

PNRI Newsletter

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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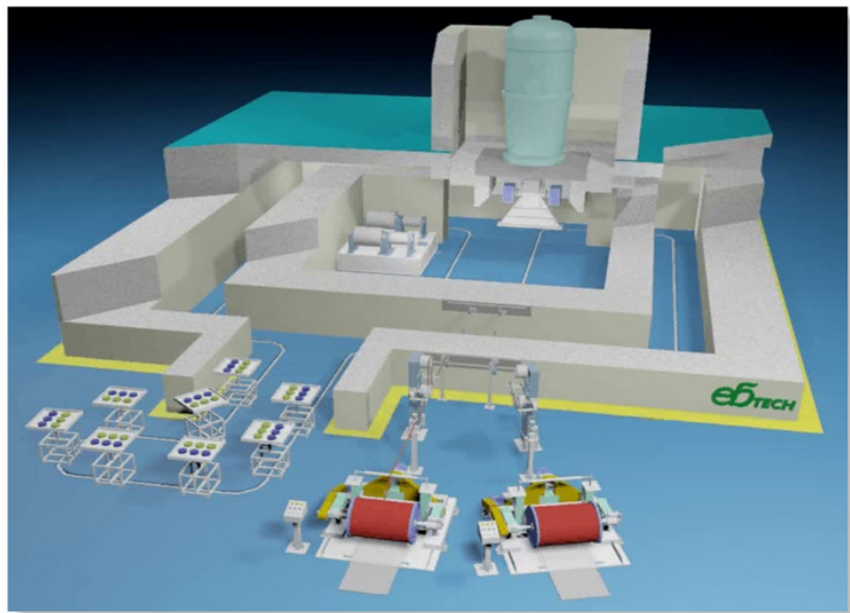
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PNRI-DOST ESTABLISHES ELECTRON BEAM IRRADIATION FACILITY FOR RESEARCH AND INDUSTRIAL APPLICATIONS



The Philippine Nuclear Research Institute – Department of Science and Technology (PNRI-DOST) is establishing an Electron Beam (EB) Irradiation Facility at the PNRI compound, bringing the country's technology at par with the international community through the applications of radiation processing in various industries.

With this new facility, the Institute takes the next step in its use of irradiation technologies. PNRI's present Cobalt-60 Multipurpose Irradiation Facility has demonstrated many of the applications of radiation processing using gamma-rays and has been regularly serving clients from the food, packaging, medical products and pharmaceutical industries.

While the facility operates on a semi-commercial scale, the institute currently encourages industries to establish commercial irradiators to make an impact on the country's sustainable development.

Over the past 30 years, both developed and developing countries all over the world have already established around 1,200 E-beam accelerators dedicated to commercial and industrial purposes. Meanwhile, except for two private facilities intended for limited use, the Philippines barely has any electron beam accelerators open for commercial use.

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From the Director



Greetings to everyone!

In our second issue of the PNRI Newsletter, we are proud to share to our readers how the Philippine Nuclear Research Institute meets 2014 with a hopeful and productive outlook as it gains ground in pioneering facilities and products through nuclear science and technology and in equipping the country's key players from the government and private sector in the fields of engineering, public safety and the environment.

Just before last year ended, our scientists and researchers won various awards for their papers published in internationally-recognized journals in the International Publication Awards by the National Academy of Science and Technology.

PNRI continues to do its part in helping various industries, as the Electron Beam Facility, which is nearing completion, will be a welcome addition to our institute's capabilities in radiation processing along with the semi-commercial Cobalt-60 Multipurpose Irradiation Facility.

In the medical field, our scientists developed a wound dressing from indigenous honey designed to be more affordable but just as effective as the average commercially available antibiotics.

PNRI hosted a number of workshops for foreign and local participants alike. Under technical cooperation projects with the International Atomic Energy Agency, the Institute hosted a regional training course on nuclear analytic techniques for food traceability and a national training course on isotope data interpretation.

Participants from various government agencies, medical practitioners and members of the academe attended follow-up training courses on responding to nuclear and radiological emergencies, environmental radioactivity monitoring and reactor engineering conducted by PNRI with help from the Japan Atomic Energy Agency.

For the following months, PNRI commits to deliver on its mandate to bring the benefits of nuclear science and technology closer to the Filipinos.

PNRI-DOST Establishes Electron Beam Irradiation Facility...from page 1

PNRI's 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.

While irradiation through gamma rays has certain advantages in radiation processing such as the deeper penetration of gamma rays for thicker materials, electron accelerators are capable of delivering higher dose rates than gamma radiation sources, speeding up the irradiation process and allowing for applications which would otherwise be impractical using radiation sources since it would take extremely longer periods of time.

Hence, faster irradiation opens the doors to more potential applications such as

improving the quality of automobile parts, plastics, fibers and semiconductors, better waste management, nanotechnology and jewelry.

Instead of using chemicals to harden, cure or change the composition of polymer and plastic-based products, radiation from electron beams can induce the cross-linking of molecules in various materials.

In cross-linking, polymers interact with each other to form a three-dimensional network, making tires, rubber sheets, wires, batteries and electrical

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PNRI DEVELOPS WOUND DRESSING FROM HONEY

The PNRI-DOST has developed an effective wound dressing from local honey sources in the Philippines.

Science research specialists from PNRI's Biomedical Research Section are taking advantage of the antimicrobial properties of these local products to produce a cheaper and comparable alternative – if not a better one already – to antibiotics for treating exuding wounds and burns.

"Honey has, since ancient days, been used for medicinal purposes; its composition makes it a very effective agent for healing wounds," said Biomedical Research Section head Zenaida De Guzman.

According to Ms. De Guzman, honey is ideal as a wound dressing not only for its antimicrobial and potentially anti-inflammatory composition, but also for its low pH level that is suitable for fast healing. Its sugar content helps in the granulation of wounds, while its low moisture gives honey a longer shelf-life. Furthermore, honey's low water activity helps the dressing draw out water and pus, thereby drying the wound and reducing the chances of infection.

Among the samples obtained from the University of the Philippines Los Baños, three indigenous types of honey stood out: the pineapple flower honey from Bacolod which proved comparable to the average antibiotic, the scarce coconut honey from

Mindanao and the natural dark honey found in the highlands of Northern Luzon, both of which matched and at times even bested antibiotics in dealing with pathogens such as *Staphylococcus aureus*.

As they are readily available, these honey samples provided the material for the research section's honey dressings.

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The finished products in 2x2 and 6x6 sizes

Philippines Hosts IAEA Regional Workshops/Training Courses

Regional Training Course on Stable Isotope and Trace Element Analyses for Food Traceability



Participants and lecturers in the Regional Training Course on Stable Isotope and Trace Element Analyses pose with PNRI Director Dr. Alumanda dela Rosa (standing 1st row, 9th from right), IAEA Technical Officer Mr. Russell David Frew, and PNRI Nuclear Analytical Techniques Application Section head Dr. Preciosa Corazon Pabroa (standing 1st row, 3rd from left).

Aiming to help improve food traceability and food safety in the Asia-Pacific region through nuclear and related analytic techniques, the International Atomic Energy Agency (IAEA) conducted a regional training course on the application of stable isotope and trace element analyses for food traceability at the PNRI from February 3 to 14, 2014.

The training course highlighted the use of stable isotopes of hydrogen, carbon, nitrogen and oxygen as well as trace metal elements to help trace where our food commodities and beverages are coming from.

Researchers from various nuclear institutes and agencies in the Middle East, Eastern, Central, Southern and Southeast Asia participated in the two-week training course

with Dr. Preciosa Corazon Pabroa, head of the PNRI Nuclear Analytical Techniques Application section as training course director .

The participants were not only trained in advanced theoretical knowledge on stable isotopes and trace elements, but also in practical skills such as sample collection and processing, among others.

IAEA experts along with PNRI scientists conducted lectures, tabletop activities and demonstrations of instruments and processes in the various laboratories of PNRI and the University of the Philippines National Institute of Geological Sciences (UP NIGS).

The regional training course is part of the ongoing RAS 5062 – “Building Technological Capacity for Food Traceability and Food Safety Control Systems through the Use of Nuclear Analytical Techniques”, a technical cooperation project of the Joint Division of the Food and Agriculture Organization and the IAEA for the Asia-Pacific region. A similar training course under the same project was held in Malaysia last year. 🌐

PNRI Develops Wound Dressing from Honey...from page 2

Results from initial testing in rabbits showed that the dressing healed the wounds around the same time as the Generic Neomycin; in some cases, the honey treatment was a day ahead of that with the antibiotic.

Pre-clinical testing conducted in a government hospital showed that with the honey dressing, full treatment of a burn patient was achieved earlier by a month than the usual healing time.

Sodium alginate made from brown algae, already used by hospitals for dressings, serves as a base for the honey. They are mixed and molded into a gauze

before being sprayed with calcium chloride to bind them.

After being cured, dried and packaged in vacuum-packed aluminum foil, the dressing is irradiated at 25 kilogray at PNRI's Multipurpose Irradiation Facility to keep it microbe-free and longer-lasting.

The Biomedical Research Section applied for the honey dressing's patent last year and hopes to eventually finish the clinical tests. Ms. De Guzman expects the product's commercialization to begin by 2015. 🌐

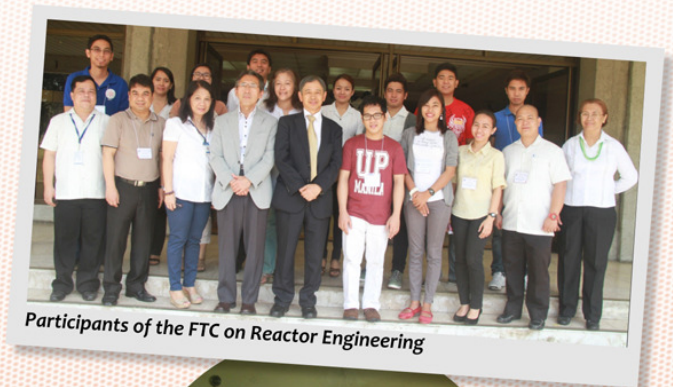


Production of honey alginate on gauze

Follow-up Training Course (FTC) on Nuclear/Radiological Emergency Response, Environmental Radioactivity Monitoring and Reactor Engineering



Participants of the FTC on Nuclear/Radiological Emergency Preparedness and Response



Participants of the FTC on Reactor Engineering



Participants of the FTC on Environmental Radioactivity Monitoring

Fulfilling its part in equipping the country's civil servants and professionals with technical knowledge and skills in the field of nuclear science and technology, the PNRI-DOST conducted follow-up training courses in nuclear/radiological emergency response, environmental radioactivity monitoring and reactor engineering.

Participants from various government departments as well as the private sector attended the workshops held from January 27 to February 21 at the PNRI Nuclear Training Center.

Experts from the Japan Atomic Energy Agency (JAEA) as well as PNRI's own scientists conducted lectures and field exercises on the applications of nuclear and radiation technologies.

The week-long National Workshop on Nuclear/Radiological Emergency Preparedness and Response aims to develop the capability and coordination of manpower and resources in the event of a nuclear or radiological emergency such as a terrorist attack involving radioactive materials, focusing on radiation safety, protective gear and equipment, safe handling of radioactive materials and decontamination procedures. The highlight of the workshop was the conduct of emergency field exercises that allows the participants to apply the theoretical knowledge acquired and carry out the response actions of each government agency associated with a radiological or nuclear incident.

The workshop was participated in by officers from the National Disaster Risk

Reduction and Management Council – Office of Civil Defense (NDRRMC-OCD), the Philippine National Police Philippine Bomb Data Center (PBDC), Bureau of Fire Protection (BFP) and Patrol 117 of the Department of Interior and Local Government (DILG), Metropolitan Manila Development Authority (MMDA), Department of Health – Health Emergency Management Staff (HEMS), and the Philippine Atmospheric, Geophysical and Astronomical Services Administration – Department of Science and Technology (PAGASA-DOST) and PNRI researchers held on January 27-30 with lecturers from JAEA and PNRI's Nuclear Regulatory Division.

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NAST-DOST International Publication Awards



PNRI awardees in the NAST-DOST International Publication pose with PNRI Director Dr. Alumanda dela Rosa (2nd from left); NRCP-DOST President and International Publication Committee Chairperson Dr. Lourdes Cruz (1st from left); DOST Undersecretary for Scientific and Technological Services Prof. Fortunato de la Peña (3rd from left), and NAST-DOST Secretary Dr. Evelyn Mae Tecson-Mendoza (1st from right).

Scientists and researchers from the PNRI-DOST won awards for their published works in internationally-recognized journals in the fields of environmental protection, microbiology, agriculture, and chemistry during the first DOST International Publication Awards.

The National Academy of Science and Technology (NAST), the Philippines' leading advisory and scientific recognition body, awarded 13 papers during the first DOST-IPA ceremonies held on December 12 at the Trader's Hotel Manila. The PNRI garnered 5 awards out of the 13 research papers authored by scientists from the DOST Research and Development Institutes (RDI's). A second awarding ceremony was held on December 27 at the same venue, with PNRI authors garnering seven more awards.

Dr. Soledad Castañeda, chief of the PNRI Atomic Research Division, is the principal author of the paper "Environmental isotopes and major ions for tracing leachate contamination from a municipal landfill in Metro Manila, Philippines." The study, which traced the movement of contaminants from a Metro Manila landfill in nearby water systems through isotope techniques, was published in the Journal of Environmental Radioactivity.

Not to be outdone, the scientists from the Nuclear Analytical Techniques Applications Section authored the paper "Receptor modeling studies for the characterization of air particulate lead pollution sources in Valenzuela sampling site (Philippines)" which was published in the Atmospheric Pollution Research journal. The paper investigated the levels of lead and particulates that contribute to air pollution in

Valenzuela through the use of nuclear and related analytical techniques. The paper's principal author is section head Dr. Preciosa Corazon Pabroa.

Experimenting on the application of gamma radiation against pathogens in honey bees, Biomedical Research Section head Zenaída De Guzman is the senior author of the study entitled "Radiation inactivation of *Paenibacillus* larvae and sterilization of American Foul Brood (AFB) infected hives using Co-60 gamma rays" published in Applied Radiation and Isotopes.

Agriculture Research Section head Glenda Obra is the principal author of two papers that tackle on various techniques in controlling Mango pests – "Irradiation as a potential phytosanitary treatment of mango pulp weevil, *Sternonchetus frigidus* (Fabr.) (Coleoptera: Curculionidae) in Philippine Super Mango", which was published in The Philippine Agricultural Scientist, and the study entitled "Influence of adult diet and exposure to methyl eugenol in the mating performance of *Bactrocera philippinensis*", which was published in the Journal of Applied Entomology. Along with senior author Louella Lorenzana of the Department of Agriculture, Ms. Obra also co-authored a third paper entitled "Mass rearing technique for mango pulp weevil *Sternonchetus frigidus* (Fabr.) (Coleoptera: Curculionidae)" which was published in the journal of the International Society for Southeast Asian Agricultural Sciences.

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Follow-up Training Course on Nuclear/Radiological Emergency Response...from page 4

The following week, scientists from the Atomic Research Division along with JAEA experts conducted the Follow-up Training Course on Environmental Radioactivity Monitoring from February 3 to 7. The course imparts the basic principles of radiation monitoring as well as practical skills in performing sampling procedures, laboratory processing and radioactivity measurement in the environment. Researchers from the Department of

Environment and Natural Resources – Environmental Management Bureau (DENR-EMB), professionals and students from the private sector and researchers from PNRI participated in the training course.

Finally, PNRI and JAEA experts held the Follow-up Training Course on Reactor Engineering Level 1 from February 10 to 21. The comprehensive two-week workshop delved into the fundamentals of radiation

and reactor physics, reactor operations, infrastructure and safety, aiming to train the next generation of nuclear science workers. Among the attendees are engineers and specialists from the National Power Corporation, particularly the Bataan Nuclear Power Plant joined the training course along with graduate students, university researchers, school teachers and PNRI specialists. 🌐

NAST-DOST International Publication Awards...from page 5

Section head Dr. Lucille Abad of PNRI's Chemistry Research Section is the principal author of two studies on the properties and applications of carrageenan seaweed extracts – "NMR analysis of fractionated irradiated k-carrageenan oligomers as plant growth promoter", which was also published in Radiation, Physics and Chemistry and "Antioxidant Activity Potential of Gamma-Irradiated Carrageenan", published in Applied Radiation and Isotopes. Dr. Abad also co-authored a third paper with Jhalique Jane Fojas and Rizalinda De Leon of the University of the Philippines Diliman. The paper, "Effects of irradiation to morphological, physicochemical and biocompatibility properties of carrageenan", was published in the World Academy of Science, Engineering and Technology.

Science Research Specialists from Dr.

Abad's section also received awards for their published works. Charito Aranilla is the senior author of "Synthesis and characterization of carboxymethyl derivatives of kappa-carrageenan" published in Carbohydrate Polymers. The spread of the pollutant Tributyltin in coastal areas was the subject of "Tributyltin in marine sediments and Philippine green mussels (*Perna viridis*) in Manila Bay", a study by its senior author Ryan Olivares published in the Journal of Marine Science and Technology. Jordan Madrid is the principal author of two papers which were published in Radiation Physics and Chemistry – "Gamma radiation-induced grafting glycidyl methacrylate (GMA) onto water hyacinth fibers" and "Abaca/polyester nonwoven fabric functionalization for metal ion adsorbent synthesis via electron beam-induced emulsion grafting", both of which are dealing with polymer grafting technology.

The annual awards require that the journals where the works will be published must be indexed by Thomson-Reuters (formerly the Institute for Scientific Information) and Scopus. The papers must be published within two years before the awarding. Majority of the research should have been done in the Philippines and the co-author must be affiliated with any of DOST's research and development institutes.

NAST founded the International Publication Awards under a DOST-funded project entitled Evaluation and Improvement of the Research Performance and IP Productivity of the DOST R&D Institutes, which aims to improve the country's productivity in research and to make our scientific community more recognized in the international stage. 🌐

PNRI Hosts Foreign Exchange Students from South Korea



Foreign exchange students from Dong-A University with PNRI Biomedical Research Section staff (standing, 1st and 2nd from right) during their hands-on training.



For the first time in the Institute's history, the PNRI hosted seven foreign exchange students from the prestigious Dong-A University in South Korea for two weeks of hands-on laboratory training from January 20 to 31.

In collaboration with Our Lady of Fatima University (OLFU), the Institute's Biomedical Research Section involved the students in actual experiments in the fields of microbiology and cytogenetics, developing their practical skills in laboratory work.

"We taught them the best practices, especially for an ISO-certified laboratory such as ours," said Biomedical Research

Section head Zenaida De Guzman. The section's microbiological laboratory under the Atomic Research Division is certified under ISO 17025.

"They learned so much from their experience at PNRI. Most of the things they previously learned in college were more theoretical, but here we allowed them to work on actual samples to put their knowledge into practice," Ms. De Guzman said.

The students assisted PNRI researchers and scientists in the microbiological testing of food and medical products. They also engaged in laboratory microscopy and

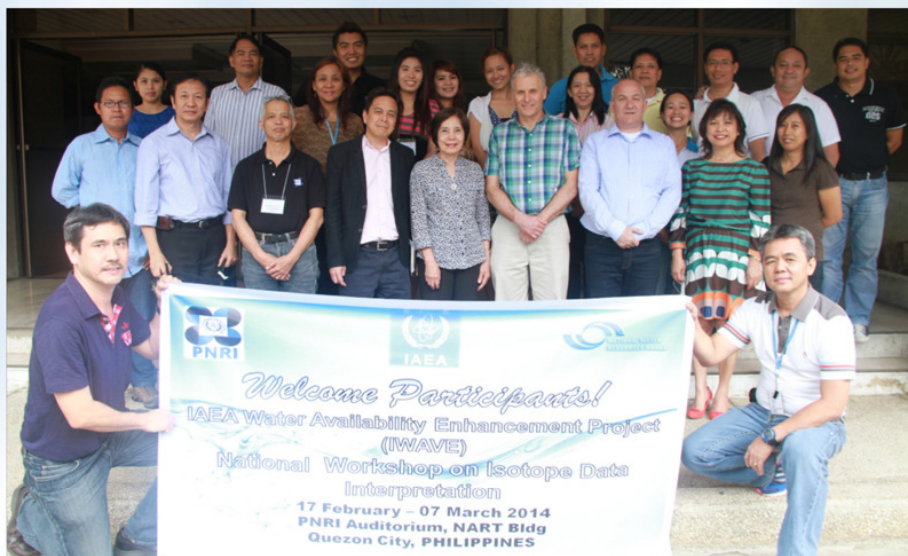
biodosimetry. "They were also very new to nuclear and radiation technologies. PNRI really introduced them into many of its various beneficial applications," said De Guzman.

The exchange program with Dong-A and OLFU not only involved academic and scientific outputs, as the Korean students visited the country to learn our culture and have a taste of Filipino hospitality. Despite the gaps in language and culture, the PNRI scientists would often eat out with the exchange students and join them in bonding and recreational activities.

Enjoying a very holistic experience at PNRI, the Koreans expressed "a very positive feedback" in their final report by the time they said farewell, De Guzman said.

The memorandum of agreement between PNRI, Dong-A and OLFU, which made the exchange students' visit possible will in turn allow trainees and scientists from PNRI to visit South Korea. De Guzman recognizes the exchange program as part of the integration efforts for ASEAN 2015, hoping that the strengthened network between countries "will help our country's scientists and universities become more competitive in the Southeast Asian region." 🌐

PNRI Hosts IWAVE National Workshop on Isotope Data Interpretation



Participants and lecturers in the IWAVE National Workshop on Isotope Data Interpretation pose with PNRI Director, Dr. Alumanda dela Rosa (standing 1st row, 5th from left); National Water Resources Board Executive Director, Dr. Sevilla David, Jr. (standing 1st row, 4th from right); Dr. Ian Clark, University of Ottawa professor (standing 1st row, 4th from right); Dr. Luis Araguas, IAEA Isotope Hydrology Section (standing 1st row, 3rd from right), and PNRI Atomic Research Division chief Dr. Soledad Castañeda (standing 1st row, 2nd from right).

Taking another step in supporting water agencies to provide our country with better access to water resources, the PNRI hosted the National Workshop on Isotope Data Interpretation under the International Atomic Energy Agency – Water Availability Enhancement (IWAVE) Project from February 17 to March 7, 2014.

Renowned experts in the field of isotope hydrology served as resource persons for the training workshop. Among them are Dr. Bhishm Kumar, Dr. Matsumoto Takuya, and Dr. Luis Araguas of the IAEA Isotope Hydrology Section; Prof. Jeffrey McDonnell, University of Aberdeen, School Geosciences, Aberdeen, UK; Prof. Neil

Sturchio, Department of Earth and Environmental Sciences, University of Illinois, Chicago, USA, and Prof. Ian Clark, Department of Earth Sciences, University of Ottawa, Canada. They provided lectures on the principles of isotope techniques application related to groundwater assessment and groundwater dynamics and facilitated hands-on training on the use of software for groundwater dating. Moreover, through their expert guidance, they engaged the participants in the processing of past and present isotope, chemical and hydrogeological data and in the interpretation of these data to come up with conceptual models of the recharge in their respective study areas.

Participants in the three-week workshop were professionals in groundwater management and the water supply industry coming from various government agencies such as the National Water Resources Board, Local Water Utilities Administration, Bureau of Soils and Water Management, Mines and Geosciences Bureau and representatives from water districts in Regions 2 and 10. The water districts represented were the Metropolitan Tuguegarao Water District and Ilagan City Water District in Region 2, and Cagayan de Oro Water District, Butuan Water District and Manolo Fortich Water District in Region 10.

Dr. Soledad Castañeda, who heads PNRI's Atomic Research Division, was the workshop's Course Coordinator. PNRI researchers also participated in the training course. At the culmination of the workshop, the participants realized the importance of nuclear techniques in mapping surface and groundwater sources and in the assessment of vulnerability to contamination to improve the freshwater supply throughout the archipelago.

Contributing to the United Nation's Millennium Development Goal of halving the number of people worldwide without access to clean drinking water and basic sanitation by 2015, IWAVE aims to make freshwater more available to the IAEA member states, with an emphasis on groundwater supply.

The Philippines is one of the pilot countries for the IWAVE project along with Sultanate of Oman and Costa Rica.

VP Binay and PNRI Director dela Rosa Attend Nuclear Security Summit 2014



Philippine officials to the Nuclear Security Summit pose with Vice-President of the Philippines, Hon. Jejomar Binay, (3rd from right); (L to R) Employers Confederation of the Philippines (ECOP) President, Mr. Edgardo Lacson, Ms. Gina Ledda, PNRI Nuclear Safeguards and Security Section head, Ms. Julieta Seguis, Ms. Mila Lacson, Ambassador to the Netherlands, Mr. Jaime Victor Ledda, and PNRI Director, Dr. Alumanda dela Rosa.

Representing President Benigno Aquino III in the international stage, Vice President Jejomar Binay was joined by PNRI Director Alumanda Dela Rosa and Nuclear Safeguards and Security section head Julieta Seguis at the 3rd Nuclear Security Summit at the Hague, Netherlands on March 24-25, 2014. In his address to the Summit, the Vice President emphasized the

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Meeting on the Comprehensive Nuclear Law



Representatives from various government departments and legislative committees (left) participated in the discussions on the Comprehensive Nuclear Law. Senior Legal Officer Andrea Gioia of the International Atomic Energy Agency (right) gave his remarks on the Philippines' legal framework on nuclear safety and security.

In light of House Bill 147 or the Comprehensive Nuclear and Radiation Regulation Act of 2013, the PNRI-DOST hosted a meeting with representatives of legislators and fellow executive departments on March 14.

The meeting was attended by officials from DOST, the Food and Drug Administration – Center for Device Regulation, Radiation Health and Research (FDA-CDRRHR) under the Department of

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VP Binay and PNRI Director dela Rosa Attend Nuclear Security Summit 2014...from page 7

need for nuclear security in the Philippines. VP Binay reported on the Philippines' progress in improving our nuclear security infrastructure at all ports of entry and on-

site facilities, legal framework, and emergency response, as well as in developing a nuclear security culture for all stakeholders responsible for radioactive and nuclear

materials. He thanked the International Atomic Energy Agency for its continued support in maintaining the country's nuclear safety and security.

PNRI-DOST Establishes Electron Beam Irradiation Facility...from page 2

industrial cables tougher and more resistant to heat, corrosion and chemical damage. The same process may also be applied to improve fabrics, paints, and food packaging materials.

E-beams may also be used for polymer grafting, where polymer chains are "grown" from the surfaces of polymers. PNRI scientists are focusing on developing applications such as metal ion absorbents for water purification, catalysts for desired chemical reactions and chemical sensors, among others." said Jordan Madrid, a Science Research Specialist from PNRI's Chemistry Research section who also worked with electron beams in his research on polymer grafting under the Japanese government's MEXT program.

In agriculture, electron beams will prove useful in irradiating food products for sprout inhibition, delaying fruit ripening, pasteurization and microbial decontamination.

Its applications in the medical field ranges from sterilizing medical pharmaceuticals and "high-purity"

equipment such as scalpels and syringes to reinforcing specialized membranes with electronic and biological sensors without damaging sensitive components. Electron beams can also be used for synthesizing nanogels and microgels such as PNRI's recently commercialized hydrogels for wounds and burns.

The higher dose rates would allow for faster irradiation of food and medical products, said Biomedical Research section head Zenaida De Guzman.

The Biomedical Research section will be actively involved in research and development studies on the effects of the E-beam to meat and poultry or fully cooked meals such as chicken and pork adobo developed for patients needing clean or sterile diets.

"We aim to be able to extend the shelf-life of meals such as adobo compared to our previous results with gamma rays. With electron beams, we could even get faster results at even lesser doses of radiation," she said.

Their more recent research on rice-in-a-box-style emergency meal for calamity victims consists of fried rice and chicken adobo. the experimental meal may also be developed to serve as military and relief rations.

The accelerator's capabilities are also a welcome development in fighting pollution, particularly the E-beam's potential in "hygienizing" sewage sludge and in treating or reprocessing of waste water and flue gases.

With enough doses, electron accelerators are able to alter the color and composition of gemstones, proving itself useful to the jewelry industry.

The establishment of the electron beam facility in the Philippines received financial support from the International Atomic Energy Agency, the Japanese and US governments, and DOST. After completing the installation and commissioning of the electron beam facility targeted in the middle of this year, PNRI will conduct trial runs on different samples and products.

Meeting on the Comprehensive Nuclear Law...from page 8

Health (DOH), the Department of Energy (DOE), Energy Regulatory Commission (ERC), National Power Corporation (NPC), Department of Justice (DOJ), Department of Transportation and Communication (DOTC) and representatives from the Senate and the House of Representatives, particularly the respective house's committees on science and technology.

Authored by Congressman Francis Gerald Abaya, House Bill 147 seeks to create an independent and unified nuclear regulatory body in the Philippines to encompass the regulatory functions currently undertaken by separate bodies from separate departments.

PNRI Director Alumanda Dela Rosa sees House Bill 147 as "a milestone in the nuclear regulatory framework of the country."

"In 1958, most of the countries adopted a dual mandate for their nuclear agency, so many or almost all of the countries promote as well as regulate nuclear energy. But with the developments in nuclear energy, many of the countries now in Southeast Asia and throughout the world are going towards an independent regulatory body," she said.

"We need to harmonize with the developments and to comply with the international standards in having an independent regulatory body."

Legal experts from the International Atomic Energy Agency Awareness Mission were also present at the meeting. The experts emphasized the need for our national laws to be consistent with international treaties and commitments, as well as the Philippines' increased participation with various conventions on nuclear safety and security

even without a nuclear power plant.

"Now, the Philippines, I understand, has not foreclosed the possibility of having in the future a nuclear power plant, although this decision as to whether or not to have one has not yet been made. But irrespective of that decision, I think it will be important for the Philippines to join these conventions," said Andrea Gioia, Senior Legal Officer of the IAEA.

PNRI, formerly the Philippine Atomic Energy Commission (PAEC) is mandated under Republic Acts 2067 and 5207, both as amended, and Executive Order 128 to license and regulate the possession and use of nuclear and radioactive materials and facilities for the protection of the workers and the general public. The Institute fulfills this task through its Nuclear Regulatory Division. 🌐

Philippines Serves as Pilot Country for the IWAVE Project



A PNRI researcher collects water samples from a deep well in the water district of Gingoog, Misamis Oriental for analysis.

Capitalizing on the unique advantage of nuclear technology, the Philippines joins the world in providing better access to clean and safe drinking water as it takes a pioneering role in the International Atomic Energy Agency (IAEA) Water Availability Enhancement Project, or IWAVE.

The Philippines is the first Member State of the IAEA to participate in the project, followed by Oman and Costa Rica. IWAVE aims to build capacity in these Member States and assist them in gathering and using scientific information to fully

assess the availability and quality of water resources, contributing to the United Nations Millennium Development Goal of halving the number of people worldwide without access to clean drinking water by 2015.

The PNRI-DOST implements the IWAVE project in collaboration with the National Water Resources Board (NWRB), the Department of Environment and Natural Resources – Mines and Geosciences Bureau (DENR-MGB) and other water-based agencies.

In 2011, PNRI, NWRB and MGB, with contributions from other water agencies, began developing a Philippine Hydrological Gap Plan which agrees to fill the technology, expertise, infrastructure and investments needed. The report entitled "Investment Needs for Resource Assessment Capability in the Philippines to Improve the Planning and Management of Water Infrastructure" was completed in August 2012 and published the following month.

An adequate national assessment of water sources is the first and vital step in making these resources more accessible. Assisting the MGB project on Groundwater Resources and Vulnerability Assessment of the Philippines (GRVAP), the IAEA and PNRI lent their expertise in the design and

application of isotope hydrology techniques with data analysis and interpretation in Water Resources Regions (WRR) 2 and 10 through a Technical Contract. The project covers the provinces of Cagayan, Isabela, Nueva Viscaya and Quirino in Region 2, and Bukidnon, Misamis Oriental, Dinagat Islands, Surigao Del Norte, Agusan Del Sur and Agusan Del Norte in Region 10. The water districts in these municipalities are collaborating in the endeavor.

The isotope hydrology approaches that are developed and tested will be replicated in other water critical areas which will be undertaken within the 2014-2015 IAEA Technical Cooperation project "Integrating Isotope Techniques for Increasing Effectiveness in Water Assessment and Management."

With corresponding support under the IWAVE project, capacity building activities to address identified priority gaps have been implemented, with some still underway. These include conducting national workshops where appropriate international experts were invited and training courses on the application of hydrological tools to improve water resources assessment. 🌐

LIST OF NUCLEAR TRAINING COURSES FOR 2014

NO.	TITLE OF COURSE	DATE	DURATION	TRAINING FEE	NO.	TITLE OF COURSE	DATE	DURATION	TRAINING FEE
01	FTC on Nuclear and Radiological Emergency Preparedness*	January 27 - 31	5 days	Waived	10	Radioisotope Techniques Training Course – Medical (1 st Batch)	June 2 - 27	4 weeks	Php10,000
02	FTC on Environmental Radioactivity Monitoring*	February 3 - 7	5 days	Waived	11	Radiation Safety Course for Medical and Radiopharmaceutical Facilities	June 27 (start) – August 29 (end)	10 days (Fridays only)	Php9,000
03	FTC on Reactor Engineering – Level 1*	February 10 - 21	10 days	Waived	12	Radiation Safety Course for Commercial Sale and Distribution (2 nd Batch)	July 15 - 16	2 days	Php2,000
04	Radiation Safety Course for Commercial Sale and Distribution (1 st Batch)	March 5 - 6	2 days	Php2,000	13	Radiation Safety Officer Refresher Course (2 nd Batch)	August 5 - 7	3 days	Php3,000
05	Safety in the Use of Nuclear Equipment and Devices Training Course (1 st Batch)	March 10 - 14	5 days	Php5,000	14	Safety in the Use of Nuclear Equipment and Devices Training Course (3 rd Batch)	August 25 - 29	5 days	Php5,000
06	Radiation Safety Officer Refresher Course (1 st Batch)	March 25 - 27	3 days	Php3,000	15	Radioisotope Techniques Training Course – Medical (2 nd Batch)	September 1 - 26	4 weeks	Php10,000
07	Seminar on Nuclear Science for High School Science Teachers	April 14 - May 16	5 weeks	Waived	16	Radiation Safety Officer Training Course	October 6 - 17	10 days	Php9,000
08	Course on Nuclear Technology for University/College Faculty	April 14 - May 16	5 weeks	Waived	17	Radiological Health and Safety Course for Industrial Radiographers	October 27 – November 7	10 days	Php9,000
09	Safety in the Use of Nuclear Equipment and Devices Training Course (2 nd Batch)	May 26 - 30	5 days	Php5,000	18	Safety in the Use of Nuclear Equipment and Devices Training Course (4 th Batch)	November 17 - 21	5 days	Php5,000

NOTE:

* Follow up Training Course (FTC) of Japan Atomic Energy Agency (JAEA)

LIST OF NON-DESTRUCTIVE TESTING COURSES FOR 2014

NO.	DATE	TITLE OF COURSE	LEVEL	TRAINING FEE	REMARKS	NO.	DATE	TITLE OF COURSE	LEVEL	TRAINING FEE	REMARKS
01	January 13 – 17	Welding Inspectors Course		11,000	Minimum of 10 participants	10	June 16 – 27	Radiographic Testing	2/3	20,000/22,000	“
02	January 13 – 24	Ultrasonic testing	2/3	20,000/22,000	“	11	July 7 – 18	Eddy Current Testing	2/3	20,000/22,000	“
03	February 3 – 14	Surface Methods	2/3	20,000/22,000	“	12	August 4 – 15	Ultrasonic Testing	2/3	20,000/22,000	“
04	Feb. 24 – March 7	Radiographic Testing	2/3	20,000/22,000	“	13	Aug. 18 – Sept. 2	Surface Methods	2/3	20,000/22,000	“
05	March 17 – 28	Eddy Current	2/3	20,000/22,000	“	14	September 15 – 19	Welding Inspectors Course		11,000	“
06	April 21 – 25	Infrared Thermographic Testing	1	13,500	“	15	October 6 – 10	Infrared Thermographic Testing	1	13,500	“
07	May 5 – 16	Ultrasonic Testing	2/3	20,000/22,000	“	16	October 13 – 24	Radiographic Testing	2/3	20,000/22,000	“
08	May 19 – 30	Surface Methods	2/3	20,000/22,000	“	17	November 10 – 21	Ultrasonic Testing	2/3	20,000/22,000	“
09	June 2 – 6	Welding Inspectors Course		11,000	“						

NOTE:

1. PSNT is NON-VAT registered. Therefore, client shall pay in full as quoted i.e. NO DEDUCTION/ WITHOLDING TAXES.
2. PSNT reserves the right to cancel any of its programs due to unforeseen circumstances. Place your reservation at least one week before the scheduled program.


FOR MORE INFORMATION, PLEASE CONTACT:

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IAEA Expert Presents Phase 3 of ASPAMARD



Former PNRI Atomic Research Division (ARD) chief Dr. Emerenciana Duran (extreme left) presented data from the Phase 3 of the Asia Pacific Marine Radioactivity Database (ASPAMARD) during the ARD lecture Series held on March 27, 2014 at the PNRI Audio-Visual Room. She is joined by Atomic Research Division Chief Dr. Soledad Castañeda, Agriculture Research Section Head Glenda Obra and Health Physics Research Section Head Teofilo Garcia (2nd to 4th from left). Dr. Duran is an International Atomic Energy Agency expert for ASPAMARD, which is a compilation of available data on radionuclide concentrations in seawater, sediment and marine biota in the Asia Pacific region. Under the IAEA project RAS 7/021, Phase 3 focuses on the potential impact of the Fukushima nuclear accident on the marine life and environment. The Philippines is the focal point for compiling ASPAMARD throughout the region. 

Philippine Army Visits PNRI Facility



Twenty-five members of the Chemical, Biological, Radiological and Nuclear (CBRN) response platoon of the Explosive Ordnance Disposal Battalion, Philippine Army conducted an educational tour on February 27, 2013 at PNRI facilities and laboratories. The tour aims to provide individual knowledge and skills, develop teamwork necessary for operations of CBRN decontamination, defense, detection and monitoring of equipment. A lecture on the basic facts about radiation, radiation protection, and emergency preparedness and response and hands-on demonstration on the use of radiation detection instruments were presented during the tour. 

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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