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## **SPECIFICITY OF ECOLOGICAL AUDIT OF BURIAL PLACES AND STORAGES OF RADIOACTIVE WASTES ON THE EXAMPLE OF CHNPP**

*The specificity of ecological audit of burial places and storages of radioactive wastes on the example of CHNPP is considered; namely main principles, positions, requirements, tasks, objects, subjects of ecological audit, a team of specialists for its fulfillment, ecological problems, connected with storing of radioactive wastes and their influence on the human's health. Main possibilities of improving radioactive wastes control system are also considered.*

*Розглянуто специфіку екологічного аудиту місць захоронення і зберігання радіоактивних відходів на прикладі ЧАЕС, принципи, позиції, вимоги, задачі, об'єкти, суб'єкти екологічного аудиту, склад команди спеціалістів для його проведення, екологічні проблеми, пов'язані зі зберіганням радіоактивних відходів і їх вплив на здоров'я людей, а також основні можливості поліпшення системи контролю радіоактивних відходів.*

### **Introduction**

Handling of radioactive wastes is currently the main task of liquidation of consequences of CHNPP accident. It is an urgent issue due to negative influence on the functioning of all living organisms, especially on people's health. Consequently, radioactive wastes (not only those generated by CHNPP, but also others caused by human's activity) must be under special control, and must be stored in special places, which are constructed for these purposes. Today we have a lot of work to do and, taking into account considering radioactive wastes problem, there must be a well-established system of ecological audit for providing control of this problem and in future improving of the control system, special methodological, different analyses of radioactive wastes.

### **Principles of ecological audit**

The principles of ecological audit should:

- 1) ensure conservation of environmental conditions;
- 2) balance ecological, economic and social interests;
- 3) provide objectivity and scientific substantiation of ecological audit;
- 4) ensure compliance with the provisions of international agreements on ecological audit.

As other types of audit, an ecological audit of NPP must be held in 3 stages (preaudit, audit and postaudit), but in our case the specificity of these stages differs one from other. They differ not only in quality and complement of audit command, but also in audit planning, its methodology of implementation and so on.

First of all, ecological audit will include such positions as:

- determine and appoint the exact location of radioactive wastes and their burial conditions;
- set hydrogeological, engineer-geological, topographic conditions and characteristics of waste location, because it is a very important factor and if neglected, it could have negative consequences;
- establish the level of ecological safety of radioactive wastes;
- determine physical-chemical properties of radioactive wastes;
- find out the amount of radioactive wastes.

### **The main tasks of ecological audit**

We need to obtain most comprehensive information about radioactive waste, located at burial places, and ecological audit consists of such tasks [1]:

- 1) providing radiation safety of radioactive wastes' storage;
- 2) prognosis of possible threat of undesirable actions;
- 3) planning work of radioactive wastes handling;
- 4) defining requirements according to storage projecting;
- 5) defining terms of radioactive waste storage according to the requirements of environmental regulations of Ukraine;
- 6) addition of burial radioactive wastes posts and posts of temporary localization of radioactive wastes;
- 7) work organization of radioactive wastes storages maintenance.

The object of this ecological audit is radioactive wastes. One of the main issues during audit is observation of all dangerous radioactive substances conduct (first of all Sr, Cs, Po, Am, Rn, etc.) in the environment [1].

Subjects of ecological audit of radioactive wastes in Chernobyl zone:

- places of burial of radioactive wastes (they are used according to the license on following requirements of regulatory documents);
- temporary storage site of radioactive wastes (radioactive wastes aren't under regulated control);
- established sites of exploited radioactive wastes of CHNPP;
- temporary storages of unorganized radioactive wastes.

Usually, an ecological audit of such difficult objects as NPP is performed during the period of 2-3 weeks up to 2-3 months, depending on geology-geographical, ecological and technological conditions of the object.

Of course, radioactive wastes also are located beyond storage sites (radioactively polluted equipment on the storage ground, different accumulations of radioactive wastes in the Chernobyl exclusion zone, polluted buildings, constructions, soil, water reservoirs etc).

That's why we need to execute ecological audit regularly for all components of infrastructure of NPP's territory [2].

Carrying out inventory of unauthorized burial places of radioactive wastes and creation of the unique state system of registration of origin, transportation, storage and burial places of radioactive wastes, which must allow to optimize the ways of negotiation of CHNPP accident's consequences, is determined as one of the main tasks of state policy in the sphere of protecting of population and territories from emergency situations in the process of liquidation of CHNPP catastrophe (by the Ministry of Emergency Situations of Ukraine).

The main aim of state account of radioactive wastes is prevention of possible uncontrolled accumulation of radioactive wastes and providing operative control of their location and displacement, conditions of storage and burial of radioactive wastes.

It must be permanent of control and it should be provided on the well-prepared level [1].

#### **Characteristics of ecological audit providing**

Ecological audit of radioactive wastes is carried out by qualified specialists, who must be well-informed in this sphere. Usually, the team consists of :

- radio-ecologist;
- land-surveyor, geologist;
- chief engineer of the object;

- lawyer-ecologist;
- radiotechnologist;
- engineer of labour safety standards;
- representative of local administration;
- representative of local organisation.

Ecological audit of such objects has some peculiarities (special methodology, analyses), but generally rules of carrying it out are common, because the aim is common. As we know, ecological audit is documentary formalized systematic process of checking of objectively obtained and estimated data for defining compliance with the audit's criteria.

So, the main task of ecological audit of burial and storage areas of radioactive wastes is finding of rational ways of handling and storing radioactive wastes for preventing any possible ecological, social and economic disasters .

Currently, there is no full information about radioactive wastes, so ecological audit must promote an increase of authentic data about wastes in their disposal areas, temporary localization sites, and unauthorized disposal sites.

The Law of Ukraine "On handling radioactive wastes"(1995) requires carrying out regular inventories of radioactive wastes and their storages for ensuring permanent restoration of information in State register of radioactive wastes and State land-survey of storages and places of temporary storing of radioactive wastes.

The ecological audit is to have the plan of carrying out, progress report, confinement.

An auditor must obtain all information, which is in the firstly card numeration [3].

Carrying out of ecological audit of radioactive wastes is very important, because today our country lacks a good system of ecological control. And, as a result, we have many problems, which must be solved in the nearest future.

#### **Ways of improving control system of radioactive wastes**

What we must do as to the problems of radioactive wastes:

- 1) improve normative-legal regulation and determine sources of financing;
- 2) solve problems of radioactive waste processing;
- 3) improve technical-scientific providing of activity in the sphere of radioactive wastes handling;
- 4) develop a system of radioecological monitoring (observation, modeling, prognosis of radionuclides' migration into the environment and their influence on human's health);

- 5) realize a short-term and long-term prognosis of radioecological state of Chernobyl exclusion zone;
- 6) provide creation and functioning of the National centre of processing and storing radioactive wastes;
- 7) provide safe working conditions for personnel (improving control of internal system irradiation of the personnel, dosometric control, physical protection).

### Conclusion

Solving radioactive wastes problem is a national issue.

Of course, consequences of Chernobyl disaster have long-term impact on our environment and many problems will not disappear quickly. We must improve control system of radioactive wastes, ecological audit system, because simultaneously with the problem of radioactive wastes, we have ecological problems (air, water, soil pollution), negative impacts on the human health and as a result of it different diseases, increasing mortality rate, social and economic problems.

Timelines of radiological wastes handling in the Chernobyl exclusion zone generally depend on tempos and quality of actions fulfillment by the state.

Well-developed control system of radioactive wastes, their state, radiological situation in the places of storage and in the environment – is the obligatory component for improvement of current ecological situation.

It is better to prevent the problem than to find ways of its solving.

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