The First Nuclear Renaissance was a flop. So let's have another one!

Background: July 22 2018

Just before the last federal election, the Harper government turned over control of all federal nuclear holdings to a consortium of private, profit-oriented, multinational corporations. The staff of the government-owned Atomic Energy of Canada Limited (AECL) went from 3600 to 40. A new corporation, called Canadian Nuclear Laboratories (CNL) was created as a wholly-owned subsidiary of AECL, and then turned over completely to be owned and operated by the consortium, most of whose people are not Canadians.

In the last two years the hollowed-out shell of a company called AECL has been getting close to a billion dollars in annual allocations of Canadian taxpayers' money, most of which goes directly to CNL and some of it into the profit statement of the consortium members. The Auditor General of Canada has estimated the "nuclear liability" associated with AECL's radioactive waste management, site decontamination, and decommissioning of hundreds of radioactively contaminated buildings, at about seven billion dollars. But it's CNL that is in charge, and getting the lion's share of the money, under the nominal "control" of AECL — whose main task seems to be to funnel money to CNL.

But CNL has grandiose plans of its own. Adopting "quick and dirty" approaches to radioactive cleanup and decommissioning activities, CNL wants to "clear the decks" and use federal funds and federal lands to allow the global nuclear industry to test and develop a whole new generation of "small" nuclear reactors to meet a non-existent demand (nobody actually wants these things!). But the industry is in a position to commandeer billions of dollars of taxpayers' money and obtain permission to play with their expensive nuclear toys for decades to come on Canadian territory, leaving Canada with the cost, the newly-created radioactive waste, and a brand-new legacy of abandoned radioactive hulks to deal with.

The word has gone out from CNL to the world's nuclear community that Canada is "easy pickings" for funding and hosting a bewildering variety of "Small Modular Reactors" (SMRs) designs: in Ontario (Chalk River), Manitoba (Whiteshell at Pinawa), and New Brunswick (Point Lepreau site).

Back in 2001, the nuclear industry announced the arrival of a "Nuclear Renaissance" based on a whole new generation of larger, safer, and cheaper reactors that would be built much quicker than previous reactors which have typically taken a decade to construct. That idea never materialized — it was a gigantic flop. And now the global nuclear industry is in steep decline in the west.

No nuclear renaissance means the nuclear industry is stuck in the "Dark Ages".

But the nuclear industry is not ready to quit. They have their backs to the wall and are fighting for their lives (as a technology, that is). So, if bigger reactors are not going to save them, what about smaller reactors? Now the nuclear industry is launching "Nuclear Renaissance — Part 2". Even though Part 1 was a flop, the sequel is just around the corner. Back by unpopular demand.

There is no specific definition of an SMR, except that it should be no larger than 300 megawatts in electrical output and can be mass-produced in a "prefabricated" state, so that the entire reactor can be transported and planted almost anywhere one likes. Or dislikes.

Two key aspects of this momentum toward SMRs: (1) Public money, taxpayer's money, is essential to fund the research; (2) Commercialization on an economically viable footing is highly

dubious — the small reactors are prohibitively expensive and will require an enormously large market to break even, meaning thousands or even tens of thousands of units being ordered.

So why worry? Well, Canada's tax money is in danger of being squandered in a cul-de-sac technology, and we Canadians will be left with even more radioactive waste and contaminated sites, while "missing the boat" on the much more promising renewable energy options.

Gordon Edwards.

Article: "Moltex molten salt reactor being built in New Brunswick, Canada"

https://www.nextbigfuture.com/2018/07/moltex-molten-salt-reactor-being-built-in-new-brunswick-canada.html

https://www.youtube.com/watch?v=2N93I2HdaAM&feature=youtu.be

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Below is an excerpt from the Wikipedia article about the Moltex design.

Notice that the fuel is 1/3 plutonium, thus raising grave security concerns, as plutonium is an immediately nuclear-weapons-usable explosive material, unlike the fuel in any of today's generation of civilian nuclear power reactors in North America.

The linked article about the Moltex reactor in New Brunswick (above) is fundamentally deceptive in many respects:

(1) it does not disclose the need for plutonium as the most important fissile component of the fuel;

(2) it does not disclose that the full panoply of chemically inert fission gasses are to be released after a planned "hold-up" mechanism that is subject to possible failure;

(3) it does not disclose that fission products such as iodine-129 and technetium-99 with half-lives far in excess of 100 thousands years will be produced and remain in the irradiated fuel;

(4) it does not disclose that the Moltex reactor requires reprocessing of existing irradiated nuclear fuel to extract the plutonium needed for Moltex fuel, thereby producing large volumes of acidic heat-generating highly-radioactive liquid wastes as a left-over;

(5) it does not disclose that the irradiated Moltex fuel, like all irradiated nuclear fuel, will have to be kept out of the environment of living things for hundreds of thousands of years, and proposes no plan for this;

(6) it does not disclose that a terrorist attack or an act of warfare or sabotage can disperse highly radioactive irradiated fuel over a very wide area;

(7) it makes no mention of the extreme security measures including suspension of civil liberties that might be needed in the event of theft or highjacking of the fuel before it is irradiated, due to the plutonium content.

Cheers, Gordon Edwards.

Fuel & materials (excerpted from Wikipedia)

The fuel is made up of two-thirds sodium chloride (table salt) and one-third plutonium and mixed lanthanide/actinide trichlorides. Fuel for the initial six reactors is expected to come from stocks of pure plutonium dioxide from PUREX reprocessed conventional spent nuclear fuel, mixed with pure depleted uranium trichloride. Further fuel can come from reprocessed nuclear waste from today's fleet of reactors.

[See https://en.wikipedia.org/wiki/Stable_salt_reactor]