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## KAZAKHSTAN NUCLEAR INNOVATION PROJECTS AND PROBLEMS OF EDUCATION AND PERSONNEL TRAINING

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At present in the Republic of Kazakhstan there are four large innovation projects [1] related with application of an advanced nuclear technologies: “Creation of Kazakhstan Materials Testing Tokamak” [2]; “Implementation of Inter-Disciplinary Research Complex on the Base Heavy Ions Accelerator at the L.N. Gumilev Eurasian National University (ENU)” [3]; “Creation of Technology Park in Kurchatov city” [4]; The Implementation of the Center of Nuclear Medicine and Biophysics”. Items of personnel training in these projects – together with special ones – are playing the principal role.

The first project is directed on supporting of Kazakhstan participation in the ITER project, and on development up-to-date trends of science, techniques and technologies, as well as on training of high-qualified scientific and engineering personnel for this domain. In particular the theoretical and methodical model for training of professional and competent specialists for operation at a thermonuclear synthesis facility is developed at the al-Farabi Kazakh National University. Here in the framework of Summer University (SU) ‘Specialists for Tokamak’ the special curriculum for thermonuclear facilities operational personnel training is implemented [5]. Activity of the SU is focused on the – preparation and organization of selection competition of talented young people for participation in the SU. The competition is conducting between leading universities students (having master or bachelor degree). Content of the SU theoretical course is adapted to real demands of Kazakhstan nuclear organizations. The first training sessions were conducting in 2005.

One of principal task for creation of Inter-Disciplinary Research Complex at the ENU is training of high-qualified specialists of natural-science and technical profile for the Kazakhstan economy. The core facility of the complex is DC-60 heavy ion accelerator. The commissioning of the accelerator gives an opportunity to create experimental training base for scientists, postgraduates, students.

Purposes for implementation of Technology Park in the Kurchatov city are:

- Development of modern infrastructure for manufacturing application of new technologies;
- Provision of high-tech developments promotion ahead to a market;
- Solution of existing socio-economic problems of the Kurchatov city.

Key facilities of the Technology Park: reactor complex; industrial accelerator; gamma-radiation facility; production and laboratory facilities. On the base of the techno park facilities the Center for training and retraining of specialist for nuclear energy and industry of Kazakhstan is planning.

Necessity of implementation in the Republic of Kazakhstan of the Center of Nuclear Medicine and Biophysics is conditioned by a serious country developmental lagging in nuclear medicine methods application. Operation of the Center is closely related with main existing facilities of the Institute of Nuclear Physics of the National Nuclear Center (INP NNC) – research reactor WWR-K and isochronous cyclotron – and new objects (building of radio-pharmaceutical products preparation, treatment-and-diagnostic building; biophysical

laboratory; building of radiation sterilization). PET technology for the first time in Kazakhstan will be applied in the Center. In the process of the project launch a number education and training measures is planning. Training of the engineering personnel is conducting at the INP NNC special course. Also for accelerator facilities specialists a fellowships at a lotron producing company is organizing. Chemical engineers and analysts will study at the Institute of Biophysics (Moscow, Russian Federation) on experimental tests of and quality control for radiopharmaceuticals. Doctors, radio diagnostics specialists will study at the corresponding medicine centers. Doctors on radionuclide diagnostics, computer tomography, magnetic resonance tomography and radiology will study abroad in the specialized centers.

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