



Consolidated Information on the Transportation of Used Fuel - Plain Language Summary

March 16, 2026

APM-REP-05000-0223 R000

Prepared by: The Nuclear Waste Management Organization



APM-REP-05000-0223 R000

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1 Consolidation of the Information Provided by the NWMO on Transportation

The NWMO's highest priority as we plan for the construction and operation of the Deep Geological Repository is safety. Safety is at the core of everything we do at the NWMO; our overriding objective is the protection of people and the environment.

A number of comments submitted on the Initial Project Description for the Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project (the Project) were related to various aspects of transportation. To address those comments the NWMO provided additional information in our response to the Summary of Issues. In this document, the NWMO is consolidating the information we have provided related to transportation in both our Initial Project Description and our response to the Summary of Issues so that it is easier for a member of the public to have:

- Confidence that transportation of used nuclear fuel is safe.
- Transportation will have no new impacts on their health or the environment during normal operations or in the event of an accident because used fuel will use an existing CNSC certified transportation container and will be transported on existing road/rail infrastructure.
- An understanding of how the NWMO has proposed that transportation be included in the scope of the Project to be considered in the impact assessment.

The NWMO has been part of thousands of conversations about the transportation of used nuclear fuel. We continue to engage widely across Canada, including with Indigenous Nations, communities and organizations, first responders, municipalities and the public, to share information, and invite feedback. This is an ongoing conversation that will continue throughout the many years before any shipments begin in the 2040s.

2 Including Transportation in the Impact Assessment

The Impact Assessment will assess potential effects for the area where the NWMO will be making physical changes. The NWMO is including in the project two physical changes associated with transportation: construction of a new Hwy 17 turn-off with accompanying access roads to the site and construction of a potential rail spur. The NWMO is making no other changes to highway or railway infrastructure in Canada.

To clarify, transportation effects associated with those activities were included in the Initial Project Description and the NWMO continues to propose that they be included in the scope of the assessment in this way. This is consistent with impact assessment practice in Canada – effects are studied where a change is proposed to be made.

3 Regulatory Context for Transportation

Safe and secure transportation of radioactive material, including used fuel, already occurs in Canada today. It occurs on existing highways and railways, as well as through other modes. Safe transportation is a well-established practice with a strong track record of safety, governed by existing federal and provincial regulations, such as the CNSC's *Packaging and Transport of Nuclear Substances Regulations* (PTNSR) and Transport Canada's *Transportation of Dangerous Goods Regulations* (TDGR).

The TDGR are federal regulations made under the *Transportation of Dangerous Goods Act, 1992*. That act, and the TDGR, administered by Transport Canada, form an extensive and overarching framework regulating, used nuclear fuel transport in Canada. The TDGR requirements include:

- Training and certification of persons who package, load, offer for transport, transport, unload and pack dangerous goods;
- Clear and standardized documentation to accompany the shipment at all times, identifying hazards and providing essential information for safe packing, loading, transporting, unloading, and unpacking;
- Marking and labelling of packages and conveyances; and
- Reporting of incidents associated with the transportation of dangerous goods.

Shipments of radioactive materials must also comply with the CNSC's PTNSR. The PTNSR incorporate the requirements from the International Atomic Energy Agency's (IAEA) *SSR-6 Regulations for the Safe Transport of Radioactive Material*. The requirements of the PTNSR include:

- Licences for certain types of shipments or material (as is the case for used nuclear fuel);
- Package design requirements for normal and accident conditions of transport, certification and registration of use;
- Limits on dose rates from packages to limit radiation exposure to people along transportation route and workers involved in the shipment;
- Consignor and transporter (i.e., the carrier) responsibilities beyond those imposed under the TDGR, including the requirement to have a radiation protection program; and
- Reporting of dangerous occurrences by consignors, carriers, and consignees.

In addition, to be given permission to transport the used nuclear fuel, the NWMO will need to prove it could respond to an emergency. In Canada, the federal, provincial, and local governments use a comprehensive approach to emergency management, which includes having in place measures for prevention, mitigation, preparedness, and response and

restoration activities for all modes of transportation. This applies today to shipments of radioactive materials, including used fuel.

4 Used Fuel Transportation Package Safety

Used fuel will be placed into specially designed and built transportation containers for shipment from the existing sites. The container meets rigorous requirements based on international standards; safety is inherent to the package design. The packaging for used fuel provides protection against radiation and prevents release of contents, even in the event of accidents.

There will be no spill of the used nuclear fuel, which is a solid, if an accident were to occur.

The NWMO's Used Fuel Transportation Package (UFTP), has been certified by the CNSC and is currently in use by Canadian Nuclear Laboratories to safely transport used fuel. It has been demonstrated to meet the regulatory requirements and will provide adequate radiation shielding and containment of radioactive materials, including through drop, puncture, fire and immersion tests that simulate cumulative accident scenarios.¹

The container also provides shielding that protects the people and the workers involved in the transportation from harm.

Carleton University assessed the impact to members of the public of a passing UFTP along a hypothetical transport route.² Radiological doses to members of the public were determined to be very, very small, between approximately 0.0000013 to 0.00054 mSv per year, a tiny fraction of the CNSC regulatory dose limit³ of 1 mSv per year or in comparison the 1.8 mSv the average Canadian receives on an annual basis from natural background radiation.

Our drivers, security escort and other workers will also be safe; occupational doses were assessed to be within a range of approximately 0.012 to 0.35 mSv per year.

The safety inherent to the UFTP provides confidence that the transportation of used nuclear fuel will not result in people or the environment being harmed by radiation.

¹ For more information about transportation packages used to transport used nuclear fuel, please see our [Confidence in Transportation Package Performance report](#).

² For more information, please refer to NWMO's [Generic Transportation Dose Assessment](#) and [Generic Transportation Worker Dose Assessment](#)

³ The CNSC has established a limit of 1mSv per year as the amount of additional radiation to which a person may be safely exposed without harm.

5 Accident Prevention – Safe Shipping

Although transportation will not start for many years, the NWMO has developed a Preliminary Transportation Plan.⁴ This Plan outlines potential safety and operational features such as enhanced vehicle safety technologies, shipment monitoring and communications through a transportation command centre, escort vehicles to identify potential hazards, and operational controls that account for weather, road conditions, and other factors. The NWMO is considering two transportation options, either an all-road used fuel transportation system; or a road/rail used fuel transportation system. Both transportation mode options can be safely implemented to the Project location.

To develop a robust preliminary transportation plan, the NWMO collected available collision data relevant for both road and rail transport of used nuclear fuel. This was analyzed and assessed to understand the types of collisions, severity, and potential causal factors (including inclement weather).⁵ The NWMO then explored potential preventative and mitigating measures that can be used by the NWMO to reduce the likelihood of transportation collisions.⁶

During operations, the NWMO anticipates two to three used fuel shipments arriving at the Project location per day, six days per week, nine months per year. This represents about a 0.5% increase in existing traffic volumes on the TransCanada Highway and is therefore not expected to increase the potential for collisions.

With respect to demands on existing infrastructure, a truck carrying used nuclear fuel is roughly the same size and weight as a logging truck, well within the existing design capacity of the highway.

The NWMO will also develop, consistent with the establish process, a transportation emergency response plan. The transportation emergency response plan will show the co-ordination among the NWMO, provincial and local first responders, as well as federal agencies, that would occur if an accident happened. The NWMO will be required to establish specialized teams with expertise and training in response and recovery that could be dispatched to the scene of an accident.

This Preliminary Transportation Plan and other information will continue to be updated. Before any shipments of used nuclear fuel can begin and the NWMO will be required to demonstrate that all applicable safety and security requirements have been met.

⁴ For more information, please see the NWMO [Preliminary Transportation Plan](#)

⁵ For more information please see the NWMO [Transportation Collision Data Analysis Report](#)

⁶ For more information please see the NWMO [Transportation Collision Mitigation Report](#)

6 In Summary

Transportation of used nuclear fuel is safe and is regulated through existing processes by the CNSC and Transport Canada. In over 60 years of transportation shipments of radioactive materials and more than 20,000 shipments of used nuclear fuel worldwide, no harm to people or the environment has resulted from radioactive release from any transportation accident. People and the environment are protected by the package in which the used fuel is shipped, and by the practices and processes the NWMO must follow to meet the existing regulatory requirements, including the relationships we will have with first responders.

The NWMO will confirm in the Impact Assessment the safety of transportation as we assess the changes that we will make to enable road and rail access to the Project site.

We will continue to engage with Indigenous Nations, communities and organizations, first responders, municipalities and the public, throughout the many years before any shipments begin in the 2040s.

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