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Prevention of an arms race in outer space: further practical measures for the prevention of an arms race in outer space

Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space

Note by the Secretary-General

The Secretary-General has the honour to transmit herewith the report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space. The Group was established pursuant to General Assembly resolution 77/250.

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Report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space

Summary

By its resolution 77/250, the General Assembly requested the Secretary-General to establish a United Nations Group of Governmental Experts to consider and make recommendations on substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space. The Group adopted its report by consensus.

The present report reflects the discussions of the Group relating to general considerations of and key conceptual issues pertaining to substantial elements of such a legally binding instrument. This included discussions on: the evolving nature of outer space activities, threats and related capabilities; the evolution of United Nations efforts for the prevention of an arms race in outer space in all its aspects; the existing normative and legal framework; and approaches to further measures for the prevention of an arms race in outer space. The report also contains a non-exhaustive set of possible substantial elements that could be taken into account in further measures and appropriate international negotiations, including in a legally binding instrument on the prevention of an arms race in outer space.

The Group concluded that the present report could serve as a reference document for further measures and appropriate international negotiations on an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space and that the report could contribute to future work on the prevention of an arms race in outer space, such as in the forthcoming open-ended working groups established by the General Assembly. The Group agreed that efforts and approaches to elaborate measures on the prevention of an arms race in outer space, including on capabilities, activities and behaviours, should continue to take into account the evolving space activities and threats. It also identified areas where further work could be undertaken by States.

The Group recommended that the Secretary-General make the present report widely available, that Member States fully examine and consider it and that further consideration of various substantial elements and measures be pursued.

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Foreword by the Secretary-General

Today’s complex geopolitical context, rapid technological developments and the expanding use of outer space are increasing risks in this vital yet fragile domain.

A growing number of State and non-State actors operate in outer space, deploying ever more satellites. These systems provide essential services to all nations and are critical to achieving the Sustainable Development Goals. At the same time, any armed conflict originating in or extending to outer space could have catastrophic consequences for life on Earth. Every State, therefore, has an interest in pursuing a stable, secure, safe and sustainable outer space environment.

The present report provides a non-exhaustive set of potential elements for an international legally binding instrument on the prevention of an arms race in outer space, including measures to prevent the placement of weapons in outer space. These elements are aimed at informing future United Nations efforts and international negotiations on this critical issue. Such work could serve to further develop measures on capabilities, activities and behaviours, in view of evolving space activities and threats. In the report, the Group also identifies areas where additional research could be undertaken.

I recommend the present report to all Member States and to the public. I encourage everyone to fully consider its insights for future deliberations on the prevention of an arms race in outer space.

Letter of transmittal

23 August 2024

I have the honour to submit herewith the report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space, established pursuant to General Assembly resolution 77/250. The report was adopted by consensus on 16 August 2024.

The members of the Group included governmental experts nominated by the following Member States: Australia, Brazil, Canada, Chile, China, Cuba, Egypt, France, Germany, Hungary, India, Iran (Islamic Republic of), Israel, Japan, Morocco, Pakistan, Philippines, Republic of Korea, Russian Federation, Sweden, South Africa, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland and United States of America. The list of experts is contained in annex I to the report.

The report was prepared from November 2023 to August 2024, during which period the Group of Governmental Experts held two sessions in Geneva, from 20 November to 1 December 2023 and from 5 to 16 August 2024. As mandated by the General Assembly, the Chair of the Group convened a two-day open-ended intersessional informal consultative meeting, from 29 February to 1 March 2024 at United Nations Headquarters in New York, so that all Member States could engage in interactive discussions and share their views on the basis of a report on the work of the Group provided by the Chair in his own capacity. That meeting also included engagement with the broader outer space community, including representatives of civil society.

In accordance with resolution 77/250, the Group considered substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space, and made recommendations on the prevention of an arms race in outer space.

The Group recommended: that the Secretary-General make the present report available to all Member States, to the Conference on Disarmament, to any body or process established pursuant to a decision of the General Assembly and to the public; that Member States fully examine the report and consider its contents in any future deliberations or negotiations on the prevention of an arms race in outer space; and further consideration of substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space, and further consideration of measures on the prevention of an arms race in outer space, taking into account, as appropriate, processes initiated by Assembly resolutions 78/20 and 78/238.

On behalf of the members of the Group, I wish to express appreciation for the support of the officials of the Office for Disarmament Affairs who assisted the Group, Michael Spies, Ariana Smith and Eunsong Choi, as well as for the contribution of Sarah Erickson of the United Nations Institute for Disarmament Research, who served as a consultant to the Group.

(*Signed*) Bassem **Hassan**
Chair of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space

I. Introduction

1. In resolution 77/250, on further practical measures for the prevention of an arms race in outer space, the General Assembly requested the Secretary-General to establish a United Nations Group of Governmental Experts, with a membership of up to 25 Member States, chosen on the basis of fair and equitable geographical representation, to consider and make recommendations on substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space. The Assembly decided that the newly established Group of Governmental Experts would operate by consensus, without prejudice to national positions in future negotiations, and hold two 2-week sessions in Geneva, one in 2023 and the other in 2024, and requested the Secretary-General to transmit the report of the Group of Governmental Experts to the Assembly at its seventy-ninth session and to the Conference on Disarmament prior to its 2025 session.

II. Organizational matters

2. In accordance with the terms of the resolution, the Secretary-General appointed a Group of Governmental Experts from the following Member States: Australia, Brazil, Canada, Chile, China, Cuba, Egypt, France, Germany, Hungary, India, Iran (Islamic Republic of), Israel, Japan, Morocco, Pakistan, Philippines, Republic of Korea, Russian Federation, South Africa, Sweden, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland and United States of America. In accordance with resolution 77/250 and, taking into account resolution 65/69, the Secretary-General established the Group on the basis of fair and equitable geographical distribution and with a view to achieving the equitable and effective representation of women and men. A total of nine Member States nominated women to participate as experts in the work of the Group. The list of experts is contained in annex I to the present report.

3. The Group met in two sessions at the United Nations Office at Geneva, the first from 20 November to 1 December 2023 and the second from 5 to 16 August 2024. Prior to its first session, the Group benefited from an informal virtual preparatory meeting, which was convened on 10 October 2023 by the Office for Disarmament Affairs and the United Nations Institute for Disarmament Research (UNIDIR) in coordination with the Chair-designate of the Group. At its first session, the Group elected Bassem Hassan (Egypt) as its Chair.

4. Michael Spies, Ariana Smith and Eunsong Choi of the Office for Disarmament Affairs served as the secretariat of the Group. Sarah Erickson of UNIDIR served as consultant to the Group.

5. In accordance with resolution 77/250, the Chair of the Group convened a two-day open-ended intersessional informal consultative meeting, from 29 February to 1 March 2024 at United Nations Headquarters in New York, so that all Member States could engage in interactive discussions and share their views on the basis of a report on the work of the Group provided by the Chair in his own capacity.[1] That meeting also included engagement with the broader outer space community, including representatives of civil society.

6. The Group benefited from two rounds of virtual informal consultations convened by the Chair on 8 May 2024 and on 10 July 2024, at which it discussed

[1] Materials from that meeting are available on the website of the Office for Disarmament Affairs at https://meetings.unoda.org/.

proposed elements for the report of the Group. The Group also benefited from a virtual informal workshop organized by UNIDIR and the Office for Disarmament Affairs on "The characterization and verification of weapons in space and other capabilities that can pose a threat to space systems", held on 22 and 23 May 2024.

7. During its sessions in Geneva, the Group received briefings by Guilherme de Aguiar Patriota (Brazil), Chair of the 2018–2019 group of governmental experts on further practical measures for the prevention of an arms race in outer space, and by Omran Sharaf (United Arab Emirates), Chair of the Committee on the Peaceful Uses of Outer Space. The Group also benefited from presentations by representatives of UNIDIR and the United Nations Office for Disarmament Affairs, as well as from an independent expert from the Center for International Security, the Primakov National Research Institute of World Economy and International Relations, Russian Academy of Sciences. The Group also benefited from presentations, a total of 25 working papers and other inputs from its own members. In addition, the Group received written inputs from Member States, international organizations and non-governmental organizations.[2] The list of working papers submitted by the members of the Group, as well as other written inputs that it received are listed in annex II to the present report.

8. In accordance with resolution 77/250, the Group considered substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space ("substantial elements on the prevention of an arms race in outer space") and made recommendations on the prevention of an arms race in outer space. At its 36th meeting, on 16 August 2024, the Group adopted its final report.

III. General considerations and key conceptual issues pertaining to substantial elements of a legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of placement of weapons in outer space

9. The Group recalled previous efforts within the United Nations on outer space security, including the group of governmental experts established by General Assembly resolution 65/68, the group of governmental experts established by Assembly resolution 72/250, the Disarmament Commission, the open-ended working group established by Assembly resolution 76/231, the Conference on Disarmament and the First Committee. The Group sought to respect the mandates of relevant United Nations bodies and recognized the interrelationship between issues related to outer space security, safety and sustainability.

10. The Group considered that its report could serve as a reference document for further measures and appropriate international negotiations on an international legally binding instrument or instruments on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space ("legally binding instrument on the prevention of an arms race in outer space"), and could contribute to future work on the prevention of an arms race in outer space, such as at the forthcoming open-ended working groups established by General Assembly resolutions 78/20 and 78/238. The Group noted that experts did not seek a common view on all elements in the present report and that the considerations, conclusions and

[2] Working papers made publicly available by Group members and written inputs from non-members are available at https://meetings.unoda.org/.

recommendations in the report are not intended to prejudge any future negotiations or agreements and are without prejudice to national positions.

A. Evolving nature of outer space activities, threats and related capabilities

11. The Group noted that its work was taking place in a difficult geopolitical environment that creates greater mistrust and increases the risk of misperceptions and miscalculations, which has significant implications for international security.

12. The use of outer space has changed significantly over the past several decades. The space security environment is no longer solely tied to the dynamics of competition between two super Powers. An increasing number of State and non-State actors operate in outer space with more and more satellites providing a growing range of benefits and essential services. Space services are increasingly being integrated into various aspects of essential services to all States and peoples, such as communications, energy, transportation, finance, emergency and humanitarian operations, as well as into defence and national security. Space science and technology and their applications, including satellite communications, Earth observation systems and satellite navigation technologies, provide indispensable tools for sustainable development. Therefore, every State has an interest in pursuing a stable, secure, safe and sustainable outer space environment, and the interests of all States should be taken into account in the elaboration of measures for the prevention of an arms race in outer space in all its aspects.

13. The Group noted that the elaboration of substantial elements on the prevention of an arms race in outer space should be based on a comprehensive understanding of threats in the context of outer space. The Group also noted that the perception of threats may differ among States.

14. The Group considered all vectors of threats relating to space systems and the broadest possible range of practical measures relevant for the prevention of an arms race in outer space in all its aspects. The increasing variety of threats to or involving space systems were considered along four vectors: Earth-to-space, space-to-Earth, space-to-space and Earth-to-Earth. These threats could involve kinetic and non-kinetic means, resulting in a gradient of reversible or irreversible effects.

B. Evolution of United Nations efforts for the prevention of an arms race in outer space in all its aspects

15. The Group discussed how developments relating to the evolving nature of outer space activities and space threats have influenced efforts to address the prevention of an arms race in outer space. The Group recalled that the goal of the prevention of an arms race in outer space was first agreed to in 1978 during the first special session of the General Assembly devoted to disarmament and that, in its final document, the Assembly stated that "further measures should be taken and appropriate international negotiations held in accordance with the spirit of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies".[3]

16. The General Assembly adopted two resolutions in relation to the prevention of an arms race in outer space in 1981. Through resolution 36/99, the Assembly proposed "to take effective steps, by concluding an appropriate international treaty, to prevent

[3] Resolution S-10/2, para. 80.

the spread of the arms race to outer space", and through resolution 36/97 C, it proposed the consideration "as a matter of priority [of] the question of negotiating an effective and verifiable agreement to prohibit anti-satellite systems". The Assembly subsequently adopted various resolutions relating to the prevention of an arms race in outer space, which have included, inter alia, decisions to establish groups of governmental experts and open-ended working groups, by its resolutions 45/55 B, 65/68, 72/250, 76/231, 77/250, 78/20 and 78/238.

17. The Conference on Disarmament first took up the matter of the prevention of an arms race in outer space in 1982 and first established an ad hoc committee on this item in 1985. In 2008, China and the Russian Federation introduced the draft treaty on the prevention of the placement of weapons in outer space and the threat or use of force against space objects and its revised version in 2014. From 1985 to 1994 and in 2009, 2018, 2022 and 2024, the Conference on Disarmament decided to establish a subsidiary body in order to advance the substantive work on the prevention of an arms race in outer space.

18. The Disarmament Commission, at its 2018, 2022 and 2023 sessions, considered the agenda item entitled "Preparation of recommendations to promote the practical implementation of transparency and confidence-building measures in outer space activities with the goal of preventing an arms race in outer space, in accordance with the recommendations set out in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities" and adopted, by consensus, the recommendations contained in A/78/42.

19. The Group recalled the relevant reports of the Secretary-General relating to the prevention of an arms race in outer space.

C. Existing normative and legal framework

20. The Group affirmed the applicability of international law to outer space, including the Charter of the United Nations and relevant outer space and arms control treaties to which States are party.

21. The Group considered the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies ("Outer Space Treaty") and all its principles and obligations as a foundation of international space law and the key framework governing space activities. The Group affirmed the importance of the Treaty to the prevention of an arms race in outer space, especially its article IV. The Group underscored the need to seek strict compliance with and the universalization of the Outer Space Treaty.

22. The Group agreed that compliance with applicable existing international law is essential for building trust and for the prevention of an arms race in outer space.

23. There were diverging views among experts on discussing international humanitarian law in the context of outer space. Some experts affirmed that international humanitarian law applies to outer space and regulates the activities of all parties with their respective obligations in armed conflict, including State and non-State actors, in any environment, and that discussing and reaffirming it in no way legitimizes the use of force in violation of international law. Other experts affirmed that it is not appropriate to discuss international humanitarian law in the context of the prevention of arm race in outer space or the outer space domain and that any reaffirmation of the applicability of international humanitarian law to outer space legitimizes the use of force in outer space and an arms race in outer space.

24. The Group discussed the possible role of the principle and obligation on due regard as set forth in article IX of the Outer Space Treaty, in the prevention of an arms

race in outer space. Application of the principle of due regard could help States to avoid miscalculation and misinterpretation, avoid activities that could exacerbate tensions and undermine security and stability and foster engagement between States. The Group discussed the possibility that the application of the principle of due regard could be clarified, including through further discussions in the Committee on the Peaceful Uses of Outer Space and other relevant bodies, as appropriate, and could be taken into consideration when discussing further measures related to the prevention of an arms race in outer space, including in the negotiation of a legally binding instrument on the prevention of an arms race in outer space.

25. The Group affirmed that the existing normative and legal framework on outer space plays a significant role in preventing an arms race in outer space but does not guarantee the prevention of an arms race in outer space, and that there is a need to consolidate and reinforce that regime and enhance its effectiveness and that it is important to comply strictly with existing agreements, both bilateral and multilateral. The Group recalled the necessity of further measures with appropriate and effective provisions for verification to prevent an arms race in outer space, including on the weaponization of outer space.[4]

D. Approaches to further measures for the prevention of an arms race in outer space

26. The Group discussed the possible interrelationships and distinctions between legally binding instruments and non-legally binding measures.

27. The Group recalled that negotiations for the conclusion of an international agreement or agreements to prevent an arms race in outer space remain a priority task of the Conference on Disarmament.[5] The Group further recalled that measures designed to strengthen transparency, confidence and security in the peaceful uses of outer space, are without prejudice to efforts towards the conclusion of an effective and verifiable multilateral agreement or agreements on the prevention of an arms race in outer space.[6]

28. The Group also recalled that the group of governmental experts established pursuant to General Assembly resolution 65/68 had endorsed efforts to pursue political commitments, for example declarations regarding the peaceful use of outer space, noting that such commitments could form the basis for the consideration of concepts and proposals for legally binding obligations.

29. The Group discussed but did not seek a common understanding on the concept of responsible behaviour in the context of outer space.

30. Some experts recalled that the prevention of an arms race in outer space requires various forms of measures, including legally binding measures and non-legally binding measures. Some experts expressed the view that both legally and non-legally binding measures can contribute to the goal of the prevention of an arms race in outer space in all its aspects and be pursued in a progressive, sustained and complementary manner. Some of those experts noted also that international non-legally binding measures can have a binding character for States participating in that measure and can obtain a legally binding status at the national level as an interpretation of existing legally binding instruments or when enshrined in national legislation and practice, without prejudice to the relevant constitutional or legal stipulations of States. Other experts were of the view that non-legally binding measures can complement and

[4] Resolution 78/19, para. 3.
[5] Ibid., preambular para. 17.
[6] Ibid., para. 7.

contribute to, but not substitute for, a legally binding instrument on the prevention of an arms race in outer space. Some of those experts considered also that non-legally binding measures should be aimed at increasing outer space safety, sustainability and security and, especially, at the prevention of an arms race in outer space and the conclusion of an international legally binding instrument on the prevention of an arms race in outer space.

31. The Group recalled that the group of governmental experts established pursuant to General Assembly resolution 65/68 endorsed efforts to pursue political commitments, for example, in the form of unilateral declarations, bilateral commitments or a multilateral code of conduct, to encourage responsible actions in, and the peaceful use of, outer space.

32. The Group considered that any possible measures would need to avoid adversely impacting the national security, technological, economic or development interests of States.

33. Without prejudice to the substance of existing proposals, a proposal was made for the States parties to the Outer Space Treaty to consider one or more additional optional protocols to the Treaty. It was noted that the Treaty lacks any provision for such a protocol and that not all States participate in the Treaty.

IV. Consideration of substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space

A. General considerations including definitions and verification

34. The Group agreed that the provisions of a legally binding instrument on the prevention of an arms race in outer space should be: practical, clear, scientifically and technically accurate, tailored to the specific objective of the measure under consideration and non-discriminatory; consistent with existing international law; and not adversely impact the national security, technological, economic or development interests of its States parties.

Definitions

35. The Group affirmed the importance of achieving a common understanding on key terms related to the prevention of an arms race in outer space in all its aspects, as this could impact the scope and implementation of any proposed measures. An international legally binding instrument on the prevention of an arms race in outer space would require definitions of terms. The definitions could be elaborated during negotiations drawing on previously agreed terms as appropriate. Explicit definitions might be required, especially in the absence of international common understanding on the underlying concepts. The Group also considered that definitions in existing multilateral legal instruments on outer space should be used to the extent feasible. The Group discussed possible terms on which definitions or understandings may be

sought and considered that specific terms that require definition or understanding would depend on the objectives and measures of instruments.[7]

36. The Group considered that any definitions included should ideally be the minimum number of terms required for such an instrument to function effectively. Any definitions should be practical, clear, scientifically and technically accurate and tailored to the specific objectives and provisions of the instrument. Definitions should provide clarity to the provisions of an instrument, facilitate compliance and be crafted to avoid legal uncertainty. The elaboration of definitions should also take into account multilingualism.

37. The Group discussed, in particular, whether States should attempt to elaborate a definition for infrastructure in the context of outer space as a first step towards its special protection. In this discussion, a concern was raised that establishing special protection for a certain category of space objects could imply that other categories of space objects could be legitimate or lawful targets or undermine legal certainty by introducing reinterpretation of international law.

Verification

38. The Group recalled that, in the final document of the first special session of the General Assembly devoted to disarmament, the Assembly emphasized that disarmament and arms limitation agreements should provide for adequate measures of verification satisfactory to all parties concerned in order to create the necessary confidence and ensure that they are being observed by all parties.[8] The Group recognized the necessity of including measures for verification as an integral part of substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, and that such measures should be considered at every stage of the negotiating process.

39. The Group considered that methods, procedures and techniques related to verification should be able to provide, in a timely, effective and efficient fashion, credible evidence of compliance or non-compliance with the provisions of a legally binding instrument on the prevention of an arms race in outer space. The Group noted that the development of verification measures should be without prejudice to the national security, sustainable development, technological, economic or development interests of its States parties.

40. The Group considered whether a layered or packaged approach towards verification could be pursued, depending on the nature of the measure. Experts presented various and different suggestions on what methods could form such an approach, including, inter alia, national technical means, monitoring systems, on-site pre- and post-launch inspections, routine inspections, ground and space-based sensors for space situational awareness, data exchanges and declarations, consultative and dispute settlement mechanisms as well as post facto observations of suspected

[7] The Group did not seek to agree on any specific definitions for the terms contained in the present report. Various experts suggested non-exhaustive lists of terms which partially overlapped on which definitions may be sought, including: behaviour of space objects; counterspace capabilities; critical infrastructure; convert; damage; denial; destroy; disruption of normal functioning; dual-use; dual-purpose; harmful interference to outer space objects; lowering of effectiveness; military use of outer space; outer space object; partial orbit; operations in a professional manner; placement in outer space; rendezvous operations; proximity operations; safe separation; safe trajectory; space weapon; space safety risks; threat or use of force against outer space objects; threat or use of force by means of outer space objects; weapon in outer space.

[8] Resolution S-10/2, para. 31.

violations. The Group considered that potential verification measures should be clearly tied to specific obligations.

41. The Group discussed the importance of space situational awareness as a means for characterizing or verifying the activities and behaviours of space objects. The Group noted documents and discussions in the Committee on the Peaceful Uses of Outer Space, including the guidelines for the long-term sustainability of outer space activities (A/74/20, annex II), in which the Committee calls, inter alia, for the sharing of information on space objects and orbital events, and proposals for a possible international mechanism under the auspices of the United Nations to facilitate the sharing of space situational awareness data, as well as the sharing of such data through national or regional initiatives. The Group noted that the sharing of space situational awareness data should be without prejudice to the national security, sustainable development, technological, economic or development interests of its States parties.

42. The Group recognized that further consideration would be required, inter alia, on the technical aspects of verification in relation to substantial elements on the prevention of an arms race in outer space, as verification of the characteristics of an object placed in outer space and verification of activities of space objects could involve challenges. The Group acknowledged that the elaboration of verification measures would take time and require engagement by technical, military and legal experts.

43. In particular, verification of dual-use systems may be challenging owing to their inherent characteristics and might involve monitoring their actual use rather than only assessing their characteristics, which may provide options for certain types of verification measures. Consideration could be given to characteristics and activities where there is greater risk. The Group acknowledged that this topic could benefit from further discussion, including on relevant space technology, taking into account current technological limitations and the benefits of further technological development.

44. With a view to addressing the relevant challenges related to defining weapons placed in outer space and verifying the characteristics of space systems, a possible option was presented for a possible framework intended to facilitate analysis of the relationship between threats, characteristics, definitions and verification of threats emanating from any vector. Other experts presented other possible options for how to determine characteristics of weapons placed in outer space. The Group acknowledged that these possible options also had various limitations and that this issue could benefit from further discussion.

B. Substantial elements on the prevention of an arms race in outer space

45. Consistent with its mandate, the Group considered the following non-exhaustive set of possible substantial elements that could be taken into account in further measures and appropriate international negotiations, including in a legally binding instrument on the prevention of an arms race in outer space. The Group did not seek a common view on, inter alia, all aspects of these proposed elements and concluded that further discussions are needed in order to further examine, develop and refine these and potentially other proposed elements, as well as to identify areas of convergence. The Group further discussed each of these possible substantial elements, the threats and the associated issues related to definitions and verification. The considerations in this section are not intended to prejudge any future negotiations or agreements and are without prejudice to national positions.

Elements on principles and objectives

46. A possible element could reaffirm the relevance to the prevention of an arms race in outer space of principles and obligations contained in the Outer Space Treaty. They include, inter alia, that:

(a) The exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all humankind;

(b) Outer space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means;

(c) States parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international cooperation and understanding;

(d) States parties to the Treaty undertake not to place in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner;

(e) The Moon and other celestial bodies shall be used by all States parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden;

(f) States parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State party to the Treaty;

(g) Each State party to the Treaty that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and each State party from whose territory or facility an object is launched, is internationally liable for damage to another State party to the Treaty or to its natural or juridical persons by such object or its component parts on the earth, in airspace or in outer space, including the Moon and other celestial bodies;

(h) In the exploration and use of outer space, including the Moon and other celestial bodies, States parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States parties to the Treaty;

(i) If a State party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with activities of other States parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment.

47. A possible element could reaffirm that future measures on the prevention of an arms race in outer space should be consistent with provisions contained in the Charter of the United Nations, including, inter alia, those concerning:

(a) The prohibition of the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations;

(b) The settlement of international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered;

(c) The inherent right of individual and collective self-defence if an armed attack occurs against a Member of the United Nations;

(d) The precedence of the Charter of the United Nations, in the event of a conflict between the obligations of the Members of the United Nations under the Charter and their obligations under any other international agreement.

48. A possible element could reaffirm principles and objectives contained in existing arms limitation and disarmament agreements, including, inter alia:

(a) The right to develop, access and use technology for peaceful purposes;

(b) Implementation of instruments in a manner to avoid hampering the economic or technological development of States;

(c) The need for adequate and effective verification;

(d) Non-discrimination;

(e) The objective of general and complete disarmament.

49. The Group recognized that further work is needed to determine the possible impact of threats to space systems on sustainable development. The Group noted that a possible element should have the objective of ensuring equal opportunities for women and men to enable their meaningful engagement in efforts to achieve the prevention of an arms race in outer space. Some experts expressed the view that any future instrument should avoid using gender-exclusive terms, aim at gender equality and be informed by diverse perspectives, and that further work is needed to determine the possible differentiated impacts of threats to space systems on vulnerable groups, including, but not limited to, women and girls.

Elements on obligations

50. The Group discussed the following elements and concluded that these elements on obligations required further discussions to identify areas of convergence.

51. The Group discussed whether possible elements in this section should be limited to addressing “intentional” acts, without seeking any common understanding on this issue.

Threat or use of force

52. The Group recalled that a possible element should include the obligations and principles enshrined in the Charter of the United Nations.

53. A possible element could include a provision on the threat or use of force against space objects, without prejudice to the provisions of the Charter of the United Nations and without expanding or detracting from their meaning.

54. A possible element could include a provision on the use of space objects as a means of a threat or use of force, including to destroy any targets on Earth or in outer

space, without prejudice to the provisions of the Charter of the United Nations and without expanding or detracting from their meaning.

Intentional acts / acts that damage or destroy space systems

55. A possible element could include specific prohibitions relating to acts that damage or destroy space systems, such as:

(a) Intentional acts / acts against space objects under the jurisdiction or control of another State without its consent that could result in their destruction or damage;

(b) Intentional acts / acts that damage or destroy terrestrial infrastructure used to control space objects, including command and control or space surveillance systems, by any means, including through malicious use of information and communications technologies;

Acts that can disrupt or interfere with the safe operation or normal functioning of space objects

56. A possible element of a legally binding instrument could include provisions obliging States to refrain from:

(a) Intentional acts / acts that cause harmful interference with space objects under the jurisdiction or control of another State without its consent, especially with certain outer space activities that pose a particular risk of escalation, that disrupt peaceful space activities or that create space safety risks;

(b) Intentional acts / acts that disrupt the normal functioning or alter the trajectory of space objects under the jurisdiction or control of another State without its consent, including physical connection to space objects under the jurisdiction and control of another State, without appropriate consultation and/or consent;

(c) Intentional acts / acts that cause the destruction of space objects in a manner that creates space flight safety risks, including through the use of counterspace capabilities, such as direct-ascent anti-satellite missiles.

57. A possible element could also contain obligations relating to the safe conduct of operations with the objective of preventing misunderstandings, miscalculations and unintended escalations, such as, inter alia, requirements to ensure, to the greatest extent feasible and practicable, that space objects do not:

(a) Operate in proximity to space objects under the jurisdiction and control of another State without the provision of appropriate notification of the operation;

(b) Cause safety risks to spaceflight, including by not maintaining necessary safe separation from other space objects;

58. The Group discussed the challenges relating to measures based on “proximity”, “space safety risks” and “safe separation” and verifying obligations related to these measures.

Protection of space-based services to civilians

59. A possible element could include provisions for the protection of space infrastructure which provides services to civilians, including provisions obliging States parties and non-State actors to avoid activities against such infrastructure that generate collateral impacts on civilian activity, especially over large areas. In this regard, some experts gave the following examples: disruption of air traffic, emergency services or global navigation satellite services. Some experts also indicated that such activities can include jamming or spoofing of signals.

Placement of weapons in outer space

60. A possible element could include obligations not to place weapons in outer space, including those designed to attack outer space systems or objects, or Earth-based targets. The Group discussed relevant challenges and possible options associated with defining a weapon in outer space and verifying such obligations.

Research, development, testing, stockpiling and deployment of systems designed for the use in intentional acts / acts that damage or destroy space systems, as well as their elimination

61. A possible element could include provisions:

(a) Prohibiting research, development, testing, stockpiling and deployment of systems designed for acts that damage or destroy space systems, including destructive direct-ascent anti-satellite missiles, including counterspace testing activities that impair the safe operation of satellites, while taking into account the national security, technological, economic or development interests of States;

(b) Prohibiting destructive testing of direct-ascent anti-satellite missiles;

(c) Providing for the elimination of such systems that States already possess, provided that such systems are prohibited by the legally binding instrument on the prevention of an arms race in outer space.

National space policies, doctrines and strategies and other measures that could reduce the risk of escalation, conflict and an arms race in outer space

62. Taking into account the relevant agreed recommendations of the Committee on Peaceful Uses of Outer Space, the Group also discussed possible other measures that could to the greatest extent feasible and practicable reduce the risk of escalation, conflict and an arms race in outer space, including such as:

(a) To operate in, from, to, and through space in a safe and sustainable manner;

(b) To operate their space objects in a manner that maintains safe separation from other space objects and plan trajectories that avoid introducing spaceflight safety risks for other space objects;

(c) To refrain from any tests, experiments or other intentional acts / acts that result in satellite break-ups or the intentional destruction of space objects;

(d) To communicate and make notifications to enhance stability, safety and sustainability of outer space activities and to resolve concerns about international peace and security that arise from the conduct of outer space activities;

(e) To provide appropriate notification of manoeuvres expected to impact space systems and services in order to reduce the risk of misunderstanding or misperception of their intentions;

(f) To promote policies, strategies or doctrines related to outer space aimed at improving transparency, avoiding misunderstanding regarding States' goals and keeping outer space free from military confrontation;

Assistance and encouragement in certain acts

63. A possible element could include provisions that obligate States to refrain from assisting, encouraging or inducing any State, intergovernmental organization, entity, or anyone located on their territory or under their jurisdiction or control, in the conduct of any acts prohibited by the instrument.

National implementation

64. A possible element could include provisions requiring States, in accordance with their constitutional procedures, to take necessary measures to ensure compliance with the provisions of the instrument, including by any entities under their jurisdiction or control.

Elements on transparency and confidence-building measures

65. The Group recalled the consensus that exists within the United Nations on the importance of transparency and confidence-building measures as a means of reinforcing the objective of preventing an arms race in outer space and need for States to review, as appropriate, implement and report, to the greatest extent practicable, the proposed transparency and confidence-building measures contained in the 2013 report of the Group of Governmental Experts on transparency and confidence-building measures in outer space activities (A/68/189).

66. Transparency and confidence-building measures can, as appropriate, be an integral element of a legally binding instrument on the prevention of an arms race in outer space. Such measures can be designed to facilitate, inter alia, the resolution of disputes related to the implementation of an instrument. They could also be aimed at enhancing space security and sustainability. The Group also noted that, when applicable, transparency and confidence-building measures can be designed to apply to both State and non-State actors.

67. The Group recalled that transparency and confidence-building measures for outer space activities could also complement and contribute to, but not substitute for, an international legally binding instrument on the prevention of an arms race in outer space, as stated in the 2023 report of the Disarmament Commission.[9]

68. The Group recalled that voluntary transparency and confidence-building measures, considered as complementary measures, could contribute to the consideration of concepts and proposals for legally binding measures for the prevention of an arms race in outer space, as well as verification protocols included in legally binding international instruments.[10]

69. In this connection, the Group discussed possible elements on transparency and confidence-building measures, including from the 2013 report of the group of governmental experts and recalled in the 2023 report of the Disarmament Commission, that could contribute to the consideration of substantial elements on the prevention of an arms race in outer space, giving due consideration to national security considerations:

(a) Exchanges of information on the principles and goals of a State's outer space policy;[11]

(b) Exchanges of information on major military outer space expenditure and other national security space activities;

(c) Exchanges of information on orbital parameters of outer space objects and potential orbital conjunctions;

[9] A/78/42, para. 12.

[10] Ibid., para. 12.

[11] In this context, some experts expressed the view that the United Nations Institute for Disarmament Research (UNIDIR) Space Security Portal is a useful tool to improve the transparency of States' and other organizations' policies related to space security. Other experts expressed the view that the Space Security Portal is an initiative under the sole responsibility of UNIDIR.

(d) Exchanges of information on forecast natural hazards in outer space;

(e) Notification of planned spacecraft launches;

(f) Notifications on scheduled manoeuvres that may result in risk to the flight safety of other space objects;

(g) Notifications and monitoring of uncontrolled high-risk re-entry events;

(h) Notifications in the case of emergency situations;

(i) Notifications of intentional orbital break-ups;

(j) Voluntary familiarization visits;

(k) Expert visits, including visits to space launch sites, invitation of international observers to launch sites, flight command and control centres and other operations facilities of outer space infrastructure;

(l) Demonstrations of rocket and space technologies.

70. The Group discussed possible further elaboration of transparency and confidence-building measures, including whether and how to provide routine communication and notifications of military activities in space; establish emergency channels to facilitate the resolution of crises; and establish points of contact to facilitate communication and reduce misunderstandings.

Elements on consultative mechanisms and settlement of disputes

71. The Group discussed how possible elements of a legally binding instrument could address consultative mechanisms or the resolution of disputes. States could also expand current existing consultative procedures or mechanisms and, in the case where existing procedures or mechanisms may not be considered sufficient to address concerns related to outer space to establish them on a bilateral basis.

Elements on international cooperation

72. Possible elements on international cooperation, taking into account the particular needs of developing countries, could include:

(a) A reaffirmation that outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies;

(b) An undertaking for States to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the peaceful exploration and use of outer space on a mutually acceptable basis[12] and in conformity with international obligations;

(c) A provision for States with significant space technologies to consider international cooperation on a mutually acceptable basis, such as providing assistance and training and transferring technology, data and material to requesting States for the equitable and mutual benefit of, and taking into account the legitimate rights and interest of, all parties concerned.

73. In addition, any possible measures included in a legally binding instrument on the prevention of an arms race in outer space should provide for implementation in a manner that avoids hampering economic development and the advancement of

[12] A/68/189, para. 62.

technology for peaceful purposes, while protecting sensitive information for national security or commercial proprietary reasons.

Elements on other aspects

74. The Group briefly noted possible elements on institutional arrangements, including on the potential need for a dedicated secretariat or an implementation support unit as well as a review process of its implementation, with the understanding that institutional arrangements would depend on the objective and scope of a specific legally binding instrument on the prevention of an arms race in outer space. A legally binding instrument could provide for review of its implementation process through review conferences, regular meetings of States parties and the establishment of a specialized international institutional body.

75. The Group also briefly noted possible requirements for the entry into force of a legally binding instrument. The Group discussed the necessity of participation by major space-faring nations, which would be essential for the effectiveness of such an instrument, bearing in mind the experience of instruments with specific criteria for their entry into force.

V. Conclusions

76. Given the depth of its exchanges, the work of the Group enabled a better understanding of the issues relating to the prevention of an arms race in outer space as well as consideration of substantial elements on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space and possible aspects of relevant negotiations. Over the course of its work, the Group gained a fuller appreciation of the range of issues and identified areas which could be considered in future negotiations. Without prejudice to national positions, the members of the Group are confident that the present report can serve as a valuable reference for States and as a useful resource for addressing the prevention of an arms race in outer space.

77. Taking into account Sections III and IV, the Group concluded that the present report could serve as a reference document for further measures and appropriate international negotiations on an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space. The Group also concluded that the report could contribute to future work on the prevention of an arms race in outer space, such as at the forthcoming open-ended working groups established by General Assembly resolutions 78/20 and 78/238, taking into account previous work carried out pursuant to Assembly resolutions 72/250 and 76/231.

78. Taking into account the content of sections III and IV, the Group agreed that efforts and approaches to elaborate measures on the prevention of an arms race in outer space, including on capabilities, activities and behaviours, should continue to take into account the evolving space activities and threats. Measures that can contribute to the prevention of an arms race in outer space in all its aspects could relate to, inter alia, the threat or use of force against outer space objects, prohibiting the placement of weapons in outer space, preventing the possibility of the extension of armed conflict into outer space, as well as measures and efforts to reduce the risk of tensions arising from misperceptions and miscalculations.

79. The Group identified areas where further work could be undertaken by States, including, but not limited to:

(a) Further developing definitions for a legally binding instrument on the prevention of an arms race in outer space in all its aspects;

(b) Further developing common understanding on threats in the context of outer space;

(c) Further consideration of effective arms control, limitation or prohibition measures that would contribute to the prevention of an arms race in outer space and their scope;

(d) Further study of the issue of verification;

(e) Continuing discussions on proposals on other aspects, including institutional arrangements;

(f) Further consideration of possible measures to strengthen international cooperation on the peaceful uses of outer space in the context of the prevention of an arms race in outer space;

(g) Further elaboration of understandings on the principles of space law, such as peaceful purposes, due regard, continuing supervision and authorization and the duty to consult in the Outer Space Treaty, including on how these principles could contribute to the goal of the prevention of an arms race in outer space in all its aspects;

(h) Further consideration to ensuring equal opportunities for women and men to enable their meaningful engagement in efforts to achieve the prevention of an arms race in outer space in all its aspects;

(i) Further encouragement and facilitation of engagement by civil society and commercial actors in efforts to achieve the prevention of an arms race in outer space in all its aspects;

(j) Further implementation or elaboration of transparency and confidence-building measures without prejudice to the conclusion of a legally binding instrument on the prevention of an arms race in outer space.

VI. Recommendations

80. The Group recommends that the Secretary-General should make the present report available to all Member States, to the Conference on Disarmament, to any body or process established pursuant to a decision of the General Assembly and to the public.

81. The Group recommends that Member States fully examine the present report and consider its contents in any future deliberations or negotiations on the prevention of an arms race in outer space.

82. The Group recommends further consideration of substantial elements of an international legally binding instrument on the prevention of an arms race in outer space, including, inter alia, on the prevention of the placement of weapons in outer space, and further consideration of measures on the prevention of an arms race in outer space, taking into account, as appropriate, processes initiated by General Assembly resolutions 78/20 and 78/238.

Annex I

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Annex II

List of documents

Document No.	*Title*
GE-PAROS/2023/WP.1	Working paper submitted by Felipe Cousiño
GE-PAROS/2023/WP.2	Working paper submitted by Yurika Ishii
GE-PAROS/2023/WP.3	Current trends and developments in outer space security, including vectors of threats, submitted by UNIDIR
GE-PAROS/2023/WP.4	Gender-based considerations for a legally binding instrument on the prevention of an arms race in outer space (PAROS), submitted by Ashlyn Milligan
GE-PAROS/2023/WP.5	Possible substantive elements for a legally binding international instrument on the prevention of an arms race in outer space, in particular, on the prevention of the placement of weapons in outer space, submitted by Konstantin Vorontsov
GE-PAROS/2023/WP.6	Working paper for the agenda item on: Review of existing international law relevant to prevention of an arms race in outer space, including, inter alia, on the prevention of placement of weapons in outer space, submitted by Noelle Riza Castillo
GE-PAROS/2023/WP.7	Review of the analyses submitted to the Conference on Disarmament of the 2014 Russian – PRC draft “treaty on the prevention of the placement of weapons in outer space, the threat or use of force against outer space objects” (PPWT), submitted by Eric Desautels
GE-PAROS/2023/WP.8	Proposals of the United States of America regarding responsible State behaviour for outer space activities, submitted by Eric Desautels
GE-PAROS/2023/WP.9	Working paper submitted by Eric Desautels
GE-PAROS/2023/WP.10	Working paper submitted by Eric Desautels
GE-PAROS/2023/WP.11	Working paper submitted by Eric Desautels
GE-PAROS/2023/WP.12	Security threats, counter-space capabilities and irresponsible behaviours, submitted by Noelle Castillo and Florian Seitz
GE-PAROS/2023/WP.13	Working paper submitted by Nassereddin Heidari
GE-PAROS/2023/WP.14	Principles of international law relevant to the discussions of the Group of Governmental Experts submitted by Ashlyn Milligan
GE-PAROS/2023/WP.15	Verification of legally binding measures for the prevention of an arms race in outer space (PAROS), submitted by Szilvia Balázs, Noelle Riza D. Castillo, Felipe Cousiño, Ruth Hill, Clive Hughes, Ashlyn Milligan, Eun-jin Park, Lena von Sydow, Pierre-Alain Voltz, Yurika Ishii
GE-PAROS/2023/WP.16	Response to comments on the working paper on the principle of Due Regard, submitted by Noelle Castillo

Document No.	*Title*
GE-PAROS/2023/WP.17	Preventing an arms race in outer space, submitted by Clive Hughes
GE-PAROS/2023/WP.18	The positive contribution of public space security doctrines, strategies and policies to prevention of an arms race in outer space, submitted by Florian Seitz, Szilvia Balázs, Lena von Sydow and Pierre-Alain Voltz
GE-PAROS/2023/WP.19	Working paper submitted by Lena von Sydow
GE-PAROS/2023/WP.20	A proposed framework for categorizing weapons placed in outer space, working paper submitted by Bassem Hassan
GE-PAROS/2023/WP.21	In all its aspects: further developing PAROS as a modern concept for addressing space security threats, submitted by Ruth Hill, Clive Hughes, Yurika Ishii, Ashlyn Milligan, Eun-jin Park, Florian Seitz, Pierre-Alain Voltz
GE-PAROS/2023/WP.22	Proposal of considering optional additional protocol(s) to the Outer Space Treaty, submitted by Felipe Cousiño
GE-PAROS/2023/WP.23	Principles and criteria related to adequate and effective verification, submitted by Eric Desautels
GE-PAROS/2023/CRP.1	Draft agenda
GE-PAROS/2023/CRP.2	Indicative timetable
GE-PAROS/2024/WP.1	Working paper submitted by Liang Guotao
GE-PAROS/2024/WP.2	Proposed draft structure for the report, submitted by Szilvia Balász, Clive Hughes, Florian Seitz, Pierre-Alain Voltz and Lena Von Sydow
GE-PAROS/2024/WP.3	Working paper submitted by Konstantin Voronstov, Possible substantive elements of a final report of the United Nations Group of Governmental Experts on the Prevention of an Arms Race in Outer Space
GE-PAROS/2024/WP.4	Working paper submitted by the Kingdom of the Netherlands
GE-PAROS/2024/WP.5	Supporting a complementary approach to considering possible legally binding instruments to address the threat of conflict in outer space, working paper submitted by New Zealand
GE-PAROS/2024/WP.6	Working paper submitted by the United Kingdom on the prevention of an arms race in outer space
GE-PAROS/2024/WP.7	Incorporating transparency and confidence-building measures (TCBMs) into legal approaches to the prevention of an arms race in outer space (PAROS), submitted by Project Ploughshares
GE-PAROS/2024/WP.8	Potential pathways for concrete improvement of space security, submitted on behalf of the European Union and its member States
GE-PAROS/2024/WP.9	Working paper submitted by UNIDIR: Verification for Outer Space Security

Document No.	*Title*
GE-PAROS/2024/CRP.1	Report by the Chair of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space
GE-PAROS/2024/CRP.2	Indicative timetable (week one)
GE-PAROS/2024/CRP.3	Revised proposed elements for the Report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms race in Outer Space (reissued for technical reasons)
GE-PAROS/2024/CRP.3/Rev.1	Draft report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space
GE-PAROS/2024/CRP.3/Rev.2	Revised draft report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space
GE-PAROS/2024/CRP.4	Report of the Group of Governmental Experts on Further Practical Measures for the Prevention of an Arms Race in Outer Space