remote sensing data holder”⁹⁴ once that person has obtained data which may cause adverse effect to international and national security in view of i) distinguishing accuracy of target, ii) the scope and degree of the processing of raw data, iii) time elapsed from the receipt of data and iv) other relevant circumstances.⁹⁵ These data are termed “satellite remote sensing data”.⁹⁶ A

87 The definition is found in RSDA, Art. 2, item 4.

88 The definition is found in RSDA, Art. 2, item 3.

89 RSDA, Art. 4.

90 Cabinet Office Order, No. 41 of 2017 (9 August 2017). For instance, optical sensor, equal or better than two meters, SAR sensor, equal or better than three meters in case of raw data are subject to the license. Also, optical sensor better than 25 centimeters and SAR sensor, better than 24 centimeters in standard data (processed data) are subject to the license. RSDR, Art. 3, para. 1 and its attached table.

91 SAA, Art. 20.

92 RSDA, Art. 4.

93 RSDA, Art. 6.

94 RSDA, Art. 2, item 8.

95 RSDA, Art. 2, item 6.

96 *Ibid.*

satellite remote sensing data holder is responsible for disseminating data only to a certified satellite remote sensing data handler who has been given a certificate in advance from the Prime Minister.⁹⁷ If a satellite remote sensing data holder provides data to a person who is not qualified,⁹⁸ he/she is punished by imprisonment with required labor of not more than three years or a fine of not more than 1,000,000 yen, or both⁹⁹ even if this crime has been committed outside Japan.¹⁰⁰ Personal jurisdiction⁹⁹ is applied for the sake of international and national security of Japan.

When the Prime Minister believes on the sufficient ground that the use of satellite remote sensing data is likely to cause adverse effect on ensuring international and national peace and security, the Prime Minister may issue an order requiring a satellite remote sensing data holder not to provide the satellite remote sensing data for a specified scope of data and time period, but it shall be limited to the minimum extent to ensure international and national peace and security.¹⁰¹ If the satellite remote sensing data holder concerned is a person whose domicile or residence, or principal office of his/her business is outside Japan, that is not a requirement, but just the request from the Prime Minister in view of the enforceability.¹⁰² If a satellite remote sensing data holder does not abide by the Prime Minister's order, the same punishment shall apply as the case of an illegal data provision mentioned above.¹⁰³

V. Conclusion

As NewSpace activities, the operation of the big constellation of small satellites, active debris removal, the moon exploration, and the production of artificial shooting stars are now seriously pursued in Japan, with none of them in the operational phase. Based on the study above, the following evaluation is made as to whether SAA and RSDA are sufficient to authorize and supervise these activities or the amendment of SAA and/or RSDA is needed.¹⁰⁴

97 RSDA, Arts. 18, 21.

98 RSDA, Art. 18, para. 3.

99 RSDA, Art. 33, item 7.

100 RSDA, Art. 36.

101 RSDA, Art. 19, paras. 1-2.

102 RSDA, Art. 19, para. 3.

103 RSDA, Art. 33, item 6, Art. 36.

104 There is no reference here about the suborbital space tourism, as a space vehicle for that purpose has been in the research and development phase, and no Japanese company has the capability of testing a human space flight vehicle, while there are a few travel agents located in Japan contracting with future tourists for a suborbital and orbital space flight on behalf of a foreign company. Once space technology has matured to the extent that a human space flight seems safe enough, then the SAA will be amended.

1. Active space debris removal, and the production of artificial shooting starts are to be appropriately authorized and supervised based on SAA/SAR/Satellite Guidelines.
2. It can be said that SAA/SAR/Satellite Guidelines can authorize and supervise the Moon exploration as long as such activity remains within the scientific exploration and not directly seeking commercial benefits. However, once exploration is developed into an exploitation phase, should the Government deem it appropriate to advance the private space resource mining, clear conditions for carrying out such activities shall be made in the form of legally-binding norm in accordance with international space law. Such norm will be formed either as the amendment of the SAA or the making of a new independent act.
3. For some category of the satellite operators, e.g. the operator of the big constellation of small satellites, it may be necessary to prepare for the damage to cause to the other space object in outer space. Thus, the amendment of the SAA to provide the obligatory on-orbit TPL insurance for such satellite operators may be preferable. In that case, governmental indemnification in case the damages is beyond the insured amount shall be provided as is the case with the launch operator. In contrast, it seems that the TPL insurance for the damage on the Earth is not needed for the satellite operators in view of the balance between the slim possibility of the event and the financial burden of the satellite operators.