ANALYSIS OF RADIOACTIVE DAMAGE TO SURFACES AND INDIVIDUALS

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Abstract: *In the following article it is described about the adopted law on radiation conditions and their safety, nuclear explosion products rise to the troposphere and stratosphere, and then gradually fall to the surface forming precipitates of the earth in the latitude of the region where the nuclear explosion occurred.*

Key words: *competence, foresight, radioactive damage, global, local, gamma rays, ionization, X-rays, dose rate, pollution density, concentration, absorbed dose, radiation level.*

INTRODUCTION.

In the higher education system of the Republic of Uzbekistan, one of the important tasks is to create theoretical knowledge and practical skills to ensure the stable operation of enterprises and organizations in emergency situations. It is necessary to make a long-term prediction of man-made emergency situations in advance and to develop action plans as a result. Nowadays, foresight is widely used as one of the most modern forecasting technologies in developed countries [1].The utilize of prescience within the instructive prepare is the premise for the arrangement of premonition competence in future masters, as well as progressing the quality of education [2,3].

One of the man-made crises that can happen in generation ventures is the surpassing of the passable level of radioactivity. Radioactivity was discovered in 1896 by scientists Henri Becquerel and Marie Curie while working with phosphorous power. The three materials glowed in the dark after exposure to light, and Becquerel suspected that the glow produced by X-rays in cathode rays might be due to phosphorescence. He wrapped the photographic plate in black paper and placed various phosphoric salts. Everything was wrong until they used uranium salts. Uranium salts caused the plate to darken, despite being wrapped in black paper. The three radiations were named "Becquerel rays". It soon became clear that the darkening of the plate had nothing to do with phosphorescence, as the darkening was also produced by phosphorus-free uranium salts and uranium metal. These experiments revealed that there is a form of invisible radiation that passes through the paper and causes the plate to react to light. At first, the new radiation seemed similar to the recently discovered X-rays. Later research by Becquerel, Ernest Rutherford, Paul Villar, Pierre Curie, Marie Curie, and others showed that this form of radioactivity was significantly more complex. Rutherford was the first to realize that all such elements decay according to the same mathematical exponential formula. Rutherford and his student Frederick Soddy were the first to realize that many decay processes lead to the transition of one element to another. Later, the radioactive displacement law of Fajans and Soddy was developed to describe the products of alpha and beta decay.

RESEARCH METHODS

In the process of research, the analysis of scientific and teaching-methodical literature, pedagogical observation, comparative analysis, generalization, pedagogical experiment-test and foresight methods were used.

RESEARCH RESULTS AND DISCUSSIONS

Radioactive substances that are not visible to the eye in the form of cigarette smoke gradually cover the surface of the earth even in regions far away from the place where radioactive substances are spread. This is a local deposition of radioactive substances. A nuclear explosion in the air is mainly characterized by non-artificial radioactive damage. In this case, the products of the nuclear explosion rise to the troposphere and stratosphere, then gradually fall to the surface of the earth, forming a global (latitudinal) subsidence in the region where the nuclear explosion took place [4].

In the process of transformation, the inner core produces radioactive substances containing radioactive isotopes of 36 chemical elements. Depending on the power of the explosion, 60 to 80% of the radioactive substances produced are deposited locally. As a result, if the "large" molten particles produced by the surface explosion fall not far from the center of the explosion, the wind can carry the "light" radioactive dust far away. 20-40% of surface explosions and all radioactive substances from air explosions rise to the troposphere, even to the stratosphere, spread around the globe, and eventually fall to the ground with global subsidence. Radioactive substances fall from the troposphere in 2-4 months, and from the stratosphere in 5-7 years [5,6]. Global deposition increases pollution density by mixing with local deposition. Large particles fall to the ground within 20-45 minutes at a distance not far from the explosion site, and several hours at a distance of more than 100 km. When fine particles are in the air, they form aerosols. Radioactive sediments deposited on the ground contaminate the soil and all other objects on the surface of the earth [7].

A radioactive cloud will have the following harmful radiation:

-Gamma radiation, which creates general external radiation;

- Beta-particles that cause radiation damage to the skin upon external exposure and radiation sickness as a result of exposure through the digestive and respiratory organs;

Alpha-particles are dangerous if they enter the body.

Radioactive radiation causes varying degrees of radiation sickness in humans and animals, depending on the magnitude and duration of the total external gamma-radiation dose in the radioactive trace. The course of the disease is divided into four periods. Primary reactions begin immediately after exposure to light and last from several hours to 2-3 days. During this period, the body is sluggish and agitated, loss of appetite, redness of the mucous membranes, vomiting and similar conditions are observed. Then everything disappears. The latent period lasts from 3 to 14 days, sometimes even longer (depending on the radiation dose). During this period, people and animals do not differ from healthy people in their external signs, pathological changes continue to develop in the blood and blood-forming tissues. The intense period of light disease is characterized by clearly expressed symptoms of the disease. This period lasts more than 2-4 weeks, depending on the severity of the disease. The last period of the disease occurs with clinical recovery or death of the infected.

Mild radiation sickness is characterized by fatigue, general weakness, headache, and a decrease in the number of leukocytes in the blood. A mild disease develops when taking a dose of 150 - 250 R. The moderate form of radiation sickness is manifested by severe dizziness, nervous system dysfunction, and headache. At the beginning, vomiting and diarrhea often occur, then the body temperature may rise, the amount of leukocytes in the blood, mainly lymphocytes, decreases by more than two times. Without complications, people recover after a few weeks, and the morphological composition of the blood is restored only after a few months. Moderate radiation sickness develops after receiving a dose of 250-400 R. A severe form of radiation sickness occurs when irradiated with a dose of 400-600 R. In this case, there is a general severe condition: severe headache, nausea, internal bleeding, sometimes fainting or sudden weakness, bleeding into the mucous membranes and skin, necrosis of the mucous membranes around the gums. The number of leukocytes, including erythrocytes and platelets, decreases sharply. Various infectious complications appear due to a decrease in the protective properties of the body. The most severe form of radiation sickness occurs when the radiation dose is higher than 600 R, and if left untreated, it usually leads to death after two weeks in rare cases. The time to die depends on the level and duration of the radiation dose. The most dangerous part of radioactive rays is that the human body does not have any symptoms until this disease is clearly visible. On August 31, 2000, the Law of the Republic of Uzbekistan "On Radiation Safety" was adopted on radiation conditions and their safety. The purpose of this law is to regulate issues related to ensuring the protection of human life, health and property. When uranium and plutonium, which make up the nuclear charge, decay, its unreacted remains pollute places, soil elements and all objects on the surface of the earth with artificial radioactivity.

CONCLUSION

Consolidation of the above-mentioned theoretical materials in the laboratory training of the subject "Safety of life activities" will lead to the formation of practical skills in radioactivity and its effects on the human body, its sources and ways of protection [8]. During the post-higher education career, future professionals are required to improve their professional competence, including radiation protection, based on the principle of "Lifelong learning". Of course, this is done through distance education [9]. However, a person's extensive use of digital technologies in his life also has its own negative aspects [10]. This, in turn, requires studying the positive and negative aspects of digital technologies based on foresight technology [11] and developing appropriate measures.

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