CMD 20-H2.1B

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Supplementary Information

Written submission from BWXT Nuclear Energy Canada Inc. in response to undertakings to provide clarification or additional information.

Renseignements supplémentaires

Mémoire de BWXT Nuclear Energy Canada Inc. en réponse aux engagements de fournir des explications ou davantage d’information.

In the Matter of the

À l’égard de

BWXT Nuclear Energy Canada Inc.,
Toronto and Peterborough Facilities

BWXT Nuclear Energy Canada Inc.,
installations de Toronto et Peterborough

Application for the renewal of the licence for Toronto and Peterborough facilities

Demande de renouvellement du permis pour les installations de Toronto et Peterborough

Commission Public Hearing

Audience publique de la Commission

March 2 to 6, 2020

Du 2 au 6 mars 2020

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Nuclear Energy Canada Inc.

Mr. Marc Leblanc
Commission Secretary
Canadian Nuclear Safety Commission
P.O. Box 1046, Station B
280 Slater Street
Ottawa Canada
K1P 5S9

Date: March 30, 2020

Subject: **Response to BWXT NEC undertakings from CNSC hearing March 2-6 with respect to FFOL-3620.01/2020**

Dear Mr. Leblanc,

At the subject hearing BWXT Nuclear Energy Canada Inc. (BWXT NEC) took on two undertakings to the Commission. Responses to these undertakings are provided below.

1) **Pinholes in pellets**

At the hearing there was a question with respect to pinholes in fuel pellets and the measures that BWXT has in this context. While the question related to pinholes in pellets we respond here for both fuel pellets, and for the zirconium fuel element within which the fuel pellets are enclosed.

The quality of pellets is well described in AECL specifications for CANDU reactors. There are various allowances for different defect types which are generally characterized by size and quantity. All pellets are inspected based on these specifications. Our quality plan covers the specific methods used to evaluate conformance to the specifications.

Zirconium fuel element integrity is verified by two separate methods. Each tube is 100% inspected for defects using ultrasonic evaluation and the end closure weld is ultrasonically tested on a sampling basis. Additionally, each welded fuel element is filled with helium and once incorporated into a fuel bundle is checked for leaks using a helium leak tester to verify that there are no leaks in the fuel cladding. Each fuel bundle must successfully pass the helium leak tester before moving on to final inspection.

David A. Snopek, P.Eng. *Director, EHS & Regulatory*
1160 Monaghan Rd Peterborough K9J 0A8 Canada
t: +1.705.536.3624 www.bwxt.com

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2) **<u>Information with respect to the distance away from the Toronto facility that the maximum uranium in air concentration extends</u>**

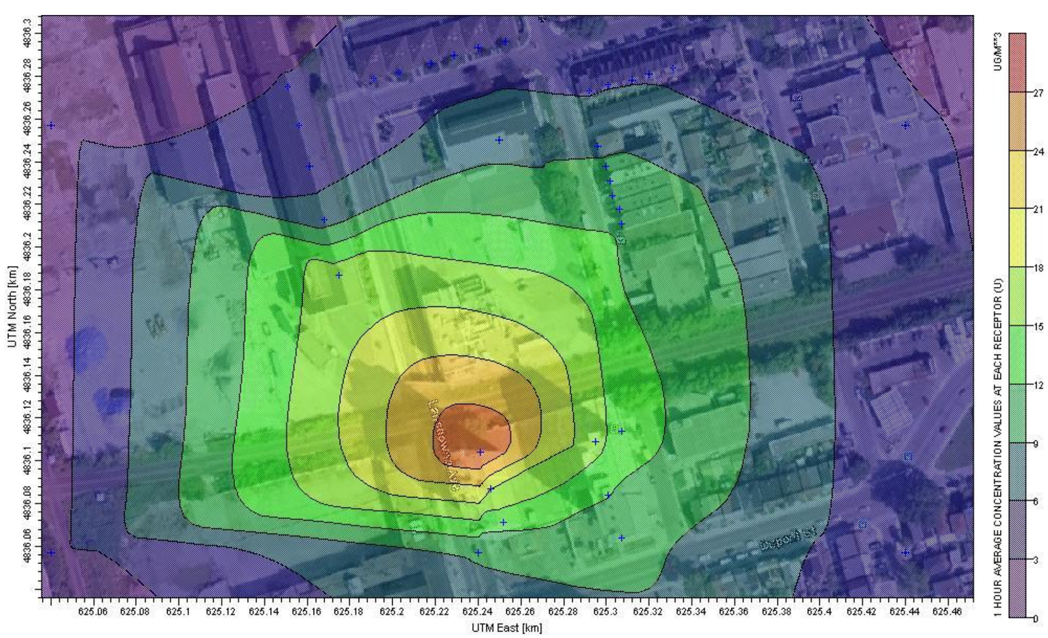
Modelling of airborne release of radioactivity due to the identified hazard scenarios was completed using the buoyant area source algorithm in the CALPUFF air dispersion model for Toronto. The meteorological data set applied in this assessment was the AERMOD regional data for Toronto (Central region) prepared by Ontario Ministry of the Environment (MOE) for the year 2000 with urban type of land use. CALPUFF modelling outputs of maximum offsite concentrations are for one-hour averaging periods.

Isopleths of maximum one-hour concentrations were generated for each scenario based on a 1 g/s emission rate. Isopleths for the worst-case scenario are shown in Figure 1. These isopleths show the relative distribution of offsite concentrations around the facility and demonstrate how the concentration decreases away from the location of the maximum point of impingement.

For CALPUFF modelling for Toronto, the maximum one-hour concentration at each point represents the maximum concentration at that point over the entire 8784 hours modelled for the year. Note that the hour for a given maximum at a given point may be different than the hour for the maximum at another point. Therefore, concentrations under all but the worst case meteorological conditions would be expected to be lower, and potentially much lower.

The maximum concentration offsite extends 40 m beyond the fence and drops off beyond that point.

Figure 1 – Isopleth for a 1 g/s Fire in Building 7 (Toronto)



In preparing this memo, it was discovered that for Toronto scenarios, air dispersion dilution factors for Building 7 and Building 9 were transposed. This memo uses the corrected air dispersion dilution factors based on the isopleth in Figure 1. The Safety Analysis Report has been updated to reflect this correction which results in a reduction in the worst-case concentration from 6.1 mg/m^3 to 3.9 mg/m^3.

Sincerely,

David Snopek
Director, EHS & Regulatory

Cc: J. MacQuarrie, J. Lundy, T. Richardson, M. Lee (BWXT)