

PNRI Newsletter

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A newsletter of the Philippine Nuclear Research Institute (PNRI)

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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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PNRI CELEBRATES 42ND ATOMIC ENERGY WEEK

in celebration of the
42ND ATOMIC ENERGY WEEK
Theme: **"THE PHILIPPINES: MOVING FORWARD WITH NUCLEAR SCIENCE AND TECHNOLOGY"**
8-12 December 2014 | **Philippine Nuclear Research Institute**
Commonwealth Avenue, Diliman, Quezon City



From Left: PNRI Director Dr. Alumanda Dela Rosa, Congressman Francis Gerald Abaya and DOST Undersecretary Dr. Amelia Guevara observe as a PNRI researcher demonstrates the detection of radioactivity from beach sands containing allanite using an RS230 portable gamma-ray spectrometer.

Spearheading the country's progress in nuclear science and technology, the Philippine Nuclear Research Institute-Department of Science and Technology (PNRI-DOST) celebrated the 42nd Atomic Energy Week (AEW) celebration from December 8-12, 2014 at the PNRI compound.

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.

With the theme, "The Philippines: Moving Forward with Nuclear Science and Technology", PNRI opened its facilities to hundreds of visitors daily during the week, featuring the latest advances in nuclear science and technology in the country in the fields of agriculture, industry, health & medicine, and the environment.

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From the Director



Greetings to everyone!

Having ended 2014 with great success and optimism, we at PNRI bring you the activities in the last quarter that served as the culmination of the work we have been doing this entire year .

Despite the harsh weather, the celebration of the 42nd Atomic Energy Week hardly lost steam. In fact, this year's celebration hosted hundreds of visitors from various sectors and was also the stage for showcasing the latest advances in nuclear science and technology here in our country, particularly the brand new facilities and equipment that we are proud to have here at PNRI, with assistance from our partnership with International Atomic Energy Agency (IAEA).

Foremost among these is the newly inaugurated Electron Beam Facility, which will pave the way for more irradiation applications, and the donation of the EFRD-3300 online environmental radiation monitoring system which will enhance our institute's capabilities in radiation emergency preparedness and response. We thank the IAEA, the US and Japanese governments, and the Philippine government for funding the EB Facility. We thank the Korean Ministry of Trade, Industry and Energy for donating the environmental radiation monitor.

Meanwhile, another project that is nearing completion is the Centralized Medical Cyclotron and PET-CT Facility being established by the KHealth Corporation at the National Kidney Transplant Institute, which will certainly improve nuclear medicine services in our country. This was formed through the efforts of a task force composed of PNRI and other government agencies in partnership with the private sector.

Also early this last quarter, the quarantine treatment developed by PNRI scientists against the mango pulp weevil has already been approved through a final rule published in the US Federal Register, contributing to the improving export competitiveness of Philippine Super Mangoes.

In the area of technology diffusion, the Philippines once again becomes a pilot country for an IAEA project, this time for reaching out to secondary schools through an outreach program on nuclear science and technology using a compendium of resources & activities for high school students. Numerous meetings, seminars and workshops were also held and hosted by PNRI in the field of agriculture, radioactive waste management, emergency public communications and nuclear analytical techniques.

We are proud of PNRI's achievements in 2014. With our heads held high, we are confident that this year's accomplishments are but a foreshadowing of an even more productive 2015.

R&D NEWS

PNRI INAUGURATES E-BEAM FACILITY

The Philippine Nuclear Research Institute – Department of Science and Technology has inaugurated its Electron Beam (EB) Irradiation Facility at the PNRI compound in time for the celebration of the 42nd Atomic Energy Week.

Radiation has already proven itself useful in the sterilization of medical devices, packaging materials and pharmaceuticals, decontamination of cosmetic raw materials, spices, dehydrated vegetables and herbal products, extension of shelf-life of food and quarantine treatment of fruits and vegetables.

Electron beams are capable of delivering higher dose rates than gamma radiation sources, speeding up the irradiation process. This makes more applications of radiation possible such as improving the quality of wires and cables insulation, tires, heat-shrinkable tube and sheets, automobile parts and semiconductors, among others.

The 2.5-MeV electron beam accelerator will be the first in the country intended for full-scale research and development and semi-commercial E-beam services.



The inauguration of the Electron Beam Facility at the PNRI Compound

PNRI scientists are looking forward to the E-beam's applications on radiation cross-linking, where polymers interact with each other to form a three-dimensional network, making them tougher and more resistant to heat, corrosion and chemical damage. Cross-

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PNRI RECEIVES ENVIRONMENTAL RADIATION MONITOR SYSTEM FROM KOREA

Once again reaping the fruits of international cooperation on nuclear technology, the Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST) received an online environmental radiation monitoring system through its partnership with the Korean government.

The Eco Friendly Radiation Detector EFRD-3300, which was formally inaugurated at PNRI on December 8 during the 42nd Atomic Energy Week, was donated by the Korean Ministry of Trade, Industry and Energy through a project of the Korea Trade-Investment Promotion Agency (KOTRA). Designed for continuous and real-time monitoring of ambient gamma radiation, the system boasts the ability to

provide stable dose rate measurements, discrimination between artificial and natural radionuclides, and data transmission through an online network in conjunction with other monitoring stations.

The EFRD-3300 is the product of joint research and development by the Korea Atomic Energy Research Institute (KAERI), the Korea Institute of Nuclear Safety (KINS) and Satrec Initiative, a Korean company manufacturing radiation detection systems. Similar EFRD systems have been installed in China, Thailand, Malaysia, Qatar, and Korea. The donation project is the result of the cooperation of KOTRA, Satrec Initiative and ALV Technologies, a local partner with the

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Top: The EFRD-3300 Environmental Radiation Monitoring System



Bottom: PNRI Director Dr. Alumanda Dela Rosa and SATREC Initiative VP Dr. Hyon Sock Chang signing the Deed of Donation

42nd Atomic Energy Week - Continued from Page 1

“Coming over to PNRI in spite of your very busy schedule and the not-so-good weather serves to remind us that we are important to you,” said Dr. Graceta Cuevas, Chairperson of the 42nd AEW as she delivered her welcome address, daring the participants “to be challenged, excited and inspired by the activities that await us for the next 5 days.”

Despite the onslaught of Typhoon Ruby, the AEW opening ceremonies successfully pushed through, and was graced with the presence of DOST Secretary Mario Montejo, and Congressman Francis Gerald Abaya of the 1st District of Cavite, along with other officials of the DOST, technical experts from the International Atomic Energy Agency (IAEA) and the European Union (EU), members of the diplomatic corps, former officials and employees of the PNRI, and the media.

In delivering his inspirational message, Secretary Montejo found that this year’s theme “embodies my aspiration for an empowered S&T community working forward on the socio-economic and technological development of the country.”

“I witnessed the vigor and enthusiasm of the PNRI workforce, the mature staff mentoring the new wave of nuclear scientists in fulfilling the commitment of PNRI to explore the peaceful uses of nuclear science and technology for the benefit of our people,” said Secretary Montejo.

Congressman Abaya, who filed House Bill 147 or the Comprehensive Nuclear Law, continued to pledge his support for the creation of a separate and independent regulatory body to strengthen the Philippines’ commitment to international nuclear safety and security. Abaya said it was his pleasure to work with PNRI “in achieving the fullest potential of nuclear science and technology through proper institutional and legal mechanisms.”

“I also encourage everyone here present, as partners and stakeholders in the field of nuclear science and technology, to continue building synergy in order to propel the field into even greater heights. The potential of nuclear technology in the various fields of human endeavor is vast, and it is my wish that we can all harness this potential for the benefit of every Filipino,” Congressman Abaya said in his keynote address.

During the celebration, the PNRI inaugurated its brand new Electron Beam Facility and accepted a donation of an online environmental radiation monitor from South Korea.

The ceremonies were attended by representatives from the IAEA, EB Tech Co., Korea Atomic Energy Research Institute (KAERI), the Korea Trade Promotion Corporation (KOTRA), EB Tech, Co., and Satrec Initiative.



Left: 42nd Atomic Energy Week Chairperson Dr. Graceta Cuevas (on podium) gives the welcoming remarks at the opening day. Seated from left are PNRI Director Dela Rosa, DOST Secretary Mario Montejo, Congressman Abaya and Minister Counselor Guillermo Eduardo Devoto of the Embassy of Argentina.



Right: PNRI Director Dr. Alumanda Dela Rosa announces the awarding of ISO certification to PNRI



The 2014 PNSQ Top 3: Parañaque Science High School, Caloocan City Science High School and Manila Science High School



A tour guide explains the exhibits at the PNRI Lobby to high school visitors



An “egg hunt” for radioactive sources supervised by the PNRI Radiation Protection Services

Technical Sessions were held on December 10 from morning until afternoon, with experts from PNRI, the IAEA and South Korea delivering lectures on electron beam applications, environmental radiation monitoring, and various applications of nuclear analytical techniques in food, agriculture and marine industries. Meanwhile, veteran scientists, employees and staff of PNRI who have already retired came home in a heartwarming reunion in An Afternoon in PNRI.

High school students from across the country competed in a showdown of knowledge in nuclear science and technology in the Philippine Nuclear Science Quiz (PNSQ) on December 11. Parañaque Science High School won first place with Lawrence Glen Sabaria, Justine Mateus Medina and coach Jane Andrea Nitro, followed by Caloocan City Science High School for second place with Patrick Canacana, Ma. Steffi Lucum and coach Angelo Cabic, and Manila Science High School in third place with Benedict Anuta, Christopher John Limos

and coach Ferdinand Bautista. The first placer received a cash prize of Php 30,000, the second placer Php 20,000 and the third placer Php 10,000, with plaques and certificates.

At the closing ceremonies on December 12, PNRI scientists who recently won in the DOST International Publication Awards, those who were able to patent their works, exemplary civil servants and the PNSQ winners were awarded and recognized.

PNRI won the DOST International Awards for the highest number of ISI Publications and approved Patents. PNRI Director Dr. Alumanda Dela Rosa also proudly announced that the Institute was finally awarded the ISO 9001:2008 certification as of December 2014, prompting loud cheers among the PNRI employees.

“This is a team effort, and even I know that it involved very difficult work,” said the Director as she thanked everybody for achieving another milestone for the Institute.

PNRI Inaugurates E-Beam Facility - Continued from Page 2



Top: The electron beam facility in its final stages of construction

Left: IAEA Expert Mr. Sunil Sabharwal with Congressman Francis Gerald Abaya at the entrance to the irradiation room of the Electron Beam Facility

Right: (From Left) DOST Undersecretary Dr. Amelia Guevara, IAEA Technical Expert Mr. Sunil Sabharwal, PNRI Director Dr. Alumanda Dela Rosa and Congressman Francis Gerald Abaya at the ribbon-cutting for the inauguration of the Electron Beam Facility

linking can practically increase the toughness of much lighter materials such as carbon fiber or reinforced plastic, and the same process may also be applied to improve fabrics, paints, and food packaging materials.

Electron beams may be used for polymer grafting to produce metal ion absorbents for water purification, catalysts for desired chemical reactions and chemical sensors, among others. Electron beams can also be used for synthesizing hydrogels such as PNRI's recently commercialized hydrogels for wounds and burns. The higher dose rates would also allow for faster irradiation of food and medical products.

With this new facility, the Institute takes the next step in its use of irradiation technologies. PNRI's present Cobalt-60 Multi-purpose Irradiation Facility has showed many of the applications of radiation processing

using gamma-rays and has been regularly serving clients from the industries involved in spices and dehydrated food, cosmetics, packaging and medical devices on a semi-commercial scale.

In cooperation with other government agencies, PNRI is also currently encouraging industries to establish commercial irradiators to make an impact on the country's sustainable development.

The establishment of the electron beam facility in the Philippines received financial support from the International Atomic Energy Agency, the Japanese and US governments under the Peaceful Utilization Initiative (PUI).

The PNRI received counterpart funds from the DOST and the National Government for the facility.



PHILIPPINES ESTABLISHES CENTRALIZED MEDICAL CYCLOTRON AND PET-CT FACILITY

Nuclear medicine in the Philippines is about to get a huge boost thanks to the establishment of the Centralized Medical Cyclotron and Positron Emission Tomography – Computed Tomography (PET-CT) Facility at the National Kidney and Transplant Institute (NKTi) in Quezon City.

Medical cyclotrons around the world are used for radiopharmaceuticals production. These medical isotopes serve as tracers for the diagnosis of various diseases.

PET-CT imaging procedures are used with radiopharmaceuticals to analyze and identify cardiovascular, oncological and neurological problems in the body.

The centralized medical cyclotron facility aims to bring the local production of radiopharmaceuticals closer and more accessible to other hospitals. Construction of the facility began in 2013 and is slated to be finished by late 2014 or early 2015.

The establishment of the facility received technical assistance from the International Atomic Energy Agency (IAEA) under a technical cooperation project. A joint task force was formed consisting of the Department of Science and Technology (DOST), particularly the Philippine Nuclear Research Institute (PNRI)



and the Technology Resource Center (TRC), Office of the Government Corporate Counsel (OGCC), Public-Private Partnership Center of the Philippines (PPPCC) under the National Economic and Development Authority (NEDA), nuclear medicine practitioners and potential hospital partners.

The task force was chaired by Dr. Teofilo San Luis of the Philippine Society of Nuclear Medicine (PSNM).

Around 39 hospitals and medical centers in the Philippines are equipped with nuclear medicine facilities that are using radiopharmaceuticals and gamma cameras for diagnostic procedures. These facilities are licensed by PNRI and are being monitored to meet the



The Centralized Medical Cyclotron Facility at the National Kidney and Transplant Institute

required international safety and security standards. PNRI has also recently established a Technetium-99m Generator Facility, which can help supply Technetium radiopharmaceuticals to Philippine hospitals.

The Food and Drug Administration has licensed PNRI to operate the said facility early in 2014.

Technology in Focus

PNRI Mango Pulp Weevil Irradiation Treatment Approved by USDA



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Rules and Regulations

Federal Register
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Wednesday, October 1, 2014

This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are issued by an agency under authority of the Executive Order 12180, and which are issued by the Department of Justice under authority of the Executive Order 12180. Prices of new books are listed in the first FEDERAL REGISTER issue of each week.

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

7 CFR Part 319
(Docket No. APHS-2013-0057)
RIN 0578-AD04

Expansion of Areas in the Philippines Considered Free of Mango Seed Weevil and Mango Pulp Weevil and Establishment of a Lower Irradiation Dose as a Treatment for Mango Pulp Weevil

AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Final rule.

SUMMARY: We are amending the list of designated pest-free areas for mango seed weevil and mango pulp weevil within the Philippines. We are also amending the Plant Protection and Quarantine Treatment Manual to establish a specific approved dose of irradiation as an authorized treatment for mango pulp weevil. These actions are necessary because survey data have determined that additional areas within the Philippines are free of mango seed weevil and mango pulp weevil. Additionally, we have determined that the mango pulp weevil can be irradiated with a lower dose of irradiation than the current generic dose for most plant pests of the class Insecta.

DATES: Effective Date: October 1, 2014.

FOR FURTHER INFORMATION CONTACT: Mr. Juan A. (Tany) Roman, Senior Regulatory Policy Specialist, PQA APHIS, 4700 River Road Unit 120, Riverdale, MD 20757-1231; (301) 861-2242.

SUPPLEMENTARY INFORMATION: The regulations in "Subpart—Fruits and Vegetables" (7 CFR 319.56-1

through 319.56-71, referred to below as the regulations) prohibit or restrict the importation of fruits and vegetables into and within the United States from certain parts of the world to prevent the introduction of plant pests into the United States.

Prior to the effective date of this final rule, the regulations only allowed mangoes (*Mangifera indica* L.) to be imported into the continental United States from the Philippines if they were produced on the island of Guimaras, which was determined to be free of both *Sternochetus mangiferae* (mango seed weevil) and *S. frigidus* (mango pulp weevil). Mangoes from all other areas of the Philippines except Palawan were ineligible for importation into Hawaii and Guam only. Mangoes from the island of Palawan were prohibited entry into all areas of the United States due to the presence of mango pulp weevil.

However, the national plant protection organization (NPPO) of the Philippines requested that the Animal and Plant Health Inspection Service (APHIS) amend the regulations to increase additional areas of that country as being free of mango seed weevil and mango pulp weevil. Specifically, the Government of the Philippines asked that we recognize the mango growing regions of Luzon, Visayas, and Mindanao as free of mango seed weevil and mango pulp weevil and the island of Palawan as free of mango seed weevil.

In response to the request by the NPPO of the Philippines, we prepared a commodity import evaluation document (CID) entitled "Recognition of Mango Production Sites That are Free of Mango Seed Weevil, *Sternochetus mangiferae* and Mango Pulp Weevil, *Sternochetus frigidus* in the Philippines." Based on the evidence presented in the CID on April 10, 2014, we published in the Federal Register (79 FR 19088-19098, Docket No. APHS-2013-0057) a proposal to amend the list of designated pest-free areas for mango seed weevil and mango pulp weevil within the Philippines. We also proposed to amend the box labeling restriction in § 319.56-3(d) and the additional declaration requirement in § 319.56-3(e) to refer to areas that are

free of mango seed weevil and mango pulp weevil in accordance with the regulations in § 319.56-1 rather than to specific areas. This allows us to update the list of pest-free areas through a notice published in the Federal Register in accordance with § 319.56-1 rather than a proposed rule. We provided notice of a new pest-specific irradiation dose of 165 Gy that we determined is effective against mango pulp weevil in mangoes. The request for that determination was described in a treatment evaluation document (TED) we prepared in support of that action. Therefore, we proposed that the importation of mangoes from areas of the Philippines that are either free of mango pulp weevil or that are treated for that pest with the new pest-specific irradiation dose, because the Plant Protection and Quarantine (PPQ) Treatment Manual also lists a pest-specific irradiation dose of 200 Gy for mango seed weevil, which was not previously reflected in the regulations, we also proposed to allow that suspension of mangoes from areas of the Philippines that are either free of mango seed weevil or that are treated for that pest in accordance with the authorized pest-specific irradiation dose listed in the Treatment Manual. Finally, we proposed to amend the regulations to allow the use of any approved treatments for *Sternochetus* fruit flies. This change specifically with regard to mangoes from the Philippines with the new irradiation dose for mango pulp weevil or the current irradiation dose for mango seed weevil, both of which exceed the minimum irradiation dose approved for the treatment of *Sternochetus* fruit flies.

We solicited comments on the proposed rule for 60 days ending June 5, 2014. We received eight comments that date. They were from private citizens, an industry group, and representatives of State and foreign governments. One commenter supported the proposed rule. One commenter raised issues that were not germane to the proposed rule. The issues raised by the other commenters are discussed below.

The majority of commenters objected to the importation of Philippine mangoes into Hawaii because Hawaii also produces mangoes and they were

aggravates the economic woes of the local mango growers and exporters who contribute a substantial share of the Philippines' total agricultural exports.

Guimaras Island has a thriving mango industry from which most Philippine mango exports allowed to the US come from. The island boasts of a huge annual production of mangoes that are free of mango seed-weevils (*Sternochetus mangiferae*) and mango pulp-weevils, making them acceptable for US importation. Mangoes from certain areas in Palawan, on the other hand, were deemed infested by the pulp weevils since 1987 and are subject to strict quarantine to prevent the spread of mango pulp weevil to other islands.

In collaboration with the Department of Agriculture (DA) – Regional Field Unit 4B, researchers from the PNRI Agriculture Research

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Left: Dissection of irradiated and unirradiated mango pulp weevil-infested mangoes at the PNRI Mango Pulp Weevil Holding Laboratory

Right: Mangoes for irradiation. Based on PNRI's research studies, a minimum radiation dose of 165 gray (Gy) is enough to make the adult mango weevil (inset, left photo) sterile

Enhancing the export competitiveness of Philippine Carabao mangoes, the United States has approved the quarantine treatment developed by the Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST) using gamma irradiation against the local mango pulp weevil *Sternochetus frigidus* (Fabr.).

The final rule approving the treatment was recently published in the United States' Federal Register as certified by the United States Department of Agriculture – Animal and Plant Health Inspection Service - Center for Plant Health Science and Technology (USDA-APHIS-CPHST).

Quarantine pests such as the mango pulp weevil prevent our country's mango exports from entering international markets such as the US and other countries with strict quarantine regulations. The wasted potential

PNRI Receives Environmental Radiation Monitor - Continued from Page 3

PNRI Health Physics Research Section.

The brand-new equipment will be part of a nationwide early-warning system for monitoring radiation emergencies such as that which transpired at the Fukushima Nuclear Power Plant Station in 2011. The first unit will be deployed at the PNRI compound, where it will be integrated to the Institute's Nuclear Emergency Response Support Center. The real-time radiation monitoring system is also designed to receive data from remote monitoring stations.

Additional EFRD units are expected to arrive by 2015 and will be installed at selected areas throughout the country, helping to improve our radiation emergency preparedness and response capability. The EFRD-3300 will also complement the PHP52 Air-Particulate Radionuclide Monitoring

Station of the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) operated by PNRI in Tanay, Rizal, as well as the portable gamma spectrometers and other equipment used by PNRI for their regular monitoring activities.

Beyond nuclear power plant accidents, the need for real-time radiation monitoring is also intensified by possible risks of nuclear terrorism through radiation dispersal devices (RDDs) that scatter radioactive materials with conventional explosives.

KOTRA, which will sponsor the installation and training of PNRI personnel in using the system, continues to be PNRI's partner in environmental radiation monitoring.



Left: The EFRD-3300 Environmental Radiation Monitoring System at the PNRI Compound

Workshops/Training Courses

Seminar on Nuclear Techniques in Soil Testing for Corn Crops



Left: PNRI Director Dr. Alumanda Dela Rosa (2nd row, 4th from right), Mr. Roland Rallos of the PNRI Agriculture Research Section (2nd row, 2nd from left) and Dr. Edna Samar of the BSWM (2nd row, 3rd from left) with the seminar participants



Right: The project experts engaging in an open forum with the participants

Helping to boost the potential of agriculture in northern Philippines, the Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST) conducted a “Seminar on the Use of Nuclear Analytical Techniques for Improving Soil Test Calibration & Irrigation Management in Corn Production” at the Cagayan Valley Research Center (CVRC) in San Felipe, Ilagan, Isabela last November 4.

The seminar served as a venue for the participating agencies to share the preliminary findings of the study after two years of research work.

The project on nuclear applications for nutrient and irrigation management is funded by DOST and the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD).

PNRI also works in collaboration with the Bureau of Soils and Water Management (BSWM) of the Department of Agriculture (DA), the Philippine Rice Research Institute (PhilRice), and Central Luzon State University (CLSU) in developing better “precision-farming” methods by assessing soil, nutrient and irrigation efficiency for corn, among other crops.

Nuclear techniques play a special role in this project as the use of various stable isotopes present in fertilizers and water provide a more direct assessment of fertilizer use efficiency compared to other analytical methods.

The findings showed that on average, over half of the nitrogen absorbed by the plants came from the fertilizers added at the earlier stages. This percentage decreases as it nears the harvest period. Still, the nitrogen absorbed

from fertilizers increased towards maturity and were proportional to the biomass yield. As for the total nitrogen absorbed by the crops (including nitrogen from both soil and fertilizers), these demonstrated an increasing trend regardless of soil fertility levels. The use of fertilizers becomes less efficient as one increases the rate of nitrogen fertilizer application.

Many of the participants were from the project’s beneficiaries and stakeholders such as the DA Regional Field Unit 2, the National Corn Program, local government units in the nearby provinces and municipalities and other farmer-cooperators.

Having met the first half of the planned activities, the DOST and PCAARD-funded project will continue for another two years, for a total of four years of research on crop nutrient and irrigation management.

Philippines Pilots IAEA Educational Outreach Program for Secondary Schools

Taking another opportunity to help develop nuclear science education in the country, the International Atomic Energy Agency (IAEA) has selected the Philippines as one of the pilot countries in launching an outreach program on nuclear science and technology for secondary schools through the collaboration of the Philippine Nuclear Research Institute-Department of Science and Technology (PNRI-DOST) and the Quezon City Division of City Schools of the Department of Education (DepEd).

Under Project RAS/0/065 on Supporting Sustainability and Networking of National Nuclear Institutions in Asia and the Pacific Region, the country was chosen along with

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Top: Ms. Jane Gerardo-Abaya of the Division for Asia and the Pacific, IAEA Department of Technical Cooperation (1st row, 2nd from right), Ms. Brenda Pagannone of the IAEA Department of Nuclear Energy (1st row, 2nd from left), Mr. Sunil Sabharwal of the IAEA Department of Nuclear Sciences and Applications (1st row, 1st from left) with experts and representatives from various participating countries for the outreach program on secondary schools.



Bottom: Ms. Valerie Garcia Segovia of the Nuclear Power Institute (extreme left) and the participants engage in discussion during the meeting for the implementation of RAS/0/065 on Supporting Sustainability and Networking of National Nuclear Institutions in Asia and the Pacific Region through the outreach program.

ANSN Annual Meeting and Regional Workshop on Radioactive Waste Management



Mr. Kai Moeller of the International Atomic Energy Agency (2nd row, 4th from right), Mr. Shigeyuki Saito of the Japanese Nuclear Regulation Authority (1st row, 3rd from left), Officer-in-Charge, PNRI Office of the Deputy Director Dr. Christina Petrache (1st row, 2nd from right) Ms. Editha Marcelo of the PNRI Radiation Protection Services Section (1st row, 4th from right) and Ms. Nydia Medina, National Liaison Officer and PNRI International Cooperation Section Head (1st row, extreme right) with the representatives and participants for the ANSN Annual Meeting and Regional Workshop

Doing its part in the international effort to improve radioactive waste management in the Asia-Pacific region, the Philippines, through the Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST), hosted the annual meeting of the Asian Nuclear Safety Network (ANSN) Radioactive Waste Management Topical Group and the ANSN Regional Workshop on Field Data Acquisition and Data Processing for the Safety Case of Waste Disposal Facilities from November 5 to 7 at the Crowne Plaza Manila, Quezon City.

The country was designated as this year's host following the successful plenary meeting in South Korea on November 2013.

Representatives from Bangladesh, Indonesia, Japan, South Korea, Malaysia, Thailand, Vietnam and the Philippines participated in the meeting, which was presided by the topical group coordinator, Mr. Shigeyuki Saito of the Japanese Nuclear Regulation Authority (NRA). Technical Officer Mr. Kai Moeller of the International Atomic Energy Agency (IAEA) Department of Nuclear Safety and Security led the conduct of the workshop. Ms. Editha Marcelo of the PNRI Radiation Protection Services Section served as the workshop director.

The meeting discussed the proposed activities for the 2015-16 cycle, consisting, for the most part, of workshops which will highlight the principles of spent fuel and radio-

active waste management and the safe development of near surface disposal and repository sites.

The regional workshop, on the other hand, focused on developing a safety case for radioactive waste disposal facilities through gathering the necessary information to adequately demonstrate the safety of these facilities.

Founded in 2002, the ANSN serves as a platform for sustainable regional cooperation on nuclear safety in the region by facilitating the exchange of nuclear safety information and practical experience among the countries.

FNCA Workshop on Neutron Activation Analysis



Professor Tomoaki Wada of the FNCA (7th from left), Professor Mitsuru Ebihara of the Tokyo Metropolitan University (7th from left) and Dr. Preciosa Corazon Pabroa of the PNRI Nuclear Analytical Techniques Applications Section (4th from left) with the participants from various countries.

The country's international cooperation once again bears fruit: this time in the form of a Workshop on Neutron Activation Analysis held under the auspices of the Forum for Nuclear Cooperation in Asia (FNCA).

It was conducted from November 4 to 6 at the Imperial Palace Suites in Quezon City and hosted by the Philippine Nuclear Research Institute – Department of Science

and Technology (PNRI-DOST) in collaboration with the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Nuclear Safety Research Association (NSRA).

Neutron Activation Analysis (NAA), which involves the use of neutron irradiation to analyze the type and amount of elements in samples, has a wide range of applications such as in food safety, geochemical mapping,

marine sediment analysis and air pollution studies.

The FNCA project on NAA ultimately seeks to contribute to the formulation of environmental policies across the Asia-Pacific region.

Representatives from Japan, Australia, Bangladesh, Indonesia, Kazakhstan, Mongolia, South Korea, Malaysia, Thailand,

National Training Course on Public Communication in Nuclear & Radiological Emergencies



Left: Ms. Bushra Nasim of the International Atomic Energy Agency and Ms. Vasiliki Tafili of the Greek Atomic Energy Commission (1st row, 8th to 9th from left) with the training course organizers and participants



Right: The participants engage in a simulated press conference in response to the training scenario of an on-going radiological emergency

Recognizing the importance of public communication in a well-coordinated preparation and response to emergencies, the Philippine Nuclear Research Institute-Department of Science and Technology (PNRI-DOST) in collaboration with the International Atomic Energy Agency (IAEA) and the Asian Nuclear Safety Network (ANSN) hosted the National Training Course on Communication with the Public in a Nuclear or Radiological Emergency from October 20-24 at the PNRI compound.

Experts from the IAEA and the Greek Atomic Energy Commission (GAEC) handled the week-long training course, emphasizing the need to keep the public informed and the responding agencies credible and prepared well beforehand in case of a nuclear or radiological emergency.

the IAEA Department of Nuclear Safety and Security – Incident and Emergency Centre.

The course also gave special attention to scenarios such as hoaxes, rumors and overreactions that could cause misinformation and panic in a very volatile situation – as well as the means to prevent them.

“When you are not responding, you should be planning to respond. This is very important; whatever your requirements, whatever your communication needs, they should all be prepared in advance,” said Ms. Bushra Nasim of

“There is uncertainty and anxiety about these events, so our objective as communicators is to prevent the rumors by providing the essential information in order to remove

PNRI Mango Pulp Weevil Irradiation Treatment- Continued from Page 5

Section experimented on various radiation doses to determine the minimum dose required to sterilize the weevils infesting export-quality Philippine Carabao mangoes, also known as Manila Super mangoes.

The collaborative project funded by USDA and the Philippines’ Bureau of Plant Industry (DA-BPI) was completed in 2011 and the results were submitted to the USDA for approval the following year. Consultations with the public as well as representatives from various sectors were conducted by the USDA-APHIS in 2013.

Based on PNRI’s research studies, a minimum radiation dose of 165 gray (Gy) is enough to make the adult mango weevil sterile, providing sufficient quarantine security for the Philippine super mangoes. The USDA-APHIS Plant Protection and Quarantine (PPQ) Treatment Manual sets the generic irradiation dose for most pests, including the pulp weevil, at 400 Gy.

However, PNRI studies determined that the country’s mangoes can only tolerate as far as 300 Gy, hence the need for a more practical minimum radiation dose.

“We are lobbying for a radiation dose that is much lower than the generic dose for pests, such that it will be effective against

the local weevil without compromising the quality of our mangoes,” said Agriculture Research Section head Glenda Obra.

A cooperation agreement late in 2006 between the PNRI, DA-BPI and the USDA began the development of a quarantine treatment which will allow Philippine mango exports to enter the United States – not only from Guimaras but also from other mango-producing provinces and regions in the Philippines, particularly Palawan.

As per the final rule, the Philippines also succeeded in getting the US government to recognize the mango-producing regions of the country as pulp weevil and seed weevil-free areas, except for Palawan in the case of pulp weevil as it is currently eliminating the said infestation. This finally allows Philippine export mangoes into the mainland United States.

The mango pulp weevils were mass-reared in selected sites in Palawan and handled according to DA-BPI’s strict requirements.

The weevil-infested mangoes were then brought to the PNRI’s Cobalt-60 Multipurpose Irradiation Facility to be irradiated at various doses, after which they were dissected at a holding laboratory. Adult male and female weevils were paired to mate and the eggs were collected afterward for study.

PNRI pushed for amending the APHIS PPQ manual that will set the 165-Gy dose as the minimum irradiation dose for both the mango pulp weevil and fruit fly as the prescribed 400-Gy generic dose, which is intended for all insects (except pupae and adult of Lepidopterans which include moths and butterflies) was proven excessive for Philippine mangoes.

“The irradiation dose for mangoes infested with weevils may also cover the treatment for fruit flies, making the quarantine treatment very adaptable and efficient,” said Ms. Obra.

PNRI will also play a major role in implementing the quarantine treatment through the upgrading of its semi-commercial irradiation facility, which already serves hundreds of clients annually through food irradiation and sterilization of medical products, among others. The upgrade will also receive accreditation from the USDA. The DA is also considering proposals to put up its own irradiation facility.

Irradiation as a quarantine treatment is approved internationally and may provide an alternative to other current treatment methods such as vapor heat treatment, according to Ms. Obra.

EU Training Workshop on Regulatory Framework and Guidance



Left Photo: Participants from the PNRI Nuclear Regulatory Division discuss with the experts at the PNRI Nuclear Emergency Response and Support Center



Right Photo: The EU experts, Mr. Jean-Yves Ravachol and Mr. Ilari Aro

The Philippine Nuclear Research Institute – Department of Science and Technology in cooperation with the European Union (EU) hosts a training workshop to help improve the country's legal framework for nuclear safety and strengthening the capabilities of the Institute as its regulatory body. The workshop was conducted from December 8 – 12 at the PNRI Nuclear Emergency Response and Support Center.

Experts from the EU handled the workshop, which involved a systematic review of existing Philippine nuclear law and regulatory framework as compared with European counterparts and considering the IAEA safety requirements and safety guides.

The workshop will also help determine which Philippine documents will be retained, amended, replaced or developed.

Regulators and staff from the PNRI Nuclear Regulatory Division attended the week-long workshop.

The EU workshop was conducted as part of the EU Project PH3.01/09 (PH/RA/01) on Technical Assistance for Improving the Legal Framework for Nuclear Safety and Strengthening the Capabilities of the Regulatory Authorities of the Philippines and its Technical Support Organization.

National Training Course on Public Communication During Emergencies - Continued from Page 8



Ms. Bushra Nasim of the International Atomic Energy Agency conducts the activities at the PNRI Auditorium with participants from various government agencies

uncertainty. Rumors find a place to grow where there is a gap in information," said Ms. Vasiliki Tafili of the GAEC International and Public Relations Office.

Representatives from the Philippine National Police (PNP), National Disaster Risk Reduction and Management Council (NDRRMC), Metropolitan Manila Development Authority (MMDA), Bureau of Fire Protection (BFP), Department of Interior and Local Government (DILG), Department of Health (DOH), Science & Technology Information Institute (STII-DOST), Office of Civil Defense (OCD), Philippine Information Agency (PIA) and the National Power Corporation (NPC) participated in the training course with technical experts from PNRI and members of the media.

Lectures on risk communication, radiation basics, and nuclear/radiological incidents were followed by practical exercises on building a public communication program, holding press conferences, choosing and training agency spokespersons, handling interviews and writing information releases.

The training course also aimed to facilitate collaboration and cooperation between the various government agencies tasked to respond in case a nuclear or radiological emergency happens in the country.

PNRI Director Dr. Alumanda Dela Rosa said that the training course will prove helpful in the revision of the National Radiological Emergency Preparedness and Response Plan (RADPLAN) which will incorporate the lessons learned from the nuclear incident in Japan three years ago. She also expressed the Institute's desire to continue their collaborative efforts in emergency public communication – nuclear or otherwise.

"I hope that our interaction will also go beyond this course to ensure that the Philippines becomes more prepared in responding to each and every calamity. I am confident that our participants will leave the training course more prepared for future events, whether nuclear, radiological or conventional," she said.

FNCA Workshop - Continued from Page 7

Vietnam and the Philippines participated in the workshop, which was co-chaired by Professor Tomoaki Wada of the Tokyo University of Science (TUS) and Professor Mitsuru Ebihara of the Tokyo Metropolitan University (TMU).

The participants presented updates on the activities being implemented in support of the NAA project for their respective countries, as well as establishing linkages with the technology's stakeholders.

An open seminar was conducted on the last day at the PNRI Compound, which drew more than a hundred attendees from various academic and research institutions.

Experts from PNRI as well as the workshop participants from other countries shared the applications of NAA in their respective research projects.

Founded at the turn of the millennium by the Japanese government through MEXT, the FNCA is a cooperation framework on fostering the peaceful use of nuclear technology in Asia. FNCA projects involve the development of radiation utilization, industrial, environmental and healthcare applications and research reactors, as well as the strengthening of nuclear safety infrastructure.



Students from Quezon City Science High School (Regional Science High School for the National Capital Region) (Top) and San Francisco High School (Bottom) during a guided tour of the PNRI facilities on the 42nd Atomic Energy Week Celebration

Indonesia, Malaysia and the United Arab Emirates in addressing what the IAEA recognizes as a very vital area in reaching out and developing the youth's interest in nuclear science and technology by adopting the best practices in science education for secondary schools in the region.

Representatives from the participating Member States in the Asia-Pacific Region met at the IAEA Headquarters in Vienna, Austria from October 14 to 17 for the insights and experiences of experts from the IAEA, United States, United Kingdom, Japan and Australia and the establishment of national work plans to implement the outreach program in the pilot countries.

The Philippines was represented by Ms. Rhodora Leonin, Head, Nuclear Information & Documentation Section and Mr. Roel Loteriña, OIC, Nuclear Training Center of PNRI, as well as Ms. Helen Grace Go and Ms. Ma. Violeta Tupas of DepEd.

The IAEA developed a compendium of resources and activities for use by high school teachers and students, which will be tailored to the flow of DepEd's K to 12 Basic Education Curriculum, such that it may touch on the basics of nuclear science and its applications.

Beyond raising awareness and understanding of nuclear concepts and applications, the program also intends to encourage more students to eventually engage in Science, Technology, Engineering

and Mathematics (STEM) careers after graduating from college.

For the Philippines, the collaborating agencies plan to hold a special seminar and workshop for high school teachers and students.

The agencies are also planning to conduct a weekly extracurricular activity dubbed as Science on Saturday (S.O.S.) which aims to enhance the nuclear experience for younger students through practical, hands-on exercises such as simple classroom and outdoor experiments, science quiz bees, essay, poster and chart competitions, and field trips to nuclear research facilities.

The program will also address the issue of women empowerment with the aptly named Powerful Opportunities for Women Eager and Ready for Science Engineering and Technology (POWER SET) Program, which will prepare aspiring female high school students who perform well in mathematics and science subjects for science-related courses and careers through scholarship opportunities, mentoring by industry professionals, visits to science and technology facilities and professional development activities such as seminars and workshops, among others.

Two public secondary schools in Quezon City will participate in the pilot testing by January 2015: Quezon City Science High School (Regional Science High School for the National Capital Region) and San Francisco High School.

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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