Reference note on the development of a radiological concept for the permanent safe residence of the population within the territory of the RSFSR, the Ukrainian SSR and the Belarusian SSR, which was exposed to radioactive contamination as a result of the Chernobyl accident

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Secret

According to operational and official sources, the USSR Ministry of Health and the Ministries of Health of the RSFSR, Ukrainian SSR, and Byelorussian SSR are currently discussing the development of conceptual guidelines and methodological approaches to the issue of permissible permanent residence in areas exposed to radiation after the Chernobyl accident. The question of the permissible lifetime dose for the population living in these areas is a pressing one.

On October 21, 1988, under the chairmanship of E.I. Chazov, the USSR Ministry of Health Board held a meeting “On the state of medical and sanitary support for the population of controlled areas of the RSFSR, Ukrainian SSR and Byelorussian SSR exposed to radioactive contamination as a result of the accident at the Chernobyl Nuclear Power Plant and the regulation of irradiation of this population in the long term.”

In the Bryansk, Kiev, Zhytomir, Gomel, and Mogilev regions, dispensary observation and provision of medical and preventive care are carried out for the population (247,000 people) living in 686 settlements located in contaminated areas, controlled areas (currently, about 56,000 people live in areas with cesium-137, 134 contamination above 555,000,000,000 Bq/km^2 [555 GBq/km^2], and over 534,000 in areas from 185,000,000,000 to 555,000,000,000 Bq/km^2 [185-555 GBq/km^2]).

Between 1986 and 1988, taking into account the changing radiation situation in the monitored areas, the USSR Ministry of Health developed and revised, to tighten, temporary emergency standards governing radiation exposure levels for both personnel involved in the clean-up efforts and the population living in these areas.

The practice of regulating the population's activities in contaminated areas demonstrated the effectiveness of protective measures to reduce internal radiation doses (a tenfold reduction) and the comparatively low effectiveness of measures (including decontamination) to reduce external radiation doses.

Individual radiation doses accumulated by the fall of 1988 by most residents of the monitored areas averaged 53 mSv, and only in isolated cases did they reach 200 mSv. By the end of 1989, the average radiation dose is expected to reach 60 mSv, with the regulated radiation level for the period 1986–1989 equal to 173 mSv. Public safety was achieved through the implementation of a number of restrictive measures that significantly disrupted the way of life, work, and economic activities of the local population.

Since the accident, the radiation situation within the contaminated areas has largely stabilised. Radiation exposure levels have decreased to levels that preclude the possibility of

radiation sickness. Population exposure is currently primarily due to radioactive caesium, which will continue to shape the radiation situation in the controlled areas for several decades.

Due to changing conditions, it became necessary to revise the population protection strategy and develop a new approach that would ensure the safety of the population and return it to its traditional (pre-accident) way of life and activity.

Based on developed long-term forecasts and utilising scientific advances in radiation medicine and biology, the National Commission on Radiation Protection under the USSR Ministry of Health, at the request of the Government Commission of the Council of Ministers of the USSR and the USSR Ministry of Health, developed a radiological concept for the permanent safe residence of the population within the territories of the RSFSR, Ukrainian SSR, and Byelorussian SSR exposed to radioactive contamination as a result of the Chernobyl accident.

The concept was reviewed at the Board. It includes:
– establishing two time periods for regulating population exposure – an emergency period (from April 26, 1986 to January 1, 1990);
– establishing, starting January 1, 1990, a lifetime dose limit for the population of controlled areas equal to 350 mSv for 70 years (5 mSv per year).

The choice of a dose limit of 350 mSv was determined by a number of factors.

The specified dose guarantees the absence of radiation effects in the population, for which a threshold is assumed, above which the severity of the effect depends on the radiation dose. It is characterised by a relatively low risk of long-term consequences, such as radiation-induced cancer. This dose limit allows for a certain safety factor for unplanned cases of exceeding the dose limit, as well as maintaining the approaches to regulating the irradiation of a limited portion of the population, as laid out in the Safety Zone Standards (NRB-76/87).

The concept provides for the free and secure residence of people in populated areas located in contaminated territories. In this regard, living conditions in the controlled areas of the RSFSR, Ukrainian SSR, and Byelorussian SSR were examined. Based on the radiation doses received by the population, all populated areas in the controlled areas were divided into three groups: up to 350 mSv, 350-500 mSv, and more than 500 mSv.

According to the accepted conditions for permanent safe residence of the population in the first group, expected doses will not exceed 350 mSv, where people can live and work without restrictions. The total number of settlements in this group is 437, home to 181,100 people.

Expected doses in settlements in the second group will not significantly (by a maximum of 40%) exceed the permissible limit of 350 mSv. In these settlements, it is possible to lift the current restrictions, provided that a certain set of agricultural reclamation works is centrally implemented.
The total number of settlements in this group is 141, home to 43,900 people.

The third group includes 108 settlements, home to 22,200 people. In these settlements, even with the entire current system of protective measures and restrictions in place, it is very difficult to ensure the proposed dose limit.

The Board approved the proposal of the National Commission on Radiation Protection under the USSR Ministry of Health to introduce a basic dose limit for the population of 350 mSv, ensuring safe residence for the entire period of life in the controlled territories of the RSFSR, Ukrainian SSR, and Byelorussian SSR, beginning in 1990.

The Board submitted these proposals to the Government Commission for consideration, with subsequent submission to a meeting of the Politburo of the CPSU Central Committee.

The Board also ordered the Ministers of Health of the RSFSR, the Ukrainian SSR, and the Byelorussian SSR, as well as the heads of the USSR Ministry of Health, to ensure the early implementation of the "Comprehensive Environmental Program for the Study of the Consequences of the Chernobyl Nuclear Power Plant Accident" by their subordinate institutions, by June 1990.

The meeting of the USSR Ministry of Health Board was preceded by a scientific and technical meeting on developing a concept for permissible permanent residence in areas contaminated by radioactive substances. It was held in Kiev at the All-Russian Scientific Foundation for Radiological and Nuclear Medicine of the USSR Academy of Medical Sciences from September 26–30 of this year, chaired by L.A. Ilyin, Vice President of the USSR Academy of Medical Sciences and Director of the Institute of Medical Biology of the USSR Ministry of Health. Discussions arose at the meeting regarding the validity of the concept of a permissible lifetime dose of 350 mSv starting in 1990 and the lifting of restrictions on food products.

Thus, according to the proposed concept, doses received during the emergency period of 1986–1989 are not taken into account, despite the fact that, according to calculations, the population should have received up to 180 mSv during this period.

Scientists from the Institute of Biophysics of the USSR Ministry of Health (L.A. Buldakov, Deputy Director; V.A. Knizhnikov, Laboratory Head; R.M. Barkhudarov, Laboratory Head) and the All-Russian Scientific Center of the Republic of Moldova of the USSR Academy of Medical Sciences (I.A. Likhtarev, Department Head) are attempting to explain that the actual doses received by the population of "strictly controlled" areas for 1986–1989 will be half the calculated doses due to the effectiveness of preventive measures.

Given the dynamics of the radiation situation and the transition of the population of these areas to pre-accident levels since 1990, the majority of the population will not "exhaust" this value over a 70-year lifespan, even taking into account the four years of the accident. It is noted that there will indeed be a portion of the population whose total dose may exceed 350 mSv, but "everyone knows" that doses of 750 mSv, extended over a life time, do not cause any changes in the health of the population.

According to L.A. Ilyin (Director of the TBP of the USSR Ministry of Health), Romanenko (Minister of Health of the Ukrainian SSR), when posing the question in this way, it is necessary

to formulate a clear concept for the press and the public and explain why the entire population was not immediately resettled, what dose level does not affect the foetus, what is the fate of children who received high doses to the thyroid gland, and why the emergency situation ended in 1990, and why the estimated emergency dose of 180 mSv has no biological significance.

Another contentious issue remains the concept of lifting all restrictions on food control in areas contaminated with cesium-137, ranging from 111,000,000,000 to 555,000,000,000 Bq/km^2 [111-555 GBq/km^2] and higher.

M.G. Shandala (Director of the Research Institute of Cholesterol, Ministry of Health of the Ukrainian SSR), M.M. Skryabin (Research Institute of Radiation Protection, Ministry of Health of the Byelorussian SSR), O.A. Bobyleva (Head of Department, Ministry of Health of the Ukrainian SSR), and I.P. Los (Head of Laboratory, VNCRRM, USSR Academy of Medical Sciences) believe that to maintain a dose of 350 mSv, the existing standard for milk of 370 Bq/L must be maintained, as there is no guarantee that Agroprom will implement all measures to reduce the dose load.

However, this creates new problems in terms of the increasing number of settlements which residents must be compensated, or perhaps resettled.

Other experts (K.I. Gordeev, O.A. Pavlovsky, R.M. Barkhudarov, M.I. Balonov - all from the Institute of Biochemistry and Pharmacology of the USSR Ministry of Health, Yu.O. Konstantinov - from the Research Institute of the Russian State Research Institute of the Ministry of Health of the RSFSR) recommend changing the milk standard to 1,110-1,850 Bq/L in order to reduce the number of settlements subject to monitoring and resettlement.

This is explained by the fact that the contribution of cesium-134 to the formation of radiation doses for the population has significantly decreased, and the only remaining nuclide is cesium-137, and the share of other dietary components (meat, potatoes, local vegetables) has turned out to be very insignificant.

L.A. Buldakov (Deputy Director of the Institute of Biochemistry and Physics of the USSR Ministry of Health) suggested that medicine should narrow its scope of tasks and recommendations should be purely medical, and what Agroprom does is not their concern.

At the end of the meeting, the specialists agreed to lift all restrictions and radiation monitoring where a dose of 350 mSv is maintained. In populated areas where the dose is exceeded, the restrictions will be maintained, but temporary permissible levels for food products will be tightened, requiring the USSR Agro-Industry and other ministries and agencies to implement a set of measures to reduce the population's radiation exposure. The duration of the restriction period will be determined by the time it takes to reach a lifetime dose of 350 mSv.

The population of villages where a dose of 350 mSv cannot be ensured while maintaining restrictions for more than 5-7 years should be resettled.

L.A. Ilyin, Director of the Institute of Biochemistry and Physics of the USSR Academy of Medical Sciences, raised the issue of iodine-131 exposure levels in children. He noted that currently, approximately 150,000–160,000 children have thyroid radiation doses ranging from 300 to 2,000 mSv or more. The obtained data on the prognosis of thyroid cancer development indicate that its incidence will increase within 14 years. Therefore, it is necessary to urgently change the healthcare structure of districts and cities, train highly qualified endocrinologists, and ensure that the entire population is screened, with a particular focus on children.

The Minister of Health of the Ukrainian SSR, A.E. Romanenko, reported that over 1,000 people, mostly elderly, retired, and disabled workers, currently live within the 30-kilometer zone. Previously, the Ministry of Health of the Ukrainian SSR had not objected to their residence, provided that certain conditions were met by Soviet party organs. However, these conditions are not being met.

L.A. Ilyin noted that if the Ministry of Health has not firmly resolved the hygienic, organisational, and food security issues for people living in the zone, the issue of their evacuation must be raised. The residence of people under 50 years of age in the zone is a crime. This situation is apolitical and could cause a stir in the press. The role of medicine is not to cover up outrages. He has proposed preparing a report for the government on the impossibility of people living in the 30-kilometer zone.

6th Department of the UKGB of the Ukrainian SSR