



reactor type had no containment dome and its roof was made of combustible bitumen. All these factors were to render the Chernobyl disaster a more dangerous accident than might otherwise have been the case.

The experiment on April 25-26 was a test of safety equipment that had been tried previously at both the Chernobyl-3 reactor and the Krusk station in Russia. To prevent a reactor automatic shutdown, operators had dismantled emergency shutdown devices, but an operator error almost brought down the reactor's power to zero before the removal of safety rods from the core caused a power surge. We now know that the design of the safety rods themselves was faulty and the attempt subsequently to shut down the reactor by plunging the rods back into the core may have contributed to the dramatic power surge which blew the roof off the fourth reactor building. Neither the plant manager nor the chief engineer was on hand at the time of the accident, a steam explosion at 1:23am on April 26.

The immediate events in the aftermath of the explosion are well-known. The ensuing graphite fire with extremely high levels of radiation took a heavy toll especially on firemen and first-aid workers. The Soviet government response was slow, and Ukrainian officials, operating by precedent (previous accidents had been concealed successfully from the general public), were reluctant to take the initiative in making decisions to evacuate those in the vicinity. Initially, about 40 hours after the accident, a 10-kilometer-radius zone around the reactor was evacuated, commencing with the city built for plant employees - Pripjat - 2 miles to the north. After May 2, when the Gorbachev Politburo dispatched two officials to the scene, Yegor Ligachev and Nikolay Ryzhkov, the zone was extended to 30 kilometers.

The radiation levels were unprecedented for a civilian nuclear power plant accident and for almost two weeks radiation

continued to escape from the gaping hole in the reactor. It was eventually blocked off using both machine and human methods, the crudest being the use of "volunteers" to traverse the reactor roof, fling a shovelful of hot graphite chunks into the gaping hole, and be removed from the area. Such work was highly hazardous. Safety equipment and clothing was inadequate and the toll was heavy. After 30 days, military reservists conducted the bulk of the decontamination work. At the same time the evacuated population had been informed that it would be moved temporarily and that enough belongings must be taken to last for three days. The westward evacuation path, however, emulated that of the radiation cloud, meaning that a reevacuation was soon necessary.

About 116,000 people were removed from the 30-km zone which stretched into the Byelorussian SSR (Belarus).

From the Ukrainian side, 76 settlements or towns were evacuated, 91,000 residents. The amount of land contaminated in Ukraine was not known until the spring of 1989. Revelations from the Narodychi Region in Zhytomyr Oblast, 200 miles to the west, indicated that radiation levels there after the accident had been as high as 3 rems per hour. Cesium levels in the soil attained 100 curies per square kilometer in places (15 curies had been designated as the tolerance limit warranting immediate evacuation). Such information caused widespread panic among the population and contributed to the notion that the authorities had deliberately misinformed them as to the real impact of Chernobyl. This viewpoint was partially true, though the majority of officials in Zhytomyr and Kyiv were unaware of the actual radiation levels.

Since 1989, and the declaration of independence by Ukraine in August 1991,

the picture has become much clearer. After Chernobyl, 123,000 hectares of agricultural land were taken from cultivation in the republic, in addition to 136,000 hectares of forest. Further evacuations of population from regions such as Narodychi brought the Ukrainian total to around 160,000 people. Using the criterion of 1 curie per square km of cesium in the soil, the area of Ukraine contaminated amounts to more than 40,000 sq kms encompassing around 2,200 towns, villages and hamlets. An estimated 3.2 million people have been affected of which about 1 million are children. They either live in irradiated regions or have been evacuated from the same. According to official Ukrainian statistics, 2,148,969 people today live in areas suffering from contamination.

Evacuation is dependent upon the precise level of radiation in the soil, and zones have been divided accordingly, with 15 curies the minimum limit for immediate evacuation; 5-15 curies for subsequent evacuation; and 1-5 curies of cesium the level at which families have a right to evacuation if they are unable to obtain clean supplies of food and water. Often these stipulations remain more on paper than reality. In December 1995, for example, 5,500 families, 1,500 of which had children, were still awaiting removal from the areas of obligatory evacuation in the Poliske Raion of Kyiv Oblast. Like other families, these have consumed contaminated food products in their native villages for almost a decade.

The levels of radiation, as noted, vary considerably. Studies have indicated that the worst affected oblasts are those of Kyiv, Chernihiv and Zhytomyr, and these have received the bulk of attention. However, significant radiation fallout has been found well south of the city of Kyiv, in Kirovohrad and other central regions. Low-level fallout reached Rivne and Volyn oblasts of the far northwest, and 72 raions in 12 Ukrainian oblasts embracing 4.5 million hectares of



Abandoned cultural centre and children's playground in Pripjat, a city of 45,000 evacuated after the nuclear explosion.

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