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**Committee on the Peaceful
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Item 13 of the provisional agenda*
Use of nuclear power sources in outer space

Draft report containing recommendations for potential future work to promote and facilitate implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space

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

* A/AC.105/C.1/L.336.



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 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. A total of 17 presentations were made by 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. Six of the 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. Nine of the 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. The specific challenges faced or foreseen in implementing the Safety Framework or specific elements thereof were as follows:

(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 mission would fly;

(c) The implementation of the prime responsibility 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 organization of launch safety and emergency preparedness and response for different launch phases and accident scenarios.

8. Two additional member State presentations — one in a plenary meeting of the Subcommittee and one in an informal meeting of the Working Group — provided information relevant to discussions on implementing the guidance from the Safety Framework.

9. Also, one member State provided a non-paper to the Working Group on the proposal to initiate a discussion on updating the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.

10. The Working Group concluded that the workshops and relevant technical presentations had fulfilled objective (a), 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.

11. 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.

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

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

14. The Working Group had extensive discussions about potential technical topics for additional 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.

15. 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 member States concerning the implementation of the Safety Framework;

(b) The preparation of a technical document by one or more member States 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 member States 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.

16. With respect to the option presented in paragraph 15 (a) above, regarding a survey among member States, the Working Group identified several issues that would need to be addressed:

(a) What would be the question set?

(b) By what means would the questions be communicated to member States? In a note verbale from the Secretariat or by some other means?

(c) How would the Working Group follow up the survey questionnaire to ensure a broad, meaningful response?

(d) Who would be responsible for collecting and analysing the results of the survey?

(e) How would the survey results be reported and how would they be used?

17. With respect to the option presented in paragraph 15 (b) above, regarding the preparation of a technical document, the Working Group considered three potential options: an IAEA-sponsored technical report; an IAEA-sponsored safety report; or a report under the joint sponsorship of the Subcommittee and the IAEA:

(a) An IAEA-sponsored technical report could be completed by a single expert member State. It would require an IAEA document-preparation profile but would not be reviewed by an IAEA safety committee. The resultant document would be accessible online from IAEA for three years;

(b) An IAEA-sponsored safety report would require at least two expert member States. It would require an IAEA document-preparation profile that would be reviewed by the IAEA secretariat for grammatical (but not technical) accuracy. The resultant document would be accessible online from IAEA for more than three years;

(c) A report under the joint sponsorship of the Subcommittee and IAEA would be implemented in a manner similar to the arrangements under which the Safety Framework was developed. This would require the preparation and coordination of both an IAEA document-preparation profile and a workplan. The resultant document would likely be accessible online from both IAEA and the Office for Outer Space Affairs for an indefinite period of time.

18. The Working Group identified several issues that would need to be addressed if the option of a technical document in coordination with IAEA were to be pursued:

(a) What would be the process for the Subcommittee to provide input into the identification of a topic for either an IAEA-sponsored technical report or safety report?

(b) How would the Subcommittee be able to ensure that one or more member States would participate in preparing an IAEA-sponsored technical report or safety report?

(c) How would the Subcommittee provide input into the document-preparation profile for either an IAEA-sponsored technical report or safety report?

(d) How would the results of an IAEA-sponsored technical report or safety report be reported back to the Subcommittee?

(e) What would be the approval process for the final document by the Subcommittee and the IAEA?

19. With respect to the option presented in paragraph 15 (c) above, regarding presentations by member States, the Working Group identified several potential topics that one or more member States with experience in space NPS indicated could be addressed 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, processes and tools;

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

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

20. The Working Group identified several issues that would need to be addressed to more fully develop this option:

(a) In what format would presentations be made? Recognizing the limitations of technical presentations during plenary meetings of the Working Group, it may be more fruitful to hold a workshop where more extensive participation by, and technical exchanges among, technical experts of member States and international intergovernmental organizations could be encouraged;

(b) What are the logistical issues associated with ensuring that the papers are generated and distributed to member States well in advance of any such workshop to allow for greater technical exchanges?

(c) How should the output of such a workshop be captured and disseminated? Would it be useful and viable to have it available in a video format for distribution in addition to a print and/or electronically accessible format?

(d) What would be the scope of the workplan needed to cover this option and what would be the logical conclusion of the activity?

21. After consideration of the results from the current workplan, the Working Group reached consensus on the following recommendations pertinent to potential future activities of the Subcommittee:

(a) The Working Group recommends that the Subcommittee encourage and provide a continuing opportunity 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.

(b) The Working Group recommends that for any future amendment or supplement to the Safety Framework the Subcommittee again partner with IAEA in defining the required workplan.
