Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 23-H103.3

File/dossier : 6.01.07
Date : 2023-04-11
Edocs: 7020425

Written submission from the Saugeen Ojibway Nation

Mémoire de la Nation Ojibway de Saugeen

In the Matter of

À l'égard de

Bruce Power Inc.
Bruce Nuclear Generating Stations A and B

Bruce Power Inc.
Centrales nucléaires de Bruce-A et B

Application to amend the power reactor operating licence for the Bruce Nuclear Generating Stations (NGS) A and B

Demande visant à modifier son permis d'exploitation d'un réacteur de puissance pour les centrales nucléaires de Bruce-A et B

Hearing in writing based on written submissions

Audience par écrit fondée sur des mémoires

April 2023

Avril 2023

Canada

Saugeen Ojibway Nation Request to Intervene:
Bruce Power Reactor Operating Licence Amendment Application Hearing

April 11, 2023

A. SON REQUEST TO INTERVENE

The Saugeen Ojibway Nation (SON) requests to intervene in the Canadian Nuclear Safety Commission (CNSC) hearing regarding the Bruce Power application to amend the Power Reactor Operating Licence (PROL) 18.02/2028 for Bruce Nuclear Generating Stations A and B.

The SON's interest in these proceedings

The SON consists of the Chippewas of Saugeen First Nation and the Chippewas of Nawash Unceded First Nation. The SON's traditional and treaty territory (Territory) extends east from Lake Huron to the Nottawasaga River and south from the tip of the Bruce Peninsula to the Maitland River system, 11 miles south of Goderich. The SON traditional waters include the lakebed of Lake Huron from the shore to the international boundary with the United States and the lakebed of Georgian Bay to the halfway point. Throughout its Territory, the SON has proven and asserted Aboriginal and Treaty rights, including a commercial fishing right in the waters of Lake Huron and Georgian Bay.

The Bruce Nuclear Generating Station (NGS) is within SON Territory and interacts significantly with SON traditional waters within Lake Huron. The SON and its leadership have a long history of participating in regulatory proceedings respecting Bruce NGS to ensure that the ongoing operations are protective of the SON People and Territory, and that the physical, radiological, and chemical impacts of the facility are credibly understood and carefully managed.

Nature and Scope of the SON's intervention

The SON requests to intervene in these proceedings by way of written submission. An overview of the SON's intended submissions is provided below.

Contact information for SON

SON can be contacted through its Environmental Office as well as through its legal counsel at:

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B. OVERVIEW OF THE SON SUBMISSIONS

The SON intends to make submissions on:

(1) its concerns regarding the proposed lifting of Licence Condition (LC) 15.3;
(2) the request that LC 15.3 be modified rather than lifted; and
(3) the request that a LC be included to require Bruce Power to keep SON informed regarding Heq levels, pressure tube fitness, and the ongoing research and development into fracture toughness modelling.

Lifting of Licence Condition 15.3

Nuclear reactor safety is one of SON's greatest concerns. The siting of the world's largest operating nuclear facility in SON Territory, without consultation or consent, has caused immeasurable stress and anxiety to the SON People. When Bruce Power applied to refurbish its reactors and renew its PROL to effectively double the life of the Bruce NGS, SON expressed deep concerns about the significant risks and the potential harm such an extension could cause to its People, land, water, animals, and resources.

A key issue to be addressed when considering extending a reactor's operating lifespan is ensuring the fitness of the facility's pressure tubes. As stated by the CNSC, pressure tubes are the heart of a CANDU reactor, containing both fuel bundles and the primary coolant. Pressure tubes that are in extended operation (i.e., beyond 210,000 equivalent full power hours) are susceptible to rising hydrogen equivalent concentrations (Heq) levels, making them vulnerable to cracking. The operational safety of a CANDU reactor depends on the fitness of the pressure tubes and their ability to resist rupturing. The failure of one or more pressure tubes would have—and has had—significant negative impacts.

To protect against such an outcome, the CNSC included LC 15.3 (Pressure Tube Fracture Toughness) in Bruce Power's renewed PROL. This licence condition requires the licensee to demonstrate to the Commission that it is safe to operate a reactor with Heq levels in excess of 120 ppm. This threshold was based on the industry's fracture toughness model. In anticipation of the expected challenge of remaining under the 120 ppm threshold with the passage of time, the industry began developing plans to extend the validity of the existing fracture toughness model beyond 120 ppm. Its aim was to develop a model that would support the operation of the pressure tubes in extended operation to the planned end-of-life.

In 2021, in the midst of these efforts to extend the validity of the existing model, Bruce Power discovered Heq levels of up to 212 ppm in certain pressure tubes, well above the 120 ppm limit. Despite these developments, the industry persevered with

its original plan of seeking to have CNSC raise the limit of LC 15.3 in the spring of 2022. Specifically, the industry sought to have CNSC staff accept the use of the Revision 2 model for Heq values up to a maximum of 140 ppm, with a 100 ppm restriction for material within 1.5 m of the front end of the pressure tube. Prior to the discovery of Bruce NGS Heq levels, it was expected that these revised limits would be sufficient to cover pressure tube operations until additional tests could be completed to achieve the 160 ppm target. The CNSC conditionally accepted the use of the Revision 2 model.

Bruce Power is now seeking to remove LC 15.3 entirely rather than seeking a modification to the Heq limits in its PROL. Bruce Power contends that reliance on LC 6.1 (Fitness for Service) is adequate, and that consolidating LC 15.3 and 6.1 will eliminate redundancies. The SON submits that LC 15.3 represented an essential safety measure rather than a redundancy. The industry's inability to meet this safety threshold is not a justification for removing the condition from the PROL. Nor is it proof that LC 6.1 is adequate to ensure the safety of the SON Territory or its People.

Allowing the Bruce NGS to operate above the established safety limits to provide industry with the time to complete additional research to demonstrate it is safe to continue to do so is not sound or logical. The SON requests that new and science-based thresholds be established on the basis of currently understood fracture toughness models, and that reactor units that are unable to operate under these thresholds be taken offline or that other demonstrably suitable risk mitigation measures are designed and implemented.

Reliance on Plan Safety Systems

In considering Bruce Power's request, CNSC staff have concluded that these elevated Heq limits should have "no impact on the ability of process and safety systems to mitigate the consequences of a pressure tube rupture because of these findings."[1] Referring to the plan safety systems and the fact that pressure tube failure is a design-basis event for CANDU reactors is not reassuring to the SON.

The industry and the regulator are considering entering unchartered waters with respect to the safety of extended operation pressure tubes. Given the apparent lack of sound scientific data to provide guidance, references are now being made to the built-in mitigating safety system that will shut down the facility in the event of a tube rupturing. Given that the Bruce NGS is located in SON Territory and the SON People live in communities adjacent to the facility, reliance on CANDU reactors safety mechanisms in the event of a pressure tube failure is cold comfort.

[1] https://www.brucepower.com/wp-content/uploads/2022/10/CMD22-M37.pdf

The SON are concerned that Ontario's energy dependence on Bruce NGS is impacting CNSC Risk Informed Decision Making process and ultimately putting them and their Territory at risk.

Licensing Conditions to keep the SON informed

In addition to the SON seeking to have a modified LC 15.3 retained in the PROL, it will also be seeking to have an additional LC included in the PROL that requires Bruce Power to keep the SON informed about Heq levels, pressure tube fitness, and the ongoing research and development into fracture toughness modelling.

Over the past 60 years, the SON Territory has been subject to intense nuclearization. The negative impacts regarding the operation of the Bruce NGS on SON communities are both real and serious. The SON People experience the effects of increased risk and perception of risk, which causes fear, strain, and dread. Removing or lowering safety standards associated with the extended lifespan of the Bruce NGS will further exacerbate these impacts. The SON relies on the rigorous oversight of the nuclear facilities within its Territory by the CNSC. Although some of the harm is intractable and could be made worse depending on the outcomes of the present hearing, part of this harm can be mitigated through increased information sharing and transparency between the CNSC, Bruce Power, and the SON.