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WORLD

# Ukraine Warns That Power Cut at Chernobyl Could Cause Nuclear Accident

The IAEA and other experts play down the risk of an imminent problem at the site of the world's biggest nuclear disaster

By *Laurence Norman*

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Ukrainian authorities said Wednesday that a power cut caused by Russian attacks on Kyiv could deprive the Chernobyl nuclear site of power within 48 hours, leading to a potential meltdown of spent nuclear fuel.

The warning was the latest of several incidents threatening Ukraine's nuclear sites in the wake of the Russian invasion of the country last month.

The International Atomic Energy Agency on Wednesday played down risks of an imminent problem at Chernobyl, the site of the world's biggest nuclear accident, in 1986, which contaminated large areas of surrounding countryside and sent a plume of radioactive dust that spread across Europe. They and other experts say Ukraine's nuclear facilities are on the whole modernized and robust.

Never before has such an intense conflict taken place around so many nuclear power facilities.



A fire at a building in the Zaporizhzhia nuclear power plant in Ukraine last week.

PHOTO: STATE EMERGENCY SERVICES OF UKRAINE VIA REUTERS

Last week, a Russian projectile caused a fire at a building in the largest nuclear power plant in Europe, the Zaporizhzhia facility in Ukraine, around 340 miles southeast of Kyiv, which contains six reactors.

Communications between Ukraine's regulator and some of the nuclear facilities has been reduced and on Tuesday, the IAEA said it had lost contact with monitoring systems that send the agency data and information on activities at Chernobyl.

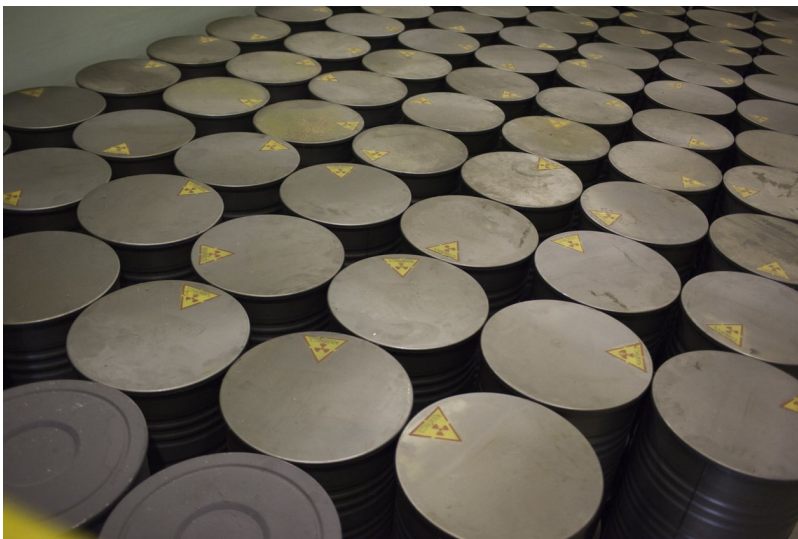
The irradiated fuel ponds of the type Ukrainian authorities warned about at Chernobyl on Wednesday contain radioactive substances like iodine, cesium and plutonium. However, they are usually built out of concrete and buried underground.

At Chernobyl, the nuclear waste has been stored for over two decades, making it potentially hazardous to staff but unlikely to cause a major accident.

“The Chernobyl Power Plant has been shut down since 2000, and therefore the spent fuel rods stored on the site have been cooled for 22 years. Therefore they will not be producing significant amounts of heat, making a release of radiation very unlikely,” said Prof. Geraldine Thomas of Imperial College London.

Steve Nesbit, president of the American Nuclear Society, sees the chances of an explosion or meltdown at Ukraine’s nuclear facilities being relatively low.

One risk is a hydrogen explosion at Ukraine’s pressurized water reactors of the type that happened in the 1979 Three Mile Island accident in the U.S. If a reactor was knocked off the power grid and the backup system failed, there could be damage to the core of the reactor within hours, which could lead to a buildup of hydrogen outside the reactor. However, as was the case at Three Mile Island, a hydrogen explosion shouldn’t pierce through the concrete containment structure shielding the reactor, built to design major shocks, Mr. Nesbit said.



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PHOTO: JOHN WENDLE FOR THE WALL STREET JOURNAL

The IAEA has said there has been no turnover of the more than 200 staff at Chernobyl since Feb. 23, raising worries about their well-being and ability to do their jobs. Missiles have struck two other nuclear-related facilities, although none of the incidents has yet caused any radioactive release, the agency said.

“The situation in Ukraine is unprecedented and I continue to be gravely concerned,” International Atomic Energy Agency Director General Rafael Grossi said last week.

Ukraine has four nuclear plants dotted around the country, plus the Chernobyl site near the Belarus border, supplying around half of the country’s electricity supply. The facilities, which include 15 reactors, are generally considered safe and reasonably modernized, including being outfitted with safety procedures recommended after the 2011 Fukushima nuclear disaster in Japan, experts say.

Only Zaporizhzhia and Chernobyl have so far been taken over by Russian forces, following fighting between Ukrainian and Russian forces.

Senior Ukrainian officials have spoken in alarming terms about the fate of the country’s nuclear facilities. President Volodymyr Zelensky said after the Zaporizhzhia fire it could have caused an accident six times as large as Chernobyl, and on Wednesday, his foreign minister said the risks to Ukraine’s nuclear facilities from Russia’s invasion is putting the whole of Europe in danger. On the other side, the U.N. atomic agency has dismissed Russian claims in recent days that Ukraine is working on nuclear weapons.

Mr. Grossi is in discussions with Ukraine about sending a team of experts to help deal with safety risks. He has also proposed mediating negotiations between Ukraine and Russia to agree on a framework to keep fighting away from nuclear facilities. Neither idea has yet got off the ground.



The Chernobyl site is near the Belarus border.

PHOTO: GLEB GARANICH/REUTERS

For now, Chernobyl and Zaporizhzhia are both being run by their Ukrainian staff, although the IAEA reported that at Zaporizhzhia, plant management have been ordered to check decisions on running the facilities with the Russian commander at the site.

Mark Zheleznyak, a professor at the Fukushima Institute of Environmental Radioactivity, who is from Ukraine, said that were Russia to put its own staff in charge of the Ukrainian sites, they could do so with relative ease. Ukraine's water pressurized reactors are based on designs that remain common in Russia, he said.

"It was a Soviet design. For sure, Russian knowledge about these reactors is no better or worse than Ukrainians," he said.

Given the intensity of conflict in Ukraine, experts say they can't exclude the risk of a major accident. But their greatest concerns are human error by staff who are working in stressful conditions and not getting proper rest, food or medicine; the difficulty emergency repair teams could face in reaching facilities amid the war; and nuclear facilities running short of vital spare equipment—from diesel for backup power systems to cooling water for spent waste pools.

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