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September 16, 2010

Cynthia L. Quarterman, Administrator
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
East Building, 2nd Floor
Mail Stop: E27-300
1200 New Jersey Ave., SE
Washington, DC 20590

Via certified U.S. mail, email to phmsa.administrator@dot.gov and fax to 202-366-3666

RE: Anticipated USDOT/PHMSA permit proceeding of proposed
Canadian shipment of 16 radioactive steam generators through
Great Lakes and St. Lawrence Seaway

Dear Ms. Quarterman:

I'm writing on behalf of Beyond Nuclear;¹ Physicians for Global Survival;² Nuclear Information and Resource Service;³ Sierra Club and its member, Edward McCardle of Melvindale, Michigan;⁴ Kay Cumbow of

¹Beyond Nuclear ("BN") is a Maryland-based public education and advocacy group that aims to educate and activate the public on issues pertaining to the hazards of nuclear power, its connection to nuclear weapons and the need to abandon both. Beyond Nuclear advocates for an energy future for the State of Michigan and the United States that is sustainable, benign and democratic. Beyond Nuclear has approximately 8000 members nationally, several of whom live within 50 miles of the anticipated water route of the steam generators through the Great Lakes.

²PGS is the Canadian chapter of the International Physicians for the Prevention of Nuclear War, Nobel Peace prize winner in 1985. PGS is headquartered in Ottawa with about 1,500 members, many of whom live and practice medicine within 50 miles of the Great Lakes and St. Lawrence Seaway in Canada.

³NIRS is a non-profit corporation based in Washington, D.C. which has more than 6000 members, several dozen of whom reside in Michigan, and several of whom live within 50 miles of the Lake Huron, the Detroit River, St. Clair River, and Lake Erie. NIRS has a mission to promote a non-nuclear energy policy and a concern for the health and safety of the people and ecosphere including Michigan and the surrounding region.

⁴The Sierra Club is a national environmental organization dedicated to preservation of the environment on many fronts, from opposing the use of coal-fired electricity generation to preserving and expanding forestlands, to halting stripmining, to organizing and educating the public about the risks

Brown City, Michigan; Citizens for Alternatives to Chemical Contamination;⁵ Great Lakes United;⁶ and Don't Waste Michigan⁷ and its member, Michael Keegan of Monroe, Michigan. Our purpose in writing is to petition PHMSA to conduct a thorough investigation pursuant to the National Environmental Policy Act ("NEPA", 42 U.S.C. § 4321 *et seq.*) of the expected as well as potential environmental effects associated with the proposed Canadian shipment of 16 radioactive steam generators through the Great Lakes system to Sweden prior to the issuance of any USDOT license or permit for that shipment to proceed through U.S. waters of the Great Lakes.

THE PROPOSED TRANSPORT PROJECT

Bruce Power is seeking Canadian Nuclear Safety Commission (CNSC) approval of an application for the transport of 16 steam generators being removed from its Ontario nuclear power generating complex on Lake Huron to a Swedish facility, operated by Studsvik, that specializes in recycling of radioactively contaminated metal. Bruce power submitted this application under the requirements of Canada's Packaging and Transport of Nuclear Substances (PTNS) Regulations, Transport Canada Transportation of Dangerous Goods (TDG) Regulations and the International Atomic Energy Agency Regulations, Regulations for the Safe Transport of Radioactive Material, TS-R-1.

and choices between nuclear power and other energy options. The Sierra Club has approximately 16,191 members in Michigan, and an estimated 4,000 of them live within 50 miles of the route the Bruce transport freighter would take. The Sierra Club specifically writes on behalf of its member, Edward McArdle, who lives in Melvindale, Michigan, within 3 miles of the route the Bruce transport freighter would take.

⁵Citizens for Alternatives to Chemical Contamination ("CACC") is a Michigan-based grassroots organization that since 1978 years has educated the public concerning issues of chemical and radiation safety and protection of the environment. CACC has about 200 members, several of whom live within 50 miles of the anticipated water route of the steam generators through the Great Lakes.

⁶Great Lakes United is diverse coalition of organizations and individuals, including citizens, environmentalists, conservationists, labour unions, First Nations, tribes, hunters, anglers, academics, and progressive business which work together to clean up toxic pollution, stop invasive species, and protect the waters of the Great Lakes and St. Lawrence River from damage and irresponsible use. Thousands of voices are calling for a healthier Great Lakes and St. Lawrence River and Great Lakes United continues to be the coalition through which these voices are heard.

⁷Don't Waste Michigan ("DWM") is a 25-year-old grassroots organization in Michigan whose members educate the public about various incarnations of nuclear energy, from commercial nuclear power plants to radioactive waste. DWM has about 40 members statewide, several of whom live within 50 miles of the route which the Bruce Power steam generator freighter would travel. DWM writes on behalf of its member, Michael J. Keegan, who lives within 5 miles of the anticipated water route of the steam generators through Lake Erie.

The 16 generators, each weighing about 90.8 metric tonnes, are to be transported this year. They will be affixed in a sealed but otherwise unpackaged state in the cargo hold of an ocean-going freighter, to be transported across Lake Huron and the lower Great Lakes and the St. Lawrence Seaway. It is undisputed that on many segments of the journey, the generators will be navigated through U.S. territorial waters.

The CNSC concedes that a U.S. Department of Transportation permit or license is required for the plan, and so we are writing your office as the one responsible for the processing and issuance of that approval.

ASPECTS OF PROJECT REQUIRING U.S. PUBLIC SCRUTINY

This precedent-setting project, if allowed to proceed, will normalize some risky practices that have larger implications for human health and the environment. Bruce Power's aim is to save money on long-term stewardship costs of radioactive waste by reducing its volume and mixing some of it into recycled metal markets. However, international transport of the generators for "recycling" would boost trafficking in nuclear waste as a form of legitimate commercial activity. The shipments would routinize the re-use of radioactive metals insidiously, converting the notion of "recycling" into a means of dispersing potentially health- and environmentally-consequential nuclear waste into a host of consumer goods to be used by unsuspecting human populations. The IAEA estimates that there may be more than 1 million missing radioactive sources worldwide, some of which are finding their way into metals for consumer uses.⁸

There are important unresolved questions about the Canadian Nuclear Safety Commission staff analysis, which can be downloaded from a website footnoted below.⁹ CNSC indicates that the estimated steam generator internal contamination is about 26 percent of the limit for SCO-1 [surface contaminated] objects as regards beta, gamma, and low-toxicity alpha emitters, and about 42 percent of the limit for high-toxicity alpha emitters. But these estimates are very rough, and do not correspond to direct measurements. In fact, even the CNSC list of radionuclides is incomplete, hence the activity listed is underestimated for that reason alone. And the CNSC staff admits that IAEA limitations for the shipment as a whole are exceeded:

When considering the consolidated shipment of all 16 generators by ship, the IAEA TS-R-1 Regulations specify a maximum total activity that can be transported aboard a single ship.

⁸<http://articles.latimes.com/2008/nov/12/business/fi-radioactive12>

⁹Available online at <http://www.beyondnuclear.org/storage/CNSC%20Staff%20Recs1.pdf>

Based on the total quantity of material present in the 16 steam generators, the limit for a single vessel containing SCO-I material is exceeded.

Staff report p. 18.

With regard to an accidental release the CNSC staff says the following on page 17:

Total Possible Release. The total releasable inventory is thus 13% plus 0.2%, or 13.2%. Based on the IAEA guidance (TS-G-1.1) developed from experience with past transport accidents, a maximum of 1% of the activity that is available for release in a package would actually be released into the environment in a severe accident. . . . Applying this release fraction to the releasable inventory of 13.2%, CNSC staff calculated that a maximum of 0.132% of the total activity in the steam generator could be released into the water in a worst case accident scenario as described above.

So CNSC staff estimates the total radioactive inventory (p. 10 of staff report) in the 16 steam generators as 3.67 Tera becquerels, and the releasable amount is 13.2 percent of that = 484 billion becquerels, or about 30 billion becquerels per generator.

But we differ, and submit that ***the inventory may be much higher.*** An Ontario Power Generation (OPG) document gives a total radioactive inventory of 16 giga becquerels per cubic metre for the Bruce steam generators. We estimate that there are about 57.5 cubic metres in each steam generator, so the amount in 16 steam generators would be 14.7 Tera becquerels, about 4 times greater than the CNSC figures. ***This means that the releasable amount would also be 4 times higher, that is, about 2 Tera becquerels.***

The CNSC staff's discussion of the consequences of a partial release of the inventory (0.132%) from one steam generator were based on an accident scenario involving "a near shore accidental release before expected salvage operations mitigated any impacts. . . close to a drinking water supply plant on a major body of water on the Great Lakes." Staff report p. 22. The modeling used was derived from a "major spill of tritium into Lake Ontario at the Pickering Nuclear Generating Station in August of 1992." Thus even the postulated accident scenarios do not contemplate an open water spill in the depths of the Lakes, nor even an accident in the St. Clair or Detroit rivers.

We believe the proposed shipment manifests as yet un-quantified threats to water, the environment and public health in the event of a seal rupture on the generators. Radionuclides could enter the Lakes and Seaway, and if so, fisheries and resort activities will be seen as contaminated. It is established that all exposure to ionizing radiation has risk and is cumulative (BEIR VII), and yet we have seen no

detailed risk assessment nor plans for proper mitigation of such effects. As far as we can ascertain, there are no plans in place to deal with the prospect of large-scale freshwater radioactive contamination in the event of an accident while the vessel is under way. The Canadian plans presently do not contemplate a scenario where the freighter sinks or experiences severe damage below the waterline, as by running aground with severe damage. In such events, there are no articulated cleanup plans, spill remediation protocols or drinking water protection measures in place. There also is no mention of coordinated emergency arrangements with any U.S. responders should sinking or running aground occur in U.S. territorial waters.

There further are unanswered questions as to who has jurisdiction, who bears the responsibility and liability before and during shipment, and who regulates shipping on shared waters. While medical isotopes have been shipped in the past, these are generally short-lived radioactive materials loaded in internationally-approved containers which offer a clear benefit to the end user. This is not so with the steam generators, which are contaminated with much more toxic and very long-lasting isotopes, these steam generators have no internationally-approved containers, and the contents of the steam generators offer no benefits to any of the ultimate end-users. The precise degree of contamination varies with what portion of the Canadian permitting documents one reads, but it is clear that there is a great deal of guesswork involved; reference terms range from "moderate" to "minimal."

THE GENERATORS ARE TRANSURANIC WASTES UNSUITABLE FOR 'RECYCLING'

According to CNSC data, about 15% of the radioactivity contained within each Steam Generator is due to transuranic isotopes. These are all high-toxicity man-made alpha-emitters whose atomic numbers are greater than 92, the atomic number of uranium.

The majority of these transuranic isotopes have exceedingly long half-lives and therefore constitute a potential long-term threat to the environment:

<u>Transuranic Element</u>	<u>Half-Life</u>	<u>Megabecquerels (for all 16 SG)</u>
Americium-241	430 years	234,400
Americium-243	7,400 years	272
Curium-244	18 years	74,560
Neptunium-237	2,100,000 years	13
Plutonium-238	88 years	62,480
Plutonium-239	24,400 years	84,800
Plutonium-240	6,500 years	120,640
Plutonium-242	380,000 years	122
		=====
		577,287

The activities given above are calculated for all 16 steam generators (eight (8) from Unit 1 and eight (8) from Unit 2), using the figures given by CNSC.

In terms of disintegrations per second, the transuranic isotopes correspond to 577,287 megabecquerels, which is 15.7 percent of the total activity in all 16 Steam Generators, given by CNSC as 3.67 terabecquerels.

Each alpha disintegration is much more energetic - usually by about one order of magnitude - than a gamma disintegration [e.g. 5 MeV per alpha particle compared with 500 keV for a gamma photon or beta particle]. Thus the transuranic isotopes in the Steam Generators represent about twice as much ionizing energy as that of all the gamma and beta emitters combined ($577,287 \times 5 = 2,886,435$ MeV of ionizing energy from alpha emitters, compared with $3,092,713 \times 0.5 = 1,546,360$ MeV of ionizing energy from gamma and beta emitters. In fact, the transuranics represent about two-thirds (2/3) of the total ionizing energy inside the steam generators.

It is also well known that, per unit of ionizing energy deposited in living tissue, alpha particles are about 20 times more biologically damaging than gamma rays or beta particles. Thus, in terms of risks to human health and to the environment, the alpha-emitting contents of the steam generators are the predominant risk by far.

For this reason, we believe that these steam generators should not be classified as low level radioactive waste or as SCO-1 wastes, but as TRU wastes (Transuranium Contaminated Wastes), unsuitable for anything but permanent storage at a designated waste storage site. Such wastes should not be recycled and sold as scrap metal for unrestricted use. Nor should they be transported through the Great Lakes for that, or indeed any, purpose.

AN ALTERNATIVE DISPOSITION WHICH DOES NOT INVOLVE SHIPPING

There also is an alternative to this questionable shipment that has been in place for some time: indefinite storage of the steam generators on-site at the Bruce complex. That was the contemplated disposition until the notion of "recycling" them surfaced in 2009.

THE PROPOSED SHIPMENT MUST BE CONSIDERED UNDER NEPA

Due to the unique and precedential nature of the planned shipment, and the above-stated questions we raise which contradict the official read of public health and environmental consequences, we hereby request that PHMSA undertake an environmental assessment as prelude to an environmental impact statement, pursuant to NEPA, 42 U.S.C. § 4321 et seq. An EIS is required for "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. § 4332(2)(C). The test for "major Federal action" and "significantly affecting" is the single criterion of "significance." 40

C.F.R. § 1508.27. The degree of environmental impact (or potentially adverse environmental consequences in the event of an accident) determines significance. "Significantly" involves "intensity", which (40 C.F.R. § 1508.27(b)) "refers to the severity of impact" - *i.e.*, that environmentally negative consequences may occur in implementation of the project.

The discretionary grant of a PHMSA license for shipment of the steam generators through U.S. waters is a "major federal action" in that federal (U.S.) approval is a *sine qua non* to the action taken by the private actor, Bruce Power. Since PHMSA possesses authority over the outcome and the project cannot go forward absent a PHMSA license, the project should be deemed "federalized" for purposes of NEPA. *Save the Bay v. U.S. Army Corps of Engineers*, 610 F.2d 322 (5th Cir. 1980); *Sylvester v. U.S. Army Corps of Engineers*, 884 F.2d 394, 400-01 (9th Cir. 1989).

We understand that presently there is nothing formally pending before PHMSA for this project. There is a public hearing in Ottawa on September 29, 2010. The anticipated CNSC license for Bruce Power to proceed would obviously be meaningless without USDOT permission, and we expect that there might be more than the usual pressure for quick licensing action by your agency. However, given the inadequate factual basis for the plan, the apparent understatement of the radiation characteristics of the cargo, and the dangers that can befall Great Lakes shipping in even moderate circumstances, it is incumbent upon PHMSA to comply fully with NEPA in deliberations over the expected license application.

We look forward to a transparent and informed public process under the National Environmental Policy Act.

We hereby formally request to be notified if Bruce Power or representatives of the federal government of Canada initiate a license application with PHMSA, and further, please electronically provide us with all documents associated with such filing.

Thank you very much.

FOR THE PETITIONERS

/s/ Terry J. Lodge
Terry J. Lodge

cc: *Via hand-delivery to:*
Great Lakes states' U.S. Senators and Representatives

Via certified U.S. mail, return receipt requested to:
Secretary, Ray LaHood
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Via email to phmsachiefcounsel@dot.gov and fax to 202-366-7041:

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Richard Boyle, PHMSA

Via email to:

Physicians for Global Survival, c/o Michael Dworkind, M.D.
Citizens Against Chemical Contamination, c/o Kay Cumbow
Michigan Sierra Club, c/o Anne Woiwode
Beyond Nuclear, c/o Kevin Kamps
Nuclear Information and Resource Service, c/o Diane D'Arrigo
Don't Waste Michigan, c/o Michael J. Keegan