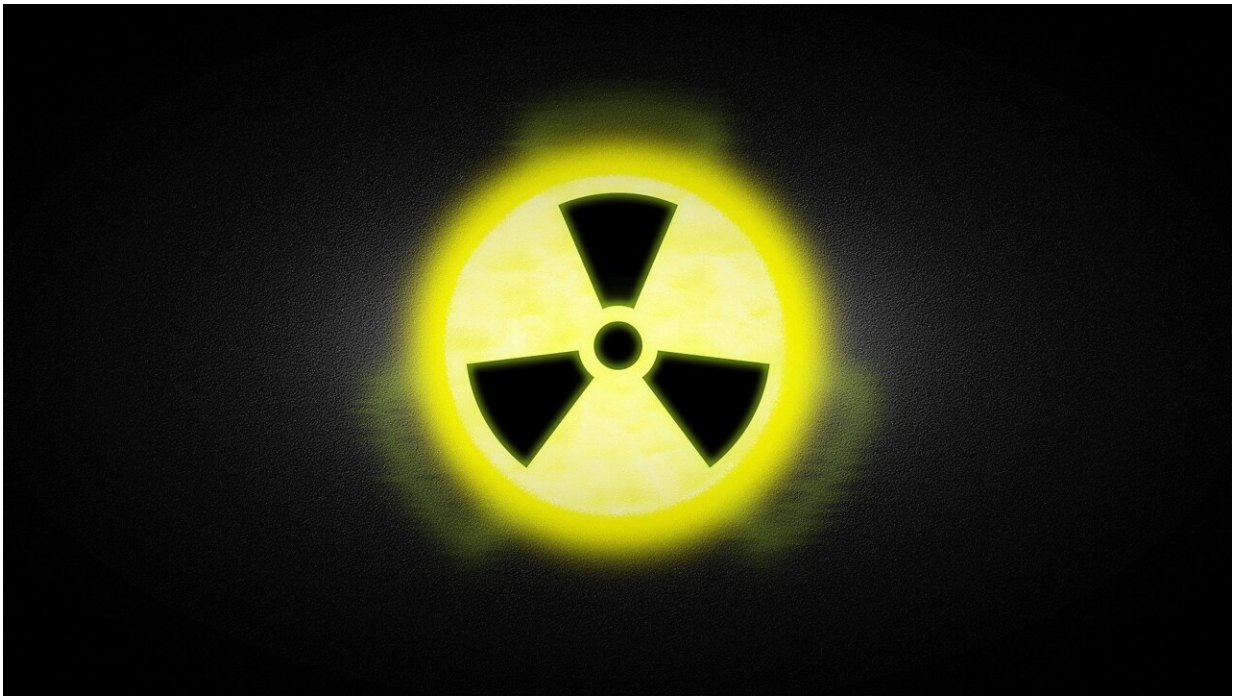
# Opinion: Ukraine demonstrates the problem with nuclear power

March 14 2022, by Steve Cohen



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Many of my colleagues have long maintained that the best solution to climate change is nuclear power. Free of greenhouse gasses, nuclear is a powerful, scalable energy technology. We know how to build these plants, and most have operated without incident for many decades. However, nuclear power is also, as Barry Commoner once wrote, "A hell of a complicated way to boil water." While I am far from anti-

technology, I have always had two problems with nuclear energy. First, the waste remains toxic for hundreds of thousands of years, and second, the possibility of radioactive release due to poor design, poor operation and maintenance, or from a terrorist attack. I had never thought that the military of a legitimate sovereign state would be demented enough to attack an operating nuclear power plant, but then Vladimir Putin proved me wrong. His twisted, evil attack on the people of Ukraine has also become an attack on the ecological well-being of all of Europe and a large chunk of his own country. Any species that can produce a Putin and give him an army cannot be trusted with the management of such a complex and potentially dangerous technology.

An NPR report by Geoff Brumfiel, Meredith Rizzo, Tien Le, Alyson Hurt, Tim Mak and Daniel Wood provided graphic detail about the Russian attack on the Zaporizhzhia Nuclear Power Plant in Ukraine. According to their report:

"Last week's assault by Russian forces on the Zaporizhzhia Nuclear Power Plant was far more dangerous than initial assessments suggested, according to an analysis by NPR of video and photographs of the attack and its aftermath. A thorough review of a four-hour, 21-minute security camera video of the attack reveals that Russian forces repeatedly fired heavy weapons in the direction of the plant's massive reactor buildings, which housed dangerous nuclear fuel. Photos show that an administrative building directly in front of the reactor complex was shredded by Russian fire. And a video from inside the plant shows damage and a possible Russian shell that landed less than 250 feet from the Unit 2 reactor building."

As if attacking a functioning plant was not sufficient, Russia has also taken over the site of the no longer operating Chernobyl nuclear power plant. The Chernobyl nuclear power plant accident in 1986 spread radioactive materials throughout Europe and was one of the largest

nuclear catastrophes in history. As reported by Tucker Reals of CBS News:

"Russian forces quickly seized the Chernobyl site after launching their invasion on February 24. Ukrainian officials have said the team of plant operators who ensure safe operations at the decommissioned facility have tried to continue carrying out their work, but under the orders of Russian troops and without being allowed to leave the compound at all… Asked on Thursday about concerns over safety at Chernobyl, U.S. Director of National Intelligence Avril Haines told the Senate Intelligence Committee that the U.S. 'should be concerned, but we haven't yet seen anything that takes us from concerned to "it's a complete crisis."' Matt Kroenig, who worked on both nuclear and Russia related issues under the Bush, Obama and Trump administrations, told CBS News senior investigative correspondent Catherine Herridge this week that Putin was weaponing Ukraine's civilian nuclear facilities as part of a strategy to terrorize, and potentially to stage a major nuclear event."

While the United States, Europe and many other nations are doing all they can to muster economic sanctions against Russia and send arms and humanitarian aid to Ukraine, Russia is in the third week of this relentless invasion. Their willingness to risk nuclear catastrophe is an indication of both Russia's recklessness and their military inadequacy. Terrorizing civilians and threatening the ecological well-being of the planet is an unusual but sadly not unique strategy of homicidal maniacs serving as national leaders. We have seen it for many years with Bashar al-Assad in Syria. Now we see it in Russia. I do not believe that this is the last instance we will see of such lunacy.

Until we develop a form of nuclear power that does not produce dangerous waste and cannot be weaponized as we are now seeing in Ukraine, we should limit the use of this technology as much as possible. The origins of civilian nuclear energy in the "Atoms for Peace" initiative

of the Eisenhower years was a contrived effort to change the image of nuclear technology from the terror of Hiroshima and Nagasaki to something more benign: electricity that would be "too cheap to meter." Nuclear energy proved to be a little more expensive than that. Nuclear technology was not ready for prime time in the 1950s and events in Ukraine indicate it is too dangerous today.

I do not underestimate the threat of climate change, but if I had to choose between a radioactive planet and a warm planet, I'd go with the warmth. Fortunately, we do not need to choose. Improved energy efficiency, and a generation-long transition to renewable energy, are achievable. The technological breakthroughs needed to decarbonize have started and I believe will pick up momentum. No technology will be free of environmental impacts, but I prefer the impacts that don't last hundreds of thousands of years and are the type we can work on and reduce as technology develops.

We are highly dependent on energy for many aspects of modern life. Our food, homes, water supplies, waste management systems and transportation systems all require energy. These human systems can coexist with the natural world if we pay attention to the damage they cause and work to minimize that damage. The problem with nuclear power is that while the probability of damage is low, if the damage occurs, its impact can be massive. The lands surrounding Chernobyl and Fukushima have been damaged beyond cost-effective repair. As Russia's evil and relentless attack on Ukraine continues, so too does the threat. According to the World Nuclear Association:

"Ukraine is heavily dependent on nuclear energy—it has 15 reactors generating about half of its electricity." A map of the nation's nuclear power plants appears on the website of the World Nuclear Association. Some of the reactors are in the southern part of the nation others are in the west, areas that are now starting to come under Russian attack.

As we watch Russia bomb Ukrainian cities, and their residents are forced to live without sources of water, food, medicine, and energy, we see the fragility and interconnectedness of the technological systems that are central to our modern way of life. We are observing undeniable courage by ordinary people who have become extraordinary. They are getting by without the comforts we take for granted. But there are limits to what people can endure. Some of these limits are physical, some are psychological, and others come from the sheer toxicity and deadliness of the threats that are posed. Bombs, bullets, and missiles can end life powerfully and suddenly. Nuclear contamination can present itself suddenly or gradually over time. The technology we depend on needs to be resilient, reliable, and as safe as possible. Nuclear power fails those tests, as the war in this nuclear energy-dependent nation demonstrates. We are learning difficult lessons from this horrific and evil attack on Ukraine. The vulnerability of nuclear power to military attack is one of those lessons.

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