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**May 16, 1986**

**Report on Radiation Situation. Secret. Signed by  
Experts A.V. Produnov and G.V. Yeremin**

**Citation:**

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**Summary:**

Radiation levels in Pripjat and the surrounding area following the Chernobyl nuclear disaster.

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Russian

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REPORT [i]

According to the data from the radiation control support unit, as of 8am 1 May 1986, the radiation level in the disaster zone is up to 1000 micro roentgen per second, in separate areas of Pripyat city - 60 / 100.

The work of covering the accident cluster with mixture of sand, boron and Pb from helicopter is in progress (1850 tons have been used since the beginning of the effort). Through the adopted measures, the surface of the accident cluster was basically closed off from the environment, but still releasing smoke. During April 30, 1986 the level of radiation, particularly above the reactor, slightly decreased from 300 roentgen per hour to 200 roentgen per hour.

The work of NPP [nuclear power plant] personnel, the supply of electricity, communications, decontamination, public peace, and protection support services in the city and NPP were organized in a rotating scheme.

According to scientists and specialists, the most probable cause of the accident is the reactor's self-acceleration (there was a phenomenon of uncontrolled chain reaction).

In order to verify proposed versions of events using intelligence sources, the front-line investigative group seized all the necessary technical documentation, as well as tape recordings of conversations among operational staff, which it is now analyzing. The State Commission was provided with assistance in carrying out detailed filming of the scene.

According to the Republican Administration of Hydrometeorology and Environmental Control, the movement of air masses from the area of the accident caused radiation to exceed background levels in some areas by 20 - 2000 micro roentgen per hour (in Kyiv at 7 am 1 May 1986, 550 - 1200 micro roentgen per hour).

It was noted that a number of foreign tourists, students, and specialists aimed to discontinue their period of stay in Kyiv. The Finnish decided to send home travelers pre-term, 20 students out of 36 enrolled in the Kyiv State University, and specialists from firm named "Lemkon," working at the Kyiv garment factory, the British Embassy - students of Russian language courses. On 1 May 1986, specialists from West German firms named "RVPA," who were working on production at the Fastov consumer packaging plant and "Byzon verka," and at the production association "Kievdiv" are going to Moscow.

The situation is normal and controlled in Pripyat and Chernobyl, at the evacuation locations, as well as among the population in Kyiv and foreigners staying in the Republic.

The reason for the substantially unequal effect of the explosion in different directions is explained by the asymmetrical walls and coverings located towards the center of the explosion and by the differences in their strength characteristics, as well as the shielding effect of the individual parts of the reactor itself.

Taking into account that glass, found in the windows of the undestroyed part of the main building of the second stage of the NPP and the adjacent buildings, was not destroyed, we can only speak of an equivalent TNT explosion, rather than the use of a high explosive in the destruction of the power reactor. The gentler nature of the building's destruction more closely resembles the explosion of dust-gas-air mixtures and thermal explosion. Otherwise, it is possible that there has been a combination of both types of explosions.

According to nuclear scientists, there is a possibility of prompt decomposition of water into hydrogen and oxygen with the subsequent formation of a hazardous explosive mixture inside the reactor core under high temperature conditions, which occur during an uncontrolled chain reaction.

In calculating the required amount of hazardous explosive mixture - for an explosion that could cause the existing destruction - the fact that during the explosion other components from the substances located in the reactor and heated to high temperatures (water, graphite, etc.) may have been involved was not taken into account.

Calculations for the two boundary conditions of manometrical pressure that would be

needed to destroy the walls of varying strength (0,55 kg/cm<sup>2</sup> and 1 kg/cm<sup>2</sup>), show that the production of such damage requires 3.5 - 6 tons of hazardous explosive mixture.

RESULTS □□□ The center of the explosion was in the reactor zone at a height of 20-30 meters from zero mark of the building

. To cause the damage occurred it would take about 30 tons of condensed explosives of the TNT type. However, the "gentle" nature of the destruction, the lack of window damage, indicates that these are not the result of destruction of condensed explosive.

. Existing damage could also occur after the explosion of hazardous explosive mixture in mass from 3.5 tons to 8.0 tons, which could be formed in the reactor core.

□□

Specialists: A.V. Produktov

G.V. Yeremin

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[i] This is a report on radiation situation in Chernobyl disaster zone in the first days after the accident. The scanned copy of the document is available at:

<http://pripyat-city.ru/pages/pripyat/docs/radiation-01.jpg> (p. 1) and

<http://pripyat-city.ru/pages/pripyat/docs/radiation-02.jpg> (p. 2) [translator's note].