



Sixty-first regular session

Item 18 of the agenda
(GC(61)/25)

Strengthening the Agency's activities related to nuclear science, technology and applications

Resolution adopted on 21 September 2017 during the seventh plenary meeting

A.

Non power nuclear applications

1.

General

The General Conference,

- (a) Noting that the Agency's objectives as outlined in Article II of the Statute include "*to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world*",
- (b) Noting also that the statutory functions of the Agency as outlined in Article III of the Statute, paragraphs A.1 to A.4, include encouraging research and development and fostering the exchange of scientific and technical information and the training of scientists and experts in the field of peaceful uses of atomic energy, with due consideration for the needs of developing countries,
- (c) Noting the Medium Term Strategy 2018–2023 as guidance and input in this respect,
- (d) Taking note of the *Nuclear Technology Review 2017* (document GC(61)/INF/4),
- (e) Stressing that nuclear science, technology and applications address and contribute to a wide variety of basic socio-economic human development needs of Member States, in such areas as energy, materials, industry, environment, food and agriculture, nutrition, human health and water resources, noting that many Member States, both developing and developed, are obtaining benefits from the application of nuclear techniques in all the above areas and noting the successful cooperation and significant results being achieved by FAO and the Agency through the Joint FAO/IAEA Programme,

- (f) Recognizing the commitment of the Food and Agriculture Organization of the United Nations (FAO) to the Revised Arrangements regarding the work of the Joint FAO/IAEA Division for Nuclear Techniques in Food and Agriculture, signed in 2013, and the FAO's Strategic Framework for 2010–2019, as well as its five strategic objectives, all of which provide a foundation for the strong and effective collaboration with, inter alia, the IAEA through the Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture, and taking note of the support of the FAO to continue collaborating with the IAEA through this joint programme,
- (g) Appreciating the support of the Joint FAO/IAEA Division to the control of outbreaks of peste des petits ruminants, swine fever, foot-and-mouth disease, Ebola virus disease, avian influenza, bluetongue and lumpy skin disease in Africa, Asia and Europe,
- (h) Aware of the activities of the Latin American and Caribbean Analytical Network (RALACA), composed of national food safety institutes in 20 countries in Latin America and the Caribbean, to address food contamination issues and improve environmental and food safety with health, trade and economic benefits, the VETLAB network of 32 African and 17 Asian national animal disease diagnostic laboratories in disseminating the use of nuclear techniques for the diagnosis and control of transboundary animal and zoonotic diseases, and the ALMERA network on Analytical Laboratories for the measurement of Environmental Radioactivity providing accurate measurement for monitoring radioactivity in the environment, represented with 149 laboratories from 84 Member States,
- (i) Noting that the United Nations General Assembly, in resolution 64/292, called upon States and international organizations to provide financial resources, capacity-building and technology transfer, through international assistance and cooperation, in particular to developing countries, in order to scale up efforts to provide safe, clean, accessible and affordable drinking water and sanitation for all,
- (j) Welcoming the adoption of the 2030 Agenda for Sustainable Development by the United Nations General Assembly of 2015 (A/RES/70/1), and recognizing the Secretariat activities that contribute to fostering sustainable development and protecting the environment,
- (k) Further welcoming the adoption of the Paris Agreement at the twenty-first Conference of the Parties (COP 21) of the United Nations Framework Convention on Climate Change,
- (l) Recognizing the success of the sterile insect technique (SIT) in the suppression or eradication of populations of the screw worm, tsetse flies, and various fruit flies and moths pests that can cause large economic impacts,
- (m) Confirming the important role of science, technology and engineering in enhancing nuclear and radiation safety and security, and the need to resolve the issues of managing radioactive waste in a sustainable manner,
- (n) Acknowledging that the peaceful use of fusion energy can be advanced through increased international efforts and with the active collaboration of interested Member States and international organizations, such as the International Thermonuclear Experiment Reactor (ITER) project group, in fusion-related projects, appreciating the efforts taken in leading the demonstration fusion power plant (DEMO) experiments and biennial IAEA Fusion Energy Conferences, and taking note of the 26th biennial IAEA Fusion Energy Conference (FEC2016) held in Japan in October 2016,

- (o) Recognizing the role of ion beam accelerators and synchrotron radiation sources in research and development in material science, environmental science, bio- and life sciences and cultural heritage,
- (p) Aware of the problems of pollutants arising from urban and industrial activities and the potential of radiation treatment to address some of them, including industrial wastewaters, and noting the initiative taken by the Agency to explore the use of radiation technology for waste water treatment and the remediation of pollutants in Member States through coordinated research activities (CRAs),
- (q) Taking note of the high potential of electron beams as a source of radiation for the treatment of materials and pollutants and the attenuation of pathogens for development of vaccines and acknowledging the encouraging results produced through the related coordinated research projects (CRPs),
- (r) Noting with appreciation the success of the Scientific Forum held during the 60th General Conference in 2016, focused on the theme Nuclear Technology for the Sustainable Development Goals, the Agency's first International Conference on Applications of Radiation Science and Technology (ICARST-2017), held from 24–28 April 2017, and the Third FAO/IAEA International Conference on Area-Wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques held from 22–26 May 2017,
- (s) Recognizing the increasing use of radioisotopes and radiation technology in healthcare practices, sanitation and sterilization, industrial process management, environment remediation, food preservation, crop improvement, new materials development and analytical sciences, and in assessing the impacts of climate change,
- (t) Noting the expanding use of positron emission tomography (PET), PET-computed tomography (PET-CT) and therapeutic radiopharmaceuticals and acknowledging the efforts taken by the Secretariat in planning appropriate activities to address the needs for production of hospital prepared therapeutic radiopharmaceuticals and their use following the applicable national regulatory requirements,
- (u) Noting the importance of molybdenum-99 availability for medical diagnosis and treatment, and acknowledging with appreciation the efforts made by the Agency, in coordination with other international organizations, Member States and relevant stakeholders, to facilitate a reliable supply of molybdenum-99 by supporting the development of Member States' abilities to generate, for their indigenous needs and for export, the non-HEU-based production of molybdenum-99 and technetium-99m, where technically and economically feasible, including research into the accelerator-based alternative production of technetium-99/ molybdenum-99,
- (v) Aware of the new cooperative initiatives that have emerged to provide reactor irradiation services, of the significant advances reported in the development of new molybdenum-99 production facilities and the expansion of existing facilities, and of the continued interest of many countries in establishing non-HEU-based molybdenum-99 production facilities to meet domestic needs, for export and/or to serve as a partial reserve capacity,
- (w) Acknowledging the multiple uses of research reactors as valuable tools for, inter alia, education and training, research, radioisotope production and materials testing and also as a learning tool for Member States that are considering the introduction of nuclear power,
- (x) Aware that greater regional and international cooperation will be needed to ensure broad access to research reactors, owing to the fact that older research reactors are being replaced by

fewer multi-purpose reactors, resulting in a drop in the number of operational reactors and noting with appreciation the Secretariat's integrated and systematic support to countries embarking on their first research reactor project,

(y) Noting with concern that the 38 TRIGA reactors worldwide would be adversely affected by the inability of the sole supplier of TRIGA fuel to guarantee a long-term supply of this fuel due to a weak business case,

(z) Recognizing the importance of nuclear instrumentation in the monitoring of nuclear radiation and nuclear materials in the environment and noting with appreciation the development of instruments for monitoring surface radioactivity and the provision of services to requesting Member States for the mapping of their land,

(aa) Acknowledging the need for increasing the capacity of Member States for using advanced nuclear techniques in disease management, including cancer, and aware of the need to develop performance indicators for measuring such capacity,

(bb) Recognizing that independent external peer-reviews, forming part of a comprehensive quality assurance programme, are an effective tool for quality improvement of the radiation medicine practice, and appreciating the Secretariat's efforts in developing the peer-review mechanisms in nuclear medicine, diagnostic radiology and radiotherapy,

(cc) Aware of the innovative use of IT tools in capacity building and educational tools in human health through the well-developed IAEA Human Health Campus,

(dd) Noting ongoing cooperation and partnership between the World Health Organization (WHO) and the Agency, and the increasing demand from Member States in nuclear applications for human health,

(ee) Noting that the Agency has compiled and disseminated isotope data on aquifers and rivers worldwide and is addressing links between climate change, rising food and energy costs and the global economic crisis, with the aim of assisting decision-makers in adopting better management practices for integrated water resources management and planning, especially for surface water related to agricultural use,

(ff) Recognizing the Agency's unique capabilities in contributing to global efforts to protect the marine environment, acknowledging the important contribution of the Ocean Acidification International Coordination Centre at the IAEA Environment Laboratories in Monaco to the coordination of activities supporting a better understanding of the global effects of ocean acidification, and welcoming the significant financial and in-kind support for the Centre provided by a number of Member States, including under the IAEA Peaceful Uses Initiative,

(gg) Aware that the events sponsored by the IAEA Nobel Peace Prize Cancer and Nutrition Fund have led to an increase in requests from Member States for cooperation in the field of infant and young child nutrition, and prevention of obesity related non-communicable diseases, and noting that the IAEA International Symposium on Understanding Moderate Malnutrition in Children for Effective Interventions, held in Vienna, Austria from 26 to 29 May 2014 has led to closer cooperation with other agencies working in the area of malnutrition,

(hh) Recognizing the success of science and technology studies projects in enhancing scientific communication and their contribution to training the trainer,

(ii) Noting with appreciation the on-going efforts of the Secretariat, together with Member States, under the programme and budget for 2018–2019, to allocate sufficient resources to

renovate the Agency's nuclear applications laboratories at Seibersdorf with facilities and equipment that are fully fit-for-purpose and to ensure that maximum benefits in terms of capacity building and technology enhancement are made available to Member States, particularly developing countries,

(jj) Recognizing the Agency's contribution through the human health and food and agriculture programmes to address the Zika virus outbreak in Latin America and the Caribbean region, in close collaboration with WHO through the offices of the Pan-American Health Organisation (WHO-PAHO), and

(kk) Recognizing the Agency's success at establishing partnerships and successful significant funding with non-conventional partners, notably in human health,

1. Requests the Director General, in conformity with the Statute, to continue to pursue, in consultation with Member States, the Agency's activities in the areas of nuclear science, technology and applications, with special emphasis on supporting the development of nuclear applications in Member States with a view to strengthening infrastructures and fostering science, technology and engineering for meeting sustainable growth and development needs of Member States in a safe manner;
2. Requests the Secretariat to fully utilize the capacities of Member State institutions through appropriate mechanisms in order to expand the extent to which nuclear sciences and applications are utilized to achieve socio-economic benefits and looks forward to the Agency's contribution to the implementation of the 2030 Agenda for Sustainable Development (A/RES/70/1), as well as the Paris Agreement on Climate Change;
3. Underlines the importance of facilitating effective programmes in the areas of nuclear science, technology and applications aimed at pooling and further improving the scientific and technological capabilities of Member States through CRPs within the Agency and between the Agency and Member States and through direct assistance, and urges the Secretariat to further strengthen capacity-building for Member States, particularly through interregional, regional and national training courses and fellowship training in the areas of nuclear science, technology and applications, and expanding the scope and outreach of CRAs;
4. Following up on the success of the Scientific Forum during the 2016 General Conference, ICARST and the Third FAO/IAEA International Conference on Area-Wide Management of Insect Pests, urges the Secretariat to communicate the benefits of various applications of nuclear technologies for development that could benefit Member States and to address the needs for human resource training in these applications;
5. Requests the Secretariat to continue consultations with Member States on the preparation of the 2018 Ministerial Conference on nuclear science, technologies and applications for peaceful uses, and their delivery to Member States through the Agency's Technical Cooperation programme, while highlighting their future contribution to sustainable development;
6. Urges the Secretariat to continue implementing efforts that contribute to greater understanding and a well-balanced perspective of the role of nuclear science and technology in sustainable global development, including the Kyoto commitments, and future efforts to address climate change;
7. Welcomes all contributions announced by Member States, including the IAEA Peaceful Uses Initiative, as extra budgetary contributions to the Agency;
8. Calls upon the Secretariat to continue to address identified priority needs and requirements of Member States in the areas of nuclear science, technology and applications, including nuclear

applications related to food and agriculture, such as climate-smart agriculture, the use of the SIT to establish tsetse-free zones and for combating malaria-transmitting mosquitoes and the Mediterranean fruit fly, the application of nuclear-derived techniques to early, rapid diagnosis and control of emerging and re-emerging transboundary animal and zoonotic diseases, the unique applications of isotopes to track the global uptake by the oceans of carbon dioxide and the resulting acidification effects on marine ecosystems, the use of isotopes and radiation in groundwater management and applications relating to agriculture, such as land and water management, crop improvement and management in light of climate change, and to human health, and in the use of cyclotrons, research reactors and accelerators for the production of radiopharmaceuticals, and the use of radiation technology for development of novel materials, as well as the treatment of waste water, flue gases and other pollutants resulting from industrial activities;

9. Encourages strengthening mutual cooperation between Member States to exchange information on relevant experiences and good practices on water resources management in synergy with the UN system organizations dealing with water resources management, such as the IAEA and UNIDO;

10. Takes note with appreciation of the continued efforts of the Secretariat with Member States party to the Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (RCA) and encourages the Secretariat to develop and disseminate IT tools in various areas of nuclear applications;

11. Urges the Secretariat to continue exploring the use of accelerators for various radiation technology applications and to facilitate demonstrations and training for interested Member States;

12. Recognizes the success of the VETLAB network of veterinary diagnostic laboratories in disseminating the use of nuclear techniques for the diagnosis and control of transboundary animal and zoonotic diseases such as Ebola virus disease, avian influenza and lumpy skin disease in Africa, Asia and Europe, and urges the Secretariat to further increase these efforts;

13. Requests the Secretariat, in collaboration with interested Member States, to continue with the development of appropriate instruments and to make available, to requesting Member States, services for the rapid and economic mapping of radioactivity on the Earth's surface;

14. Urges the Secretariat to continue to implement activities that will contribute to securing and supplementing the molybdenum-99/technetium-99m production capacity, including in developing countries, in an effort to ensure the security of supplies of molybdenum-99 to users worldwide and further urges the Secretariat to continue its cooperative work towards this goal with other international initiatives such as the High-level Group on the Security of Supply of Medical Radioisotopes established by the OECD Nuclear Energy Agency;

15. Requests the Secretariat, upon request from interested Member States, to provide technical assistance to emerging national and regional efforts to establish non-HEU based molybdenum-99 production capabilities, and to provide technical assistance to transition existing production capabilities to utilize non-HEU-based methods and facilitate training activities such as workshops to support Member States in their efforts to achieve self-sufficiency in local production of medical radioisotopes and radiopharmaceuticals;

16. Requests the Secretariat to continue to provide to interested Member States, upon request, technical assistance regarding production of medical isotopes and radiopharmaceuticals;

17. Requests the Secretariat to foster regional and international efforts in ensuring wide access to existing multi-purpose research reactors to increase research reactor operations and utilization, and further requests the Secretariat to facilitate safe, effective and sustainable operation of these facilities;

18. Urges the Secretariat to continue to assist Member States considering their first research reactor with systematic, comprehensive and appropriately graded infrastructure development and to provide guidelines on the applications of research reactors to help Member State organizations make informed decisions that ensure the strategic viability and enduring sustainability of these projects;
19. Requests the Secretariat to assist interested Member States in developing safety infrastructure and in establishing regional training and education centres in their regions, where they do not exist, for the specialized training of nuclear and radiological experts, and requests the Secretariat to take advantage of qualified instructors from developing countries in this regard;
20. Urges the Secretariat to continue to engage with stakeholders and to encourage the international fuel supply industry to ensure uninterrupted and adequate supplies of research reactor fuels, including TRIGA fuel;
21. Encourages the Secretariat to continue cooperating with the World Nuclear University (WNU) in the biennial School on Radiation Technologies and to enhance its support for the participation of applicants from developing countries;
22. Requests the Secretariat to strengthen the Agency's activities in the area of fusion science and technology in view of the advances in nuclear fusion research at ITER and worldwide and to continue the DEMO activities, expanding the scope and participation to the extent possible;
23. Recognizing the underpinning nature of reliable nuclear data for all activities related to nuclear sciences and engineering, expresses its appreciation to the Secretariat for the provision of reliable nuclear data to the Member States for over 50 years as well as the development of an application for accessing nuclear data through mobile phones, and encourages it to continue the service in future;
24. Calls for the support of the Agency in setting guidelines for the adoption of advanced techniques and equipment in radiation medicine in Member States;
25. Encourages the Secretariat to further strengthen the IAEA-WHO partnership, and to explore the possibility for a more formalized cooperation, such as a joint programme or entity between the WHO and the IAEA;
26. Requests the Secretariat to continue providing assistance with capacity-building for quality assurance in radiopharmaceutical development and the use of radiation technology in industries and disseminating radiation technology guidelines based on international quality assurance standards;
27. Encourages Member States to make use of the existing peer-review mechanisms in radiation medicine to strengthen quality diagnosis and patient treatment;
28. Requests the Secretariat to make efforts together with Member States in developing industrial irradiation facilities such as electron accelerators and their accessories for use in, inter alia, healthcare practices, crop improvement, food preservation, industrial applications, sanitization and sterilization, and further requests the provision of technical support for the use of research reactors in the production of radiopharmaceuticals and industrial radioisotopes;
29. Requests also that the actions of the Secretariat called for in this resolution be undertaken subject to the availability of resources; and
30. Recommends that the Secretariat report to the Board of Governors and to the General Conference at its sixty-second (2018) regular session on the progress made in the areas of nuclear science, technology and applications.

2.

Support to the African Union's Pan African Tsetse and Trypanosomosis Eradication Campaign (AU-PATTEC)

The General Conference.

- (a) Recalling its previous resolutions on support to the African Union's Pan African Tsetse and Trypanosomosis Eradication Campaign (AU-PATTEC),
- (b) Recognizing that the main objective of AU-PATTEC is to eradicate tsetse flies and trypanosomosis by creating sustainable tsetse- and trypanosomosis-free areas, using various suppression and eradication techniques, while ensuring that the reclaimed land areas are sustainably and economically exploited and hence contributing to poverty alleviation and food security,
- (c) Recognizing that tsetse fly and trypanosomosis (T&T) control programmes are complex and logistically demanding activities that require flexible, innovative and adaptable approaches in the provision of technical support,
- (d) Recognizing that tsetse flies and the trypanosomosis problem which they cause are increasing and constitute one of the greatest constraints on the African continent's socio-economic development, affecting the health of humans and livestock, limiting sustainable rural development and thus causing increased poverty and food insecurity,
- (e) Recognizing that although the new reported cases of human African trypanosomosis (HAT) are now below 3000 per year and are currently at the lowest level for several decades, animal trypanosomosis still affects millions of livestock every year and is a constraint to rural development for tens of millions of people in rural communities in 39 African countries, most of which are Agency Member States,
- (f) Recognizing the importance of the development of more efficient livestock production systems in rural communities affected by tsetse flies and trypanosomosis in order to reduce poverty and hunger and to form the basis for food security and socio-economic development,
- (g) Recalling decisions AHG/Dec.156 (XXXVI) and AHG/Dec. 169 (XXXVII) of the Heads of State and Government of the then Organization of African Unity (now African Union) to free Africa of tsetse flies and on a plan of action for implementing AU-PATTEC,
- (h) Recognizing the upstream work of the Agency under its Joint FAO/IAEA Programme of Nuclear Techniques in Food and Agriculture in developing the sterile insect technique (SIT) against tsetse flies and providing assistance through field projects, supported from the Agency's Technical Cooperation Fund, on integrating tsetse SIT into Member States' efforts to address the T&T problem in a sustainable manner,
- (i) Cognizant that the SIT is a proven technique for the creation of tsetse-free zones when integrated with other control techniques and when applied within an area-wide integrated pest management (AW-IPM) approach,
- (j) Welcoming the continuing close collaboration of the Secretariat with AU-PATTEC, in consultation with other mandated specialized United Nations organizations, in raising awareness regarding the T&T problem, organizing regional training courses and providing, through the Agency's Technical Cooperation programme and Regular Budget programme, operational

assistance to field project activities, as well as advice regarding project management and policy and strategy development in support of national and sub-regional AU-PATTEC projects,

(k) Welcoming the progress made in the implementation of the AU-PATTEC Strategic Plan for the period 2012–2018, and looking forward to its conclusion,

(l) Welcoming the progress made by AU-PATTEC in increasingly involving — besides international organizations such as the Agency, the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) — also non-governmental organizations and the private sector in addressing the T&T problem and to foster sustainable agriculture and rural development (SARD),

(m) Welcoming the progress made in the Agency-supported tsetse eradication project under the National Institute for Control and Eradication of Tsetse and Trypanosomiasis (NICETT) in the Ethiopian Southern Rift Valley and the progress made in eradication of tsetse in the Niayes Region of Senegal,

(n) Appreciative of the contributions made by various Members States and United Nations specialized agencies in support of addressing the T&T problem in West Africa, especially the contributions made by the United States of America through the Peaceful Uses Initiative (PUI) in support of projects for T&T control in Senegal and Burkina Faso,

(o) Acknowledging the continued close collaboration of the Secretariat and the International Centre of Research and Development for Livestock in Subhumid Zones (CIRDES) in Bobo-Dioulasso, Burkina Faso, the first IAEA Collaborating Centre in Africa for the ‘Use of the Sterile Insect Technique for Area-Wide Integrated Management of Tsetse Fly Populations’,

(p) Welcoming the opening of the Insectary of Bobo-Dioulasso (IBD) under the Burkina Faso PATTEC project as a sub-regional centre for the production and distribution of tsetse flies for the SIT,

(q) Acknowledging the assistance given by the Agency’s Department of Technical Cooperation and the Insect Pest Control Section to the IBD in supplying additional equipment and biological material to establish the colonies,

(r) Welcoming the efforts made by the Agency’s Department of Technical Cooperation and the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture in support of AU-PATTEC,

(s) Welcoming the efforts made by the Secretariat to address and eliminate obstacles to applying the SIT against tsetse flies in African Member States through applied research and methods development, both in-house and through the Agency’s coordinated research project mechanism, and

(t) Acknowledging the continued support given to AU-PATTEC by the Agency as outlined in the report submitted by the Director General in document GC(61)/12, Annex 1,

1. Urges the Secretariat to continue assigning high priority to agricultural development in Member States and to further intensify the efforts in advocating at the national and international levels in order to sensitize on the burden imposed by the T&T, and to redouble its efforts to build capacity and further develop the techniques for integrating the SIT with other control techniques in creating tsetse-free zones in sub-Saharan Africa;

2. Calls upon Member States to strengthen the provision of technical, financial and material support to African States in their efforts to create tsetse-free zones, while stressing the importance of a

needs-driven approach to applied research and methods development and validation to support operational field projects;

3. Requests the Secretariat, in cooperation with Member States and other partners, to maintain funding through the Regular Budget and the Technical Cooperation Fund for consistent assistance to operational SIT field projects and to strengthen its support for R&D and technology transfer to African Member States in order to complement their efforts to create and subsequently expand tsetse-free zones;

4. Requests the Secretariat to support Member States through technical cooperation projects on baseline data collection, development of full project proposals and implementation of operational tsetse eradication projects underpinned by on-site based experts, with priority given to genetically isolated tsetse populations;

5. Encourages the Agency's Department of Technical Cooperation and the Joint FAO/IAEA Division to continue supporting and working closely with AU-PATTEC in the agreed areas of collaboration as specified in the Memorandum of Understanding between the African Union Commission and the Agency signed in November 2009;

6. Stresses the need for continued harmonized, synergetic efforts by the Agency and other international partners, particularly FAO and WHO, with the aim of supporting the African Union Commission and Member States through the provision of guidance and quality assurance in planning and implementing sound and viable national and sub-regional AU-PATTEC projects;

7. Requests the Agency and other partners to strengthen capacity-building in Member States for informed decision-making regarding the choice of T&T strategies and the cost-effective integration of SIT operations in AW-IPM campaigns;

8. Urges the Secretariat and other partners to continue capacity building and to explore the possibilities of private-public partnership for the establishment and operation of tsetse mass rearing centres for providing cost-effectively large numbers of sterile male flies to different field programmes;

9. Encourages the countries that have selected a T&T strategy with an SIT component to focus initially on the field activities, including releases of sterile males imported from mass production centres as in the case of the successful eradication project in Senegal;

10. Encourages the Agency's Department of Technical Cooperation and the Joint FAO/IAEA Division to continue to support AU-PATTEC; and

11. Requests the Director General to report on the progress made in the implementation of this resolution to the Board of Governors and to the General Conference at its sixty-second (2018) regular session.

3.

Use of isotope hydrology for water resources management

The General Conference,

(a) Appreciating the work of the Agency in the area of isotope hydrology in response to resolution GC(59)/RES/12.A.3,

(b) Taking note of the progress made towards sustainable development during 2000–2015 under the United Nations' Millennium Development Goals and in the International Decade for Action, Water for Life, 2005–2015,

- (c) Taking note of the United Nations International Decade for Action, Water for Sustainable Development, 2018–2028, which will focus on the sustainable development and integrated management of water resources,
- (d) Aware that the United Nations continue to recognize the need for greater and concerted action in the area of water and that water is critical for sustainable development and the eradication of poverty and hunger,
- (e) Recognizing that the Sustainable Development Goals emphasize the need for increased availability of freshwater and expanded capacity-building efforts, which continue to be the primary objectives of the Agency's Water Resources Programme,
- (f) Aware that a lack of comprehensive mapping of water resources and related human capacity adversely impacts the ability of Member States to increase water availability and use,
- (g) Recognizing that the Agency has continuously demonstrated the importance of isotope techniques for water resources development and management, particularly for groundwater management in arid and semi-arid regions and for improved understanding of the water cycle,
- (h) Noting that initiatives of the Agency, as mentioned in document GC(61)/12, Annex 3, are addressing national priorities and have resulted in a wider use of isotope techniques for water resources and environmental management,
- (i) Appreciating the fact that the initiatives taken by the Agency, particularly in conjunction with bilateral and other international agencies, including the development of a new series of isotope hydrology outreach materials and the holding of joint training workshops, by the United Nations Commission on Sustainable Development and by the World Water Forum have significantly raised awareness of the Agency's work on water resources,
- (j) Appreciating the Agency's efforts in providing easier access for Member States to isotope hydrology analytical facilities through laser-based stable isotope analysers and tritium measurement systems,
- (k) Recognizing the Agency's efforts in strengthening Member States' capacities for performing standardized and high-quality isotope measurements, including through the development of software for the operation and performance assessment of laboratories engaged in the routine analysis of hydrogen and oxygen isotopes in water samples,
- (l) Noting that, under the pilot phase of the IWAVE (IAEA Water Availability Enhancement) Project, the Agency assisted Member States in increasing the availability and sustainability of freshwater based on comprehensive assessments of national water resources, and welcoming the steps being taken to expand the IWAVE Project to other Member States by including its methodology in new regional technical cooperation projects in the upcoming technical cooperation project cycle,
- (m) Noting the discussions and conclusions of the 2011 Scientific Forum, entitled "Water Matters: Making a Difference with Nuclear Techniques", and taking note of the Agency's participation in the sixth "World Water Forum", and
- (n) Noting the efforts of the Secretariat to assist Member States to better manage water resources, including its work aimed at improving expertise and collaboration among participating Member States in the use of environmental isotopes to better assess nitrogen pollution and eutrophication of lakes and rivers for optimal water resources management and remediation strategies,

1. Requests the Director General, subject to the availability of resources:
 - (a) to continue to further strengthen the efforts directed towards the fuller utilization of isotope and nuclear techniques for water resources development and management in the interested countries through appropriate programmes, by increased collaboration with national and other international organizations dealing directly with water resources management,
 - (b) to continue to help Member States obtain easy access to isotopic analysis by upgrading selected laboratories and by assisting Member States in adopting new and less expensive analytical techniques based on recent advances in relevant technologies, including laser-based ones,
 - (c) to expand activities related to the IWAVE Project and to groundwater management, particularly the assessment and management of fossil groundwater resources, including in arid and semi-arid areas, as well as to the safety and sustainability of these resources, in collaboration with regional and other international organizations, and to develop tools and methodologies for the improved mapping of water resources,
 - (d) to provide easier access for Member States to new techniques for the use of noble gas isotopes in the age-dating of groundwater, and
 - (e) to strengthen activities which contribute to the understanding of climate and its impact on the water cycle and which are aimed at better prediction and mitigation of water-related natural calamities, and to contribute to the success of the International Decade for Action, Water for Sustainable Development, 2018–2028;
2. Requests the Agency to continue, along with other relevant United Nations agencies and with relevant regional agencies, to develop human resources in isotope hydrology through appropriate courses, at universities and institutes in Member States, through the use of advanced communication techniques and educational tools and at regional training centres, designed to provide practicing hydrologists with the ability to use isotope techniques; and
3. Further requests the Director General to report on achievements in implementing this resolution to the Board of Governors and to the General Conference at its sixty-third (2019) session under an appropriate agenda item.

4.

Renovation of the Agency's Nuclear Applications Laboratories at Seibersdorf

The General Conference,

- (a) Recalling paragraph 9 of resolution GC(55)/RES/12.A.1, in which the General Conference called upon the Secretariat to make efforts, together with Member States, to modernize the Agency's Nuclear Applications (NA) Laboratories at Seibersdorf, thus ensuring maximum benefits to Member States, particularly developing ones,
- (b) Further recalling additional resolutions requiring that the NA Laboratories at Seibersdorf be fully fit-for-purpose (such as resolution GC(56)/RES/12.A.2, concerning the development of the sterile insect technique for the eradication and/or suppression of malaria-transmitting mosquitoes; resolution GC(57)/RES/12.A.3, concerning support to the African Union's Pan African Tsetse and Trypanosomosis Eradication Campaign (AU-PATTEC); resolution GC(56)/RES/12.A.4, on strengthening the support to Member States in food and agriculture;

resolution GC(57)/RES/9.13, regarding nuclear and radiological incident and emergency preparedness and response; and resolution GC(57)/RES/11, relating to the strengthening of the Agency's technical cooperation activities),

(c) Recognizing the growing applications, with economic and environmental benefits, of nuclear and radiation technologies in a wide variety of areas, the vital role that the NA Laboratories at Seibersdorf play in the demonstration and development of new technologies and in their deployment in Member States, and the dramatic increase in associated training courses and provision of technical services during recent years,

(d) Acknowledging with appreciation the worldwide leading role of the NA Laboratories at Seibersdorf in the establishment of global laboratory networks in several areas, such as the animal disease control networks supported through the Peaceful Uses Initiative (PUI), the African Renaissance Fund (ARF) initiative and numerous other initiatives,

(e) Further recognizing that the NA Laboratories at Seibersdorf are in urgent need of modernization in order to respond to the evolving range and complexity of the requests submitted to them and the growing demands of Member States and keep pace with increasingly rapid technological developments,

(f) Emphasizing the importance of fit-for-purpose laboratories that comply with health and safety standards and that have the appropriate infrastructure,

(g) Supporting the Director General's initiative regarding the modernization of the NA Laboratories at Seibersdorf, announced in his statement at the 56th regular session of the General Conference,

(h) Recalling resolution GC(56)/RES/12.A.5, and specifically paragraph 4, in which the General Conference requested the Secretariat "to develop a strategic overarching plan of action for the modernization of the NA Laboratories at Seibersdorf, provide a concept and methodology for the short-, medium- and long-term modernization programme and outline the vision and future role for each of the eight NA laboratories",

(i) Further recalling the report of the Director General to the Board of Governors (GC(57)/INF/11), mapping out activities and services of the NA Laboratories at Seibersdorf aimed at benefiting Member States and other stakeholders, quantifying projected future needs of and demands by Member States and identifying current and anticipated future gaps,

(j) Welcoming the Director General's report to the Board of Governors on the Strategy for the Renovation of the Nuclear Sciences and Applications Laboratories in Seibersdorf as contained in GOV/INF/2014/11, which outlines the necessary elements and resource requirements for assuring fit-for-purpose laboratories, known as the ReNuAL project, to be implemented from 2014–2017 within a €31 million target budget, and the Addendum to the Strategy as contained in GOV/INF/2014/11/Add.1, which provides an update to the Strategy defining the additional elements as contained in paragraph 15 of the Strategy, known as ReNuAL Plus (ReNuAL+), and the Agency's consideration to establish its own Biosafety Level 3 (BSL3) laboratory capabilities,

(k) Noting GOV/INF/2017/1, "The Renovation of the Nuclear Applications Laboratories Project (ReNuAL)", which provided an update to Member States on progress, resource requirements and the scope of ReNuAL+,

- (l) Further welcoming the Director General's report in GOV/2017/30-GC(61)/12, Annex 2, to the Board of Governors on progress made in implementing the ReNuAL project since the 60th General Conference,
- (m) Welcoming progress made in the construction of the new laboratory buildings and infrastructure under both ReNuAL and ReNuAL+ and noting that the Insect Pest Control Laboratory will be inaugurated on 25 September 2017 and that construction remains on schedule and on budget,
- (n) Recognizing the importance of the Agency's BSL3 capabilities to support Member States' efforts to control transboundary animal and zoonotic diseases, and appreciating the good cooperation with Austrian authorities, in particular the Austrian Agency for Health and Food Safety (AGES), which began providing full access and use of its new BSL3 facility at Mödling, thereby enhancing the Agency's ability to provide increased assistance to Member States in controlling transboundary animal and zoonotic diseases, and further noting the Austrian Government's offer of a package of land, infrastructure and technical services that it values at €2 million towards the Agency establishing its own BSL3 capabilities at the same facility in Mödling,
- (o) Noting the detailed planning carried out for ReNuAL+ in the second half of 2016 with the resulting scope and cost estimates described in GOV/INF/2017/1 and the target budget for ReNuAL+ of €26 million,
- (p) Welcoming that approximately €27 million in extrabudgetary funds have been raised for ReNuAL and ReNuAL+ to date, including over €6 million for ReNuAL+,
- (q) Further welcoming the financial and in-kind contributions and cost-free experts for the implementation of the ReNuAL project provided by the following 31 Member States: Australia, Austria, Belgium, Canada, China, France, Germany, India, Indonesia, Israel, Japan, Kazakhstan, the Republic of Korea, Kuwait, Oman, Malaysia, Mongolia, New Zealand, Norway, Pakistan, the Philippines, Qatar, the Russian Federation, Saudi Arabia, South Africa, Spain, Switzerland, Thailand, Turkey, the United Kingdom and the United States of America, as well as the Food and Agriculture Organization of the United Nations, the African Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA), one of the Agency's Collaborating Centres and two private contributors,
- (r) Recognizing the efforts of the informal group of Member States known as the 'Friends of ReNuAL' which are actively facilitating the mobilization of resources for the project and encouraging all Member States that are in a position to do so, to make resources available to support the renovation of the NA Laboratories at Seibersdorf,
- (s) Noting with appreciation that the €10.4 million planned in the Agency's capital Regular Budget to contribute approximately one-third of the ReNuAL project's €31 million budget has now been fully allocated and that full funding of the €31 million budget has been achieved,
- (t) Further noting the proposal in the draft 2018-2019 Programme and Budget to allocate €2 million each year to ReNuAL+ from the Major Capital Investment Fund, and
- (u) Acknowledging the efforts and progress made in seeking partnerships and contributions from non-traditional donors, particularly with regard to equipment needs, and further acknowledging with appreciation the establishment of a partnership with a manufacturer to provide the Dosimetry Laboratory with a linear accelerator at no cost for up to ten years, which represents the largest partnership of its kind to date for the Agency,

1. Stresses the need, in conformity with its Statute, for the Agency to continue pursuing adaptive research and development activities in the areas of nuclear science, technology and applications where the Agency has a comparative advantage, and to retain its focus on capacity-building initiatives and the provision of technical services so as to meet the basic sustainable development needs of Member States;
2. Requests the Secretariat to strive to ensure that, commensurate with the prominence of the NA Laboratories at Seibersdorf within the Agency, the urgent needs and projected future demands of Member States as regards the services of those laboratories are met within the overall funding target for the renovation project;
3. Encourages the Secretariat to continue to explore the possibilities of extra budgetary funding and in-kind contributions from non-traditional donors, and to assess the potential for collaboration with the private sector, within the Agency's financial and administrative rules and regulations, including for low- or no-cost arrangements for equipment acquisition;
4. Calls on the Secretariat to continue to pursue a project specific resource mobilization strategy seeking resources from Member States, foundations and the private sector and encourages partnerships amongst them and further encourages the Secretariat to consider devoting financial resources from savings or efficiency gains to the project, in consultation with Member States;
5. Further calls on the Secretariat to continue to develop targeted resource mobilization packages that will match the interest of the potential donors with the needs of ReNuAL+, prioritizing the elements that were originally in the adjusted project scope of ReNuAL and now moved to ReNuAL+;
6. Requests the Secretariat to provide information on the financial resources required for upcoming implementation and to indicate where resources are needed to match implementation schedules;
7. Invites Member States to make financial commitments and contributions, as well as in-kind contributions in a timely manner, as well as to facilitate cooperation with other partners, as relevant, including foundations and the private sector, to ensure that the completion of the third wing of the Flexible Modular Laboratory (FML) with full functionality can be undertaken as early as possible to ensure cost savings;
8. Further invites Member States, based on the information provided from the recent planning efforts of the Secretariat, to make the appropriate contributions to support the completion of the renovation of the NA Laboratories in Seibersdorf, as described in GOV/INF/2017/1, so that those elements within ReNuAL+ are implemented as soon as possible, in consultation with all Member States;
9. Encourages the 'Friends of ReNuAL' under the co-chairmanship of South Africa and Germany, and all Member States to continue to support the implementation of the project with a focus on mobilizing resources in a timely manner; and
10. Requests the Director General to report on progress made in the implementation of this resolution to the General Conference at its sixty-second (2018) session.

B. Nuclear power applications

1. General

The General Conference.

- (a) Recalling resolution GC(60)/RES/12 and previous General Conference resolutions on strengthening the Agency's activities related to nuclear science, technology and applications,
- (b) Noting that the Agency's objectives as outlined in Article II of the Statute include "to accelerate and enlarge the contribution of atomic energy to peace, health and prosperity throughout the world",
- (c) Noting also that the Agency's statutory functions include "to encourage and assist research on, and practical application of, atomic energy for peaceful uses", "to foster the exchange of scientific and technical information" and "to encourage the exchange and training of scientists and experts in the field of peaceful uses of atomic energy", including the production of electric power, with due consideration for the needs of developing countries,
- (d) Recalling the importance of involving the Member States in the drafting and publication process of important publications on nuclear energy,
- (e) Noting that in the present resolution, 'expanding countries' or 'expanding nuclear power programmes' mostly refers to re-embarking countries with existing nuclear power programmes, now considering or actively pursuing one or more modern nuclear power plants,
- (f) Noting the continued value of Integrated Work Plans (IWPs), which provide an operational framework for the delivery of optimized Agency assistance to support Member States with new and expanding nuclear programmes,
- (g) Acknowledging that actions have been taken by the Secretariat and Member States with nuclear power, drawing upon the lessons learned from the Fukushima Daiichi accident, endeavoring to enhance the robustness of nuclear power plants and fuel cycle facilities, as well as human and organizational effectiveness, and emphasizing the need for ensuring competent technical support at every stage of the lifetime of a nuclear power plant for safe and reliable operations,
- (h) Recalling the International Conference on Topical Issues in Nuclear Installation Safety: Safety Demonstration of Advanced Water Cooled Nuclear Power Plants, held in Vienna in June 2017, and organized jointly by the Department of Nuclear Safety and Security and the Department of Nuclear Energy, where participants considered the approaches to enhancement nuclear safety for newly designed water cooled reactors,
- (i) Recalling that launching new, as well as maintaining and expanding existing nuclear power programmes, require the development, implementation and continuous improvement of appropriate infrastructure to ensure the safe, secure, efficient and sustainable use of nuclear power, and implementation of the highest standards of nuclear safety, taking into account relevant Agency standards and guidance and relevant international instruments, as well as a strong and long-term commitment of national authorities to creating and maintaining this infrastructure,

- (j) Recognizing the growing interest within a number of Member States in next generation reactor designs,
- (k) Recalling that the development of innovative fast neutron systems, closed fuel cycles and alternative fuel cycles (e.g. thorium, recycled uranium) are regarded as steps towards a long-term sustainable energy supply that can extend the lifetime of nuclear fuel resources and contribute to effective solutions for nuclear waste management,
- (l) Recalling the International Conference on Fast Reactors and Related Fuel Cycles: Next Generation Nuclear Systems for Sustainable Development (FR17), held in June 2017 in Yekaterinburg (Russian Federation), where the main conclusions shared by participants were that innovative fast reactors and closed fuel cycles are a bridge to future sustainable and safe nuclear power, and that their current status demonstrates the maturity of technology that can extend the lifetime of nuclear fuel resources and be an effective solution for nuclear waste management,
- (m) Noting the increasing number of requests from Member States for advice on the exploration of uranium resources and on mining and milling for safe, secure and effective uranium production while minimizing the environmental impact, and acknowledging the importance of the Agency's assistance in this field,
- (n) Noting the importance of identifying undiscovered uranium or secondary uranium resources, and underlining the necessity to support uranium mine remediation, as part of a sustainable nuclear programme,
- (o) Noting the 26th edition of the 'Red Book' (Uranium 2016: Resources, Production and Demand), a recognized world reference on uranium, jointly prepared by the OECD Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA) and published in November 2016,
- (p) Recalling the signing of a Host State Agreement between the Agency and Kazakhstan, and the signing of a Transit Agreement between the Agency and the Russian Federation and welcoming the signing of a Transit Agreement between the Agency and China to support the implementation of the low enriched uranium (LEU) bank,
- (q) Welcoming the opening of the LEU Bank Storage Facility on 29 August 2017, in Oskemen, Kazakhstan,
- (r) Taking note of the Workshop organized by the Agency, along with the publication of related Secretariat documents, dedicated to assuring a fair, transparent and competitive process for the acquisition of LEU,
- (s) Noting also the functioning of the LEU Guaranteed Reserve in Angarsk, Russian Federation, comprising 120 tons of LEU under the aegis of the Agency,
- (t) Aware of the availability of the American Assured Fuel Supply, a bank of approximately 230 tons of LEU, for responding to supply disruptions in countries pursuing peaceful civilian nuclear programmes,
- (u) Welcoming the conversion of the Miniature Neutron Source Reactor (MNSR) in Ghana from highly enriched uranium (HEU) fuel to LEU fuel, which has been completed by China, the United States, the Agency and the host country Ghana,
- (v) Recognizing the role that the effective management of spent fuel and radioactive waste should play in avoiding imposing undue burdens on future generations, and recognizing that,

while each Member State should, as far as is compatible with the safe management of such material, dispose of the radioactive waste it generates, in certain circumstances the safe and efficient management of spent fuel and radioactive waste might be fostered through agreements among Member States to use facilities in one of them for their mutual benefit,

(w) Stressing the importance of Agency safety standards related to the management of radioactive waste and spent nuclear fuel and the benefits of strong cooperation with international organizations, and commending the technical documents published by the Department of Nuclear Energy intended to support their implementation,

(x) Recognizing that the establishment of a robust safety, security and non-proliferation infrastructure in States considering introducing nuclear reactors is vital for any nuclear programme, and stressing that the use of nuclear power must be accompanied at all stages by commitments to and ongoing implementation of the highest standards of safety and security throughout the life of the power plants, and effective safeguards, consistent with Member States' national legislation and respective international obligations and welcoming the Agency's assistance in these areas,

(y) Emphasizing the need to ensure effective management of spent fuel and radioactive waste, decommissioning and remediation in a safe and sustainable manner, and confirming the important role of science and technology in continuously addressing these challenges, particularly through innovations,

(z) Recognizing the continuing efforts and good progress that have been made on the Fukushima Daiichi site, whilst noting the important and complex decommissioning, environmental remediation and radioactive waste management challenges that remain,

(aa) Acknowledging that it is important for Member States that opt to use nuclear power to engage the public in science-based and transparent dialogue,

(bb) Recognizing that the growing number of shutdown reactors increases the need for collecting experience and developing adequate methods and techniques for decommissioning, environmental remediation and managing large volumes of radioactive waste, including contaminated water, resulting from the decommissioning of facilities, legacy practices and radiological or nuclear accidents,

(cc) Acknowledging progress made in the field of deep geological disposal of both spent nuclear fuel and highly radioactive waste, and further acknowledging the vital importance of involving national authorities, including regulatory bodies, in order to enhance stakeholder engagement,

(dd) Recognizing the need for Member States to evaluate and manage the financial commitments that are necessary for planning and implementing radioactive waste management programmes, including disposal,

(ee) Commending the continuous efforts of the Secretariat to enable the safe and effective borehole disposal of disused sealed radioactive sources, and acknowledging Canadian funding to enable borehole pilot projects being implemented in Ghana, the Philippines and Malaysia,

(ff) Noting the Agency's integrated peer review service for radioactive waste and spent fuel management, decommissioning and environmental remediation programmes (ARTEMIS) and welcoming the requests made by Italy, Australia and Poland to each host a mission in 2017, and by France, Bulgaria, Luxemburg and Spain for reviews in 2018,

(gg) Noting the request for Member States, expressed in Madrid in 2016 and reflected in the corresponding Proceedings “Advancing the Global Implementation of Decommissioning and Environmental Remediation Programmes”, to reach consensus on matters where further international collaboration could contribute to safe and cost-effective decommissioning and remediation, wherever applicable,

(hh) Recalling the importance of human resource development, education and training and knowledge management and stressing the Agency’s unique expertise and capacity to assist Member States in building their national capacities to support the safe, secure and efficient use of nuclear power and its application, inter alia through its technical cooperation programme,

(ii) Recognizing the importance and ongoing need to strengthen management competencies in the nuclear sector, especially in developing countries embarking on or expanding nuclear power programmes, and commending the Agency’s successful facilitation of university implemented master’s programmes in nuclear technology management (NTM) through the collaboration framework of the International Nuclear Management Academy (INMA),

(jj) Noting that significant concerns related to energy resource availability, the environment, energy security, climate change and its impacts, which have been reflected in the Sustainable Development Goals (SDGs) by the Member States of the United Nations in September 2015, suggest that a wide variety of energy options needs to be addressed in a holistic manner in order to promote access to competitive, clean safe, secure and affordable energy, so as to support sustainable economic growth in all Member States,

(kk) Taking note that nuclear power does not produce either air pollution or greenhouse gas emissions during normal operation, which makes it one of the low carbon technologies available to generate electricity,

(ll) Acknowledging that each State has the right to decide its priorities and establish its national energy policy in accordance with its national requirements, taking into account relevant international obligations, and to use diverse portfolios of energy sources in order to achieve its energy security, while also working to address climate change, including, as applicable, through actions under the Paris Agreement adopted on 12 December 2015,

(mm) Recognizing the challenges in obtaining a large amount of financing to construct nuclear power plants as a viable and sustained option in meeting energy needs, and taking into account appropriate financing schemes, which could involve investors from not only the public sector but also the private sector where it is available,

(nn) Acknowledging the importance of fostering increased international collaboration in research on advanced nuclear power technologies and alternative non-electric nuclear energy systems and their applications,

(oo) Noting the important role that the Agency plays in assisting Member States in the establishment, preservation and enhancement of nuclear knowledge and in implementing effective knowledge management programmes at national and organizational levels and confirming the important role of nuclear knowledge management programmes in strengthening nuclear education, training and networking capabilities,

(pp) Recognizing the role that safe, secure, reliably operated and well utilized research reactors can play in national, regional and international nuclear science and technology programmes, including support of R&D in the fields on neutron science, fuel and material testing, and education and training,

(qq) Acknowledging the increasing regional demand for the Agency's Nuclear Energy Management School and its positive impact on enhancing awareness and understanding of nuclear sector issues and challenges among future nuclear professionals and managers,

(rr) Calling attention to the long term benefit of implementing effective and targeted capacity building to support national plans to implement new or expanding nuclear power programmes, especially in developing countries,

(ss) Commending the Secretariat for the continued support provided for the implementation and promotion of the International Centre based on Research Reactors (ICERR) scheme and acknowledging with appreciation the designation as ICERR of the Belgian Nuclear Research Centre (SCK-CEN) and of the US Department of Energy (Idaho National Laboratory and Oak Ridge National Laboratory), and

(tt) Taking note of the Nuclear Technology Review 2017 (GC(61)/INF/4), as well as of the report Strengthening the Agency's Activities related to Nuclear Science, Technology and Applications (GOV/2017/30-GC(61)/12) prepared by the Secretariat,

1. Affirms the importance of the role of the Agency in facilitating through international cooperation among interested Member States, the development and use of nuclear energy for peaceful purposes, including the specific application of the generation of electric power, in assisting these States in that regard, in fostering international cooperation and in disseminating to the public well-balanced information on nuclear energy;
2. Encourages the Agency to continue its support to interested Member States in building their national capacities in the operation of nuclear power plants and in embarking on new nuclear power programmes;
3. Encourages Member States to develop programmes and initiatives in close coordination with the Agency, to improve and promote Member States' expertise;
4. Encourages the Secretariat to support regional technical cooperation projects for initiatives in the areas of knowledge management, including support for the implementation of national level Education Capability Assessment and Planning missions and initiatives, programmes to foster and strengthen university collaboration in nuclear research, the development of e-learning resources and support for e-learning platforms, and flexible student fellowships to support nuclear professionals from developing countries to participate in and to complete INMA-endorsed university master's programmes in NTM;
5. Urges the Secretariat to support participation in regional NEM Schools for qualified developing-country students through regional funding of technical cooperation fellowships;
6. Commends the Agency for the assistance and review services for Member States with embarking and re-embarking national nuclear power programmes and encourages Member States to voluntarily use this assistance and the Agency's review services when planning and assessing the economics/socio-economics of their energy programmes, developing their national infrastructures for nuclear power and defining their long-term strategies for sustainable nuclear energy;
7. Requests the Secretariat to initiate a programme to explore new ways to foster international partnerships, investment and collaboration that is inclusive of developing countries and is focused on innovation through joint international research and development in advanced nuclear power technologies and alternative non-electric nuclear energy systems and their applications that will significantly contribute to attaining the SDGs in a responsible, safe, secure and economically sound manner that enhances proliferation resistance.

8. Encourages the Secretariat to pursue its efforts in reducing the number of finalized but unpublished documents, and in promoting the systematic review of older publications, as appropriate;
9. Welcomes the Secretariat's sharing of a regularly updated list of documents being drafted and the opportunity for willing Member States to provide inputs;
10. Urges the Secretariat to improve the ability of policymakers and experts to access information on the IAEA web site in support of the Agency's work;
11. Recognizes the importance of assisting Member States interested in uranium production to develop and maintain sustainable activities through appropriate technology, infrastructure and stakeholder involvement and the development of skilled human resources and encourages the Agency to cooperate with the OECD/NEA for the publication of the 27th edition of the 'Red Book' on Uranium: Resources, Production and Demand;
12. Looks forward to the organization by the Secretariat of the 4th International Symposium on Uranium Raw Material for the Nuclear Fuel Cycle: Exploration, Mining, Production, Supply and Demand, Economics and Environmental Issues (URAM 2018), which is expected to take place in 2018;
13. Encourages the Agency to formulate guidance documents on uranium mining for countries developing uranium exploration and mining programmes based on the analysis and promotion of practical know how and innovative knowledge regarding environmental aspects of uranium exploration, mining and site remediation;
14. Welcomes the Secretariat's efforts in pursuing activities for enhancing Member State capabilities in modelling, predicting and improving the understanding of the behaviour of nuclear fuel under accident conditions, for instance through Coordinated Research Projects;
15. Welcomes the Secretariat's effort to ensure a fair LEU acquisition process for the LEU bank;
16. Encourages discussion among interested Member States on the development of multilateral approaches to the nuclear fuel cycle, including on the one hand possibilities of creating mechanisms for assurance for nuclear fuel supply and on the other hand possible schemes for the back end of the fuel cycle, recognizing that any discussion on these matters should take place in a non-discriminatory, inclusive and transparent manner and be respectful of the rights of each Member State to develop national capabilities;
17. Encourages the upcoming publication of the report setting out the results of the 2013 project on 'Status and Trends in Spent Fuel and Radioactive Waste', which was initiated as a joint activity of three agencies — the OECD/NEA, the IAEA and the European Commission;
18. Stresses the importance of the safe management of spent fuel, which for some Member States includes reprocessing and recycling, as well as the safe management and/or disposal of radioactive waste, including its transport, inter alia for the safe, secure, efficient and sustainable development of nuclear science and technology, including nuclear power, and to avoid imposing undue burdens on future generations;
19. Requests the Secretariat to continue and strengthen its efforts relating to the fuel cycle, spent fuel and radioactive waste management, and to assist Member States, including those embarking on nuclear power programmes, to develop and implement adequate disposal programmes, in accordance with relevant safety standards and security guidance;

20. Encourages the Secretariat to continue the preparation of safety and technical documents on the management of large amounts of waste generated after a nuclear or radiological accident and on the implementation of post-accident decommissioning and environmental remediation projects;
21. Encourages the Secretariat to promote information sharing to better integrate approaches to the back end of the fuel cycle that impact retrievability, transport, storage and recycling of spent nuclear fuel, for example through the coordination of research projects and to provide more information on designing, constructing, operating and closing a radioactive waste disposal facility, and thereby assisting Member States, including those embarking on nuclear power programmes, to develop and implement adequate disposal programmes, in accordance with relevant safety standards and security guidance;
22. Encourages the Secretariat to pursue its activities on 'Status and Trends of Radioactive Waste Management' by publishing a series of reports on global inventories on radioactive waste and spent nuclear fuel and on advanced planning for their management;
23. Requests the Agency, through its new Decommissioning and Environmental Remediation Section, to formulate guidance documents on decommissioning and action plans to support decommissioning, inter alia by establishing an international cooperation framework for implementation with a view to promoting the safe, secure, efficient and sustainable execution of these activities;
24. Encourages the Agency to further strengthen its activities in the area of environmental remediation such as the ENVIRONET network, in close collaboration with the Department of Nuclear Safety and Security;
25. Encourages the Secretariat to further promote the ARTEMIS peer review service concept, explaining its benefits as a means of encouraging Member States to invite such peer reviews where appropriate;
26. Encourages further strengthening of Agency safety standards and strong cooperation with international organizations, such as through the Net-Enabled Waste Management Database;
27. Encourages the Agency to further strengthen its activities in support of the effective management of disused sealed radioactive sources (DSRS) through support to field operation and capacity building for characterization, dismantling, packaging for storage or transport and the development of Qualified Technical Centres for DSRS management;
28. Looks forward to the upcoming 4th IAEA International Ministerial Conference on Nuclear Power in the 21st Century, to be hosted by the United Arab Emirates in October/November 2017, and encourages interested Member States to participate in this important event;
29. Encourages the Agency to continue to organize capacity building workshops on vital topics related to nuclear power to understand and implement, in an integrated way, the requirements of effective management systems to ensure the safety, effectiveness and sustainability of nuclear power programmes;
30. Acknowledges the importance of the Agency's technical cooperation projects for assisting Member States in energy analysis and planning, and in establishing the infrastructure required for the safe, secure and efficient introduction and use of nuclear power, and encourages interested Member States to consider how they can further contribute in this field by enhancing the Agency's technical assistance to developing countries, and notes the importance of active stakeholder involvement in the development or expansion of nuclear power programmes;

31. Encourages the Secretariat to continue to enhance Member States' understanding as they seek to identify potential approaches to financing nuclear power programmes, including radioactive waste management in a changing international financial landscape, and encourages interested Member States to work with the relevant financial institutions towards addressing financial issues related to the introduction of enhanced safety design and technologies for nuclear power;
32. Encourages the Secretariat to analyse the technical and economic cost drivers for economic sustainability of nuclear power operation, especially in the scope of life extension, to determine the value of nuclear power in the energy mix considering environmental conditions;
33. Welcomes the new quadrennial report *International Status and Prospects for Nuclear Power 2017* (GOV/INF/2017/12-GC(61)/INF/8), which is an important document for the 2017 International Ministerial Conference on Nuclear Power in the 21st Century owing to its analysis of global nuclear power capacity;
34. Encourages the Secretariat to reshape the annual publication Energy, Electricity and Nuclear Power Estimates for the Period up to 2050, Reference Data Series No. 1, in order to better describe the plausible development of new nuclear power plants in different world regions whatever the scenario taken into account, and invites willing Member States to support the Secretariat with the promotion of this publication;
35. Requests the Secretariat to continue to pursue, in consultation with interested Member States, the Agency's activities in the areas of nuclear science and technology for nuclear power applications in Member States, with a view to strengthening infrastructures, including safety and security, and fostering science, technology and engineering, including capacity building via the utilization of existing research reactors;
36. Encourages the Secretariat to continue to foster regional and international collaboration and networking that expands access to research reactors, such as international user communities;
37. Encourages the Secretariat to inform Member States considering the development or installation of their first research reactor of the issues related to utilization, cost-effectiveness, environmental protection, safety and security, nuclear liability, proliferation resistance, environmental protection, and waste management associated with such reactors, and, on request, to assist decision makers in pursuing new reactor projects following the Agency-developed Specific Considerations and Milestones for a Research Reactor Project systematically and on the basis of a robust, utilization-based strategic plan;
38. Urges the Secretariat to continue to provide guidance on all aspects of the research reactor life cycle, including the development of ageing management programmes at both new and older research reactors, to ensure continuous improvements in safety and reliability, sustainable long term operation, the sustainability of fuel supply, and the exploration of efficient and effective disposition options for spent fuel and waste management and the development of a knowledgeable customer capability in Member States embarking on decommissioning of research reactors;
39. Acknowledges with appreciation the requests from Uzbekistan and Portugal to host Operation and Maintenance Assessment for Research Reactors (OMARR) missions at their WWR-SM facility and RPI facility respectively, and further encourages Member States operating research reactors to voluntarily invite an OMARR mission;
40. Acknowledges with appreciation the engagement of the Secretariat in the promotion of the ICERR scheme, calls on willing Member States to apply for designation, and encourages already designated facilities to cooperate together or join international networks and research programmes on relevant activities of interest to Member States;

41. Acknowledges with appreciation the kick-off of the IAEA Internet Reactor Laboratory project in Latin America, Europe and Africa with the successful broadcasting of reactor physics experiments as well as the implementation of multi-research reactor-based regional schools and hands-on training courses and encourages the Secretariat to further strengthen its efforts to support capacity building based on research reactors;
42. Calls on the Secretariat to continue to support international programmes working to minimize the civilian use of HEU, for example through the development and qualification of LEU high density fuel for research reactors, where such minimization is technically and economically feasible;
43. Stresses the importance, when planning and deploying nuclear energy, including nuclear power and related fuel cycle activities, of ensuring the highest standards of safety and emergency preparedness and response, security, non-proliferation, and environmental protection, for example through the promotion of a platform for the international nuclear community to continuously exchange information on R&D addressing safety issues highlighted by the Fukushima Daiichi accident, as well as the strengthening of long-term research programmes to learn about severe accidents and related decommissioning activities;
44. Welcomes the continuation of the IAEA Peaceful Uses Initiative and all contributions announced by Member States or regional groups of States, and encourages Member States and groups of States, in a position to do so, to contribute;
45. Requests that the actions of the Secretariat called for in this resolution be undertaken as a priority subject to the availability of resources; and
46. Requests the Secretariat to report to the Board of Governors as appropriate and to the General Conference at its sixty-second (2018) session on developments relevant to this resolution.

2.

Communication and IAEA cooperation with other agencies

The General Conference,

- (a) Welcoming the Secretariat's contributions to international discussions addressing global climate change, such as at the Conferences of the Parties to the United Nations Framework Convention on Climate Change (COP), and taking note of the participation of the Agency in the Intergovernmental Panel on Climate Change (IPCC), and
 - (b) Commending the proactive approach of the Secretariat to identify relevant areas of activities among the 17 SDGs adopted by the United Nations in 2015,
1. Requests the Secretariat to continue cooperation with international initiatives such as UN-Energy, and to explore the possibility of cooperation with Sustainable Energy for All (SE4All), stressing the importance of ongoing, transparent communications about the risks and benefits of nuclear power in operating and newcomer countries;
 2. Encourages the Secretariat's efforts in providing comprehensive information on nuclear energy's potential as a low carbon energy source and its potential to contribute to mitigating climate change, in advance of COP 23 to be held in Bonn, in November 2017, and encourages the Secretariat to work directly with Member States upon request and to continue to extend its activities in these areas, including the Paris Agreement;

3. Encourages the Agency to participate in and contribute expertise and data to the scientific assessment on climate change in the IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-industrial Levels and related Global Greenhouse Emission Pathways;
4. Encourages the Agency to consider senior level representation at COP 23 and other major international forums where climate change and the potential role of nuclear power may be discussed; and
5. Encourages strengthening mutual cooperation between Member States by exchanging information on relevant experiences and good practices with respect to nuclear power programmes, through international organizations such as the IAEA, OECD/NEA and the World Association of Nuclear Operators (WANO).

3. Operating nuclear power plants

The General Conference,

- (a) Stressing the essential role the Agency plays as an international forum for the exchange of information and experience on nuclear power plant operation and for continuous improvement of this exchange among interested Member States, inter alia through the Nuclear Operator Organization Cooperation Forum held during regular sessions of the General Conference, while recognizing both the role of international organizations such as the OECD/NEA, and multinational networks among operators, such as WANO, and the need to further strengthen the cooperation between the Agency and these organizations,
 - (b) Noting the growing importance of long-term operation of existing nuclear power plants and underlining the need to share relevant lessons learned from long-term operations, including safety aspects, for the benefit of new programmes that may have nuclear power plants capable of operating beyond 60 years,
 - (c) Welcoming new IAEA publications and tools on procurement and supply chain issues, including bidding and contract evaluation processes, and
 - (d) Stressing the importance of adequate human resources for ensuring, inter alia, the safe and secure operation and the effective regulation of a nuclear power programme, and noting the increasing need, worldwide, for trained and qualified personnel to support nuclear energy related activities during construction, commissioning and operation including long-term operation, performance improvements, effective radioactive waste management and decommissioning,
1. Requests the Secretariat to promote collaboration among interested Member States for strengthening excellence in nuclear power plant operation and to establish effective collaboration mechanisms such as technical working groups for safe, secure, efficient and sustainable operation of nuclear power plants and also for application of management systems in the nuclear industry to exchange information on relevant experiences and good practices in safe and effective nuclear power plant operation;
 2. Requests the Secretariat to continue its support to interested Member States, in particular through strengthening their knowledge, experience and capacity in management of ageing and plant life management, and welcomes the upcoming 4th International Conference on Nuclear Power Plant Life Management (PLiM), in France, in October 2017;

3. Encourages the Secretariat to disseminate best practices and experience through the publication of technical documents with respect to learning and development, leadership, safety culture, organizational culture, stakeholder involvement, decision-making and management, for the whole life cycle of facilities and activities, including the need to maintain an appropriate organizational structure while nuclear power plants are in permanent shutdown, or in transition to decommissioning;
4. Acknowledges the growing interest in the application of advanced instrumentation and control systems and encourages the Agency to provide further support to interested Member States;
5. Recognizes the need to enhance further the support for grid and nuclear power plant interfaces, grid reliability and water usage, and recommends that the Secretariat collaborate with Member States that have operating nuclear power plants on these matters;
6. Encourages the Secretariat to identify and promote best practices and lessons learned, through Technical Documents and Guides, with respect to procurement and supply chain issues, including bidding and contract evaluation processes, and also to support experience sharing related to quality control and quality surveillance activities related to nuclear construction, component manufacturing, and modifications, with respect to fitness for service issues and independent nuclear training accreditation;
7. Welcomes the Technical Meeting on Operational Experience with Implementation of Post-Fukushima Actions in Nuclear Power Plants and encourages the nuclear owner/operating organizations of Member States to share their experience and knowledge related to methods and strategies for the implementation of post-Fukushima actions at nuclear power plants; and
8. Requests the Secretariat to support Member States involved with nuclear power, which needs a knowledgeable workforce, and welcomes the Third International Conference on Human Resource Development for Nuclear Power Programmes: Meeting Challenges to Ensure Future Nuclear Workforce Capability, which will take place in Gyeongju, Republic of Korea, from 28–31 May 2018.

4.

Agency activities in the development of innovative nuclear technology

The General Conference,

- (a) Recalling its previous resolutions on the Agency's activities in the development of innovative nuclear technology,
- (b) Conscious of the need for sustainable development and of the potential contribution of nuclear power to meet the growing energy needs in the 21st century and mitigating climate change,
- (c) Noting the progress achieved in a number of Member States in the development of innovative nuclear energy system technologies and the high technical and economic potential of international collaboration in the development of such technologies,
- (d) Noting that the membership of the Agency's International Project on Innovative Nuclear Reactors and Fuel Cycles (INPRO), which was launched in 2000, is continuing to grow and now comprises 41 Member States and the European Commission,
- (e) Noting also that the Agency fosters collaboration among interested Member States on selected innovative technologies and approaches to nuclear power through INPRO Collaborative Projects, Technical Working Groups (TWGs) working on facilitating innovations

for advanced reactors and nuclear fuel cycle options, and Coordinated Research Projects, and acknowledging that the coordination of INPRO-related activities is achieved through the Agency's Programme and Budget and the INPRO Subprogramme Plan,

(f) Noting that the INPRO Subprogramme Plan identifies activities in areas of global and regional nuclear energy scenarios, innovations in nuclear technology and institutional arrangements including such key collaborative projects as Roadmaps for a Transition to Globally Sustainable Nuclear Energy Systems (ROADMAPS), the project on Key Indicators for Innovative Nuclear Energy Systems (KIND), the project on Cooperative Approaches to the Back End of the Nuclear Fuel Cycle: Drivers and Legal, Institutional and Financial Impediments and other collaborative projects on specific issues of interest related to innovative nuclear reactor and fuel cycle concepts and designs,

(g) Noting that the scope of INPRO includes activities to support interested Member States in developing national long-range sustainable nuclear energy strategies and related nuclear energy deployment decision making, including nuclear energy system assessments (NESAs) using INPRO methodology, the INPRO Dialogue Forum and regional training on nuclear energy system modelling, including collaborative scenarios, and sustainability assessment using the INPRO methodology,

(h) Noting with appreciation that INPRO has successfully completed the collaborative project on Synergistic Nuclear Energy Regional Group Interactions Evaluated for Sustainability (SYNERGIES) and received content approval for the final report of the Secretariat,

(i) Noting that the INPRO Secretariat has drafted the final report of the collaborative project on KIND,

(j) Noting that INPRO and the Planning and Economic Studies Section have jointly drafted an IAEA TECDOC on Experience in Modelling Nuclear Energy Systems with MESSAGE: Country Case Studies,

(k) Noting that within the on-going collaborative ROADMAPS project, INPRO has developed a template comprising structural elements, linked by a common logic and allowing for the characterization of the current situation through the NESAs and plans for its development from a short-, medium- and long-term perspective, indicating the opportunities for saving time, effort and resources for improving characteristics of a national NESAs through international cooperation,

(l) Noting the progress of other national, bilateral and international activities and initiatives, and their contributions to joint research and development work on innovative approaches to nuclear energy deployment and operation,

(m) Recognizing that a number of Member States are planning to license, construct and operate prototypes or demonstrations of fast neutron systems, high temperature reactors and other innovative reactors and integrated systems within the next decades, and noting that the Secretariat is fostering this process through the provision of international fora for the exchange of information, thus supporting interested Member States to develop innovative technology with enhanced safety, proliferation resistance and economic performance,

(n) Welcoming the increased participation at the meeting, organized in November 2015, to "present and share important information on the interest and status of technology developments in the area of molten-salt and molten-salt cooled advanced reactors" and welcoming the meeting that took place in November 2016, and

(o) Noting with appreciation the Director General's report on Agency activities in the development of innovative nuclear technology contained in document GOV/2017/30-GC(61)/12,

1. Commends the Director General and the Secretariat for their work in response to the relevant General Conference resolutions, in particular the results achieved to date within INPRO;
2. Emphasizes the important role that the Agency can play in assisting interested Member States in building long-term national nuclear energy strategies and in long-term sustainable nuclear energy deployment decision-making through NESAs, based on the INPRO methodology, and nuclear energy scenario analyses;
3. Encourages the Secretariat to consider further opportunities to develop, coordinate and integrate the services it provides to Member States, including broad energy planning and long-term nuclear energy planning, economic analysis and technico-economic assessments, NESAs and assessments of transition scenarios to sustainable nuclear energy systems using, inter alia, the analytical framework developed by INPRO;
4. Encourages the Secretariat to consider further implementation of on-line conferences for interested Member States, based on distance communication systems, so that they may support the application of the analytical framework for modelling and assessment of the INPRO Collaborative Project: Analytical Framework for Analysis and Assessment of Transition Scenarios to Sustainable Nuclear Energy Systems, an approach for comparative evaluation of nuclear energy system options based on key indicators and multi-criteria decision analysis methods;
5. Encourages interested Member States and the Secretariat to apply the ROADMAPS template for national case studies on options for achieving a Transition to Globally Sustainable Nuclear Energy Systems, including case studies based on cooperation among technology holder and technology user countries;
6. Requests the Secretariat to promote collaboration among interested Member States in developing innovative, globally sustainable nuclear energy systems and to support the establishment of effective collaboration mechanisms to exchange information on relevant experiences and good practices;
7. Requests the Secretariat to promote further application of multi-criteria decision analysis methods for comparative evaluation of plausible nuclear energy system options by interested INPRO Members to support decision analysis and prioritization in national nuclear energy programmes;
8. Encourages the Secretariat to study cooperative approaches to the back end of the nuclear fuel cycle with a focus on the drivers and institutional, economic and legal impediments to ensure effective cooperation among countries towards the long-term sustainable use of nuclear energy;
9. Invites Member States and the Secretariat to examine the role that technological and institutional innovations can play in improving nuclear power infrastructure and enhancing nuclear safety, security and non-proliferation and to exchange information, including through the INPRO Dialogue Forum;
10. Invites all interested Member States to join, under the aegis of the Agency, in the activities of INPRO in considering issues of innovative nuclear energy systems and institutional and infrastructure innovations, particularly by continuing assessment studies of such energy systems and their role in national, regional and global scenarios for the further use of nuclear energy, and also by identifying common topics of interest for possible collaborative projects;

11. Encourages the Secretariat to further its efforts on distance learning/training on development and evaluation of innovative nuclear technology for students and staff of universities and research centres, and to further develop tools supporting this activity that supports efficient delivery of services to Member States;
12. Notes with appreciation that the INPRO Section jointly with the Planning and Economic Studies Section has prepared a new Nuclear Energy Series report on Modelling Nuclear Energy Systems with MESSAGE: A User's Guide, and is using it as a reference document in learning and training activities carried out by both sections;
13. Encourages the Secretariat and interested Member States to complete the revision of the INPRO methodology, taking into account the results of NESAs performed in Member States and lessons learned from the Fukushima Daiichi accident, while noting updates to the INPRO manuals dealing with infrastructure, economics, depletion of resources and environmental stressors;
14. Recognizes ongoing efforts by the Secretariat and interested Member States to conduct comprehensive case studies for deployment of factory-fuelled small modular reactors as follow on to the already published preliminary study on transportable nuclear power plants (TNPPs);
15. Recommends that the Secretariat continue to explore opportunities for synergy between the Agency's activities (including INPRO) and those pursued under other international initiatives in areas relating to international cooperation in peaceful uses of nuclear energy, safety, proliferation resistance and security issues and, in particular, supports collaboration among INPRO, appropriate TWGs, the Generation IV International Forum (GIF), the International Framework for Nuclear Energy Cooperation (IFNEC) and the European Sustainable Nuclear Industrial Initiative (ESNII) with regard to innovative and advanced nuclear energy systems;
16. Invites interested Member States that have not done so to consider joining INPRO and to contribute to innovative nuclear technology activities by providing scientific and technical information, financial support, or technical and other relevant experts and by contributing to joint collaborative projects on innovative nuclear energy systems;
17. Encourages the Secretariat to continue, through the consolidation of available resources and additional assistance from interested Member States, regular training and workshops on innovative nuclear technologies and their underlying science and technology to exchange knowledge and experience in the area of innovative, globally-sustainable nuclear energy systems;
18. Notes the role of research reactors in supporting the development of innovative nuclear energy systems;
19. Calls upon the Secretariat and Member States in a position to do so to investigate new reactor and fuel cycle technologies with improved utilization of natural resources and enhanced proliferation resistance, including those needed for the recycling of spent fuel and its use in advanced reactors under appropriate controls and for the long-term disposition of remaining waste materials, taking into account, inter alia, economic, safety and security factors;
20. Recommends that the Secretariat continue to explore, in consultation with interested Member States, activities in the areas of innovative nuclear technologies, such as alternative fuel cycles (e.g. thorium, recycled uranium) and Generation IV nuclear energy systems including fast neutron systems, supercritical water-cooled, high-temperature gas cooled and molten salt nuclear reactors, with a view to strengthening infrastructure, safety and security, fostering science, technology, engineering and capacity building via the utilization of existing and planned experimental facilities and material test reactors, and with a view to strengthening the efforts aimed at creating an adequate and harmonized

regulatory framework so as to facilitate the licensing, construction and operation of these innovative reactors;

21. Welcomes the extra budgetary funds provided to the Secretariat's activities for the development of innovative nuclear technology and encourages Member States in a position to do so to consider how they can further contribute to the Secretariat's work in this area; and

22. Requests the Director General to report on the progress made in the implementation of this resolution to the Board of Governors and to the General Conference at its sixty-second (2018) regular session under an appropriate agenda item.

5.

Approaches to supporting nuclear power infrastructure development

The General Conference.

(a) Recognizing that the development and implementation of an appropriate infrastructure to support the successful introduction of nuclear power and its safe, secure and efficient use is an issue of great importance, especially for countries that are considering and planning for the introduction of nuclear power,

(b) Recalling its previous resolutions on approaches to supporting nuclear power infrastructure development,

(c) Stressing that primary responsibility for nuclear safety and security rests with States and their regulatory agencies, licensees and operating organizations in order to achieve the protection of the public and environment, and that a strong infrastructure is necessary to execute this responsibility,

(d) Commending the Secretariat's effort to provide support in the areas of human resource development, which continues to be a high priority to Member States that are considering and planning for the introduction of nuclear power with assessments of infrastructure needs, taking into account relevant economic, social and policy considerations, to support the safe, secure and efficient use of nuclear power, and noting the Agency's increasing activities in this area, in accordance with the requests of Member States,

(e) Noting the Secretariat's effort to provide support in the area of stakeholder involvement, which continues to be of utmost importance to Member States that are considering and planning for the introduction of nuclear power,

(f) Recognizing the continued value of the Agency's Integrated Nuclear Infrastructure Review (INIR) missions, which provide expert and peer-based evaluations, in helping requesting Member States to determine their nuclear infrastructure development status and needs,

(g) Noting the 22 INIR and follow-up INIR missions performed since 2009 at the request of 16 Member States, and further noting that additional countries thinking of launching or re-embarking on nuclear power programmes are considering requesting INIR missions,

(h) Welcoming the establishment of IWPs, which provide an operational framework for the planning and delivery of Agency assistance in support of national nuclear programmes, thereby facilitating optimized assistance by the Agency to embarking countries,

- (i) Noting the publication of Nuclear Energy Series reports and the organization of a wide range of conferences, technical meetings and workshops on topics related to infrastructure development,
 - (j) Recognizing the NEM School and other training courses on management and leadership and on construction management, and mentoring programmes implemented under the Agency's auspices, in China, the Czech Republic, France, Japan, the Republic of Korea, the Russian Federation, Sweden, the United Kingdom and the United States of America, as effective platforms for leadership development,
 - (k) Taking note of the Secretariat's cooperation with the IFNEC,
 - (l) Noting the importance of coordination of activities within the Agency for nuclear infrastructure development, through the Nuclear Power Support Group, the Infrastructure Coordination Group and the respective Core Teams established to support each specific Member State considering and planning the introduction of nuclear power, or the expansion of their existing nuclear power programme,
 - (m) Noting the increasing number of Technical Cooperation projects, including the provision of assistance to Member States planning to introduce or expand nuclear power generation in conducting energy studies to evaluate future energy options, especially in the scope of their Nationally Determined Contributions (NDCs), taking into account the highest standards of safety and planning for appropriate nuclear security frameworks,
 - (n) Noting the joint efforts of the Nuclear Infrastructure Development Section and INPRO in developing innovative infrastructure approaches for future nuclear energy systems,
 - (o) Commending the Technical Working Group on Nuclear Power Infrastructure that provides guidance to the Agency on approaches, strategy, policy and implementing actions for the establishment of a national nuclear power programme,
 - (p) Welcoming the Secretariat's efforts in the production of a series of e-learning modules, based on the 19 infrastructure issues defined by the Agency's Milestones approach, of which 17 have already been released on-line, supporting capacity building in both countries embarking on new nuclear programmes and countries expanding their nuclear programmes;
 - (q) Recognizing the importance of encouraging effective workforce planning for operating and expanding nuclear power programmes, worldwide, and the increasing need for trained personnel, and
 - (r) Taking note of other international initiatives focusing on support for infrastructure development,
1. Commends the Director General and the Secretariat for their efforts in implementing resolution GC(60)/RES/12.B.5 as reported in document GC(61)/12;
 2. Encourages the Nuclear Infrastructure Development Section to pursue its activities integrating the Agency's assistance provided to Member States embarking on or expanding nuclear power programmes;
 3. Encourages the Secretariat to facilitate broad international participation at all technical meetings, workshops, training courses and conferences on nuclear infrastructure development sponsored by in kind support from Member States;

4. Encourages Member States to ensure the development of the appropriate legislative and regulatory frameworks, which are necessary for the safe introduction of nuclear power;
5. Encourages Member States embarking on nuclear power programmes to conduct a self-evaluation based on IAEA Nuclear Energy Series No. NG-T-3.2 (Rev. 1) to identify gaps in their national nuclear infrastructure and to invite an INIR mission and relevant peer review missions, including site design safety reviews, prior to commissioning the first nuclear power plant, and to make public their INIR mission reports in order to promote transparency and to share best practices;
6. Requests the Secretariat to consolidate the application of the Milestones approach (IAEA Nuclear Energy Series No. NG-G-3.1 (Rev. 1), 2015) across the Agency as the leading document for the use of Member States in the development of new nuclear power programmes and in the establishment of corresponding IWPs;
7. Invites Member States to make use of INIR follow-up missions to assess progress and determine whether recommendations and suggestions were successfully implemented;
8. Requests the Secretariat to continue to learn lessons from INIR missions and to enhance the effectiveness of such INIR activities;
9. Urges Member States to develop and keep updated Action Plans to address the recommendations and suggestions provided by the INIR missions and encourages them to participate in the development and updating of their Member State-specific IWPs;
10. Welcomes the activities undertaken by the Secretariat to finalize the development of the evaluation methodology for Phase 3 (before commissioning) INIR missions, with willing newcomers or expanding Member States close to commissioning;
11. Encourages the Secretariat to be prepared to perform INIR missions in all UN official languages, to allow the highest level of information exchange during the missions and to expand the panel of related experts, especially in countries using one of these languages as a working language, while ensuring that the use of such experts does not constitute a conflict of interest or convey commercial advantage;
12. Encourages the activities undertaken by the Secretariat to promote cooperation between newcomer countries and those with established nuclear power programmes;
13. Encourages Member States to use the competency framework and requests the Secretariat to continue to update the nuclear infrastructure bibliography, as a useful tool to help Member States plan Technical Cooperation and other assistance;
14. Encourages the Secretariat to continue to strengthen training related to the development of a knowledgeable future owner/operator;
15. Invites all Member States that are considering or planning for the introduction or expansion of nuclear power to provide, as appropriate, information and/or resources to enable the Agency to apply its full spectrum of tools in support of nuclear infrastructure development;
16. Requests the Secretariat to provide an update, at the earliest opportunity, of the technical document on managing suspect and counterfeit items in the nuclear industry and encourages Member States to consider making use of the document once it is published;
17. Calls on the Secretariat to facilitate, as necessary, ‘soft coordination’ among Member States for the more efficient implementation of multilateral and bilateral assistance to countries considering or planning for the introduction or expansion of nuclear power;

18. Welcomes the activities undertaken by Member States, both individually and collectively, to cooperate on a voluntary basis in nuclear infrastructure development and encourages further such cooperation;
19. Welcomes the extra budgetary funds provided to the Secretariat's activities for the infrastructure development support to Member States and encourages Member States, in a position to do so, to consider how they can further contribute to the Secretariat's work in this area; and
20. Requests the Director General to report on the progress made in the implementation of this resolution to the Board of Governors and to the General Conference at its sixty-second (2018) session under an appropriate agenda item.

6.

Small and medium-sized reactors or small modular reactors – Development and deployment

The General Conference,

- (a) Recalling its previous resolutions on small and medium-sized nuclear reactors – development and deployment,
- (b) Noting that the Agency has a dedicated project, to support small and medium or modular reactors (SMRs), highlighting their potential as an option for enhancing energy availability and supply security both in expanding and embarking countries and to address economics, environmental protection, safety and security, reliability, enhanced proliferation resistance and waste management issues,
- (c) Aware of activities in some Member States related to the development and deployment of small modular reactors that produce electric power up to 300 MW(e), and which can be manufactured as modules in factory setting and are transportable to utilities for installation,
- (d) Aware also of the continuing activity of the International Framework for Nuclear Energy Cooperation on SMRs, with participation by the Agency,
- (e) Recognizing that smaller reactors could be better suited to the small electrical grids of many developing countries with less developed infrastructure, and that for some developed countries they could be one way to replace, in line with goals to reduce greenhouse gas emissions, obsolete, ageing or high-carbon-emitting power sources, but acknowledging that the size of nuclear reactors is a national decision that each Member State takes on the basis of its own needs and the size of its electrical grid,
- (f) Noting that SMRs could play an important role in appropriate markets with cogeneration such as district heating, desalination and hydrogen production systems in future, and their potential for innovative energy systems,
- (g) Acknowledging that the Secretariat in 2013 – 2017 has published Nuclear Energy Series reports Approaches for Assessing the Economic Competitiveness of Small and Medium Sized Reactors (NP-T-3.7), Options to Enhance Proliferation Resistance of Innovative Small and Medium Sized Reactors (NP-T-1.11), and Instrumentation and Control Systems for Advanced Small Modular Reactors (NP-T-3.19), TECDOCs Progress in Methodologies for the Assessment of Passive Safety System Reliability in Advanced Reactors (IAEA-TECDOC-1752) and Design Safety Considerations for Water Cooled Small Modular Reactors Incorporating Lessons Learned from the Fukushima Daiichi Accident (IAEA-TECDOC-1785), which

contributed to Action 12, Effectively utilize Research and Development, of the IAEA Nuclear Safety Action Plan, and a technical booklet Advances in Small Modular Reactor Technology Developments – A Supplement to IAEA Advanced Reactors Information System (ARIS), and looking forward to the forthcoming Nuclear Energy Series report on Technology Roadmap for Small Modular Reactor Deployments and TECDOCs on Environmental Impact Assessment for Small Modular Reactor Deployments and Options to Enhance Energy Supply Security using Hybrid Energy Systems using SMRs – Synergizing Nuclear and Renewable Energies.

(h) Noting the outcomes of the 13th INPRO Dialogue Forum on Legal and institutional issues in the global development of small modular reactors and the meeting on Incorporating Lessons Learned from the Fukushima Daiichi Accident in SMR Technology Assessment for Design of Engineered Safety Systems and the completion of the pilot project for a Small Modular Reactor Regulators' Forum in May 2017,

(i) Recognizing the role that innovative technologies can play in developing SMRs, and noting the ongoing initiative from INPRO of a collaborative project The INPRO Case Study for the Deployment of a Factory Fuelled Small Modular Nuclear Reactor (SMR), and

(j) Noting with appreciation the Director General's report entitled Development and Deployment of Small and Medium Sized Reactors, Including Small Modular Reactors (GOV/2017/30-GC(61)/12, Annex 7),

1. Commends the Director General and the Secretariat for their work in response to previous relevant General Conference resolutions;
2. Encourages the Secretariat to continue taking appropriate measures to assist Member States, particularly embarking countries, engaged in the process of preparatory actions with regard to demonstration projects, and encouraging the development of safe, secure, economically viable SMRs with enhanced proliferation resistance;
3. Calls upon the Secretariat to continue to promote effective international exchange of information on options as regards SMRs available internationally for deployment and on topics such as technology roadmaps for SMR development and deployment, infrastructure requirements for countries embarking on new nuclear power programmes, operational performance, maintainability, safety and security, waste management, constructability, economics, and enhanced proliferation resistance, by organizing technical meetings and workshops, as appropriate, and to produce relevant status and technical reports;
4. Invites the Secretariat and Member States that are in a position to offer SMRs to foster international cooperation in undertaking studies of the social and economic impacts of SMR deployment in developing countries;
5. Encourages the Secretariat to continue consultations and interactions with interested Member States, the competent organizations of the United Nations system, financial institutions, regional development bodies and other relevant organizations regarding advice on the development and deployment of SMRs;
6. Encourages the Secretariat to continue working on defining indicators of safety performance, operability, maintainability and constructability so as to assist countries in assessing advanced SMR technologies, and developing guidance for SMR technology implementation, and looks forward to upcoming reports on enhancing energy supply security and approaches to environmental impact assessment;

7. Encourages the Secretariat to continue providing guidance for safety, security, economics, licensing and regulatory reviews of SMRs of various designs;
8. Encourages the Secretariat to foster collaboration among interested Member States with the objective of facilitating the licensing of SMRs;
9. Encourages the Secretariat to facilitate capacity building in embarking countries as regards SMR technology assessment;
10. Looks forward to the Secretariat's report on the Small Modular Reactors Regulators' Forum Pilot Project;
11. Encourages the Secretariat to finalize the publication of the Nuclear Energy Series report entitled Technology Roadmap for Small Modular Reactor Deployments and TECDOCs entitled Environmental Impact Assessment for Small Modular Reactor Deployments, and Options to Enhance Energy Supply Security using Hybrid Energy Systems using SMRs – Synergizing Nuclear and Renewable Energies;
12. Encourages the Secretariat to continue the activities of the project Common Technologies and Issues for SMRs on both the development of key enabling technologies and the resolution of key infrastructure issues for innovative SMRs of various types, which is complementary to INPRO;
13. Invites the Director General to raise appropriate funding from extra budgetary sources in order to contribute to the implementation of Agency activities relating to the sharing of construction and operating experience for the development and deployment of SMRs; and
14. Requests the Director General to continue to report on:
 - i. the status of the programme initiated to assist developing countries interested in SMRs,
 - ii. progress made in the research, development, demonstration and deployment of SMRs in interested Member States intending to introduce them, and
 - iii. progress made in the implementation of this resolution to the Board of Governors and to the General Conference at its sixty-third (2019) regular session under an appropriate agenda item.