United Nations A/AC.105/L.304

General Assembly

Distr.: Limited
16 March 2016

Original: English and Russian

Committee on the Peaceful Uses of Outer Space
Fifty-ninth session
Vienna, 8-17 June 2016

Reviewing opportunities for achieving the Vienna Consensus on Space Security encompassing several regulatory domains

Working paper submitted by the Russian Federation

The General Assembly resolution provides perspectives that involve a set of goals and a pattern of political action that may integrate approaches to space security

1. The success and relevance of the work of the Committee on the Peaceful Uses of Outer Space will be determined, to a decisive degree, by whether it is able to consolidate an appropriate strategy and implement an important agenda on the safety and security of space activities in the part of this extensive subject that falls within its competence. Resolution 70/82, adopted by the General Assembly on 9 December 2015, is highly motivated and may create a significant positive impact, due in large part to the chair of the Committee, held by Algeria. The Russian Federation believes that the resolution essentially proposes an accelerated scenario for study of the feasibility of the practical aspects of ensuring security in outer space by the Committee and the Office for Outer Space Affairs of the Secretariat. New and important points were accentuated in a timely manner. The Committee should endeavour to produce anew the collective allegiance to the authoritative value of common security and determine what areas and solutions should be identified in order to establish more reliable space safety and security prerequisites. The safety and security issue, to the extent that it falls within the competence of the Committee, has clear and precise aspects. The Committee should seriously address those aspects. The preparation and adoption of a full-fledged set of guidelines to ensure the long-term sustainability of outer space activities, providing clear and diverse regulatory functions with a genuine beneficial effect on the safety of space operations, could be a key development. It would be important to stop obscuring and mismanaging consideration of the priority item on the Committee's agenda on the ways and means of maintaining outer space for peaceful purposes. The Russian Federation calls for consideration to be given to the essential aspects of the

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regulation of space security, based on a comprehensive concept of that security, and for a thorough and publicly open analysis of quite practical issues.

The advisability of addressing the gap between the concept of self-defence as conditioned by the Charter of the United Nations and its interpretation to suit political interests

2. The Russian Federation was guided by a positive and responsible approach when inviting the Committee to analyse the extent of the alignment between the positions espoused by States regarding the modalities of a hypothetical exercise of the right to self-defence under the Charter of the United Nations as extrapolated to outer space. The specific nature of the space environment and of space activities (in particular the fact that a potential conflict would be likely to spread rapidly and inevitably draw in a significant number of States) is a sound reason to conduct a thorough analysis of this topic in all its aspects. This is borne out, not least, by the results of the analysis of national regulatory documents in the field of space and safety of space operations adopted in several countries. There are cases providing for particularly rigid (in nature and intensity) self-defence measures in response to any (intended or unintended) negative impact on space objects of these countries and for positioning active preventive (pre-emptive) measures against foreign space objects. Regulation of this kind may well mean not taking into account the special case envisaged by article 51 of the Charter of the United Nations. The Russian Federation has not yet taken the liberty of responding to this development through replicatory ("mirror") regulations, believing that the model of behaviour of States in different crisis situations in outer space should not be programmed only to choose the toughest options. It is impossible not to see the need to distinguish clearly between situations that would justify exercising the right to self-defence (immediate response to an armed attack against a State) and situations when it is necessary to define measures in response to the use of force or a threat of force. The task of joint analytical work in the Committee would be to develop a set of categories (notions) to be used when assessing actions taken by States in cases where conflicts of interests of various kinds and intensity erupt in space, and to determine the objective attributes of such actions. Ascertaining the interpretation of the norm on self-defence would be important for ensuring the safety of space operations. The very possibility of addressing self-defence in its extrapolation to outer space should not be perceived as a disturbing development; nobody is proposing a "militarization" of the agenda. The idea is to work out a "road map" that would provide for step-by-step advancement towards a unified interpretation of such a norm. It should be remembered in this context that the Committee, at its fifty-seventh session held in 2014, agreed on the importance of considering, under its agenda item entitled "Ways and means of maintaining outer space for peaceful purposes", the broader perspective of space security and associated matters, and of identifying effective tools that could potentially provide the Committee with new guidance, in a pragmatic manner and without prejudice to the mandate of other intergovernmental forums. In this connection, the Committee observed that a focused consideration of issues pertaining to the application of norms of international law that are relevant for preserving outer space for peaceful purposes could be useful.

Valid statement of requirements for ensuring the safety of space operations

3. The Russian Federation has applied maximum efforts so that States could develop serious and responsible ideas for practical ways and means of reinforcing operational safety in outer space. In the short period that the negotiations have spanned, the Russian Federation has first of all made sure that its own relationship to this delicate topic has been a frank one. Doing so has enabled it, in the end, to contribute substantially to an understanding of the rules that could significantly and effectively govern the safety of space operations. It has proposed a comprehensive approach, combining the most various aspects of the issue. It has been an immense task to work out a coherent structure for a set of draft guidelines that, taken together, could be effective and produce synergistic benefits. The task has been completed; the norms of behaviour have been duly defined, that is, convincingly in political terms and pragmatically in terms of the methods and means of implementation, i.e., in a proper way, given that the document on the agenda is intended for voluntary implementation. The solutions proposed for meeting vital operational safety needs, including those noted by the representatives of the expert community, are those that are uniquely sound and delicately and properly worded. The issue of space operations safety has acquired clear and distinct dimensions. In their entirety, the draft guidelines proposed by the Russian Federation provide for addressing and deciding on all key issues and for taking account of the factors that determine space operations safety and forming views on what management of space operations safety actually comprises. Each draft guideline details specific actions to ensure a realistic attribution to States of broader responsibilities for maintaining operational safety in outer space. The proposals submitted by the Russian Federation have to a decisive degree defined the logic and essence of the current text of the set of draft guidelines, regardless of whether someone likes it or not. It is precisely this focus on specific aspects of safety that has been negatively perceived by the United States of America and some of its allies.

Pamphleteering for responsible behaviour in space has given way to complete political self-exposure

4. The development of guidelines for the long-term sustainability of outer space activities enables realistic and appropriate solutions to many space safety issues to be worked out. Within the framework of collective responsibility, States should set themselves the task of conceptualizing the space operations safety regime. The consensus on managing safety and security in outer space is not easy to reach. It requires real political will. Whether such political will can be consolidated in order to achieve the desired results remains to be seen. It is obvious that, since the actual work on the issue began in February 2012, the Working Group on the Long-term Sustainability of Outer Space Activities has generally succeeded in effectively enriching the perception of the subject matter and analysing specific risks in outer space. The direction taken in the work essentially encouraged the expectation that it would be possible to establish the prerequisites for developing a regulatory instrument. However, such optimistic expectations are not being met. Some States have proved to be unwilling to show solidarity in promoting the long overdue positive changes needed in this field. They do not wish to establish exact safety regulations, standards and criteria and tend to oppose the implementation of rational ways of establishing the system of space operations safety. There is a tactical move to avoid implementing the goal, agreed in 2011, of setting up the Working

Group: severe constraints are being imposed on the process of consolidating ideas on the pursuit of safety that are realistic, possess absolute certainty and are capable of ensuring effective regulation. Instead of showing a readiness to tackle the most significant problems, the States concerned prefer to manipulate them by relying on bias and partiality. They fail to offer answers regarding the real safety and security issues or tenable arguments in support of their opposition to all Russian proposals. Meanwhile, they have not identified any actual flaws in the Russian proposals. The position of this group of States has thus become the factor that is bringing about the breakdown of the negotiating process because it would be useless to reason or argue with those who do not want any regulation at all. The practical and disappointing conclusion to be drawn from this negative development is that there are diminishing prospects of achieving the main aim of concerting States' efforts for the benefit of managing space operations safety. There has been an overestimation of the potential for positive developments and for securing the dedication of all States members of the Committee to the pursuit of intelligent and motive-driven policy capable, through joint efforts, of producing an integrated system of rules of conduct in outer space. Whether the Working Group on the Long-term Sustainability of Outer Space Activities will ever have the major achievement of an agreed set of guidelines to its credit is highly questionable. It is also unclear whether it will be possible, in further negotiations, to do something to reverse the negative trend. It would be equally embarrassing for the Working Group to discontinue the work or to promote and adopt a document mostly consisting of abstract assertions, not only lacking any definite bearing on the resolution of outstanding space operations safety issues but also devoid of all political effect conducive to completing this task.

The need to prevent the collapse of the new undertaking

5. In October 2015, the Working Group on the Long-term Sustainability of Outer Space Activities held its first full-scale discussions in Vienna, albeit in the form of informal intersessional meetings. It is regrettable that the work was not equally intensive before that point. The Russian delegation has repeatedly called for the topic to be addressed at the Working Group meetings. Nevertheless, work in that area was done in a completely different manner where informal consultations lacking any status became, essentially, the only available option for communicating. The Working Group was convened for quite short periods of time and it was often done for appearances' sake only, with meetings being opened and immediately adjourned. The Vienna intersessional meetings provided incomparably more opportunities for focused discussions and turned out to be a useful experience. In general, the meetings prompted serious reflection and in-depth discussion of potential major decisions in the field under review. The set of draft guidelines is based on materials not yet fully formulated or organized. The task ahead, therefore, is to update the text and make it functional as well as to consolidate the draft guidelines into an integral whole. A suitable modality needs to be found. The Russian Federation believes that it is still possible to achieve this objective. Drafting a coherent and concise text means considering its ergonomic aspects, removing the dead weight and placing emphasis on the key regulatory elements. The Working Group is obliged to do its best to continue consolidating the text in the framework of full-fledged and substantive meetings. The increased substantive dialogue and the discrepancies that have emerged in the approaches of States and groups of States to the safety of space operations require that the Chair of the

Working Group provide essential information on the differences of views in the draft Working Group report. It would be of practical importance not only and not so much for the sake of history or defining the areas of potential future work on the guidelines, but rather for understanding — in the context of States' practices — the way space security architecture should be shaped given the reluctance of some States to agree, in a reasonable manner, upon the key operational aspects of such security. This essential aspect should receive proper attention.

Actions that should precede attempts to conceptualize space traffic management

6. The regulatory functions that the Russian Federation proposes to introduce through the guidelines are quite significant and capable of producing positive policies able to stand the test of time. They also objectively correspond to the guiding philosophy behind the space traffic management concepts to be considered by the Legal Subcommittee at its session in 2016. Basically, these functions encompass key aspects of the tasks required for hypothetical space traffic management, and raise questions that call for immediate answers if the intention is to seriously engage in future in an in-depth examination of space traffic management. Whichever version of such traffic management may have been taken as a basis for the discussion, it is clear that basic regulation of the safety of space operations cannot be bypassed; otherwise, there would be no impetus to the substantive discussion and the opportunity to define the direction for the enhanced interaction would be lost. The elements of a future space traffic management model may be derived, precisely, from a synthesis of positive developments supported by a compelling concept for and practice in the maintenance of space operation safety based on the guidelines being drafted. If there is no consensus on the meaningful regulation of space security, then common sense should dictate removing the space traffic management item from the agenda once and for all because reflection on issues seen in perspective will become irrelevant. Thus, the review of space traffic management by the Legal Subcommittee is an additional reason for the Member States to make an effort and jointly achieve tangible success in agreeing on the guidelines.

The ethics of space policy

7. The simplified work programme in respect of space operations safety imposed upon the Committee by a number of countries is not merely aimed at leaving the international community bereft of any meaningful regulation in this area. The wider aim is clearly to render the Committee incapable of framing real and high-quality policy for upholding international legal standards and developing regulatory functions. If the Committee is incapacitated and loses its high-level status that entitles it to exercise major functions in the regulation of space activities and, hence, its capacity to keep negative tendencies in check, this will lead to unilateralism gaining ascendancy in the long run. Such developments have proved to be neither hypothetical nor remote. The United States vividly demonstrated a connection between diminishing the Committee's role and powers, on the one hand, and manifestations of total disrespect for international law order, on the other, by adopting the Commercial Space Launch Competitiveness Act on 25 November 2015 (the full title being: "Act to facilitate a pro-growth environment for the developing commercial space industry by encouraging private sector investment and creating more stable and predictable regulatory conditions, and for other purposes"). The

provocative novelty of the law is that it entitles the United States private sector to explore, appropriate and sell resources of the Moon, asteroids and other celestial bodies. Trying to avoid ambiguity and wishing to lend its own actions the appearance of legitimacy, the United States also proclaimed a new understanding of "national appropriation of outer space, including the Moon and other celestial bodies" which, according to its reasoning, does not derogate from its fundamental obligations under the 1967 Outer Space Treaty. Disregarding the history of the talks within the framework of the United Nations on the 1979 Moon Agreement and the integral regulation envisaged in that Agreement of the status and procedure for using the natural resources of the Moon, as well as — according to the terms of the Agreement — of other celestial bodies (including asteroids, comets and dwarf planets), the United States decided to resort to the argument, previously voiced mainly by the academic community, that article II of the 1967 Outer Space Treaty, prohibiting the above national appropriation, does not affect the said resources since it is not established expressis verbis. There is something fundamentally wrong with such new displays of attitudes. It is worth thinking about the causes behind this phenomenon, since a real technical capability for the development of resources may not be achieved for many years. It is clear that the United States seeks to identify space resources exploration and mining as an area in which it is capable of displaying its particular excellence. The true motives behind its actions include a desire to demonstrate who is entitled to determine "new verities" in interpreting the principles and norms of international law. This stance is in line with the "style" of the notorious doctrine of domination in outer space, which is rather broad in its various meanings and manifestations. As an unprecedented political manifestation, the arbitrary self-extension by the United States of its own "freedoms" in outer space has a history. The introduction to the international practice of ideas and messages alluding to "freedom to use outer space" — at expert forums and in specialized publications — has been and remains an integral element of the transition to the policy of unilateralism, although the 1967 Outer Space Treaty does not contain such a norm. This has led to the dominant influence of certain clichés actually supplanting real principles and norms of international law with the aim of causing specific shifts in perceptions and paradigms. Regardless of how a particular State understands or allegedly understands the meaning of the term "appropriation", the United States, in highlighting the need for responsible conduct in outer space, should have had the courage to speak out on its new understanding of the status of resources of the Moon and other celestial bodies at the Legal Subcommittee, which had repeatedly conducted reviews of the five basic multilateral treaties on outer space adopted under the United Nations auspices. This subsidiary body of the Committee has a responsibility to make the entire system of international space law stable and efficient. The United States could very well propose discussing the possibility of reaching a uniform understanding of the status of resources and set forth the structure of a doctrine incorporating safety and security aspects. Such an approach would at least give the impression that it seeks to confirm the validity of the entire philosophy behind the law referred to above. Unfortunately, a different course of action was taken, whether from a failure of courage or out of highhanded presumption. It is evident that in this case the Legal Subcommittee has not fulfilled its political and legal functions and has failed to develop an organic set of views on the issue of resources. Although technological changes inevitably occur and will require new institutional solutions, the current status quo in relation to the 1979 Moon Agreement does not justify the implementation of anti-status quo

policies, as intended by the United States. The Moon Agreement was designed to develop the Outer Space Treaty and define it in greater detail. Business and economic issues related to the exploitation of natural resources not only of the Moon but also, having regard to article 1, of all other celestial bodies constitute the specific subject of the agreement. The regime of the common heritage of mankind with regard to the Moon, other celestial bodies and their resources was not regarded as inconsistent with the principles of the Outer Space Treaty. Moreover, there is evidence that at the negotiating stage the United States proceeded from the understanding that the exploitation regime had to be developed within the framework of the Committee on the Peaceful Uses of Outer Space. Thus, a "new reading" of the Outer Space Treaty advanced by the United States sharply contrasts with its previous understanding, especially given that the text of the Moon Agreement was adopted unanimously at the 34th session of the General Assembly in 1979. The Committee should be ready to establish criteria for the evaluation of the emerging situation and to offer rules in this area. It would be of interest if the United Nations Secretariat prepared a review of the positions presented by the States during the negotiations. Certainly, the emerging situation should be carefully examined by the Legal Subcommittee. However, there is a quite specific area where the Scientific and Technical Subcommittee could also be engaged: safety issues of operations that provide for the deflection of small asteroids (using various technologies which may even provide for exerting an influence on impact) and, especially, operations involving the movement of such bodies to the vicinity of the Earth and the Moon. Such operations present a high risk for the whole population of the Earth and should be regulated at the international level. Another very important aspect relates to the fact that technologies and systems, which predictably will be required for such operations, will be of dual use as a minimum and will possibly be barely distinguishable from arms systems.

Loyalties and interests underlying the draft code of conduct for outer space activities

8. The emerging trends in international relations, which could also potentially have a negative impact on space activities, were amply manifested in those actions taken in 2015 to advance, bypassing the Committee, the international draft code of conduct for outer space activities prepared by the European Union, not without the support of the United States. In the midst of the work on the set of guidelines for the long-term sustainability of outer space activities a move was made to switch between the document prepared by the Scientific and Technical Subcommittee and the newly introduced code. Obviously, the objective was to minimize the importance of the guidelines, divest them of any politically privileged status and, essentially, replace them by the code. To this end, ideas associated with the safety of space operations were employed, but placed in a completely unacceptable context. This context is defined by the rather specific provisions of paragraph 4.2 of the draft code (in its most recent versions up to 2015), which are nothing but an attempt to legitimize variable use of force on absolutely untenable grounds. The provisions of this paragraph are such as to make everyone hostage to a highly dangerous scheme evidently invented by those that act within the paradigm of their own dominance in outer space. In all other aspects the draft code is quite "convincing" in its inability to produce regulation: it contains no self-sufficient or authentic ideas and is characterized by a lack of normative certainty and inherent, rather dangerous

ambiguities. For these reasons, it can be neither an alternative nor a parallel instrument for ensuring the safety of space operations and long-term sustainability of outer space activities.

Elucidatory comments on the Russian proposals on the draft basic safety norms

9. The following are useful and instructive comments on all the draft guidelines introduced by the Russian Federation. They should help delegations link the proposed approaches more precisely to the realities to be taken into account. In this context, the discussion points and the comments on the Russian proposals provided by the United States in conference room paper A/AC.105/2015/CRP.18 as well as in the course of the Working Group's intersessional meeting in Vienna have called for additional clarifications. The numbering of specific draft guidelines below corresponds to the numbering adopted in document A/AC.105/C.1/L.348.

Enhancing the practice of registering space objects (draft guideline 6)

This draft guideline brings together all the important aspects of the problem of enhancing the practice of registering space objects. Firstly, it is aimed at reinforcing efforts to ensure implementation of the existing obligations of States under the 1975 Registration Convention and, secondly, at ensuring the uniform and broad implementation of the recommendations outlined in General Assembly resolution 62/101 on enhancing the practice in registering space objects. The practical need for the guideline has arisen from the loose practices that have evolved in the context of implementation of the Convention and the recommendations set forth in the General Assembly resolutions. The proposed regulation aims to produce collective allegiance to the attainment of international standards and the objectives of the General Assembly resolutions. This would make it possible to successfully enhance registration practices in accordance with resolution 62/101 as complete normative certainty has already been achieved with regard to a range of technical terms without any reworking of the recommendations. Merely referring to the General Assembly resolution is futile from the point of view of achieving the desired results. The most important element of the draft guideline is the proposed way of addressing the inadmissible situation which, for a variety of reasons, has developed regarding the discontinuation of the previous practice of assigning unique designations as the basis for identifying space objects. Informal consultations in the framework of the Working Group have revealed the erroneous view that the assignment of international designations is the prerogative of the launching States' national authorities. In this connection, the delegations in question should examine more closely the report of expert group B (A/AC.105/2014/CRP.14), which explains the problem clearly. The draft guideline specifically states the need to provide information on the possibility of separating the additional space objects from the main space objects. It should be kept in mind that the technological development of "fractionated" space objects, i.e., objects with a satellite architecture wherein the functionality of a traditional "monolithic" spacecraft is replaced by a cluster of wirelessly interconnected spacecraft modules, is currently in progress. Accordingly, the draft guideline proposed by the Russian Federation should not be simplified, as some delegations have suggested, but may, on the contrary, be further refined.

Implementation of measures of self-restraint in outer space (draft guideline 8)

One of the most relevant ideas proposed by the Russian Federation is, essentially, a simple message that States and international intergovernmental organizations should refrain from applying to foreign space objects methods and techniques that they themselves would not deem pertinent and/or acceptable applied to their own space objects. The draft guideline for practising self-restraint in outer space is of particular importance and has a special purpose: it is one of the pillars designed to support the concept of ensuring safety of space operations. In fact, it deserves special focus if the objective is to truly expand views on safety and provide a rationale for building relations of trust and fostering new positive practices. Taken as a whole, this guideline is unprecedented in its wisdom and functionality. Its advantage is that, while not purporting to initiate any kind of "ethical discourse", it will have to genuinely ensure that States and international intergovernmental organizations within their own operational activities in outer space make choices founded on ethical reflection. With such an approach it will be possible to start addressing the problem of self-restraint in outer space through annual analysis of real events. Opportunities for containing tensions in outer space can definitely be enhanced by emphasizing the factor of self-restraint. The United States has been manipulating the real content of the draft guideline, rather than giving reasons for its rejection. The interpretation of the guideline by the United States that it coincides in its orientation and substantive content with two other draft guidelines, "Adopt, revise and amend, as necessary, national regulatory frameworks for outer space activities (guideline 1)" and "Consider a number of elements when developing, revising or amending, as necessary, national regulatory frameworks for outer space activities (guideline 2)", is not at all convincing. These two guidelines have a well-defined meaning. Importantly, they stress the need to take account of the provisions of General Assembly resolution 68/74 of 11 December 2013, entitled "Recommendations on national legislation relevant to the peaceful exploration and use of outer space". There are a number of other points that need to be retained. Apparently, in order to further streamline the text as a whole, it is felt that these two guidelines should be combined. (It would make even more sense to move some provisions into the introduction to the set of draft guidelines.) In any case, even if the essential points from each of them were taken, it would still be far from equivalent to the separate guideline on measures of self-restraint in outer space proposed the Russian Federation. There is no reason even to compare their contents. The Russian draft guideline offers a real tool for ensuring security in outer space with due consideration of the behavioural factor. It sets a specific and very important task — that of giving objective form to the conscious needs of States to maintain the safety of space operations. Such needs imply that in the course of their own activities in outer space (including inspection operations), States should neither render foreign space objects vulnerable nor endanger them. Two other draft guidelines contain nothing other than useful general guidance on how national space regulation should be developed institutionally. The United States uses the same method of inappropriate comparison when it seeks to prove that the Russian proposal basically reproduces the draft guideline related to the need to perform conjunction assessment during orbital phases of controlled flight (guideline 14). The latter focuses on the description of how the conjunction assessment should be performed in order to avoid collisions, while the Russian draft guideline focuses on the operations that provide for a deliberate approach, including a protracted

approach. It is possible to avoid collisions only by adjusting the trajectory of motion (in line, precisely, with draft guideline 14). It is important to understand that collision is only one of the possible dangerous situations facing space objects. Meanwhile, there may be dangerous situations that are not related to the threat of physical collision. For example, close approach to foreign space objects (which may be protracted) can result in disruption of the operation of such an object: it may obstruct the field of view of sensors or target equipment, cause radio-frequency interference, etc. In conclusion, all the guidelines that have been examined are designed to solve specific problems that are by no means interrelated.

Preclusion of interference with the operation of foreign space objects through unauthorized access to their on-board hardware and software (draft guideline 9)

This draft guideline is intended to secure the understanding of States and international intergovernmental organizations that responsible conduct of space activities means ceasing to contemplate or pursue policies involving unauthorized installation (in the framework of export or other types of supplies) of programs with hidden malicious functions on foreign space objects. This issue, which has never been considered internationally and multilaterally, requires attention. If States really intend to abide by the principle of responsible conduct of space activities, then the responsibilities set forth by the draft guidelines should not become a stumbling block for them, but should, rather, form a standard to be followed by all. It is noteworthy that, in its report (A/70/174) adopted on 26 June 2015, the Group of Governmental Experts on Developments in the Field of Information and Telecommunications in the Context of International Security offered, among other things, recommendations, for consideration by States, for voluntary norms, rules or principles of responsible behaviour aimed at promoting an open, secure, stable, accessible and peaceful information and communications technology (ICT) environment. Paragraph 13 (i) of the report provides that “States should take reasonable steps to ensure the integrity of the supply chain so that end users can have confidence in the security of ICT products. States should seek to prevent the proliferation of malicious ICT tools and techniques and the use of harmful hidden functions”.

Refrain from modifications of the environment (draft guideline 10)

Deliberate manipulation of the parameters of the space environment, which may result in risks and threats to foreign and any other space objects and objects of space-related ground infrastructure, is considered a serious matter that may adversely affect the safety of space operations. Strictly speaking, the factor of manipulation of the characteristics of the space environment is essential not only for space operations but also in a broader context of international security. Unfortunately, the United States representatives expressed their unwillingness to discuss the parameters of the proposed draft guideline without making any arguments in support of their position. This issue is too important, however, to be ignored. It is noteworthy that this topic was not reflected in the draft international code of conduct for outer space activities. It is also notable that the specific reference to the Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques, which entered into force on 5 October 1978, was initially missing from the vast list of multilateral treaties on outer space and space activities that was included in all versions of the draft code (until 2015).

All these facts objectively show that some States reserve the possibility to use space environment modification techniques in their own specific interests. The guideline, as drafted, does not duplicate the subject of regulation as covered by the above-mentioned Convention and does not in any way contain any interpretation of its provisions. The subject of regulation, i.e., the outer space environment, is the only connection between the draft principle and the Convention.

Various aspects of raising awareness of scheduled space launches (draft guideline 15)

The Russian Federation proposed a guideline recording a scrupulous and complex understanding of a range of practical aspects related to enhancing the safety of space launches at the orbital flight stage. First and foremost, the guideline proposes to stipulate a commitment on the part of States to develop solutions for providing standardized information on a planned flight path of a launch vehicle at the stage of launching spacecraft (payloads), as would be required for early detection of potentially dangerous conjunctions. As things stand at present, there is no relevant international standard. Moreover, this draft guideline provides a strong incentive to shape consolidated practice in furnishing pre-launch notifications. The proposed format for notifications covers every type of information required for the safety of space operations. In this regard, the proposed format has a distinct advantage over the set of data that the parties to the International Code of Conduct against Ballistic Missile Proliferation (the Hague Code) are required to provide for the specific requirements of that document. Finally, finding a technical solution to provide a prompt response to risks of unforeseen collision in the course of an actual launch is a tough challenge that requires in-depth study and cost-intensive technical interventions aimed at developing new algorithms for launch vehicle flight control systems and design refinement. The emphasis is on making States and their space industries duly receptive to the need to advance understanding of the conceptual and technological aspects of this problem. Moreover, the draft guideline states the important goal of introducing the provision of pre-launch information (in a standardized form) on the planned flight path of spacecraft after separation from the launch vehicle. This information is required for early planning of in-orbit operations.

Preclusion of activities that could impair or adversely affect foreign ground and information infrastructures related to space activities (draft guideline 18)

At the intersessional meetings of the Working Group a large amount of time has been taken up by explaining the incorrectness of the approach proposed by the United States, which in fact proposed to replace the norm against malicious interference with the operation of foreign space-related ground infrastructure with the provision that all States should ensure the resilience of their own ground infrastructure. Following the results of the Vienna intersessional meetings of the Working Group, the United States drafted a new version of guideline 19. In itself, the suggestion to address the issue of resilience is quite reasonable and is in line with the general concept of safety and security of space activities. However, it has its own set of tasks. For example, the document adopted in 2014 by the United States Army states that resilience represents the ability to cope with adversity and losses and is a component of endurance, while the Air Force of the same country understands resilience as the ability of a system infrastructure to continue providing

required capabilities in the face of a system failure, environmental challenges or adversary action. Thus, it is fair to say that it is quite possible and even necessary to combine the provisions against causing harm to foreign ground infrastructure and those for enhancing the resilience of a country's own ground infrastructure. What matters is that it should not be possible to interpret the wording of the updated guideline in a way that gives priority to ensuring resilience over an obligation to exclude any harm to foreign ground space architecture. In preparing the updated version of the guideline, it would be practical to use the wording of the Russian-sponsored draft for guideline 18 with more specific provisions regarding resilience outlined mostly in paragraphs 19.3 and 19.4 of draft guideline 19. A sound and promising approach to a compromise that could bring comprehensive benefits would be to reach an understanding that these functions are mutually complementary and not to be placed in opposition, and that neither should be seen as having priority over the other. The draft text of the guideline should include a provision along the following lines: "In implementing this guideline, States and international intergovernmental organizations should provide for a regulation which ensures that methods and procedures used to support the resilience of ground infrastructure are consistent with responsibilities to preclude any action that could impair or adversely affect the operation of ground infrastructure under foreign jurisdiction and/or control".

Active removal (draft guideline 20)

The draft guideline proposed by the Russian Federation provides for the only possible way to regulate all the issues arising in connection with operations for the active removal of space objects from orbit in compliance with the norms of international law and all necessary precautionary measures. Such a norm would be very appropriate not only in the long term, but quite possibly in the near future, inter alia, in view of the intention declared by space agencies of Japan and Europe to conduct such operations. The proposed regulation is applicable to any technological solutions. Generally, whatever specific technological solutions emerge in future, it is evident that the purpose of this operation is to have a physical impact (through mechanical means or a power source) on a specific object. The draft guideline submitted by the Russian Federation contains important requirements for any active removal operation as such in terms of its safety. Moreover, it emphasizes the importance of strict accounting of the status of any objects for which such an operation is conducted. The exercise of jurisdiction and control over space objects under the norms of international law is clearly of key importance and should not be ignored in any event. The absence of any developed and common practice in conducting operations for active removal should not be an obstacle to normative regulation. It should be mentioned here that the United States follows the practice of registering even those fragments resulting from break-ups of space objects. This may be useful in terms of the implementation of obligations under the Liability Convention. At the same time, this practice obviously leads to a situation where no activities to mitigate space debris other than those conducted by the United States itself or with its concurrence can be applied to any fragments of space debris resulting from United States space objects after their registration in compliance with the 1975 Registration Convention. This fact underscores the need to apply basic criteria founded on international law to operations for active removal. The Russian Federation has added the following text to the draft of this guideline: "It should be

presumed that this guideline applies equally to any operation in outer space that implies any kind of physical impact on a space object".

Safe conduct of operations for destruction of space objects (draft guideline 21)

The Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space contain an instruction to prevent the generation of long-lived fragments of space debris when conducting operations for the destruction of space objects. Notwithstanding the importance of this basic instruction, when planning and conducting destruction operations many considerations need to be taken into account. The proposed guideline is based on a fully integrated approach to solving this problem in compliance with international law. It may not satisfy those who seek to impose on the international community a scheme for conducting destruction operations that fundamentally violates the international law. The main idea of the scheme envisaged under the draft code of conduct put forward by the European Union and the United States is to give legitimacy to supra-jurisdictional actions aimed at destroying foreign space objects on various untenable grounds. That is why it is of crucial importance that the Russian draft guideline elaborates in great detail the lawful procedure for conducting destruction operations.

Appropriate solutions for active removal and destruction of unregistered space objects (draft guideline 22)

The procedure for active removal and destruction operations needs to be specified for those cases when actions are taken with regard to unregistered space objects, including their launch vehicles and components. It is noted in special analyses that there is a real challenge concerning this category of objects. Experts have even hypothesized that non-registration of objects essentially makes them ownerless. The reason for this is that the legal status of these objects is ambivalent. On the one hand, exercising jurisdiction and control over space objects is mainly linked to the fact of their registration. On the other hand, States under international law are also liable for damage caused by their space objects. Furthermore, international law does not recognize failure to register as a justification for non-compliance with States' liabilities. Therefore, there really is a conflict of international laws, which needs to be taken into account. It would be important to endeavour to work out a practical course of action for States in dealing with unregistered space objects. Obviously, disregarding the legal status of unregistered objects may have negative consequences, one of these being that a launching State will be deprived of its ability to meet its obligations under the 1972 Liability Convention. Moreover, the issue of the legal ambivalence of non-registered objects has technical aspects. Failure to register a space object results in a lack of information that could help to identify it. International cooperation in determining the origin of an object is therefore acquiring particular importance. The Russian Federation proposes stating explicitly that any primary and definitive decision to remove a space object should be made by the State that exercises jurisdiction and control over the object. There can be no alternative options for developing approaches and practices in this regard. Moreover, a sound mechanism was proposed for taking all necessary decisions for allowing removal operations to be performed for the remediation of outer space. It should be noted that international experts recognize the challenge of distinguishing between space objects considered to be "valuable assets" by their owners and space objects considered to be space debris. However, there were no viable options for

addressing the issue until recently. Obviously, the task of tracking, cataloguing and identifying objects — all this being absolutely essential — is complicated and therefore calls for a sufficiently comprehensive and nuanced common understanding of the issues involved. In technical terms this issue could be addressed by establishing under the auspices of the United Nations a unified Centre for Information on Monitoring Near-Earth Space, as proposed by the Russian Federation. The Russian Federation therefore proposes what is essentially the only possible mechanism for addressing the issue related to the status of non-registered space objects.

Implementation (draft guideline 29)

Effective regulation of the safety and security of space activities should be characterized by important functions and unprecedented and unique solutions in full harmony with international law. It is important for the guidelines to be institutionally prepared for integration into national regulatory frameworks. A set of guidelines (as a regulatory format) is the optimal way to support the goals of ensuring the long-term sustainability of outer space activities, provided the formula for their implementation is the right one. Such a formula should be integral and self-sufficient, enabling the set of guidelines to gain the status of a document with an authoritative role in practical policy.

Long-term sustainability — defining the term

10. The notion of the long-term sustainability of outer space activities is gaining currency in political and expert discourse and even in common parlance. It has many meanings and can be interpreted in a variety of ways. However, there is still no proper definition of this concept. An important step would be to determine the core elements of the behavioural strategy pursued by States that decide to apply the criteria of long-term development to outer space activities, in order to provide this notion with essential characteristics and qualities and to give it a functional definition to be used in the context of guidelines. With due regard to the discussions during informal consultations in June 2015 and as a careful follow-up to proposals submitted earlier by a group of developing countries, the Russian Federation proposes to support and institutionalize the following functional definition:

> “The long-term sustained development of outer space activities implies a balance between the needs of States, international intergovernmental organizations and the international community in general for an intensive use of outer space and their abilities to maintain outer space fit for operationally safe, stable and conflict-free use. Ensuring the long-term sustainability of outer space activities should be understood to mean a strategy, as collectively and individually pursued by States and international intergovernmental organizations, of achieving the objectives of chrono-holistic transition to space policy design and implementation that would provide a strong rationale as well as practical opportunities and incentives for maintaining such a balance. States and international intergovernmental organizations are to assure a full understanding and support of these objectives across all sectors of their space activities and with regard to all aspects of space policy decision-making”.
>
> “The concept and policy of ensuring the long-term sustainability of outer space activities, as the guidelines endow them with specific regulatory

functions, entail the need to identify the general context of, and modalities for, continuous changes for the better in the way States and international intergovernmental organizations, when developing, planning and executing their space activities, attest to their peaceful intentions with regard to outer space and take into meaningful consideration the imperatives of preserving and protecting the outer space environment for future generations. In consonance with this overriding task it should be strongly presumed that the interests of States and international intergovernmental organizations in outer space, as they have or may have defence/national security implications, are to be fully compatible with preserving outer space free for exploration and use as well as safeguarding its status pursuant to article I of the 1967 Outer Space Treaty and the principles and norms of international law. Such an approach should be reflected in policies and normative regulations by means of which States and international intergovernmental organizations determine operational requirements in respect of outer space, leverage space capabilities, manage their own space assets or those related to them on legal grounds and deal with unforeseen contingencies in outer space".

The need to establish a common security-related lexicon

11. It is essential to have a good command of the vast lexicon pertaining to the safety of space operations. It is worth noting the continuing relevance of developing a common understanding and interpretation of such a notion as "safety/security", which is fundamental with regard to the functioning of a potential system for maintaining the long-term sustainability of outer space activities. This is directly linked to understanding the essence and functions of a safety/security system, to defining the objectives, means and criteria for ensuring safety/security and the functioning of mechanisms to counter risks, hazards, and threats, and, hence, to organizing specific types of outer space activity and analysing their results. That is why having a clear understanding of this notion is of considerable practical importance. This issue is especially relevant when regulations are formulated in English, as there are two words used in this context, namely "safety" and "security". These words in different variations have a multitude of definitions, including "safe condition" and "protection/safeguarding against hazards/threats/encroachments". All these points suggest that it would be useful to try to answer the question: what is the common understanding of the "safety of space operations" as a dimension of policymaking and an essential tool for ensuring the long-term sustainability of outer space activities. The lack of clarity regarding this issue may lead to a subjective understanding and interpretation of provisions of the guidelines. It should be noted that a linguistic working group was purposely established to clarify the interpretation of "safety" and "security" in all six official languages of the United Nations. The Russian side has submitted relevant ideas. The native English speakers in the working group (representing the United States and the United Kingdom of Great Britain and Northern Ireland) agreed to prepare the definitions of these terms (e.g., in the form of an explanatory note) to make it possible to find their close equivalents in the other official languages of the United Nations. As at the end of 2015, there was still no input regarding this issue. It is likely that colleagues are facing a serious challenge, as, for example, an analysis of operational documents adopted in the United States seems to indicate that it would be problematic to give a general definition conveying all the nuances of the meaning carried by these two

different terms. It is notable that these and, for that matter, other terms and notions that are important for the safety of space operations are not always used consistently across all documents prepared by different departments, even if these documents essentially address the same issues. It seems that a constructive solution to this real problem would be to agree, within the framework of the set of guidelines being drafted, on a common understanding of the "safe conduct of space operations". Judging by a number of statements by its officials, the United States ought not to object to developing a definition of this notion. Accordingly, it should not be a problem for the Working Group on the Long-term Sustainability of Outer Space Activities to carry out meaningful discussions and adopt the following definition, proposed by the Russian Federation:

> "The safe conduct of space operations implies a certain procedure for carrying out outer space activities whereby States and international intergovernmental organizations undertake a range of efficient (sufficient) and timely measures at political, regulatory, technical and organizational levels that would quite confidently and reliably allow parties, firstly, to protect their own space objects and related ground infrastructure from risks, hazards, threats and encroachments and, secondly, not to create (through intentional actions or inaction) and to prevent the emergence of such risks, hazards and threats to and encroachments upon foreign space objects and related ground infrastructure that could result from, and/or be induced by, their own space objects and related ground infrastructure. These measures should include:
>
> - Ensuring safety of parties' own space objects and related ground infrastructure;
> - Renouncing intentional actions and preventing inaction that may cause vulnerability and/or pose danger to parties' own and foreign space objects and related ground infrastructure;
> - Setting tasks, developing security system parameters and capabilities of parties' own space objects and related ground infrastructure, as well as ensuring protection of parties' own space objects and related ground infrastructure from unauthorized outside interference and countering negative impacts thereto that may be caused by contingencies, in a safe manner considering internationally recognized principles, norms and procedures, including the holding of consultations".

The potential for further regulatory capacity-building has not been exhausted

12. As part of the efforts to make the set of guidelines being drafted a complete document in terms of topics covered, the Russian Federation introduces for consideration a number of proposals outlined below.

Draft regulations proposed to be included in the text of guidelines

Topic

Address approaches to the design and operation of small-size space objects

Comment

The wide use of small-size space objects (in particular, objects known as nano- and picosatellites) is becoming increasingly more feasible and promising thanks to technological development. Consequently, the number of objects that are difficult to track (during the operational stage and after completion thereof) is constantly growing in different areas of near-Earth outer space, thus increasing risks of collision. Besides, the growing number of such objects exacerbates the challenges related to rational use of the radio-frequency spectrum and ensuring electromagnetic compatibility which are already being discussed at the International Telecommunication Union. The proposed regulations may — as an option — be built into draft guideline 28, as set forth in document A/AC.105/C.1/L.348. They include recommendations geared to increasing the accuracy of trajectory information and detectability of small-size space objects at different flight stages, and to decreasing the population of space debris in near-Earth outer space by preventing those objects from staying in orbits when they cease to function.

Proposed provisions

States and international intergovernmental organizations should, in view of the challenges that untraceable objects pose from the standpoint of safety in outer space, be encouraged to give all due emphasis and regulatory attention to providing design solutions to enable radar and optical monitoring means to detect and observe small-size space objects launched into different orbits. Desirable and feasible policies with regard to operating small-size space objects should also include solutions that would create the motivation to:

(a) Provide for design solutions to increase the accuracy of determining the location of small-size space objects in orbit during the operating phase (such as on-board navigation receivers that operate using global navigation satellite system (GNSS) signals);

(b) Provide for design solutions to increase observability of such space objects in radar and optical bands;

(c) Refrain, as practicable, from placing small-size space objects in orbits where their ballistic lifetime would exceed their operation lifetime by many times;

(d) Seek to ensure that the period of ballistic lifetime of small-size space objects upon the completion of their operation is made as unprotracted as practicable due to technological solutions that provide for drag augmentation (including changing the eccentricity of the orbit to lower the perigee);

(e) Evade, as practicable, the placement of large groups of small-size space objects in the areas of those near-Earth orbits that are characterized by the highest spatial density of objects so as to avoid negative dynamics in the growth of space debris population over long periods of time.

Topic

Comply with procedures for mitigating risks associated with uncontrolled re-entry of space objects

Comment

The set of guidelines being drafted includes preliminary agreed provisions on required notifications of controlled re-entry of space objects. However, in most cases the re-entry of space objects is uncontrolled. In some instances the cases concerned involve potentially hazardous space objects that have large mass or carry hazardous materials or substances on board, such as incapacitated spacecraft and launch vehicle stages. The regulations on information exchange in cases of uncontrolled re-entry of hazardous space objects proposed by the Russian Federation are essential in themselves, while also duly corresponding to draft guideline 21, introduced earlier by the Russian Federation (as set forth in A/AC.105/C.1/L.348). The concept of ensuring the long-term sustainability of outer space activities requires the comprehensive regulation of aspects related to re-entering space objects for the purpose of mitigating risks. Accordingly, it is proposed to merge the following text with the text that is currently paragraph 2.4 of guideline 2. It would be worthwhile providing for discussions, with the participation of the Secretariat, of ways and means of creating within the Office for Outer Space Affairs an automated system of timely provision to the international community of information on events involving the uncontrolled re-entry of space objects.

Proposed provisions

States and international intergovernmental organizations should have in place officially approved sets of procedures for providing the international community, as practicable, with early information on forecast events of uncontrolled re-entry of potentially hazardous space objects that are, in accordance with international law, regarded as being under their jurisdiction and control and tracked foreign and any other unidentified potentially hazardous space objects, as well as for ensuring communication and coordination for the mitigation of risks associated with such events. Without prejudice to furnishing, when feasible, preliminary notifications on possible hazardous events associated with the uncontrolled re-entry of space objects, the procedures referred to above should be fully employed at the final phase of the orbital flight of a space object and used until the termination of the ballistic flight of the space object is confirmed, as well as in the event of identification of the space object or its fragments that reach the surface of the Earth. States and international intergovernmental organizations should, with a view to adhering to an objective and transparent approach, furnish timely international notifications containing, to the extent deemed reasonably necessary, information at their disposal on:

- Predicted time and area of re-entry into the atmosphere at the last orbital path at the altitude of 80 km (with the understanding that the said altitude is used as a reference criterion for practical purposes);
- Predicted time and area of possible fall of fragments to the surface of the Earth;
- Space object mass and size;

- Presence or absence on board the space object or in the composition of its fragments of hazardous substances/materials and the possibility of their reaching the near-surface layer and/or surface of the Earth;
- Probability of space object fragmentation and fragments reaching the surface of the Earth (including estimated fragment mass);
- Safety requirements and precautions that should be observed, whenever necessary, when treating fragments that have reached the surface of the Earth.

States and international intergovernmental organizations should adhere to a common practice to provide for mutual assistance (proactive and/or in responding to a request) in the interests of improving the reliability of results when predicting the time and area of uncontrolled re-entry of potentially hazardous space objects, in particular by tracking the objects and generating information on their trajectory and possible impact areas. Such assistance is provided with regard to the existing technical capabilities and resources.

Pursuant to the provisions of guideline 11 (“Provide contact information and exchange [develop procedures for the] exchange [of] information on space objects and orbital events”), States and international intergovernmental organizations should designate appropriate entities authorized to provide internationally (to the Office for Outer Space Affairs and through other relevant channels) official information on uncontrolled re-entry of potentially hazardous space objects which are under the jurisdiction and control of these States and international intergovernmental organizations and information on uncontrolled re-entry of tracked foreign and any other unidentified and potentially hazardous space objects, as well as to request and obtain similar information from other States or international intergovernmental organizations.

Notwithstanding the provisions of article 5 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 22 April 1968, the State having jurisdiction over the territory on which a space object (or its component parts) has (have) been discovered, or has (have) presumably reached the surface of the Earth should honour a request of the State or international intergovernmental organization having jurisdiction and control over such an object for timely consultations with a view to making practical arrangements for coordinated implementation of procedures which would effectively meet the requirements concerning search, identification, assessment, analysis, evacuation and return of such an object or its fragments. In the same manner, requests for observing procedures for the safe treatment of the discovered objects or their fragments for the purposes of technology safeguards should also be met. Such procedures are to ensure the use of the least intrusive methods and means of identification, assessment and analysis of the object or its fragments.

Subject

Observe safety precautions when using sources of laser beams passing through outer space

Comment

Installations that form a narrow beam of electromagnetic emission in visible, infrared or ultraviolet bands, passing through near-Earth outer space, are widely used during space operations. Such installations are used, inter alia, for solving high-precision space geodesy tasks (measurement of range to reference space objects equipped with special laser retroreflectors), refining the theory of lunar motion, establishing optical communication channels, and as an illuminator during optical observations of the space objects which are not sunlit. In addition, there have been a growing number of projects on the use of such installations to address the problem of space debris. However, it is proposed to complement the overall space operations safety regulations by a basic arrangement regarding the need to observe safety precautions when working with laser installations, without pursuing the goal of imposing any unreasonable restrictions on this important activity involving research and practical use. `

Proposed provisions

When governmental and/or non-governmental entities under the jurisdiction and control of States and international intergovernmental organizations use lasers, which generate beams passing through near-Earth outer space, the States and international intergovernmental organizations should, as part of overall space operations safety regulations, provide for procedures which would ensure an appropriate development and implementation of the necessary safety precautions when using such lasers in order to avoid malfunctioning of, damage to and/or break-up of space objects under their jurisdiction and control and of foreign space objects. Such safety precautions shall be based on quantitative assessments of laser radiation hazard to space objects, with a view to minimizing possible risks.