

Nuclear Licensing and Supervision in Germany



Translation of the 4th revised edition of GRS-S-41 „Atomrechtliche Genehmigung und Aufsicht in Deutschland“. In cases of doubt, GRS-S-41 is the factually correct version. GRS would like to thank the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety for providing assistance with respect to the legal terminology.

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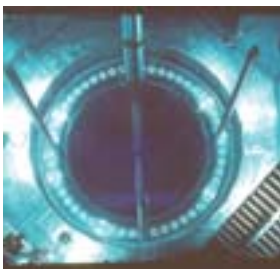
Nuclear Licensing
and Supervision
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With the amendment of the Atomic Energy Act (Atomgesetz, AtG) – which entered into force on 22 April 2002 – essential parts of German Nuclear Energy Law have been redesigned.

The new objective of the Act is to phase out the use of nuclear energy for the commercial generation of electricity in an orderly manner. Still, the existing nuclear power plants will have to be operated at a high level of safety for their residual operating lives.

For the implementation of this objective, the AtG stipulates e. g. that **no further licences** shall be granted for the construction and operation of new nuclear power plants and facilities for the re-processing of irradiated nuclear fuels; operating licences for existing commercial reactors will become extinct as soon as certain electricity amounts have been generated which have been determined separately for each nuclear power plant.

Nevertheless, the current licensing procedure continues to be applicable as both essential modifications of existing installations and the construction of non-industrial new facilities (e. g. research reactors) require licensing.

The fourth edition of this brochure takes into account the changed general framework as well as further developments which have arisen from other fields of law relevant to Nuclear Energy Law since the third edition.

2

Legal Basis

International Regulations

There are various regulations on international level. Their relevance and legal impact differs from country to country, depending on the respective national rules and regulations.

For example, the International Atomic Energy Association (IAEA) runs special programmes to harmonise the safety requirements internationally for nuclear facilities. These are to be understood as recommendations and provide a framework for technical safety, especially for those countries which are at the beginning of their nuclear development.

As opposed to these recommendations, the "Nuclear Safety Convention" – which came into force in 1996 – contains regu-

lations that are binding under international law for the more than 50 states that have ratified the Convention in the meantime. The "Nuclear Safety Convention", which sets requirements for the safety of civil nuclear power plants, originates from a German initiative during the IAEA Special Conference in Vienna in September 1991. The signatory states are obliged to meet high technical safety standards as well as to ensure independent and effective state supervision. The signatory states have to subject themselves to a verification procedure at regular intervals. The preparation of a Country Report is a part of the verification procedure in which each party to the Convention provides information on compliance with the duties arising from this Convention. In addition, verification includes the submission of written questions and comments on the reports of the other countries as well as the answering of such



Nuclear power plants require a licence according to Section 7 AtG: The photo shows the Emsland Nuclear Power Plant near Lingen in Lower Saxony.

questions within a certain time-limit. In 2002, the government of the Federal Republic of Germany submitted the report for the second Review Conference.

The Treaty establishing the European Atomic Energy Community, which entered into force on 1 January 1958, is applied throughout the European Union. The Treaty covers i. a. competences for the EC institutions within the framework of nuclear research, health protection and the ensurance of safety during the transport of fissile materials.

The purpose of the Atomic Energy Act is outlined in Section 1:

- 1. to phase out the use of nuclear energy for the commercial generation of electricity in a structured manner, and to ensure on-going operation up until the date of discontinuation,*
- 2. to protect life, health and property against the hazards of nuclear energy and the detrimental effects of ionising radiation and to provide compensation for damage caused by nuclear energy or ionising radiation (the so-called protective purpose - editorial annotation),*
- 3. to prevent danger to the internal or external security of the Federal Republic of Germany arising from the application or release of nuclear energy,*
- 4. to enable the Federal Republic of Germany to meet its international obligations in the field of nuclear energy and radiation protection.*

German Constitution

According to the **German Constitution**, the *Länder* are responsible for the implementation of the Atomic Energy Act on behalf of the Federal Government. To ensure a uniform implementation of the Atomic Energy Act, the *Länder* are subject to federal supervision. The Federal Govern-

ment has the right to issue instructions concerning the legality and expediency of the implementation.

The Atomic Energy Act

In Germany the **Atomic Energy Act (AtG)** provides the legal prerequisites for the peaceful utilisation of nuclear energy. It was enacted in 1960 and in the meantime has been amended several times due to political and technical/scientific developments.

The Atomic Energy Act primarily serves the purpose of protecting the population against the dangers of nuclear energy and to ensure the orderly phase-out of the use of nuclear energy. The German parliament, all the Federal Governments to date, the *Länder* bodies politically responsible and the responsible courts of justice have always emphasised that the protection of the population against the dangers of nuclear energy is granted first priority over economic interests.

The Atomic Energy Act regulates in particular:

- ☐ import and export of nuclear fuel (Section 3 AtG),
- ☐ carriage of nuclear materials (Sections 4, 4a, 4b AtG),
- ☐ authorized possession and safe custody of nuclear fuel (Section 5 AtG),
- ☐ storage of nuclear fuel outside state custody (Section 6 AtG),
- ☐ erection, operation, holding and decommissioning of stationary

The licensing requirements pursuant to Section 7, para. 2 of the Atomic Energy Act are as follows:

(2)

A licence may only be granted if

1. *there are no known facts giving rise to doubts as to the reliability of the applicant and of the persons responsible for the erection and management of the installation and the supervision of its operation, and the persons responsible for the erection and management of the installation and the supervision of its operation have the requisite qualification,*
2. *it is assured that the persons who are otherwise engaged in the operation of the installation have the necessary knowledge concerning the safe operation of the installation, the possible hazards and the protective measures to be taken,*
3. *the necessary precautions have been taken in the light of the state of the art in science and technology to prevent damage resulting from the erection and operation of the installation,*
4. *the necessary financial security has been provided to comply with the legal liability to pay compensation for damage,*
5. *the necessary protection has been provided against disruptive action or other interference by third parties,*
6. *the choice of the site of the installation does not conflict with overriding public interests, in particular in view of its environmental impacts.*

nuclear facilities for the production, treatment, fission or reconditioning of irradiated nuclear fuel (Section 7 AtG),

- ☐ treatment, processing or other utilization of nuclear fuel outside installations requiring a licence (Section 9 AtG), and
- ☐ utilization of residual radioactive material and the safe disposal of radioactive waste (Section 9a AtG).

If a licence pursuant to Section 7 AtG, e.g. for a nuclear research

facility, is to be granted, the **licensing requirements** pursuant to Section 7, para. 2 AtG are to be fulfilled in particular.

Pursuant to Section 7a AtG, an **advance notice** can be issued concerning individual questions on which the granting of a licence pursuant to Section 7 AtG is dependent.

Government supervision of nuclear facilities is laid down in Section 19 AtG, stipulating that the supervisory authority has to supervise compliance with the Atomic

Energy Act and that it may order to remove hazard states and may issue directions upon violation. The supervisory authority furthermore shall have access to a nuclear facility at all times and shall be authorized to carry out examinations there.

According to Section 9a, para. 3 AtG, the *Länder* are to establish **state collecting facilities** for the interim storage of radioactive waste originating in their territory, and the Federal Government shall establish **facilities for the safe-keeping and final storage** of radioactive waste. According to Section 9b AtG, a **plan approval procedure** comprising an **environmental impact assessment** is to be carried out for these federal installations upon erection, operation as well as any major alterations.

The Atomic Energy Act further comprises a series of regulations

which, in particular, refer to the following areas:

- ❑ enabling provisions for the issue of ordinances by the Federal Government (Sections 11 and 12 AtG),
- ❑ regulations on restrictions, conditions and the revocation of licences;
- ❑ distribution of responsibilities (Sec. 22 to 24 AtG) as well as
- ❑ liability (Sections 25, 26, 31 AtG), compensation (Sections 28, 29, 30 AtG), criminal and administrative fine regulations (Sections 46, 49 AtG).

specified by further laws and regulations including:

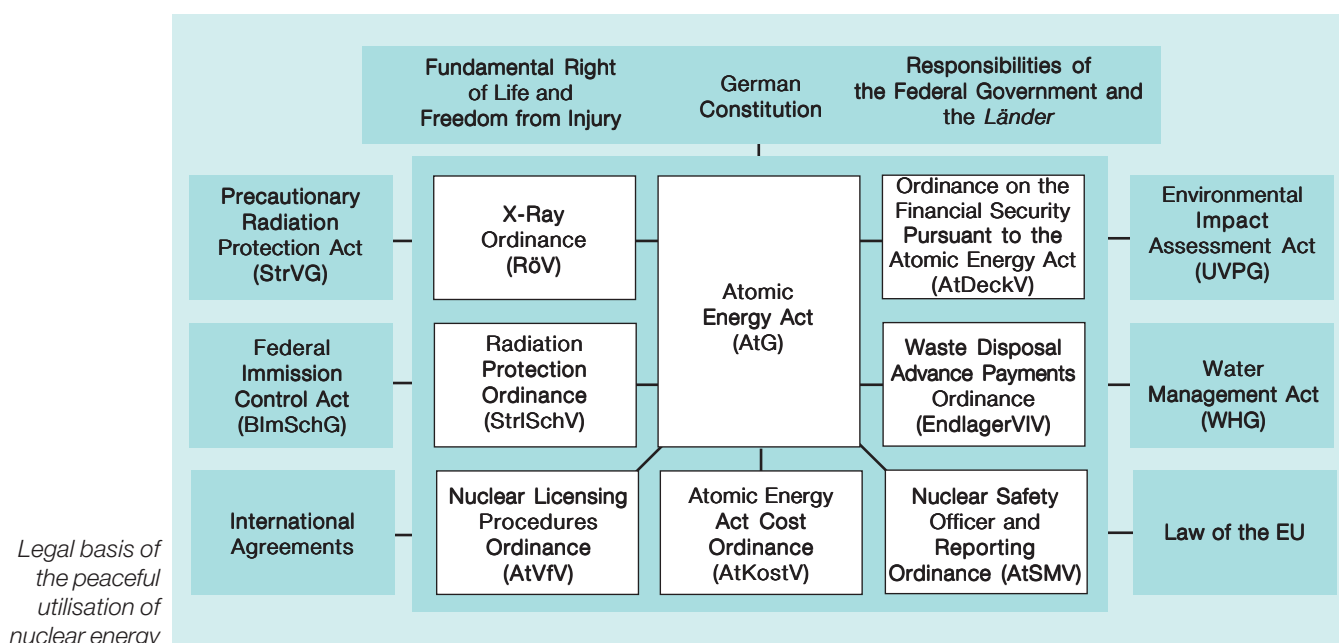
- ❑ Precautionary Radiation Protection Act (*Strahlenschutzvorsorgegesetz (StrVG)*)
- ❑ Water Management Act (*Wasserhaushaltsgesetz (WHG)*)
- ❑ Federal Immission Control Act (*Bundesimmissionsschutzgesetz (BImSchG)*)
- ❑ Environmental Impact Assessment Act (*Gesetz über die Umweltverträglichkeitsprüfung (UVPG)*).

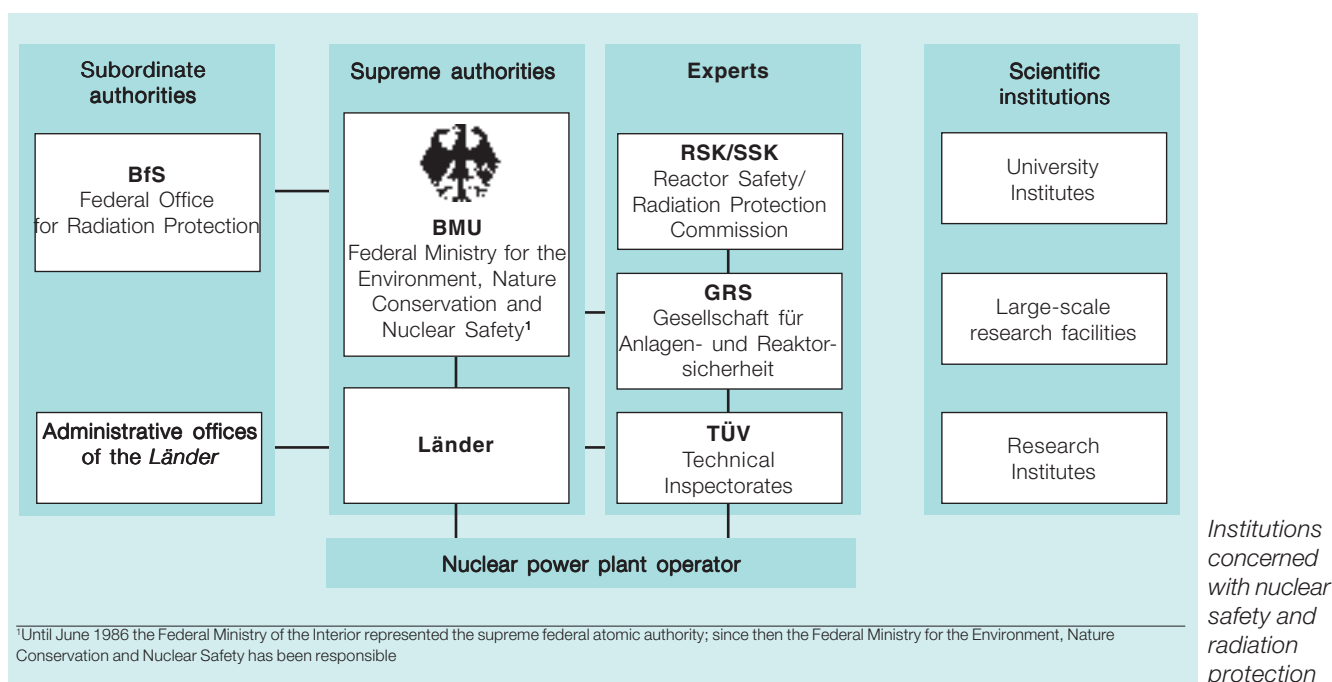
The most important statutory ordinances include:

- ❑ Radiation Protection Ordinance (*Strahlenschutzverordnung (StrlSchV)*),
- ❑ Nuclear Licensing Procedure Ordinance (*Atomrechtliche Verfahrensverordnung (AtVfV)*),

Statutory Ordinances and Technical Rules

The provisions of the Atomic Energy Act are supplemented or





- ❑ Ordinance on the Financial Security Pursuant to the Atomic Energy Act (*Atomrechtliche Deckungsvorsorge-Verordnung (AtDeckV)*),
- ❑ Atomic Energy Act Cost Ordinance (*Atomrechtliche Kostenverordnung (AtKostV)*)
- ❑ Nuclear Safety Officer and Reporting Ordinance (*Atomrechtliche Sicherheitsbeauftragten- und Meldeverordnung (AtSMV)*)
- ❑ Waste Disposal Advance Payments Ordinance (*Endlager-vorausleistungsverordnung (EndlagerVIV)*)
- ❑ X-Ray Ordinance (*Röntgenverordnung (RöV)*)

The **safety requirements** have not been specified in great detail. Thus, there is room for different technical solutions, which, however, all have to meet the same

protection objective. The licensing and supervisory authorities then have to examine whether this objective is actually met.

The Appendix comprises a comprehensive summary of the most important laws and statutory ordinances referring to the Atomic Energy Act.

A variety of **safety regulations** which are to be considered within the framework of the nuclear licensing procedure and nuclear supervision are subordinate. They serve the purpose of demonstrating adequate provisions against damages.

These safety regulations include:

- ❑ Nuclear Power Plant Safety Criteria approved by the Länder Committee for Nuclear Energy,
- ❑ BMI and BMU guidelines, demanding e. g. proof of the

technical qualification of nuclear power plant personnel,

- ❑ safety criteria for final storage,
- ❑ safety-related guidelines of the Reactor Safety Commission (*Reaktor-Sicherheitskommission – RSK*),
- ❑ safety standards of the Nuclear Safety Standards Commission (*Kerntechnischer Ausschuss – KTA*), comprising sample solutions and representing resources for the decision process of the authorities;
- ❑ standards of the German Institute for Standardisation (*Deutsches Institut für Normung – DIN*),
- ❑ conventional guidelines and recommendations, like provisions relating to accident prevention prepared by the Ger-

man mutual indemnity associations,

- relevant international agreements, foreign rules and regulations, e.g. for the transport of radioactive substances across national borders.

Further implementing guidelines, administrative regulations and recommendations as well as technical rules and guidelines are documented in the **"Handbuch Reaktorsicherheit und Strahlenschutz"** (Reactor Safety and Radiation Protection Manual) edited by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (*Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* (BMU)) and published by the Federal Office for Radiation Protection (*Bundesamt für Strahlenschutz* (BfS)).

Responsibilities of the Authorities

There is no central nuclear licensing and supervisory authority in the Federal Republic of Germany. Pursuant to Section 24 AtG, the Atomic Energy Act is implemented by the *Länder* on behalf of the Federal Government (**administration on behalf of the Federation**). The *Länder* authorities are subject to the so-called supervision of lawfulness and expediency, which the Federal Government can exercise e. g. by giving instructions.

Only the so-called **competence to execute the duties** belongs

indefeasibly to the Land within the framework of its authority to issue instructions. This competence extends to activities relating to actions and responsibilities towards third parties. For instance, it covers the conclusion of public-law contracts or the issue of a licence.

The **factual competence** consists of the components factual assessment and substantive decision. First and foremost, this competence belongs to the Land as well. But apposed to the competence to execute the duties, it may be assumed by the Federal Government. In such a case, the Federal Government can examine the documents submitted by the applicant to the *Land* authority responsible and provide a comment. If federal and *Länder* authorities assess an individual case differently, the Federal Government can issue instructions to the competent *Land* authority, if necessary. These instructions are binding for the *Länder* authorities.

The federal supervision is carried out by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU). It is assisted by the Federal Office for Radiation Protection (BfS), the Reactor Safety Commission (RSK) and the Radiation Protection Commission (SSK) as well as by *Gesellschaft für Anlagen- und Reaktorsicherheit* (GRS), an expert nuclear safety organisation.

At the end of 1989 the **Federal Office for Radiation Protection (BfS)** was established in the scope of responsibility of the BMU. The BfS supports the BMU on the expert, scientific and adminis-

trative level, ensuring federal supervision by making comments and suggestions to improve the safety of nuclear facilities. The BfS is furthermore responsible for the safe custody of nuclear fuels by the state, for the construction and operation of final storage facilities as well as for licensing carriage and storage of nuclear fuels.

Licences for the construction and operation of nuclear facilities pursuant to Section 7 AtG are granted by the **supreme *Länder* authorities**, generally the Ministries for the Environment of the *Länder*. These are also responsible for the supervision of the nuclear facilities in operation.

The ***Länder* Committee for Nuclear Energy** and its technical committees, which are presided over by the BMU, serve for an exchange of experience between the Federal Government and the *Länder* and co-ordination to ensure a uniform procedure of all *Länder* in the field of nuclear safety and radiation protection.



The chamber of the German Bundestag, where laws are passed by the Members of Parliament

Nuclear Licensing Procedure for Nuclear Power Plants

3

Application

As nuclear power plant operators, the private power utility companies also assume the role of applicant in the nuclear licensing procedure. They submit a written application to the licensing authority of the *Land* where the plant to be modified is located. The documents which have to be attached to the application are specified in Section 3 of the Nuclear Licensing Procedures Ordinance (AtVfV).

An important document is the safety report with site plans and survey diagrams. This report describes the plant and its operation as well as the connected effects – including the consequences of design-basis accidents – and explains the preventive measures.

Pursuant to Section 3 AtVfV, further documents have to be submitted to fulfill the licensing prerequisites, i. e.:

- ☐ supplementary plans, drawings and descriptions of the plant,
- as well as details on
- ☐ the protection against malevolent disruptive acts,
- ☐ the applicant and the persons responsible,
- ☐ the necessary know-how of the other persons involved in the operation of the plant,
- ☐ the safety specification,
- ☐ financial security,



View of the open reactor pressure vessel with refuelling machine.

- ☐ the kind of radioactive residual materials arising as well as on the measures provided for avoiding, using and/or removing these residual materials or radioactive parts of the plant,
- ☐ the presumed storage of the radioactive residual materials or radioactive plant components until final storage, and
- ☐ the protective measures provided for the environment (keeping water, soil and air pure).

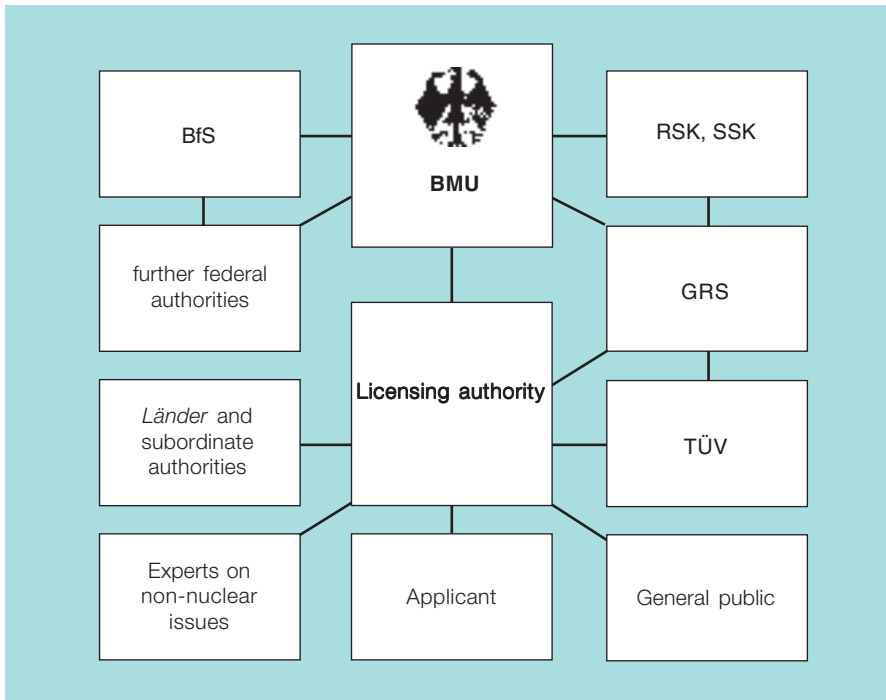
In addition, a brief description of the planned modification and its presumed effects on the general public and the neighbourhood has to be submitted together with the application (Section 3, para. 2 AtVfV).

Examination of the Application

On the basis of the submitted documents, the licensing authority of the *Land* examines whether the prerequisites for granting a licence have been fulfilled. In doing so it is advised scientifically by experts, generally by a Technical Inspectorate (*Technischer Überwachungs-Verein, TÜV*). At the same time the Federal Environment Ministry as well as the responsible federal, regional and local authorities are involved and the general public is informed.

Federal Authorities

The Federal Ministry for the Environment, Nature Conservation



Nuclear licensing procedure

and Nuclear Safety (BMU) involves other Federal Ministries that are concerned. In performing its role as federal supervisor, the BMU is advised in particular by its expert committees, the Reactor Safety Commission (RSK) and the Commission on Radiological Protection (SSK). These expert committees are composed of independent experts of different scientific disciplines.

After thorough examination of the planned project, RSK and SSK give a recommendation to the BMU. The BMU analyses this recommendation and then provides its comment to the responsible licensing authority. This comment has to be considered in the decision-making process of the *Land* authority responsible.

In addition, *Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH*, being the main expert adviser to the Federal Government, provides expert opinions to the BMU.

Land Authorities

All the authorities of the *Land* concerned, the communities surrounding the plant location, and all other expert authorities and institutions whose responsibility may be affected (in particular building, water, fire prevention, disaster control and nature protection authorities) are involved in the examination process.

Experts

The licensing authorities generally entrust experts with the examination of which requirements are to be met by nuclear safety and



During a hearing, objections are brought forward, explained and discussed with the applicant.

radiation protection and whether the licensing prerequisites have been met.

Experts support the licensing authority. They do not have the authority to take decisions.

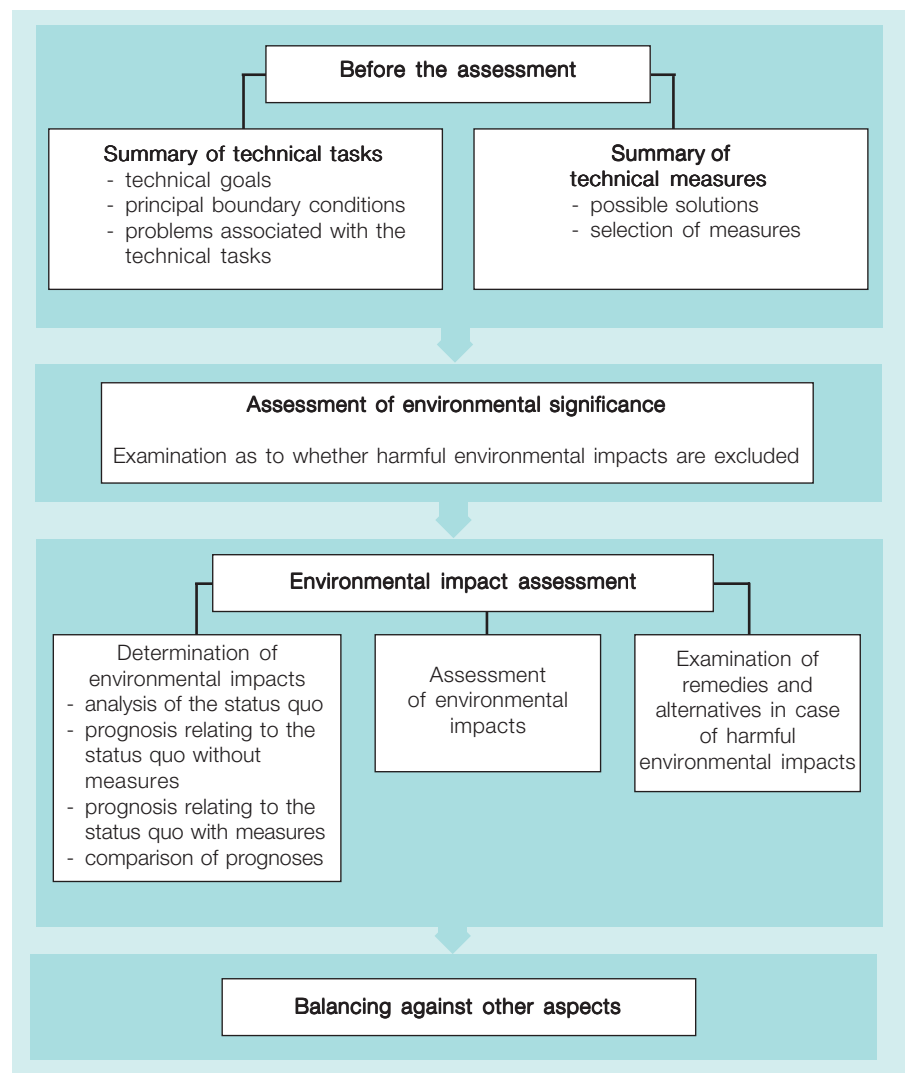
Because of the large scope of the examinations, expert organisations – such as the Technical Inspectorates or *Gesellschaft für Anlagen- und Reaktorsicherheit (GRS)* – are generally entrusted with the assessment and the examination of the application documents.

Further competent experts examine the planned site with respect to its suitability from a geological, seismological and hydrological point of view.

General Public

An important task of the licensing authority is to involve the general public. The basic rights of those citizens who might be affected by the effects of the modified plant are thus protected. Compliance with the procedural regulations as set out in Section 5 of the Nuclear Licensing Procedures Ordinance (AtVfV) is an important prerequisite for the legality of the decision. The following steps are mandatory:

- ☐ public announcement of the project in the *Federal Bulletin* and in the local press,
- ☐ public display of the application documents at the licensing authority and at least one suitable location near the site for a period of two months,
- ☐ a hearing to be carried out where objections can be dis-



Scheme illustrating an environmental impact assessment

cussed by the licensing authority, the applicant and objectors,

- ☐ minutes comprising the object of the licensing procedure, the course and the results of the hearing,
- ☐ serving of the licensing authority's decision concerning the objections.

Objectors can take legal proceedings before the administrative court against the licensing authority's decision.

Environmental Impact Assessment

The environmental impact assessment (*Umweltverträglichkeitsprüfung – UVP*) which has to be carried out pursuant to the provisions of Section 1a AtVfV represents an important constituent of the nuclear licensing procedure.

The UVP procedure is laid down in the Environmental Impact Assessment Act (UVPG), which supplements the Nuclear Licens-



Units A and B of the Biblis nuclear power plant have been in service since 1975 and 1977, respectively, and are among the oldest commercial nuclear power plants in Europe.

ing Procedures Ordinance. According to the Appendix to Section 3 UVPG, environmental impact assessments have to be carried out in particular in connection with

- ❑ major alteration of the facility or its operation which require licensing, with participation of the general public pursuant to Section 7 AtG and
- ❑ the construction and operation of a facility for the safe custody and final storage of radioactive waste as well as in connection with any essential modification of such a facility or its operation which require plan approval pursuant to Section 9b AtG.

The *Land* authority responsible has to inform the applicant about the presumed extent of the assess-

ment as soon as the applicant has informed the authority about the project, possibly even before the actual application. The responsible authority here has to

- ❑ determine, describe and assess the impacts on the environment at an early stage and in a comprehensive way as well as to
- ❑ consider the result of the UVP at the earliest possible point in time in all decisions of the authority on the permissibility of the planned project.

For this purpose other authorities, experts and third parties (site and neighbouring communities, recognised nature conservation associations) can be called in. The

general public is also involved in the environmental impact assessment.

The applicant has to submit documents on the environmental impacts of the project to the responsible authority at the beginning of the procedure. In addition, the applicant has to disclose the most important procedural alternatives he examined as well as the essential reasons for his choice.

The authority responsible then prepares a comprehensive summary of the project on the basis of the documents submitted by the applicant, the comments made by the other authorities as well as the statements of the general public and carries out a final assessment. This assessment represents the

basis for the decision on the permissibility of the project with respect to effective environmental provisions.

Licensing Decision

The licensing authority examines whether the licensing prerequisites pursuant to Section 7 para. 2 AtG are met for the applied-for facility. The following criteria are considered in the assessment:

- ☐ the opinions of the authorised experts,
- ☐ the BMU comment,
- ☐ the comments of the other authorities involved,
- ☐ the objections brought forward by the general public, and
- ☐ the results of the environmental impact assessment.

All these pieces of information together with the application documents represent the basis for the decision process of the licensing authority.

The licensing authority can

- ☐ reject the application if the licensing prerequisites have not been met (Section 15, para. 2 AtVfV) or
- ☐ grant the licence applied for (Sections 16, 18 AtVfV).

According to Section 16 AtVfV, the licensing decision has to contain i.a. the following details:

- ☐ the applicant's name and place of residence,

- ☐ the information that a licence will be granted, indicating the legal basis,
- ☐ an exact definition of the object of the licence including the location of the facility,
- ☐ incidental provisions for the licence as well as
- ☐ the reasons for the decision and the treatment of objections.

The decision of the licensing authority has to be served on the applicant and the objectors in writing. If a decision is to be served on more than 300 objectors, the serving can be replaced by public announcement (Section 15, para. 3 AtVfV). The directive part of the licensing decision and the instruction about legal remedies are to be made public. The conditions are to be indicated. A copy of the decision has to be laid out for inspection for two weeks (Section 17 AtVfV).

After this, the objectors can order the decision and the statements of its reasons in writing from the licensing authority until the end of the term for legal remedy (period for initiating legal action).



*Installation of new blade rings
in order to increase the
efficiency of the turbines.*



Fuel element storage halls at Gorleben:

The transport cask storage hall (large hall at the centre of the picture) was licensed in accordance with Section 6 AtG, the radwaste storage hall (small hall on the right) in accordance with Section 3 StrlSchV. Furthermore, the construction site of the pilot conditioning plant, which is being licensed pursuant to Section 7 AtG, can be seen on the left.

The nuclear licence is normally granted in several partial steps (partial erection, partial operating licences). Because of the scope and the construction time of nuclear power plant projects it makes sense to examine and licence the technical details step by step. The advantage of such a procedure is that the individual licensing steps can thus be based on the latest state of the art.

For example, the location, safety concept and erection of the essential buildings are licensed in the first partial construction licence. Further licensing steps are:

- ☐ the erection of the safety-related systems and components of machinery and electrical systems,

- ☐ handling and storage of fuel elements as well as loading of the reactor with fuel elements including pre-operational tests,
- ☐ final construction, first nuclear start-up and operation of the facility.

It has to be noted in this connection that the nuclear licence does not comprise all areas affected by the modified plant. This means that the nuclear licence does not cover all the necessary licences and permissions or other decisions made by different authorities.

As a result, a series of further licensing procedures is carried out by the *Länder*, e. g. pursuant to the water, immission control or energy

sector laws, which vary from *Land* to *Land*.

After the nuclear licence has been granted, later requirements can be made under certain conditions by the authority responsible. If a nuclear facility represents a considerable danger for the employees or the population and if this danger cannot be removed by appropriate measures within a reasonable time, the licensing authority has to revoke the licence (Section 17 para. 3 AtG).

4

Plan Approval Procedure for the Final Storage of Radioactive Waste

In Germany, radioactive waste is to be finally disposed of in deep geological formations.

The issue of final disposal has gained importance again due to the amendment of the Atomic Energy Act. The current option to send irradiated nuclear fuel originating from the operation of German nuclear power plants to a reprocessing plant will cease on 1 July 2005. This disposal pathway will be replaced by the duty of the operator of the power plant to set up an on-site interim storage facility and to store irradiated nuclear fuels there until their shipment to a repository.

In 2002, the plan approval procedure was concluded for the Konrad repository in Germany. Until its closure in 1976, ore and iron deposits were mined at the site. In the following years, extensive and long lasting research was carried out to examine the suitability of the rock formation with a view to the final storage of radioactive waste with negligible heat generation.

This disposal pathway is regulated by the following laws and regulations:

□ Legal Regulations

- Atomic Energy Act (AtG)
- Federal Mining Act (*Bundesberggesetz – BBergG*),
- Environmental Impact Assessment Act (*Gesetz über die Umweltverträglichkeitsprüfung – UVPG*),

- Water Management Act (*Wasserhaushaltsgesetz – WHG*),
- Radiation Protection Ordinance (*Strahlenschutzverordnung – StrlSchV*),

□ Implementing Provisions

- mining regulations,
- safety criteria for the final storage of radioactive waste in a mine,
- technical regulations, e.g. of the Nuclear Safety Standards Commission (KTA),

□ Other Technical Regulations

- DIN standards,
- geotechnical recommendations of the German Geotechnical Society.

Responsibilities

Pursuant to Section 9a AtG, the Federal Government has to provide installations for the safe-keeping and final storage of radioactive waste.

This task falls into the area of responsibility of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) which takes care of this task through the Federal Office for Radiation Protection (BfS), which was set up in accordance with Section 2, para. 1 of the law on the establishment of such an authority. The BfS has to ensure that neither present nor future generations are endangered by a release of radioactive substances. To fulfil these functions, it can make use of third parties.

Until 1 November 1989, the *Physikalisch-Technische Bundesanstalt (PTB)* was responsible for the erection and operation of installations for safekeeping and final storage of radioactive waste. In 1989 these functions were assumed by the Federal Office for Radiation Protection (BfS) (Section 23 AtG).

To fulfil these tasks, the BfS makes use of third parties, e.g. the



The Konrad mine is intended for the final storage of radioactive waste with negligible heat generation.



Gorleben Exploration Mine:

On 1 October 2000, exploration was stopped against the background of the moratorium. Currently, activities are largely restricted to maintenance and repair operations as well as to measuring and documentation.

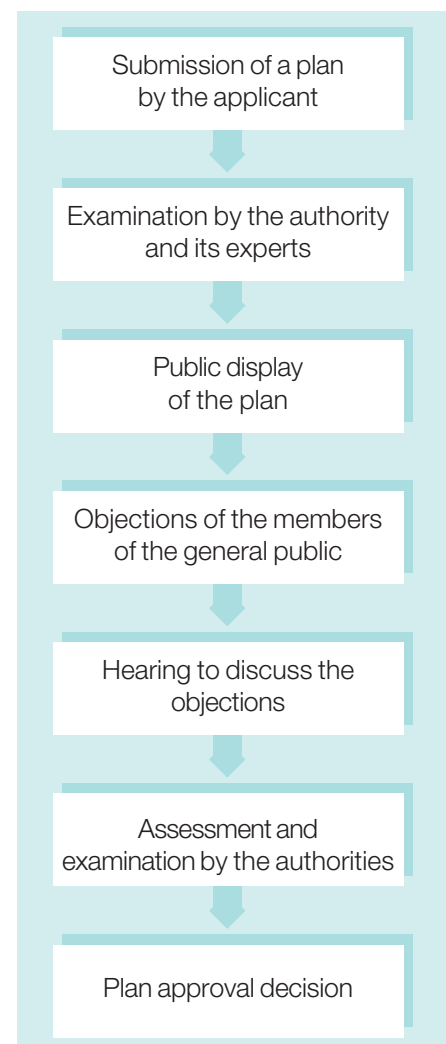
Deutsche Gesellschaft zum Bau und Betrieb von Endlagern für Abfallstoffe mbH (DBE), a company for the construction and operation of waste repositories. An important partner is the Federal Institute for Geosciences and Natural Resources (Bundesanstalt für Geowissenschaften und Rohstoffe – BGR), dealing with geo-

technical and scientific issues associated with the design, construction and decommissioning of repositories. In addition, university institutes, large research centres and the industry provide solutions for the final storage of radioactive waste within the framework of research and development projects.

Procedure

The erection and operation of a repository for radioactive waste requires plan approval. Section 9b AtG determines how the plan approval procedure is to be carried out. At the same time, the environmental impact assessment of the planned final storage facility has to be examined.

The bearer of the project has to submit the so-called plan, i.e.



Plan approval procedure

the **description of the repository concept**, to the licensing authority. The licensing authority responsible according to the respective *Land* law examines the documents submitted and, pursuant to the Nuclear Licensing Procedures and Sections 72 to 78 of the Administrative Procedures Act, holds a hearing which comprises the following steps:

- ☐ the project and the date of the hearing are announced,
- ☐ the plan is displayed for public inspection,
- ☐ the objections raised by the members of the public are collected and evaluated,
- ☐ the hearing is held and
- ☐ the decisions taken are served on the applicant.

The procedure ends with the **plan approval decision** which comprises all licences in accordance with the respective relevant acts. Partial licences which are customary for the licensing procedure for nuclear facilities are not provided for by the plan approval procedure.

Section 9b AtG contains a special regulation relating to mining law. Plan approval does not extend to the permissibility of a repository according to mining and deep storage law. It is the competent mining authority which decides on this issue.

In contrast to plan approval, the **mining law procedure** is a continuous procedure which is carried out parallel to the operation of the mine. It ends with the decommissioning of a mine and a possibly

required recultivation of the premises.

Post-operational Phase

According to the Atomic Energy Act and the Radiological Protection Ordinance, radioactive waste is to be handled and stored in a way which ensures the protection of man and the environment against damage by radioactive radiation.

The safety criteria for the final storage of radioactive waste in a

mine prescribe a limit of 0.3 mSv/a as the **radiological protection target** for the population in the post-operational phase of a repository. This value reflects the variation of natural radiation exposure in Germany and ensures that future generations also do not have to expect higher radiation exposure rates than those currently permitted.

Long-term safety analyses serve to prove quantitatively that the predetermined radiological protection targets are kept in the post-operational phase of a repository.



Morsleben repository for radioactive waste (ERAM) in Saxony-Anhalt:

In 1971, the first radioactive waste was emplaced. In 1978, the trial operation of ERAM started. A provisional operating licence was granted in 1981 and an unlimited operating licence in 1986. In the course of German Unification, Morsleben became a federal property. About 37,000 m³ of low and intermediate-active waste are emplaced at ERAM with a total activity of 1.7×10^{14} Bq. Due to a court ruling, emplacement was stopped by the BfS on 25 September 1998. In a press release of May 2001, the BfS stresses that there will be no further disposal and that operation of the repository will be restricted to keeping it open until the beginning of decommissioning. The decommissioning procedure has been initiated.

5

Supervision of Nuclear Facilities



Experts regularly examine the surroundings of nuclear power plants for radioactive substances e.g. with a device for measuring the local dose rate (shown in an enlarged image on the left).

After the licence for the erection and operation of a nuclear facility has been granted, the plant is subject to continuous state supervision. Section 19 of the Atomic Energy Act (AtG) and the ordinances specifying this act, in particular the Radiation Protection Ordinance (StrlSchV) and the Nuclear Safety Officer and Reporting Ordinance (AtSMV) represent the legal basis.

In the supervisory procedure, the *Länder* also act on behalf of the Federal Government. Similar to the licensing procedure, the *Länder* are supported by experts, generally the Technical Inspection Institutes (TÜV), and the BMU is advised by the Reactor Safety Commission (RSK), the Commission on Radiological Protection (SSK) as well as by the nuclear

safety expert organisation *Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH*.

The federal and *Länder* authorities responsible are bound to the principle of the best possible accident and risk prevention. The **overriding objective** of the state supervision of nuclear facilities is **to protect the population and the people employed in these facilities** against the hazards associated with the operation of such facilities. Pursuant to Section 19, para. 1 AtG, the supervisory authorities examine in particular:

- ☐ compliance with the regulations of the Atomic Energy Act, the statutory ordinances issued because of this act, and other safety rules and guidelines,

- ☐ compliance with the regulations and decrees issued by the supervisory authorities,
- ☐ fulfilment and compliance with the requirements and regulations prescribed in the licensing decision,
- ☐ implementation of the additional requirements ordered by the supervisory authority at a later stage.

As one part of the authorities' supervisory activities, the safety of the plants is checked continuously.

The supervisory authority, with the help of its experts or subordinate authorities, supervises and checks, e. g. by plant inspections and the review of reports,

- ☐ compliance with the operating instructions,
- ☐ in-service inspections of safety-relevant plant components,
- ☐ the radiological protection of the nuclear plant personnel and the environment,
- ☐ the observance of limits upon the controlled release of radioactive substances and
- ☐ the technical qualification of persons responsible for the operation of the plant.

The supervisory authority can order special safety measures and safety inspections as well as an interruption of operation if deviations from legal provisions or the licensing conditions or risks to the life, health and ownership of third parties are detected.

Upon non-compliance with the legal requirements, ordinances or provisions of the licensing decision, the supervisory authority can order pursuant to Section 19, para. 3 AtG that

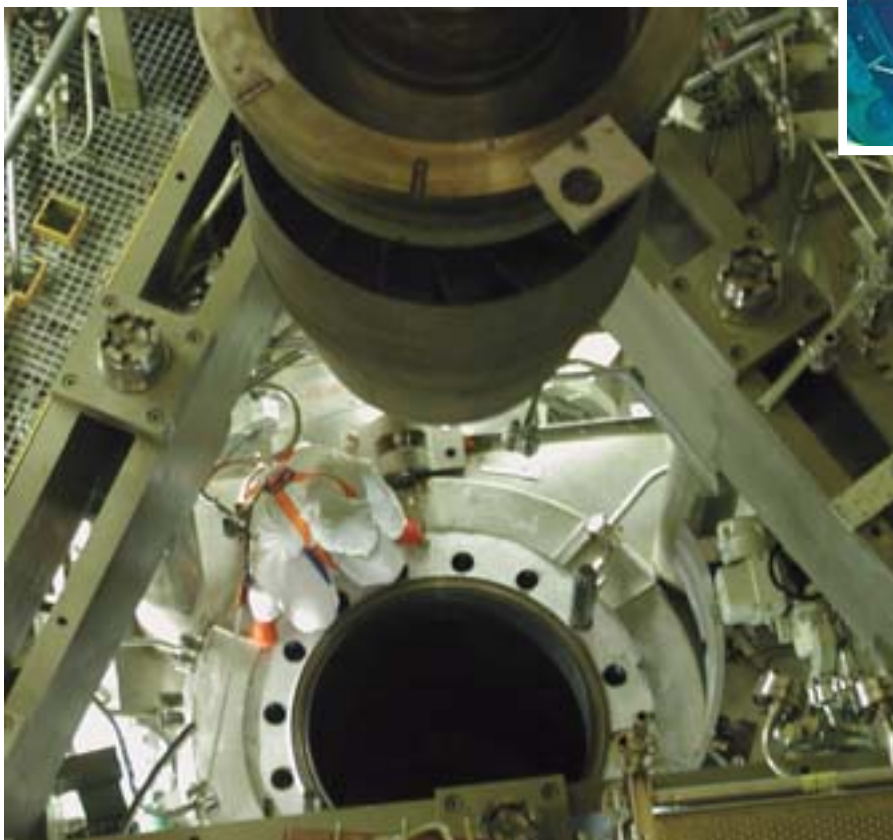
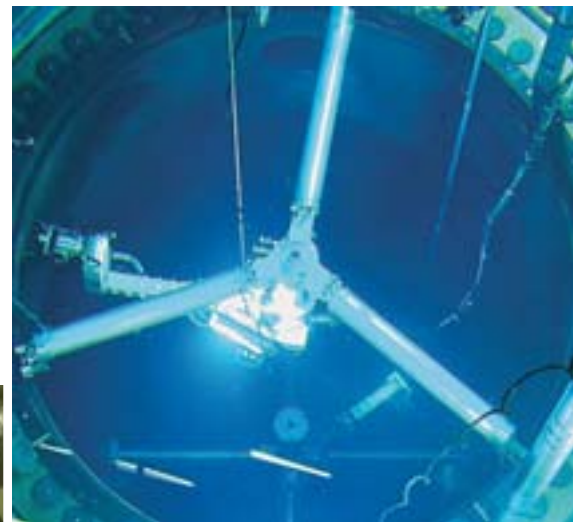
- protective measures be taken,
- radioactive material be kept in custody at a location determined by the authority, and

- the handling of radioactive material, the construction and the operation of facilities be temporarily or finally given up.

The supervisory authority usually entrusts the Technical Inspectorates (TÜV) with **inspections and supervisory and controlling functions**. The examiners and experts authorised by the supervisory authority have **access** to the

nuclear facilities **at all times**, and they are entitled to carry out the necessary inspections and ask the operator for relevant information. In addition, the operator of a plant has to present **operating reports** to the supervisory authority on a regular basis and report any **safety-relevant incidents** to the authority immediately.

Ultrasonic testing of welds in the reactor pressure vessel with the help of a test manipulator.



Reinstallation of an overhauled reactor coolant pump.

Within the framework of the amendment of the AtG, the current practice of performing a **periodic safety review every 10 years** for every nuclear power plant in operation has been turned into a legal obligation (Section 19a AtG). This review is a comprehensive overall safety assessment to complement state supervision. The obligation to perform the safety review is void if the licensee declares bindingly that he is going to close down the plant for good.

Apart from this, it is common practice that safety technology and operating modes are further developed in accordance with the progressing state of the art.

6

Transport of Radioactive Substances

According to the Atomic Energy Act (AtG), most transports of radioactive substances are subject to approval. Section 4 AtG regulates the carriage of fuel elements. Section 16 of the Radiation Protection Ordinance applies to other radioactive substances. Pursuant to Section 4 AtG, nuclear licences are only granted if the respective **conditions under traffic law** have been fulfilled. These are specified in Section 4, para. 2 AtG:

□ Reliability

Pursuant to Section 12b AtG, the applicant and the persons carrying out the transport are examined by the licensing

authority, in particular with respect to their reliability.

□ The necessary knowledge

The applicant has to demonstrate the necessary knowledge relating to possible irradiation hazards and protective measures to be applied to the carriage of nuclear fuel by participating in courses, special training or demonstrating practical experience.

□ Compliance with transport regulations

The carrier must guarantee that the nuclear fuels are

carried in compliance with all legal provisions.

□ Liability provisions

The carrier has to make sure that the legal liability for damages can be fulfilled.

□ Protection against interferences

The applicant has to demonstrate sufficient protection against possible interferences, e.g. theft, arson, or sabotage. This protection can be achieved by using special armoured vehicles, escorts or by applying administrative measures.



Radioactive waste and fuel element casks approved for the shipment to and emplacement in the Storage Facility for Radioactive Waste Materials and the Transport Cask Store at Gorleben.

Top: Waste drums prepared for dispatch by road (left) and a CASTOR V/19 cask (right). Bottom (from left to right): MOSAIK cast-iron containers, Konrad waste containers, and reinforced-concrete shields (VBA) for waste containers.

❑ **Consideration of pre-dominantly public interests**

A transport licence may be refused if the kind of carriage, the time and the route of carriage counteract public interests.

❑ **Proof relating to on-site interim storage facilities**

As a result of the amendment of the AtG, the licensee of a facility for the fission of nuclear fuels for the commercial generation of electricity is obliged to set up a **near-site** interim storage facility (Section 9a, para. 2, no. 3 AtG). Until the development of a repository is completed, the irradiated nuclear fuels are to be stored there. As no on-site interim storage facilities were available when the amendment entered into force, the nuclear fuels still have to be carried to central interim storage facilities for the time being (Section 6, para. 1 AtG). In order to bind the licensee to his obligation to build a near-site interim storage facility, he shall only be entitled to carry his nuclear fuels to a central interim storage facility if he can demonstrate to the legislator the non-availability of a near-site interim storage facility.

A permission is granted for every individual **carriage**. Pursuant to Section 4, para. 4 AtG it can generally only be granted to an applicant upon fulfilment of all licensing conditions for three years at the most. During carriage of nuclear fuels a copy of the licensing decision as well as a certificate meeting the requirements of the **Paris Nuclear Liability Convention**

On 25 April 1995, external interim storage began at the Transport Cask Store Gorleben; the image shows a CASTOR HAW 20/28-type transport and storage cask for canisters holding vitrified waste in the maintenance room.



has to be taken along. During inspections, these documents have to be shown upon request to the supervisory authority in charge.

Pursuant to Section 23 AtG the **Federal Office for Radiation Protection** is responsible for licensing carriages of nuclear fuels and large radiation sources.

To monitor compliance with rules and regulations, there is a steady exchange of information between the authorities responsible and the parties participating in the transport operation.

With the restructuring of the German nuclear industry in 1988, **responsibility for the transport of radioactive substances fell to the German Federal Railways (Deutsche Bundesbahn)**. Transports are supervised by the Land authorities (e.g. police, trade supervisory authority) and the *Bundesbahn* central office. Since the privatisation of the railways and the creation of the *Bahn AG*, the "*Eisenbahn Bundesamt*" has assumed the functions of the *Bundesbahn* central office.

Appendix

Overview of the most important statutory ordinances relating to the Atomic Energy Act

Verordnung über den Schutz vor Schäden durch ionisierende Strahlung (Strahlenschutzverordnung (StrlSchV) – Radiation Protection Ordinance) in the version of 1 August 2001 (Federal Law Gazette I, p. 1714), last amended on 18 June 2002 (Federal Law Gazette I, p. 1869)

The Radiation Protection Ordinance contains supervisory and protective provisions, i. a. for

- ❑ the handling and carriage of radioactive substances,
- ❑ the protection of the population, the environment and the employees against the hazards of ionising radiation.

Sections 6, 46 to 49 of the Radiation Protection Ordinance comprise the most important radiation protection principles relating to environmental protection in connection with nuclear facilities. These Sections state that every unnecessary radiation exposure or contamination of individuals, goods or the environment has to be avoided and, even below the specified limits, has to be kept as low as possible.

Section 47 StrlSchV stipulates that during normal operation the following limits must

not be exceeded within the period of one calendar year:

- ❑ 0.3 mSv (30 mrem)/year effective dose and organ dose for gonads, uterus and red bone marrow,
- ❑ 0.9 mSv (30 mrem)/year for organs and tissue such as colon, lung, stomach, liver, chest, etc.
- ❑ 1.8 mSv (180 mrem)/year organ dose for bone surface and skin.

Pursuant to Section 49, para. 1 nos. 1, 2 Radiation Protection Ordinance it has to be demonstrated that the limit of 50 mSv (5 rem)/incident effective dose or 150 mSv (15 rem) thyroid dose is not exceeded during possible accidents in a nuclear facility.

The proof that the radiation exposure in the environment of nuclear facilities even outside these limits is kept as low as possible represents the main emphasis of the examinations in the nuclear licensing procedure.

Verordnung über das Verfahren bei der Genehmigung von Anlagen nach § 7 des Atomgesetzes (Atomrechtliche Verfahrensordnung (AtVfV) – Nuclear Licensing Procedures Ordinance) in the version of 3 February 1995 (Federal Law Gazette I, p. 180) last amended on 25 March 2002 (Federal Law Gazette I, p. 1193)

The Nuclear Licensing Procedures Ordinance (AtVfV) determines the details of the nuclear licensing procedure. It comprises in particular detailed regulations on:

- ❑ form and content of the application,
- ❑ kind and scope of application documents,
- ❑ participation of third parties in the licensing procedure, including public announcement of the project, public display of the application documents,

acknowledgement and discussion of objections,

- ❑ examination of the application by the licensing authority,
- ❑ decision on the application and the content of the licensing decision,
- ❑ announcement of the application.

This statutory ordinance contains precise standards for all actions of participants in the licensing procedure, i. e. the applicant, the licensing authority and third parties.

Verordnung über den kerntechnischen Sicherheitsbeauftragten und über die Meldung von Störfällen und sonstigen Ereignissen (Atomrechtliche Sicherheitsbeauftragten- und Meldeverordnung (AtSMV) – Nuclear Safety Officer and Reporting Ordinance) of 14 October 1992 (Federal Law Gazette I, 1766) last amended on 20 July 2001 (Federal Law Gazette I, no. 38)

This statutory ordinance obliges the operator to appoint a safety officer whose main task is the analysis of safety-relevant events. The safety officer has to be employed for the entire operating time of a facility. This regulation also specifies the kind of procedure during events which have to be reported and the content and the terms for reporting these incidents.

Verordnung über die Deckungsvorsorge nach dem Atomgesetz (Atomrechtliche Deckungsvorsorge-Verordnung (AtDeckV) – Ordinance on the Financial Security Pursuant to the Atomic Energy Act) of 25 January 1977 (Federal Law Gazette I, p. 220), last amended on 18 April 2002 (Federal Law Gazette I, p. 1869)

The kind, scope and amount of the financial security to be demonstrated for nuclear facilities are laid down in this statutory ordinance. In most cases it has to be provided for by a liability insurance. In the nuclear licensing procedure the licensing authority examines whether there is sufficient financial security.

As part of the amendment of the AtG, the upper limit of financial security to be provided by the holder of a nuclear licence has been fixed to an amount of 2.5 billion euros, which is ten times the previous amount.

Verordnung über den Schutz vor Schäden durch Röntgenstrahlen (Röntgenverordnung (RöV) – X-Ray Ordinance) of 8 January 1987 (Federal Law Gazette I, p. 114), last amended on 18 June 2002 (Federal Law Gazette I, p. 1869)

The licensing and protective regulations to be met by X-ray facilities and stray radiation emitters are specified in this statutory ordinance.

In June 2002, the RöV was comprehensively amended to meet guidelines under European Law.

Verordnung über Vorausleistungen für die Einrichtung von Anlagen des Bundes zur Sicherstellung und zur Endlagerung radioaktiver Abfälle (Endlagervorausleistungsverordnung (EndlagerVIV) – Waste Disposal Advance Payments Ordinance) of 28 April 1982 (Federal Law Gazette I, p. 562), last amended on 20 July 2002 (Federal Law Gazette I, p. 1714)

This statutory ordinance specifies the amount of the fees for the construction of a repository to be paid to the Federal Government by the nuclear facility operators.

Kostenverordnung zum Atomgesetz (Atomrechtliche Kostenverordnung (AtKostV) – Atomic Energy Act Cost Ordinance) of 17 December 1981 (Federal Law Gazette I, p. 1457), last amended on 22 April 2002 (Federal Law Gazette I, p. 1359)

The fees to be paid by the applicant or the licensee for the activities of the licensing and supervisory authorities are laid down in the cost ordinance.

Brief outlines of further important laws with relevance to nuclear licensing

Gesetz zum vorsorgenden Schutz der Bevölkerung gegen Strahlenbelastung (Strahlenschutzvorsorgegesetz (StrVG) – Precautionary Radiation Protection Act) of 19 December 1986 (Federal Law Gazette I, p. 2610), last amended on 14 December 2001 (Federal Law Gazette I, p. 3714)

To protect the population, the Precautionary Radiation Protection Act stipulates that the radioactivity of the environment is to be monitored continuously and that the radiation exposure of the population during a possible radioactive contamination of the environment is to be kept as low as possible. The Federal Government is responsible for the large-scale measurement of radioactivity in the air and in water as well as for the determination of sampling, analysis, measuring and calculation procedures, the evaluation of data relating to the radioactivity in the environment, and the transfer of data and the results of the evaluations to the *Länder*. For this purpose the Federal Government uses the federal information system „Radioaktivität in der Umwelt“ (Radioactivity in the Environment) which is directly available to the respective *Land* authorities responsible.

To protect the environment, the Federal Government is entitled to set down dose values, contamination values and calculation procedures by way of statutory ordinances. On the basis of these contamination values the Federal Government can prohibit or restrict food, fodder, medicine and other substances if these values are exceeded. Upon violation of the statutory ordinances, imprisonment of up to one year or monetary fines can be imposed. It is the responsibility of the *Länder* to measure the radioactivity in food, drinking water and groundwater, residual materials and waste as well as in the soil and in plants, and to transmit

these data to the federal environmental radioactivity monitoring centre.

At present, the Precautionary Radiological Protection Act is specified by two statutory ordinances:

- The ordinance concerning the assignment of measuring and analysing functions according to the Precautionary Radiological Protection Act sets down the responsibilities for the determination of radioactivity in the air. The German Meteorological Service (*Deutscher Wetterdienst*) and the Federal Environmental Agency (*Umweltbundesamt*) are responsible for the determination of the overall beta and iodine 131 activity concentration. The trace analysis of aerosol or gaseous artificial radionuclides is carried out by the Institute for Atmospheric Radioactivity (*Institut für Atmosphärische Radioaktivität*), the German Meteorological Service and the *Physikalisch-Technische Bundesanstalt*.
- In the second ordinance on the supervision of measuring and analysing functions according to the Precautionary Radiological Protection Act, the Federal Research Centre for Fisheries (*Bundesforschungsanstalt für Fischerei*) is entrusted with the determination of radioactivity in marine organisms of the North Sea and the Baltic Sea, including coastal waters.

**Gesetz über die
Umweltverträglichkeitsprüfung
(Gesetz über die
Umweltverträglichkeitsprüfung
(UVPG) – Environmental Impact
Assessment Act) of 12 February 1990
(Federal Law Gazette I, p. 205), last
amended on 18 June 2002 (Federal
Law Gazette I, p. 1914)**

It is the purpose of this act to determine, describe and assess the impacts on the environment at an early stage and in a comprehensive way. For this purpose, environmental impact assessments are carried out with participation of the general public. The assessments examine the impacts of planned projects on humans, animals and plants, the soil, water, air, climate and landscape, including the respective correlations, as well as on cultural and material goods.

Projects which may have significant effects on the environment are subject to the environmental impact assessments. These are in particular:

- ☐ essential changes of the location, the nature and the operation of a plant subject to licensing in a public procedure pursuant to Section 4 Federal Immission Control Act and which is mentioned in the Appendix of the relevant ordinance relating to such plants,
- ☐ essential changes to a plant or its operation requiring a licence pursuant to Section 7 AtG,
- ☐ construction and operation of a plant for safe custody and final storage of radioactive waste as well as essential changes to such a plant or its operation requiring plan-approval pursuant to Section 9b AtG.

The result of the environmental impact assessment is to be considered as early as possible in all decisions on the permissibility made by the authorities.

**Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch
Luftverunreinigungen,
Geräusche, Erschütterungen und ähnliche Vorgänge
(Bundes-Immissionsschutzgesetz (BImSchG) – Federal Immission Control Act)
in the version of 14 May 1990
(Federal Law Gazette I, p. 880), last amended on 11 September 2002
(Federal Law Gazette I, p. 3622)**

It is the purpose of this law to protect humans, animals and plants, the soil, water, the atmosphere as well as cultural and other goods against damaging environmental effects, i.e. immissions (air pollution, noise, vibration, light, heat, radiation, etc.) and to prevent their emergence. In addition to the general provisions of the first part of this Act, regulations on the construction, operation and closedown of facilities which, because of their nature or of their operation, can create damaging environmental effects (facilities requiring a licence) are specified in the second part. The legal requirements to be met by facilities which do not need to be licensed are also described here. In addition, the licensing procedure to be carried out, the measures for determining emissions and immissions and for performing safety checks are laid down. In the third part the nature of installations, substances, products, fuels and lubricants is specified.

Part 5 of this act provides for measures for monitoring air pollution in the Federal Republic, e.g. with the help of clean air plans and noise abatement measures. Parts 6 and 7 BImSchG contain pro-

visions i.a. on the supervision by the authorities responsible, the duties and the rights of the operator, appointment of a hazardous incident officer, etc. In addition, the BImSchG is currently further specified by 26 statutory ordinances. Particularly important for the nuclear licensing procedure are:

- ☐ **Facilities Licensing Ordinance (*Anlagenverordnung – 4th BImSchV*, Ordinance on Facilities Subject to Licensing)** which classifies in its Appendix stationary plants which require a special licensing procedure for their construction and operation
- ☐ **Hazardous Incident Ordinance (*Störfall-Verordnung – 12th BImSchV*)** which contains measures and requirements to be met by accident prevention and defence and the mitigation of accident consequences. This ordinance further specifies the kind and the scope of safety analyses and the operator's duty to report the occurrence of an accident.

**Gesetz zur Ordnung des Wasserhaushalts
(Wasserhaushaltsgesetz (WHG) – Water Management Act),
last amended on 19 August 2002
(Federal Law Gazette I, p. 3245)**

The Water Management Act regulates the permission or grant of the use of water. The conditions of use and the requirements and criteria for tapping and discharging water are laid down in this act. Several water permissions which are granted in particular pursuant to Section 2 WHG are required for the operation of nuclear facilities according to the progress of the construction. The permission is granted taking Section 3 WHG (tapping and discharge of water) into account. The water authorities of the *Länder* are responsible for the permissions.

Extracts from the Nuclear Safety Convention

Article 1. Objectives

The objectives of this Convention are:

- (i) to achieve and maintain a high level of nuclear safety worldwide through the enhancement of national measures and international co-operation including, where appropriate, safety-related technical co-operation;
- (ii) to establish and maintain effective defences in nuclear installations against potential radiological hazards in order to protect individuals, society and the environment from harmful effects of ionising radiation from such installations;
- (iii) to prevent accidents with radiological consequences and to mitigate such consequences should they occur.

Article 7. Legislative and Regulatory Framework

1. Each Contracting Party shall establish and maintain a legislative and regulatory framework to govern the safety of nuclear installations.
2. The legislative and regulatory framework shall provide for:
 - (i) the establishment of applicable national safety requirements and regulations;
 - (ii) a system of licensing with regard to nuclear installations and the prohibition of the operation of a nuclear installation without a licence;
 - (iii) a system of regulatory inspection and assessment of nuclear installations to ascertain compliance with applicable regulations and the terms of licences;
 - (iv) the enforcement of applicable regulations and of the terms of licences, including suspension, modification or revocation.

Article 10. Priority to Safety

Each Contracting Party shall take the appropriate steps to ensure that all organisations engaged in activities directly related to nuclear installations shall establish policies that give due priority to nuclear safety.

German-English Glossary

German	English
4. BImSchV – Verordnung über genehmigungsbedürftige Anlagen (Anlagenverordnung)	Ordinance on Facilities Subject to Licensing (Facilities Licensing Ordinance)
AtDeckV – Verordnung über die Deckungsvorsorge nach dem Atomgesetz (Atomrechtliche Deckungsvorsorge-Verordnung)	Ordinance on the Financial Security Pursuant to the Atomic Energy Act (Nuclear Financial Security Ordinance)
AtG – Gesetz über die friedliche Verwendung der Kernenergie und den Schutz gegen ihre Gefahren (Atomgesetz)	Act on the Peaceful Utilisation of Atomic Energy and the Protection Against its Hazards (Atomic Energy Act)
AtKostV – Kostenverordnung zum Atomgesetz (Atomrechtliche Kostenverordnung)	Cost Ordinance under the Atomic Energy Act (Atomic Energy Act Cost Ordinance)
AtSMV – Verordnung über den kerntechnischen Sicherheitsbeauftragten und über die Meldung von Störfällen und sonstigen Ereignissen (Atomrechtliche Sicherheitsbeauftragten- und Meldeverordnung)	Ordinance on the Nuclear Safety Officer and on the Notification about Accidents and Other Events (Nuclear Safety Officer and Notification Ordinance)
AtVfV – Verordnung über das Verfahren bei der Genehmigung von Anlagen nach § 7 des Atomgesetzes (Atomrechtliche Verfahrensordnung)	Ordinance on the Procedure for Licensing Facilities pursuant to Section 7 of the Atomic Energy Act (Nuclear Licensing Procedures Ordinance)
BBergG – Bundesberggesetz	Federal Mining Act
BfS – Bundesamt für Strahlenschutz	Federal Office for Radiation Protection
BGR – Bundesanstalt für Geowissenschaften und Rohstoffe	Federal Institute for Geosciences and Natural Resources
BImSchG – Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigung, Geräusche, Erschütterungen und ähnliche Vorgänge (Bundes-Immissionsschutzgesetz)	Act on the Prevention of Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibration and Similar Phenomena (Federal Immission Control Act)
BMU – Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
Bundesanzeiger	Federal Gazette
Bundesforschungsanstalt für Fischerei	Federal Research Centre for Fisheries
Bundesgesetzblatt	Federal Law Gazette
Deutsche Gesellschaft für Geotechnik e.V.	German Geotechnical Society
EndlagerVfV – Verordnung über Vorausleistungen für die Einrichtung von Anlagen des Bundes zur Sicherstellung und zur Endlagerung radioaktiver Abfälle (Endlagervorausleistungsverordnung)	Ordinance on Advance Payments for the Establishment of Federal Facilities for Safe Custody and Final Storage of Radioactive Waste (Waste Disposal Advance Payments Ordinance)
Institut für Atmosphärische Radioaktivität	Institute for Atmospheric Radioactivity
KTA – Kerntechnischer Ausschuss	Nuclear Safety Standards Commission
RöV – Verordnung über den Schutz vor Schäden durch Röntgenstrahlen (Röntgenverordnung)	Ordinance on the Protection against Injuries and Damage caused by X-Rays (X-ray Ordinance)
RSK – Reaktor-Sicherheitskommission	Reactor Safety Commission
SSK – Strahlenschutzkommission	Radiation Protection Commission
StörfallV – Störfall-Verordnung	Hazardous Incident Ordinance
StrlSchV – Verordnung über den Schutz vor Schäden durch ionisierende Strahlung (Strahlenschutzverordnung)	Ordinance on the Protection against Damage and Injuries Caused by Ionising Radiation (Radiation Protection Ordinance)
StrVG – Gesetz zum vorsorgenden Schutz der Bevölkerung gegen Strahlenbelastung (Strahlenschutzvorsorgegesetz)	Act on the Precautionary Protection of the Population against Radiation Exposure (Precautionary Radiation Protection Act)
TÜV – Technischer Überwachungs-Verein	(Regional) Technical Inspectorate
Umweltbundesamt	Federal Environmental Agency
UVPG – Gesetz über die Umweltverträglichkeitsprüfung (Umweltverträglichkeitsprüfungsgesetz)	Act on the Assessment of Environmental Impacts (Environmental Impact Assessment Act)
WHG – Gesetz zur Ordnung des Wasserhaushalts (Wasserhaushaltsgesetz)	Act on the Regulation of Matters Relating to Water (Water Management Act)

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