



Safety and radiation protection

The safety of men and the environment is paramount when transporting radioactive materials. To ensure this, the competent authorities examine the applications of the companies responsible for packaging, transport and storage on the basis of binding national and international regulations (BMU/German only). Only when the applicants have demonstrated reliable compliance with all regulations and specified limits will the competent authorities grant the permits required for transport and subsequent storage.

The protection concept

According to the protection concept of the "safe package", for the transport of radioactive material, the package itself, i.e. the packaging or containment, must, by virtue of its design, provide all essential protective functions during normal (i.e. accident-free) transport and in the event of any transport and handling accidents. (Source and as further information: BMU/German only and BASE)

The protection goals are:

- the containment of the radioactive contents (tightness),
- the limitation of the external dose rate (shielding of radioactive radiation),
- the dissipation of heat from the contents, and
- the exclusion of the occurrence of a nuclear chain reaction (criticality safety)

In the case of the vitrified reprocessing waste to be recycled, the packaging consists of the glass canister and the transport and storage cask.

The glass canisters are packed in CASTOR® casks. These are solid cast iron safety casks weighing over 100 tons with stainless steel lids. They have proven in various tests that they are safe even under extreme conditions. The wall thickness of around 40 centimeters and the materials used ensure that there is no danger to people or the environment from the radioactive waste and its radiation.

Radiation protection

In order to exclude any risk to people and the environment, the internationally binding IAEA regulations stipulate a limit value of 0.1 mSv/h at a distance of 2 m from the transport vehicle.



Source: "Regulations for the Safe Transport

of Radioactive Material

This value means that a person staying at a distance of 2 m from the transport for one hour receives an additional dose of 0.1 mSv ("millisievert"). For comparison, this is the dose during a flight from Frankfurt to New York and back (Source: [BfS](#))

Transport casks are designed to ensure compliance with this limit value without additional shielding measures (see protection concept). Only those inventories for which the limit value is not exceeded are accepted for approval under traffic law. As part of the application procedure for the transport permit, it is checked that the limit value is complied with at all times during transport.

Measurements and calculations



Already after loading at the reprocessing plant, dose rate measurements are carried out on each individual cask by independent experts on behalf of the competent authorities to demonstrate compliance with the limit values. The casks can only be transported back to the site if compliance with the specified limit value during transport is ensured. These calculations are also used as the basis for planning the deployment of the personnel deployed for handling and securing the transport.

In the course of the 2020 transport from Sellafield to Biblis, compliance with the dose rate limits for railway transport was again verified on each individual railway wagon after reloading from the ship.

Covid-19

Due to the worldwide spread of COVID-19, the companies and institutions involved in the repatriation transport 2020 have developed comprehensive precautionary concepts and hygiene rules for all phases of the transport.