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Draft report of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. In accordance with paragraph 10 of General Assembly resolution [74/82](#), the Scientific and Technical Subcommittee, at its 915th meeting, on 3 February 2020, reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space, with Sam A. Harbison (United Kingdom of Great Britain and Northern Ireland) as Chair.
2. The Working Group recalled the following objectives of its multi-year workplan for the period 2017–2021, adopted by the Subcommittee at its fifty-fourth session, in 2017 ([A/AC.105/1138](#), annex II, paras. 8 and 9):

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 nuclear power source (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. Discuss within the Working Group advances in knowledge and practices and their potential for enhancing the technical content and scope of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space through presentations from member States and international intergovernmental organizations based on one or more of the following:

- (a) Their practical experience in implementing the Principles;
- (b) Their knowledge of advances in science and technology relating to space NPS;
- (c) Their knowledge of internationally accepted norms, standards and practices regarding radiation protection and nuclear safety.



3. The Working Group recalled that, in accordance to its workplan, in 2020, it had to receive technical presentations, determine whether the current workplan should be extended and, if it is not to be extended, prepare a draft report summarizing the technical presentations received and the challenges identified during the course of the workplan and identifying potential enhancements to the technical content and scope of the Principles.

4. The Working Group agreed that the purpose of the Safety Framework was to promote the safety of space NPS and noted with satisfaction that a number of States and one international intergovernmental organization had been implementing the Safety Framework. The Working Group called upon Member States and international intergovernmental organizations to continue, or to begin, the implementation of the Safety Framework.

5. The Working Group noted that advances in knowledge and planned space activities have occurred since the adoption of the Safety Framework in 2009.

6. The Working Group had before it a working paper entitled “Preliminary analysis of how the Principles Relevant to the Use of Nuclear Power Sources in Outer Space contribute to the safety of space nuclear power source applications” ([A/AC.105/C.1/L.378](#)), prepared by the Chair of the Working Group in collaboration with the delegations of France and the European Space Agency. The Working Group discussed the working paper and provided a number of views and recommendations. It also noted that the co-authors of the paper would revise its content in the course of 2020 on the basis of inputs from the members of the Working Group, with a view to presenting a revised version at the next session of the Subcommittee, in 2021.

7. In relation to the working paper referred to in paragraph 6 above, the Working Group:

(a) Discussed whether and how the preamble and the 11 principles of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space contributed to safety during design and development, implementation and operation and post-end of service phases of space NPS applications;

(b) Noted that some principles of the Principles have a practical impact on the safety aspects of space NPS applications;

(c) Also noted that, since the adoption of the Principles in 1992, substantial advances have taken place in knowledge and practices, as well as in internationally accepted norms and standards, relevant to the safety of NPS applications.

8. The Working Group also considered at its informal meetings:

(a) An informal paper prepared by the delegation of the United States of America on the updated and risk-informed process for launching space nuclear systems in the United States. The paper concluded that the United States policy, set in the Presidential Memorandum on Launch of Spacecraft Containing Space Nuclear Systems issued on 20 August 2019, is consistent with the spirit of the Principles and the Safety Framework, and provides the United States with an architecture for: ensuring compliance with safety policies; establishing processes to satisfy fundamental safety requirements and objectives; and, ultimately, for the fulfilment of safety in the use of nuclear power in space;

(b) An informal presentation by the delegation of the United Kingdom on plans for research and development in space nuclear power technologies;

(c) An informal paper prepared by the delegation of the Russian Federation on its practical application of the Principles and the Safety Framework. The paper concluded that the approach of the Russian Federation takes into account the recommendations of the Safety Framework and corresponds with the principles and criteria for the safe use of NPS set forth in the Principles.

9. The Working Group was informed that the informal papers referred to in paragraph 8 above would be finalized and submitted to the Secretariat by the end of

March 2020, with a view to making them available at the sixty-third session of the Committee, in June 2020.

10. In relation to the informal papers and presentation referred to in paragraph 8 above:

(a) The view was expressed that the application of the Principles, as well as the practical recommendations contained in the Safety Framework, are sufficient tools for States and international intergovernmental organizations seeking to ensure the safety of the development and use of NPS in outer space;

(b) The view was expressed that the implementation of international and national requirements suggested an opportunity for the safe use of NPS at all stages of the spacecraft life cycle, both during normal operation and in emergency situations;

(c) The view was expressed that planned research and development in space nuclear power technologies, namely fission surface power, thermal propulsion and fusion applications, were not covered by the Principles, and the Principles did not provide clarity for those technologies;

(d) The view was expressed that the safety goals and guidelines contained in the Principles were wholly reflected in the implementation guidance contained in the complementary Safety Framework and, together, those documents provided sufficient guidance and a sound foundation for the safe development and use of nuclear power in space to States and international intergovernmental organizations. Furthermore, the more general implementation of the Safety Framework continues to allow advances in knowledge and practice to further enhance space nuclear safety policy, and thus advances the safety intent of the Principles;

(e) The view was expressed that some principles did not contribute to the safety of space NPS applications, while others might have an unintended negative impact on the safety of space NPS applications.

11. On the basis of detailed discussions and taking note of the views expressed above, the Working Group agreed that there was a range of possible options for exploring potential enhancements to the technical content and scope of the Principles, consistent with objective 2 of the workplan of the Working Group. Further work would be required to elaborate and discuss those options with the view to reaching a consensus position in the final report to the Subcommittee, in 2021.

12. The Working Group agreed that, in order to carry out the tasks for the year 2020 under its multi-year workplan, it would be necessary to convene an intersessional meeting. In this connection, the Working Group agreed to meet from 17 to 19 June 2020, on the margins of the sixty-third session of the Committee, and requested that the Secretariat facilitate that meeting.

13. At its [...] meeting, on [...] February, the Working Group adopted the present report.