

Background:

June 4 2019

Bill C-69 is a new proposed law that would establish a Canadian Impact Assessment Agency to conduct assessments of the potential environmental and societal impacts of certain projects. This Bill is currently undergoing parliamentary scrutiny; it has already been passed by the House and is now being reviewed by a Senate Committee. The brief interventions reproduced below were submitted by CCNR last week — they are both commenting on the proposed “Project List” that will determine which projects should be subject to impact assessment.

In 2012, the Conservative government of Canada under Prime Minister Stephen Harper passed the Environmental Assessment Act. This Act gives the Canadian Nuclear Safety Commission (CNSC) total authority and decision-making power over all nuclear-related projects. As a result, the CNSC is currently conducting environmental assessments of three of the most contentious radioactive waste “disposal” projects ever proposed in Canada. Each of them is the brainchild of a consortium of private multinational corporations operating under the name “Canadian Nuclear Laboratories” (CNL). This consortium was hired by the Harper government to manage Canada’s \$7.9 billion radioactive waste legacy. The consortium consists of the scandal-ridden SNC-Lavalin, currently facing criminal charges for fraud and corruption in a Canadian court, and two corporate partners, both of whom have also faced criminal charges of a similar nature in the past. See www.ccnr.org/Hill_Times_ad_2019.pdf (In 2013, even before being hired by the Canadian government, SNC-Lavalin and 50 SNC-Lavalin associate companies were banned for 10 years from even bidding on any International projects funded by the World Bank — a penalty imposed as a result of systematic practices of bribery, fraud and unethical behaviour in several countries.)

The three projects now being assessed by CNSC under the 2012 law are: (1) a permanent surface dump for one million cubic metres of mixed radioactive wastes, five to seven stories high, covering 11 hectares of land, less than a kilometre from the Ottawa River; (2) the permanent entombment of Canada’s first electricity-producing nuclear reactor, the NPD, by encasing the radioactive remains of the reactor in concrete and abandoning it less than 250 metres from the Ottawa River; (3) the same procedure of entombment for the radioactive remains of a prototype nuclear reactor, the WR1, right beside the Winnipeg River in Manitoba. All three projects run counter to guidelines published by the International Atomic Energy Agency (IAEA) and contradict earlier assurances given to Canadians about how carefully radioactive waste storage and reactor decommissioning would be conducted.

The Canadian nuclear agency AECL, the private consortium CNL, the regulator CNSC, and the government ministry NRCAN (Ministry of Natural Resources) — a ministry with an avowed mission to promote and expand nuclear power, in part through the promotion and deployment of a fleet of “Small Modular Nuclear Reactors” (SMNRs) — all have urged that most nuclear reactors be exempted from any kind of impact assessment under Bill C-69. One wonders whether they are motivated by a fear that such projects will not be able to withstand close scrutiny by an independent agency. After all, any reactor — regardless of size — will create its own legacy of radioactive wastes of all categories — high-level, intermediate-level and low-level.

CNSC has long been recognized as a “captured” regulator. The fact that CNSC has lobbied to have most SMNRs exempted from impact assessments clearly demonstrates its inappropriate behaviour in promoting a streamlined approvals process that minimizes effective public participation in decision-making for nuclear projects. CNSC has never once

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denied a licence for any major nuclear project. CNSC reports to the Minister of Natural Resources, the very Ministry whose job it is to promote and expand nuclear facilities.

Below are two short interventions from CCNR, filed shortly before the deadline, critical of the proposed "project list" itemizing facilities that would automatically be subject to impact assessment under Bill C-69. Projects not listed would be exempt from assessment.

According to the government's Discussion Paper on the proposed list of projects to be assessed under Bill C-69, any new nuclear reactors designed to produce less than 200 megawatts of heat would be exempted from any impact assessment if located on a new site, while any reactor producing under 900 megawatts of heat would be exempted if it is on an existing nuclear power plant site.

Bear in mind that electricity production in a nuclear power reactor is generally about 1/3 of the heat production, so that 900 MW of heat would correspond to about 300 MW of electricity. This is hardly a "small" facility! The Douglas Point power reactor at Kincardine, Ontario, the Gentilly-1 power reactor at Bécancour, Québec, and the Nuclear Power Demonstration (NPD) power reactor at Rolphton, Ontario, are all designed to produce less than 300 MW of electricity. In addition the NPD Reactor at Rolphton, Ontario, the Wr-1 reactor in Manitoba, the NRU and NRX reactors at Chalk River, and the McMaster reactor in Hamilton, are all designed to produce fewer than 200 megawatts of heat. They are all capable of undergoing catastrophic reactor accidents, including meltdowns.

Because not all software will faithfully reproduce numbers written in exponential notation, I have used a wedge character ^ to indicate an exponent. Thus "10 to the fifteenth power" ["one" followed by fifteen "zeros"] is represented as 10^15 or as 10¹⁵.

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From the government's Discussion Paper relating to the Project List for Bill C-69 (EXCERPTS):

The following project types were determined as having the greatest potential for adverse environmental effects in areas of federal jurisdiction and are proposed for inclusion on the Project List: [for projects requiring impact assessment under Bill C-69 - GE]

- ö New facility for the processing, reprocessing or separation of an isotope of uranium, thorium, or plutonium, with a production capacity of 100 t/year or more.*
- ö New facility for the manufacture of a product derived from uranium, thorium or plutonium, with a production capacity of 100 t/year or more.*
- ö New facility for the processing or use, in a quantity greater than 10¹⁵ Becquerels per calendar year, of nuclear substances with a half-life greater than one year, other than uranium, thorium or plutonium.*
- ö New facility for the storage of irradiated fuel or nuclear waste, on a site that is not within the licensed perimeter of an existing nuclear facility.*

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ö New facility for the long-term management or disposal of irradiated fuel or nuclear waste;

ö Expansion of an existing facility for the long-term management or disposal of irradiated fuel or nuclear waste that would result in an increase in the area, at ground level, of the facility of 50% or more.

ö New nuclear fission or fusion reactor, or reactors, with a cumulative thermal capacity of more than 900 MW thermal on a site that is within the boundaries of an existing licensed Class IA nuclear facility; or

ö New nuclear fission or fusion reactor, or reactors, with a cumulative thermal capacity of more than 200 MW thermal on a site that is not within the boundaries of an existing licensed Class IA nuclear facility.

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CCNR comments: [intervention #1]

"All nuclear reactors must be subject to environmental assessment without exception, given that all reactors (regardless of size) produce every category of human made radioactive waste materials -- low-level, intermediate level and high-level -- which if released to the environment can cause long-lasting damage due to radioactive contamination.

"These materials are capable in principle of causing thousands to millions of human cancers if released through any means whatsoever. Given that the world's first major nuclear accident occurred in 1952 at the NRX reactor at Chalk River, a very small reactor producing only 10 to 20 megawatts of heat (and no electricity), and creating high-level radioactive waste (irradiated nuclear fuel) much of which is still on site, that will remain dangerous for hundreds of millennia, as well as highly radioactive structural materials (including the destroyed reactor vessel) that will remain radioactive for tens of thousands of years, it is clear that any reactor producing as little as 10 megawatts of heat can have extraordinary impacts on the environment.

"Basic environmental justice demands that remote and indigenous communities that may be the intended recipients of such reactors must have the opportunity to question the plans and challenge the assumptions of the promoters, and educate themselves to the range of risks that they may be facing as well as the long-lived radioactive legacy that such a reactor will create."

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CCNR comments: [intervention #2]

"(1) It is completely unacceptable that a reprocessing facility producing up to 100 tons per year of plutonium should be exempted from environmental assessment. It has been made abundantly clear by unassailable authoritative bodies in the USA that all varieties of reactor-produced plutonium (that can be extracted through the reprocessing of irradiated nuclear fuel) are nuclear weapons-usable. Reliably powerful nuclear explosive of all kinds, and at all

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levels of technical sophistication, can be made using so-called "reactor grade" plutonium. "See the documentation cited at www.ccnr.org/Findings_plute.html as well as www.ccnr.org/plute_sandia.html .

"(2) It is also unacceptable that a uranium enrichment plant (i.e. a uranium isotope separation facility) producing up to 100 tons per year of enriched uranium — without any specification or limitation on the degree of enrichment — should be exempted from environmental assessment. As the Iranian situation makes clear, uranium enrichment is a highly sensitive technology with major international implications related to the potential proliferation of nuclear weapons. Given the ever-present potential for accidental criticality accidents involving even low-enriched uranium (LEU), such enrichment facilities must not be exempted from environmental assessment.

"(3) The project list currently proposed would require an EA for any "new facility for the processing or use, in a quantity greater than 10^{15} Becquerels per calendar year, of nuclear substances with a half-life greater than one year, other than uranium, thorium or plutonium." In the interests of consistency, this same level of radioactivity (a quantity greater than 10^{15} Becquerels per calendar year) should also be applied to nuclear reactors — that is, any nuclear reactor that is designed to produce more than 10^{15} Becquerels per calendar year of fission products (such as cesium-137, strontium-90, iodine-131 or radioactive noble gases) and other post-fission radioactive materials (such as transuranic actinides like plutonium, americium, neptunium and curium, or activation products like tritium, carbon-14, cobalt-60 or nickel-59). [See www.ccnr.org/Long-Lived_Activation_Products.pdf]

"If this criterion were applied to nuclear reactors, the thermal power (heat production) above which an EA would be required for a nuclear fission reactor would be dramatically less than 200 megawatts of heat production. For example, in a CANDU power reactor producing about 600 megawatts of electricity per year, approximately 100 Terabecquerels of cesium-137 would be produced each year by as few as six fuel bundles out of a total of over 4000 such bundles in the core of the reactor. Such a CANDU reactor produces about 1800 megawatts of heat, so that 6 fuel bundles would be responsible for producing only about $(6/4000) \times 1800 = 2.7$ megawatts of heat.

"So, to limit the production of cesium-137 to 10^{15} Becquerels per calendar year, which is equal to 1000 Terabecquerels, the thermal power of such a reactor should be limited to less than 27 megawatts of heat — almost 7 times smaller than the 200 megawatt thermal limit proposed in the current project list. If we include all the other fission products and post-fission waste materials the thermal power would have to be reduced by at least another factor of 10. [See www.ccnr.org/hlw_chart.html] That lowers the bar to 2.7 megawatts of heat.

Thus any fission reactor producing more than (say) three megawatts of heat (3 MWth) should logically be required to have an EA."

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See also: www.ccnr.org/SMR_Second_Make-Believe_Renaissance_2018.pdf