Ottawa intends to hatch a new generation of nuclear power reactors

Background: *October 10, 2018*

On October 8 (Thanksgiving Day in Canada) a French-language television news clip was broadcast on Radio-Canada highlighting the Canadian government's plans to promote a whole new generation of nuclear reactors called "Small Modular Reactors" (SMRs). See the story below. You can view the French-language video using the link & pressing "play".

In 2014 the government of Canada turned over the management of its federally-owned nuclear facilities to a private consortium of multinational corporations – the recipient of federal funding to the tune of many hundreds of millions of dollars per year. The consortium owns and operates an entity, created for just that purpose, called Canadian Nuclear Laboratories (CNL).

The consortium has a contractual obligation to "reduce" Canada's nuclear liabilities at Chalk River by finding a safe and secure home for the large volumes of radioactively contaminated soil and equipment, including radioactive rubble from hundreds of contaminated buildings that are to be demolished, plus the contents of numerous radioactive waste storage areas. Being business-oriented, these corporations are also bent on developing products to be sold for a profit using public money to prime the pump. In particular, they are eager to build, test, and eventually market "Small Modular Reactors" or SMRs.

The Canadian government's radioactive waste liabilities have been estimated by the Auditor General of Canada to cost about eight billion dollars to deal with. These federal liabilities consist of more than 2 million cubic metres of radioactive waste (excluding irradiated nuclear fuel), about half of it related to Canada's participation in America's Nuclear Weapons program.

The current federally-owned radioactive waste inventory is associated with (1) two sprawling nuclear research centres at Chalk River, Ontario, and Pinawa, Manitoba; (2) an entire radioactively contaminated community called Port Hope, Ontario; and (3) four prototype nuclear reactors located at four different sites in three provinces (the NPD, WR1, Douglas Point, and Gentilly-1 reactors).

In previous years, some members of the CNL consortium were involved in highly controversial and challenging radioactive waste "clean-up" projects at sites such as Rocky Flats, Colorado; Hanford, Washington; and Sellafield in the UK. One consortium member was convicted in a US court of criminal charges in relation to the Hanford project. Another was involved in a multi-billion dollar Sellafield contract that was abruptly terminated amid a highly publicized scandal involving mismanagement and fraud. SNC-Lavalin, a leading member of the CNL consortium, has been banned for ten years from bidding on any projects funded by the World Bank because of prior fraudulent activities in Libya. SNC-Lavalin is also facing criminal charges for fraud in Canadian courts this year (2018); it recently failed in its efforts to pay a $200 million fine in lieu of going to court and facing the risk of conviction.

Because the government of Canada has no policy governing the long-term management of radioactive wastes other than irradiated nuclear fuel, CNL felt free to propose "quick and dirty" approaches to the handling of the radioactive waste inventory at Chalk River (estimated to be about one million cubic metres in volume), as well as the radioactive demolition of two of Canada's four prototype reactors: the NPD reactor, located at Rolphton Ontario right beside the Ottawa River, and the WR-1 reactor at Pinawa Manitoba, right beside the Winnipeg River. By getting the waste out of the way quickly — by "clearing the decks" as it were — CNL could get down to the more attractive business of building SMRs.

Accordingly, CNL proposed to place all of the Chalk River radioactive waste (except for irradiated fuel) in a gigantic engineered mound, right on the surface, five stories high, covering an area of 11 hectares, in a marshy area less than one kilometre from the Ottawa River. The river is the source of drinking water for millions of people in dozens of communities downstream, including Ottawa, the nation's capital, and large portions of Montreal, where the Ottawa River joins the mighty St. Lawrence River.

This proposal came as a shock to many, who had never imagined that radioactive wastes would be treated in such a cavalier fashion – "just another landfill, folks, nothing to worry about. Radioactive wastes may be dangerous for tens or hundreds of thousands of years, and some leakage into the Ottawa River is indeed inevitable, but our experts assure us that the mound will endure no matter what."

Drenching rains a few months ago led to flooding along the banks of the Ottawa River, casting doubt on CNL's assurances. Credibility was further strained when five tornados recently set down in the Ottawa area. And to make matters worse, the Ottawa Valley (including the Chalk River site) is in an active earthquake zone. The idea that a surface mound without any solid structures to contain it will protect the environment and our grandchildren's grandchildren for thousands of years seems absurd.

With half a mind on the hundreds of small modular reactors that CNL and the government of Canada hope will one day be scattered across the country, CNL proposed a novel approach to reactor decommissioning. Instead of dismantling the highly radioactive structures in the core area of the reactor, carefully packaging the radioactive entrails in robust containers and shipping them offsite for eventual emplacement in some suitable engineered waste facility, CNL proposed to just bury the radioactive rubble in cement, along with all the contaminated pumps, seals, tubes, and boilers, right beside the river that once supplied the cooling water for the reactor when it was operating.

This procedure, which CNL calls "in situ" decommissioning, involves dumping all the radioactive garbage into the sub-basement of the reactor building and then flooding every nook and cranny with tons of flowing cement. The entire structure then becomes a permanent radioactive waste storage site, a kind of cemented nuclear mausoleum, or a concrete radioactive outhouse. No doubt that's what CNL will also want to do with the radioactive carcasses of small modular reactors – just cement them in place wherever they are.

Never mind the facts: that concrete is not expected to last for 100 years, while the waste is known to be dangerous for thousands of years. By then we'll all be dead and gone.

These are human-made wastes. Most of the hundreds of radioactive byproducts of nuclear fission were never observed in nature prior to 1939.

Thanksgiving? Let us not give thanks for the lack of foresight of the ever-hopeful nuclear industry and the oh-so-gullible Canadian government, who have colluded together to pool their ignorance — the government, by not taking the trouble to develop a policy for the long-term management of nuclear wastes that would make such quick-and-dirty schemes unacceptable, and the industry, by ploughing ahead with a new generation of waste-producing nuclear reactors without ever having demonstrated a satisfactory method for dealing with the waste we already have over the very long term.

Gordon Edwards, Ph.D., president,
Canadian Coalition for Nuclear Responsibility

(Google translate version)

Ottawa could boost nuclear power

Report by Fannie Olivier, Radio-Canada, October 8, 2018
https://ici.radio-canada.ca/nouvelle/1128227/gouvernement-trudeau-energie-nucleaire-chalk-river-petits-reacteurs-modulaires

At a time when many countries have chosen to phase out nuclear energy, Canada hopes to become a world leader in the production of new types of reactors: small modular reactors.

The Trudeau government's initiative is raising hopes - nuclear energy does not generate greenhouse gases - but it also raises many fears.

Small modular reactors (SMRs) do not exist anywhere in the West, but Ottawa sees them as promising. "The role of my department and the federal government is to explore the potential of these new technologies," Natural Resources Minister Amarjeet Sohi told CBC Radio.

Nuclear industry stakeholders have been working on a "road map" since this winter to make Canada a leader in the emerging market for a new kind of nuclear reactor. In early November, they will unveil this strategy, commissioned by the federal government.

Small modular reactors (SMRs) would be less powerful than traditional reactors, but they could be mass-produced at the factory and assembled on-site where needed. Remote northern Aboriginal communities, oil sands, mines or oilfields would be ideal places to install [such reactors].

Canadian Nuclear Laboratories hopes to build a prototype SMR at Chalk River, Ontario, within the next eight years.

Clean energy?

Nuclear energy is considered by Justin Trudeau's government as part of Canada's "clean energy basket".

"We see the potential of this technology to reduce environmental impacts," notes Minister Sohi. He says his role is to bring industry, government, and the provinces together to "see how SMRs can play a role in Canada's energy mix."

Gina Strati, director of the Energy Division of the Canadian Nuclear Laboratories, also believes that SMRs would allow Canada to reduce its CO2 emissions, for example by replacing diesel generators in remote areas.

Small modular reactors at a glance

• SMRs would have a maximum power of 300 MW (compared to a conventional 800 MW reactor power);

• According to Gina Strati, the smallest SMRs could be the size of the basement of a house, and the larger ones, that of a building;

• Canadian Nuclear Laboratories hopes to host a prototype by 2026.

Radioactive waste

But although they do not generate greenhouse gases, the new reactors will produce nuclear waste.

"It's nuclear technology, so they use nuclear fuels. They will have fuel waste," says Strati, in an interview at laboratories testing materials that could be part of the reactors.

It is not yet known where these wastes will be stored, which will remain radioactive for thousands of years. According to Strati, developers, including private companies, will have to propose a waste management plan.

Since SMRs will be less powerful than traditional reactors, they will individually generate less waste, she says.

> *"I think small reactors are really the modern nuclear solution."*
> *Gina Strati, Director, Energy Division, Canadian Nuclear Laboratories*

At the moment, waste generated by nuclear activities is stored on the grounds of power plants.

Gina Strati, director of the Energy Division of the Canadian Nuclear Laboratories, sees SMRs as the nuclear solution of the future.

Antinuclear movement

The Liberals' approach to nuclear energy does not please everyone. "They do not have a mandate from the people. There was no consultation or parliamentary debate. They should not move forward," argues Gordon Edwards, co-founder of the Canadian Coalition for Nuclear Responsibility.

"What worries me is that it will cost a lot of money, which could instead be invested in viable alternatives, such as solar and wind energy," says the long-time activist, whom we met 350 km away from Chalk River, located upstream on the Ottawa River.

In the past, Gordon Edwards has been a vocal opponent of a [radioactive] waste storage project in Chalk River, fearing that drinking water would be contaminated.

Like Mr. Edwards, Gilles Provost, spokesman for the Ralliement against radioactive pollution, believes that the issue of [radioactive] waste management is at the heart of the nuclear issue.

"Clean energy is a matter of vocabulary," says Provost. "If we mean that it is not dangerous or that it does not create any environmental contamination, then the SMRs do not constitute clean energy."

He fears that Canada will become strewn with radioactive waste sites that are poorly monitored.

> *"It really seems to me the height of irresponsibility."*
> Gilles Provost, spokesman for the Ralliement against radioactive pollution,
> *believes that radioactive waste management is at the heart of the nuclear issue.*

Even at the Canadian Nuclear Laboratories in Chalk River, the risk of a nuclear accident can not be swept under the carpet.

"I think there is always a risk, I can not say there is a zero risk," concedes Gina Strati. "But there are many things in place that are built into SMR design to reduce the likelihood [of an accident]."

In recent years, the federal government has moved away from the nuclear power sector, as shown by the privatization of the CANDU reactor division of Atomic Energy of Canada Limited (AECL), the once-proud [originator and disseminator of Canadian-designed] nuclear power plants.

Ottawa is about to change its strategy.

Because the government may not meet its targets as set by the Paris Agreement, it is tempting for Ottawa to consider any energy source that does not emit CO2.

But if they relaunch nuclear power, the Liberals could find themselves navigating in troubled waters: those of social acceptability.