PIK REACTOR

Brief Information about state of affairs in 1992–1993

S. L. Smolsky

The PIK reactor is aimed for research on the neutron beams and for the samples irradiation into the central gap in the $4.5 \cdot 10^{15}$ n/(cm^2·s) thermal neutron flux density. A light water core is dipped into a heavy water reflector of high thermal neutron flux density (maximum 10^{15} n/(cm^2·s)) at 100 MW. The reactor structure makes possible to change experimental channels depending on experimental requirements.

The core fuel elements, composed at 18 fuel assemblies, have the high specific fuel core loading (600 gm/l) of the 90% uranium235 enrichment and the developed specific heat transfer surface (6.61 cm^{-1}); these factors provide the high neutron flux density. The reactor control is performed with 9 independent devices — the central control device ("curtains", $\approx 9\ \beta_{eff}$) and 8 control rods ($\approx 0.5\ \beta_{eff}$/rod) in the reflector.

A project of a reconstruction due to strengthening the nuclear energetics regulation has led to modifications of all important safety systems. By the end of 1993 year 90 percents of working drawings have been produced by the GENPROECTIROVSHJIK and fixed with the GOSATOMNADZOR. All that enables to begin the works on the internal reconstruction of the main 100A and 100B buildings. The works to reinforce the cap of the 100A and 100B buildings have been half performed.

According to the technology of the Germany SIKA CHEMIE firm the poured floors have been constructed in the main experimental hall.

Practically, the common-build works have been finished in the creogent 100E building that makes possible to begin the equipment mounting.

The experimental and calculative works have been conducted on the PIK reactor physical model together with the staff of the reactor physics sector of the DTP to prove the choice of the technical decisions, to increase the reactor safety — developing the burn-up absorber, proving the partial overloading of the fuel, choosing the material for control rods, increasing the speed of response for negative reactivity input, utilizing the additional means in the emergency system.

The difficult economic situation of the reactor creation made the administration to search for other then the Academy of Science financial sources, both inside and outside Russia.

In January 1993 under the government support the inspection of the PIK reactor has been organized by the experts from some european countries, the U.S.A. and European commission. According to the professional viewpoint the results of the examination are positive, however, the financial problem has not been solved. At the end of 1993 the construction of the isotopic purification building (N113) has been started and now is conducted in partnership with the MINATOMENERGO. Of a concrete fence mounting around the PIK reactor buildings has been finished, the first technical border of the signaling system has been mounted, the N115 building has been put into exploitation.

This additional means drawing may be considered as a positive fact.