

Information on the operating power units of the Chernobyl NPP and the radiation situation near the nuclear power plant

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Secret

Regarding the situation at the Chernobyl Nuclear Power Plant and its surrounding area

From December 29 to January 16, 1987, the situation at the Chernobyl Nuclear Power Plant and its surrounding area was characterised by the stable operation of power units No. 1 and No. 2 at nominal power, the implementation of planned measures to eliminate the consequences of the accident, a further reduction in radiation levels in certain areas of the special zone, and the completion of the transition of the workforce to normal shift work.

The presentation of government awards to a large group of Chernobyl Nuclear Power Plant workers by Comrade V.S. Shevchenko, member of the Politburo of the Central Committee of the Communist Party of Ukraine and Chairman of the Presidium of the Supreme Soviet of the Ukrainian SSR, on December 31, 1986; the visit of Comrade V.I. Dolgikh, candidate member of the Politburo of the Central Committee of the CPSU, to the plant, the city of Chernobyl, and the Zeleny Mys shift camp on January 7, 1987, and a tour of the progress of the clean-up efforts following the accident were met with great enthusiasm by the workforce.

A unanimous opinion was expressed regarding the Party and government's high appreciation for the dedicated work of the plant's personnel and other organizations, the attention to their requests and needs, the creation of safe working conditions, and the quality and speedy completion of preparations for the launch of Unit 3.

During counterintelligence activities, additional information was obtained regarding the increased interest of foreign citizens in the Chernobyl Nuclear Power Plant accident and the measures being taken to address its consequences.

Thus, in accordance with the decision of the authorities, on January 13 of this year, from 12:40 to 15:00, IAEA Director General Hans Blix and Director of the IAEA Department Mark Rosen were at the plant.

According to the program of their visit, they inspected Power Unit No. 1 (Control Room No. 1, the turbine hall near Turbogenerator No. 1), the Shelter facility from the observation deck, took photographs in front of it, and held discussions with Acting Plant Director N.A. Steinberg and Deputy Chief Engineer for Science N.V. Karpan. The foreigners showed the greatest interest in the safety monitoring measures for the Shelter facility, the situation inside the unit and individual technological solutions for its isolation, methods for decontaminating contaminated areas, and the substances used.

Rosen was interested in Steinberg's biographical information. The nature of some of the foreigners' questions may indicate attempts to double-check the data they knew from official sources. If the station's visitors had dosimetry equipment, they could have recorded levels of radioactive contamination of up to 500 $\mu\text{Sv/hr}$ on the observation deck of the mothballed unit, where they remained for 4-5 minutes.

The radiation situation within the Chernobyl Nuclear Power Plant and the special zones has not changed significantly. Snow cover, the absence of wind-blown radioactive dust, and the temporary cessation of roof cleaning work on Unit 3 have stabilized radiation levels, and in some areas, they have decreased.

In most manned and semi-managed areas of the first stage, the radiation situation does not interfere with their normal operation.

The exception is the turbine hall on the side of Unit 3 and the de-aerator stack, where the annual doses received by personnel may significantly exceed permissible levels.

During the reporting period, the following average radiation levels were recorded: reception area, director's office, chief engineer's office, and conference room – 3-4 $\mu\text{Sv/hr}$; Unit 1 control room (UCB-1) and central control room (CCB) - 5 $\mu\text{Sv/hr}$; UCB-2 – 6 $\mu\text{Sv/hr}$. Minor radiation fluctuations without a clear pattern were observed at the entrance to the administrative and amenity building of the first stage (ABK-I), from 30 to 60 $\mu\text{Sv/hr}$; along axis 36 in the turbine hall between turbogenerators No. 2 and No. 3 from 60 to 100 $\mu\text{Sv/hr}$; along axis 68 in the turbine hall behind turbogenerator No. 4, around 400 $\mu\text{Sv/hr}$.

At the NPP perimeter, at decontamination monitored points, radiation levels remained unchanged during the reporting period, ranging from 5 $\mu\text{Sv/hr}$ to 30 $\mu\text{Sv/hr}$ (maximum values are in the western and southwestern directions from the Shelter). Outside the plant perimeter, in these directions, there are areas with contamination exceeding 100 $\mu\text{Sv/hr}$.

In Pripyat, radiation levels range from 2.5 to 70 $\mu\text{Sv/hr}$, unchanged at constantly monitored points. In Chernobyl, they have steadily decreased from 0.5–14 $\mu\text{Sv/hr}$ on December 29, 1986, to 0.5–11 $\mu\text{Sv/hr}$ on January 15, 1987.

The unfavourable radiation situation near the Chernobyl Nuclear Power Plant (CNPP) is currently caused by the construction site (an area of 3 square kilometres west of the plant) and the so-called "red" forest, a pine forest with dead trees (pine trees die at an integrated dose of 6,000 mSv), covering an area of approximately 5 square kilometres, southwest of the plant. According to official data from CNPP specialists as of November 1986, after the accident, a "tongue" of radioactive contamination with a dose rate of 150,000-300,000 $\mu\text{Sv/hr}$, with isolated patches of up to 1,500,000-2,000,000 $\mu\text{Sv/hr}$, extended through the construction site toward the "red" forest.

At our request, the intelligence department of the USSR Ministry of Defence task force conducted additional measurements on January 10, 1987, and determined the contamination level of the soil, buildings, and stored materials at the construction site to be over 100,000 $\mu\text{Sv/hr}$ in some areas, and up to 20,000 $\mu\text{Sv/hr}$ in the "red" forest at a height of 1 meter from the ground. The existence of other points with higher levels cannot be ruled out. These areas are currently the sources of the greatest radioactive contamination of the surrounding area, including the Chernobyl Nuclear Power Plant site.

According to experts, a possible fire in the "red" forest would lead to severe contamination of large areas, requiring appropriate decisions on additional fire safety measures. The situation may be somewhat complicated by the work that has begun to build a railway line from Yanov

station to Phase III of the Chernobyl Nuclear Power Plant, with a section through the "red" forest.

In late December 1986, units of the USSR Ministry of Defence completed a second decontamination of the roof of Unit 3.

In certain sections, a significant reduction in radiation levels has been achieved overall. However, near the ventilation stack, there are still points with levels exceeding 20,000,000 $\mu\text{Sv/hr}$. Due to high radiation levels, most of the interior spaces, including the central hall and turbine hall, are unsuitable for repair and restoration work, which is preliminarily estimated at 44 million roubles in capital investment, excluding the USSR Ministry of Defence's decontamination costs. Roof clean-up of radioactive contamination has been temporarily suspended pending recommendations on how to proceed.

The previously planned launch of Unit 3 in the second quarter of 1987, according to experts, may not be completed until the end of that year. A significant amount of radioactive water from snowmelt will leak into the upper rooms of the unit in the spring through openings in the roof, leading to additional contamination.

The natural decay of the nuclear reaction continues in the mothballed Unit 4. At an altitude of 200 meters above the unit, the gamma radiation dose rate has steadily decreased from 43,000 $\mu\text{Sv/hr}$ on December 29, 1986, to 33,500 $\mu\text{Sv/hr}$ on January 15, 1987. Monitoring instruments have recorded a decrease in the maximum temperature inside the unit to 128.5°C.

Due to the discharge of radioactive waste into one of the rooms of the Shelter during decontamination of the roof of Unit 3, the forced ventilation systems were shut down by order of Chief Engineer N. Steinberg and remain inoperative to this day. He justifies this decision by citing the need to first seal the facility. Ventilation is provided by natural draft along a safe line. The concentration of aerosols at the outlet is determined primarily by ruthenium-106 and 103, niobium-96, cesium-134 and 137, and zirconium-95. Alpha-active plutonium and uranium were not detected.

During the reporting period, power units No. 1 and No. 2 operated reliably at minimal load. The investigation into the shutdown of power unit No. 2 on December 26, 1986, which resulted in a loss of 70.9 million kWh of electricity, has not identified any direct culprits. According to N.A.S. and K.N.V., the cause of the activation of the emergency protection system (AP-5) is the failure of the design to decode input signals for each channel of the reactor control and protection system (RCPS) logic.

This, in turn, does not preclude the system's response to random signals from various electrical interference, comparable in amplitude and duration to genuine signals. To prevent such incidents in the future, the aforementioned sources propose installing special traps to detect false signals. This issue is being studied by specialists.

In agreement with GAEN, the Kurchatov Institute of Atomic Energy, and the Scientific Research Institute of Power Engineering, Unit 2 was restarted on December 29, 1986, despite the fact that nuclear safety regulations prohibit bringing the reactor up to nominal power until the cause of its shutdown is determined.

An analysis of the most common defect—holes in pipeline welds—revealed a number of violations of nuclear power plant safety regulations. For example, electrodes and welding wire arriving at the plant are not provided with documentation on testing these materials for susceptibility to intergranular corrosion. In violation of the "Rules for Inspection of Welded Joints at Nuclear Power Plants," mandatory intergranular corrosion testing of filler material for welding corrosion-resistant metals is not performed or reflected in the process procedures. The identified causes of the plant's declining operational reliability have been reported to the management of the State Nuclear Energy Supervision Authority (Gosatomenergondzor), and their progress is being promptly monitored.

Some of the station's internal railway tracks are covered with concrete or are in disrepair, no one has been appointed to ensure the safe and timely transportation of nuclear fuel from the Yanov station to the storage facilities, and the spur line to the turbine halls is almost completely destroyed.

The plant's management has been informed of the above, which could lead to accidents during nuclear fuel delivery and complicate the replacement of transformers for the power units should they fail.

The Chernobyl Nuclear Power Plant employs 4,925 people (91.8% of the workforce required). Of the 124 plant managers, including shift supervisors for the plant, units, and workshops, and their deputies, more than half (57%) have received the temporarily permissible dose of external (excluding internal) radiation of 250 mSv or are approaching it. A forced one-time replacement of managers could negatively impact the stability and reliability of the operating power units.

According to available operational data, some qualified specialists deliberately do not use personal dosimetric devices to prevent radiation safety officials from recording their true radiation doses. They explain the neglect of their health by citing the difficulty of finding work in their field outside of nuclear power plants, financial considerations, and a lack of confidence in their body's ability to adapt.

A study of this issue through trusted specialists at Medical Unit No. 126 established that the method of determining radiation doses using blood tests is only applicable to cases of large single doses. In the absence of established dosimetric monitoring, the gradual accumulation of doses and internal absorption of radionuclides could be partially determined using a human monitoring system (HMS), which Medical Unit No. 126 has but does not use due to a lack of available space in the village of Zeleny Mys. The Prip'yat City Committee of the Communist Party of Ukraine has been informed of the above.

The state of the plant's security is a legitimate concern. Despite the accelerated pace of construction, the perimeter of the second phase, including the Shelter facility, is not fully fenced. There is free access to Unit 3, through which uncontrolled access to the operating units is possible, reaching locations vulnerable to sabotage. Physical security and access control at the plant are carried out by poorly trained conscripts from the special commandant's office, 65% of whom are from the Central Asian republics of the USSR.

They are replaced by other units with several people, which typically include individuals with a negative reputation. Given the increased demands on the Chernobyl Nuclear Power Plant's security, we believe it is appropriate to replace departing service members with full platoon strength, along with their command staff.

During operational monitoring of the security regime at the Chernobyl Nuclear Power Plant and the Combine, a number of violations in the storage and use of radiation data were identified. These deficiencies were corrected, and those responsible were punished administratively. The absence of a deputy security director at the Combine and the understaffing of the first department create the preconditions for serious security violations.

Over 2,000 Ministry of Internal Affairs personnel, including 1,080 service members from the Internal Troops of the Ministry of Internal Affairs of the Ukrainian SSR and the Moldavian SSR, are responsible for maintaining security and law and order in the special zone. According to available, verified operational data, the state of security in the special zone does not preclude unauthorized persons from entering its territory. For example, due to the lack of physical capability, the presence of individual passes is not checked for citizens passing through the checkpoint in convoys of buses carrying station personnel, construction workers, and military personnel on shift.

Drivers of vehicles carrying out one-time cargo transportation for organizations in the zone are allowed through if they have a note on their waybill. A significant number of group and individual passes remain in the possession of individuals who previously worked in the special zones (an estimated 300,000-400,000). Previously, police authorities issued an unjustifiably large number of passes to the city of Pripjat and the Government Commission building.

According to agent "Vasiliev" at the Dibrova waste disposal site, vehicles leaving the Chernobyl Nuclear Power Plant are washed directly on the road, and the water flows down the gutters dug into the road shoulder, further polluting the environment.

To eliminate the preconditions for an emergency, the Chernobyl Regional Electric Networks and the Public Utilities Combine (PUC) worked with the paramilitary fire department to resolve the issue of disconnecting power to evacuated buildings in Chernobyl and repairing fire hydrants, which had led to several fires in December 1986. Specialists from the Main Fire Protection Directorate (GlavPRU) prevented the commissioning of electric boilers at the Lelev and Cherevach wastewater treatment plants without connecting emergency protection circuits due to the lack of control panels, which could have led to accidents with serious consequences.

Conflicts potentially damaging to political life have repeatedly arisen within the teams of organizations involved in the aftermath of the accident. For example, due to insufficient outreach, a group of employees from the plant, the Chernobyl Nuclear Power Plant Construction Department, and their relatives visited the reception office of the Central Committee of the Communist Party of Ukraine regarding the provision of imported furniture to evacuees. This parasitic attitude was inspired by shop foreman Krasin, who is being investigated to prevent any politically damaging behaviour.

Through the management of the Chernobyl Nuclear Power Plant Construction Department, awareness-raising activities were conducted among a group of 22 construction workers who, due to the delay of the bus from Chernigov at the end of their shift, made negative statements about local authorities, intended to file a collective complaint with the authorities, and reported a possible evasion of work for the next shift. The instigator of this behaviour, Smolentsev, has been placed under operational investigation.

The Ukrainian SSR KGB Department for Kiev and the Kiev Region provides counterintelligence support to facilities with the help of 37 agents, 72 authorized representatives, and two residents. Investigations into the "Felix" and "Genrikh" DPO facilities are ongoing.

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