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Written submission from Evelyn Gigantes

Mémoire de Evelyn Gigantes

In the Matter of

À l'égard de

Decision on the scope of an environmental assessment of the proposed Micro Modular Reactor Project at the Canadian Nuclear Laboratories Ltd., in Chalk River

Décision sur la portée de l'évaluation environnementale pour le projet de microréacteur modulaire aux Laboratoires Nucléaires Canadiens ltée, à Chalk River

Hearing in writing based on written submissions

Audience par écrit fondée sur des mémoires

June 2020

Juin 2020

Canada

Response to CNSC staff proposed Scope of EA

I received the "Request for a Commission Decision on the Scope of an Environmental Assessment" of Global First Power's MMR Project at Chalk River on May 1 and noted that anyone wishing to participate in the SNSC hearing concerning the staff recommendations concerning that scope would have to indicate in writing by June 2020.

I would like to so indicate.

It has not been an easy matter to digest the material associated with the staff recommendations. The main document does not include the responses of staff to the comments received made to the original GFP Project Description by mid-September, 2020 from Indigenous and other public groups and individuals. The link provided to that material produces a printout which has extremely small print - definitely not encouraging to participation in the process.

The objective of the document is to assist the CNSC in defining the terms of its' future Environmental Assessment of the GFP proposal. The document notes that GFP has selected the option of integrating the Licensing and the EA processes associated with the proposal. (p.15)

Scope of Factors:

The long and short of the staff proposal is that the EA be limited to *"the scope of factors mandated in paragraphs 19(1) (a) to (h) of the CEAA 2012".* This means the staff is recommending the Commission not "*exercise its discretion of taking into account any other matter relevant to the EA that the CNSC, as the responsible Authority, requires to be taken into account.*" (p.8)

The reader is left to assume that the reason almost 50% of the comments received from Indigenous and other public commenters were deemed "*out of scope*" for the coming EA process was because they were submissions *"that express general opposition to SMRs"* (p. 23). There is no reason offered by staff why a "general opposition to SMRs" is considered irrelevant to the EA process, and the determination that it is "out of scope" therefore seems quite arbitrary. I suggest it be reconsidered, particularly given the July, 2019 proposal by CNL of the Canadian Nuclear Research Initiative, designed to stimulate research about, and development of SMRs in Canada. The GFP proposal for Chalk River is clearly the first step in the Initiative, and it is therefore surely delinquent for comments in "general opposition to SMRs" to be ruled "out of scope" for consideration in the associated EA that will be conducted by the CNSC.

Further, the "Disposition Table of Public and Indigenous Groups' and Organizations' Comments

On the Project Description –Micro Modular Reactor Project" (hereinafter termed "Disposition

Table"), under the theme "Reactor and Systems Design" on page 36 has CNSC staff response as follows:

*"**Operational experience***

Review of operational experience from similar facilities is relevant information that is expected to be taken into account in a licence application. CNSC staff require the applicant to consider operational experience from similar facilities and HTGR generic safety issues, incorporating adequate safety measures to address accidents and malfunctions…. Details regarding the modules and other design related considerations such as containment will be considered under the assessment of the Licence to Construct application."

As GFP has opted for a combined EA- Construction Licence process, it makes sense that public comments in "general opposition to SMRs" be considered "within scope" for purposes of the CNSC Environmental Assessment.

<u>Indigenous and Other Public Consultation</u>

The "Request for a Commission Decision…" document is explicit about the role CNSC staff have played in both identifying and communicating with Indigenous groups and organizations. In fact the role it has taken on is so extensive that I went to generic CNSC documents that describe the obligation carried by CNSC to provide high-quality consultation with Indigenous peoples.

Appendix C in REGDOC -3.2.2.

"CNSC's Commitment to Indigenous Consultation and Engagement

The CNSC builds on the guiding principles to establish project-specific processes for Indigenous consultation and engagement:

- ***that provide opportunities for CNSC staff and Indigenous peoples to meet and discuss issues and to allow for reasonable opportunities for participation*** *in the hearing process before the Commission, such that all evidence relevant to the Indigenous interests – including any potential impacts thereon by Indigenous peoples, CNSC staff, the licensees, the various federal, provincial and territorial departments and agencies, and other interested parties – is heard and taken into account by the Commission in relation to a project, and*
- ***that are as accessible as reasonably possible to Indigenous peoples*** *through: organized community meetings, open houses, technical workshops and/or site visits; other direct consultation with Indigenous peoples where appropriate; the CNSC's public hearings which are occasionally held in host communities with opportunities for oral or written interventions by Indigenous peoples; video-conferencing facilities (in some situations) for intervenors at hearings held in Ottawa; webcast public hearings and meetings on the CNSC website; the publication on the CNSC website of hearing transcripts, information on CNSC licensing processes, technical/safety facts and publications about the nuclear industry that the CNSC regulates; and, assurance that the licensees and proponents are assisting the CNSC in consulting and engaging with Indigenous peoples."*

This commitment is commendable. But it can be undertaken in such a pronounced manner that the role of the project proponent and the role of CNSC staff becomes confused on the important issue of consultation. On pages 7 and 8 of the Disposition Table it is noted that several commenters have alluded, either directly (William Turner) or indirectly to the fact they find this potential confusion disturbing. One suggests "documenting and posting of all communications between the CNSC and the proponent" as part of the Public Participation Process. (Denise Giroux).

Northwatch even recommends that the subject of the Request for a Commission Decision be transformed from a staff recommendation into an open Commission hearing:

. "the scope of factors decision should be made by the full Commission and should be subject to a full public hearing that allows for interventions." P 8, Disposition Table

When does CNSC engagement drift into CNSC promotion of the project? Pages 17-20 of the "Request for Decision" document describe the identification of groups and the many contacts CNSC staff have undertaken in this process. Pages 20 and 21 describe CNSC staff's overview of GFP's obligations concerning Indigenous consultation, and CNSC staff's expectations for GFP's reporting of how *"specific requests, issues and concerns raised were addressed and mitigated "* in the Environmental Impact Statement GFP will develop.

I think it important that CNSC staff (and the Commission) be sensitive to the issue of that staff should not take on the role of "promoters" of the project as staff members attempt to ensure that consultation is meaningful. I note that on page 9 under the theme of Public Participation (PP 2) staff states "*an administrative protocol between CNSC and the proponent is currently under development… to outline the administrative framework that includes roles and responsibilities such as communications between both parties related to the regulatory review*". This might be an appropriate process for defining the difference between the proponent and the staff on the important question of roles assumed in the consultation process, particularly in the process of consultations involving Indigenous peoples.

<u>Economic/Social Issues:</u>

Another area noted several times by CNSC staff could be broadly called "socio-economic" factors associated with the proposed SMR. Again staff is careful to outline the limited nature of such consideration :

. *"Market potential, economic feasibility and sources of company funding (with the exception of financial guarantees) are not within the mandate of the CNSC".* (p.15, Disposition Table)

. "*Overall economic feasibility, addressing items such as cost of materials used in the project or economic considerations from frequency of required maintenance are outside the scope of the CNSC's mandate"*. (p.35, Disposition Table)

. "*With respect to comments on financial supports and agreements, details of funding sources and commercial arrangements, such as those between GFP and AECL are not within the CNSC's mandate [except that] CNSC requires …the applicant…has the authority…to carry on the [proposed] activity.* " (p.13, Disposition Table)

These staff comments are in response to many comments from Indigenous and public groups questioning the economic viability of MMR developments and operations, and questioning also the GFP claim that the GFP reactor proposed at Chalk River would receive no federal funds.

To the lay person it seems as if rules developed in the times when nuclear facilities were operated by government agencies and therefore continuing government responsibility for funding provided the assurance that nuclear facilities would not be subject to financial bankruptcy, are rules now being applied without hesitancy to privately-developed facilities where that is not necessarily the case.

Overall, the staff comments seem circular or even mutually-contradictory on this subject. Take, for example, the following staff response concerning

> ***"Purpose of the project and alternative means of carrying out the project***
>
> *As outlined in subsection 4.1 (Purpose of the project) of the EIS Guidelines, the proponent's EIS will have to document in sufficient detail the justification and rationale for the project. If the objectives of the project are related to broader private or public sector policies, plans or programs, this information should also be included.* " (P.10, Disposition Table)

This staff response can be read as a requirement that the GFP MMR proposal be described as having the purpose of being the first step in the development of the CNRI, but staff also notes later that

> "*CNRI considerations, as an initiative by an organization that is not the proponent, are not within the scope of this EA and application for a Licence to Prepare Site. Detailed design information and the research and studies supporting the design including technical topics such as ones addressed by the CNRI are considered in detail during the assessment of an application for a Licence to Construct under REGDOC - 1.1.2*." (p.p. 36-7 Disposition Table)

Surely, for purposes of receiving public responses to the GFP MMR proposal, staff should be prepared to accept public and Indigenous comments on any part of the CNSC consideration at any time. To insist that such-and- such a concern should be expressed by the public or

Indigenous peoples only at a particular point in the whole process is both confusing and irritating and has the effect of discouraging participation.

On the subject of economic issues associated with the GFP MMR proposal this is especially the case. Staff notes that the CNSC "*has the authority…to require financial guarantees to cover eventual decommissioning costs of a facility, or, to mitigate business continuity conditions if the ownership model puts the licensee at risk of being inadequately funded by the owners (due to, for example, business failure*)." p.15, Disposition Table

The key phrase would appear to be "*has the authority… to require*", as the referenced General Nuclear Safety and Control Regulations (paragraph 3(1)(1) does not require the CNSC to set standards for the decommissioning or "financial mitigation" capacity of the proponent:

11	**Process systems**		
	Applicable section(s) of the NSCA or regulations made under the NSCA: **NSCA**: **24.** (5) A licence may contain any term or condition that the Commission considers necessary for the purposes of this Act, including a condition that the applicant provide a financial guarantee in a form that is acceptable to the Commission. Specific reporting provisions The licensee shall report on:		
	1. a serious process failure		Immediate
	2. a reactor shutdown or an unplanned change in reactor power		Immediate (significant) Or Five business days (non-significant)

I note that the above image is impossible for a 77-year-old participant in the Public Participation Process to reduce so that all columns are properly reproduced.

I further note that REGDOC -3.3.1, as it may affect financial guarantees associated with decommissioning, is officially "Currently under development" (see below)

3.3 Financial guarantees

Documents in this series provide information on financial guarantees used to ensure a licensee will have sufficient funds to decommission a licensed location and dispose of any associated nuclear substances.

Title	PDF	Statu
REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities* **Will supersede:** • **G-206, *Financial Guarantees for the Decommissioning of Licensed Activities* | PDF**	PDF, 38 pages, 874 KB	Currently und development

https://nuclearsafety.gc.ca/eng/acts-and-regulations/regulatory-documents/index.cfm#R26

This is not an easy matter for would-be participants in the Public Participation Process to sort out. And that is a real flaw in that Process because, as many commenters have indicated, the financial and economic elements of the CNSC decisions on the GFP proposal are of major concern.

Issues of Climate Change, Greenhouse Gases and Alternative Energy Sources:

This is a subject which again causes staff some difficulty in identification for purposes of the CNSC's oversight responsibilities. Responding to several comments, staff suggests

"*Many facets of a sustainability assessment are matters of policy and are outside the mandate of the CNSC. For instance, the CNSC's mandate is not to evaluate alternative energy sources or to make energy policy decisions, but to ensure, in accordance with the NSCA, the regulation of the development, production and use of nuclear energy to prevent unreasonable risk to the environment and to the health and safety of persons*." P.35, Disposition Table

The proponent's EIS is required to describe alternative methods for achieving the purposes of the MMR proposal at Chalk River. How is possible for the CNSC to evaluate the alternative (s) advanced by GFP without considering alternative energy sources or making energy policy decisions? At what level of risk to the environment and the health and safety of persons does the cost of proceeding with this particular MMR at this particular site become an unreasonable risk, and how, without evaluating alternative energy sources and making policy decisions, does the CNSC determine that matter?

In response to the many times participants provided comments under the Theme **Sustainability and Greenhouse Gas Assessments,** staff stated

"*…the proponent is required to conduct a greenhouse gas emission statement as outlined in sections 2.1 and 5.1 of the EIS guidelines and provide sufficient detail in the EIS*" p.35, Disposition Table.

Staff then refers interested readers to CNSC's Fact Sheet on greenhouse gas emission assessments for the Canadian nuclear fuel cycle. However, there the reader finds

"CNSC's interim strategy for environmental assessments

In order to align with ECCC's proposed methodology, the CNSC has proposed that proponents assess the total GHG production as part of CNSC-led environmental assessments. This assessment will be achieved through the use of a lifecycle analysis approach that includes estimation of upstream and downstream GHG emissions.

Lifecycle analysis is a recognized approach for characterizing GHG emissions from various electricity generating technologies. A lifecycle analysis on the core elements within the Canadian nuclear generation lifecycle may include the following stages:

- *mining and milling*
- *refining*
- *fuel fabrication*
- *nuclear power plant*
- *waste disposal (low-, intermediate-, and high-level radioactive waste disposal*)"

This appears to suggest that the "requirement" for a greenhouse gas emission assessment is, instead, part of an "interim strategy" for environmental assessments.

Appendix I of this document reproduces a further "clarification" of when and how the CNSC includes an estimate of greenhouse gases in considering factors that a proponent will produce for an EIS. Unfortunately I have tried unsuccessfully to identify where I first found this citation. However, it reflects the same ambivalence of CNSC processes on this subject.

The Staff Recommendations on "Scope"

All-in-all the staff recommendations to the Commission appear to be as limiting as possible within framework of the CEAA, and the criteria for some significant decisions to be made by the Commission are themselves not currently well-defined. These factors will make for a frustrating process for all involved in the future process as far as the GFP MMR proposal is concerned.

At this point I will indulge in a couple of observations about the "dispositions" of staff concerning my own previous submission in response to the GFP Project Description.

1) Staff note that on the "Theme" of Project Location a comment was made about its location being "*situated within an earthquake zone*" . page 33,Disposition Table.

That does not reflect the point raised in my submission, which is that the location proposed is in a Level 2 earthquake zone.

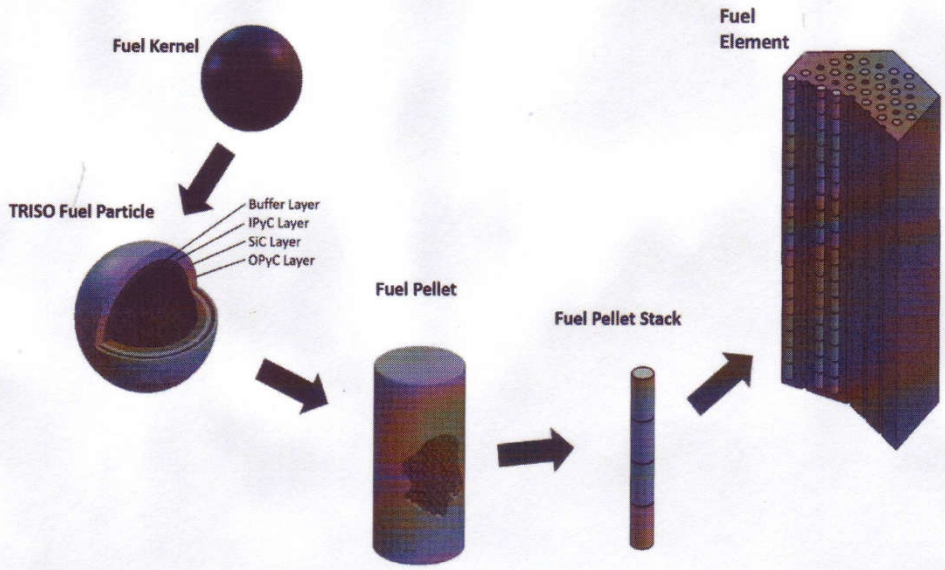
2) Staff note on the ”Theme” of Reactor Systems and Design that ”*the fuel is a prismatic block and not a pebble bed as outlined in Exhibit 3-6 of the project description*”. Page 36, Disposition Table

The fundamentals of ceramic coated particle fuel were developed in the 1960s. TRISO fuel was then applied to gas-cooled reactors. In the 1980s TRISO fuel was adapted for even higher temperature operation in the High Temperature Gas-cooled Reactors (HTGRs). TRISO technology has demonstrated irradiation performance. This reliable and historically proven TRISO fuel is suitable for use in the MMR reactor. The TRISO particles are highly proliferation resistant and provide environmental protection during and after operations.

The TRISO particles are bonded together to form fuel pellets. TRISO particles provide containment of radioactive materials during operations and accident conditions. The TRISO particles can be bonded together in graphite or in silicon carbide to form the fuel pellets. Exhibit 3-6 illustrates the MMR fuel concept.

The MMR fuel would be fabricated in a separate fuel fabrication facility, independent of the Project and not located within the Project's site.

Exhibit 3-6: The MMR Fuel and Fuel Elements



3.3.2.1.2. Reactor Core

The Reactor Core consists of hexagonal graphite blocks containing stacks of fuel pellets and full-length channels for helium flow, together called fuel elements (see

3)

"*The TRISO particles are bonded together to form fuel pellets. TRISO particles provide containment of radioactive materials during operations and accident conditions. The TRISO particles can be bonded together in graphite or in silicon carbide to form the fuel pellets. Exhibit 3-6 illustrates the MMR fuel concept. The MMR fuel would be fabricated in a separate fuel fabrication facility, independent of the Project and not located within the Project's site.*

The MMR Fuel and Fuel Elements Reactor Core The Reactor Core consists of hexagonal graphite blocks containing stacks of fuel pellets and full-length channels for helium flow, together called fuel elements (see Project Description for the Micro Modular Reactor™ Project at Chalk River Document Classification Number Revision Unrestricted CRP-LIC-01-001 2 The hexagonal fuel elements are stacked to form columns, which rest on support structures in the reactor. The core provides adequate coolant flow paths for heat removal, and the graphite material itself assists with further heat removal. The graphite core provides a neutron moderation and reflection function. The core also provides for areas for insertion of control rods. The MMR reactor core has a low power density and a high heat capacity resulting in very slow and predictable temperature transients." p. 22-23, Project Description for the MMR

What is it about the above description and diagram that is supposed to indicate that what is proposed is not "pebble bed" fuel? What is a "prismatic block" and how does it operate differently from a "pebble bed"?

Further, if this is a significantly different fuel in terms of its' operation, why, under the "Theme" of Accidents and Malfunctions, does staff specifically mention two learned articles cited by the CCRCA, one examining accident scenarios involving pebble bed high temperature reactors, the other examining the operation and waste-management of new pebble-bed nuclear reactors, and then provide the comment: "*CNSC appreciates the references provided by CCRCA, and will review them"*? p.33, Disposition Table.

Summary

The main concerns I would like to raise in discussing the Commission's consideration of the scope of factors to be contained in the EIS are

A. That because the GFP proposal for an MMR at Chalk River constitutes a research prototype in the development of the CNRI, the decision by staff to reject anti-MMR views expressed by almost 50% of the respondents to the GFP proposal is inappropriate and should be rejected by the Commission.

B. It is inappropriate for staff to involve themselves so intently in the effort to insure full participation of Indigenous groups and organisations that it begins to suggest staff are becoming proponents of the GFP proposal.

C. The assertion by staff is that the Licensing element of Commission consideration of the GFP MMR proposal will provide an adequate examination of the proposal so that it's financial and economic viability (and associated safety) are assured. The contradictory way in which staff suggest "scoping" (or non-scoping) of financial and economic information does not encourage confidence in this process. The Commission's examination of the financial and economic factors, particularly those which impact long-term safety of the GFP proposal, must be thorough.

D. The manner in which staff have suggested that issues of climate change, greenhouse gas production and alternative energy systems will, or will not, be considered within Commission review of elements to be addressed by the EIS is unsatisfactory. It is very important that the GFP proposal for an MMR at Chalk River be thoroughly assessed by the Commission in light of the Government's policy on Climate Change.

E. Overall the recommendations of staff are both excessively limiting on the elements to be included in the EIS which GFP will submit to the Commission, and those recommendations are not clearly based on CNSC guidelines, which themselves are also unclear on some important subjects.

Appendix I

Pursuant to subsection 19(2) of the CEAA 2012, the scope of the factors to be taken into account under paragraphs 19(1)(a), (b), (d), (e), (g), (h) and (j) is determined by the CNSC, as the responsible authority. To implement the Government of Canada interim measure with respect to upstream greenhouse gas emissions, the CNSC may require consideration of these types of emissions in the scope of the EA. On March 19, 2016, a definition of upstream GHG emissions was published by Environment Canada and Climate Change in the Canada Gazette. The proposed definition of upstream includes "all industrial activities from the May 2016 Generic Guidelines for the Preparation of an Environmental Impact Statement e-Doc: 4904776 (WORD) 12 e-Doc: 4995339 (PDF) point of resource extraction to the project under review." The processes that are to be considered as upstream activities will vary by the type of resource and the nature of the project under assessment. In general, upstream activities will include extraction, processing and handling as well as transportation. Where there is a reliable and feasible methodology for calculating upstream greenhouse gas emissions that are linked to the project, the proponent will be required to provide sufficient information to estimate these types of emissions. This information should be presented by individual pollutant and should be summarized in CO2 equivalent units per year. If upstream greenhouse gas emissions are not considered in the assessment, the proponent will provide a rationale in the EIS.