

The following brief on Small Modular Nuclear Reactors (SMRs) has been endorsed by the board members of International Physicians for the Prevention of Nuclear War Canada (IPPNWC).

We are a group of physicians with long standing concerns about the dangers of proliferation of nuclear weapons in a world where we are “one step away from a miscalculation of their use”. We know that even small amounts of radioactive contamination, whether from the testing of a nuclear weapon, from uranium mining tailings or from slow leakage from a nuclear power plant, have the potential to cause cancer, genetic disease, birth defects, infertility and other illnesses. Recently in Ukraine, the dangers inherent in weaponization of a nuclear power plant have become apparent.

There absolutely must be rapid transition away from human made greenhouse gas (GHG) production by the immediate halting the burning of fossil fuels. The COP26 and the current IPCC guidelines are clear on this, but they also go on to endorse nuclear power. SMRs are presented as a possible magic bullet to help solve the pressing issues of climate change, but we must pause to consider all factors.

The well funded nuclear industry activists have been present at international meetings that decide policy such as the COP26. It is documented that these lobbyists also visit both MPs and senators regularly to promote their industry. In addition they are lobbying for decreased environmental regulation of the whole nuclear industry. The effect of this sponsored lobbying effort appears to have given a stamp of approval or a hollow legitimization for nuclear power. However, there are many reasons to examine the nuclear power issue more deeply and to listen to the quiet voices of caution.

According to M.V. Ramana: * “In 2003, an important study produced by nuclear advocates at the Massachusetts Institute of Technology identified costs, safety, proliferation and waste as the four “unresolved problems” with nuclear power. Not surprisingly, then, companies trying to sell new reactor designs claimed that their product would be cheaper, produce less - or no - radioactive waste, be immune to accidents, and not contribute to nuclear proliferation.”

Cost, safety, proliferation and waste remain the “unresolved problems” with nuclear power. Our federal government and four provincial governments are keen to site SMRs in remote areas, including the oil sands, the far north, and Indigenous lands. Plans are to build SMRs on the grounds of aging nuclear reactors, including Darlington (east of Toronto in a densely populated area), and Point Lepreau, N.B. on the ecologically sensitive Bay of Fundy. Most of the start up companies applying to build SMRs on Canadian soil are foreign owned.

The nuclear industry, hoping to reverse its worldwide decline of recent decades, has persuaded government officials and the public that these unbuilt, untested reactors, based on previously unsuccessful designs, qualify as “green energy” and will solve our climate crisis. But nuclear energy is not the answer to our climate emergency. Here are a few reasons:

1. A nuclear power plant is GHG free during its operational years (average 40 years), but it is not GHG free if the total GHG production of mining, refining, transportation of uranium is included. Also there is GHG production during construction of the plant, especially its cement, refining its high quality metals and its eventual decommissioning.

2. Although GHG free during its operational years, a nuclear power plant does produce other gases while operating. These gases include a radioactive form of carbon (C14) and a radioactive form of hydrogen (tritium). Both these elements in their non-radioactive forms are part of all living organisms, including our food and us. Our bodies cannot distinguish a radioactive element from its normal cousin, so we ingest radioactive nuclear power emissions. There are regulations which define ‘safe’ levels of these radioactive elements, however it is accepted by worldwide radiation safety regulators that any amount of radiation exposure, however small, is harmful, especially for women, children and fetuses. There are studies which show elevated levels of leukemias, especially in children who live within a 5 km radius of a nuclear power plant.

3. Nuclear projects consistently run many years behind schedule, making them irrelevant to our urgent climate crisis. They routinely exceed budgets by billions of dollars, making them exorbitantly expensive. Public dollars spent on renewables could sustainably address the climate crisis right now. Additionally, nuclear off-site damage is uninsurable - the taxpayer bears the costs of leakage, accident and cleanup, costing billions more.

4. The dilemma of what to do with highly toxic radioactive nuclear waste remains unsolved. This deadly legacy persists for longer than humankind has walked the earth. Presently, there are 57,000 tons of high-level radioactive waste in storage at Canadian nuclear reactor sites, increasing every day. The proposed solution of burying it deep in the ground, hoping that it won’t contaminate local drinking water, soil and air, is fantasy. These projects have not succeeded anywhere in the world. It is unconscionable to burden future generations with more of this toxic waste with no safe method for disposal.

5. Proponents of molten salt SNRs use the words “recycling nuclear waste” to describe the process of removing the tiny fraction of plutonium in CANDU waste

for fuel as a way to “reduce nuclear waste.” However, this process leaves harder-to-handle radioactive waste of approximately the same volume, increasing the complexity and cost of radioactive waste management. Clearly, this is not a solution to our nuclear waste dilemma.

6. Reprocessing or extracting plutonium is known to be a risky, dirty business, legally banned in U.S. in the 1970s. Canada followed suit with a voluntary plutonium extraction ban. Has recent government support for SMRs unwittingly changed Canada’s position against plutonium extraction?

7. In 1974, India utilized Canada’s gift of a research nuclear reactor to make its first nuclear weapons. This illustrates the inextricable link between nuclear energy production and nuclear proliferation. In May 2021, an open letter was sent to PM Trudeau from nine international nuclear experts including physicist Frank von Hippel of Princeton U, Alan Kuperman, co-ordinator of the Nuclear Proliferation Prevention Project and Thomas Countryman, who was U.S. Assistant Secretary of State for Disarmament. The signatories stated that the company Moltex, which wants to reprocess spent CANDU fuel in NB using molten salt, would create “high environmental and proliferation risks”. Clearly, international nuclear experts are giving a staunch warning about extraction of plutonium by SMRs and the proliferation risks associated with this.

8. Will Canada now approve industry’s aspirations to export SMRs to countries which may become intent on acquiring nuclear weapons? This would implicate Canada in the scary new age of a “plutonium economy” just when we are hearing overt threats of nuclear weapons usage in the Ukraine war. Plutonium extraction poses unbridled risk; it is an invitation for proliferation and nuclear terrorism.

9. Catastrophic nuclear accidents, though rare, do happen - think Fukushima, and Chernobyl. Contrary to industry claims, SMRs would be equally susceptible to such accidents since all nuclear plants depend on engineering to keep irradiated fuel constantly cooled and contained. Loss of containment can occur, whether from meltdowns, explosions or external events, causing widespread contamination from radioactive poisons. An accident like Fukushima occurring in Toronto would cause population displacement and radioactive exposure of possibly millions of people.

10. The current conflict in Ukraine has shown that nuclear power installations can act as nuclear weapons ready to explode if struck, or melt down if their electrical power supply is interrupted. The Zaporizhzhia reactor in Ukraine suffered a near direct hit, luckily escaping a massive radiation release similar to Chornobyl’s 1986 accident, which led to the large exclusion zone in the heart of Ukraine’s wheat belt. This crisis is ongoing and extremely dangerous at the time of writing

this letter. SMRs would potentially pose a bigger risk, as there would be more reactors to strike.

As physicians, we know that our health depends on a clean and peaceful planet. Why exacerbate the known dangers of nuclear technology with many small new reactors? SMRs are too slow to help with the climate crisis. They create more toxic waste while being at risk of devastating accidents and widespread nuclear proliferation. In keeping with the precautionary principle, and when we have cleaner cheaper sustainable alternatives, why would we choose nuclear energy? We would prefer to see the available funds in the Net Zero Accelerator Initiative to be directed to truly renewable energy which has neither the dangers of GHG production nor the significant problems and risks surrounding nuclear power.

Thank you for considering our submission.

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* <http://peacemagazine.org/archive/v38n3p14.htm>
The Impossible Promises of Small Modular Nuclear Reactors, M.V. Ramana