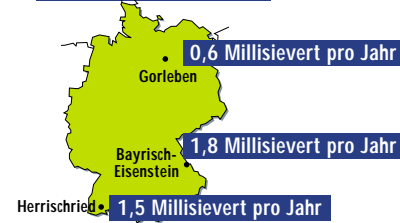


## Radioactivity in the Environment

Radiation is a natural occurrence in our environment. This includes cosmic radiation from outer space, part of which is absorbed by the atmosphere and therefore varies depending on the altitude. However, on the earth itself there

are naturally occurring radioactive substances in differing concentrations. The terrestrial radiation which they give off therefore varies according to local geological conditions and also exhibits seasonal and climatic fluctuations. In Germany, natural radiation exposure of the population averages approx. 2.4 millisievert per year.

### Natürliche Strahlung



Die aus dem Erdreich und aus dem Weltraum kommende Strahlung ist je nach Ort unterschiedlich hoch.

### Medizinische Anwendung



im Durchschnitt ca. 1,5 Millisievert pro Kopf und Jahr

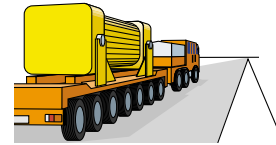
### Flug Frankfurt - New York und zurück



0,1 Millisievert

for example, the after-effects of surface testing of nuclear weapons as well as radiation used in research, industry and households. Exposure to radiation resulting from the peaceful use of nuclear energy is well under 1 percent of aggregate civilisation-induced radiation.

### Begleitung von CASTOR-Transporten



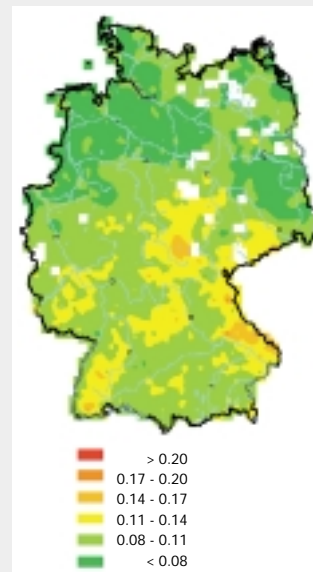
< 0,03 Millisievert

Auch bei dem mehrtägigen CASTOR-Transport im März 1997 nach Gorleben wurden zahlreiche der begleitenden Polizisten mit Messinstrumenten ausgerüstet. Das Ergebnis: Es konnten selbst bei der niedrigen Nachweisgrenze von 0,03 Millisievert keine Strahlenexpositionen gemessen werden.

### Local gamma-wave output

The German Federal Radiation Protection Agency releases weekly environmental radioactivity readings on Deutsche Telekom's T-Online service. The radiation map for all Germany is also available on the Internet at <http://www.bfs.de>.

Daily mean readings measured in microsieverts per hour (1 microsievert = 0.001 millisievert).



## Top-quality Radiation Protection

Strict safety requirements among the most stringent in the whole world apply to the operation of nuclear facilities in Germany. The measures which must be taken aim to shield the environment from impermissible radiation – not only in daily operations but also during extreme events such as earthquakes or aircraft crashes.

The provisions of the Nuclear Power Act and the Radiation Protection regulations in particular govern the handling of radioactive substances. They stipulate maximum permissible levels which must never be exceeded when nuclear facilities are operated. These levels are within the natural fluctuation range. Moreover, the minimisation rule states that even when the permissible levels are complied with the exposure of employees and people living in the immediate vicinity must be kept to a minimum.



The BLG Premises

The BLG waste disposal facilities have been constructed with these principles in mind. The facilities were constructed to maximise safety in approval proceedings lasting many years and involving the relevant authorities and their experts. The responsible supervisory authorities – the Ministry for the Environment of the State of Lower Saxony and the Lüneburg Trade Supervisory Office – monitor compliance with the statutory requirements and the specific conditions of the operating permits on an ongoing basis.

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## Safety Comes First in the Operation of Nuclear Facilities at Gorleben



### Measures for Protecting the Environment

## Numerous Measures With a Single Goal: Safety to Protect the Environment

### Interim Storage of Radioactive Waste and Spent Fuel Assemblies

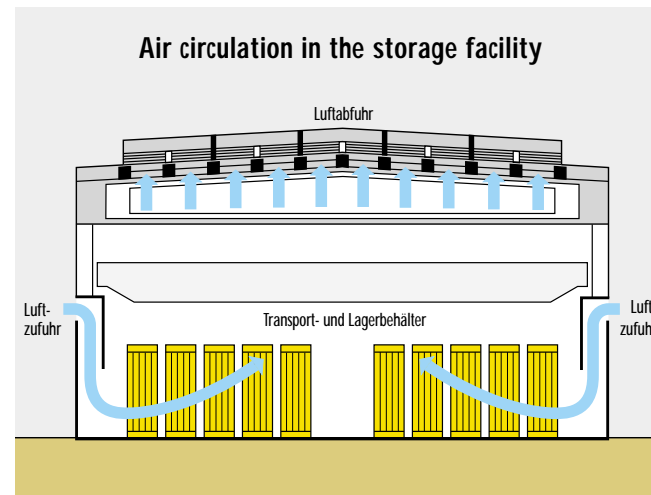
A large part of the radioactive waste temporarily stored at BLG gives off only low-level radiation. These materials do not develop any heat and, depending on their type, are securely enclosed in drums and concrete or steel casks. They are placed in storage under the supervision of independent inspectors assigned by the Trade Supervision Office in Lüneburg. They check in advance that only those substances for which a permit for interim storage has been issued are delivered to the Gorleben waste disposal site.



Spent fuel assemblies and heat-generating radioactive waste resulting from reprocessing must be allowed to cool off over a period of several decades in an interim storage facility before being disposed of permanently. The high radiation given off by these substances necessitates special protective measures. They are therefore transported and stored in safety casks such as the CASTOR specially designed for this purpose. These casks are designed in such a way

**The CASTOR meets all safety requirements**

as to comply with all safety requirements, ensuring that no radioactive substances can escape and reducing radiation to negligible levels. At the same time, they provide a high degree of protection from accidents. The casks are monitored constantly during interim storage to ensure that they remain leak-tight.



The storage facility holding the transport casks is designed to ensure that the heat given off by the casks is removed with optimum effect by means of a natural airflow.

### Monitoring of Surroundings

Even though the extensive construction, operative and administrative measures ensure that the BLG waste disposal facility does not pose any risk to the environment, the surroundings are monitored permanently.

As early as in 1983 – before the facility went into operation – extensive data on pre-existing natural and civilisation-induced radiation in the region were collected. These measurements have been continued as part of a scheme to monitor the surroundings since the BLG waste disposal facilities went into operation. This means that it is possible to prove that the facilities are being operated without any risk to the environment at all times.



**Measuring unit for monitoring the surroundings**

Measuring units have been installed on the facility premises as well as in the surroundings. Inspectors monitor radiation and evaluate activity concentration in samples taken of the air, soil, plants and water. The surroundings-monitoring programme is conducted by BLG as the operator of the facility and, independently of this, by the relevant government authority, the State Office for Ecology of Lower Saxony.



**Evaluating samples at BLG's environmental laboratory**

The measurements are published in annual reports. Experience shows that the radiation given off by the nuclear facilities is far lower than the maximum statutory limits. Thus, for example, no increase in radiation levels outside the premises has been registered since the facilities went into operation.

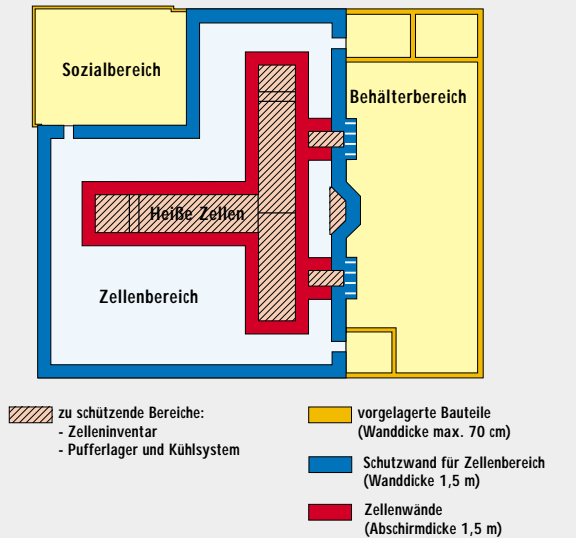
### The Pilot Conditioning Plant (PKA)

The Pilot Conditioning Plant, which is being constructed on the BLG premises, forms a key element in the direct final disposal concept. The plant will test the methods for treating spent fuel assemblies and for packaging them ready for final disposal, i.e. "conditioning". Planned as a multi-purpose plant, the PKA will also be able to perform other tasks thanks to its technical facilities. This includes maintenance and inspection work on all kinds of transportation and storage casks. The PKA is also subject to the strict requirements of the Radiation Protection regulations, with environmental safety taking precedence over all other considerations.

The plant is constructed to afford maximum resistance to external impact, e.g. an aircraft crash.

Work on radioactive material takes place in the so-called "hot cells" using remote-handling technology.

### Concept for protecting the PKA in the event of an aircraft crash



**PKA construction site on the BLG premises**

No-one will enter these rooms during operation. Radiation arising inside these rooms will be contained by concrete walls 1.5 m thick with windows made of lead glass. A slight vacuum pressure inside the "hot cells" prevents the uncontrolled escape of radioactive substances. Air inside the cells coming into contact with radioactive material is passed through filters and cleansed, before being released from the roughly 40 m chimney stack.

Although traces of radioactive substances will still enter the biosphere via the air and water, these will be so small that the resultant radiation will be just a fraction of the statutory maximums and well under natural radiation levels.