

## BASIC PRINCIPLES OF FEDERAL POLICY FOR REHABILITATION OF TERRITORIES AND POPULATION EXPOSED TO RADIATION (ILLUSTRATED BY THE SITUATION IN THE URALS, RUSSIA)

V. Ya. Voznyak, V.V. Panteleyev

The Urals region is known to be one of the most unsafe territories of the Russian Federation both in terms of radiational and general ecological conditions. An emergency radiational situation arose mainly due to the activities of the Mayak Industrial Association (MIA) subordinated to the MinAtom of Russia. The facility's operation has become a source of radioactive contamination of the territory, radiation effects on the population. Besides, it may potentially lead to major radiation accidents.

Radiation exposures of large populations in the Urals resulted from uncontrolled gas-aerosol routine releases which were going on from 1948, discharges of radioactive wastes into the river Techa in 1949-1956, an explosion of a storage tank with high-level wastes in 1957 which led to the formation of the East-Urals Radiation Trace (EURT), downwind transfer of activity from the shores of the drying-up lake Karachay (a depot of medium-level wastes) in 1967, on-going discharges into the bypassing canals from which the activity enters the Techa due to seepage through dams constructed on the river. As a result of only the first three incidents large territories were contaminated in three oblasts (provinces): Chelyabinsk, Sverdlovsk, Kurgan. About 23,000 sq km were contaminated with long-lived radionuclides and 437,000 people were exposed to radiation. Within first years of exposure the maximum absorbed effective doses received by the population due to different radiation accidents were as follows: 170 cSv for the residents of the upper reaches of the Techa, 60 cSv for the EURT residents. In a proportion of exposed population and Mayak workers cases of chronic radiation sickness (CRS) were observed. Over 2000 cases of CRS were diagnosed in Mayak personnel and over 900 cases in off-site population.

The radiation incidents in the Urals inflicted considerable damages on the population's health and the socio-economic status of the entire region. On the whole, economic losses were estimated as 9.5 billion (calculated on the basis of the prices operant in 1990) for Chelyabinsk Oblast alone. The destruction of the social-production infrastructure on these territories, exclusion of the contaminated lands from agricultural use resulted in deformed demographic, migrational and other social processes. The majority of the population of the region developed a persistent radiophobia and anxiety which resulted from living in the locality characterized by increased radiation risk.

In spite of the steps taken before 1992 to minimize the impacts of the radiation exposure on the population and the damage inflicted by the territory contamination the results of such steps proved to be inadequate. The health measures did not encompass the entire exposed population, measures aimed at radiation protection, economic and ecological rehabilitation proved to be ineffective too.

In 1992 the Federal Program for radiation rehabilitation of the population and environment restoration in the Urals region was adopted. It specified the economic, engineering and social tasks which had to be achieved in the period from 1992 through 1995. The dose from accidental exposure was assumed to be the main criterion for decision-making about the necessity of carrying out protection measures on the contaminated territories, the character and scope of such measures, as well as compensation of damages suffered by the population. The effects of radiation exposure on human health were considered in combination with other confounding factors, such as chemical pollution, endemic and biogenic factors characteristic of different rayons.

The principal objectives of the Program were as follows:

- localizing the sources of radiation contamination and preventing further spread of radiation contamination in the Urals region and adjacent territories which may result from further waste accumulation and re-distribution of radionuclides currently deposited in the environment;
- nature restoration in the areas designated as sanitary-restricted zones;

- further development of monitoring the radiation conditions on the territory contaminated with radionuclides;
- improving the standards of medical assistance to the exposed people, especially to the critical population groups, safeguarding the population's health, minimizing the exposure to non-radiation polluting factors;
- development of social and industrial infrastructure, diminution of the socio-psychological tension.

The achievement of each of the tasks listed was based on the implementation of a complex of corresponding measures.

The period of the implementation of the Program coincided with a very complicated phase of the country's economic development. Because of inadequate funding many important tasks of the Program related to social, medical and radiation rehabilitation of the population could not be realized in full measure.

The social-economic and radiation conditions determined the necessity of the development of a follow-on comprehensive Federal Program for social and radiational rehabilitation of the Urals population exposed due to MIA operation for the period 1996-2000.