

Safety Assessment Of OPG's Used Fuel For Dry Storage

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ABSTRACT

Ontario Power Generation (OPG) operates the Pickering Waste Management Facility (PWMF) and Western Waste Management Facility (WWMF) where OPG has been storing 10-year or older used fuel in the Dry Storage Containers (DSCs) since 1996 and 2003 respectively. The construction licence for the Darlington Used Fuel Dry Storage Facility (DUFDSF) was obtained in August 2004.

Safety assessment of the used fuel for dry storage is required to support each request for regulatory approval to construct and operate a dry storage facility. The objective of the safety assessment is to assess the used fuel performance under normal operation and postulated credible accident scenarios.

A reference used fuel bundle is defined based on the operating history and data on fuel discharged from the reactors of the specific nuclear generating station. The characteristics of the reference used fuel bundle are used to calculate the nuclide inventory, source term and decay heat used for the assessment.

When assessing malfunctions and accidents, postulated external and internal events are considered. Consideration is also given to the design basis accidents of the specific nuclear generating station that could affect the used fuel under dry storage. For those events deemed credible (i.e. probability $> 10^{-7}$), a bounding fuel failure consequence is predicted. Given the chemical characteristics of the radionuclides in used fuel, the design of the CANDU fuel and the conditions inside the DSC, in the event that a used fuel bundle should become damaged during used fuel dry storage operations, the only significant radionuclides species that are volatile are krypton-85 and tritium. Release of these radionuclides is considered in calculating public and worker doses.