

Youm-e-Takbeer: A proud day for nation

Youm-e-Takbeer: the day PAEC made the nation proud



By Muhammad Aftab Alam

May 28 has a special significance in the life of every Pakistani. On this day, the scientists, engineers and technicians of PAEC achieved the unachievable and delivered what they had promised in the form of five nuclear blasts at Chaghi in Balochistan, making the nation's defense unconquerable. Besides some known names who contributed in this herculean task through unmatched contributions for the country's security, there were numerous unsung heroes who worked day and night towards achieving this unbelievable mission by a developing country.

PAEC has so far established nineteen (19) Atomic Energy Cancer Hospitals (AECHs) located in all provinces and major cities of the country while the 20th cancer hospital at Muzaffarabad, AJ&K, is under construction. These hospitals are helping the government in catering to the healthcare needs of cancer-affected patients in the country by providing diagnostic and therapeutic facilities. PAEC-managed cancer hospitals provide diagnostic and therapeutic facilities to patients at subsidized rates by dint of support from Patient Welfare Society (PWS) of the hospitals and Pakistan Bait-ul-Mal (PBM).

In the field of international cooperation and promotion of the culture of sharing and learning from fellow scientists' research, PAEC started conducting annual meetings of researchers and scientists in Pakistan. A brainchild of the Nobel Laureate of Pakistani origin, Dr. Abdul Salam, the idea of holding the annual

at CERN and International Atomic Energy Agency (IAEA). Pakistan became Associate Member State of CERN on July 31, 2015, the only Asian country to attain this position at that time. Pakistan ratified the status agreement with CERN on August 26, 2015.

In the use of nuclear energy for generating electricity, PAEC is currently operating six nuclear power plants (NPPs), including Karachi Nuclear Power Plants Unit-2 & Unit-3 commonly known as K-2 and K-3 in Karachi; and C-1, C-2, C-3, C-4 NPPs in Chashma, Mianwali. These plants are collectively producing over 3500 megawatts (MWs) of electricity.

Advantages of nuclear power generated electricity include low per unit cost of generation, all-year-round availability, and no emissions of greenhouse gases, besides being critically important from energy-security point of view.

As a responsible nuclear state, a founding member of the IAEA and

Four PAEC agriculture research centers have been established in the three provinces of Pakistan having a major share of the cultivatable land in the country. Nuclear Institute of Agriculture (NIA) in Tando Jam, established in 1962 was the first such institute followed by Nuclear Institute for Agriculture and Biology (NIAB), in Faisalabad; Nuclear Institute for Food and Agriculture (NIFA), in Peshawar and National Institute for Biotechnology & Genetic Engineering (NIBGE), in Faisalabad.

So far, these PAEC-run agriculture centers have developed and evolved more than one hundred and fifty (150) crop varieties for Pakistan. For utilization of marginal lands, PAEC has developed technology for the utilization of salt-affected lands and this technology is being provided not only to the local farmers but also at international level.

These centers also have a fair share in human resource development through training courses, workshops and internships. These courses equally benefit researchers, students and academia from various research organizations and universities. NIAB and NIBGE in Faisalabad are also affiliated with Pakistan Institute of Engineering and Applied Sciences (PIEAS) - the leading university of the country, for award of MPhil and PhD degrees in Biology and Biotechnology.

Taking a big step towards agriculture industrialization and commercialization, PAEC recently organized a huddle of agriculture scientists, agriculturists and business leaders in the field of agriculture. The Agriculture symposium cum exhibition was organized at NIAB and NIBGE institutes in Faisalabad.

Titled "Cultivate Innovation to Harvest Business Growth", the two-day event was sponsored by Support Industries and Technologies (SITECH), in line with Government's Green Pakistan Initiative. Its ultimate aim was to commercialize and popularize the latest technical advancements in the field of agriculture and biotechnology.

Leading agricultural experts and researchers from seed companies, progressive farmers, corporate sectors, researchers, academia from agri and biotech fields and representatives from government, Fongrow Coy and FFC also participated. The participants appreciated the event and they hoped that organizers will provide more such opportunities of establishing linkages among agricultural researchers, farmers and allied departments as well as businesses, in future.

Although PAEC is striving to prove a catalyst in all key areas of national development, May 28 will always remain a feather in its cap as it made Pakistanis hold their heads high with pride. - The writer is a PR practitioner. He can be reached at joumalistinmaking@gmail.com



meeting of topnotch researchers and scientists of the world in Pakistan was adopted by the then Chairman Muneer Ahmed Khan and his successor Dr. Ishaq Ahmad and all successive chairmen of PAEC.

International Nathiagali Summer College (INSC) on Physics and Contemporary Needs' has been organized every year since 1976, mostly at the scenic hill resort of Nathiagali. So far, 7 Nobel laureates and 41000 scientists, out of which 1000 were foreigners, from 72 countries have participated in the annual springs of scientists in Pakistan to exchange valuable knowledge with their local colleagues and science students.

Owing to the untiring efforts of PAEC scientists, engineers, technicians and researchers, Pakistan is proudly an Associate Member of European Organization for Nuclear Research (CERN) and scientists from the country are actively participating in various research activities

clearly placed in a better position than Pakistan.

The PM, Nawaz Sharif, was on official visit to Kazakhstan. He talked to Gen Jehangir Karamat, Chairman JCSC and COAS, it was decided to hold a meeting of Defence Committee of Cabinet (DCC) upon his arrival. However, according to Naeem Salik, (The Genesis of South Asia Nuclear Deterrence: Pakistan's Perspective p141) Gen Karamat's account of the event is little different. The PM called General and told him to start preparations for the test. He suggested the PM to return to Pakistan as soon as possible, and then the decision would be taken after deliberation in DCC, the institution designed to deliberate and take such decisions. It is relevant to clarify speculation about whether the decision was taken by political leader-

ship or was it thrust upon it by the military. The DCC meeting was held on 13 May chaired by the PM, attended by Foreign Minister, Finance Minister, Interior Minister, Chairman JCSC, and Services Chiefs. In addition Dr. A Q Khan and Dr. Samar Mubarakmand attended as reps of KRL and PAEC respectively. A lot of deliberations had taken place to decide appropriate response. The opportunity provided by India to become nuclear state and the economic challenges were pondered thoroughly. The meeting was like a war cabinet taking the decision in a crisis mode where the DCC members were evaluating all the implications of testing, under tremendous economic and international pressures. It was virtually an undeclared emergency situation. Armed forces were alerted for extra safe guards of the

sensitive areas. The test tunnels prepared at Ras Koh have to be provided extra security which was entrusted to Corps Cdr at Quetta, Navy augmented the sea patrol and PAF flew Combat Air Patrol (CAP). On political front all the opposition parties were for the nuclear detonation. A unanimous resolution was passed in Senate for an effective response to the Indian tests. In accordance with Gohar Ayub, the Foreign Minister (Testing Times, p35), General Jehangir Karamat, views were, we could match India, but the decision to do so would have to be political. Dr Samar informed the DCC that PAEC will take 10 days to conduct the tests. Later when Dr. Ishaq, Chairman PAEC returned from abroad, gave the positive reply about the preparations. The cabinet meeting was called on 14 May, which sup-



Nuclear Technologyan imperative for national defense and development

By Saima Durrani

The famous lines of US president John F Kennedy uttered half a century ago "Ask not what your country can do for you-ask what you can do for your country" may seem bit cliched now but the devotional pledge and undercurrents of selfless service embodied in his statement can still inspire anyone anywhere in the world eager to serve one's motherland.

This notion of selfless service should resonate rather well with us who are still striving to achieve the cherished dream of seeing a prosperous Pakistan among the comity of nations.

Pakistan today faces formidable social, economic, and security challenges. Many nations have faced similar challenges in history and successfully turned them into opportunities through dedicated commitment of self less hard working individuals. Once effectively addressed, our challenges likewise offer unprecedented opportunities for transformational progress.

And if this dedication is coupled with capability in science and technology, the real engine for economic growth, we have the recipe for success at our hands. Science and technology (S&T) are fundamental for social and economic progress in developing countries as they have been central in the progress and development of virtually all the nations of the world. Nuclear technology, a top notch specialty in its own domain offers a wide array of applications leading to the development push we all aspire. Moreover, in today's geo-political scenario, the strategic and defense portfolio of any country is measured up against its potential economic viability. And it is the growth of this nexus of strong economy and defense which can guarantee a prosperous country.

It was no mere coincidence that despite initial problems, as early as 1956, an S&T set up the Pakistan Atomic Energy Commission PAEC was established by the far-sighted leaders to make use of the international trend of atoms for peace initiative of American president Eisenhower . This organization not only provided the scientific thrust intended for national development in agriculture, human health, energy& industry but also delivered when asked to make the motherland's defense impregnable.

The Commission now holds sway over utilization of nuclear technology for a wide array of national development initiatives. Incidentally these initiatives are also key tools used to support the UN Sustainable Development Goals (SDGs). Out of the 17 SDGs of UN agenda, PAEC contributes to 11 of them

through its dedicated setup of laboratories and institutes.

As nuclear technology is the most innovative way to improve agriculture practices, PAEC never lagged behind in this arena and recruited its first biologist way back in 1958 which was followed by the establishment of Radiobiology Division in early 60's at Atomic Energy Centre, Lahore.

Subsequently, first full fledged Atomic Energy Agriculture Research Center was established in 1962 at Tandojam which was followed by Nuclear Institute for Agriculture and Biology (NIAB) in 1972 at Faisalabad, Nuclear Institute for Food and Agriculture (NIFA) at Peshawar in 1982 and National institute of Biotechnology and Genetic Engineering (NIBGE) in 1994.

The Commission took lead in utilizing nuclear technology to improve productivity by developing new crop varieties, pest control technologies, plant nutri-

and genetically modified organisms.

Likewise, at Pakistan Radiation Services (PARAS), a subsidiary of PAEC, a 10 MeV, 20 kW E-Beam plant caters for sterilization of healthcare products manufacturing as well as fulfilling the requirements of export food items to Australia, America, New Zealand, and other European countries.

In the human health domain, PAEC has been providing services in cancer care through use of radiation since 1960s. PAEC's 60 years' experience of designing, executing and operating cancer hospitals has resulted in 19 Atomic Energy Cancer Hospitals (AECHs) throughout Pakistan. One more hospital is under construction at Muzaffarabad, AJK. Patients receive high quality diagnostic and treatment facilities here.

AECHs are equipped with latest SPECT-CT Gamma Cameras, PET-CT Scanners, Cyclotrons, Radioisotope therapy and

C-2, C-3, & C-4) of cumulative 1,330 MWe capacity are located at the Chashma Nuclear Power Generating Station (CNPGS). Ground breaking for another similar plant named C-5 at Chashma has also taken place.

Two NPPs (i.e., K-2 & K-3) of the total 2,200 MWe capacity are operating near paradise point of mega polis Karachi. K-2 is operating commercially since May, 2021 and K-3 since April, 2022. During the year 2023, these six nuclear power plants supplied 22,372 million kWh to NTDC system.

An elaborate and diversified engineering set up of PAEC successfully caters to design, manufacturing & testing of mechanical equipment for medium and heavy industries in accordance with the International Codes and Standards especially for Power Plants, Chemical and Petrochemical Plants and other Industrial Projects for itself and the national industry. These setups are well equipped with modern engineering manufacturing and fabrication facilities geared toward attaining excellence.

A set up of PAEC, viz Heavy mechanical complex-3, HMC-3 is one of the largest industrial projects in the heavy engineering sector of Pakistan. One of PAEC entity National Centre for Non-Destructive Testing (NCDT) is providing, inspection, testing, training, calibration, qualification, certification, condition assessment and root cause analysis services to PAEC and national industry to meet the requirements in accordance with local and international standards.

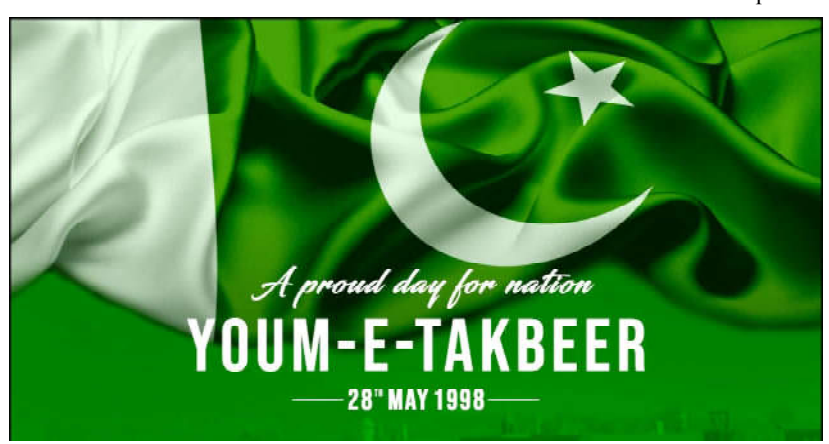
International collaboration is highly valued by PAEC and this aspect is covered mainly through technical cooperation with International Atomic Energy Agency IAEA, European Organization for Nuclear Research CERN and other such organizations and also the scientific discourses of International Nathiagali Summer College INSC which help its manpower both personnel as well as students of its Human Resource Development institutes to engage with the latest technologies and add to their technical acumen.

Even this cursory summary of the scope and achievements of the organization presented here makes it clear that PAEC is uniquely placed to cater to national needs of both socio-economic development and strategic edge. Whereas this special occasion of Yaum-e-Takbeer calls for renewing the self less dedication of PAEC personnel to remain motivated and strive to excel in both domains of national development in future as well, it also reiterates the critical support needed from all relevant stakeholders if we pledge to serve our nation and see it prosper.

Production of electricity through nuclear power has evolved over the decades and nuclear reactors now being installed in the world are far superior to their predecessor in term of performance and safety.

PAEC currently operates six nuclear power plants at two sites generating 10 percent of electricity through nuclear of the country's total and almost a quarter of its low-carbon electricity. Nuclear power generation is economically competitive in the power market of Pakistan. Among these six, four NPPs (C-1,

unable to convince them not to carry out the nuclear test (Daily Dawn, June 6, 2004, Sharif Government refused to receive USN-delegation). Seventeen days before the nuclear devices were detonated, were very difficult, for the PM, Ministers and Army Chief to sustain external pressure not to detonate especially from USA. On 27 May a day before tests US President called the PM about five times not to carry out tests and used carrot and stick (Sartaj Aziz, Between Dreams and Realities, p194). In the decision making process, the government also sought the views of retired defence and eco-



Comprehensively deliberated decision for Youme-e-Takbeer

By Dr Anjum Sarfraz

India surprised the world on 11 May 1998 by conducting three nuclear underground explosions and two on 13 May. The PM of India very proudly announced that we have become sixth nuclear weapon state and should be treated by the world as such. At the same time, Indian stance towards Pakistan became aggressive. The senior Indian hierarchy started giving provocative statements. The Indian Home Minister L.K Advani made a statement of Indian intention to cross the LoC under the pretext of hot pursuit. The Corps Cdr in Indian Illegally Occupied Kashmir (IIOJK) held an unprecedented news conference and advocated his plans to attack Azad Kashmir across the LoC. As a declared nuclear state and almost negligible international reaction, India was

