Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

CMD 21-H113.2

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Questions from External Advisory Committee to Bruce Power Inc. and CNSC Staff

In the Matter of

Request for authorize Bruce Power Inc. to restart Bruce Nuclear Generating Station A Unit 4 and Bruce NGS B Units 5, 7, and 8 following future outages

Public Hearing - Hearing in writing based on written submissions

November 2021

Questions du Comité consultatif Externe à Bruce Power Inc. et au personnel de la CCSN

À l'égard de

Demande de Bruce Power Inc. afin d'obtenir l'autorisation de redémarrer la tranche 4 de la centrale nucléaire deBruce-A et les tranches 5, 7 et 8 de Bruce-B après tout arrêt futur

Audience Publique - Audience fondée sur des mémoires

Novembre 2021

Canada

EAC Comments on Documents provided for Nov 12 CNSC Meeting

Nov 9, 2021

CMD 21-H113 CNSC staff assessment of supplemental information……

1. Generally agree with the overall recommendations

2. Section 4, last paragraph*:" Pressure tubes are most at risk of crack initiation and failure during heatup or cooldown of the reactor; it is irrelevant whether the heatup or cooldown cycle occurs as a result of a planned or unplanned outage*."

   This comment is valid for heat-ups, as these are planned events which are carried out under predictable conditions. Similarly, cooldowns during planned outages are carried out under predictable conditions. However, cooldowns during forced outages can be very challenging for the operators because of the sudden nature of the failure causing the outage and the possibility of unusual conditions in the reactor due to the failure. The risk of crack initiation may be higher during challenging cooldown activities.

E-DOCS-#6668418-v1-CMD 21-H113.1-Submission from Bruce Power Units 4-5-7-8

3. I think that there is general agreement that it is unwise to carry out extensive, un-planned inspections during forced outages. It should not be necessary to continue to provide lengthy explanations of how carefully work is planned for a forced outage.

4. In previous submission CMD 21-H11.2A (File / dossier: 6.01.07; Date: 2021-09-02; Edocs: 6633418) Bruce Power appears to be arguing that they meet the requirements of both Option A and Option B. In this submission, Bruce Power is providing information only in support of Option B. Does Bruce Power believe that it also meets the conditions for Option A.? If so, this represents a difference of opinion from that of the CNSC. Is there an intention to resolve this difference of opinion if it still exists?

5. **Attachment A**, page 1, para1 states:"*All inspections completed on Unit 4 have demonstrated there were no elevated levels of hydrogen above licensing requirements in the inspected area of the tubes".* This comment is repeated several times in the Attachment. However, it is not possible to judge the relevance of this statement to the issue at hand, i.e. the observation of anomalously high Heq in the ROI, without knowing whether any of these inspections included any parts of the region of Interest. Did any do so?

In Attachment A regarding unitized inspection findings, the number of flaws in the inboard 100 mm of the outlet BM (OBM) are reported for each of units 4, 5, 7 and 8.

- What about data from Units 3 and 6?
- Why is the axial length 100 mm when Enclosure 1 uses 75 mm for the axial inboard length to define the region of interest?

We realize that we are missing some detail in the methodology, but we are unable to find the description in prior updates of supplemental information from BP. As noted at the November 5 hearing, it would be much easier for the readers and particularly the decision-makers to understand the arguments if the text of the CMD presents the information necessary to understand the argument without needing to dig through previous submissions on the subject.

6. **Enclosure 1**: In section 4.0, para 2, the statement is made: "*It was judged that the product of these two probabilities would be virtually unaffected by increasing the axial extent of the database*." A judgement decision would be more acceptable if there were some sensitivity cases run to confirm that the two terms do indeed cancel each other out.

7. Section 5.1 on page 20 of 37 begins with the statement: "*This probability is assumed to follow a Poisson distribution "*. Is there any physical evidence to confirm that this assumption is valid? What would be the consequence if it wasn't? Validating assumptions is an important part of any engineering assessment.

8. In Section 5.2 and 5.4, results are given to 5 significant figures. For example in Section5.2 "…*that a flaw is present is estimated to be 0.011606* ". What is the basis for the surprisingly large number of significant figures reported in these sections of the report?

9. **Enclosure 2**: In the last sentence of the Results Section (on p.35 of 37), the following statement is made:" *the estimated number of flaws in the uninspected population was …~1.9-2.0. The updated, more refined analysis … indicate a more realistic value of 0.6 dispositionable flaws* …". What is the basis for stating that 0.6 is more realistic than 2. It is more favourable (which is why the conservatism was removed), but how was it concluded that the lower figure is more realistic?

10. In addition, the argument is that there were 6 real flaws and it was assumed that 1/3 would be dispositionable, i.e. there would be 2 dispositionables. In fact, there were 0 dispositionable flaws. Saying that this shows the assumption is conservative seems a bit weak. If we calculate how often in a population you would get you get 0 dispositionable items if you had a 1/3 dispositionable population …. we think it is just (2/3)^6 which means that 9% of the time, that is the result you would expect. It seems inappropriate to discard the 1.9 expected flaws when it is expected that 9% of the time that is indeed the number you expect.