PNRI Newsletter

A newsletter of the Philippine Nuclear Research Institute (PNRI)

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In this Issue

The PNRI Newsletter is an online publication of the Philippine Nuclear Research Institute (PNRI), a research and development institute of the Department of Science and Technology (DOST).

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PHILIPPINE EXHIBITS ON NUCLEAR SCIENCE AND TECHNOLOGY AT THE 58th IAEA GENERAL CONFERENCE

IAEA Director General Yukiya Amano visits the Philippine exhibit at the Vienna International Center with DOST Undersecretary Dr. Amelia Guevara and PNRI Director Dr. Alumanda Dela Rosa. *Photo: DFA*

Giving the world a glimpse of "Atoms for Peace" the Filipino way, the Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST) showcased the country's various accomplishments in nuclear science and technology, nuclear safety, safeguards and security during the 58th General Conference of the International Atomic Energy Agency (IAEA) held in Vienna, Austria from September 22 to 26, 2014.

Attended by thousands of delegates from more than 160 IAEA Member States and various United Nations agencies and other international organizations, the annual IAEA General Conference provides a forum for its Member States to further its general programs and projects as well as to deliberate on key issues in nuclear power, nuclear science and technology and nuclear safety, safeguards and security.

With the theme "The Philippines: Moving Forward With Nuclear Science and Technology", the Philippine exhibits highlighted the nation's fruitful partnership with IAEA for more than half a century through PNRI. IAEA Director General Yukiya Amano himself graced the Philippine exhibits and was welcomed by DOST Undersecretary Dr. Amelia Guevara, PNRI Director Dr. Alumanda Dela Rosa and Philippine Ambassador and Permanent Representative to the IAEA Lourdes Yparraguirre.

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From the Director

Greetings to everyone!

This third quarter of 2014 has been a very eventful one for our Institute. In this issue of the PNRI Newsletter, it is our great pleasure to share with you how PNRI has served as the beacon of nuclear science and technology – not only throughout the country but also in the global stage.

Just this September, the Institute had the great privilege of showcasing the country's achievements in the nuclear field through the Philippine exhibits during the 58th General Conference of the International Atomic Energy Agency held in Vienna, Austria.

With the theme "The Philippines: Moving Forward with Nuclear Science and Technology", PNRI proved worthy of the opportunity at hand as representatives from among more than 160 Member States and members of the nuclear scientific community bore witness not only to the product of more than half a century of cooperation between the Philippines and the IAEA, but also the culture, warmth and well–known hospitality of Filipinos.

Back home, the PNRI also joined its fellow DOST Research and Development Institutes (RDI's) and other attached agencies in celebrating the 2014 National Science and Technology Week with the theme "Philippines: A Science Nation Meeting Global Challenges." The celebration hosted thousands of visitors from the academic, industrial, commercial, government and private sectors at the SMX Convention Center, and PNRI is proud to be part of the government's thrust towards national development in the field of industrial competitiveness and quality healthcare, among others.

Professionals from the medical and research sectors also graduated from the 1st Course on Medical Use of Radioisotopes (CMR) and Course on Radioisotope Technology (CRT) conducted by PNRI's Nuclear Training Center. It is our hope that the participants will help us carry public awareness and advanced scientific knowledge in their respective fields.

For our featured technologies, we believe it is high time we highlighted the results of our Institute's air pollution studies through the use of nuclear analytical techniques. These could not have been possible without the efforts and expertise of the Nuclear Analytical Techniques Applications Section in more than a decade of research in air particulates throughout Metro Manila.

It has been a very successful quarter, and a promising sign as we are nearing the end of 2014. We promise to keep the fire alive as we continue to fulfill our mandate.

R & D News

PNRI Embarks on Study Missions to Japan, Korea and Austria

PNRI Director Alumanda Dela Rosa and DOST Undersecretary Dr. Amelia Guevara with PNRI and IAEA officials at the IAEA Nuclear Applications Laboratories in Seibersdorf, Austria. *Photo: DFA*

Seeking to strengthen the cooperation between foreign counterparts and to improve its own research capabilities, the PNRI- DOST conducted study missions in collaboration with its counterpart nuclear research agencies in Japan and Korea, as well as the International Atomic Energy Agency (IAEA) and Vienna University of Technology (TU Wien) laboratories in Austria.

The missions were conducted in May, June and September 2014 under the joint project by DOST and the Bases Conversion and Development Authority entitled "Capacity Building for Science, Technology and Innovation Towards Self-Sustaining Research and Development Institute (RDIs) of the DOST."

Aside from initiating new cooperative research and development activities, PNRI aims to foster an exchange of scientific and technical information as well as scientists, engineers and other experts between the PNRI and the cooperating agencies.

The first mission was conducted in the Republic of Korea from May 6 to 10. PNRI participants visited the Korea Atomic Energy Research Institute (KAERI) facilities in Daejeon, South Korea, Advanced Radiation Technology Institute (ARTI) in Jeongeup and the Korea Institute of Science and echnology (KIST) in Seoul.

This was followed by the mission to Japan conducted from June 3 to 7, which included a visit to the Ministry of Science and Technology (MEXT), Japan Society for the Promotion of Science (JSPS) and the Japan Science and Technology Agency (JST) in Tokyo. The PNRI participants undertook a more focused visit of the facilities of the Japan Atomic Energy Agency (JAEA) in Ibaraki Prefecture, particularly the Tokai Research and Development Center and the O-arai Research and Development Center.

The final mission was conducted in Vienna, Austria from September 23 to 26, coinciding with the 58th IAEA General Conference (GC). Participants to the mission, who also formed part of the Philippine delegation to the GC, had the opportunity to visit the IAEA laboratories in Seibersdorf and the Isotope Hydrology Laboratory. A major part of the mission was to visit the Vienna University of Technology – Institute of Atomic and Subatomic Physics (TU Wien-ATI).

The study missions highlighted awareness of the vast areas for

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Philippine exhibits on nuclear science and technology...from page 1

IAEA Director General Amano speaking at the Plenary Hall during the 58th IAEA General Conference

IAEA Director General Amano in a bilateral meeting with members of the Philippine delegation

PNRI highlighted the country's achievements in the peaceful and productive applications of nuclear technologies such as enhancing agricultural productivity through precision farming methods and plant growth promoters, radiation processing and quarantine treatment of mangoes for exports to improve industrial competitiveness, newer and better nuclear medicine facilities, updating detection methods for red tide and nuclear analytical techniques in groundwater resource assessment and pollution studies.

"In its cooperation with the IAEA, the Philippines aims to create and maintain a reservoir of scientific and technological know-how, providing world-class solutions that empower Filipinos to attain higher productivity and better quality of life," said DOST Undersecretary Dr. Amelia Guevara as she addressed the plenary on September 23. Undersecretary Guevara, who led the delegation, also emphasized the country's steadfast commitment to ensure nuclear safety and security through the development of nuclear regulations, radioactive waste management, emergency preparedness and response mechanisms, and the ongoing establishment of a National Nuclear Security Support Center.

She also expressed the country's gratitude for the collaboration and support of IAEA, as well as other associated agencies and governments, without which the said accomplishments would not have been possible as the IAEA "will continue to play a vital role in enabling developing countries to use science and technology for development and for maintaining international peace and security."

International experts from the scientific community, the nuclear power industry and officials and representatives from various states visited the exhibits and were also treated to the taste of Filipino food such as Philippine dried mangoes, spring rolls and sapin-sapin.

The Philippine delegation also had the opportunity to do a technical visit to the various IAEA laboratories at Seibersdorf, Austria, which hosts many of the Agency's latest applications in the field of nuclear science and technology.

Photos: Dean Calma/IAEA; DFA

Technology in Focus

PNRI Conducts Air Pollution Studies with Nuclear Analytical Techniques

Left Photo: Gent sampler set-up at an air monirtoring station

Right Photo: Results on Coarse and Fine Particulates from 2001 to 2013

In the face of rising industrialization and pollution in urban areas, the PNRI – DOST engages in studies of air pollution in Metro Manila and beyond with the use of nuclear analytical techniques.

Air pollution caused by particulates in the atmosphere is of great concern all over the world, as well as in the Philippines. When inhaled, fine particulates (matter smaller than 2.5 micrometers (μm) or $PM_{2.5}$) can penetrate even deeper into the lungs and eventually into the bloodstream, which can cause heart and lung diseases, cancer and even death. Black carbon, which forms much of the fine air particulate pollutants in Metro Manila, comes mostly from burning biomass and residential refuse, and compounded by emissions from vehicles and industrial establishments in urban areas. Alongside black carbon, lead particulates are another threat to public health, as the poisonous metal can damage the nervous systems of young children, leading to brain or blood disorders.

Section 12 of the Philippine Clean Air Act of 1999 sets the National Ambient Air Quality (NAAQ) Guideline Values for coarse particulates (less than 10 μm or PM_{10}) to an average of 150 micrograms per normal cubic meter ($\mu g/m^3$) daily and 60 $\mu g/m^3$ annually. The Department of Environment and Natural Resources – Environmental Management Bureau (DENR-EMB) has recently established a national guideline value for $PM_{2.5}$ particulates – 75 $\mu g/m^3$ daily and 35 $\mu g/m^3$ annually until 2015, and 50 $\mu g/m^3$ daily and 25 $\mu g/m^3$ annually for 2016.

Meanwhile, the World Health Organization (WHO) guideline limits since 2005 are 50 $\mu g/m^3$ daily and 20 $\mu g/m^3$ annually for coarse particulates. For fine particulates, the limits are 25 $\mu g/m^3$ daily and 10 $\mu g/m^3$ annually.

In a world beset by record–breaking temperatures and storms, air pollution is also a major contributor to global warming and the climate change phenomena feared across the globe. Aside from greenhouse gases such as carbon dioxide, black carbon is also among the culprits in gradually rising average temperatures. But unlike greenhouse gases which stay in the atmosphere for up to 40 years, black carbon only lasts for several weeks to around a month or more. Reducing black carbon emissions will have an immediate effect on the overall composition of the atmosphere, helping to mitigate global warming.

Still, while most measurements can only identify how much particulate matter there is in the air, few are capable of classifying the pollutants in the air, let alone objectively able to trace their origins. The varieties of sources make it impossible to simply collect and weigh the air particulates and draw conclusions – and this is where nuclear applications come in. As part of its studies on the application of nuclear and nuclear-related analytical techniques in multi-elemental data and analysis, PNRI engages in air pollution source identification and apportionment studies which aim to determine what the sources of pollution are, how much is the contribution of each pollutant and where these are coming from.

In cooperation with the EMB and the Australian Nuclear Science and Technology Organisation (ANSTO), PNRI has established five air monitoring stations in Metro Manila and Bulacan. The sampling sites at the Manila Observatory at the Ateneo de Manila University in Quezon City and the EMB station in Valenzuela continue to be active for more than a decade. Additional stations previously operating were also established at the Poveda Learning Center in Pasig City, the National Mapping and Resource Information Authority (NAMRIA) office in Mandaluyong City, and the Notre Dame de Vie compound in Angat, Bulacan.

Gent samplers are used to collect samples from the air twice a week. Then, the samples are subjected to multi-elemental analysis through the energy-dispersive X-Ray Fluorescence Spectrometry, a nuclear-related technique that is non-destructive and can provide a multi-elemental analysis of air particulate matter in less than 15 minutes. Traditional methods can only analyze elements individually, taking several days or longer.

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Nuclear Training Update

PNRI Conducts the 1st Sessions of the Course on Medical Use of Radioisotopes and Course on Radioisotope Technology

***Left Photo:** Doctors and medical workers participating in the Course on Medical Use of Radioisotopes (CMR) during a tour of the PNRI Technetium-99m Generator Facility.*

***Right Photo:** Participants for the Course on Radioisotope Technology (CRT) present a case study to a panel of PNRI experts and regulators.*

Professionals from the medical and research sectors completed the first Course on Medical Use of Radioisotopes (CMR) and Course on Radioisotope Technology (CRT) conducted at PNRI – DOST from September 1 – 26.

Formerly the Radioisotope Techniques Training Course (RTTC) with iterations for medical personnel and general training, the new CMR and CRT courses reflect PNRI's continuing efforts to improve and update the knowledge and skills of professionals engaged in the use of radioisotopes in their respective fields.

The Institute accomplishes this through the PNRI Nuclear Training Center (NTC), which organized and conducted the courses with experts from partner agencies as well as PNRI's own instructors on nuclear science and technology as well as the equally important aspect of radiation protection and nuclear safety and security.

Thirty-five (35) doctors and medical technologists from various hospitals throughout the country graduated from the medical course, while six science research specialists, analysts and assistants from PNRI finished the general course.

The month-long training courses were held daily from 8:00 am to 5:00 pm, with the first eight days spent on a joint class where the participants were taught basic nuclear physics and radiation chemistry, radiation protection and monitoring instruments, proper handling practices of radioactive materials, radiation dosimetry and radiation processing.

Starting Day 9, the two courses underwent separate lectures and activities suited for their specific area, with the medical class studying cellular radiobiology, cytogenetics, contamination and decontamination, radiopharmacy practices.

While CMR focuses on medical applications and discusses them in greater detail, CRT involves a wider grasp of the various applications of nuclear science and technology in other fields, such as isotopes for soil fertility studies, air pollution and freshwater quality management, geology, tissue culture and plant mutation breeding. For the medical field, the CRT students joined their CMR counterparts in discussion on nuclear medicine, positron emission tomography and radiation therapy.

By the third week, the courses were again taught in a joint class, this time for lectures on the Code of PNRI Regulations, licensing requirements, categorization and security of radiation sources, radioactive waste management and emergency procedures, among other nuclear safety and security measures.

Long quizzes were given every week to test how much the participants have learned. In addition, the participants were also required to present a case study as part of a group to assess procedures or facilities in their respective fields. The case studies were presented at the final day of the training course. A certificate of completion was awarded to participants for successfully finishing the course.

The participants also toured the various facilities of PNRI, including the semi-commercial Cobalt-60 Multipurpose Irradiation Facility, the Electron Beam Facility which is in the final stages of construction, the brand-new Technetium-99m Generator Facility and the historic Philippine Research Reactor – 1 (PRR-1).

PNRI Signs MOU for Non-Destructive Training Program in South Africa

Left Photo: (from Left) ISO-Q Executive Director Mr. Jerrick Transfiguracion, Embassy of South Africa in the Philippines Charge d'affaires Ms. Tshire Kau, PNRI Director Dr. Alumanda Dela Rosa, PNRI Atomic Research Division Chief Dr. Soledad Castañeda and PNRI Nuclear Regulatory Division Chief Mr. Teofilo Leonin, Jr.

Right Photo: PNRI Director Dela Rosa and ISO-Q Executive Director Transfiguracion signing the Memorandum of Understanding

The PNRI-DOST signed a Memorandum of Understanding (MOU) with the South African consultancy firm ISO-Q for collaboration in conducting Non-Destructive Testing (NDT), nuclear and radiation safety training programmes in South Africa on August 14 at the PNRI Compound.

The PNRI will be in charge of providing lecturers and experts on NDT, nuclear and radiation safety to South Africa to facilitate the training programme, as well as the development of manuals, syllabi and other training materials for the participants. The ISO-Q consultancy firm will handle the logistics, including the venue, equipment and the travel and living expenses of the PNRI lecturers.

ISO-Q has also committed to help develop the NDT program in the Philippines through donations for facility upgrades, additional equipment and human resources development.

ISO-Q is a private firm in South Africa which provides consultancy and training services in developing safety, health, environmental, risk and quality management.

PNRI Signs MOU with KAERI for Collaborative Research and Development

Left Photo: DOST Undersecretary Dr. Amelia Guevara and PNRI Director Dr. Alumanda Dela Rosa (3rd and 4th from left) pose with KAERI President Dr. Jong Kyung Kim (3rd from right) after the MOU signing at the Vienna International Center with PNRI International Cooperation Section Officer-in-Charge Ms. Nydia Medina, PNRI Atomic Research Division Chief Dr. Soledad Castañeda (1st and 2nd from left), KAERI International Cooperation Team Head Mr. Jeong Kong Lee and PNRI Planning Section Head Ms. Ma. Celerina Ramiro (1st and 2nd from right)

Right Photo: PNRI Director Dela Rosa and KAERI President Kim signing the Memorandum of Understanding. *Photo: DFA*

Forging closer cooperation in the peaceful uses of nuclear energy, the PNRI-DOST signed a Memorandum of Understanding (MOU) with the Korea Atomic Energy Research Institute (KAERI) for collaborative activities in nuclear science and technology on September 24 at Vienna, Austria.

The technical cooperation between the agencies will consist of complementary research and development undertakings and a healthy exchange of technical information as well as scientists, engineers and other experts, which will entail short or long–term visits and working assignments.

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Philippines Hosts IAEA Regional Workshops/Training Courses

National Workshop on Nuclear Security Culture

Left Photo: (1st row from left) PNRI Finance and Administrative Division Chief Dr. Graceta Cuevas, PNRI Nuclear Nuclear Safeguards and Security Section Head Ms. Julietta Seguis, and IAEA Experts Ms. Kazuko Hamada of Japan, Mr. Axel Hagemann of Germany and Mr. Khairul of Indonesia pose with the workshop participants.

Right Photo: IAEA Expert Ms. Kazuko Yamada gives an overview of nuclear security culture during the first day of the workshop.

Keeping the country on its feet in the field of nuclear security, the PNRI–DOST in cooperation with the International Atomic Energy Agency (IAEA) hosted the National Workshop on Nuclear Security Culture in Practice from August 26 to 29 at the PNRI Compound.

The workshop aims to provide a basic awareness and understanding of nuclear security culture to ensure effective nuclear security measures that can prevent and combat possible threats.

Participants from various hospitals and medical centers, industrial corporations attended the four-day workshop. Regulators and representatives from PNRI as well as the Center for Device Regulation, Radiation Health, and Research of the Food and Drug Administration under the Department of Health also participated in the national workshop.

International experts from the IAEA lectured on the various aspects of developing nuclear security culture and its practice, including risk assessment surveys, management systems, roles and responsibilities of the personnel in charge, and leadership and personnel behavior.

The Philippines is an active partner in implementing the IAEA's Integrated Nuclear Security Support Plan (INSSP), and aims to establish a National Nuclear Security Support Center with assistance from the IAEA.

PNRI conducts air pollution studies with nuclear analytical techniques...from page 4

To identify the sources of air pollutants and how much each contributes to the pollution, PNRI uses receptor modeling to trace the pollutants from the environment to the source. PNRI scientists are also able to trace the path of pollutants by analyzing wind direction for particulates carried into the air. So far, the results of their research show that vehicular emissions comprise more than half (49 to 57 percent) of the fine ($PM_{2.5}$) air pollutants in various stations. The other contributions come from the following: industrial emissions (13 to 31 percent), secondary sulphur (22 percent), smoke (14 percent) and fine soil (8 to 13 percent).

The project resulted in a better understanding of the sources of particulate pollution in Metro Manila. In addition to generating basic data for air quality management, continuous monitoring is also helpful in documenting impact of government policies such as the reduction of lead levels in the fine fraction coinciding with the phase-out of leaded-gasoline. High levels of lead pollution in certain areas also prompted further studies to help formulate measures to mitigate the problem.

"Addressing problems regarding traffic-related activities can greatly reduce our fine particulate pollution problems including the black carbon which can bring about better air quality in the area, resulting to a healthier air to breath by the general public and contributing to the mitigation of climate change," said Dr. Preciosa Corazon Pabroa, project leader and head of the PNRI Nuclear Analytical Techniques Applications Section.

PNRI's air pollution studies are also being conducted in cooperation with international counterparts. In 2007, the Institute engaged in a technical cooperation project with the International Atomic Energy Agency in a joint effort with other countries in the Asia-Pacific region to build an Asia–Pacific Aerosol Database (A–PAD) for fine and coarse air pollutants.

PNRI Experts at the National Workshop on Irradiation as a Phytosanitary Treatment

PNRI Irradiation Services Section Head Ms. Luvimina Lanuza (2nd row, 4th from right) with participants, USDA experts and PNRI staff at the PNRI compound

The PNRI-DOST shared and demonstrated its expertise in irradiation technology and radiation processing during the National Training Workshop on Irradiation as a Phytosanitary Treatment held at the Intercontinental Hotel Manila, Makati City from September 16 to 18.

The workshop, which was organized by the Department of Agriculture – Bureau of Plant Industry (DA–BPI) in collaboration with PNRI and the United States Department of Agriculture - Animal and Plant Health Inspection Service (USDA – APHIS), aimed to improve the knowledge and technical competence of local quarantine officers regarding the use of irradiation as a phytosanitary treatment against insects. These include dose mapping for determining the proper irradiation dose and exposure time of products, as well as safety and quality procedures in irradiation facilities, among others.

PNRI Section Heads Luvimina Lanuza of the Irradiation Services Section, Zenaida De Guzman of the Biomedical Research Section and Glenda Obra of the Agricultural Research Section conducted lectures during the workshop as technical experts in radiation processing and its application to food, agriculture and other plant products.

More than 30 participants from various BPI regional offices and four foreign participants from Malaysia joined the training course. Ms. Haydee Solomon (QA/QC Supervisor) and Mr. Aurelio Maningas (Senior Operator) of the PNRI Multipurpose Irradiation Facility also participated in the three–day workshop.

The workshop was also conducted in anticipation of the projected entry of Philippine mango exports to the United States in the near future, as the country is well on its way to meeting the standards of the USDA in producing mangoes which are free of infestation with irradiation technology.

Part of these efforts is the submission of the quarantine treatment developed by PNRI against the local mango pulp weevil *Sternochetus frigidus (*Fabr.), with the proposed rule on its adoption recently published at the United States' Federal Register. Meanwhile, the BPI will play a central role as the body tasked with issuing exports and phytosanitary certification for exporters.

The participants also visited the PNRI laboratories and its radiation processing facilities – the Cobalt-60 Multipurpose Irradiation Facility, which currently operates on a semi-commercial scale and the newer Electron Beam Irradiation Facility currently under construction. PNRI is also striving towards the eventual accreditation of its irradiation facilities by the USDA.

PNRI embarks on study missions to Japan, Korea and Austria...from page 2

development and enhancement of R&D in the country as gleaned from the best practices presented and demonstrated by the institutions visited.

Japan's utilization of the decommissioned Japan Research Reactor 1 (JRR-1) as a reactor simulator for training and education purposes may serve as a model for the potential conversion of Philippine Research Reactor 1 (PRR-1) as a training facility for reactor operations.

With the new Memorandum of Agreement (MOU) inked between PNRI and KAERI during the mission in Vienna, as an outcome of the first mission, the PRR-1 may yet be revived with KAERI offering technical and expert support in the assessment of the country's first nuclear research reactor.

As for the IAEA, the Philippines continues in its commitment as a Member State as it reaps the benefits of various technical cooperation projects conducted through the efforts of PNRI.

Other potential areas of improvement and collaboration between PNRI and its foreign counterparts include a renewed focus on basic research on nuclear science and engineering, the development of state-of-the-art facilities and materials for more advanced industries and human resource development.

All these opportunities can bring into fruition the PNRI's goal to sustain nuclear technology knowledge in the country.

National Workshop on the Logical Framework Approach

***Left Photo:** IAEA Training Officers Ms. Galya Dimitrova (1st Row, 5th from Left) and Mr. Francis Xavier Campbell (1st Row, 6th from right) with the workshop participants*

***Right Photo:** The participants discuss about the process trees developed during the activity for various projects.*

Aiming to improve the skills of our scientists and professionals in crafting well-formulated and well-written proposals for both national and international projects, the PNRI–DOST in cooperation with the International Atomic Energy Agency (IAEA) hosted a National Workshop on the Logical Framework Approach for Technical Cooperation Project Design from July 8 to 11 at the PNRI compound in Diliman, Quezon City.

Project leaders and other participants from PNRI, National Power Corporation (NPC), Jose Reyes Memorial Medical Center (JRMMC), Philippine Society for Nuclear Medicine (PSNM), Philippine Council for Health Research and Development (PCHRD–DOST), Bureau of Soils and Water Management–Department of Agriculture (BSWBM-DA), Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA–DOST) and the Environmental Management Bureau – Department of Environment and Natural Resources (EMB–DENR) representing the following agencies.

Experts from the IAEA handled the four-day workshop, emphasizing the benefits of the logical framework approach as part of the agency's quality management system, particularly as a foundation for a successful technical cooperation project.

"In order to ensure quality and meet the following criteria – relevance, ownership, sustainability, efficiency, effectiveness and safety – the methodology that will help us is the logical framework approach," said IAEA Training Officer Galya Dimitrova.

The framework involves a thorough analysis of the various aspects of the project, from the problem and situation analyses to the project's objectives and the issues that various stakeholders would like to be addressed.

"For example, before I can start a radiotherapy treatment in a country, I need to see what kind of existing equipment is already there, what kind of expertise do I already have, what additional expertise will I need, who do I need to train, what do I need to build, what equipment to buy, et cetera," said IAEA Training Officer Francis Xavier Campbell during his discussion on situation analysis.

Since the Philippines became a Member State of the IAEA in 1958, the IAEA, which is the United Nations' center for world cooperation on nuclear matters, has supported many of the projects involving the peaceful and beneficial applications of nuclear and radiation science and technology in the country through its strong partnership with PNRI, formerly the Philippine Atomic Energy Commission.

The workshop will also particularly benefit the younger participants in light of their increasing role in the institute's technical cooperation projects with the IAEA and other functioning organizations, said PNRI Director Dr. Alumanda Dela Rosa.

"Indeed, many of our younger researchers are already becoming the project leaders themselves," she said.

Dr. dela Rosa added that the logical framework approach will help the institute's project leaders in crafting proposals not only for international projects but also for local cooperation projects with other institutions.

PNRI signs MOU with KAERI for collaborative R & D...from page 6

Collaborative activities by PNRI and KAERI will also cover basic and applied research on nuclear energy, radiation technology, technology transfer and human resource development, among others.

The agencies have previously engaged in similar cooperative efforts through an MOU in 1994, which according to them proved to be mutually productive and beneficial through the years.

The KAERI is a Korean government–sponsored nuclear science and technology research institute based in Daejon, South Korea.

News & Events

Nuclear Technologies Featured at 2014 NSTW Celebration

Nuclear technologies, state-of-the art facilities, services and products that help boost competitiveness of local industries and for more accessible and improved healthcare were featured by the PNRI-DOST at the exhibits and forum during the National Science and Technology Week (NSTW) celebration at the SMX Convention Center, Mall of Asia from July 24 to 28, 2014.

Focusing on this year's theme "Philippines: A Science Nation Meeting Global Challenges", PNRI showcased its exhibits in line with the department's eight target outcomes, particularly Outcome 3 on Industry Competitiveness and Outcome 6 on Quality Healthcare, which provided the perfect opportunity to impart the peaceful and productive benefits of nuclear science and technology to students, researchers, entrepreneurs, and representatives from the local government units, non-government organizations, private and government sectors.

The Institute's exhibits were among hundreds of other technologies featured by the DOST's attached agencies, regional offices and Research and Development Institutes (RDI's), as well as several commercial firms, government agencies and academic institutions.

In a grand opening ceremony, the celebration went for a mystical turn as performers from the Cultural Center of the Philippines (CCP) represented the various DOST agencies as embodied by ancient creatures and fairies of native folklore. PNRI was represented by Bumabakal, who was clad in colorful atom-like particles that his power harnesses.

PNRI experts also presented radiation technologies that have numerous beneficial applications in a techno forum entitled "Radiation: May Benepisyo Ito!" on July 25 at Forum Hall 2 of SMX. Members from the academic, industrial and commercial sectors attended the lectures and engaged with the experts in a lively open forum on topics such as nuclear-based and isotopic nuclear analytical techniques to ensure food safety and traceability, applications of electron beam and gamma irradiation.

The PNRI facilities and technologies for industry competitiveness were the following: Cobalt-60 Multipurpose Irradiation Facility, Electron Beam Facility, Nuclear-based and Isotopic Analytical Techniques, Portable Gamma-Ray Spectrometry, Gamma-Ray Column-Scanning Technology, Receptor Binding Assay for Red Tide Monitoring and Non-Destructive Testing with Gamma Radiography.

For quality healthcare, PNRI also featured the following technologies: Technetium 99m for Radiopharmaceutical Production, Radiation-Sterilized Food for Immuno-compromised Persons, Skin-Up™ PVP-Carrageenan Hydrogel Dressing, Honey Alginate Wound Dressing and Development of PVP-Chitosan Injectible Hydrogel Implant for Treatment of Vesicoureteral Reflux.

Announcement

PNRI-DOST Features Advances in Nuclear Science and Technology in 42nd Atomic Energy Week Celebration

The PNRI-DOST will open its facilities to the public and feature the latest advances in nuclear science and technology in the country in the fields of food, agriculture, industry, medicine and the environment during the 42nd Atomic Energy Week (AEW) celebration on December 8-12, 2t014 at the PNRI compound along Commonwealth Avenue in Diliman, Quezon City.

This year's AEW celebration will focus on theme, "The Philippines: Moving Forward with Nuclear Science and Technology".

The activities slated for the week-long celebration include the AEW opening ceremonies on December 8; technical sessions on December 9 and 10; the Philippine Nuclear Science Quiz (PNSQ) for high school students on December 11, and closing/awarding ceremonies with A Night at PNRI on December 12.

The inauguration of the PNRI Electron Beam Facility as well as the turnover of an environmental radiation monitor from the South Korean government will also be held during the celebration.

Free guided tours to PNRI laboratories and facilities and viewing of exhibits and film showing are available daily from morning to afternoon.

The annual AEW celebration, as mandated under Presidential proclamation No. 1211 in 1973, aims to generate awareness of the Filipino people on the beneficial uses of nuclear science and technology in food and agriculture, industry, medicine and the environment.

For more information on the activities for the 41st Atomic Energy Week, please contact the PNRI Nuclear Information and Documentation Section at 920-8787 and 929-6011 to 19 local 286, or send your emails to information@pnri.dost.gov.ph, or visit www.pnri.dost.gov.ph.

SCHEDULE OF ACTIVITIES

42nd Atomic Energy Week Celebration
8 to 12 December 2014
PNRI Compound

DECEMBER 8 (Monday)	**Opening Ceremonies**	
	Inspirational Message	**Hon. Mario G. Montejo** Secretary Department of Science and Technology
DECEMBER 9 (Tuesday)	**Technical Sessions I**	
DECEMBER 10 (Wednesday)	**Technical Sessions II**	
DECEMBER 11 (Thursday)	**Philippine Nuclear Science Quiz (PNSQ)**	
	Morning Session – Elimination Round Afternoon Session – Final Round	
DECEMBER 12 (Friday)	Closing Ceremonies	
	Awarding Ceremonies	
	A Night at PNRI	
DAILY	**Open House**	
	Technical Exhibit Guided Tour of PNRI Facilities and Laboratories Film Showing	

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About Us

The Philippine Nuclear Research Institute (PNRI) is a research and development institute under the Department of Science and Technology (DOST) mandated by law to undertake research and development activities in the peaceful uses of nuclear energy, render nuclear and specialized services and exercise regulatory control in the field of nuclear science and technology. The Institute has been serving the public for the past 55 years, harnessing the beneficial applications of nuclear energy while ensuring the safe use and security of radioactive materials and nuclear facilities for the protection of workers, the general public and the environment.

PNRI Vision

The PNRI is an institution of excellence in nuclear science and technology propelled by a dynamic and committed workforce in the mainstream of national development.

PNRI Mission

We contribute to the improvement of the quality of Filipino life through the highest standards of nuclear research and development, specialized nuclear services, nuclear technology transfer and effective and efficient implementation of nuclear safety practices and regulations.

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