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Draft implementation plan to achieve the objectives of the Working Group on the use of Nuclear Power Sources in Outer Space under its five-year workplan for the period 2024–2028

Prepared by the Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. The Committee on the Peaceful Uses of Outer Space, at its sixty-sixth session, held from 31 May to 9 June 2023, endorsed the final report of the Working Group on the Use of Nuclear Power Sources in Outer Space on the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space and recommendations for potential enhancements of the technical content and scope of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space (A/AC.105/C.1/124) (A/78/20, para. 149). The conclusions contained in that final report of the Working Group, which describes the work carried out under the multi-year workplan for the period 2017–2023, are summarized in paragraphs 2 to 6 below. On the basis of those conclusions, the Committee endorsed the recommendations of the Scientific and Technical Subcommittee and the Working Group for a new five-year workplan for the Working Group for the period 2024–2028 (A/78/20, para. 150).

2. Nuclear power sources (NPS) have opened the solar system to exploration, allowing the observation and understanding of dark, distant planetary bodies that would otherwise be unreachable. Nuclear reactor power sources, for habitation purposes and in-space propulsion and power supply of spacecraft, may enable faster and more robust crew and cargo missions to the Moon, Mars and beyond, and scientific missions to the outer solar system. The experience gained during many decades of NPS applications has led to a good understanding of the risks involved and the lessons learned, which provide context for evolving safety practices.

3. The Safety Framework is widely accepted and has proved valuable to member States when developing and/or applying their national systems for ensuring the safe use of NPS in outer space. Its usefulness has also been acknowledged and accepted by other member States and international intergovernmental organizations that are not currently involved in utilizing NPS in space, as they consider the safe use of such applications. No significant challenges in implementing the guidance provided in the Safety Framework have been identified, although several Working Group members

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have expressed the view that, as more than a decade has passed since its adoption, the Framework could usefully be supplemented with additional guidance. The guidance could address developments including the potential involvement of non-governmental and commercial entities in a variety of space NPS missions, and the need to take account of the guidance being developed on the long-term sustainability of space activities.

4. Future efforts could be directed towards compiling best practices and, if applicable, providing enhanced guidance in support of the fundamental safety concepts embodied in the Principles and the Safety Framework.

5. While the application of the Principles, in conjunction with the guidance contained in the Safety Framework, provides a sufficient basis for member States and international intergovernmental organizations wishing to establish national or regional safety frameworks to ensure the safe development and use of NPS in outer space, there is still a need for further work on the safety aspects of space NPS applications, particularly nuclear fission reactors and new types and uses of radioisotope power systems.

6. It would be beneficial to invite the International Atomic Energy Agency (IAEA) to continue to participate in the work of the Working Group. If that work indicates the need for additional safety guidelines, appropriate mechanisms could be established to address the need, such as the establishment of a joint expert group with IAEA, which would have a clearly defined role in relation to that of the Working Group and which would report back to the Subcommittee through the Working Group.

Objectives of the workplan for the period 2024–2028

7. The Committee, at its sixty-sixth session, endorsed the recommendations of the Subcommittee and the Working Group for a new five-year workplan (A/AC.105/1279, annex III, paras. 8–9) for the Working Group (A/78/20, para. 150), with the following objectives:

Objective 1. Promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space by:

(a) Providing an opportunity for member States and international intergovernmental organizations considering or initiating involvement in space NPS applications to summarize and discuss their plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework;

(b) Providing an opportunity for member States and international intergovernmental organizations with experience in space NPS applications to make presentations on challenges identified under subparagraph (a) above, and on their mission-specific experiences in implementing the guidance contained in the Safety Framework.

Objective 2. Collect and analyse relevant technical information about potential future uses of NPS in outer space, particularly those involving nuclear reactors, by:

(a) Inviting more member States and international intergovernmental organizations, in particular IAEA, to join the Working Group and share their views, plans and experiences;

(b) Agreeing on appropriate activities to collect information about potential future uses of NPS in outer space;

(c) Producing a critical analysis of the safety implications of the information shared under subparagraphs (a) and (b) above and presenting this analysis to the Subcommittee.

Objective 3. Discuss within the Working Group the implications of the analysis described in objective 2 with respect to further work of the Working Group and recommend suitable actions to the Subcommittee.

Implementation of the workplan

8. The Working Group agreed that it would advance those objectives by conducting the following work for the period 2024–2028:

2024 Conduct intersessional work by holding teleconferences and meetings, as necessary, in order to prepare for activities to be implemented under the workplan. Invite IAEA to continue to participate in the work of the Working Group.

Define, discuss and plan appropriate activities to collect information about potential future uses of NPS in outer space, including with IAEA.

Request the Secretariat to invite States members of the Committee and international intergovernmental organizations to collect and make technical presentations pursuant to objectives 1 and/or 2 of the workplan.

2025 Conduct intersessional work by holding teleconferences and meetings, as necessary, in order to prepare for activities to be implemented under the workplan. Receive technical presentations pursuant to the invitation extended in 2024. In its report to the Subcommittee, the Working Group will:

(a) Summarize the technical presentations received on plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework;

(b) Summarize the technical presentations received on potential future uses of NPS in outer space, particularly those involving nuclear reactors;

(c) Identify significant challenges as referred to in subparagraph (a) above that should be addressed in the presentations planned for 2026 by member States and international intergovernmental organizations;

(d) Identify safety implications of the information identified under subparagraph (b) above and discuss approaches to address them.

Request the Secretariat to invite States members of the Committee and international intergovernmental organizations to collect and make technical presentations pursuant to objectives 1 and/or 2 of the workplan.

2026 Conduct intersessional work by holding teleconferences and meetings, as necessary, in order to prepare for activities to be implemented under the workplan. Receive technical presentations under the same arrangements as in 2025. In its report to the Subcommittee, the Working Group will:

(a) Summarize the technical presentations received on plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework;

(b) Summarize the technical presentations received on potential future uses of NPS in outer space, particularly those involving nuclear reactors;

(c) Identify significant challenges as referred to in subparagraph (a) above that should be addressed in the presentations planned for 2027 by member States and international intergovernmental organizations;

(d) Identify safety implications of the information identified under subparagraph (b) above and discuss approaches to address them, including options for further work of the Working Group and for recommendations to the Subcommittee.

Request the Secretariat to invite States members of the Committee and international intergovernmental organizations to collect and make technical presentations pursuant to objectives 1 and/or 2 of the workplan.

2027 Conduct intersessional work by holding teleconferences and meetings, as necessary, in order to prepare for activities to be implemented under the workplan. Receive technical presentations under the same arrangements as in 2026. In its report to the Subcommittee, the Working Group will indicate its recommendation as to whether the current workplan should be extended and, if it is not to be extended, prepare a draft report summarizing:

(a) The technical presentations received and the challenges identified during the course of the workplan;

(b) The analysis described under objective 2;

(c) Eventual recommendations for further work of the Working Group and suitable actions.

2028 If the workplan has not been extended, finalize the report.