



**Questions from External Advisory
Committee to Ontario Power
Generation and CNSC Staff**

**Questions du Comité consultatif
Externe à Ontario Power Generation et
au personnel de la CCSN**

In the Matter of

À l'égard de

**Request for authorization to return
Pickering Nuclear Generating Station
(NGS) Units 6-7-8 and Darlington NGS
Units 1 and 4 to service**

**Demande pour obtenir l'autorisation de
remettre en service les tranches 6-7-8 de la
centrale nucléaire de Pickering et les tranches
1 et 4 de la centrale nucléaire de Darlington**

Public Hearing - Hearing in writing based on
written submissions

Audience Publique - Audience fondée sur des
mémoires

November 2021

Novembre 2021

OPG Document:CD# NK38-CORR-00531-22869

As discussed in the previous hearings in early October, the case for allowing Darlington to restart from a forced outage is compelling. However the information presented in this submission is un-convincing in a few areas:

1. Enclosure 1 is a statistical assessment of the possible numbers of flaws in the ROI of Darlington Unit 1 and 4. The claim is made that "*Enclosure 1 quantitatively demonstrates that no flaws which pose any challenge to pressure tube fitness for service are present in the ROI*". Claiming without any qualifiers that this analysis concludes that there is zero risk of challenging Fitness for Service seems like a stretch for a statistical analysis done at 95% confidence level.
 - a. Repeat comment from last hearing: a base case which blends Darlington data (where the use of a fuel carrier greatly reduces the risk of flaws in the ROI) with Pickering B data will present a risk for Pickering B which is shifted in the non-conservative direction.
 - b. Insufficient justification for blending Darlington flaw data with Pickering flaw data is presented since the fuel and fuel channel designs for the two stations are significantly different.
2. Enclosure 2 seems like a long (mathematical) way of saying that "FC failure is within the design basis so we don't need to worry about it". This argument has not been given much weight historically since it removes all the redundant lines of defence and relies entirely on containing the activity released by the failure.
3. Enclosure 3 provides an estimated frequency of occurrence of two independent, concurrent pressure tube (PT) failures. As expected, the frequency is the square of the frequency for a single PT failure. What is not assessed anywhere is the more difficult question of whether a PT failure (which can be a violent event resulting in calandria tube failure and end fitting ejection) can cause a second neighbouring weakened PT to fail. Consequential failures from a design-basis event are not allowed.
4. The results of full scale fuel channel burst tests at Stern Laboratories in the 1990's are not addressed in the deterministic safety assessment. The test rig contained an array of neighbouring simulated fuel channels and the results demonstrated that the only observable damage was collapse of the calandria tubes onto their pressure tubes with resultant compressive loading on the inner pressure tubes. The magnitude of a fuel channel failure at power will be limited by potential crack arrest due to the high fracture toughness at upper shelf conditions.

OPG CMD Doc # CMD 21-H112.1 - Pickering 6-7-8 Restart

This document is virtually identical to OPG Document:CD# NK38-CORR-00531-22869 (reviewed above).

The comments on the Darlington CMD apply to the Pickering 5-8 CMD also

CNSC Staff CMD: 21-H112, 21-H114

This CMD is quite short and agrees with OPG's contention that its Darlington and Pickering units meet Condition b of the Order.

Specific Comments:

1. This CNSC decision is based to a surprising extent on the ability of the plant to suffer a major FC failure and mitigate the impacts through other plant design features, in other words, "FC failure is a design basis event" (see Section 3.3 of the CMD)
2. Insufficient supporting justification is presented for reducing the ROI to 60 mm inboard of the burnish mark from the previous value of 75 mm. While this may indeed be a reasonable change, the documentation does not provide any supporting justification.
3. The logic by which a flaw observed in a channel was dispositioned as "not plausible as a future flaw" was not explained in the CMD. Rather it referenced an OPG document as the source for this conclusion.