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Committee on the Peaceful Uses of Outer Space
Scientific and Technical Subcommittee
Fifty-fourth session
Vienna, 30 January-10 February 2017
Item 12 of the provisional agenda*
Use of nuclear power sources in outer space

Note by the Secretariat

At the current session of the Subcommittee, the Working Group on the Use of Nuclear Power Sources of Outer Space has updated the text, which was contained in document A/AC.105/C.1/L.359. The updates made to the text has been agreed by the Working Group at its 2nd meeting on 2 February.

The present document contains the updated text. It will also be made available by the Secretariat, after the session of the Subcommittee, in all official languages of the United Nations in document A/AC.105/C.1/L.359/Rev.1.

* A/AC.105/C.1/L.355.

~~Draft report~~ Report on the status of implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space, and ~~general~~ recommendations for ~~potential~~ future work

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

1. At its forty-seventh session, in 2010, the Scientific and Technical Subcommittee agreed to the multi-year workplan for the Working Group on the Use of Nuclear Power Sources in Outer Space for the period 2010-2015 (A/AC.105/958, para. 134 and annex II, para. 7). In 2014, at its fifty-first session, the Subcommittee extended the workplan to 2017 (A/AC.105/1065, annex II, para. 9).

2. The workplan was initiated in 2010 after the Safety Framework for Nuclear Power Source Applications in Outer Space — a cooperative effort of the Joint Expert Group of the Subcommittee and the International Atomic Energy Agency (IAEA) — had been adopted by the Subcommittee at its forty-sixth session and endorsed by the Committee on the Peaceful Uses of Outer Space at its fifty-second session. The Safety Framework was made available by the Secretariat in document A/AC.105/934 and by the IAEA secretariat as a joint publication of the Subcommittee and IAEA.

3. The workplan had the following objectives:

(a) To promote and facilitate the implementation of the Safety Framework by providing information pertinent to challenges faced by member States and international intergovernmental organizations, in particular those considering or initiating involvement in applications of nuclear power sources (NPS) in outer space;

(b) To identify any technical topics for, and establish the objectives, scope and attributes of, any potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications. Any such additional work would require the approval of the Subcommittee and would be developed with due consideration for relevant principles and treaties (A/AC.105/958, annex II, para. 7).

4. In 2010 the Working Group agreed that it would achieve those objectives by conducting workshops and ~~hearing~~ receiving presentations in the period 2011-2015. The presentations would be of two types: (a) by member States and international intergovernmental organizations considering or initiating involvement in NPS applications in outer space, summarizing their plans, progress to date, and any challenges faced or foreseen in implementing the Safety Framework or specific elements thereof; and (b) by member States with experience in space NPS applications, providing information pertinent to addressing the challenges in implementing the Safety Framework (A/AC.105/958, annex II, para. 8).

5. The Working Group received presentations and papers from Argentina, China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the European Space Agency (ESA). In addition, two non-papers were provided that had information relevant to ongoing discussions of the Working Group.

6. Some presentations were made in response to the Subcommittee's invitation to member States and international intergovernmental organizations with experience in space NPS applications to provide information on their implementation of the Safety Framework. Those presentations addressed the following specific aspects of the Safety

Framework: (a) safety in design and development; (b) risk assessment; (c) emergency preparedness and response; (d) accident consequence mitigation; and (e) management organization for NPS mission applications.

7. The other presentations were made in response to the Subcommittee's invitation to member States and international intergovernmental organizations to summarize their plans, progress to date, and challenges faced or foreseen in implementing the Safety Framework or specific elements thereof. Some of those presentations identified specific challenges ~~faced or foreseen in implementing the Safety Framework or specific elements thereof, namely~~including:

(a) The mission launch authorization process for countries with NPS applications but without the capacity to launch the applications;

(b) The coordination of emergency preparedness and response with other countries over which the space NPS mission would fly;

(c) The implementation of the prime responsibility for safety of the organization conducting the space NPS mission and establishment of formal arrangements between it and all other relevant participants in the space mission;

(d) The allocation of responsibilities between any international intergovernmental organization and its Member States in implementing the "Guidance for Governments" section of the Safety Framework;

(e) The organizational structure of launch safety and emergency preparedness and response for different launch phases and accident scenarios of a space NPS mission.

8. A non-paper and later a conference room paper were provided by a member State, containing the proposal to trigger an exploratory discussion, within the Working Group, on the point of reviewing and updating the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.

9. The Working Group concluded that the workshops and relevant technical presentations had fulfilled objective (a) of the present workplan, namely to promote and facilitate the implementation of the Safety Framework by providing information pertinent to challenges faced by member States and international intergovernmental organizations. All member States and international intergovernmental organizations that made presentations at the workshops emphasized that the Safety Framework provided a valuable foundation for the development of national and international intergovernmental safety frameworks for space NPS applications.

10. The Working Group also concluded that the five challenges referred to in paragraph 7 above were essentially related to policy, management and coordination of space NPS activities (see sections 3 and 4 of the Safety Framework). Such activities are highly specific to the Government or Governments involved in authorizing and/or approving space NPS missions, and the Working Group considered that it would be difficult to develop generic guidance for any of those areas at this time.

11. The Working Group concluded that none of the challenges identified to date required any modifications to the Safety Framework.

12. The Working Group noted that more challenges might be identified in the future, as States members of the Committee and international intergovernmental organizations continue to implement the Safety Framework and gain experience with space NPS mission applications.

13. The Working Group discussed technical topics for potential future work to further enhance safety in the development and use of space NPS applications. Those discussions covered the objectives, scope and attributes of each such topic.

14. In particular, the Working Group discussed the following potential activities to further enhance safety in the development and use of space NPS applications:

(a) The conduct of a survey among States members of the Committee concerning the implementation of the Safety Framework;

(b) The preparation of a technical document by one or more States members of the Committee with experience in space NPS applications, and potentially in cooperation with IAEA, focused on the practical achievement of safety in space NPS applications;

(c) Presentations by States members of the Committee with experience in space NPS applications on their mission-specific experiences in implementing the guidance contained in the Safety Framework and in satisfying the intent of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space;

(d) Discussions within the Working Group about 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.

15. The Working Group considered the options presented in subparagraphs (a) and (b) of paragraph 14 above and concluded that the other options would be more effective in enhancing the safety of space NPS applications.

16. With respect to the option presented in paragraph 14 (c) above, the Working Group identified several potential topics that one or more States members of the Committee with experience in space NPS could address in presentations to the Subcommittee:

(a) Development and sustainment of space NPS safety infrastructure;

(b) Accident definition and analysis challenges;

(c) Space NPS safety management organization, knowledge and practices;

(d) Development and implementation of effective radiological contingency plans;

(e) Development and implementation of intergovernmental, including international, risk communication plans.

17. The Working Group concluded that the option presented in paragraph 14 (c) above could be efficiently accomplished through any one of a number of organizational mechanisms available to the Subcommittee, such as a working group of the Subcommittee, technical workshops or special technical presentations.

18. The Working Group concluded that the option presented in paragraph 14 (d) above would be accomplished through continuing efforts of the Working Group within a new workplan.

19. ~~After consideration of the results from the current workplan,~~ Based on the results of the current multi-year workplan, and taking note of potential opportunities for further enhancing safety in the use of space NPS, the Working Group reached consensus on the following recommendations:

(a) The Subcommittee should continue to encourage and provide opportunities for:

(i) States members of the Committee and intergovernmental organizations involved in space NPS mission applications, or planning or considering such involvement, to report on their progress in implementing the Safety Framework and to identify challenges and experiences relevant to implementing the Safety Framework;

(ii) States members of the Committee and intergovernmental organizations with experience in space NPS to share information relevant to addressing those challenges;

(iii) Presentations by States members of the Committee with experience in space NPS applications on their mission-specific experiences in implementing the guidance contained in the Safety Framework and in satisfying the intent of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space;

(b) The Subcommittee should provide the opportunity for States members of the Committee and intergovernmental organizations to engage in discussions within the Working Group about 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.

20. The Working Group prepared a new multi-year~~draft~~ workplan encompassing the recommendations, and ~~as follows~~with the following objectives:

~~2017 Develop a draft workplan with two objectives:~~

Objective 1. Promote and facilitate the implementation of the Safety Framework 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 ~~Receiving presentations from~~ member States and international intergovernmental organizations with experience in space NPS applications to make presenations on ~~such~~ challenges identified under (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 by receiving pertinent technical presentations from member States and international intergovernmental organizations with experience in space NPS applications on the application of the Principles.~~

Objective 2. Discuss within the Working Group advances in knowledge and practices and their potential for enhancing the technical content and improving the technical 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:

(a) Their practical experience in implementing the Principles; or

(b) Their knowledge of advances in science and technology relating to space NPS; or

(c) Their knowledge of internationally accepted norms, standards and practices regarding radiation protection and nuclear safety.

~~After its adoption by the Subcommittee, the Working Group will request the Secretariat to invite member States and international intergovernmental organizations to make technical presentations in the period 2018-2020 pursuant to the first and/or second objectives.~~

21. The Working Group agreed that it would advance these objectives by conducting the following workplan for the period from 2017 to 2021:

2017 Conduct inter-sessional work by holding teleconferences and meetings, as necessary, in order to prepare for activities to be implemented under the workplan. Request the Secretariat to invite, by no later than April 2017, States members of the Committee and international intergovernmental organizations to make technical presentations pursuant to the first and/or second objectives of the workplan.

2018 Receive technical presentations pursuant to the invitation extended in 2017. In its report to the Subcommittee, the Working Group will: (a) summarize the technical presentations; (b) identify any significant challenges that should be addressed in the presentations planned for 2019 by member States and international intergovernmental organizations with experience in space NPS applications; and (c) summarize the discussions about potential enhancement of the technical content and scope of the Principles. Request the Secretariat to invite, by no later than April 2018, States members of the Committee and international intergovernmental organizations to make technical presentations pursuant to the first and/or second objectives of the workplan.

2019 Receive technical presentations under the same arrangements as in 2018. In its report to the Subcommittee, the Working Group will: (a) summarize the technical presentations; (b) identify any significant challenges that should be addressed in the presentations planned for 2020 by member States and international intergovernmental organizations with experience in space applications; and (c) summarize the discussions about potential enhancements of the technical content and scope of the Principles. Request the Secretariat to invite, by no later than April 2019, States members of the Committee and international intergovernmental organizations to make technical presentations pursuant to the first and/or second objectives of the workplan.

2020 Receive technical presentations under the same arrangements as in ~~2018~~2019. 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.

2021 If the workplan has not been extended, finalize the report.

Annex

List of documents, presentations and non-papers before the Working Group in the period 2011-2016

Note: No changes were made to the Annex.