
Solid uranium materials are shipped across land and sea

Physical precautions ensure that the likelihood of radioactive material release during shipping is extremely low. Procedures are in place to ensure that should it occur, any accidental release can be rapidly and effectively contained.

What sort of radioactive materials are shipped as part of the uranium fuel cycle?

Highly radioactive liquids cannot be transported. However, highly radioactive materials that can be transported include uranium oxide (yellowcake), spent nuclear fuel and solidified high-level wastes. Packages containing highly radioactive solid materials are identified as 'Type B'.

The International Atomic Energy Agency has set very high safety standards for transportation of Type B packages. They must be resistant to fire, pressure and being dropped.

In the 1970's, Sandia National Laboratory in the United States conducted several full-scale tests of the durability of shipping containers for spent nuclear fuel. A shipping container-laden vehicle was accelerated using rocket engines to 130 km/h, and crashed into an immovable concrete barrier (see images below). There was no breach of the container. It should be noted however that there was some criticism regarding the scientific validity of the tests.



Test of the durability of containers for spent nuclear fuel

What is the safety record of shipped radioactive materials?

Since the early 1970's, there have been over 7,000 global shipments of spent nuclear fuel and solidified high-level wastes over land and sea. While there have been accidents, there has never been a breach of the container or a leak of radioactive material.

How are radioactive materials shipped currently?

Shipment of Type B packages by sea takes place in purpose-built vessels. Each are double-hulled, have several collision bulkheads, include reinforced hatch covers and feature numerous other systems in place to ensure the safety of transport.

What sort of precautions are in place if a shipping breach does take place?

Emergency responders along the paths of shipment are qualified and trained to respond to an extreme event if a breach should occur. Additional emergency response teams are trained and can be immediately mobilised as required.

The response procedure starts with isolation of any released radioactive material to ensure containment away from the public and the environment. The material is collected and placed into certified containers, and levels of radioactivity are closely monitored in real time.