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Supplementary Information

Written submission from Cameco Fuel Manufacturing Inc.

In the Matter of the

Cameco Fuel Manufacturing Inc.

Application to Renew the Class IB Nuclear Fuel Facility Licence for Cameco Fuel Manufacturing Inc. in Port Hope, Ontario

Commission Public Hearing

November 23, 2022

Renseignements supplémentaires

Mémoire de Cameco Fuel Manufacturing Inc.

À l'égard de

Cameco Fuel Manufacturing Inc.

Demande de renouvellement du permis d'exploitation de l'installation de combustible nucléaire de catégorie IB pour Cameco Fuel Manufacturing Inc. à Port Hope (Ontario)

Audience publique de la Commission

23 novembre 2022

Canada

Land Acknowledgement

We respectfully acknowledge that Cameco's facilities in Cobourg and Port Hope, Ontario are in the traditional territory of the Michi Saagiig and Chippewa Nations, collectively known as the Williams Treaties First Nations, which include: Curve Lake, Hiawatha, Alderville, Scugog Island, Rama, Beausoleil, and Georgina Island First Nations.

Cameco respectfully acknowledges that the Williams Treaties First Nations are the stewards and caretakers of these beautiful lands and waters in perpetuity, and we are grateful that they continue to maintain this responsibility to ensure the health and integrity for generations to come.

We offer this acknowledgement to reaffirm our commitment and responsibility in building meaningful relationships and to improving our own understanding of local Indigenous peoples and their cultures.

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Introduction

Cameco Fuel Manufacturing (CFM) has applied to the Canadian Nuclear Safety Commission (CNSC) for a new Fuel Facility Licence, to replace the current licence, which expires on February 28, 2023. CFM has requested a licence term of 20 years and an increase in the production limit to an annual limit of 1650 tonnes of uranium (tU) as UO_2 pellets to align with the current production capacity of the facility.

CFM is committed to maintaining a secure supply of nuclear fuel to energize a clean-air world while continually improving safety performance and operations to not only ensure the safety of workers and the public, but also to protect the environment. CFM maintains the required programs, plans and procedures in all Safety and Control Areas (SCAs) areas as described in CMD 22-H12.1.

This CMD provides three types of supplemental information to the Commission in support of the licence application: information to correct errata in CDM 22-H12.1; information received by CFM subsequent to the submission of CMD 22-H12.1; and, clarification with respect to questions raised through the interventions submitted as part of the licence renewal process.

Errata in CMD 22-H12.1

The maximum total effective dose for an individual in the five-year regulatory periods on pages 19-20 of CMD 22-H12.1 are incorrect. The correct data was provided in the licence renewal application and in the following paragraph.

The *Radiation Protection Regulations* also establishes a five-year regulatory limit of 100 mSv, which applies to specified five-year periods. The periods relevant to the review period are from January 1, 2011 to December 31, 2015, from January 1, 2016 to December 31, 2020, and from January 1, 2021 to December 31, 2025. For the first five-year period, the maximum total effective dose for an individual was 36.2 mSv. For the second five-year period, the maximum total effective dose was 30.6 mSv. The maximum total effective dose information for 2021, which is the first year of the next five-year period was 9.9 mSv.

Information Received by CFM Subsequent to the Submission of CMD 22-H12.1

Assessment of Extreme Weather Events

The approved safety analysis for CFM considers extreme weather events as potential initiating events for incidents at the facility. Changes to the intensity and magnitude of extreme weather

events have been associated with climate change. Of the types of extreme weather events considered for CFM, including tornado, ice storm, and flooding, the safety analysis considers a flood scenario to be the bounding scenario in terms of likelihood. To ensure that climate change is adequately considered for CFM, an update to the flood modelling was completed in 2022 by third-party experts.

This review included hydrologic and hydraulic model revisions reflecting changes in land use, catchment areas, survey elevations and drainage feature alignments, in addition to updated Probable Maximum Precipitation (PMP) storm event considerations. The updated PMP 12-hour storm event reflects a 560 mm event with a 1-hour peak intensity of 285.6 mm/hr. This scenario is at the upper range of the annual precipitation for the area and represents an increase of 85% from the previous flood mapping exercise. This scenario represents a significant increase in the PMP from the previous study.

In this extremely conservative scenario, the flood mapping demonstrates that the CFM facility remains more than 1 m above the potential flood water levels.

Dose to the Public

CFM's CMD described the updated Derived Release Limit report and the use of a more conservative critical receptor and conservative exposure pathways for calculation of the estimated maximum dose to a member of the public from CFM operations. This change in receptor was implemented for 2021 and identified that based on the new assumptions, the calculated maximum dose to a member of the public was just under one-third of the public dose limit in 2021, which was reported in the annual compliance report March 31, 2022.

While well below the public dose limit, in accordance with the ALARA principle, CFM identified an opportunity to reduce the calculated annual dose to the public. Thereafter, CFM retained a third-party expert to complete a comprehensive gamma survey inside and outside the fence line of CFM, with a particular focus on mapping gamma radiation from the storage areas onsite and identifying where additional shielding could be installed to lower the dose rate measurable at the fence line. CFM has initiated an engineering project for additional shielding of the storage areas, and analysis using gamma modeling is ongoing to determine the appropriate location(s) and dimensions of shielding, with installation planned in 2023 once the engineering is complete.

CFM's assessment of the proposed production increase determined that because there were no changes to storage quantities and configurations required on site, there would be no impact on the gamma component of the calculated dose to the public.

CFM will continually evaluate the effectiveness of the actions taken throughout the project and will take action as necessary to reduce the calculated maximum dose to the public.

Community Support

Cameco works to build and sustain the trust of local communities by operating safely and acting as a good corporate citizen in its local communities. A key element of building and sustaining that trust is a commitment to provide those in the community with accurate and transparent reporting of environmental practices and performance.

On behalf of Cameco, Fast Consulting conducted a public opinion survey with 402 residents of the Municipality of Port Hope in the summer of 2022. The annual survey monitors support for Cameco's Port Hope operations (CFM and the Port Hope Conversion Facility (PHCF)). The results show that 81% of respondents are very aware of Cameco's Port Hope operations, 93% of respondents are supportive of continuation of Cameco operations and 82% of respondents are supportive of CFM's application for a 20-year licence. The results of the survey are available on camecofuel.com.

In September 2022, CFM staff and subject matter experts attended the Port Hope Fall Fair and a Cameco community barbeque to meet with community members and discuss any concerns or issues regarding the Port Hope operations. This informal process of information sharing had been and was well received by the community on this occasion.

While Cameco will continue to enhance its Public Information Program, the 38 supportive interventions submitted as part of this licence renewal further demonstrate strong support for CFM's operations from employees, unions, all levels of government, medical and first response organizations, community groups, and the nuclear industry.

Based on these results, CFM is confident that our request to the Commission for a 20-year licence term and increase in production limit is widely supported by the Port Hope community.

Clarification to Areas of Interest to Intervenors

Indigenous Engagement

Cameco has met regularly with Curve Lake First Nation (CLFN) and the Mississaugas of Scugog Island First Nation (MSIFN) in 2021 and 2022. Activities to date have focused on the development of relationships between Cameco and CLFN and MSIFN while sharing information regarding our operations, environmental performance, the regulatory process and the licence renewal. Cameco appreciates the opportunity to learn from the First Nations and looks forward to continuing conversations as our relationships develop with the Williams Treaties First Nations. Future conversations focused on areas identified by the CLFN and MSIFN

interventions, such as engagement of Indigenous knowledge systems, environmental stewardship, and Indigenous inherent and treaty rights, will enable better inclusion of Indigenous perspectives in our operations.

CFM would like to clarify two items raised in the intervention by CLFN, which implied bias against Indigenous peoples. CFM acknowledges the perspective of CLFN and will endeavor to correct this in future submissions.

With respect to the use of the term "Aboriginal Engagement" in the header for section 4.2 of CFM's CMD, CFM acknowledges the facts set out by CLFN. Upon reading the intervention, CFM reviewed the submissions in support of the licence renewal: the CMD, Licence Application, 2012-2020 Operational Performance Report and Forward Outlook and Justification for Licence Term and Production Increase. CFM acknowledges that the term "Aboriginal Engagement" was incorrectly used in the CMD, but notes that the other documentation uses the term "Indigenous Engagement". It is noted that CFM referenced REGDOC-3.4.1 *Guide for Applicants and Intervenors Writing CNSC Commission Member Documents* (February 2022) as a template for our CMD, and this document uses the term "Aboriginal Engagement" under "Other Regulatory Matters". Cameco will work with CNSC to address this in future licensing documentation.

With respect to the Indigenous Engagement Report being placed as an appendix to the CMD, CFM did not intend to diminish the importance of this report. The Indigenous Engagement Report was initially submitted under its own cover letter to CNSC staff on October 4, 2021. It was included in its entirety as an appendix in the CMD to demonstrate its significance to the licence application. In future licensing documentation, Cameco will work with CNSC to address this.

Waste Management

Additional information regarding waste management at CFM is provided below to clarify and/or correct assumptions made in interventions for this licence renewal.

All radioactive waste at CFM is classified as low-level radioactive waste. This waste has radionuclide content above the established unconditional clearance levels (uranium is 1 Bq/g), requires isolation and containment but is suitable for disposal in near surface facilities.

Routine Waste Generation

The CFM facility is designed such that limited areas of the facility contain uranium dioxide (UO_2) powder. Equipment and material taken into these areas is controlled to ensure the UO_2 remains of high quality. This has a secondary benefit of minimizing the locations in the plant where materials could become contaminated with UO_2 and end up as low-level radioactive

waste. Typical waste generated in this area would be paper, Personal Protective Equipment (such as gloves and earplugs), plastic, metal and wood used for packaging. All material leaving the controlled uranium area is monitored to determine whether uranium contamination is present, including any waste generated in this area. Uranium-contaminated waste is sorted separately from non-uranium contaminated waste.

In all areas of the facility, CFM segregates waste material into the following general groups:

- Conventional waste – non-hazardous solid waste sent to municipal landfill or recycling facilities. This includes wet-waste material from lunchrooms and meeting rooms, recyclables from office areas (typically wastepaper), wood and plastic from packaging/shipping, non-combustible materials, such as insulation, concrete, glass, and scrap metal. This material is monitored by a radiation technician. Only material that is below the unrestricted release criteria is sent to municipal facilities. This material is routinely shipped to municipal waste and recycling facilities.

- Contaminated non-combustible wastes – solid materials that cannot be decontaminated. Most material is categorized into the following groups: small metal parts; soil; concrete; insulation; floor sweepings; or miscellaneous. This material is packaged in drums or bags/totes designed for waste, characterized and sent to an appropriately permitted landfill in Idaho. Approximately one truckload of waste per year is generated.

- Contaminated combustible wastes – solid combustible materials that have been, or can be reasonably assumed to be, contaminated with uranium, such as scrap lumber, pallets, rags, paper, cardboard, rubber, plastic, gloves, and coveralls. This material is packaged in totes and sent to Cameco's Blind River Refinery for incineration. Approximately one truckload of waste per year is generated.

- Hazardous waste material (including solvents and organics, fluorescent light bulbs, batteries, photocopier toner, paint, etc.) is managed under the provincial hazardous waste requirements. This material is typically generated in areas of the facility where UO_2 is not handled. Any material generated in the pelleting area is monitored by a radiation technician prior to it being removed from the uranium processing area.

- Large equipment – equipment that is potentially contaminated with uranium and is too large to be stored in drums or boxes is placed into trailers for storage. This material will be sent to an appropriately licensed facility following characterization.

Legacy Waste

In 2012 and 2013, CFM began to characterize accumulated (legacy) waste that had been stored on-site prior to Cameco's acquisition in 2006. This material was stored in drums, wooden boxes

and hazardous waste bags. The characterization was completed in collaboration with a hazardous waste landfill facility in the United States, who confirmed that the material was eligible for disposal at that facility. The waste material included construction debris, furnace brick, concrete, grinding wheels and grit blast material which had some level of surface uranium.

In 2014, CFM managed campaigns where waste was transferred by truck to a rail siding, where the packages were loaded into gondola rail cars for shipment to the landfill in Idaho. Approximately 900 m^3 of packaged waste was disposed of in these projects.

In 2019, CFM implemented Cameco's small-scale waste project model, which allows for the deployment of small projects that may be completed for a smaller inventory of a specific waste type and manages newly generated low-level radioactive wastes on an ongoing basis. Between 2019 and 2021, approximately 500 m^3 of material was disposed of at the landfill in Idaho.

Recoverable Uranium

During routine operations, the uranium material generated from processes such as grinding and wastewater treatment is collected, drummed and sent to an appropriate facility, such as the Blind River Refinery or a uranium mill to add to the feed material. Uranium dioxide pellets that do not meet fuel specifications are oxidized into U_3O_8 and directly recycled into fuel onsite. This prevents these materials from becoming waste.

Future Outlook Waste Management

In the next licence period, CFM will continue to undertake waste management projects to address the remaining inventory of legacy wastes at the facility, which is primarily surface contaminated equipment stored in trailers.

Decommissioning Planning

CFM submitted an updated Preliminary Decommissioning Plan (PDP) and financial guarantee (FG) in support of the one-year licence renewal considered by the Commission in December 2021. CFM maintains the FG for decommissioning of $10.8 million approved by the Commission in the Record of Decision issued February 2022.

The regulatory guidance for decommissioning describes four phases : planning, preparation, execution and completion. CFM is an operating fuel fabrication facility in the decommissioning planning stage and is required to maintain the PDP at an appropriate level of detail until the preparation phase, which begins at the decision to cease operations. CFM has requested a 20-year licence term and intends to operate the facility for at least another 20 years.

For the purposes of decommissioning planning, CFM has developed the plan using a prompt decommissioning strategy, where decontamination, dismantling and/or clean-up will be

completed without any planned delays. For the residual contaminated materials from these activities, creation of a waste disposal site is assumed for in-situ decommissioning. In accordance with the guidance of REGDOC-2.11.1, the interdependency of Cameco's Ontario operations is acknowledged, and it is assumed that the radioactive portion of the waste would be consolidated in a single waste disposal facility. Based on very conservative assumptions, approximately 1% of the total volume of this facility would contain decommissioning waste from CFM.

For the purposes of the PDP and FG, the single waste disposal facility is assumed to be located at the Blind River Refinery. CFM and Cameco acknowledge that this is an assumption. Multiple locations for a consolidated waste disposal facility will be evaluated and studied as part of the Impact Assessment and Detailed Decommissioning Plan, which are required in the preparation for decommissioning stage. This stage will involve Indigenous engagement, including the consideration of potential adverse impacts to Indigenous inherent and treaty rights as well as public consultation. The location of a waste disposal facility would also be considered through the CNSC licensing process.

Summary

To summarize, CFM has requested a licence term of 20 years and an increase in the production limit to an annual limit of 1650 tonnes of uranium (tU) as UO_2 pellets to align with the current production capacity of the facility.

CFM's performance over the current licensing period demonstrates that the facility is qualified to carry out the activities permitted in the license. CFM remains committed to taking all reasonable precautions to protect the environment and the health and safety of persons, to maintaining the security of the facility and the nuclear substances associated with the facility, and to taking the necessary measures to facilitate Canada's compliance with international obligations.