



Supplementary Information

Written submission from Bruce Power Inc.

In the Matter of

**Bruce Power Inc.
Bruce Nuclear Generating Stations A and B**

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

Hearing in writing based on written
submissions

April 2023

Renseignements supplémentaires

Mémoire de Bruce Power Inc.

À l'égard de

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

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

Audience par écrit fondée sur des mémoires

Avril 2023

June 15, 2023

BP-CORR-00531-04227

Mr. Denis Saumure
Commission Registrar
Canadian Nuclear Safety Commission
P.O. Box 1046
280 Slater Street
Ottawa, Ontario
K1P 5S9

Dear Mr. Saumure:

Application for the Amendment of the
Power Reactor Operating Licence: Responses to Commission Panel Members

The purpose of this letter is to provide responses to Commission Panel Members' questions received in Reference 1.

Bruce Power's responses are provided in Attachment A.

If you require further information or have any questions regarding this submission, please contact Mr. Maury Burton, Senior Director, Regulatory Affairs, at (519) 361-2673 extension 15291, or maury.burton@brucepower.com.

Yours truly,

**Lisa
Clarke** Digitally signed
by Lisa Clarke
Date: 2023.06.15
13:34:00 -04'00'

Maury Burton
Senior Director, Regulatory Affairs
Bruce Power

cc: CNSC Bruce Site Office
Monica Hornof, CNSC - Ottawa
registry-greffe@cnsccsn.gc.ca

Attach.

Reference:

1. D. Saumure to M. Burton, "CMD 23-H103Q - Questions from Commission Panel Members", June 1, 2023, e-Doc 7056203, BP-CORR-00531-04220.

Attachment A

Bruce Power's Responses to Panel Members' Questions

Attachment A: Bruce Power's Responses to Panel Members' Questions

Bruce Power's responses to the questions posed by Commission Panel Members, in Reference A1, are provided below.

External Advisory Committee Question #1: *Will there be an expectation somewhere to require that the degree of communication with Indigenous and other local community groups be enhanced until the level of engagement/communication is mutually agreed to?*

Bruce Power Response:

Bruce Power currently utilizes a number of interfaces with Indigenous communities to communicate priorities, items of interest and issues. Bruce Power also has protocol agreements with the communities of interest (Saugeen Ojibway Nation [SON], the Historic Saugeen Métis [HSM] and the Métis Nation of Ontario [MNO]) which outlines the requirement to report to the communities on regulatory matters.

Bruce Power meets with the communities' contacts at least biweekly through the Indigenous Relations Director; monthly with the broader Bruce Power team through the Training, Employment, Education and Business Opportunities (TEEBO) table; HSM and MNO on monthly touch points; and quarterly with the full Bruce Power team (Environment, Human Resources, Regulatory Affairs and Indigenous Relations).

In addition to the regular touch points, Bruce Power communicates with the communities on items of interest as needed when issues arise.

Bruce Power will continue to utilize the existing protocols and tables for communication to communities and where necessary address any gaps through the protocol agreements and existing tables.

External Advisory Committee Question #2: *Does Bruce Power accept the full 360-degree extent of the Region of Interest at the inlet and outlet?*

Bruce Power Response:

Based on extensive inspection/surveillance results and modelling results to date, Bruce Power is confident that the extent of the Region of Interest (ROI) is less than 180°.

However, based on discussions with CNSC staff, it is understood that additional research and development work will need to be completed before the definition of ROI could be changed in the licensing basis to less than the full 360° extent.

External Advisory Committee Question #3: *Has the conclusion of the Finite Element Diffusion analysis been verified on samples from the removed Pressure Tubes?*

Bruce Power Response:

Through-wall hydrogen equivalent concentration gradients can only be observed through destructive examination techniques on removed pressure tubes. Localized areas of elevated hydrogen equivalent concentration have now been detected in a number of inlet rolled joints of removed tubes at similar axial locations (such as 10 mm inboard of the burnish mark).

Metallographic examinations have been performed for the inlet localized areas of elevated hydrogen equivalent concentration for B6S13 and D1U09, and the results showed a clear through-wall hydrogen equivalent concentration gradient with the elevated hydrogen equivalent concentration residing on the outside diameter of the pressure tube.

Hydrogen equivalent concentration measurements have been performed on the inside diameter, outside diameter, and middle of wall for the B6S13 inlet localized area. The results showed that the finite element predictions of the through-wall hydrogen equivalent concentration gradient at 10 mm inboard of the burnish mark are representative, or slightly conservative, relative to the punch measurements and image analysis taken from the B6S13 inlet rolled joint.

External Advisory Committee Question #4: *If the Finite Element Diffusion analysis is correct, what will be the effect on the validity of scrape samples on the inside surface of a pressure tube to measure the Hydrogen equivalent concentration level in the tube wall?*

Bruce Power Response:

For the inlet rolled joint, given the propensity for elevated hydrogen equivalent concentrations on the outside diameter of the pressure tube, it is highly unlikely scrape sampling would be able to measure these elevated hydrogen equivalent concentration concentrations. All scrape measurements performed at the location of the localized area of elevated hydrogen equivalent concentration do not show unusual results (high hydrogen equivalent concentration).

External Advisory Committee Question #5: *Is there a document somewhere that updates the status of all the planned work that was discussed / promised at previous hearings? What percentage of each of the proposed work activities has been completed?*

Bruce Power Response:

Yes, Bruce Power has been providing, and will continue to provide, routine updates on key R&D activities. The most recent update was submitted to the CNSC in Q1 2023 (Reference A2), and the next update is planned for September 2023. All items continue to progress to the schedule committed to CNSC staff.

External Advisory Committee Question #6: *If the risk of a pressure tube failure is fully mitigated by the safety systems in the plant, why did OPG and Bruce Power spend >\$100M on R&D to prevent such failures from happening?*

Bruce Power Response:

Bruce Power has always maintained an extensive pressure tube fitness for service program which incorporates findings from in-service inspections, surveillance, and R&D with the goal to prevent pressure tube failure.

Consistent with this practice, Bruce Power has completed multiple assessments that have demonstrated that pressure tubes remain fit for service with the presence of elevated hydrogen equivalent concentration in both the inlet and outlet rolled joint area. Further, these assessments provide input to changes made to how the plant operates to provide additional margins to pressure tube fitness for service. The extensive hydrogen equivalent concentration R&D program that has been put in place is intended to further validate the inputs used in these assessments and produce predictive tools for the future.

Bruce Power has not relied on the ability to mitigate a pressure tube failure as its sole justification for continued operation.

Further, allowing a pressure tube to fail would have serious economic and reputational consequences, even if public safety was not threatened. Maintaining a current understanding of the fuel channel condition is therefore a prudent business strategy. It is good corporate stewardship to monitor and maintain the health of the generating assets.

External Advisory Committee Question #7: *How does Bruce Power decide whether the information flow to the SON and other stakeholder groups has been adequate?*

Bruce Power Response:

Bruce Power has protocol agreements with the communities of interest (SON, HSM and MNO). These agreements are drafted in collaboration with the communities and reviewed on an ongoing basis typically ahead of expiration or to address updates to funding schedules. The SON and Bruce Power agreement is currently set to expire, and a new comprehensive agreement is being drafted. Similar discussions will be happening with the HSM and MNO protocol agreements.

There will be an opportunity to review the regulatory steps and processes outlined in the protocols as part of the agreement renewal with the communities to ensure adequacy of communication.

In addition to these efforts, Bruce Power meets with community contacts at least biweekly through the Indigenous Relations Director; monthly with the broader Bruce Power team through the Training, Employment, Education and Business Opportunities (TEEBO) table; HSM and MNO monthly touch points; and quarterly with the full Bruce Power team (Environment, Human Resources, Regulatory Affairs and Indigenous Relations).

In addition to the regular touch points, Bruce Power communicates on items of interest on an ad hoc basis as needed to the communities when issues arise.

References:

- A1. D. Saumure to M. Burton, "CMD 23-H103Q - Questions from Commission Panel Members", June 1, 2023, e-Doc 7056203, BP-CORR-00531-04220.
- A2. Letter, M. Burton to M. Hornof, "Bruce A and B: Update Regarding Elevated Hydrogen Equivalent Concentrations and Response to CNSC Risk Assessment, Action Item 2022-07-26737, Closed Action Item 2022-07-23135", March 29, 2023, BP-CORR-00531-03855.