Workshop on Nuclear Safety: Current Status and Future Challenges

VCDNP
Vienna Center for Disarmament and Non-Proliferation

Permanent Mission of Japan

to the International Organizations in Vienna

4 July 2016

Workshop on Nuclear Safety: Current Status and Future Challenges

Executive Summary

On 4 July 2016, the Permanent Mission of Japan to the International Organizations in Vienna (Permanent Mission of Japan) and the Vienna Center for Disarmament and Non-Proliferation (VCDNP) co-organized the "Workshop on Nuclear Safety: Current Status and Future Challenges". In commemoration of the 30th anniversary of the Chernobyl Nuclear Power Plant accident and the fifth anniversary of the Fukushima Daiichi Nuclear Power Plant accident, the workshop's aim was to provide a forum for sharing understanding of the current status of, and identifying future challenges to, nuclear safety.

A diverse group of speakers tackled the problematics of nuclear safety from the perspectives of international organizations and national governments and their respective regulatory agencies, among others. Some recurring themes throughout the four sessions of the workshop included: the safety of nuclear installations and international legal frameworks for nuclear safety; the importance of communicating to the public information regarding nuclear accidents in a timely and simple manner; the need to increase international cooperation in the field of nuclear safety; and the necessity of drawing lessons from the past to prevent accidents from occurring in the future. Participants and speakers praised the convening of the workshop as an informal venue to engage in productive discussions on the subject of nuclear safety.

The following report on the results of the workshop was drafted by Max Moretti, VCDNP Research Fellow, in collaboration with the Permanent Mission of Japan. Photo Credit: VCDNP (David Cliff)

Opening Remarks

Laura Rockwood, Executive Director of the VCDNP, delivered the opening remarks. She noted that the workshop had been convened in commemoration of the 30th anniversary of the Chernobyl Nuclear Power Plant accident and the fifth anniversary of the Fukushima Daiichi Nuclear Power Plant accident to recall the lessons learned and the enormous and deadly consequences of inadequate nuclear safety – not just as a national matter, but as a matter of global safety and security. In that regard, Ms. Rockwood recalled Director General Yukiya Amano's statement in the International Atomic Energy Agency's (IAEA) Fukushima report: "Although nuclear safety remains the responsibility of each individual country, nuclear accidents can transcend national borders."

The disaster at Chernobyl illustrated clearly the transnational impacts of a nuclear accident on such a scale: a quarter of a million people had been displaced; 200,000 square kilometers had been contaminated with radiation in Russia, Ukraine and Belarus. It was thus fitting that the workshop was attended by participants from different corners of the world.

Laura Rockwood

Much has been achieved in strengthening nuclear safety in the intervening years. We now have an Incident and Emergency Response Centre at the IAEA, four safety conventions, two codes of conduct, fundamental safety principles and globally recognized IAEA safety standards. However, much work remains to be done. The IAEA's Action Plan on Nuclear Safety is a reminder of this. With global appetites for nuclear power recovering, Ms. Rockwood stressed, safety should be the underpinning factor in any State's decision to build a nuclear program.

Keynote Address

The following keynote address was delivered by H.E. Ambassador Mitsuru Kitano, Permanent Mission of Japan to the International Organizations in Vienna:

Your Excellencies, dear Colleagues, Ladies and Gentlemen,

It is my great pleasure to welcome you all to the "Workshop on Nuclear Safety: Current Status and Future Challenges." On behalf of the Permanent Mission of Japan and the VCDNP, I would like to thank you for your participation.

This year marks the fifth anniversary since the Fukushima Daiichi accident. In the intervening years, we have worked on strengthening nuclear safety, drawing on lessons learned from the accident. Japan's handling of the Fukushima Daiichi Nuclear Power Plant is on the right track. Internationally, we have made important achievements in recent years, including the publication of the 2013 United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) Fukushima Report and the 2015 IAEA Fukushima Report, the adoption of the Vienna Declaration by the Contracting Parties to the Convention on Nuclear Safety (CNS) and the implementation of IAEA Nuclear Safety Action Plan, which led to a revision of IAEA Safety Standards and to the increased number of IAEA review missions of various kinds to Member States.

H.E. Ambassador Mitsuru Kitano

While these are all important achievements that we should be proud of, we need to guard against becoming complacent. Building on the past achievements, we are now at the new stage of further enhancing nuclear safety. I understand that the IAEA is currently working on a new methodology to employ a systematic approach to nuclear safety, based on the IAEA General Conference's resolution on nuclear safety last year. A new IAEA Medium Term Strategy, in which nuclear safety will be an important pillar, is also in the process of being drafted. Discussions on a nuclear safety resolution for the General Conference this year will start shortly. And the wider use of nuclear technology in both power and non-power sectors worldwide should mean more demand in many countries for enhancing their capacities to safely operate nuclear installations and handle radioactive materials. Therefore, it is the right time for all of us to discuss ways forward, and that is exactly why we offered to co-host this workshop.

Ladies and Gentlemen,

As we are privileged to have so many distinguished speakers among us today, I expect a lively discussion on nuclear safety from various perspectives. It is not my intention to prejudge any takeaway of the discussion this afternoon, but do allow me the opportunity to put forward a couple of points as "food-for-thought".

First, we need to redouble our efforts to strengthen international legal frameworks for nuclear safety and ensure their effective implementation. With more newcomer countries in nuclear power and more ageing reactors in existing nuclear power countries, further universalization of the CNS and strengthening its review process are very important. The CNS provides a platform for contracting parties to peer review their respective actions to enhance nuclear safety; and the Vienna Declaration is an important document in that regard. All contracting parties have been encouraged to make enhanced national reporting in preparation for the seventh Review Meeting next year. Encouraging more countries to join other legal frameworks, such as the Joint Convention and the Convention on Supplementary Compensation for Nuclear Damage (CSC), is also important.

Second, Emergency Preparedness and Response (EPR) is a critical area for international cooperation, fully drawing on the lessons learned from the Fukushima Daiichi accident. In this respect, we are pleased to see that the IAEA Response and Assistance Network-Capacity Building Centre in Fukushima has been making a significant contribution in sharing experiences of the Fukushima accident with other countries. Japan will continue to fully support this initiative.

Third, due to the wider use of nuclear technology, the diversity of nuclear safety challenges need to be addressed in a systematic and coherent way. Nuclear safety is not just a matter for countries operating nuclear power stations, but also for the larger number of countries using radioactive sources in non-power sectors. Ensuring nuclear safety is a prerequisite for the peaceful use of nuclear technology. Capacity building support to those countries using nuclear technology is key, and IAEA Technical Cooperation (TC) programmes can play an important role to that end. Japan will actively consider supporting those TC programmes through the Peaceful Uses Initiative (PUI), in consultation with the IAEA and relevant countries. Transport safety is another important area; the Informal Dialogue between Coastal and Shipping States currently chaired by Japan serves as a trust building platform.

Last but not least, the importance of public communication on nuclear safety cannot be underestimated. In this era of social networks, information is instant. Any failure on our part to communicate effectively with the general public in the aftermath of nuclear safety incidents will lead to losing their confidence in nuclear safety. In connection with our own experience, Fukushima highlighted the challenges of disseminating data and information in a timely manner and in the right context. In this regard, the active involvement of UNSCEAR and the IAEA in public communication has been very helpful. Japan will

actively consider enhancing the capacity of UNSCEAR and the IAEA to facilitate their work in helping Member States to improve their public communication.

Ladies and Gentlemen,

Given the critical role of nuclear technology, we, the Vienna community, should reaffirm the importance of nuclear safety, renew our commitment to it and share a common vision for the next steps towards improved nuclear safety.

I hope that this workshop will be a valuable experience for all of you.

Thank you very much.

Session 1: Historical Overview on Nuclear Safety

Session 1, moderated by Ms. Rockwood, provided a historical overview of nuclear safety.

The session was opened by Juan Carlos Lentijo, Deputy Director General (DDG) of the IAEA's Department of Nuclear Safety and Security. Mr. Lentijo's presentation covered key aspects of the IAEA's Action Plan on Nuclear Safety and its report on the Fukushima Daiichi accident.

The purpose of the Action Plan was to develop a work plan for strengthening the global nuclear safety framework. With the goal of implementing lessons learned from Fukushima, the Action Plan addressed 12 areas:

- Safety assessments;
- IAEA Peer Reviews;
- Emergency Preparedness and Response;
- National Regulatory Bodies;
- Operating Organizations;
- IAEA Safety Standards;
- International Legal Frameworks;
- Member States Embarking on Nuclear Power;
- Capacity Building;
- Protection from Ionizing Radiation;
- Communication; and
- Research and Development.

Since the Action Plan was unanimously adopted in September 2011, over 1000 activities had been carried out to make nuclear power safer worldwide. The 15 IAEA international expert missions to Japan were especially noteworthy, since they implemented a number of activities ranging from costal marine monitoring to the management of contaminated water and radioactive waste. The Fukushima accident led to a 60 percent increase in IAEA peer review missions, which were further strengthened by the Action Plan.

DDG Lentijo observed that the international community had felt the need to promote information sharing and to base decisions on independent assessments of nuclear safety standards. In the wake of the accident, nine international expert meetings involving over 1500 leading experts from different fields (research, industry, regulatory) were organized by the IAEA for the purpose of identifying best practices, sharing lessons learned and, perhaps most importantly, ensuring that these best practices and lessons learned were widely disseminated. The aim was to prevent similar accidents from occurring in the future.

Approximately 180 experts were involved in drafting the 2015 IAEA Report on the Fukushima accident, which was comprised of four technical volumes and an introductory report by Director General Amano. The report highlighted more than 100 lessons learned and observations related to the causes and consequences of the accident. DDG Lentijo stressed that even though significant progress had been achieved by implementing the Action Plan, there was still work to be done, since nuclear safety was an ongoing process, "a never-ending story". Indeed, the IAEA General Conference had requested, in its September 2015 nuclear safety resolution, that the IAEA continue building on the experience of implementing the Action Plan and the observations and lessons from the Fukushima report. DDG Lentijo noted that the IAEA was responding to this request by developing a systematic approach for analyzing lessons learned not only from Fukushima, but also from peer review missions and technical meetings, with the aim of covering all kinds of nuclear facilities and activities. In his own words, this effort was intended to "strengthen nuclear safety in a continuous and systematic way". In his concluding remarks, DDG Lentijo described the IAEA's Fukushima report and Action Plan as providing a solid knowledge base for strengthening nuclear safety in the future. The IAEA is prepared to offer its support to its Member States, who are expected to continue strengthening nuclear safety based on these lessons.

The next speaker was Malcolm Crick, Secretary of UNSCEAR. Mr. Crick focused on UNSCEAR's 2013 Fukushima Report and the Committee's follow-up activities. After briefly explaining UNSCEAR's mandate, Mr. Crick identified the main findings of the report, among which were the following:

- Atmospheric releases as a result of the Fukushima accident had amounted to approximately 10 percent of those released at Chernobyl;
- There was no expectation of a discernible increase in cancer rates among workers;
- There was no expectation of an impact on birth and hereditary effects; and
- There was a theoretical increased risk of thyroid cancer for children that had been most exposed to radioiodine in the first few months after the accident.

Since its report was issued in 2013, UNSCEAR has continued to monitor the radiological situation by collecting and evaluating published information on atmospheric, marine, terrestrial and freshwater dispersion, along with worker dose and non-human biota impact assessments. UNSCEAR continues to assess whether there are any inconsistencies between scientific publications and its report. In this regard, UNSCEAR annually releases a White Paper that reviews the literature on the Fukushima accident. The latest White Paper (2015) determined that there had been no significant challenges to UNSCEAR's 2013 conclusions. Mr. Crick spoke of

the need for future scientific research to advance understanding of the accident: evaluations of doses to evacuees; studies on the migration and transfer of cesium to food; and data on thyroid screening. Among the outreach activities carried out by UNSCEAR, Mr. Crick mentioned that scientists had been trained in communicating conclusions and that UNSCEAR's reports, accompanied by factsheets, had been translated into Japanese. In summarizing his presentation, Mr. Crick emphasized the value of UNSCEAR's work due to its high standards of scientific independence and quality.

Next on the panel was Masato Usui, Director of the Japanese International Nuclear Energy Cooperation Division. Mr. Usui highlighted the activities of the Group of 7 (G7) Nuclear Safety and Security Group (NSSG) in 2016. In its 2016 meeting, the NSGG, which provides G7 leaders with policy advice on issues related to nuclear safety and security, reaffirmed the G7 commitment to ensuring nuclear safety and supporting the work of the IAEA. The NSSG 2016 report stressed the importance of enhancing legal frameworks and ensuring resources to strengthen safety infrastructures. The report specifically addressed implementation by the G7 of the IAEA's Action Plan on Nuclear Safety. In this regard, the NSSG called for: the continuous application of self-assessment; the further development of emergency preparedness and response mechanisms; and the assurance of safety in newcomer States to nuclear energy. The Group called for further assistance by the IAEA in human resource development, a much needed capacity building measure. The NSSG further urged all States exporting nuclear material to ensure that receiving States had a robust safety infrastructure in place. The establishment of such infrastructures should be deemed a priority for all, since every stakeholder in international nuclear transfers is responsible for contributing to nuclear safety. The NSSG commended the steady progress that was being made at the Fukushima Daiichi Nuclear Power Station with regard to decontamination, decommissioning and water management issues. On a similar note, the Group reiterated its commitment to cooperating with the Ukrainian Government with the aim of making the Chernobyl site environmentally safe. Mr. Usui stressed that the work of the NSSG focused on making recommendations that could be shared with, and followed by, the international community.

The last speaker during the first session was Aleksei Raiman, Senior Counsellor at the Permanent Mission of Belarus, who provided a thoughtful and personal reflection on the consequences of the Chernobyl accident for the country of Belarus. The estimated cost to the Government of Belarus exceeded 200 billion dollars; the enormous environmental damage to agriculture and forestry caused by contamination had an extremely negative impact on the country's economy. When Belarus became a sovereign State, a costly national reconstruction program was implemented. The country had focused its efforts on several priority areas, including social protection, science and research, and public information. To this day, although scientific research has produced a great deal of information about the Chernobyl event, there is still no complete understanding of the effects of the accident and human exposure to radiation continues. The main challenge was and is delivering scientific knowledge in an understandable manner to the public at large. To address that issue, the Government of Belarus instituted centers for disseminating information about radiation. The priority target groups were the most educated people who could not only help spread knowledge, but also serve as an example of how to live in a safe manner. Since younger generations are receptive to change, it was possible to reverse negative trends.

Mr. Raiman concluded by mentioning that the Government of Belarus, as a practical step for the future, plans to launch an initiative in 2017 to achieve environmental sustainability at Chernobyl.

As each of the speakers in this session had touched on the importance of outreach and education, Ms. Rockwood asked how the panelists thought better communication could be achieved. Given that radiation is perceived as frightening and risks are often exaggerated, Ms. Rockwood raised the issue of how to calm these concerns. Mr. Crick pointed out that UNSCEAR's strategy has been to work with multipliers, citizens who are locally trusted, like teachers and doctors. Mr. Crick underscored the importance of separating facts from assumptions. Delivering proven knowledge should be the first step in reassuring the public. Mr. Raiman reinforced this concern, stating that, after the Chernobyl accident, the initial silence on behalf of the authorities had actually increased fears of radiation. The other panelists agreed that communication is very difficult when nuclear incidents occur, but that priority should always be given to conveying the message that ensuring the population's health is the main goal of nuclear safety.

Panelists (from left): Laura Rockwood, Juan Carlos Lentijo, Malcolm Crick, Masato Usui and Aleksei Raiman

Session 2: Strengthening Nuclear Installation Safety

Session 2 focused on current and future efforts to strengthen nuclear installation safety. The session was moderated by Dr. Rachelle Allen, First Secretary of the Permanent Mission of Australia to the United Nations in Vienna.

The first speaker to take the floor was Philip Webster, Counsellor at the Permanent Mission of Canada and Advisor to the President of the seventh Review Meeting of the CNS. Mr. Webster started with a brief overview of the CNS Review Meetings that had taken place since the Fukushima accident. He emphasized the interconnections between the progression of CNS Review Meetings and external events, such as the development of the IAEA Action Plan. The CNS Extraordinary Meeting in 2012, for example, had led to the formation of a working group, which proposed revisions to the IAEA's Guidelines regarding the Review Process under the Convention on Nuclear Safety (INFCIRC/571) and the Guidelines regarding National Reports under the Convention on Nuclear Safety (INFCIRC/572). Both were subsequently adopted at the 2014 CNS Review Meeting. INFCIRC/571 was revised to improve training, strengthen peer review and introduce the Country Review Report. In addition, the CNS contracting parties reaffirmed that regulatory authorities should ensure that nuclear power plants are built according to the highest safety standards. In preparation for the 2017 Review Meeting, States that have signed but not ratified the CNS have been requested to do so, while newcomer countries have been asked to become signatories.

Session 2 continued with a presentation by His Excellency Rolf Stalder, Ambassador and Resident Representative to the IAEA of the Permanent Mission of Switzerland to the International Organizations in Vienna. Ambassador Stalder discussed the 2015 Vienna Declaration on Nuclear Safety. The purpose of this document is to offer principles to guide States in the implementation of the objectives of the CNS on preventing accidents with radiological consequences and mitigating such consequences should they occur. The Vienna Declaration has three core principles: (1) prevent accidents in nuclear power plants and, should an accident occur, mitigate possible releases of radionuclides causing long-term off-site contamination in order to avoid early radioactive releases; (2) conduct periodic assessments of existing nuclear power plants; (3) take into account relevant IAEA safety standards and other good practices. The aforementioned Country Review Reports should outline the work done in accordance with the principles of the Vienna Declaration. A special rapporteur will draft a number of questions addressed to all Contracting Parties with nuclear power plants as well as embarking countries. The rapporteur will then assess how the Vienna Declaration is implemented in national legislation and regulations. The introduction of Country Review Reports represents an important change. These documents provide a compliance statement about the safety of the nuclear program of each country along with basic information regarding the implementation of planned safety measures. Ambassador Stalder expects that this political document will gradually set the norm for reporting on progress, or lack thereof, in the field of nuclear safety.

The final speaker of this session was Alfonso de las Casas Fuentes, Counsellor at the Permanent Mission of Spain to the International Organizations in Vienna. Mr. de las Casas Fuentes gave a presentation on the activities of the Ibero-American Association of Nuclear and Radiological Regulators, FORO. The aim of the Association is to promote radiation protection and nuclear

safety and security in the region by providing a platform for exchanging information. Part of its mission is to harmonize regulatory practices through cooperation with organizations like the IAEA. FORO develops its technical program based on the regional and national needs of its members without duplicating the activities of other international organizations. Regulatory experts meet to discuss experiences and good practices and share their results with others. Among the projects completed by FORO, Mr. de las Casas Fuentes referred to a project on safety culture with respect to the use of ionizing radiation. Another significant project, which had recently been extended, is the implementation of SEVRRA software, a tool for preventing accidental exposures in radiotherapy through risk evaluations. SEVRRA has been used in hundreds of hospitals, mostly in Ibero-American countries, and is in the process of being linked to the IAEA's SAFRON, a large database on radiotherapy medical events. Mr. de las Casas Fuentes concluded by reiterating the importance of cooperation between FORO and the IAEA, which disseminates the results achieved by FORO and acts as its main scientific reference.

The discussion, once again, revolved around the opacity of nuclear safety and how progress could be achieved by enhancing transparency and communicating with the public. All of the panelists referred to the positive developments introduced by the Vienna Declaration. In response to a question from the audience on how to measure the success of a CNS Review Meeting, Mr. Webster suggested that two useful indicators could be the number of countries that attend the meetings and the number of reports that are submitted.

Panelists (from left): Philip Webster, Ambassador Rolf Stalder and Alfonso de las Casas Fuentes

Ambassador Stalder pointed out that, in the end, it is not what is written on paper that matters, but rather the concrete actions taken by countries.

Session 3: Strengthening Radiation, Waste and Transport Safety

Session 3 focused on strengthening radiation, waste and transport safety. The session was moderated by Hilaire Lionel Mansoux, Head of the Control of Radiation Sources Unit in the IAEA's Department of Nuclear Safety and Security.

Maryem Haddaoui

The first speaker was Maryem Haddaoui, Counsellor at the Permanent Mission of the Kingdom of Morocco to the International Organizations in Vienna. She stressed the importance of having a legal and regulatory framework. In this regard, Ms. Haddaoui referred to the adoption of a law on nuclear and radiological safety and security by the Moroccan Government in 2014 and the establishment of an independent regulatory body in 2015. In doing so, Morocco had aligned itself with the safety standards of the IAEA. Morocco plans to enhance regional cooperation by organizing the first regional meeting of African regulatory bodies. Morocco is also committed to increasing human resource development in order to build the capacities of local stakeholders through training activities supported by the IAEA's TC programme.

Every two years, in partnership with the IAEA, Morocco organizes the Post Graduate Educational Course (PGEC) on Radiation Protection and the Safety of Radiation Sources. It targets national participants and individuals from French-speaking African countries. The course is designed to improve the education of national and regional stakeholders. Within Morocco's current regulatory framework, a number of technical services, such as individual monitoring of workers and environmental monitoring of laboratories, have been established to support the national safety regulatory infrastructure and national radiation protection program. Morocco has also established a national inventory of radioactive sources and developed national strategies for gaining or regaining control over orphan sources. Ms. Haddaoui addressed the interface between the safety and security of radiological and nuclear materials, pointing to a joint exercise organized in collaboration with Spain in October 2015. Cooperation among safety and security stakeholders is, in her view, essential. Ms. Haddaoui concluded by reiterating that a legal framework and the development of human resources were necessary first steps of any national policy for nuclear and radiological safety.

The next speaker was Eduardo Ruiz Mazón, First Secretary at the Permanent Mission of the United States of Mexico to the International Organizations in Vienna. Mr. Mazón discussed Mexico's adherence to the international nuclear regulatory framework. Mexico is a contracting party to the CNS and has formally expressed its commitment to abide by the IAEA's Code of Conduct and Safety Standards. Mr. Mazón emphasized Mexico's recognition of the importance

of the IAEA Action Plan. After providing a description of Mexico's waste storage repositories, Mr. Mazón reaffirmed Mexico's preparedness to cooperate with other States to advance nuclear safety. As the previous speaker on the panel, he reiterated the importance of the relationship between safety and security. In his view, addressing these issues will be one of the main challenges that governments will face in the coming years. Repeating a leitmotiv of the workshop, Mr. Mazón highlighted the need to inform the general public as a priority for the international community.

Eduardo Ruiz Mazón

The final speaker of this session was Mathilde Prévost, Attaché for Nuclear Safety and Security at the Permanent Mission of France to the International Organizations in Vienna, who spoke on behalf of the French Nuclear Safety Authority. Ms. Prévost discussed transport safety of radioactive material in France. The majority of French transports (58 percent) are made in the context of non-nuclear industries. She identified a variety of hazards associated with transport with respect to which France uses a multilayered defense system to ensure the safe transport of radioactive material.

Mathilde Prévost

These layers involve: package robustness; reliability of transport operations; and crisis management. Prevention, limitation and damage reduction are respectively the goals of each. The regulation in place in France fulfils the international regulations defined by IAEA in the SSR-6 requirements and requires that the robustness of the package corresponds to the danger of its contents. Ms. Prévost noted that international regulations on transport are well incorporated by Member States in their national regulations. Ms. Prévost concluded by turning to future prospects for strengthening safety regulations, highlighting four points: (1) feedback on and trends in inspections and incidents should be analyzed to capitalize on experience; (2) national and international exchanges between competent authorities must be reinforced; (3) transparency should be increased, noting that certain sensitive information should

not be shared with the public; and (4) research and development programs are key elements to improving the safety of transports.

Session 4: Cross-Cutting Issues

The fourth and final session dealt with cross-cutting issues. It was chaired by Gilbert Oh, Deputy Permanent Representative of the Permanent Mission of Singapore to the United Nations and other International Organizations in Vienna.

The first speaker was Elena Buglova, Head of the IAEA's Incident and Emergency Centre (IEC). She described the international EPR framework, which is comprised of legal instruments, safety standards and protocols. She focused on the important role the IAEA plays in EPR and described some of the IAEA's responsibilities, including: notifying and exchanging official information; assessing potential consequences of emergencies and prognoses for developments; and providing assistance on request. The IEC offers Member States Emergency Preparedness Reviews (EPREV), which, upon request, examine countries' preparedness for nuclear or radiological emergencies based on IAEA Safety Standards. In November 2015, the IAEA published new EPR Safety Standards, which it assists in implementing through regional and national workshops. Ms. Buglova also highlighted the IAEA's Emergency Preparedness and Response Information Management System (EPRIMS). This online tool enables States to conduct self-assessments and enhance their national capabilities by following best practices. In October 2015, the IAEA also organized a highly successful International Conference on Global EPR, which made a number of recommendations: increase communication with the public; implement lessons learned from the Fukushima accident; and view EPR as an area that cuts across nuclear safety and security. In her concluding remarks, Ms. Buglova described EPR as "a continuous and collaborative effort" aimed at strengthening international capabilities for ensuring a response to emergencies in line with the highest nuclear and radiological safety standards.

The next speaker was Dr. Alexander Bychkov, Senior Counsellor and Representative of ROSATOM State Atomic Energy Corporation (ROSATOM) in Vienna. His presentation focused on ROSATOM's efforts in the field of capacity building and infrastructure development for nuclear power programs. The Russian Federation assists nuclear newcomer States by providing industrial and financial solutions. Dr. Bychkov explained the three steps of Russian support: (1) after assessing the status of nuclear industry development in the beneficiary country, ROSATOM presents the "customer" with a conceptual model and a road map of nuclear infrastructure development; (2) subsequently, a detailed development schedule is planned; and (3) finally, implementation occurs through consultancy, education and training activities. The creation of a pool of Russian experts to support nuclear infrastructure development in newcomer countries has led to the conclusion of a number of cooperation agreements between ROSATOM and regulatory authorities around the globe, especially in Asia.

The final speaker was Haeryoung Jung, Principal Researcher at the Korea Radioactive Waste Agency in the Republic of Korea. He discussed Korea's public communication strategies in connection with the management of radioactive waste. In the first part of his presentation, Mr. Jung described the challenges of selecting a site for a low- and intermediate-level waste

disposal facility. This process had been initiated in the 1980s and was originally unsuccessful due to a lack of transparency and insufficient public communication. Subsequently, new approaches were adopted, such as the creation of an independent committee and the decision to allow resident communities to vote on whether or not they wish to host such a facility. This led to the successful site selection in 2005 of Gyeongju. In the second part of his presentation, Mr. Jung turned to the country's program for public engagement in connection with spent nuclear fuel management. An independent commission for public engagement on spent nuclear fuel management, PECOS, was organized in October 2013 to inform the national government and make recommendations based on public opinion. In June 2015, PECOS submitted a recommendation report that outlines a timeline for geological disposal. The success of the Korean model for waste disposal siting was praised by the participants during the discussion that followed.

During the discussion, the relationship between nuclear safety and security was again raised. Many aspire to integrating the two areas, which are currently being developed in parallel, with a view to benefitting from synergies. DDG Lentijo intervened from the audience to highlight that, although several structures in the IAEA were geared to coordinating these efforts, it remained a highly sensitive issue.

Panelists (from left): Elena Buglova, Alexander Bychkov and Haeryoung Jung

Closing

In his closing remarks, Ambassador Kitano referred to the candid nature of the discussions that had taken place during the workshop, which he believed were beneficial for all of the participants. He reiterated the importance of establishing mutually beneficial international partnerships under the guidance of the IAEA as a way of ensuring safe applications of nuclear technology.

H.E. Ambassador Mitsuru Kitano

Laura Rockwood

Thanking the participants for their efforts in the common endeavor of strengthening nuclear safety, Ms. Rockwood closed the workshop with a brief comment: the world had witnessed only two dreadful nuclear accidents. Perhaps with better systems, better designs, better planning, there could have been none; certainly, the world had been fortunate that there had not been more accidents. It was, in her view, incumbent upon all who believe in the contribution that nuclear energy can make to prosperity and development – to mankind in general – to ensure that there are no more.

Conclusion

The workshop provided an excellent opportunity to analyze the current status of efforts to ensure nuclear safety and to tackle future challenges. The presence of a truly international audience enabled cross-cutting discussions on a variety of relevant topics related to nuclear safety. All of the participants considered the workshop a success in bringing the Vienna community together to discuss how to further strengthen nuclear safety. The speakers emphasized that the relevance of the subject matter could not be underestimated. The consequences of inattention or complacency are simply too high for the international community to afford. With that in mind, best practices and knowledge transfer were identified as key elements to increasing nuclear safety standards transnationally. The workshop favored the wide dissemination of crucial information, which can make a critical difference in guaranteeing that nuclear safety remains a priority on the international agenda.