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DR. NANA-OWUSUA KWAMENA
Director
Environmental Assessment Division
Canadian Nuclear Safety Commission
280 Slater Street,
Ottawa, Ontario
K1P 5S9

Dear Dr. Kwamena**:**

Subject: Update to the Project Description in Support of Global First Power's Application for a Licence to Prepare Site for the Micro Modular Reactor™ Nuclear Facility at the Chalk River Site

The purpose of this letter is to inform Canadian Nuclear Safety Commission (CNSC) staff of recent updates to the Micro Modular Reactor™[1] (MMR) design, which has resulted in some changes to the project description that was submitted in [1]. This letter will also provide rationale that the factors to be considered in the development of the Environmental Impact Statement (EIS) as determined by the CNSC [2] remain sufficient and adequate.

Ultra Safe Nuclear Corporation (USNC), the designer of the MMR, recently announced design updates to the standardized design for their flagship MMR product. These design updates are driven by the inability in the short term to procure HALEU fuel (i.e. uranium enriched to 19.75%) and also by a desire to offer a product that serves a broader market of potential applications. Through ongoing market assessments and research, GFP and USNC have understood that the original design power output of 15 MWt may be insufficient for many applications, and that an increase in power output would be far more impactful in our efforts to de-carbonize energy production for remote communities and off-grid applications. Given that GFP's Chalk River Project is intended to provide a commercial demonstration of the MMR's capabilities, GFP feels it is important to incorporate these design updates into our project plans.

The following provides a high-level description of the updates to the MMR design. To ensure the Project's EIS remains valid as the design continues to mature, bounding parameters are presented:

- A flexible design that allows for variable nominal power outputs ranging from 10 MWt to a maximum of 45 MWt, serving a wider range of potential use cases.

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- A new annular fuel geometry with a nominal uranium enrichment of 9.75% (LEU+) with a potential to operate using fuel enriched up to 19.75% (HALEU), as originally envisioned, should an acceptable supply chain for this fuel become available during the project's lifetime. Regardless of enrichment level, this updated fuel design will provide for a better coolable geometry and a higher linear power while maintaining acceptably low fuel stresses and temperatures, effectively improving safety margins.
- Provision for on-site refueling and defueling with periods varying from 3 to 13.5 years depending on power demands. These periods would be approximately doubled should fuel with enrichment at 19.75% become available. The incorporation of defueling equipment into the standard plant design will simplify planned decommissioning activities following the conclusion of plant operations.
- Provision for interim spent fuel storage on site while the reactor remains in operation.
- A facility design life of 40 years. Actual operational life will be driven by project needs and CRL demand for energy.

Other changes in facility design include an increase in reactor pressure vessel dimensions to allow for improved neutron shielding and reduction in operator exposure. It is expected this will also result in reduced activation products and lower emissions to the surrounding environment.

At this stage, GFP is still in discussion with CNL to determine the energy outputs needed to meet future site needs. Early discussions suggest that an increase in power to service the CRL site would be desirable although the specific maximum power has not been determined yet. As such, the EIS will be conducted using potential output ranging from 10 to 45 MWt.

In its Record of Decision on the scope of the environmental assessment [2], the Commission determined that the scope of the factors to be considered for the MMR project included those mandated in paragraphs 19(1)(a) to (h) of the Canadian Environmental Assessment Act (2012), with no additional factors. GFP believes that the list of factors identified remains sufficient and adequate for the project. The project continues to be focused on the development of the same technology – a small, modular, gas-cooled reactor, developed by USNC, to be hosted on the CRL site. The major project activities also remain unchanged and will consist of typical activities for any such project, conducted by the same organizations. The impacts on the environment are expected to be largely unaffected due to the project changes.

GFP is continuing to pursue the development of the draft EIS for the project, consistent with the information provided in [1]; the preliminary submission of this document to the CNSC will include all the aforementioned project updates. Simultaneously, GFP has already begun communicating these project changes to Indigenous Nations and communities, and is preparing a formal announcement to inform the public and other stakeholders of this information. GFP will then continue to communicate these changes through its ongoing public information activities.

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Should you have any questions regarding this letter, please contact Jordan Black, GFP Licensing and Environment Director, at [redacted].

Sincerely,

[redacted]

Jos Diening
President and Chief Executive Officer,
Global First Power

cc. S. Eaton, S. Belyea, S. El-Jaby, C. Ducros, H. Tadros, D. Wylie (CNSC)
cc. J. Black, S. Kaufman, I. Azevedo, K. Esseghaier (GFP)

1 The Micro Modular Reactor (MMR) is a Trade Mark of Ultra Safe Nuclear Corporation. Everywhere the term "Micro Modular Reactor" or "MMR" are used in this document, it should be noted that a Trade Mark is associated with them.

References:

1. GFP Letter, J. Howieson to C. Carrier, "Updated (Revision 2) Project Description in Support of Global First Power's Application for a Licence to Prepare Site for the Micro Modular Reactor™ Nuclear Plant at Chalk River", July 9, 2019, GFCS19-003.

2. CNSC Record of Decision DEC 20-H102, "Decision on the scope of an environmental assessment for the proposed Micro Modular Reactor Project at the Chalk River Laboratories", July 16, 2020.