Canadian Nuclear Safety Commission | Commission canadienne de sûreté nucléaire

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Supplementary Information
Oral Presentation

Presentation from
Julia Tuer

In the Matter of the

**BWXT Nuclear Energy Canada Inc.,
Toronto and Peterborough Facilities**

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

Commission Public Hearing

March 2 to 6, 2020

Renseignements supplémentaires
Exposé oral

Présentation de
Julia Tuer

À l'égard de

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

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

Audience publique de la Commission

Du 2 au 6 mars 2020

Canada

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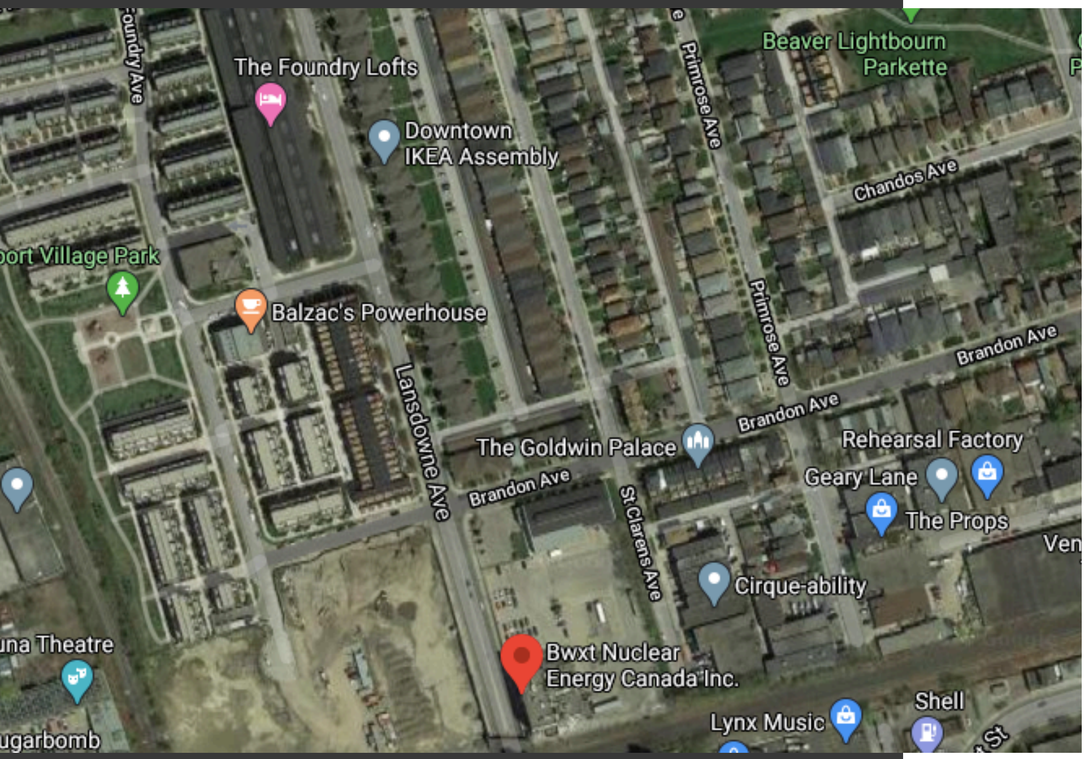
JULIA TUER
Local Resident

ACCIDENTS HAPPEN



Critical Group:

Individuals living close to the BWXT facility who would be maximally exposed in the event of a catastrophe.

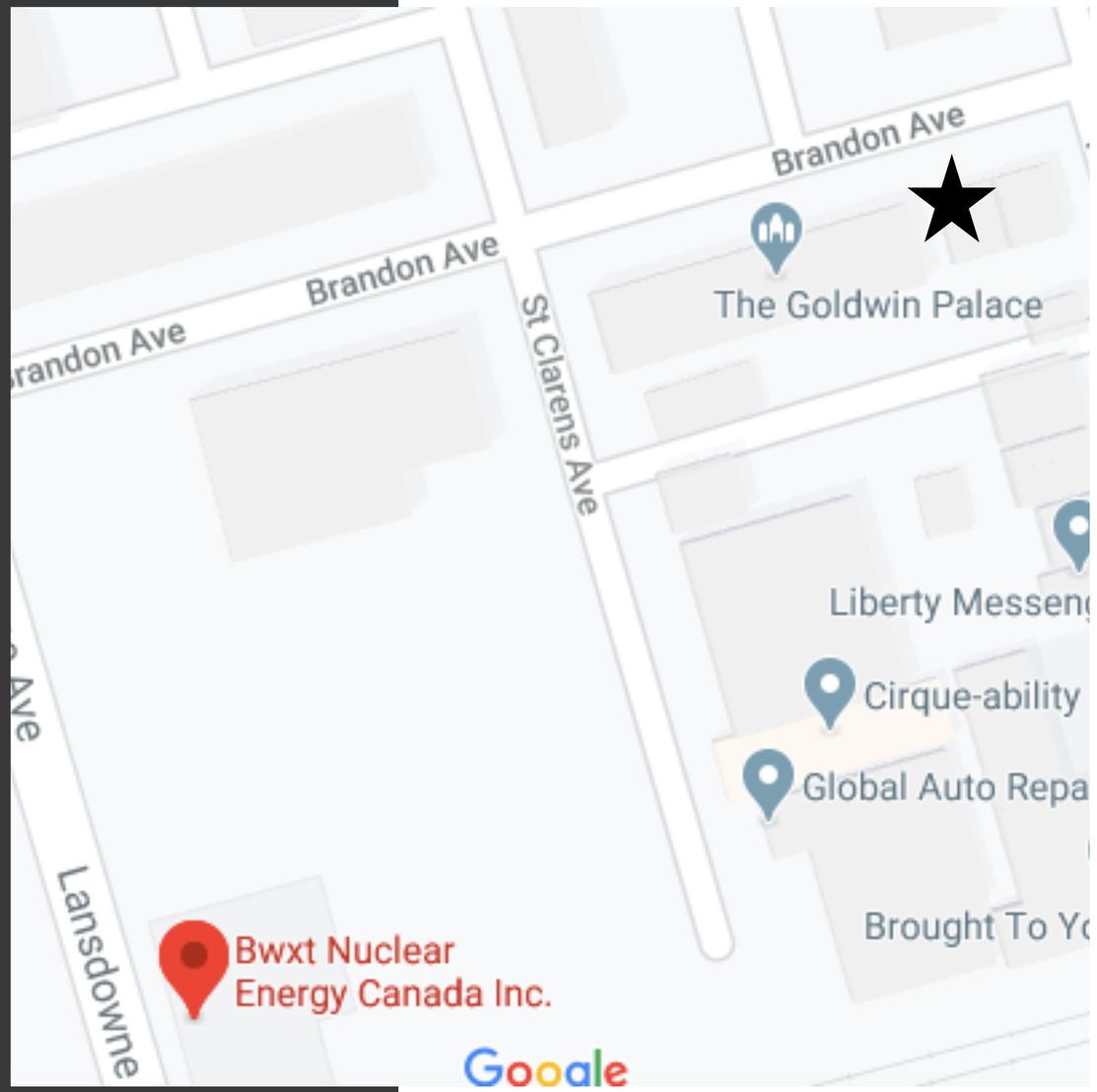
INITIATING EVENT

Fire

Fire in conversion facilities and enrichment facilities can lead to the dispersion of radioactive material and/or toxic material by breaching the containment barriers or may cause a criticality accident by affecting the system of the parameters used for the control of criticality (e.g. the moderation control system or the dimensions of processing equipment).

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1404_web.pdf

What is the evacuation plan in event of a fire that could potentially release radiation into the air?



INITIATING EVENT

Explosion

An explosion can be induced by fire or it can be the initiating event that results in a fire. Explosions could breach the barriers providing confinement and/or could affect the safety measures that are in place for preventing a criticality accident.

In conversion facilities, the **possible sources of explosions include gases (e.g. H2** or NH3 used in the reduction process).

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1404_web.pdf

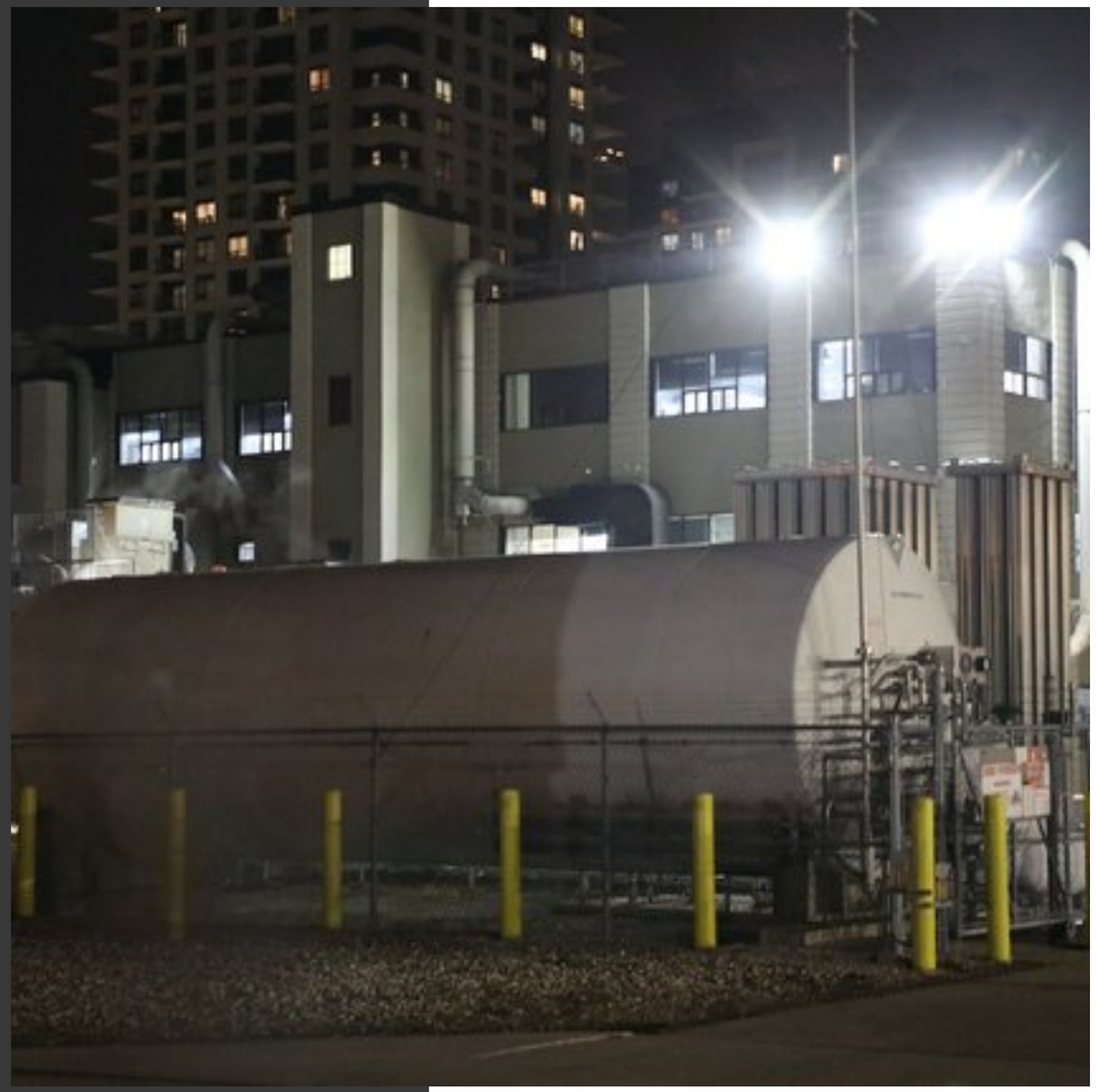
Liquid Hydrogen

NASA’s rocket fuel of choice

- **Burns with extreme intensity (5,500°F)**
- **Wide flammability range of 4-74% concentration in air, meaning extreme care must be taken to ensure it doesn’t mix with our air**
- **It requires only 0.02 millijoules of energy to ignite a hydrogen–air mixture***

*https://www.nasa.gov/pdf/513855main_ASK_41s_explosive.pdf

What is the blast radius should the tank housing 34,068 litres of liquid hydrogen explode?



INITIATING EVENT

Leaks & Spills

Leaks from containment systems can **lead to the dispersion of radioactive material** (e.g. uranium solutions and powders) and **toxic chemicals** and to the unnecessary generation of waste.

Leaks of hydrogenous fluids (water, oil, etc.) can adversely affect criticality safety. **Leaks of flammable gases (e.g. H2) or liquids can lead to explosions and/or fires.**

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1404_web.pdf

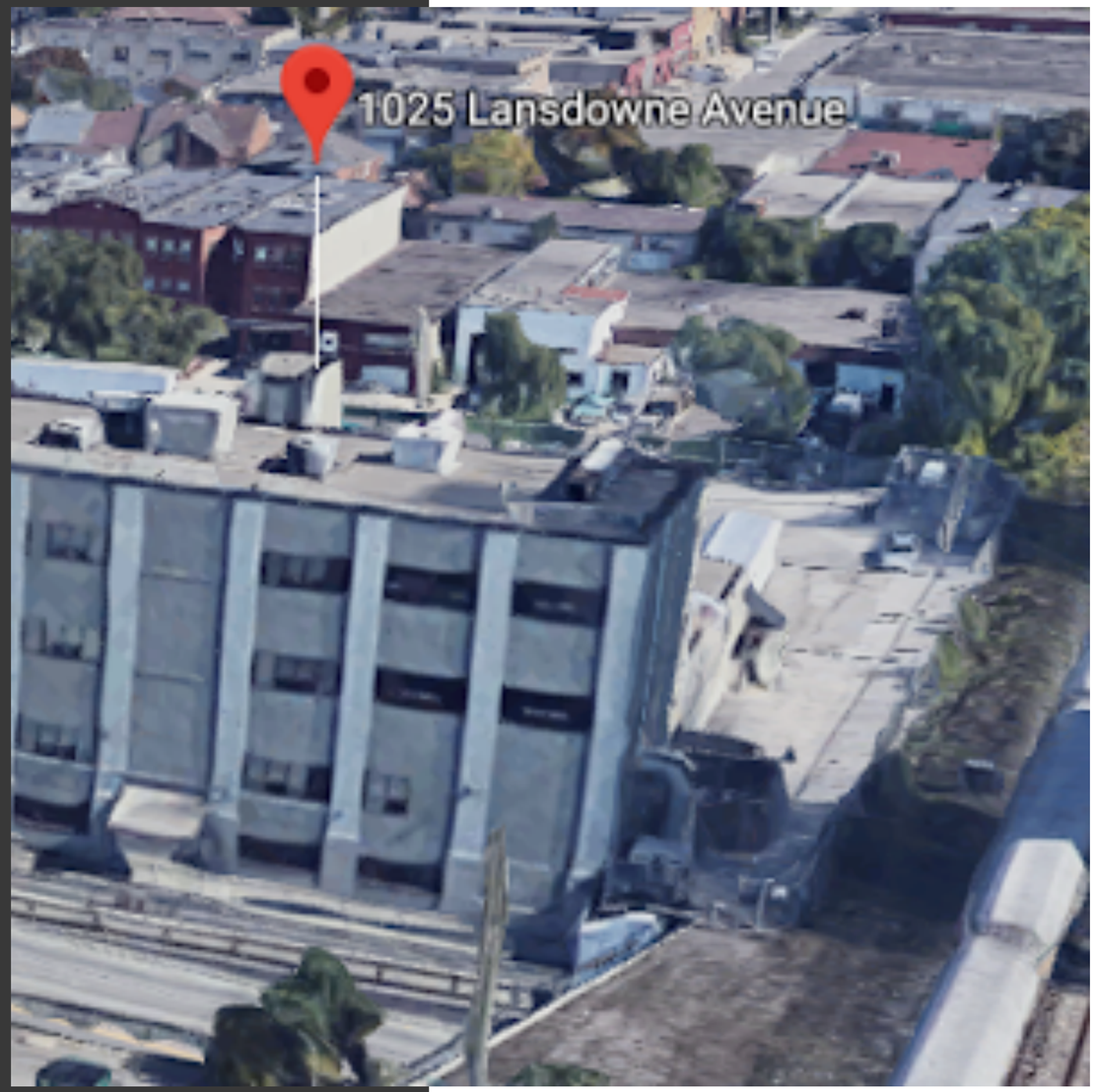
In the event of a criticality accident, what is the plan? Where is this plan communicated to the community?

INITIATING EVENT

External Fires & Explosions

Hazards from external fires and explosions could arise from various sources in the vicinity of conversion facilities, such as… **road, rail** or sea **routes used for the transport of flammable material such as gas or oil.**

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1404_web.pdf



INITIATING EVENT

External Fires & Explosions

To demonstrate that the risks associated with such external hazards are below acceptable levels, the **operating organization should first identify all potential sources of hazards and then estimate the associated event sequences affecting the facility.**

The **operating organization should carry out a survey of potentially hazardous installations and transport operations for hazardous material in the vicinity of the facility**.

In the case of explosions, risks should be assessed…to evaluate the possible effects of flammable liquids falling objects (such as chimneys) and missiles resulting from explosions, their distance from the facility and hence their potential to cause physical damage should be assessed.

Source: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1404_web.pdf

Has BWXT modeled all the possible event scenarios of a busy, urban environment?

INITIATING EVENT

Human Factor

Who is responsible for keeping my family safe?


Accidents Happen.
And our growing community of young families is in the crosshairs.