

Get Ready for a New Chernobyl in Ukraine

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In-depth Report: [UKRAINE REPORT](#)

*With the onset of winter and the increasing strain on Ukraine's energy system, the threat of a new nuclear disaster in Central Europe is becoming more than just a theoretical danger. According to analysts from [Energy Research & Social Science](#) (ERSS), **there is an 80% probability of a "serious accident" at one of Ukraine's nuclear power plants before the year 2020.** This is due both to the increased burden on the nuclear plants caused by the widespread shutdowns of Ukraine's thermal power plants (the raw material they consumed – coal from the Donbass – is in critically short supply) and also because of the severe physical deterioration of their Soviet-era nuclear equipment and the catastrophic underfunding of this industry.*

Should such an incident occur, the EU would not only be faced with the potential environmental consequences, but also – given the recent introduction of visa-free travel – a large-scale exodus of Ukrainians out of contaminated areas.

Let's start by taking a brief tour of the Ukrainian nuclear industry:



Ukraine currently has **four operating nuclear power plants**: the [Zaporizhia](#) (the largest in Europe, with six reactors and a combined power output of 6,000 MW), the [Rivne](#) (four reactors and a combined power output of 2,880 MW), the [Khmelnitskiy](#) (two reactors and a combined power output of 2,000 MW), and the [South Ukraine](#) (three reactors and a combined power output of 3,000 MW):

The [Chernobyl](#) plant with its four reactors was finally shut down for good in 2000.

Of the 15 nuclear reactors currently operating in Ukraine, 12 were brought online during the Soviet era, prior to 1990. All of them rely on the classic type of [VVER nuclear reactors](#) that were designed during the 1960s and 1970s at the Kurchatov Institute in Moscow. Those reactors should have a maximum life expectancy of 30 years. But as of today, **10 of the 15 reactors operating in Ukraine have already outlasted their expected service life.**

And all the while, the strain on Ukraine's crumbling reactors constantly increases due to the dramatic decline in the availability of anthracite reserves from the Donbass at the country's thermal power plants (by mid-2017, electricity production at Ukraine's thermal power plants had dropped to almost half of 2013's output, down to just over 50 billion kWh per year). According to Energoatom, the state company that runs Ukraine's nuclear plants, in 2016 [those plants were operating at only 65.5%](#) of their total capacity, but by January 2017 [they were up to 77.6%](#). During the first half of 2017, Ukraine's nuclear power

plants [produced more than 45 billion kWh of electricity](#) (up 13% compared to 2016), which means that they were responsible for **58%** – an unprecedented share – of the country's total energy matrix.

Today Ukraine is desperately squeezing out the last drops of use from its decrepit Soviet-era nuclear facilities.

The situation is being aggravated by Ukrainian energy officials, who are under political pressure to find a substitute for the nuclear fuel made by the Russian company [TVEL](#). Thus at a number of reactors they have made repeated attempts to instead use a product made by the [Westinghouse Electric Company](#), an American-Japanese corporation.

It is astonishing how the Ukrainians have entirely ignored the painful experiences of the Czechs. Back in 1996, the Czech [Temelín](#) nuclear plant (built by the Soviet Union) signed a contract with Westinghouse. After the reactors at the plant were fed an American fuel that had been designed to mimic the Russian TVEL product, the plant was forced to repeatedly refuel the reactors ahead of schedule, because the American assemblies leaked and exhibited structural defects. The scientists at Westinghouse could not correct the problem. In addition to the threat of a nuclear accident, the faulty fuel assemblies significantly increased the costs of producing electricity, since the reactors had to be continually shut down to replace the American parts. As a result, after yet another [major accident in January 2007](#), the Czech Republic refused to purchase further fuel from the US and by 2010 Temelín had fully returned to the use of Russian TVEL products.



The Czech Temelin nuclear power station had effectively got rid of the counterfeit Westinghouse fuel by 2010.

Ukraine has been experimenting with American-made clones of Russian fuel assemblies since 2005. That was the year that Energoatom shipped six TVS-WR assemblies manufactured by Westinghouse to the South Ukraine nuclear plant and began their pre-installation inspection. As a result of their experiments, it was concluded that the American fuel assemblies were defective. However, they still decided to proceed to the next stage of the experiment – the annual loading of the reactor using this fuel. In 2008, Energoatom and a Swedish subsidiary of Westinghouse [signed an agreement](#) to supply the South Ukraine nuclear plant with enough American fuel for the scheduled annual partial refueling of the three reactors from 2011 to 2015.

However, as early as April 2012, malfunctions in the American assemblies were noted at the reactors of the South Ukraine nuclear plant. In an emergency procedure, all the TVS-WR assemblies were completely unloaded from the reactors after they were found to be damaged, mainly due to structural flaws in the spacer grids. As a result, **in 2013, following a thorough inspection, Ukraine's State Nuclear Regulatory Inspectorate instituted a total ban on the use of American fuel at Ukrainian nuclear plants.**

But the victory of the [Revolution of Dignity](#) has once again cleared the path for American TVS-WRs to be used in Ukraine. In April 2014, Kiev carefully reassembled the torn-up scraps of its old contract with Westinghouse and decided to give things another go. The media reported that American fuel was subsequently loaded into reactor no. 3 at the South Ukraine nuclear plant ([March 2015](#)), reactor no. 5 at the Zaporizhia nuclear plant ([June 2016](#)), and

reactor no. 2 at the South Ukraine nuclear plant ([August 2017](#)). The consequences were soon evident.

In February 2016 there was an emergency shutdown of reactor no. 3 at the South Ukraine nuclear plant “*due to an increase in the level of coolant in the steam generator.*” As local residents reported on social media, the area surrounding the nuclear plant was immediately cordoned off by the military. And on March 23, 2016, operations at the South Ukraine nuclear plant [were completely suspended for an entire day!](#)

The Zaporizhia nuclear plant has already undergone a dozen emergency shutdowns of its reactors since 2014. For example, in November 2015, military troops in the Zaporizhia region [beefed up their safety measures](#) after the reactors at the nuclear plant suffered an emergency power loss – all of the soldiers and officers were issued special equipment to protect themselves from radiation and chemicals. But no official comment was forthcoming about the incident.

Curiously enough, in May 2015 the *Guardian* published a bombshell [report](#), claiming that over 3,000 spent nuclear fuel rods were being stored in metal casks in an open-air yard on the grounds of the Zaporizhia nuclear plant. Apparently these were Russian TVEL assemblies that had been hastily stored after being replaced with the TVS-WRs. This would seem to indicate that experiments to introduce the defective fuel rods into the reactor cores at the Zaporizhia nuclear plant were being conducted long before the reactor was officially brought online using American fuel in June 2016.

This being the case, the time line of accidents at the Zaporizhia nuclear plant can be viewed in a different light:

Nov. 28, 2014 – There was an emergency shutdown of reactor no. 3 after the automatic system that prevents damage to the core was activated.

July 18, 2015 – There was an emergency shutdown of reactor no. 1 in connection with the automatic shutdown of the pump responsible for cooling the nuclear reactor.

April 11, 2016 – There was an emergency shutdown of reactor no. 6 at the Zaporizhia nuclear plant in connection with the depressurization of the gas system of the turbogenerator. The local media reported a 10-fold increase in radiation levels around the station.

May 18, 2016 – There was an emergency shutdown of reactor no. 4 due to damage to the transformer.

August 14, 2016 – Reactor no. 5, the first at Zaporizhia to have been loaded with the Westinghouse knockoff product, was sent out for repairs.

Sept. 20, 2016 – Reactor no. 6 was taken off-line for “scheduled maintenance” (at the very start of the winter heating season!).

Oct. 24, 2016 – There was an emergency shutdown of reactor no. 2, only two and a half weeks after being overhauled.

In March 2017, at the peak of the energy crisis, that same reactor had to be taken off-line

again.

April 18, 2017 – There was yet another emergency shutdown of reactor no. 6.

In early August 2017, reactor no. 4 was taken off-line for “scheduled maintenance work.”

As a result, only two of the six reactors at the Zaporizhia nuclear plant are currently fully serviceable. **Overall, the accident rate at Ukraine’s nuclear plants has increased 400% since 2010!**

The report from Energy Research & Social Science mentioned above also stressed that “[i]n Ukraine, for example, most nuclear energy accidents and incidents have not been included in databases over the past several years, although state Media confirmed their occurrence.”

In addition to the use of knockoff fuel, the biggest reason for the increased number of incidents at Ukraine’s nuclear plants has been the chronic underfunding of the industry. In the 25 years since the collapse of the USSR, literally not a cent has been invested in that sector. But in the meantime, the reactors that have outlived their 30-year lifespan either need to be closed (which would cost money that Energoatom does not have) or have their service life extended. Naturally, the Ukrainians are pursuing the second option. Ideally, when the operational life of a nuclear plant is extended, that should involve a major overhaul and updates. The estimated costs of extending the lifespan of a single reactor range from \$150-180 million. But neither Energoatom nor the government of Ukraine has that kind of money, nor do they expect to find it anytime soon, hence the authorization to extend the operation of the reactors is a pure formality. Judging by [publicly-accessible reports](#), regular 10-year extensions on the service life of Ukrainian nuclear reactors are granted readily and without arguments. However, the internal documents from Energoatom that were [released](#) this week by Cyber-Berkut paint quite a different picture.

Cyber-Berkut Documents

Cyber-Berkut obtained access to [documents](#) from government offices in Austria, Romania, Moldova, Belarus, Greenpeace, and the Bankwatch network of environmental NGOs, dated from the summer of 2017, which sound the alarm about Energoatom’s plans to prolong the operation of these old reactors.

The most informative of these is a [chart](#) drawn up by the Ukrainians listing all the grievances put forth by their foreign partners, plus their own responses (the document is primarily written in Ukrainian).

The first fact that jumps out is that Kiev arbitrarily decided to extend the operation of the reactors back in 2015, but it was not until 2017 – after the fact – that it sent that (pre-approved) program to update the nuclear plants to its neighboring countries and international environmental organizations for study.

This was a simultaneous breach of two UN Conventions that require signatories to obtain public and intergovernmental approval **prior to** (not after) commencing work at a nuclear power plant: the Convention on Environmental Impact Assessment (the [1991 Espoo Convention](#)) and the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (the [1998 Aarhus Convention](#)). Jan Haverkamp, a recognized expert in nuclear energy and a Greenpeace staffer, writes about this issue specifically:



The Ukrainian response to him (third column) states, **“The State Nuclear Regulatory Inspectorate** [the Ukrainian acronym is ДІРПІ – OR] **is an independent body and its actions are not subject to these conventions [!!!-OR]”**

Echoing Mr. Haverkamp, Bankwatch’s Romanian representative, Maria Seman, also raises a red flag:



“In accordance with the Aarhus Convention, article 6 (4), public participation (along with a cross-border process to allow public participation in the Environmental Impact Assessment – EIA) should take place when all options are still open. In the case of decision-making processes that happen at many different levels, if there was no public participation in previous decisions, the public should once again be invited to take part in those decisions that were made earlier and they should still be viewed as open. This applies to reactors 1 and 2 of the South Ukraine nuclear power plant and reactors 1 and 2 of the Zaporizhia nuclear power plant, where updates were made and their license was renewed despite the red flags raised by neighboring countries and Espoo Convention Implementation Committee.”

Ukraine offered a simple, straightforward answer:

“The answer to this question was provided above.”

Following are more of Maria Seman’s contentions about how Ukraine has violated international legislation: Kiev refused to notify stakeholders before making decisions about nuclear plants and now cannot guarantee that all input will be taken into account as the reactors are being updated:



However, Kiev seems relatively unconcerned, offering only mocking answers to the objections made by the foreign investigators:

*“Ukraine did not refuse to do anything. **A delay occurred.** The decisions to extend the licenses were made in accordance with national law and it was not possible to postpone them.”*

“There may be a conflict between the laws, but the regulatory body that made the decisions on this matter *did not violate national law.*”

In other words, the Ukrainians call ignoring the demands of the UN - “a conflict between the laws,” and violating the basic principles of environmental oversight - “a delay.”

Ukraine seems unaware that these conventions were created in order to preclude arbitrary actions by political authorities on questions of nuclear energy. Violations of international law are a matter of concern not just for environmentalists. They are a legal issue that calls for investigation, the identification of the perpetrators, and the correction of the transgressions. **Where are the international commissions, where are the criminal**

cases that have been filed, where are the courts and tribunals that should be avidly defending the letter of the law? Why is the Ukrainian government being allowed to ignore UN treaties that it is bound to observe? The Espoo Convention Compliance Committee and other relevant authorities must respond.

According to Mr. Haverkamp, the authors of the program to extend the licenses of the nuclear power plants do not know the first thing about risk assessment and have not learned the lessons of Chernobyl or Fukushima, because the continued use of the reactors at the South Ukraine and Zaporizhia nuclear plants raises the chance of another nuclear disaster:



In turn, the Romanian government has submitted a whole list of transgressions, omissions, and missing information. Here are just two items:



"The statements [by the Ukrainians] about their policy in regard to nuclear safety are misleading, incomplete, and not supported with pertinent details ..."



"The documents submitted by the Ukrainians are missing important information about the assessment of the consequences of potential accidents at the nuclear power plants ..."

However, the Ukrainians are not troubled with remorse for their shoddy work – their answer again takes a defiant tone. The experts in Kiev apparently believe that there are not enough qualified investigators in the Romanian government to legitimately request such information:

"This information, in our opinion, may be a subject of interest to suitably qualified experts, but for the discussion of the EIA at the state level, it is superfluous."

Representatives from other neighboring countries also complain about the lack of data necessary to fully evaluate the program to update Ukraine's nuclear power plants.

In particular, the Ministry of the Environment of the Republic of Moldova has emphasized that the environmental impact assessment does not take into account the physical aging – resulting from bombardment by neutron fluxes – of either the reactors or the components of their radiation shield.

The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus has requested "comprehensive information regarding the documents on the basis of which the decision was made to extend the service life of the two reactors at the nuclear power plant, as well as information regarding the updates to each reactor," and so on.



Ukraine's reaction: *"That answer lies outside the scope of our authority."*

Serious concerns are being raised about the fact that the Ukrainian state agencies responsible for nuclear energy have not yet devised ways to dispose of the spent nuclear

fuel and other radioactive waste, now that the service life of the reactors has been extended and given the fact that Ukraine is refusing to use Russian storage facilities. Maria Seman, for example, has this to say:



“The section on radioactive nuclear waste does not provide enough information on the total quantity of waste generated over the course of a year, nor a detailed plan for handling it, which must include storage. The on-site facilities for storing nuclear waste at the nuclear plants are limited, and the transportation of waste and spent fuel to Russia was suspended once the civil war in eastern Ukraine intensified. It is essential to request this information.”

However, Kiev seems less concerned with problem of how to dispose of radioactive waste than with offering its own rhetoric about events in the eastern part of its country. Instead of providing a substantive answer about what to do with the increasing quantity of spent fuel, the officials advised the Romanian investigator on her choice of newspapers:

“There is no civil war in Ukraine – only the aggression of the Russian Federation [!!!-OR]. **The author should find reliable sources of information.**”

Among other topics the Europeans raised for discussion with their Ukrainian colleagues: the massive doses that Kiev has decided fall within the bounds of “permissible radioactive contamination,” despite the fact that they are lethal to 50% of the population of the zone that has been thus contaminated; the sources of the funding for the impending programs to take the Ukrainian nuclear power plants off-line in the future; the absence of assessments in Energoatom’s materials regarding the impact of radiation on the rise in leukemia among children living near nuclear power plants; and so on:



Officials in Kiev either evade answering these questions or else play the fool: “What, we should keep records of every case?” (in regard to the incidence of childhood leukemia).

All these facts are evidence that Ukraine’s nuclear power plants not only present a genuine threat to Europe’s security, but that given the current economic situation and political instability in Ukraine, they also have no chance of bucking this negative trend. How to effectively cope with this aggravating situation should be a matter of urgent technical and political talks between the Russian and concerned EU states authorities.

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