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DEVELOPMENTS IN THE USE OF NUCLEAR ENERGY FOR PEACEFUL PURPOSES

Statement by Pakistan

"The Pakistan Atomic Energy Commission which is a statutory autonomous body is responsible for generating nuclear power and applying peaceful uses of atomic energy in the fields of agriculture, medicine and industries besides carrying out research in nuclear sciences.

"The activities of the Commission during the period June, 72 - July, 73 and its prospective programmes are described below:-

"1. Nuclear Power Generation:

"Pakistan made its debut in nuclear power generation by establishing country's first nuclear power plant at Karachi. The 137 MW capacity plant was formally inaugurated by the President of Pakistan on the 28th November, 1972. Being run and maintained by Pakistani scientists and engineers the plant so far has attained an average availability of about 80% and had generated more than 400 million units of electricity till the end of July 73.

"Encouraged by the successful experience of KANUPP, the Commission has drawn plans for setting up power plant in the northern parts of the country. Feasibility studies of this 500-600 MW has already been taken in hand. The Commission also intends to set up a dual purpose desalination-cum-nuclear power plant at Karachi by 1982/83.

"A study of energy resources in Pakistan has indicated that nuclear energy will have to meet over 40% of our total power requirements towards the end of this century. It means that out of the projected power requirements of 27 000 MW, nuclear energy will have to provide 12 500 MW by that time. In November 1972 the

IAEA initiated a World-wide survey to assess the potential role of nuclear power in developing countries over the next 20 years. The Pakistan Atomic Energy Commission is also participating in this survey to assess country's nuclear power requirements. Basic data required for this survey has been collected and is presently being analysed in Vienna.

## "2. Agriculture

"About 60% of Pakistan's G.N.P. is derived from agriculture and 80% of our population depends for its livelihood on this occupation. Pakistan, therefore, is very keen to apply nuclear radiation techniques in discovering new varieties of crops, in finding ways of preserving stored foodgrains and fruits and in determining the optimum fertilizer uptake for plants under different soil conditions. At the Nuclear Institute for Agriculture and Biology, Lyallpur and the Atomic Energy Agricultural Research Centre, Tandojam, work is being done to evolve better varieties of wheat, rice and cotton. Some promising new varieties of these valuable cash crops have been evolved and are now in various stages of field trials. Studies are also being made at these centres to find economical ways of preservation of foodgrains, fruits and fish by radiation techniques and the reclamation of saline soil by biological methods. Some other studies being carried out at these centres include determination of optional use of water and fertilizer for various crops and eradication of pests by irradiation techniques.

"The successful experiments at the two centres has encouraged the Commission to set up a third centre at Tarnab near Peshawar to cater to the needs of the people of North West Frontier Province. The centre is expected to be set up next year.

## "3. Medicine

"The Commission has already established four well-equipped nuclear medical centres one each at Karachi, Multan, Lahore and Jamshoro where in addition to the routine clinical work some research projects and surveys are also being undertaken. Diagnostic and therapeutic work continued at all the centres with the help of radioisotopes and radiation techniques. Thousands of patients suffering from thyroid, liver, kidney hypertension and brain tumour are diagnosed and treated at these centres every year.

"The Commission has also decided to set up with the support of provincial Government the country's largest nuclear medical centre at Peshawar. Construction work on this project has already started.

#### "4. Research and Development

"To support its nuclear power programme and provide trained manpower for its various centres the Commission has established a research centre called Institute of Nuclear Science & Technology (PINSTECH) at Islamabad. The centre is equipped with a central facility of 5 MW swimming pool type reactor. In this Institute research work in the field of Nuclear Physics, Nuclear Engineering, Nuclear Chemistry, Nuclear Materials, Electronics, Health Physics, Radiation and Isotopes Application and General Services Division is being carried out by about 160 foreign trained Scientists. PINSTECH also runs a course at its Reactor School leading to the award of M.Sc. (nuclear technology) degree. Besides a course in industrial radiography was also offered for training several participants from various Government departments and private organizations.

#### "5. Nuclear Fuel Cycle Facilities

##### "a) Prospecting for Uranium

"To support its nuclear power programme, the Commission has intensified its search for uranium and other heavy minerals. Geologically several parts of the country are promising for uranium occurrences. So far uranium deposits have been located in the D.G. Khan District where exploration has been undertaken under an UNDP-aided project. Efforts are also being made to search uranium deposits in other areas of the country by means of aerial and ground surveys. A pilot plant for dressing the ore has also been set up and nuclear minerals laboratories have been established.

##### "b) Fuel Fabrication

"The Commission has decided to establish a fuel fabrication facility for meeting the future requirements of KANUPP and subsequent power reactors. Construction work will commence very shortly.

##### "c) Heavy Water Production

"Decision has been made to establish a plant for local production of heavy water.

##### "Other activities

##### "a) Solar desalination

"The Commission has established a solar desalination plant at the port of Gwadar on the Mekran coast where drinking water is in short supply. The plant has started working and it now supplies more than 7 000 gallons of fresh water per day to the local inhabitants."

