



September 13, 2010

Michael Binder, President
Louise Levert, Secretariat
Canadian Nuclear Safety Commission
280 Slater Street
P.O Box 1046, Station B
Ottawa, Ontario K1P 5S9

Dear Mr. Binder:

On behalf of the Great Lakes and St. Lawrence Cities Initiative, I am enclosing our written position on the proposed shipment by Bruce Power of 16 radioactive steam generators on the Great Lakes and St. Lawrence River. The Great Lakes and St. Lawrence are a precious resource providing drinking water to over 40 million people. Because of the vital resources that the Lakes and River contribute to our economy, health and lives, we need to ensure the protection and restoration of the Lakes and River.

As stewards of the Lakes and River, we have serious concerns about the proposed project in three main areas: potential environmental impact, process followed, and potential precedent setting nature. Therefore, we oppose this shipment. Until a new submission is presented with all the necessary information to make an informed decision and that information is made available to the public, the Canadian Nuclear Safety Commission should not approve this proposal. Such information must demonstrate clearly that the shipment does not present an unacceptable risk.

We have previously expressed our support for your decision to hold a hearing on this matter. We hereby request to intervene and make an oral presentation outlining our concerns at the upcoming hearing on September 29, 2010 (also requested online).

We are pleased to discuss this matter with you at any time.

Yours sincerely,

Denis Lapointe, Mayor
City of Salaberry-de-Valleyfield
Chair of the Great Lakes and St. Lawrence Cities Initiative



Presentation to the Canadian Nuclear Safety Commission

**On the matter of:
Application from Bruce Power to Ship
Radioactive Steam Generators under Special
Arrangement on the Great Lakes**

**Submitted September 13 for
Public Hearing
September 29, 2010
Ottawa**



Executive Summary

The Great Lakes and St. Lawrence River are a precious resource providing drinking water for over 40 million people. Because of the vital resources that the Lakes contribute to our economy, health and lives, we need to ensure the protection and restoration of the Lakes.

As stewards of the Lakes, the Great Lakes and St. Lawrence Cities Initiative has reviewed Bruce Power's application to package and transport sixteen radioactive steam generators on the Great Lakes and St. Lawrence. The Cities Initiative has concerns in three main areas:

- 1) Potential environmental impact,
- 2) Process followed, and
- 3) Potential precedent setting nature.

We oppose this shipment. Until a new submission is presented with all the necessary information to make an informed decision and that information is made available to the public, the Canadian Nuclear Safety Commission should not approve this proposal. Such information must demonstrate clearly that the shipment does not present an unacceptable risk.

Our concerns over potential environmental impacts are multiple. We find that:

- the shipment individually and collectively far exceeds the international allowable limits for radioactivity for a single ship on the Great Lakes and the St. Lawrence (by 50 times), and also the Atlantic Ocean and Swedish waters,
- the risks are greater on water than land,
- the Canadian Nuclear Safety Commission's environmental impact analysis appears to rest on best case rather than worst case assumptions,
- the environmental review is limited in detail and in scope and does not consider ecological impacts,
- the analysis did not consider an accident scenario on the St. Lawrence or the connecting channels or the Atlantic Ocean,
- the optimum timing for the shipment was not analysed,
- the emergency measures for the vessel shipment, rehabilitation in case of accident and responsibility for cleanup costs are vague in some areas,
- the burden of proof to demonstrate environmental safety appears to be reversed and should ideally rest with Bruce Power and then be reviewed by the Canadian Nuclear Safety Commission.

On our second concern of process followed, we note that the early process of consultation with all parties, including Mayors, and provision of information was poor. There are still several important information gaps in the materials, including environmental review, additional accident scenarios, emergency measures, demonstration of need and alternatives to the proposal. There does not appear to be an environmental or public

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health reason to justify the rushed process. We are also concerned about the difficulty in clarifying questions and obtaining the environmental review which are important to assess the proposal prior to the submission deadline.

On our third concern about potential precedent setting nature of the application, it appears that this may be the first Canadian application to ship radioactive generators on the Great Lakes and St. Lawrence. It may be the first application which exceeds international radioactivity limits for a single ship on the Lakes. It is the start of a growing global trend and therefore requires careful consideration and all safeguards.

We welcome the opportunity to discuss these concerns.



Introduction

This is a submission from the Great Lakes and St. Lawrence Cities Initiative on Bruce Power's application to the Canadian Nuclear Safety Commission for permission to ship sixteen radioactive steam generators on the Great Lakes and St. Lawrence.

1) The Great Lakes and St. Lawrence Cities Initiative

Mayors of the Great Lakes and St. Lawrence Cities Initiative are a prominent voice in efforts to protect and restore the vitality of the Great Lakes and St. Lawrence River and improve the quality of life for the residents of the region. The Great Lakes and St. Lawrence Cities Initiative (GLSLCI) is a binational coalition of mayors and other local officials that works actively with federal, state, and provincial governments to advance the protection and restoration of the Great Lakes and the St. Lawrence River.

Currently GLSCI includes over 70 mayors from around the Lakes, representing over 13 million people.

We have been actively engaged in gathering information about this application over the past few months. The Mayors of the Great Lakes and St. Lawrence Cities Initiative focussed on answering the following questions about the proposed shipment including: What are the potential environmental and health impacts of shipment of the generators and an accident involving the generators? What safeguards have been applied and are these sufficient? Is there a sound emergency response plan in case of accident and adequate resources on hand in case of accident and clean up? Have all communities been informed? Does this proposed shipment meet all requirements and does it represent a precedent?

We have discussed this proposal at length within our organization. We believe it is a very significant issue that deserves the closest possible attention and scrutiny of the Great Lakes and St. Lawrence community. A great deal is at stake.

2) Proposed Shipment

Bruce Power is proposing to transport sixteen radioactive steam generators, now in storage, by road from the Western Waste Management facility to Owen Sound and then by ship through the Great Lakes to Sweden. Remaining material too radioactive to be sold will be transported back to Bruce Power.

3) Nature of the concerns

The concerns of the Great Lakes and St. Lawrence Cities Initiative with the proposed shipment fall into three categories:

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- 1) Potential environmental impacts
- 2) Process followed
- 3) Potential precedent setting nature

Concern 1) Potential Environmental Impacts

One of the major concerns of the Mayors of the Great Lakes and St. Lawrence Cities Initiative is the potential for an accident to cause environmental and health impacts. This could result in the release of radioactivity potentially impacting drinking water, and damaging the ecosystem of the Great Lakes and St. Lawrence.

The Great Lakes and St. Lawrence River are a vital resource providing drinking water for about 40 million people. Along the Canadian side alone, about 70% of people in Ontario and almost 50% of people in Quebec take their drinking water directly from the Lakes and River. The Great Lakes form the largest system of freshwater on earth, accounting for almost 20% of the world's freshwater.

They are home to almost 35 million people in Canada and the US. Along the Canadian side, 98% of people in Ontario and 60% of people in Quebec live in the Great Lakes St. Lawrence basin. Eight of Canada's largest cities are in the Great Lakes -St Lawrence basin.

They are also home to a wide variety of wildlife, fish and plants. In fact, the Great Lakes basin is one of the most biologically rich regions of Canada. A source of clean water is also important to sustain and process our food. The Great Lakes region provides 95% of farm cash receipts in Ontario. Yet the Great Lakes and St. Lawrence are often an undervalued and underappreciated resource. Local governments have a direct role and interest in the Great Lakes and St. Lawrence.

Because of the vital resources that the Lakes and River contribute to our economy, health and lives, we need to ensure the protection and restoration of the Lakes and River.

1) Inadequate level of detail on environmental impacts by Bruce Power

The environmental impacts of this proposal are given short shift compared to the volumes of material available on some of the engineering aspects of the proposal. The document and background material describe in great detail the optimum design of some of the engineering aspects of the proposal, such as the transport saddles (over 30 pages) and yet the environmental aspects do not appear to receive the same level of detail (4 pages).

2) Risk on water greater than land

The Canadian Nuclear Safety Commission (CNSC) staff report describes various accident scenarios run by the CNSC. The document notes that the risks are greater on water compared to

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land. Section 4.1.9 “Since scenarios during road transport do not experience the flushing effect experienced during immersion in water, the water scenarios bound the potential consequences of loading and transport of the steam generators.” The fact that the risks are greater in water than on land should have increased the number and type of accident scenarios on water.

The International Atomic Energy Agency (IAEA) Safety Standards Guide TS-G- 1.2 (ST-3) also confirms that for accidents involving water transport “the spread of contamination in a waterway may be much greater than that involved in a land accident.”

3) Total amount of radioactivity on ship exceeds international regulations

The total amount of radioactivity in this proposed shipment exceeds the allowable amount as set by the International Atomic Energy Agency regulations for the safe transport of radiological materials. The international rule is “The total activity for a single hold or compartment of an inland water craft, for carriage of SCO-I in Type IP-1 cannot exceed 10 A₂, and for conveyances other than by inland waterway, 100 A₂ (paragraph 525 of regulation TS-R-1).”

The Bruce Power application notes that each steam “generator contains between 30 and 37 A₂ “and that “a total inventory of 545 A₂ for all 16 generators.” The CNSC report states “Based on the total quantity of the material presented in the 16 steam generators, the limit for a single vessel containing SCO-1 material is exceeded.”

Each of these generators individually exceeds the international guidelines and **collectively the 16 steam generators exceed the international allowable guidelines for radioactivity allowed on a single ship by more than 50 times.**

Collectively this shipment would also exceed by more than 5 times the allowable guidelines for conveyances other than by inland waterway such as the Atlantic Ocean and Swedish waters (545 A₂ vs. 100 A₂). This would mean that this shipment would not meet international guidelines on the Great Lakes, St. Lawrence Seaway, and also on the Atlantic Ocean and Swedish water. This is of concern.

These international limits are specifically set for the type of waste (SCO-1) applied to the generators in the type of package (Type IP-1) applied to the generators when shipped on inland water ways such as the Great Lakes and St. Lawrence. This international radioactivity limit is therefore directly applicable to this proposed shipment, and yet it has not been followed.

The CNSC staff report notes that Bruce Power provided a justification to CNSC for exceeding these activity conveyance limits. Bruce Power argues that even if this shipment does not meet the numerical allowable limit, it meets the intent of the regulations. The discussion is then on how to apply compensatory measures to ensure equivalent safety. Many of these compensatory measures are required anyway.

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This international limit regulating the allowable amount of radioactivity on a single ship is directly applicable to this shipment and should be followed. This shipment should therefore not be approved because it does not meet international allowable limits for radioactivity for a single ship on the Great Lakes, St. Lawrence Seaway and also on the Atlantic Ocean.

4) Use of best case instead of worse case assumptions in environmental analysis

The CNSC environmental analysis summarised in section 4.3.2 of the CNSC staff report rests on several assumptions. The assumptions include: that only one of the 16 generators is involved in an accident, only a very small partial release (0.132%) of radioactive material from one generator occurs, and large water dilution factors.

On the first assumption that only one generator is involved in an accident, this may make sense for the earlier accident scenario when only one generator is being loaded by crane onto the boat. It does not seem to make so much sense for this accident scenario to assume only one generator is involved in an accident on the Great Lakes when all 16 generators are the same hold of one ship. Indeed all 16 generators are fairly closely packed together in the ship hold, so much so, that two of the generators have to be placed in opposite orientation. What type of accident would result in only one generator being affected? This would seem like a best case scenario rather than a worst case scenario. There are no analysis presented using other than this assumption than only one generator is involved in an accident. This is of concern.

The second assumption in the environmental review is that only 1% of the radioactive material would be released in case of an accident. This document states that this 1% assumption is drawn from IAEA advisory materials. This is a critical assumption. We seek clarification on this critical assumption. IAEA descriptions on one actual accident documents 30% of the material was released. We seek clarification on whether this is based on accidents at sea, which generally have a longer recovery time

This again seems like a best case scenario rather than a worse case scenario. It is hard to imagine how only 1% of the material in one generator would be released in an accident of a ship on the Great Lakes. The environmental analysis does not present impacts if other assumptions on the amount of release are used. It would see prudent to perform the environmental analysis using a range of assumptions on the radioactivity release fraction, rather than assuming the release fraction is as low as 1%. What percentage of the material would need to be released to exceed the Health Canada guidelines?

The third assumption rests on the amount of dilution provided by the Lakes. As environmental management has evolved, using the Great Lakes to dilute radiological contamination is growing less acceptable. More specifically, the assumptions used such as type of modelling or the dilution factors is not described in the summary, so there is no way to assess the adequacy of these8

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values or this analysis. It is not clear if the analysis accounted for the different mixing behaviours of the Lakes during different seasons or under different conditions. The depths, flows and behaviour of each Lake are also quite different, so the analysis on one lake may not apply to another lake and certainly would not apply to a connecting channel or the St. Lawrence

We also seek clarification on a number of other questions including how the modelled results compare to the Ontario Drinking Water Standards individually and the ICRP method for multiple radionuclides.

The environmental impact assessment is also limited in scope. It does not include an assessment of ecological impacts such as impacts to wildlife, fish, and potential food chain contamination etc. It also does not assess the potential to contaminate water used for irrigation of crops.

The environmental impact analysis is a critically important part of this proposal, and yet the burden of proof is not borne by the proponent, it lacks the level of detail present in some other parts of the proposal, rests on a series of what appear to be best case assumptions, is limited in scope, does not include an analysis for the St. Lawrence, connecting channels or the Atlantic Ocean and the underlying analysis are not available for review. This is of concern.

5) No environmental impact analysis on St. Lawrence River, connecting channels or Atlantic Ocean

There are several accident scenarios run on the loading operation and only one run on the water shipment portion, and no accident scenarios run on the St. Lawrence or the ocean. This is inadequate.

The environmental review is limited in geographic scope to the Great Lakes nearshore. It does not consider the different conditions on the St. Lawrence River, the connecting channels or the Atlantic Ocean. The St. Lawrence connecting channels and the Atlantic Ocean have different characteristics than the Great Lakes and so the potential environmental impacts of an accident in these regions need to be evaluated. We are concerned about the potential to expose large numbers of people if an accident occurred near a heavily populated area.

It would be prudent to do accident scenarios in other geographic areas, including the St. Lawrence, connecting channels and Atlantic Ocean.

6) Burden of proof for environmental safety appears to be reversed

The burden to prove environmental safety for this shipment should rest with the proponent, Bruce Power. In this case it seems that the Canadian Nuclear Safety Commission (CNSC) assumed the burden of proof for environmental safety, instead of Bruce Power. So CNSC staff, instead of Bruce Power, performed accident scenarios to assess environmental impacts of the 9

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shipment. This assessment was then also reviewed by CNSC staff, and a staff recommendation made. In effect, CNSC staff became both the creator of the environmental review and the evaluator of the environmental review. This is not ideal. In other parts of the application, the proponent, Bruce Power assumed the burden of proof to demonstrate the safety of many of the engineering aspects of the shipment (i.e. the design of the transport saddles, the tie down system) and CNSC evaluated them.

We appreciate that the environment impact review is a CNSC staff recommendation to the CNSC Tribunal, but it carries a lot of weight. Ideally, the proponent Bruce Power would have assumed the burden of proof by conducting a more thorough environmental review and the CNSC would have evaluated the Bruce Power proposal.

7) Shipment under “exclusive use” loosens obligations

This application proposes shipment “under exclusive use”. This means that the shipment is under “the sole use, by a single consignor, of a conveyance... in which all initial, intermediate and final loading and unloading is carried out in accordance with the directions of the consignor or consignee” According to IAEA training materials, shipment under exclusive use relaxes many of the requirements on packaging and shipping. Would this shipment meet all guidelines if it was not under exclusive use?

8) Emergency measures and clean up plans are vague in parts

The emergency measures are a critical part of the assessment of this application. There are two documents describing the emergency measures- the emergency response plan and the shipboard emergency plan. The emergency response plan for the ship portion seems less detailed and vaguer than the land and truck portion, yet the report notes that the risks are greater in water than on land.

The shipboard emergency plan is not specific to this shipment or to these conditions, rather it is a generic plan developed by the company for shipping irradiated nuclear fuel. It is positive that a “more restrictive, careful plan” is being proposed for this shipment. However, not all of the measures in the shipboard emergency plan appear to be completely applicable. Some of the stated purposes of the measures are also not designed to minimise environmental impacts. In the section of the shipboard emergency plan that specifies guidance on what to do in the event of a release (7.3), it states that measures must be worked out in advance of the shipment. It is not clear that the detailed specific measures for this shipment to be taken in the event of a release have been adequately worked out in advance of this shipment. We also seek clarification on the rehabilitation and restoration plan in the event of an accident and the responsibility for the cost of clean up.



9) Optimum timing of shipment not analysed

As time has progressed, the potential dates of shipment (originally listed as June 30 to Sept 7) have become later in the year. Given the September 29 hearing date, the preparations required pre transport and the loading times (still 46 days?), it would appear the proposed shipment date would now be November or December. Has the changed potential shipment date been considered and analysed for likelihood of accident? Late fall and winter are stormy, cold, icy times on the lakes, prone to high winds and waves on some of the Lakes and the Atlantic. In addition, parts of the shipping route and Seaway close in December depending on conditions. These dates are also often very busy times on the Welland Canal and Seaway. With the changes in the world grain market, a very busy fall shipping season is expected on the Lakes and Seaway. Has the optimum time of shipment been considered? If so please provide the analysis.

The application (section 4.7) indicates that the shipment route would be “designed to minimise impact on the general public by continuous movement during daylight hours through less populated areas to the extent possible.” Does this mean that the shipment would be at night in the most populated areas?

10) New lower limits on seaway and lakes need to be considered

The CNSC staff asked questions regarding the draft of the ship. Bruce Power stated that the scantling draft of the ship was 7.25 metres. It is not clear what the expected draft would be when fully loaded with the generators and ballast. Many sections of the Great Lakes and St. Lawrence are operating under a low water regime and so the maximum allowable draft has been reduced to 8.08 m. Several ships have ground ashore this year due to lower water levels. What is the expected draft of the ship when fully loaded with the generators? And how does this compare to the new lower limits on the shipping route and Seaway? And in the expected storm conditions on the Lakes which can result in sudden storm surges of 1 meter or more? Please provide the analysis.

11) Difficulty in obtaining additional information

The Cities Initiative requested additional clarification on the technical review of environmental impacts as these were needed in advance of the deadline for written submissions and this request was declined.

The stated reason for CNSC staff refusal to clarify questions was that the hearing provided an opportunity to present concerns, and later, that the questions did not represent a written intervention. Without answers to many critical questions on the proposal, careful evaluation of the environmental impacts and other aspects of the proposal are very difficult. While the hearing does provide some opportunities to present concerns, it is not an ideal forum to review detailed technical questions. These types of questions require a discussion, review of written materials, 11

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research and careful thought not easily obtained in a hearing structure and setting. The Cities Initiative was very disappointed with the difficulty in clarifying aspects of the application prior to the deadline for written submissions. Please provide the underlying technical environmental review and discussion of the attached questions.

Concern 2) Process Followed

1) Poor initial communication and consultation

Many local mayors, groups and native governments first learnt of the project through the media, rather than through strategic advanced communication from Bruce Power. There was little information initially available, and little initial proactive consultation and communication.

Bruce Power did then move to hold a series of meetings and open houses which did help to provide some details of the proposal. CNSC also responded with a series of meetings and by announcing a one day hearing. These were positive developments but came late in the process.

2) Poor initial consultations with Mayors

This shipment was of immediate concern to many Mayors around the lakes. Several Mayors requested meetings on the issue. This direct line of communication helped to understand the proposal. However, recent refusal by CNSC to clarify questions has hampered communication.

3) Information gaps

Several parts of the original application were vague and not sufficiently detailed. These included the emergency measures, dose measurements, shipboard emergency plan, and environmental impact assessment and accident scenarios. Bruce Power did not seem to do any analysis of the accident scenarios. Bruce Power did not appear to submit any environmental impacts of accident scenarios. There are still several important gaps in the proposal. This is of concern.

4) Rushed process

While the initial application was filed in April 2010, CNSC staff asked for additional materials, and most people did not become aware of the proposal until June or July. Detailed materials were released on August 20, with submissions to CNSC due September 13 and a CNSC hearing on September 29.

This short time frame to review lengthy materials makes it difficult to respond.

What's the hurry? Many of these steam generators have been in storage for over a decade. Unit 2 generators were removed in 1995 and Unit 1 in 1997. There does not seem to be an

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environmental or public health reason that would justify the rushed regulatory and public process. We have time and should take the time to properly analyse the proposal, seek clarifications, hold hearings and consult, optimise the time of shipment and make sure all safeguards are met.

5) Late detailed plans

Many of the more detailed aspects of this proposal seem to have been worked out relatively late in the process. They also seem to have been generated in response to thoughtful CNSC concerns in several areas. Several aspects of concern to the Mayors including the emergency plans and the environmental review seem to have happened late in the process.

6) No information on need for proposal

As part of the terms of the Environmental Assessment approval, these steam generators were to be classified as radioactive wastes and stored on site. If a proponent is proposing to change the terms of the approved Environmental Assessment, it would seem to be prudent for the proponent to answer questions on need for the project and alternatives to the project which form part of the core requirements of an environmental assessment. Bruce Power does not provide an adequate justification on the need for this shipment, and the need to ship the generators this fall. While perhaps not strictly required under the transport regulations, it would be good practice for Bruce Power to provide justification of need and details of alternative considered. The lack of adequate justification of the need for this proposal, at this time, and lack of consideration of alternatives is of concern.

7) No information on alternatives to proposal

As noted above, Bruce Power does not provide an adequate discussion of the other alternatives examined, and an evaluation of why the proposed shipment is the preferred choice. Alternatives that could be considered include, Could this material be managed closer to home and minimise transport? Could other methods of transportation be used for this shipment?

8) Difficulty in obtaining clarifying information

Cities Initiative staff have reviewed the materials submitted, particularly the application by Bruce Power and the CNSC staff report. It is not possible to fully understand the assumptions used in the environmental review from the summary (section 4.3.2) in the CNSC report. As part of this review several areas requiring clarification came up. Many of these questions would help to assess the proposed shipment. This information was needed in preparation of the written submission and in advance of the hearing in order to understand the implications of the shipment. Information was requested from the CNSC staff, particularly on the environmental review. These requests for information were declined. While the hearing does provide a forum to express

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concerns, they are detailed technical questions not easily answered and considered in a hearing setting, but requiring a thoughtful review and consideration. The questions have been resubmitted as part of this submission.

Concern 3) Potential Precedent Setting Nature of Shipment

1) Appears to be first request for shipment of radioactive steam generators on the Great Lakes in Canada

The proposed shipment also seems to have the potential to set a precedent for shipment of radioactive material from Canada on the Great Lakes. It appears that this is the first shipment on the Great Lakes of radioactive steam generators requesting approval from CNSC under special arrangement. It may also be the first proposal seeking to exceed the allowable international limits for radioactivity on a single ship on the Great Lakes.

The amount, types and volumes of radioactive materials shipped on the Great Lakes is hard to evaluate without additional data from the CNSC and others in the past ten years. The Bruce Power application does note a previous shipment of a radioactive steam generator on Lake Michigan (no numbers or details given) and shipment of uranium hexafluoride on the St. Lawrence 2003 to 2005. This still does not seem like shipment of radioactive materials is common on the Great Lakes.

2) Part of a growing global trend

As the IAEA notes there is growing global trade in decommissioning nuclear plants and international business in waste conditioning resulting in increased shipment of used nuclear equipment. Indeed the Bruce Power is expected to apply to ship another 16 generators to Sweden. We need to make sure that we start the process right, ask and answer the right questions, consult and consider all options. This application may well be the start of a trend.

3) Limited transport of radioactive materials on ships

As noted above, there appears to be limited transport of radioactive materials on ships in the Great Lakes. This needs to be confirmed by the CNSC and others.

4) Conclusion

The Great Lakes and St. Lawrence are a precious resource providing drinking water for over 40 million people. Because of the vital resources that the Lakes contribute to our economy, health and lives, we need to ensure the protection and restoration of the Lakes.



As stewards of the Lakes, the Great Lakes and St. Lawrence Cities Initiative has reviewed Bruce Power's application to package and transport sixteen radioactive steam generators on the Great Lakes and St. Lawrence. The Cities Initiative has concerns in three main areas:

- 1) Potential environmental impact,
- 2) Process followed, and
- 3) Potential precedent setting nature.

We oppose this shipment. Until a new submission is presented with all the necessary information to make an informed decision and that information is made available to the public, the Canadian Nuclear Safety Commission should not approve this proposal. Such information must demonstrate clearly that the shipment does not present an unacceptable risk.

Our concerns over potential environmental impact are multiple. We find that:

- the shipment individually and collectively far exceed the international allowable limits for radioactivity for a single ship on the Great Lakes, St. Lawrence (by 50 times), and the Atlantic Ocean and Swedish waters,
- the risks are greater on water than land,
- the Canadian Nuclear Safety Commission's environmental impact analysis appears to rest on best case rather than worst case assumptions,
- the environmental review is limited in detail and in scope and does not consider ecological impacts,
- the analysis did not consider an accident scenario on the St. Lawrence or the connecting channels or the Atlantic Ocean,
- the optimum timing for the shipment was not analysed,
- the emergency measures for the vessel shipment, rehabilitation in case of accident and responsibility for cleanup costs are vague in some areas, and
- the burden of proof to demonstrate environmental safety appears to be reversed and should ideally rest with Bruce Power and then be reviewed by the Canadian Nuclear Safety Commission.

On our second concern of process followed, we note that the early process of consultation with all parties, including Mayors, and provision of information was poor. There are still several important information gaps in the materials, including environmental review, emergency measures, additional accident scenarios, demonstration of need and alternatives to the proposal. There does not appear to be an environmental or public health reason to justify the rushed process. We are also concerned about the difficulty in clarifying some questions which are important to assess the risk of the proposal prior to the submission deadline.

On our third concern about potential precedent setting nature of the application, it appears that this may be the first Canadian application to ship radioactive generators on the Great Lakes. It may be the first application which exceeds international radioactivity limits for a single ship

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on the Lakes. It is the start of a growing global trend and therefore requires careful consideration and all safeguards.

We welcome the opportunity to discuss these concerns.



Copies of previous GLSLCI letters to CNSC to be considered part of this submission

Letter of September 10, 2010

September 10, 2010

Michael Binder, President
Canadian Nuclear Safety Commission,
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Dear President Binder:

On behalf of the Great Lakes and St. Lawrence Cities Initiative, I am writing to express disappointment with the lack of information available on the Bruce Power application. In the past few weeks we have been in contact with Canadian Nuclear Safety Commission (CNSC) staff to fact find and get the information needed to help make an informed presentation.

I am disappointed that the CNSC has refused to discuss or provide the underlying technical report on the environmental impacts of an accident on the Great Lakes or the St. Lawrence, and to answer questions regarding this impact review and other details of the proposed shipment. This information is needed in advance of the hearing in order to understand the implications of the shipment. They are detailed technical questions not easily answered and considered in a hearing setting, but requiring a thoughtful review and consideration. We understand the need for all parties to share the same information and so encourage the sharing of the technical review and other information with all parties. I have attached the proposed questions, many of which have been submitted previously.

We are pleased to discuss this matter with you at any time.

Yours Sincerely,

David Ullrich
Executive Director

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Issue: Great Lakes Shipment of Radioactive Steam Generators from Bruce Power Ontario

Sept 7, 2010

Request for additional information

As a follow-up to earlier emails requesting clarification on information provided in the documents, here are a list of questions that the Great Lakes and St. Lawrence Cities Initiative would like to clarify with the CNSC. These questions reflect our interest in understanding the proposal and making an informed presentation at the upcoming hearing.

Questions include:

1. There is much information on many of the technical aspects of this proposal (design of transport saddles etc.) but so much less analysis available on the environmental impacts of potential accidents. Did Bruce Power do any analysis of environmental impacts of this shipment on the Great Lakes or is the CNSC summary presented in the CMD the entire environmental impact analysis available?
2. Are the full CNSC technical review report on the environmental impacts and underlying assumptions used in the accident scenario on the Great Lakes available? Please forward the technical review.
3. The environmental review (section 4.3.2) rests on a series of assumptions- namely that only one generator is involved in an accident, only a very small partial release (0.132%) of radioactive material from one generator occurs, and large water dilution factors. Because this is a critically important part of the decision, it would be prudent to explore additional accident scenarios- including what would happen if all 16 generators were involved in an accident on the Great Lakes and all their material was released?
4. Would the drinking water levels the day of the accident and the following days exceed the Action levels set by Health Canada if more than 1% of the material was released? And if more than one generator was involved in the accident? Is it correct to say that if 100% of the material was released from one generator then this would exceed the Action Levels by a wide margin?
5. What are the amounts of release and the number of generators damaged that would exceed the guidelines?



6. What dilution factors were used in the Great Lakes analysis? What happens to the analysis if these dilution factors are changed by half or tenfold?
7. Was an accident scenario done for accident in the St. Lawrence river, locks or at sea? These regions present different conditions that require environmental analysis and review.
8. How do the results of the modeled concentrations compare to Ontario Drinking Water Standards (Reg. 169/03) and to the ICRP method?
9. The generators appear to differ in their radioactivity- was this taken into account in the accident scenario analysis?
10. Did the CNSC verify the estimate of non fixed material?
11. This shipment exceeds the allowable amounts of radioactivity for a single ship (activity limits for conveyance) - By what margin? What number of generators would meet this amount? Has consideration been given to reducing the number of generators shipped to meet these allowable amounts? Is this the first time that these limits are exceeded for radioactive material on the Great Lakes? What other methods of compensatory measures could be considered for this shipment?
12. It seems that the steam generators completely fill the ship hold, so much so that two generators have to be place in opposite orientation. What determined the need for 16 generators to be included in the shipment'? Please provide the analysis.
13. Much of the analysis rests of the assumption that each steam generator is its own package, and so meets fissile material loading and packaging and other guidelines. However, much less of the analysis considers the cumulative effect of the 16 generators. If the 16 steam generators are collectively considered a package, then this would exceed many of the allowable guidelines, including fissile material loading and packaging restrictions.
14. As time has progressed, the potential dates of shipment become later in the year. Has the changed potential shipment date been considered and analysed for likelihood of accident? Late fall and winter are stormy, cold times on the lakes, prone to high winds and waves on some of the Lakes and the Atlantic. In addition, parts of the shipping route and Seaway close in December depending on conditions. These are also often very busy times on the Wetland Canal and Seaway. Has the optimum time of shipment been considered? If so please provide the analysis.
15. What are the potential dates of the shipment? Will the shipment stop anywhere along the route?



16. What is the draft of the ship when fully loaded with the generators? And how does this compare to the new lower limits on the shipping route and Seaway? And in the expected storm conditions on the Lakes? Please provide the analysis.
17. What routing instructions are expected?
18. What type of ship pilot and level of expertise will be required?
19. Will the ship be checked that radioactive amounts are within guidelines before loading, and will these amounts be made public?
20. How long is it estimated to take to load the generators at Owen Sound harbour? The document says 46 days — is this still correct? If there is no longer a staging area in the Harbour, then the steam generators would be loaded directly onto the boat and the boat becomes the staging area?
21. What is the estimated dose to ship workers- who are likely to be exposed to more than half an hour a day as in the analysis? What is the expected doses to seaway and lock workers? What are the does rates at one, two and three meters ? Is it correct to say that if a person stood by one generator for 10 hours (assuming average contact dose rate of 0.1 mSv/hour) they would receive the total annual recommended dose limit for the general public (1 mSv per year)?
22. Why are the most recent version (2005) of the IAEA transportation guidelines not used? If these guidelines are used, does it make any difference to the proposal?
23. Would this shipment meet IAEA or CNSC guidelines for shipment by truck or by rail?
24. This proposal is for shipment under exclusive use. It seems that many of the requirements for transportation do not apply if a shipment is under exclusive use. Would this shipment meet guidelines if it was not under exclusive use?
25. What is the CNSC view on the transport index calculations?
26. Was a criticality safety index calculated?
27. Has Bruce Power demonstrated need for this shipment?
28. Has Bruce Power demonstrated analysis of alternatives- including recycling closer to the facility?
29. Please provide a description of the safeguards used in Sweden and by the Swedish company



to ensure that the material is permitted for unrestricted use, and that the Swedish facility meets all air emission guidelines.

30. Is Bruce Power planning to ship the other remaining 16 generators on the Great Lakes at a later date? What process would be followed for this second shipment?

31. What are the expected approval and hearing requirements for the return of this first shipment? Will this be by land rather than water?

32. What are the annual volumes and number of shipment of radioactive materials shipped on the Great Lakes for the past 10 years?

33. The shipboard emergency- plan seems vague in places about what would actually happen in an emergency. In many places the purpose of the plan is to prevent injuries and does not include any mention of the need to prevent environmental damage. What additional measures could be considered for the shipboard emergency plan?

34. Were any additional measures considered for the radiation protection plan?

35. Is there a requirement for financial assurance for this shipment?

36. Has this shipment completed the IAEA tests including for water immersion? What is the estimated depth at which these generators could be expected to crush under water pressure?



Letter of August 19, 2010

Mr. Michael Binder, President and CEO
Canadian Nuclear Safety Commission
280 Slater Street, P.O. Box 1046
Station B, Ottawa
K1P 5S9

August 19, 2010

Dear Mr. Binder:

On behalf of the Great Lakes and St. Lawrence Cities Initiative, I write to express our interest and serious concern over the proposed shipment on the Great Lakes and St. Lawrence Seaway of radioactive steam generators from Bruce Power to Sweden.

The Great Lakes and St. Lawrence Cities Initiative is an association of over 70 mayors, representing over 13 million people in Canada and the United States, dedicated to the protection and restoration of the Great Lakes and St. Lawrence River. The Great Lakes and St. Lawrence are a vital resource and provide drinking water for over 40 million people.

The Cities Initiative is concerned about the lack of public consultation, lack of transparency and potential environmental and public health impacts of the proposed shipment. Based on the concerns heard around the Great Lakes and St. Lawrence basin, we support the Canadian Nuclear Safety Commission's decision to hold a public hearing.

At this time, we are seeking additional information to help us understand the risks of the shipment on the Great Lakes and through the St. Lawrence. Specifically, we are concerned about whether this shipment is necessary; whether all alternatives to this shipment, including recycling on site or at a closer facility, have been fully explored; if the shipment is approved, the measures to notify local governments and other parties along the shipment route; the timing of the shipment given the potential for bad weather in late fall/ early winter; methods to prevent an accident with the shipment; methods to minimise security risks; measures to respond to an accident; the potential environmental impact of an accident and the potential precedent setting nature of the shipment. Also of concern are the low water levels in the St. Lawrence. Specific information about the age and condition of the ship that will be used, as well as the safety and environmental record of the shipper are also important, and are requested.

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Denis Lapointe, Mayor of Salaberry de Valleyfield, Chair

Richard M. Daley, Mayor of Chicago, Founding United States Chair

David Miller, Mayor of Toronto, Founding Canadian Chair



We are looking forward to receiving and reviewing the technical studies including the emergency security plan, shipping plan, environmental impact and radiological dose and others now under way at the CNSC. As part of these technical reviews, we would encourage the Commission to fully consider the essential need to protect the Great Lakes and St. Lawrence. There should be no shipment until a full, open, and transparent process is completed and all relevant questions are answered.

Thank you,

Denis Lapointe
Mayor of Salaberry de Valleyfield
Chair, GLSLCI

Cc:

Hon. Pierre Arcand, Quebec Minister of Sustainable Development, Environment and Parks
Hon. John Wilkinson, Ontario Minister of Environment
Hon. Brad Duguid, Ontario Minister of Energy
Hon. Chuck Strahl, Federal Minister of Transport, Infrastructure and Communities
Richard Corfe, President, St. Lawrence Seaway Management Corporation