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CMD : 23-H103.B

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Response to Commission
Request for Information (CMD
23-H103Q.A)

Réponse à une demande
d'information de la Commission
(CMD 23-H103Q.A)

Bruce Power Inc.

Bruce Power Inc.

**Bruce Nuclear
Generating Stations A
and B**

**Centrales nucléaires de
Bruce-A et Bruce-B**

Public Hearing in Writing

Audience publique par écrit

Submitted by:
CNSC Staff

Soumise par :
Le personnel de la CCSN

Signed/signé le

28 July 2023



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Background

In this CMD, CNSC staff are responding to a question from the Commission provided to staff in [CMD 23-H103Q.A](#) as part of the hearing in writing [23-H103](#). This hearing deals with the request from Bruce Power to amend the Power Reactor Operating Licence for the Bruce Nuclear Generating Stations A and B to remove Licence Condition 15.3 and to consolidate all requirements for fitness for service applicable to pressure tubes under Licence Condition 6.1.

The question from the Commission directed to CNSC staff, as well as CNSC staff's response, can be found in the next section.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality considerations.

The Commission Question and CNSC Staff Response

The Commission's question has been reproduced below in the shaded box to provide suitable context for CNSC staff's response.

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| #1 | <p>The Commission requires a response to the following question raised by the EAC in CMD 23-H103.10A</p> <p>Bruce Power's Reference A4 in CMD 23-H103.1 (BP-CORR-00531-02820), states the following in the executive summary.</p> <p style="padding-left: 40px;">The "... focus of the evaluation was on the high levels of Heq at the blip and the potential impact on the hydrided region at the tip of a postulated axial blunt flaw. It was not intended to establish a comprehensive industry methodology for simulating the distribution of Heq in the entire rolled joint region. R&D work to predict the levels of Heq in the entire rolled joint region is ongoing. The simulation results of the through-wall distribution of Heq at the blip are not intended to be used in an evaluation of other surveillance pressure tubes or in a fitness-for-service evaluation."</p> <p>As noted in Reference A4, the new methodology (is) "<i>not intended to be used in an evaluation of other surveillance pressure tubes or in a fitness-for-service evaluation.</i>"</p> <p>In CMD 23-H103.1 Attachment A, Bruce Power submits the following:</p> <p style="padding-left: 40px;">"Pressure Tube Fitness for Service Requirements for Pressure Tubes with High [H]eq in Regions of Interest near the Inlet and Outlet Rolled Joints</p> <p style="padding-left: 40px;">For the Inlet Rolled Joint Region of Interest: Bruce Power shall follow the requirements of N285.4 and N285.8 to demonstrate fitness for service in the inlet region of interest. This is based on the Finite Element Diffusion Analysis of High Hydrogen Level in Rolled Joint Region with Postulated Flaw (Reference A4) results which demonstrate that that the high [H]eq does not impact on the inner diameter of the tube where a flaw may occur."</p> <p>The EAC commented that the two sentences do not appear to be consistent:</p> <p style="padding-left: 40px;">"The simulation results of the through-wall distribution of Heq at the blip are not intended to be used in an evaluation of other surveillance pressure tubes or in a fitness-for-service evaluation."</p> <p>and</p> <p style="padding-left: 40px;">"This is based on the Finite Element Diffusion Analysis of High Hydrogen Level in Rolled Joint Region with Postulated Flaw (Reference A4) results which demonstrate that the high [H]eq does not impact on the inner diameter of the tube where a flaw may occur."</p> <p>What is CNSC staff's position regarding the applicability of the results of the Finite Element Diffusion Analysis of High Hydrogen Level in Rolled Joint Region with Postulated Flaw (Reference A4) for use in a fitness-for-service evaluation?</p> |
|----|--|

The specific text from Attachment A of [CMD 23-H103.1](#) was a proposal from Bruce Power for demonstrating how the results of the Finite Element Diffusion Analysis of High Hydrogen Level in Rolled Joint Region with Postulated Flaw may be used in pressure tube fitness for service evaluation. However, CNSC staff did not accept Bruce Power's proposal for use as compliance verification criteria under Licence Condition 6.1 of the Bruce NGS A and B Licence Conditions Handbook. It is CNSC staff's position that the approach in Attachment A of [CMD 23-H103.1](#), proposed by Bruce Power, should only be adopted for fitness for service compliance verification when the Heq model has reached a sufficient state of development.

CNSC staff's conclusions regarding the confirmation of fitness for service using the inlet rolled joint Heq model, which were provided in [CMD 22-M37](#), are as follows and remain unchanged:

“However, the preliminary results of industry's modelling cannot be used to directly confirm the pressure tube fitness for service with inner diameter surface flaws near the inlet burnish mark; further model development is required.”

Conclusion

CNSC staff's conclusions and recommendations made in [CMD 23-H103](#) remain unchanged.

Glossary

For definitions of terms used in this document, see [REGDOC-3.6, *Glossary of CNSC Terminology*](#), which includes terms and definitions used in the *Nuclear Safety and Control Act* and the regulations made under it, and in CNSC regulatory documents and other publications.

Additional terms and acronyms used in this CMD are listed below.

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|----------------|------------------------------------|
| CMD | Commission Member Document |
| CNSC | Canadian Nuclear Safety Commission |
| EAC | External Advisory Committee |
| Heq | Hydrogen equivalent concentration |
| R&D | Research and development |