

8 February 2023

English only

---

**Committee on the Peaceful  
Uses of Outer Space  
Scientific and Technical Subcommittee  
Sixtieth session**  
Vienna, 6–17 February 2023  
Item 12 of the provisional agenda\*  
**Long-term sustainability of outer space activities**

## **Report on the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Japan**

The present conference room paper was prepared by the Secretariat on the basis of information received from Japan. The information was reproduced in the form it was received. A shorter related text is available in all the official languages of the United Nations in document [A/AC.105/C.1/L.409](#).

---

\* [A/AC.105/C.1/L.405](#).



# Report on the Implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities in Japan

## 1. Introduction/ Summary

As the number of players in the space sector continues to grow, Japan believes that effective rule-making and their implementation to ensure the safety, security, sustainability, and stability of outer space are imperative.

Following is a brief overview of Japan's current efforts as well as experiences, challenges and lessons learned through the implementation of the LTS guidelines. These efforts include the establishment and implementation of the national regulatory framework for space activities (Guideline A), enhancement of space situational awareness capability, development of space weather mitigation measures, update of space debris mitigation standard (Guideline B), and promotion of international cooperation in the field of national legislation and space weather forecast services (Guideline C). In order to effectively implement the LTS Guidelines, Japan carries out research and development on space debris mitigation measures such as space debris removal and has developed space robotics technologies for On-Orbit Servicing (Guideline D).

## 2. Status of the Implementation of the Guidelines

### A. Policy and regulatory framework for space activities

A.1	
Adopt, revise and amend, as necessary, national regulatory frameworks for outer space activities	
Current progress and/or proposed future activities	✓ Japan has developed the Basic Space Act. Through this Act, Japan takes into account its obligations under the relevant United Nations Treaties on Outer Space. In addition, Japan has developed the Remote Sensing Data Act, the Space Activities Act, and the Space Resources Act, and has established a domestic regulatory framework through these acts. Furthermore, review standards and guidelines have been adopted, revised, and amended in Japan's domestic

	<p>regulations.</p> <ul style="list-style-type: none"> <li>✓ When adopting, revising, or amending acts related to the domestic regulatory framework, the Government of Japan considers the need to ensure and strengthen the long-term sustainability of space activities, as well as deliberations in the Diet. In implementing domestic regulations, Japan also considers the need to ensure and enhance the long-term sustainability of space activities.</li> <li>✓ Japan requires, when adopting, revising or amending the review criteria and guidelines for domestic regulations, to be equivalent to generally accepted international standards, if necessary.</li> <li>✓ Japan seeks to ensure, in its regulations and implementation under the Basic Space Act, the Remote Sensing Data Act, the Space Activities Act, and the Space Resources Act, the provisions of General Assembly Resolution 68/74 on recommendations concerning national legislation relevant to the peaceful exploration and use of outer space (appropriate regulatory subjects, regulatory enforcement under Japanese jurisdiction, licensing system, third party damage risk considerations, on-site inspections in regulations, application of reporting requirements, object registration measures, damage compensation measures, and ownership transfer procedures).</li> <li>✓ In addition, Japan has enacted the Space Resources Act of 2021 to promote future activities related to space resources.</li> <li>✓ Japan considers its obligations under the relevant United Nations Treaties on Outer Space in the Basic Space Act. In implementing domestic regulations, Japan also strives to enhance the long-term sustainability of its space activities.</li> </ul> <p>[Reference] Basic Space Act (In Japanese)  <a href="https://www8.cao.go.jp/space/law/law.html">https://www8.cao.go.jp/space/law/law.html</a></p> <p>[Reference] Act on Ensuring Appropriate Handling of Satellite Remote Sensing Data (“Remote Sensing Data Act”), Order for Enforcement,</p>
--	---

	<p>Regulation for Enforcement, Guidelines (in English)  <a href="https://www8.cao.go.jp/space/english/rs/application.html">https://www8.cao.go.jp/space/english/rs/application.html</a></p> <p>[Reference] Act on Launching of Spacecraft, etc. and Control of Spacecraft (“Space Activities Act”), Order for Enforcement, Regulation for Enforcement, Review Standards, Guidelines (in English)  <a href="https://www8.cao.go.jp/space/english/activity/application.html">https://www8.cao.go.jp/space/english/activity/application.html</a></p> <p>[Reference] Act on the Promotion of Business Activities for the Exploration and Development of Space Resources (“Space Resources Act”) (in English)  <a href="https://www8.cao.go.jp/space/english/resource/application.html">https://www8.cao.go.jp/space/english/resource/application.html</a></p>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ The challenge is to figure out how to conduct appropriate and valid examinations to license the activities of the private sector where precedent does not exist sometimes.</li> </ul>

<p>A.2</p> <p>Consider a number of elements when developing, revising or amending, as necessary, national regulatory frameworks for outer space activities</p>	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ Japan considers the fulfillment of its obligations under the relevant United Nations Treaties on Outer Space in its regulations under the Remote Sensing Data Act, the Space Activities Act, and the Space Resources Act.</li> <li>✓ Japan stipulates the peaceful exploration and utilization of outer space when conducting space activities under the Remote Sensing Data Act, the Space Activities Act, and the Space Resources Act. Additionally, the review criteria of the Space Activities Act requires implementing space debris mitigation measures for satellites (e.g., prevention of fragmentation and termination measures in the event of an anomaly), and requires that the risks to people, property, public health, and the environment (third party injury risks) associated with the launch, on-orbit operation, and re-entry of space objects be equal to or less than the level of generally accepted international standards.</li> <li>✓ Japan requires that the effects of space development and utilization on the environment be taken into consideration in</li> </ul>

	<p>the Basic Space Act and the Space Activities Act.</p> <p>Japan requires that the review criteria and guidelines for domestic regulations be equivalent to generally accepted international standards for risk assessment of third-party damage. When adopting, revising, or amending the review criteria and guidelines, Japan also refers to relevant international standards and deliberations in international committees.</p> <ul style="list-style-type: none"> <li>✓ In enforcing the Space Activities Act, Japan has taken care to strengthen the technical capabilities and international competitiveness of industries involved in the launch and management of satellites.</li> <li>✓ When adopting, revising, or amending the review criteria and guidelines for the domestic regulatory framework, Japan arranged a hearing of expert opinions in a conference body.</li> <li>✓ Depending on the status of development of new technologies, the adoption, revision, or amendment of laws, examination criteria and guidelines shall be made in consideration of the transition period as well.</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ While there are many factors to be considered, the challenge is to follow up on them and reflect them in the domestic regulatory system in a timely manner.</li> </ul>

<p>A.3 Supervise national space activities</p>	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ Japan takes into account its obligations under the relevant United Nations Treaties on Outer Space in its Basic Space Act. In implementing its domestic regulations, Japan also strives to enhance the long-term sustainability of its space activities.</li> <li>✓ In the implementation of domestic regulations, Japan ensures that the regulated parties, including non-governmental organizations, have sufficient capabilities to carry out space activities.</li> <li>✓ In addition, Japan established a criteria with specific requirements to address the safety and reliability of space</li> </ul>

	<p>activities under the entity's control which is subject to licensing by the Government of Japan at all stages of the mission lifecycle, to assess all risks to the long-term sustainability of space activities, and to take measures to mitigate such risks to the extent feasible, as well as a manual with example procedures. Japan has established standards and manuals that provide example procedures.</p> <ul style="list-style-type: none"> <li>✓ Japan considers its obligations under the United Nations Treaties on Outer Space in the Basic Space Act. Additionally, in implementing domestic regulations, Japan implements the following measures while striving to enhance the long-term sustainability of Japan's space activities.</li> <li>✓ In its domestic regulations, Japan confirms the administrator, implementation system, management plan, etc. from the entity conducting space activities that are subject to licensing by the Government of Japan, thereby confirming that the structure and procedures for planning and implementing space activities are established. Specifically, Japan requires that the manager be at the executive level and be responsible for the organization of applicants for licensing, thereby ensuring cooperation at the management level within the organization, and confirming that the system is designed to establish a strong commitment within the organization and, when necessary, reflected in the management structure and procedures.</li> <li>✓ In addition, Japan's Space Activities Act designates a contact person within the entity conducting space activities and requires the entity conducting space activities to contact and provide information in the events of an accident or other incident.</li> <li>✓ In Japan, the National Space Policy Secretariat, which supervises or implements domestic space activities, organizes regular liaison meetings with relevant government organizations.</li> <li>✓ Japan promotes the sharing of operator experience in conducting safe and sustainable space activities through</li> </ul>
--	---

	<p>initiatives by the space agency etc.</p> <p>One such example is RABBIT (Risk Avoidance assist tool based on debris collision ProBaBliTy) developed by JAXA, which helps satellite operators in collision risk analysis and avoidance maneuver planning. The tool is available free of charge on the JAXA website for satellite operators including small/nano-satellite operators, who have difficulties in planning collision avoidance maneuvers.</p> <p>✓ JAXA updates its organization, as appropriate, based on the instructions from related ministries to promote the long-term sustainability of outer space.</p>
Experiences, challenges and lessons learned	<p>✓ The number of satellites and other equipment in operation is expected to increase in the future. The challenge is to establish a system that facilitates an appropriate level of supervision.</p>

<p>A.4</p> <p>Ensure the equitable, rational and efficient use of the radio frequency spectrum and the various orbital regions used by satellites</p>	
Current progress and/or proposed future activities	<p>✓ Coordination and operation of satellite networks in accordance with the provisions of the Radio Regulations.</p> <p>✓ NICT has been discussing the effective use of radio frequency such as active and passive remote sensors to determine space weather under agenda item 9.1a in ITU-R/WP7C, APG and WMO/IPT-SWeISS which will be input in ITU-R/WRC23 and WRC27.</p>
Experiences, challenges and lessons learned	<p>✓ To consider possible changes on procedures for frequency assignments pertaining to satellite networks under the World Radiocommunication Conference (WRC) - 23 Agenda item 7.</p> <p>✓ It is necessary to protect frequencies used for space weather sensors without imposing any additional restrictions on existing services.</p>

A.5	
Enhance the practice of registering space objects	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ Japan has been regularly carrying out space object registration procedures in accordance with the United Nations Convention on the Registration of Objects Launched into Outer Space using the United Nations Registration Information Submission Form. In this connection, the Government of Japan has prepared a manual for operators/owners who apply for registration.</li> <li>✓ When a Japanese launch service provider launches a satellite over the jurisdiction and/or control, the Government of Japan requests the launch service provider to clarify who is responsible for the registration of the space object and to request the satellite management and operation service provider of the other country to complete the space object registration procedures.</li> <li>✓ Japan responds appropriately to inquiries from other countries or international intergovernmental organizations requesting clarification on the registration/non-registration of space objects subject to Japanese regulation. Japan collects information required under the Registration Convention by requesting it from operators and notifies the United Nations. Japan also collects information on changes in operational status, etc., and notifies the United Nations. With regard to cases on the future separation of a launched space object, consideration is given to ensure that the separated satellite is given an appropriate name or sign so that the relationship between the separated satellite and the original satellite can be understood.</li> </ul> <p>[Reference] Application Manual on Space Object Registration (in Japanese)  <a href="https://www8.cao.go.jp/space/application/space_activity/documents/manual-spaceobjt.pdf">https://www8.cao.go.jp/space/application/space_activity/documents/manual-spaceobjt.pdf</a></p>



Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ When a Japanese launch service provider launches a satellite or other object over another country's jurisdiction and/or control, the challenge is to coordinate appropriately to ensure that the object is registered by that other country.</li> </ul>
---	--

B. Safety of space operations

<p>B.1 Provide updated contact information and share information on space objects and orbital events</p>	
<p>Current progress and/or proposed future activities</p>	<ul style="list-style-type: none"> <li>✓ The Government of Japan is developing a Space Situation Awareness (SSA) system for public and private satellite operating organizations. Within this system, a scheme will be established to provide SSA information from the Ministry of Defense to satellite operating organizations. Under this scheme, contact information will be updated on a regular basis.</li> <li>✓ As for our space agency's activities, JAXA provides the Cabinet Office with information on any anomalies noted in JAXA's operational spacecraft based on the Act on Launching of Spacecraft, etc. and Control of Spacecraft (Act No. 76 of 2016).</li> <li>✓ JAXA exchanges information and coordinates with CSPOC regarding the operation of JAXA's spacecraft.</li> </ul>

<p>B.2 Improve accuracy of orbital data on space objects and enhance the practice and utility of sharing orbital information on space objects</p>	
<p>Current progress and/or proposed future activities</p>	<ul style="list-style-type: none"> <li>✓ The Government of Japan improves and maintains the accuracy of satellite orbit information managed by Japanese satellite operating organizations by updating it as necessary through the SSA information provision scheme described in B.1. In addition to Japan's own SSA, the accuracy of orbit information on space objects will be improved and</li> </ul>

	<p>maintained through information sharing with the United States.</p> <ul style="list-style-type: none"> <li>✓ JAXA carries out research and development of related technology such as space situational awareness under the plan of the Government of Japan.</li> <li>✓ JAXA issued a space debris mitigation standard JMR-003, which calls for improvements in tracking JAXA's spacecraft and launch vehicles.</li> </ul>
--	---

<p>B.3 Promote the collection, sharing and dissemination of space debris monitoring information</p>	
<p>Current progress and/or proposed future activities</p>	<ul style="list-style-type: none"> <li>✓ The Government of Japan is developing an SSA system for public and private satellite operating organizations, which will be operational in 2023. For the development of this SSA system, the Ministry of Defense and JAXA are currently acquiring SSA sensors.</li> <li>✓ JAXA carries out research and development of technology related to space debris under the plan of the Government of Japan.</li> </ul>

<p>B.4 Perform conjunction assessment during all orbital phases of controlled flight</p>	
<p>Current progress and/or proposed future activities</p>	<ul style="list-style-type: none"> <li>✓ The Government of Japan requires in its Space Activities Act that all satellites capable of doing so should conduct orbital maneuvering in order to avoid collision if the possibility of collision with another satellite is identified and it is deemed appropriate.</li> <li>✓ As for our space agency's' activities, JAXA performs conjunction assessment and collision avoidance for its spacecraft in accordance with its collision risk management standard JMR-016.</li> </ul>
<p>Experiences, challenges and lessons learned</p>	<ul style="list-style-type: none"> <li>✓ The challenge remains to establish international rules for conjunction analysis and collision avoidance.</li> </ul>

B.5	
Develop practical approaches for pre-launch conjunction assessment	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ In the guidelines of the Space Activities Act, Japan encourages domestic launch and transportation service providers to introduce and use tools with up-to-date population data and population growth forecasting capabilities in assessing risks to people, property, public health, and the environment (third-party injury risk) associated with the launch, in-orbit operation, and reentry of space objects. In addition, the review criteria requires that, at the time of launch, the project team shall establish communication procedures with relevant agencies to ensure the safety of aircraft and vessels during the launch operations.</li> <li>✓ Japan will participate and respond accordingly in any future discussions on the information to be provided for pre-launch conjunction assessment through a dedicated consultative process within the Committee on the Peaceful Uses of Outer Space.</li> <li>✓ As for activities in space agencies, JAXA performs pre-launch conjunction assessment of Japanese flagship rockets with manned spacecraft, in accordance with national regulation and JAXA's standard.</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ The challenge remains to establish international rules for pre-launch conjunction assessment.</li> <li>✓ The challenge remains to create an international database for trajectories and their errors of space objects.</li> <li>✓ The challenge remains to establish an international scheme of sharing launch/re-entry schedule and trajectories.</li> </ul>

B.6	
Share operational space weather data and forecasts	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ NICT shares space weather observational data <i>via</i> its website and contributes to real time sharing of HF propagation data among ICAO global centers.</li> </ul>

Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ The challenge remains to establish a unified format for sharing of space weather observational data.</li> </ul>
---	--

<p>B.7</p> <p>Develop space weather models and tools and collect established practices on the mitigation of space weather effects</p>	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ JAXA contributes to developing standards for the space environment through the activities at ISO.</li> <li>✓ NICT works to mitigate against space weather disasters by cooperating with member states in International Space Environment Services (ISES).</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ Regarding space weather disasters, the challenge is to establish a practical scheme of information sharing.</li> </ul>

<p>B.8</p> <p>Design and operation of space objects regardless of their physical and operational characteristics</p>	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ The review criteria of Japan's Space Activities Act requires the mitigation of orbital debris generation. [Reference] Act on Launching of Spacecraft, etc. and Control of Spacecraft ("Space Activities Act"), Order for Enforcement, Regulation for Enforcement, Review Standards, Guidelines (in English) <a href="https://www8.cao.go.jp/space/english/activity/application.html">https://www8.cao.go.jp/space/english/activity/application.html</a></li> <li>✓ As for activities in space agencies, JAXA maintains its space debris mitigation standard JMR-003 in conformity with international regulatory frameworks on space debris mitigation, and conducts mission operations following that standard.</li> <li>✓ JAXA has developed a small and inexpensive reflector array (whose name is "Mt. FUJI") for laser ranging that can be used universally in low orbit to improve the tracking of space debris.</li> <li>✓ In selecting the companies implementing METI's satellite</li> </ul>

	development projects, METI has adopted procedures to evaluate companies who actively engage in the long-term sustainability of outer space activities.
Experiences, challenges and lessons learned	✓ The challenge remains to review the provisions of related national laws and regulations as necessary to ensure that they are sufficient for new forms of space objects.

B.9	
Take measures to address risks associated with the uncontrolled re-entry of space objects	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ The examination criteria of Japan's Space Activities Act requires that the structure of the satellite or equipment, etc. comprising the satellite to be dropped to the earth must be of a completely combustible structure, or that the risk to the point where landing or water landing is expected, etc. is equal to or less than the level of international standards or standards established by space agencies etc. of other countries as a result of sufficient combustion. In addition, for launch vehicles, if possible, the orbit insertion stage of a launch vehicle that has completed launch in an orbit that passes through or may interfere with Low Earth Orbit region is required to be moved to an orbit with a short orbit life by controlling its position, attitude and condition, or re-entered and disposed of in a way that prevents damage on the ground. In the case of re-entry, the structure must be such that the risk to the point where landing or water landing is expected is equal to or less than the level of international standards or standards set by space agencies of other countries.</li> <li>✓ Japan will consider methods of providing information from Japan on the forecasted uncontrolled re-entry of potentially hazardous space objects.</li> <li>✓ JAXA conducts research with the aim to reduce the risks on the ground posed by the re-entry of space objects.</li> <li>✓ As for activities in space agencies, JAXA maintains JAXA's standard JMR-003 and JERG-1-047 in conformity with international regulatory frameworks regarding uncontrolled</li> </ul>

	<p>re-entry, and conducts mission operation following that standard.</p> <ul style="list-style-type: none"> <li>✓ JAXA provides support for Japanese companies, universities and other national institutions on re-entry risk assessment by offering JAXA's re-entry survivability analysis tool "ORSAT-J".</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ The challenge remains to consider the need for controlled re-entry, especially in rocket vehicles, while taking economics into account.</li> <li>✓ The challenge is that launch providers tend to avoid controlled re-entry involving launch capacity loss.</li> <li>✓ The challenge is that an international standard or consensus for a controlled re-entry is necessary.</li> </ul>

<p>B.10 Observe measures of precaution when using sources of laser beams passing through outer space</p>	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ Although the Acts, regulations and the Guidelines on License Related to Control of Spacecraft do not explicitly mention laser beams, the requirement to obtain a license is that the activities of the applicant must not interfere with the maintenance of public safety. In addition, the Guidelines on a License to Operate a Spacecraft Performing On-Orbit Servicing stipulate that irradiation of electromagnetic energy must not interfere with the management of other satellites and other equipment.</li> <li>✓ As for activities in space agencies, JAXA conducts a technical evaluation, as appropriate, for missions using sources of laser beams passing through outer space.</li> </ul>

C. International cooperation, capacity-building and awareness

C.1 Promote and facilitate international cooperation in support of the long-term sustainability of outer space activities	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ The Government of Japan shares information on space law systems and initiatives with countries participating in APRSAF. Japan also provides capacity building support for space law development in cooperation with the UN Office for Outer Space Affairs, and is planning to conduct workshops on the implementation of the LTS Guidelines through the Quad Space Working Group.</li> <li>✓ JAXA contributes to raising-awareness of the long-term sustainability of outer space activities by participating in and hosting international events.</li> <li>✓ JAXA promotes international cooperation through the framework of the ESA / NASA / JAXA Trilateral S&amp;MA Meeting, and Trilateral Safety and Mission Assurance Conference (TRISMAC).</li> <li>✓ JAXA started NSLI during APRSAF-26 in 2019 to enhance information exchange and mutual learning among members from national governmental organizations of the countries in the Asia-Pacific region. NSLI members jointly submitted a report on the status of national space legislation in the region to UNCOPUOS LSC in 2021, and has started the 2nd phase activity in APRSAF-27 held at the end of 2021.</li> <li>✓ JAXA co-organized the 1st Space Policy and Law Working Group in APRSAF-27 in 2021 for developing community and enhancing mutual learning of experts in the region. The 2nd WG is to be held in APRSAF-28 in 2022.</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ NSLI has provided an effective regional model to enhance capacities in establishing and implementing national space legislation.</li> </ul>

C.2	
Share experience related to the long-term sustainability of outer space activities and develop new procedures, as appropriate, for information exchange	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ The Government of Japan shares information on space law systems and initiatives with the countries participating in APRSAF, and provides capacity building support for space law development in cooperation with the UN Office for Outer Space Affairs, and is planning to conduct workshops on the implementation of the LTS Guidelines through the Quad Space Working Group.</li> <li>✓ JAXA contributes to this area by participating in IADC and related symposiums, collaborating with foreign space agencies, and supporting the activities of ISO.</li> </ul>

C.3	
Promote and support capacity-building	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ The Government of Japan shares information on space law systems and initiatives with the countries participating in APRSAF, providing capacity building support for space law development in cooperation with the UN Office for Outer Space Affairs, and is planning to conduct workshops on the implementation of the LTS Guidelines through the Quad Space Working Group. The Government of Japan is engaged in activities such as sharing satellite observation data for developing countries through capacity building support activities.</li> <li>✓ The Government of Japan has been and will continue providing data and capacity-building support for disaster management through the APRSAF's Sentinel Asia, which provides satellite data imaging and the provision of data for areas affected by natural disasters through the QUAD workshops on precipitation.</li> <li>✓ JAXA started NSLI during APRSAF-26 in 2019 to enhance information exchange and mutual learning among members from national governmental organizations of the countries in the Asia-Pacific region. NSLI members jointly submitted a</li> </ul>



	<p>report on the status of national space legislation in the region to UNCOPUOS LSC from 2021, and has started the 2nd phase activity in APRSAF-27 held at the end of 2021.</p> <p>✓ JAXA co-organized the 1st Space Policy and Law Working Group during APRSAF-27 in 2021 for the developing community and is enhancing mutual learning of experts in the region. The 2nd WG is to be held during APRSAF-28 in 2022.</p>
Experiences, challenges and lessons learned	<p>✓ NSLI has provided an effective regional model to enhance capacities in establishing and implementing national space legislation.</p>

C.4 Raise awareness of space activities	
Current progress and/or proposed future activities	<p>✓ JAXA contributes to raising awareness of space activities by organizing events for the public. (e.g. activities in APRSAF)</p>

#### D. Scientific and technical research and development

D.1 Promote and support research into and the development of ways to support sustainable exploration and use of outer space	
Current progress and/or proposed future activities	<p>✓ As for activities in space agencies, JAXA acquires licenses under the Act on Launching of Spacecraft, etc. and Control of Spacecraft (Act No. 76 of 2016).</p> <p>✓ As for activities in space agencies, JAXA maintains its regulation in conformity with international regulatory frameworks regarding planetary protection, and mission operation following that regulation.</p> <p>✓ JAXA promotes various research and development for the exploration and use of outer space in a manner aligned with "JAXA Sustainable Space Principles" issued in during the 65th session of COPUOS this year, which consists of the next three pillars:</p>

	<ol style="list-style-type: none"> <li>1. Together with space related entities from around the world, JAXA commits to the preservation of outer space as a realm of all humankind.</li> <li>2. JAXA offers the benefits of its outer space exploration and utilization equally to present and future generations.</li> <li>3. By developing innovative technologies, JAXA contributes to the resolution of challenges associated with the promotion of sustainable space activities.</li> </ol> <p>One such example is the development of RABBIT (Risk Avoidance assist tool based on debris collision ProBaBlliTy), which provides support for satellite operators in collision risk analysis and avoidance maneuver planning.</p>
--	---

D.2	
Investigate and consider new measures to manage the space debris population in the long term	
Current progress and/or proposed future activities	<ul style="list-style-type: none"> <li>✓ METI is developing space robotics technologies for On-Orbit Servicing.</li> <li>✓ JAXA carries out research and development on space debris mitigation such as space debris removal.</li> <li>✓ JAXA carries out research on ground risk assessment posed by the re-entry of space objects.</li> </ul>
Experiences, challenges and lessons learned	<ul style="list-style-type: none"> <li>✓ Formation of a forward-looking international consensus on transparency and safety assurance to encourage private sectors to implement space debris removal activities.</li> </ul>

**3. Raising awareness and building capacity, in particular among emerging space nations and developing countries**

<ul style="list-style-type: none"> <li>✓ NICT helps GISTDA, Thailand to provide space weather forecast services. NICT plays the role of secretary of the Asia-Oceania Space Weather Alliance (AOSWA) for cooperating on space weather research and development among Asia-Oceania countries. (Related to Guideline B.6, B.7)</li> <li>✓ The Government of Japan supports space law development in cooperation with the UNOOSA by offering UN Member States, upon request, capacity building to draft</li> </ul>
---

national space legislation and/or national space policies in line with international space law, promoting the long-term sustainability of outer space activities. (Related to Guideline C)

- ✓ JAXA started NSLI during APRSAF-26 in 2019 to enhance information exchange and mutual learning among members from national governmental organizations of the countries in the Asia-Pacific region. NSLI members jointly submitted a report on the status of national space legislation in the region to UNCOPUOS LSC in 2021, and has started the 2nd phase activities from APRSAF-27 held at the end of 2021. (Related to Guideline C.1, C.3)
- ✓ JAXA co-organized the 1st Space Policy and Law Working Group during APRSAF-27 in 2021 for the developing community and is enhancing mutual learning of experts in the region. The 2nd WG is to be held in APRSAF-28 in 2022. (Related to Guideline C.1, C.3)

#### Appendix : List of abbreviations

APG	APT Conference Preparatory Group for World Radiocommunication Conference
APRSAF	Asia-Pacific Regional Space Agency Forum
AOSWA	Asia Oceania Space Weather Alliance
CSpOC	Combined Space Operations Center
GISTDA	Geo-Informatics and Space Technology Development Agency
IADC	Inter-Agency Space Debris Coordination Committee
METI	Ministry of Economy, Trade and Industry
NICT	National Institute of Information and Communications Technology
NSLI	National Space Legislation
ORSAT-J	Object Re-entry Survival Analysis Tool - Japan
S&MA	Safety and Mission Assurance
WMO/IPT-SWeISS	World Meteorological Organization Inter-Programme Team on Space Weather Information, Systems and Services
Quad	Quadrilateral Security Dialogue