Pakistan stands as a respectable nuclear state with excellent safety and security standards. This was stated by President, Pervez Musharraf while addressing a gathering at Chashma Nuclear Power Plant-2 after performing Containment Dome Placement ceremony on Tuesday December 18, 2007, at Chashma, Mianwali.

The President, who is also Chairman of the country’s National Command Authority (NCA), said, Pakistan Atomic Energy Commission and Pakistan Nuclear Regulatory Authority (PNRA) should work in unison towards the cherished goal.

Pakistan Atomic Energy Commission

President addresses Containment Dome Placement Ceremony of C-2

Pakistan stands as a respectable nuclear state with excellent safety and security standards

Nuclear power essential part of our policy

KANUPP and CHASNUPP-I maintaining excellent safety and operational record

Appreciates China’s support and assistance for Nuclear Power Projects

Free flow of technology and equipment to enable the region meet carbon emission limits must: President Pervez Musharraf
He applauded the PAEC and PNRA in understanding, implementing and meeting the nuclear safety and physical security requirements of the nuclear power plants in the country.

The President said, it was gratifying to note that excellent safety and security standards were being maintained at the country's existing nuclear power plants at KANUPP and CHASNUPP-I.

The President said the government has chalked out a comprehensive plan to expand power generation to meet the demands of the country's rapidly growing economy. The Pakistan Atomic Energy Commission has been given the task of increasing nuclear power generation, in accordance with the country's Energy Security Plan.

He said that in addition to the conventional and renewable power generation sources, nuclear technology has a major role in the power generation mix in the country.

The President stated that the world was realizing the promise and potential of the peaceful uses of nuclear energy and advancement in design and management has enhanced the safety of nuclear plants.

The President said “Most of the world’s population which lives in South Asian countries remained backward for a long time. The developed nations that are emphasizing free trade and carbon emission limits for this region as well, must also share their knowledge with this largest segment of world population. It is imperative for peace and harmony in the world that the energy needs of this region are well provided through open sharing of information and free flow of technology and equipment. They should be provided access to new technologies including nuclear power development. I reemphasize that technology is key to solutions for problems faced by humanity. You must look at the bigger picture and adopt strategies that provide seamless mobility for technology flow, without, of course, compromising safety and security” he added.

Commending PAEC’s work culture, the President said “Pakistan Atomic Energy Commission has demonstrated its ability to solve complex problems and work towards future needs. Qualified and trained human resource is their strength to meet the challenges of future. I realize that they need to enhance it further. They have a road map to follow”.

The President thanked the Peoples Republic of China, a time-tested friend, for its collaboration and technical assistance in various development projects, including nuclear power generation.

He said that his personal relations with Chinese President Hu Jintao have given these projects momentum and impetus. Chashma Nuclear Power Plant along with numerous other development projects in the country were a living testament to Pak-China friendship.

Vice President China National Nuclear Corporation (CNNC) Yu Jian Feng said the dome placement will mark the transfer of the project from the civil works stage to full swing equipment installation. He said that in view of the excellent cooperation between CNNC and PAEC, the Chashma-2 Power Plant would emerge as another befitting example of the friendship between the two countries.

Vice Minister, COSTIND, China, Chen Qiu Fa said the engineers of Pakistan and China have greatly benefited from each other over the years and draw on the expertise of each other in the service of the their countries and humanity.

He said the successful construction of CHASNUPP has become “good model of south-south cooperation. Earlier, in his welcome address, Chairman, PAEC, Mr. Anwar Ali informed “The projected levelised cost of electricity generated from C-2 is about six cents per unit. It is because of the performance of C-1 and the cost competitiveness of C-2, that the government of Pakistan has entrusted PAEC with the task of generating 8800 MWe of nuclear power by 2030.”

We plan to enhance indigenous contribution in each new plant and facilities and infrastructure for this purpose are being developed, Mr. Anwar Ali stated.

He also spoke of the contribution of PAEC in diverse domains of agriculture, health, research and human resource development for the socio-economic development of the country.

The 325 Megawatt capacity plant (C-2) being built with Chinese collaboration and technical assistance is likely to be completed by 2011. The plant is ahead of its completion schedule. The Dome Placement event is the most important milestone in the construction phases of a nuclear power plant.

The ceremony was attended by Chairman Joint Chiefs of Staff Committee, Director General Strategic Plans Division, Ambassador of China to Pakistan, and other high civil and military officials, as well as a large number of scientists, engineers and Chinese and Pakistani workers of the plant.
PAEC’s Pakistan Institute of Engineering and Applied Sciences (PIEAS) is establishing a National Centre for Nanotechnology. Its objectives include teaching, training, research and development in the area of Nanotechnology with particular emphasis on nanomaterials synthesis and characterization.

The PAEC/IAEA/RCA Regional Training Course on Applications of Nanotechnology was conducted from 29th October - 2nd November, 2007. A total number of 10 countries of the region, i.e. Bangladesh, China, Indonesia, Malaysia, Mongolia, Philippine, Sri Lanka, Thailand, and Vietnam were represented by a total number of 17 scientists and engineers as trainee participants apart from 5 regular representatives and 10 observers from Pakistan.

The regular faculty comprised two foreign expert lecturers who were invited from USA and Poland. In addition, eight experts from PIEAS, PINSTECH and Quaid-i-Azam University also participated as guest lecturers.

The course was meant to provide insight into nanomaterials synthesis, properties and applications. A particular emphasis was laid on the use of ionizing radiations for the synthesis of nanostructures. The other techniques emphasized in the course were: template-assisted electrodeposition, sol-gel, chemical reduction, radiation grafting, lithography, etc. All kinds of nanomaterials, typically known as nanoparticles (quantum dots), nanowires, thin films, nanocomposites, nano-templates and nano-gels were covered in detail. The typical optical, magnetic, mechanical and chemical properties of nanomaterials were also focused upon. A significant emphasis was also laid on the social and economic aspects of nanotechnology. The program was very conducive and well organized. The technical material covered in the course was composed of high quality information and new trends in nanomaterials synthesis and their applications. This training course provided an excellent opportunity of interaction among participants and lecturers. The trainee participants also presented country reports that reflected a significant activity already in progress in the IAEA member states of the region. It is expected that the course will enable the participants to find new approaches and directions in order to enhance their activities and add new dimensions to their work.

The certificate award ceremony was chaired by Dr. Ansar Parvez, Member (Science), Pakistan Atomic Energy Commission as chief guest. Dr. Muhammad Aslam, Rector PIEAS and Dr. Tehsin Hamid, Pro-Rector PIEAS were also present at the occasion along with a number of senior officials of Pakistan Atomic Energy Commission. Dr. Ansar Parvez and Dr. Muhammad Aslam stressed the need of such events that can provide the scientists and engineers an opportunity to learn from each other and work together for the betterment of their nations, particularly in the areas based on advanced technologies. They also thanked IAEA, particularly the officials working as focal persons of Regional Cooperation Agreement (RCA), for their highly valuable support.

Dr. Massimo Bertino from Virginia Commonwealth University, appreciated the arrangements of the course and expressed his desirability for more of such interactions.
Environmental Studies Coordination Cell (ESCC) was formed in August 2007 to facilitate & coordinate PAEC Environmental Research activities and to chalk out a comprehensive strategy to support the National Environmental Programme.

To introduce and start up the activities of ESCC, a workshop on “Utilization of Nuclear and other Advanced Techniques in Environmental Research” was held on 13 November, 2007. More than 50 scientists and engineers from PINSTECH, PIEAS, NIBGE, KNPC, GCISC and DOS actively involved in environmental work participated in the workshop.

Opening the Workshop, Dr. Ansar Parvez, Member, Science emphasized the need of Systematic Environmental Research well coordinated with the national programme.

A total of 14 presentations were made in three technical sessions covering different environmental aspects. The first session on Atmospheric Environmental Pollution was chaired by Dr. Jamshaid Zaidi, Director Coordination. In this session 5 presentations were made on air modeling, air pollutants and their environmental effects. The second session on Aquatic Environment Pollution was chaired by Dr. Salman Ahmad, Director System & Service and Dr. Nasrullah Qazi, Director Technology. In this session 5 presentations were made, covering marine, river & lake environment, modeling of Aquifers and Management of Coastal Environment. The third session on Terrestrial Environmental Pollutions was chaired by Dr. Syed Javaid Khurshid, Coordinator, ESCC. In this session, 4 presentations were made on Modeling System with respect to radioactivity & heavy metals.

In the concluding session, the Coordinator ESCC summarized the presentations, ideas and emphasized the need to form collaborative Mega Projects covering the modeling and analytical data. The following projects were proposed to start with:

1. Modeling of air circulation/pollution with reference to South East Asia
2. National Environmental Radioactive Surveillance
3. Hydrology and Ecology of Marine Environmental Research in Pakistan
4. Modeling of Aquifers in Industrial, Urban and Non-urban regions
5. Development of technology for contaminated marine and terrestrial environment

Patents filed by Dr. Shoukat Pervaiz approved

Dr. Shoukat Parvez, Deputy Chief Scientist at National Institute for Biotechnology & Genetic Engineering, Faisalabad was Post-Doc fellow at the Kyung-Hee University Seoul S. Korea from July 01, 2004 to September 30, 2006.

During his stay at the Department of Biological Sciences, Institute of Oriental Medicine, Kyung-Hee University, he filed nine patents along with other researchers to the Intellectuals property right of Patent office Seoul, Government of South Korea. Recently out of nine patents five have been approved and allotted the patents numbers. The approved patents are on the development of probiotic technology for enhanced bile salt hydrolysates and cholesterol reduction and economical process for yeast extract production.

On his achievements, he was awarded the certificates of excellence and appreciation from the Director R&D and Dean, Institute of oriental medicine, Kyung-Hee University Seoul, Korea.
Pink Ribbon, a Project of Women’s Empowerment Group and Vision 2015 organized a series of lectures in connection with the breast cancer awareness programme. The lectures were arranged at Islamabad College for Girls, F-6/2, OPF Girls College, Islamabad and Fatima Jinnah Women University, Rawalpindi. Dr. Kaukab Jabeen, Head, Radiotherapy Department of NORI, Islamabad, delivered lectures on Breast cancer awareness and breast self examination. She highlighted the importance of early detection of breast cancer and role of breast self examination and mammography. She informed the audience that facilities for mammography and clinical examination of breast are available in NORI.

All thirteen PAEC Cancer centers including NORI are running breast care clinics. She also emphasized the importance of early detection of breast cancer. The prognosis of disease is good with 5-years survival of more than 90%, if the disease is detected and treated in the very initial stage. The females should get their breasts examined and have regular mammograms after the age of 40. She discussed in detail the risk factors in development of breast cancer and also the treatment modalities available in NORI, Islamabad and other parts of the country. The series of lectures were found to be very informative and enlightening by the faculty staff and students. The role of Pakistan Atomic Energy Commission for creating awareness about early detection of cancer and its treatment was also appreciated.

Establishment of IT Cell at NIFA

At PAEC’s Nuclear Institute for Food and Agriculture (NIFA), an IT cell has been established as a central facility for provision of information, providing and maintaining the networking systems and PCs and catering other IT-related needs of the institution including:

- Arranging computer courses at NIFA
- Electronic circulations as a source of intra-institution communication
- Online access of literature database to every scientist.
- Library services including electronic search facility for all the printed material available in the library
- Development and maintenance of NIFA web Development of relevant databases
- Provision of internet access to all the scientists/relevant technical staff
- Preparation of audiovisual material
- Help with OS problems and software installations
- Help in experimental designing and statistical analyses

The Cell will formally be inaugurated soon.

Ph.D. Degree for PAEC Engineer

Mr. Najmul Arifeen, Principle Engineer, KCP-1, has been declared successful for the award of Ph.D. Degree in Chemical/Biochemical Engineering by The University of Manchester, UK. His title of research was “Design and Optimization of Bioethanol Production System by Mathematical Programming Techniques”.

Awareness seminar in progress at Islamabad Girls College at F-6/2, Islamabad.

Dr. Kaukab Jabeen delivering a lecture.
A PET-CT and Cyclotron is being installed by Pakistan Atomic Energy Commission at its cancer hospital INMOL, Lahore. It will be a 16 slice PET-CT scanner and a 16.5 Mev cyclotron which will be a state-of-the-art technology and the first equipment of its kind in Pakistan. Positron Emission Tomography (PET) is a molecular imaging technique of Nuclear Medicine which produces 3-D images of the functional processes of the body.

A PET scanner acquires the data of distribution of a short lived radioisotope around the body and reconstructs it into multiple thin slices which are visualized and quantified for diagnostic purpose. This technique can detect any disruption in the normal physiology and is highly useful in early detection of cancer, heart disease and brain diseases.

This is most widely used technique for early detection of cancer, response to its treatment and for picking recurrences in early stages. A cyclotron produces short-lived radioisotope to be used for PET imaging. Cyclotron is a particle accelerator in which the particles are accelerated and bombarded on certain standard targets to produce short-lived radioisotopes like F-18, C-II, N-13 and 0-15. These isotopes are utilized to prepare organ specific radiopharmaceuticals like F-18 deoxyglucose (FDG) which when injected intravenously concentrates in the rapidly dividing cancer cells. Three dimensional structural and functional images are acquired by PET-CT scanner, which are of high sensitivity and specificity.

The PET-Cyclotron project of INMOL was approved in 2005-2006. Tenders were called in early 2006 and their evaluation completed in June, 2006. A detailed agreement for the civil works and equipment was signed in June, 2007. Civil work started in the 4th week of November, 2007. It is expected that the project will be completed and become functional within 2 years.

Mr. Muhammad Akram, Principal Scientist, Radiation Surveillance Centre (RSC) has been declared successful for the award of Ph.D. degree in Environmental Science by the University of the Punjab, Lahore. His research title was “Assessment of Natural and Artificial Radionuclides in the Marine Coastal Environment of Pakistan”. He worked under the supervision of Dr. Riffat M. Qureshi, Chief Scientist, Head Isotope Application Division, PINSTECH, Dr. Tariq Jamal Solaija, D.G. Planning, PAEC and Prof. Dr. Nasir Ahmed, Director Institute of Earth Sciences, University of the Punjab. His Ph.D. research work has been published in the form of four research papers in journals of international repute.

Recently 5th Annual Endocrine Symposium was held under the auspices of Pakistan Endocrine Society in Lahore from 1st-2nd September, 2007.

Mr. Shan Elahi, Senior Scientist, PAEC’s Cancer Hospital CENUM, Lahore participated in the symposium.

He made a poster presentation of his Research Paper titled “Thyroid Related Hormone in Early Pregnancy: Factors, Interpretation and Importance” based on the results of his Ph.D. Research Work on “A Longitudinal Study of Iodine Deficiency and Thyroid Autoimmunity in normal pregnant women and their effects on maternal and neonatal Thyroid functions” already registered with Institute of Chemistry, University of the Punjab under the supervision of Prof. Dr. Saeed Ahmed Nagra. Keeping in view the importance and quality of his Research work, Mr. Shan Elahi, Senior Scientist, CENUM Lahore was awarded ‘First Prize’ from poster presentations.
**Assignment of PAEC Expert Abroad**

Mr. Hamid Mahmood, Senior Director, Directorate of Nuclear Power Engineering-Structures (DNPES), Islamabad undertook assignment as an IAEA Expert at Cairo & EI Dabaa, Egypt from 28 October, 2007 to 01 November, 2007 for Task: Site Safety Review Mission under Project - Safety and Environmental Impact Assessment for EI Dabaa Nuclear Power Plant.

**Assignment of IAEA Expert in Pakistan**


**Visit of Egyptian Delegation**

A high level delegation representing agricultural research institutes comprising Prof. Munir Gad Yousef, Director Cotton Research, Prof. Abdel Salam Abied Draz, Deputy Director Field Crops and Prof. Ahmad Ezzat Abdel Wahab, Head Rice Research visited NIAB/ NIBGE, Faisalabad on 02 October, 2007. Director NIAB, Dr. M. Ahsanul Haq briefed the visitors about R&D activities of the institute followed by a round to the labs and experimental area particularly the cotton and rice fields. The members of delegation showed keen interest in research activities, especially the crop improvement programme and were impressed with the progress for development of cotton varieties resistant to leaf curl virus and heat tolerant. They appreciated the contribution of NIAB towards national economy and expressed the views that the research conducted at this institute could also help solve problems of other countries producing crop like cotton, rice and legumes.

**Visit of Australian Research Scientist**

Dr. Nico Marcar, (Australia) Research Scientist visited NIAB, Faisalabad from 10-13 November, 2007 to coordinate and plan the collaborative activities with CSIRO Forestry Division, Canberra, Australia.

**Appointment Abroad**

Mr. Tasaddaq Ali Khan, Senior Scientist, Informatics Complex (ICC), Islamabad has been appointed as System Control Engineer at Synchrotron Light for Experimental Science and Applications in the Middle East (SESAME) Project at Amman, Jordan for a period of three years. He will start his assignment from 3rd week of November, 2007.

**Hosting of IAEA/RCA Event in Pakistan**

PAEC in co-operation with IAEA hosted an IAEA/ RCA Regional Training Course on Applications of Nanotechnology at Serena Hotel, Islamabad from 29 October to 02 November, 2007 under RCA Project - Radiation Processing Applications for Health and Environment. The following 17 foreign participants and 2 lecturers attended the above course:-

- Mr. Nirmal Chandra Dafader, Bangladesh
- Mr. Qingde Che, China
- Mr. Gang Xu, China
- Mr. Sudaryanto, Indonesia
- Ms. Yessy Warast, Indonesia
- Mr. Sivanesan Appau, Malaysia
- Mr. Mohd, Hamza Harun, Malaysia
- Ms. Sevjidsuren Galsan, Mongolia
- Mr. Balt-Erdene Khishigbadrakh, Mongolia
- Ms. Lorna Relieve, Philippines
- Ms. Valleric Ann Samson, Philippines
- Mr. Don Chaminda Nyanajith I-yanage, Sri Lanka
- Ms. Suranga Wickramarachchi, Sri Lanka
- Mr. Suppalak Angkaew, Thailand
- Ms. Prartana Kewsuwan, Thailand
- Mr. Hoa Mai Hoang, Vietnam
- Mr. Hai Le, Vietnam

**List of Lecturers**

**Human Resource Development Program**

The Central Analytical Facility Division, Directorate of Systems & Services, Pakistan Institute of Nuclear Science & Technology (PINSTECH) organized a two weeks training course entitled "Basic Training Course on Atomic Absorption Spectrophotometry (AAS) using Flame, Graphite Furnace and Hydride Generation modes w.e.f. 22-10-2007 to 02-11-2007 for scientists from NIAB (Faisalabad), NIA (Tandojam) and NMC (D.G. Khan).

**PAEC Scientists Honoured by HEC**

On the basis of international/national publications and academic contribution, Dr. Ihsanullah, DCS/Head Food Science Division, Dr. Aurang Zeb, Principal Scientist and Dr. Gul Sanat Shah, Principal Scientist of PAEC's Nuclear Institute for Food and Agriculture (NIFA), have been approved by Higher Education Commission (HEC) as Ph.D. Supervisors.
Annual Radiological Emergency Preparedness Exercise at KANUPP

A comprehensive Annual Radiological Emergency Preparedness Exercise was performed at Karachi Nuclear Power Complex on Thursday November 15, 2007. Over 100 emergency response personnel including members of Emergency Management Group (EMG) and members of Emergency Support Group (ESG) were fully involved in the Exercise. The Exercise was witnessed by the inspectors of Pakistan Nuclear Regulatory Authority (PNRA), observers of Directorate of Nuclear Power Safety (NPS) and by the Local Observers from Quality Assurance Division, Nuclear Safety and Licensing Division, Operation Division and Health Physics Division.

The Exercise was performed as per scenario developed for the exercise and all the response actions were carried out as per KANUPP On-Site Radiological Emergency Plan (KONREP). Initially “Local Emergency” was declared and subsequently “Station Emergency” and “Sector Emergency” were also declared as per scenario. Emergency response actions such as emergency announcement, activation of emergency siren and notification of emergency to the off-site authorities were taken.

Other actions such as search and rescue operation for the victims, emergency treatment for decontamination of injured person, first aid, departure of the injured person to the hospital were performed. Fire fighting at the incident area, assembly of the station personnel at the designated assembly areas, on-site/off site survey and sampling, assessment of population doses using Sectorem-2, control of public transport out side the KNPC boundaries were also performed. Board Room was used as the Command Point instead of Control Room after the declaration of Station Emergency. After bringing the plant conditions under control the Emergency was terminated.

24th Training Course on the use of Nuclear and other Techniques in Food and Agricultural Research concluded at NIFA, Peshawar

A two-week postgraduate training course on the “Use of Nuclear and other Techniques in Food and Agricultural Research” was conducted from Nov. 12-23, 2007, at PAEC’s Nuclear Institute for Food and Agriculture (NIFA), Peshawar.

The course was designed primarily to create awareness about radiation as well as its peaceful uses and to provide hands-on training to scientists and researchers, universities/colleges teachers and postgraduate students in the application of irradiation, radioisotopes and other contemporary techniques in the field of food and agriculture.

The course was organized by Dr. Abid Farid, Principal Scientist and his team. A total of 22 trainees representing various universities and R&D organizations from all over the country participated in the course. The concluding session was held at NIFA on Nov. 23. The Director General, Agric. and Biotech. PAEC, Dr. Mazhar Hussain Naqvi was chief guest at the occasion. In his welcome address, Director NIFA, Dr. Farooq-e-Azam highlighted the salient achievements of the institute and its contribution in the food and agriculture sector of the province. Addressing the audience, the chief guest, Dr. Naqvi briefed the audience about the significant role of PAEC in the economic development of the country. He also threw light on various accomplishments made by the four PAEC Agriculture and Biotechnology Centers in the overall uplift of the country.

Dr. Naqvi appreciated quality of the course and role of NIFA in organizing such type of courses regularly for the last 24 years. At the end, the chief guest distributed certificates amongst the successful candidates.