



PakAtom

Newsletter of the Pakistan Atomic Energy Commission

August - September 2022

Pakistan taking steps to limit Greenhouse Gas emissions: PAEC Chairman

Chairman Pakistan Atomic Energy Commission, Dr. Raja Ali Raza Anwar has said that Pakistan is taking all the steps to limit Greenhouse Gas emissions by achieving more nuclear energy in future. He stated this while delivering the National Statement at the 66th session of International Atomic Energy Agency (IAEA) Annual General Conference. During his address, he said that the IAEA move to organize this GC as a Green Event is commendable.

He told the world community that Pakistan is one of the top 10 vulnerable countries to face the consequences of climate change. He said that the recent extreme weather events have again brought into light the greatest challenge facing humanity. Global issues require global solutions; therefore, close and unrestricted cooperation and access to nuclear power is the need of the hours. "Pakistan is taking all the steps to limit Greenhouse Gas (GHG) emissions with the coming on line of the sixth operating nuclear power plant, the contribution of nuclear in the energy mix has increased to about 15% and generation of electricity through nuclear power has reached more than 3500MW. We are striving to achieve more nuclear energy in the future", he added. He informed the audience that Pakistan, through its association with IAEA, is effectively utilizing nuclear science and technology towards attaining UN Sustainable Developing Goals (SDGs). Apart from power generation, Pakistan is actively engaged in the areas of agriculture, human health, industry & environment and reaping benefits of nuclear technology in these areas. Nuclear technology is playing a key role in diagnosis and treatment of cancer. PAEC has added one hospital to its fleet and now it has 19 cancer hospitals across the country.



Chairman PAEC addressing the 66th general conference at IAEA

The construction of one more hospital has also started. These hospitals are catering for over one million patients annually.

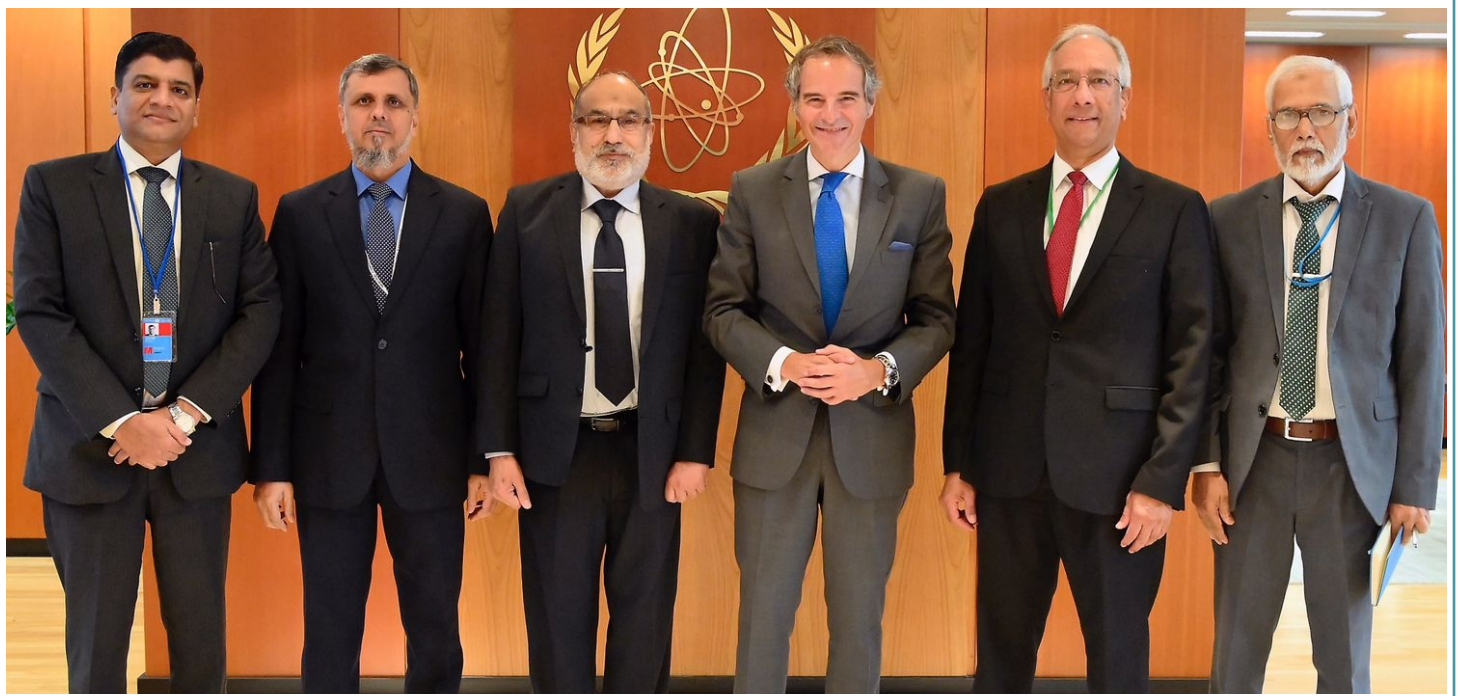
Chairman PAEC said that Covid-19 pandemic has made the world cognizant of the increasing dangers associated with zoonotic diseases. IAEA's ZODIAC initiative aims to facilitate early detection and prevention of future zoonotic outbreaks. We have benefited a great deal from the IAEA's Technical Cooperation programme. Pakistan-IAEA TC partnership not only strengthens Pakistan national capacity through TC activities but also its capabilities and expertise to support other member states by hosting Fellowships, Scientific Visits and Training Courses / Workshops under the auspices of IAEA. Pakistan has developed a comprehensive nuclear security regime. Pakistan applauds



Chairman (PAEC) with DG (IAEA) Rafael Mariano Grossi



Pakistan's delegation in 66th GC at IAEA



Pakistan's delegation alongwith DG IAEA, Chairman PAEC and Ambassador of Pakistan at IAEA, Austria

the Agency's assistance and support in the areas of nuclear security.

A Centre of Excellence in nuclear security PCENS is

functioning to train the required manpower of the country and other regional international fellows, he added.



Pakistan's delegation meeting with Rafael Mariano Grossi (DG, IAEA)

PAEC Engineer Awarded PhD Degree



Dr. Muhammad Adnan, Senior Engineer (Chemical), Pakistan Atomic Energy Commission, has been awarded PhD degree by Pakistan Institute of Engineering and Applied Sciences (PIEAS). He completed his PhD in three and half years.

His dissertation title was "Thermo-economic analysis and performance improvement of integrated

gasification combined cycle co-generation system with carbon capture". His work was complemented by high impact peer-reviewed journals and several international conferences.

His PhD work may contribute significantly towards the utilization of local resources for electricity generation as well as for production of fuels and chemicals.

Pakistan bags three awards for nuclear advancement contribution

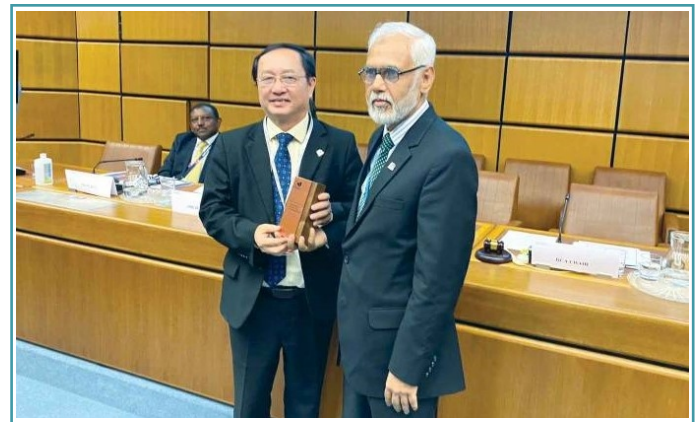
PINSTECH win Institutional category and two more for Isotope Hydrology & Theranostics

Pakistan has received three Regional Cooperation Agreement (RCA) awards in Vienna, Austria, both for the institutional category and the individual category.

Regional Cooperative Agreement (RCA) of the International Atomic Energy Agency (IAEA) recognised achievements of Pakistan Atomic Energy Commission (PAEC) on its 50th Anniversary. A ministerial level meeting was organised by the International Atomic Energy Agency (IAEA) to celebrate the 50th anniversary of the Regional Cooperative Agreement (RCA). During this event, various awards were conferred to recognise contributions to the RCA program. Pakistan had the distinction to receive three awards in individual and institute categories respectively at the event held in Vienna, Austria.

In the institute category, Pakistan Institute of Nuclear Science and Technology (PINSTECH) was recognized for its contributions in various areas of applications of nuclear science and technology including Isotope Hydrology, Water Resources Management, Industry and Air & Marine Pollution. In the individual category, two Pakistani scientists were conferred RCA Project Awards. Dr. Azam Tasneem, Chief Scientist (Retd.), PINSTECH, was recognized for his work as lead country coordinator in the areas of Isotope

Hydrology and Water Resource Management. Also, Dr Irfan Ullah, Dy Chief Scientist, Institute of Nuclear Medicine & Oncology (INMOL) was awarded for his contribution in the areas of cancer diagnosis and treatment (theranostics). The RCA is a formal intergovernmental agreement which serves as a framework for the Asia Pacific Region to intensify collaboration through programmes and projects focused on the specific shared needs of its 22 member countries in the field of nuclear science and technology.



Dr. Imtiaz Ahmed receiving one of awards for Pakistan

Pakistan's National Institute of Safety and Security (NISAS) granted status of Collaborating Center by the IAEA in Nuclear Security

The National Institute of Safety and Security (NISAS) of the Pakistan Nuclear Regulatory Authority (PNRA) was granted the status of a collaborating center by the International Atomic Energy Agency (IAEA) at a signing ceremony at the IAEA Headquarters.

Mr. Faizan Mansoor, Chairman PNRA, signed the agreement with Ms. Lydie Evrard, Deputy Director General, Head of the Department of Nuclear Safety and Security of IAEA. The signing ceremony was witnessed by Chairman Pakistan Atomic Energy Commission (PAEC), Dr. Raja Ali Raza Anwar and H.E. Aftab Ahmad Khokher, Permanent Representative and Ambassador of Pakistan in Austria.

Speaking on the occasion, Chairman PNRA said Pakistan has already been conducting nuclear security related training activities. With this agreement, these efforts will become more streamlined and would be a boon for Pakistan's cooperation with the IAEA. He thanked the Department of Nuclear Safety and Security of the IAEA for continuing to support Pakistan in these initiatives.

DDG Evrard also shared that this agreement highlights a significant development in Pakistan's ongoing collaborative efforts with the IAEA in the area of nuclear safety and security. She hoped that this center will not only contribute to national initiatives but establish itself as a center of excellence in the region. NISAS is one of the three institutes

in Pakistan dealing with nuclear security training. It has previously hosted IAEA sponsored national and regional training courses and with the signing of this agreement, the centre will further implement nuclear security related training activities at national and regional level, in coordination with IAEA, for a period of four years.

NISAS joins the Pakistan Institute of Engineering and Applied Sciences [PIEAS] as the second IAEA collaborating Centre which gained the status in 2019 and continues to implement IAEA sponsored activities in the area of nuclear energy.



Chairman PNRA after signing the Agreement with DDG IAEA/Head of nuclear safety & security

GINUM Organizes Breast Cancer Symposium



Group Photo of participants, lecturers and other officials

Breast cancer is the most common cancer in Pakistan and the management of this debilitating disease is one of the most controversial subjects in the field of Oncology. A multidisciplinary symposium was arranged by Oncology department of GINUM in collaboration with Pakistan Society of Clinical Oncology & Society of Surgeons Pakistan.

A galaxy of health professionals from different specialties from not only Gujranwala but also from various cities of the country and from all PAEC centers honored GINUM with their presence so as to play their role in the management of this challenging disease. This was an interactive program in which a few breast cancer case scenarios were discussed that are most frequently encountered in oncology clinics and the main objective was to train young doctors and post graduate trainees for better management of the most common breast cancer cases.

The session started with the presentation of Dr Muhammad Imran Khokhar, Associate Professor of Surgery Gujranwala

Medical College, he discussed about management of early stage and locally advanced breast cancer. All the guests actively participated & the experts enlightened the participants by sharing their knowledge and experience. Next presentation was delivered by Dr Kiran Shahzadi, SMO GINUM, the management of breast cancer during all the three trimesters of pregnancy was discussed in detail. In the final presentation, rare breast cancer histologies were discussed by Dr Umar Javed, SMO GINUM.

Dr Sohail Murad, Director GINUM thanked and appreciated all the participants after the completion of case presentations. The ceremony was concluded with the distribution of mementos to honorable guests and the presenters. Mementos were presented by Dr Maqbool Ahmed Shahid, Ex-Director INMOL and pioneer of Nuclear Medicine & Oncology in Pakistan, he also prayed for the welfare and early completion of Phase-II of GINUM in a collective prayer arranged at the end.

Team Ascensor from PIEAS win Bronze in Teknofest-22



The winning team with accolades

Team Ascensor is a veteran group of aspiring students from the Pakistan Institute of Engineering and Applied Sciences that has now made Pakistan proud twice by securing positions in Teknofest'21 and '22. TEKNOFEST 2022 is the largest technology competition in Turkey, sponsored by the T3 Foundation and well-known Turkish companies and



A view of PIEAS UAV fixed wing

institutions. This occasion gathers an assorted assemblage of 200,000+ graduates and understudies from various countries across the globe. This year, the team Ascensor bagged bronze medal overall in the international UAV fixed wing category with about 180 teams and 84 countries competing in the category.

The team first developed its first UAV Ascensor Mark-I to enter Teknofest'21 only last year. The plane aced all missions successfully and secured position throughout the international teams at the competition. This year, the team graced the grand stage again with Ascensor Mark-II. Mark II's amazing flight ability, refined design, vertical and horizontal 360s, and its flashing speed amazed the pilots and audience.

During the competition week, the team was visited by the Minister of Industry and Technology of Turkey, Mr. Mustafa Varank who praised the design of the aircraft. The President of the Scientific and Technological Research Council of Turkey (TUBITAK), Mr. Hasan Mandal also met the team and had a constructive conversation covering a range of technical and non-technical topics. This entire event was covered live by national news channels of Turkey.

Opening Ceremony of 34th Senior Officers Management Course (SOMC-34) held at PIEAS



Group photo of participants, lectures and Rector PIEAS with Chief Guest

The opening ceremony of 34th Senior officer Management Course was conducted in PIEAS Auditorium from September 5, 2022. This 8 week long course will accommodate 108 participants from various organizations.

The course will involve interactive sessions with chairmen of strategic commissions, military leadership, management experts, consultants, philosophers, and thinkers etc.

Dr. Muhammad Bilal Malik was the chief guest on the opening ceremony. Dr. Jamil Ahmed, Director SLPS

apprised the guests about the course conduct. Rector, PIEAS appreciated the efforts of SLPS team in course management. Speaking with the participants the chief guest, Dr. Muhammad Bilal Malik shared his own experiences about this course. He emphasized on some key personal and professional attributes that could lead the participants to be successful in their management positions. He also advised the participants to use this course platform to network and find avenues for collaboration among strategic organizations.

Workshop on Effect of Microstructure on Materials Properties

A Three days workshop on "Effect of Microstructure on Materials Properties" organized by Materials Division, Directorate of Technology, PINSTECH was held on August 29-31, 2022.

The main theme of the workshop was to disseminate the scientific and technical knowhow to participants that how the engineering materials are selected among the range of available materials keeping in view of the scientific properties and engineering parameters.

In his Inaugural Speech Dr. Qamar-ul-Haque DG, PINSTECH, emphasized the role of materials in PAEC and overall in society. The speakers highlighted the importance of Materials in Science and Engineering. They interacted

with participants to listen to their issues and consequently proposed the solutions to mitigate the problems faced in materials failure before design life.



Group photo of participants with DG, PINSTECH

PAEC's Isotope Production for diagnosis and treatment of Cancer patients in Pakistan

Maintenance of sustainable supply of radio-pharmaceuticals to various nuclear medical centres is important for the management of cancer patients.

Research & Development for the indigenous production of potential medical radioisotope/ radio-pharmaceuticals was started at Chemistry Division, PINSTECH a premiere scientific institute of PAEC after the commissioning of PARR-I in 1966.

Later in 2001, Isotope Production Division (IPD) was established, aimed to produce radioisotope and radio-pharmaceuticals indigenously. IPD has been the major supplier of radio-pharmaceutical within country and there is no such domestic entity which has infrastructure or core capability to produce radio-pharmaceuticals.

PAEC is supplying its products to 85 government and private nuclear medical centres, general hospitals and pharmacies from Karachi to Gilgit. It includes 19 Atomic Energy Cancer Hospitals owned by Pakistan Atomic Energy Commission (PAEC) where over one million patients visit every year for diagnosis and treatment.

Indigenous production of Molybdenum-99 (^{99}Mo) was started in 2012. Indigenous ^{99}Mo is subsequently used for the manufacturing of PAKGEN $^{99\text{m}}\text{Tc}$ generators. Iodine (^{131}I), another radioisotope produced at IPD, PINSTECH, is used for thyroid function scintigraphy and thyroid cancer treatment.

Currently, seven various types of freeze dried kits are being produced and dispatched to various hospitals.

Intravenous adenosine injection used in the stress myocardial perfusion, is another product of PAEC. Annually, more than 40,000 adenosine injections are being supplying to various NM centres and hospitals at national level. A $^{99\text{m}}\text{Tc}$ Generator Production Facility (GPF) currently producing 1800 PAKGEN $^{99\text{m}}\text{Tc}$ generators per annum.

IPD has upgraded its production and quality control systems



PAKGEN $^{99\text{m}}\text{Tc}$ Generator

with technologically advanced equipment, aiming towards maximum automation and standardization, while strictly following the methodologies of Good Manufacturing Practices (GMP). These facilities are ISO 9001:2015 certified and European Pharmacopoeia is followed for quality control of its products. Drug Regulatory Authority (DRAP), Ministry of Health has issued license to manufacture radio-pharmaceuticals.

To meet the emerging demands in the field of nuclear medicine, IPD is continuously developing new agents for diagnosis and treatment of cancerous tissues. Recently, five new kits have been developed.

After registration from DRAP, these kits will be available for all the Nuclear Medicine & Oncology centres within country at low cost.



Iodine-131 separation Plant



Mo-99 Separation Plant

Certificate Distribution Ceremony of 27th NPTC training camp



Dr. Mansoor Hameed Inayat giving certificate to one of a participants

The certificate distribution ceremony of 27th National Physics Talent program training camp was held on September 1, 2022 in PIEAS. Dr. Mansoor Hameed Inayat, DG National Center for Physics (NCP) and former Pro-Rector PIEAS was the chief guest for the event. He was

received by Director Center of Mathematical Sciences and NPTC training coach, Dr. Shahid Qamar and Dean Sciences, Dr. Anila Usman.

In his speech, Dr. Shahid Qamar briefed the audience about national achievements under the NPTC program. He thanked the chief guest for sparing his precious time for the event. The few selected NPTC participants also spoke about their experience of the training camp and expressed their gratitude towards PIEAS and the resource persons.

The chief guest in his speech congratulated the participants on being selected through a competitive process. He highlighted that the parents of the participants are also worthy of praise as they played a major role in providing an enabling platform to help them showcase their talent. He wished that the participants will keep working with zeal and passion to become future leaders in science & technology. He distributed certificates among the participants and also invited them to visit NCP labs. Dean Sciences presented a shield to the chief guest.



Group Photo of participants and faculty with Dr. Mansoor Hameed Inayat, DG. NCP

International Collaboration

Visits of foreigners to Pakistan

Mr. Vincent Sebastiano Perdicaro (French National) has visited NORI, Islamabad, Pakistan on 03rd September to 31st Jan, 2022 for "Installation of PET/CT Cyclotron" at AECH-NORI.

Mr. Talal Obeid (Australian National) and Ms. Hafsa Bokhari (Pakistani based in Saudi Arabia) visited INMOL, Lahore, Pakistan on 20th September to 30th October, 2022 for "Installation of Halcyon LINAC Riggers and HW Installation at INMOL.

Mr. Sedat Erygit and Mr. Cumhuri Oren from Turkey visited INMOL, Lahore, Pakistan on 26th to 30th September, 2022 for "Installation of Halcyon LINAC Riggers and HW Installation at INMOL.

Assignment of PAEC Experts Abroad

Dr. Muhammad Ashraf, NIAB visited INMOL, Fiji on 19th to 23rd September, 2022 for assignment as an IAEA Expert on "Improving the Resilience of Crops to Climate Change through Mutation Breeding Phase-II (SAPI).

International Training Course on Regulatory Functions for Security of Nuclear Material, Nuclear Facilities and Associated Activities



Group photo of participants and lecturers with Chairman (PAEC)

International Training Course (ITC) on Regulatory Functions for Security of Nuclear Material, Nuclear Facilities and Associated Activities was held from 12-23 September, 2022 at Pakistan Centre of Excellence for Nuclear Security (PCENS), Chakri near Islamabad. The event was organized by IAEA and hosted by Government of Pakistan through PCENS. Dr Raja Ali Raza Anwar, SI, (Chairman PAEC), inaugurated the International Training Course.

The security of nuclear material, nuclear facilities and associated activities is an international responsibility. Thus, it is of utmost importance to regulate measures and systems for nuclear security by periodic checks and surveillance using modern techniques.

The purpose of this ITC is to provide guidance to participants for effective implementation of regulatory approaches, processes and functions for the security of nuclear material, nuclear facilities and associated activities. It will also address the needs and priorities of regulatory staff to perform regulatory functions. It consists of lectures as well as practical group-exercises to evaluate the knowledge of participants. The organizers of this ITC have provided an excellent opportunity to participants for becoming well acquainted with the threads of this field.

Three (03) IAEA and two (02) local experts imparted knowledge and conducted practical work sessions during the course.

Hands-on Training on Analytical Techniques

A three-day training workshop entitled, "Hands-on Training on Analytical Techniques" was organized by Central Analytical Facility Division (CAFD), Directorate of Systems and Services, PINSTECH at Dr. I. H. Usmani Auditorium, PINSTECH from 07-09 September, 2022. The main objective of this workshop was to familiarize the participants about different analytical techniques and available analytical facilities of CAFD. The workshop was inaugurated by Dr. Qamar ul Haque, Director General, PINSTECH. He highlighted the importance of such workshops and emphasized that it is essential to share experiences among researchers and improve the skill related to analytical chemistry.

Earlier, in the introductory remarks, the workshop coordinator, Dr. Kashif Naeem, Principal Scientist and workshop coordinator highlighted the workshop's aims. Mr. M. Naeem Abbas, CS, Director Systems and Services, PINSTECH, in his welcome address, explained about the annual scientific calendar of PINSTECH and emphasized

that participants should get benefit by participating in different activities relevant to their fields.

The deliberations of training workshop comprised of technical sessions including lectures and hands-on laboratory sessions.



Group photo of participants with DG, PINSTECH