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Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
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Draft report

XI. Use of nuclear power sources in outer space

1. In accordance with General Assembly resolution 79/87, the Subcommittee considered agenda item 13, entitled "Use of nuclear power sources in outer space".

2. The representatives of Canada, China, France, Indonesia, Italy, Mexico, the Russian Federation, the United Kingdom and the United States made statements under agenda item 13. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

3. The Subcommittee had before it the following documents:

(a) Working paper submitted by the Chair of the Working Group on the Use of Nuclear Power Sources in Outer Space entitled "Draft questionnaire containing a preliminary set of questions to be used to collect information relating to the objectives of the workplan of the Working Group on the Use of Nuclear Power Sources in Outer Space" (A/AC.105/C.1/C.1/L.421);

(b) Conference room paper submitted by the United States entitled "Developing a mission safety analysis report for launch authorization: partnering across agency boundaries to ensure mission success" (A/AC.105/C.1/2025/CRP.23).

4. The Subcommittee heard a presentation entitled "Overview of Canadian activities on space nuclear power systems", by the representative of Canada.

5. The Subcommittee noted that the content and requirements of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, and of the Safety Framework for Nuclear Power Source Applications in Outer Space jointly developed by the Subcommittee and IAEA, represented a comprehensive foundation to ensure the safe and responsible use of nuclear power sources in outer space and were being taken into account by States and international intergovernmental organizations when developing legal and regulatory instruments for the safe use of nuclear power sources in outer space.

6. The view was expressed that the joint application of the Principles and the Safety Framework remained a sufficient and valuable tool for States and international intergovernmental organizations in their efforts to develop and use space nuclear power sources while fully respecting safety measures, and that there was no need to revise either the Principles or the Safety Framework.

7. Some delegations expressed the view that space nuclear power source applications had been used in space exploration since the dawn of the space age, opening up the solar system to exploration and allowing the observation and understanding of dark, distant planetary bodies that would otherwise be unreachable. Similarly, embarking on a new era for space exploration depended on mass-efficient, high-energy solutions to power deep-space vehicles, operate in harsh environments and increase mission flexibility. As such, the use of nuclear power sources for the in-space propulsion of spacecraft offered potential with regard to crew and cargo missions to the Moon, Mars and beyond, and scientific missions to the outer solar system, enabling faster and more robust human and robotic missions.

8. The view was expressed that, at a time of increased plans for deep-space exploration missions and projects, it was important to ensure the highest standards of safety, security and non-proliferation for the use of nuclear power source applications in outer space. The delegation expressing that view recalled that in General Assembly resolution 47/68, by which the Assembly adopted the Principles, it was stated that nuclear power sources were particularly suited to and even indispensable for certain deep-space exploration missions but must be used responsibly and in strict compliance with the highest standards of safety and security.

9. The Subcommittee welcomed the work of the Working Group on the Use of Nuclear Power Sources in Outer Space under its five-year workplan for the period 2024–2028 and under the able chairmanship of Leopold Summerer (Austria) and noted the importance of the Working Group's work in sharing the knowledge, understanding and best practices acquired by States and international intergovernmental organizations using nuclear power source applications on the implementation of the Principles and the Safety Framework.

10. The Subcommittee also noted that the Working Group had agreed on a questionnaire containing a set of questions to be used to collect information relating to the three main objectives of the workplan of the Working Group, with a view to inviting more member States and international intergovernmental organizations, in particular IAEA, to engage in the work of the Working Group. In that regard, the Subcommittee noted that the Working Group served as an important mechanism to promote the further understanding and awareness of effective processes to ensure the safe use of nuclear power sources in space and to collect and analyse relevant technical information about potential future uses of nuclear power sources in outer space, in particular those involving nuclear reactors.

11. The view was expressed that, while the Principles and the Safety Framework remained highly relevant in an era of renewed interest in lunar exploration and deep-space missions, including the use of nuclear fission reactors, the Working Group could also consider the development of complementary guidance for those future technologies and activities.

12. Some delegations expressed the view that there was a need for further work on the safety aspects of space systems utilizing nuclear power sources, in particular nuclear fission reactors and the innovative applications of radioisotope power systems.

13. The Working Group on the Use of Nuclear Power Sources in Outer Space held five meetings. At its 1030th meeting, on 12 February 2025, the Subcommittee endorsed the report of the Working Group, which is contained in annex III to the present report.