

The 2002 Amendment to the German Atomic Energy Act Concerning the Phase-out of Nuclear Power

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I. Introduction

One of the German Government's main legislative projects in the 14th legislative period of the German *Bundestag* was the legal regulation of the phase-out of the use of nuclear power. The Act on the structured phase-out of nuclear power for the commercial production of electricity entered into force on 27 April 2002.¹ Section 1 of this Act contains amendments to the Act on the Peaceful Utilisation of Atomic Energy and the Protection against its Hazards (Atomic Energy Act) of 23 December 1959 (the 1985 consolidated text of this Act is reproduced in the Supplement to *Nuclear Law Bulletin* No. 36);² Sections 2 and 3 contain amendments to the Ordinance on Financial Security Pursuant to the Atomic Energy Act of 25 January 1977 (the text of this Ordinance is reproduced in the Supplement to *Nuclear Law Bulletin* No. 18);³ and the Cost Ordinance Pursuant to the Atomic Energy Act of 17 December 1981.⁴

According to the decision of the German Government and the legislator, the further use of nuclear energy for commercial electricity production will only be permitted for a limited period due to the high risks associated with it, despite the high standard of safety at German installations in an international comparison. Even though, pursuant to the German Atomic Energy Act, precautionary action is to be taken against possible damage resulting from the operation of nuclear installations in accordance with the state of the art in science and technology, it is not possible to fully rule out the possibility of accidents resulting in major releases of ionising radiation. According to the Kalkar

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1. Federal Law Gazette 2002, Part I, page 1351.
2. Federal Law Gazette 1959, Part I, page 814, as amended and promulgated on 15 July 1985 (Federal Law Gazette 1985 Part I, page 1565), last amended by the Act of 13 December 2001 (Federal Law Gazette 2001, Part I, page 3586).
3. Federal Law Gazette 1977, Part I, page 220, last amended by the Act of 9 September 2001 (Federal Law Gazette 2001, Part I, page 2331 and 2002, Part I, page 615).
4. Federal Law Gazette 1981, Part I, page 1457, last amended by the Act of 9 September 2001 (Federal Law Gazette 2001, Part I, page 2331).

Decision taken by the Federal Constitutional Court in 1978, the fundamental decision for or against the use of nuclear power is incumbent on the legislator. The draft Act submitted by the German Government represents a reassessment of the risks of atomic energy on the basis of the experience and knowledge that have been gained throughout the world since atomic energy was first used for electricity production. The legislator therefore no longer stood by the fundamental decision taken in favour of atomic energy in the Atomic Energy Act of 1959. Research in the field of atomic technology, in particular regarding safety, remains unaffected.

Intensive preparation was carried out both within the Government and in discussions between the Government and the energy utilities. First, in 1999, a Government working group at State Secretary level reviewed the framework conditions of national and international law. This was used as a basis *inter alia* to clarify the question of the extent to which the restriction of thus far unrestricted operating licences for German nuclear power plants was permissible according to constitutional law. The discussion since the clarification of this issue at the end of 1999 between the German Government and the energy utilities led to an Agreement on 14 June 2000 (see *Nuclear Law Bulletin* No. 66).⁵ In this Agreement, the Government and the utilities agreed on the restriction of the future operation of existing nuclear power plants. Furthermore, a high standard of safety is to be maintained for the remaining period of use of these nuclear power plants. This Agreement was initialled on 14 June 2000 and signed on 11 June 2001. In keeping with the wishes of both parties, this Agreement is a political Agreement, not a legally binding contract. The draft Acts from the Government and the coalition parties of September 2001⁶ implement the fundamental elements of this Agreement. The German *Bundestag* approved this Act on 14 December 2001, and it was passed by the *Bundesrat* on 1 February 2002.

II. Overview of the key provisions

1. New purpose of the Atomic Energy Act

The new purpose of the Act is to end the use of nuclear energy for the commercial generation of electricity in a structured manner, and to ensure ongoing operation up until the date of discontinuation (Section 1, No. 1 of the Atomic Energy Act – AtG).

2. Ending the use of nuclear power and safety during the residual operating period

- No further licences will be issued for the construction and operation of new nuclear power plants or reprocessing facilities (Section 7, paragraph 1, sentence 2 AtG).
- The authorisation to operate a nuclear power plant shall expire once the electricity volume listed in the Act for that plant or the electricity volume derived from transfers has been produced [Section 7, paragraph 1(a)-1(d) AtG]. The electricity volume listed in Appendix 3 of the Atomic Energy Act corresponds to a standard operating life of 32 years per plant.

5. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (ed.), Umwelt No. 7-8/2000, pages I to IX (special section).

6. Draft Act of the SPD and Bündnis 90/Die Grünen parties of 11 September 2001, BT printed paper 14/6890 and draft Act of the Government of 1 November 2001, BT printed paper 14/7261.

- In order to improve safety during the residual operating period, a legal obligation to carry out a periodic safety review of nuclear power plants shall be introduced [Section 19(a) AtG].

3. *New waste management provisions*

- The new Atomic Energy Act shall make unlawful as of 1 July 2005 the current option of delivering irradiated nuclear fuel originating from German nuclear power plants for reprocessing [Section 9(a), paragraph 1, sentence 2 AtG].
- The operator of a nuclear power plant is now required to set up a local interim storage facility and to store irradiated fuels there until their surrender to a facility for final disposal [Section 9(a), paragraph 2, sentence 3 AtG].
- The Act contains a legal provision on providing proof of relevant disposal precautions, comprising both proof of the regulated disposal of irradiated fuels and proof of re-use of the plutonium already extracted or to be extracted from reprocessing in nuclear power plants [Section 9(a), paragraph 1(a)-1(c) AtG].

4. *Tenfold increase in financial security for nuclear power plants to EUR 2.5 billion*

The maximum limit of financial security to be provided by the licensee of a nuclear power plant for damage resulting from the operation of the plant has been increased tenfold from 500 million Deutsch Marks (DEM) to 2.5 billion Euros (EUR) (Section 13, paragraph 3, sentence 3 AtG).

5. *Repealing the amended Atomic Energy Act of 1998*

The controversial amendments made as a result of the eighth amendment to the Atomic Energy Act of 6 April 1998 (see *Nuclear Law Bulletin* No. 61) have been repealed. This concerns *inter alia* regulations on safety requirements for material changes and regulations on expropriation for the purpose of constructing and operating final disposal facilities.

III. *Ending the use of nuclear power and safety during the residual operating period*

1. *No licences for constructing and operating new nuclear power plants*

Section 7, paragraph 1, sentence 2 of the Atomic Energy Act prevents the issuing of licences for the construction and operation of nuclear power plants and reprocessing facilities. This puts into effect the new purpose of the Act, i.e. to end the use of nuclear power for electricity production. New licences will not be granted for NPPs, although licences may still be issued for a material alteration to such plants or the operation thereof pursuant to Section 7, paragraph 1, sentence 3 AtG. This will ensure high safety standards.

With regard to Constitutional law, the ban on new licences represents the abstract general exclusion of options for use that were permissible thus far. In relation with this measure, the “old rights” based on the previous legislation are adapted to the new legislation [Section 7, paragraph 1(a) AtG; operating licences that were originally unrestricted are now restricted as the licence to operate a

nuclear power plant will expire once a certain volume of electricity has been produced; see details in the next section]. The German Government is of the opinion that both these provisions concerning new and existing nuclear power plants represent a permissible stipulation of the terms and limits of property rights according to Constitutional law. This opinion is supported by the Federal Constitutional Court's decisions. The phase-out of nuclear power therefore does not require compulsory purchase. The key factor here is that the "old rights" of the operators of nuclear power plants are not abolished immediately or within a very short space of time, and that instead a pay-back period for their investments and a suitable profit is possible within an appropriate transitional period.

Other nuclear installations, such as research reactors, fuel fabrication plants and uranium enrichment plants are not affected by the new legislation.

2. *Restricting the operating period of existing nuclear power plants*

Section 7, paragraph 1(a) of the Atomic Energy Act regulates the expiry of the operating licence of existing nuclear power installations once the electricity volume listed in the new Appendix 3 of the Act or the electricity volume derived from transfers according to paragraph 1(b) has been produced. An average operating period of 32 years from the date of the start-up of a plant was used as a basis for calculating the electricity volumes listed in Appendix 3. This corresponds to an average residual operating period for German nuclear power plants of about 11.5 years. The operating licence expires pursuant to the Act once the electricity volume allocated to a nuclear installation has been produced. No action is required on the part of the licensing or supervisory authorities. Further operation without the operating licence would be a punishable offence. Other provisions concerning the licence, for example the regime for shutting down operations, remain unaffected and therefore applicable.

Section 7, paragraph 1(b) AtG regulates the options for transferring electricity volumes. This provision should prevent an inflexible specification of standard residual operating periods in order to enable operators of nuclear power plants to transfer these legally allocated electricity volumes between individual plants giving due account to commercial aspects. This does not mean an increase in the overall determined residual electricity volumes. In order to lengthen the operating period of one nuclear power plant, it is necessary to shorten the operating period of another plant. This means that it is possible to fall short of or exceed the residual electricity volumes calculated on the basis of an average operating period of 32 years for a nuclear power plant.

According to Section 7, paragraph 1(b) AtG, the electricity volumes pursuant to Appendix 3, column 2 may be wholly or partially transferred from one installation to another, provided the receiving installation commenced commercial power operation later than the donating installation. Notwithstanding this provision, electricity volumes may also be transferred from an installation which began commercial power operation later than the receiving installation, subject to the approval of the transfer by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety in agreement with the Federal Chancellery and the Federal Ministry of Economics and Technology. This approval is not necessary if the donating installation is to permanently discontinue operation and an application for decommissioning of the plant pursuant to Section 7, paragraph 3, sentence 1 of the AtG has been submitted.

Furthermore, Section 7, paragraphs 1(a) and (1c) AtG contain obligations to measure the volume of electricity produced, to organise controls by expert organisations as well as by an auditor or audit company and to notify the volume of electricity produced, the results of the controls and transfers of electricity volumes between installations. Section 7, paragraph 1(d) of this Act contains a

special provision on the transfer of the electricity volumes listed in Appendix 3 of the AtG for the Mülheim-Kärlich nuclear power plant.

3. *Periodic safety reviews of nuclear power plants*

The new Section 19(a) of the Atomic Energy Act provides for a safety review to determine the current standard of safety (safety status analysis – SSA and probability safety analysis – PSA). The responsibility and costs for this lie with the operator. The results of the safety review must be submitted to the supervisory authority by the date given in Appendix 4 of the AtG, so long as this date falls after 27 April 2002. The results of a new safety review are to be submitted ten years after the date given in Appendix 4. The obligation to submit the results of a safety review does not apply if the licensee makes a binding declaration to the supervisory and the licensing authorities stating that operation of the installation will be permanently discontinued no later than three years after the date specified in Appendix 4. The authorisation to operate the installation shall expire on the date cited in this statement.

This safety review supplements the ongoing supervisory review of nuclear power plants pursuant to Section 19 AtG. Whereas operators carried out these safety reviews on a voluntary basis in the past, they are now legally obliged to do so on the basis of the new Act. The safety review pursuant to Section 19(a) AtG is to be based on the guidelines for carrying out periodic safety reviews for nuclear power plants in the Federal Republic of Germany in the version of the notification of 18 August 1997.⁷ In the event that these guidelines require further development, the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety will involve the Länder, the Reactor Safety Commission (RSK) and the operators of nuclear power plants, as provided for in the Agreement of 14 June 2000.

The object of the safety review shall be to carry out a comprehensive review of safety systems and measures. This makes it possible to recognise weaknesses – particularly the interplay of the installation components – that may not previously have been identified. Furthermore, new operating procedures and technical developments can be taken into account. The actual status of existing installations is to be assessed according to the latest scientific and technological developments. The competent authority will make a decision on any necessary measures pursuant to Sections 17 and 19 AtG on the basis of the results of the safety review. As a result, it may be necessary to apply for licences for alterations.

IV. New waste management provisions

1. *Ban on the delivery of spent fuel elements for reprocessing*

According to Section 9(a), paragraph 1, sentence 2 AtG, the delivery of irradiated nuclear fuel originating from the operation of nuclear power plants for electricity production to a reprocessing installation shall become unlawful as of 1 July 2005. This regulation takes due account of the contracts concluded by the energy utilities under private law and the accompanying Exchange of Notes under international law between the Federal Republic of Germany and France and Great Britain. This also results from the fact that the planned provisions do not infringe the private-law contracts and the agreements binding under international law do not go further than these private-law contracts. Should it not be possible to terminate reprocessing activities in good time for reasons beyond the control of

7. Federal Gazette No. 232(a) of 11 December 1997.

the operators of nuclear power plants, suitable solutions will be sought in accordance with the Agreement of 14 June 2000. This excludes economically detrimental consequences for the respective contracting parties resulting from this legislation.

The date of 1 July 2005 is based on the Agreement of 14 June 2000 and the evidence presented by the energy utilities concerned that an end to deliveries of spent fuel elements for reprocessing could be guaranteed by 30 June 2005. By this date – and the German Government also shares this conviction – the contractually agreed volumes will have been delivered for reprocessing, thereby ruling out inconsistency with international commitments. Independently of this, the energy utilities have agreed to use all reasonable available contractual options to bring a swift end to reprocessing.

The German Government carried out a comprehensive review of the compatibility of the decision to terminate delivery of spent fuel elements for reprocessing with the primary and secondary law of the European Atomic Energy Community. It is of the opinion that Section 9(a), paragraph 1, sentence 2 of the AtG is compatible with the “nuclear Common Market” in accordance with Chapter 9 of the Euratom Treaty, in particular Article 93. Section 9(a), paragraph 1, sentence 2 does not establish a quantitative restriction on exports as is expressly prohibited by Article 93, sentence 1 of the Euratom Treaty. This ban is to be understood to mean that only targeted, trade-specific regulation of foreign trade is not permitted. This would also be applicable if Article 93 of the Euratom Treaty also identified measures having equivalent effect, as there would also be a lack of trade-specific regulation for this type of measure.

2. *On-site interim storage facilities at nuclear power plants*

The operator of a nuclear power plant is now obliged to set up a local interim storage facility and to store irradiated fuels there until their surrender to a facility for final disposal [Section 9(a), paragraph 2, sentence 3 AtG]. The option to deliver irradiated fuels for reprocessing until 30 June 2005 remains unaffected. According to Section 9(a), paragraph 2, sentence 4, upon application, the responsible authority will concede exemptions from the precautionary obligation to set up and use an interim storage facility, provided the operator of the plant has submitted an application for decommissioning and has made a binding declaration to permanently discontinue operations at the plant before 1 July 2005. Should the competent authority issue an exemption, the operating licence of the nuclear power plant will expire on the date cited by the operator in the application. To bridge the period until operations commence at the on-site interim storage facilities, Section 6, paragraph 4 AtG sets out measures to accelerate the procedure governing temporary interim storage facilities.

The move away from the central interim storage facilities at Gorleben and Ahaus linked to this concept leads to a considerable reduction in shipments of irradiated fuel elements. Greater consideration is given to the principle that the burden should be born regionally in those regions where there is the greatest benefit. The storage of vitrified residues is not affected by this regulation. The obligation in Section 9(a), paragraph 2, sentence 3 AtG does not apply to research reactors.

This provision also makes it possible for a licensee of a nuclear installation to comply with his commitments by providing proof of storage options in the vicinity of the installation. An interim storage site can be considered in the vicinity of an installation if the transport route to these facilities is shorter than the route to the nearest central interim storage site in Ahaus or Gorleben. Pursuant to Section 4, paragraph 2, No. 7 AtG, shipments to the central interim storage sites are permissible if the operator has complied with his obligation to set up interim storage facilities, but such interim storage facilities cannot be used for legal or practical reasons.

All nuclear power plants submitted applications for a licence for the interim storage of irradiated fuels at the respective power plant site before the entry into force of the new legislation. The Federal Office for Radiation Protection is currently carrying out the licensing procedures.

3. *Proof of disposal precautions*

According to Section 9(a), paragraph 1(a) of the AtG, operators of nuclear power plants are required to prove that they have taken adequate precautions to comply with their disposal obligations pursuant to Section 9(a), paragraph 1 in respect of the irradiated fuel produced and the spent fuel yet to be produced during the remainder of the operating period envisaged in accordance with Section 7, paragraphs 1(a) and 1(b), including any radioactive waste to be returned in the case of reprocessing (proof of disposal precautions). According to Section 9(a), paragraph 1(b), for the purposes of regulated disposal, proof must be provided to demonstrate that the safe storage of both irradiated nuclear fuel and returned radioactive waste from the reprocessing of irradiated nuclear fuel in interim storage facilities is guaranteed until such time as it is surrendered to a facility for final disposal. Furthermore, the Act contains detailed provisions on how to provide proof of the safe disposal of irradiated fuels. These provisions, as well as the provisions in paragraphs 1(c) and 1(d) in Section 9(a) of the AtG, were based on intensive discussions between the German Government and the energy utilities.

Insofar as the permissible non-detrimental utilisation of irradiated nuclear fuel pursuant to Section 9(a), paragraph 1, sentence 2 is envisaged, proof must be provided to show the guaranteed re-use of plutonium extracted from reprocessing as well as any future plutonium to be extracted in nuclear power plants. This shall not apply to plutonium which has already been re-used by 31 August 2000, or to plutonium which has already been extracted and for which the utilisation and consumption rights have already been transferred to third parties by the above date. Pursuant to Section 9(a), paragraph 1(d) of the AtG, the parties responsible for disposal are required to provide proof of safe storage of uranium extracted from the reprocessing of irradiated nuclear fuel in the form of realistic projections showing the availability of adequate interim storage facilities according to requirements.

V. *Tenfold increase in financial security to EUR 2.5 billion*

The maximum amount of financial security to be provided by a licensee for damage caused by the operation of a nuclear power plant has been increased tenfold from DEM 500 million to EUR 2.5 billion (Section 13, paragraph 3, sentence 2 AtG). This amount, available for every nuclear power plant operating in Germany, thus provides considerably improved protection of victims. Furthermore, on the basis of the maintenance of the real value of the financial security called for in Section 13, paragraph 3, sentence 2, the financial security for other installations and activities was also increased by 40% (Sections 8 and 11 of the Ordinance on Financial Security Pursuant to the Atomic Energy Act).

Section 14, paragraph 2 of the AtG was also revised. According to this amendment, the financial security can be provided by some other form of financial security rather than by third party liability insurance in respect of which the provisions of Section 14, paragraph 1 apply. This new version gives greater consideration to the wording of Section 10(a) of the Paris Convention on Third Party Liability in the Field of Nuclear Energy and the necessary preconditions for the use of nuclear energy for commercial electricity production. Thus it is possible to use private or mutual guarantees made by nuclear power plant operators as financial security.

In June 2001, the energy utilities submitted a proposal to the German Government on how the increased financial security envisaged in the new Atomic Energy Act could be achieved. In a statement of intent, *Energie Baden-Württemberg AG*, *E.ON Energie AG*, the *Hamburg Electricitäts-Werke AG* and *RWE AG*, committed themselves to enabling operators of German nuclear power plants that are subsidiaries of these enterprises to comply with their obligation to pay compensation up to the sum of EUR 2 244 billion per accident, and with reference to this statement of intent to comply with their obligation regarding financial security pursuant to Sections 13 and 14. The enterprises listed above commit themselves to paying the licensee of a nuclear power plant if this licensee must comply with liability to pay compensation as the result of a nuclear accident, and if neither he nor the parent company is in the position to provide compensation of EUR 2 244 billion. In addition to the statement of intent, an certificate demonstrating proof of financial security by an auditor will be submitted every year by 30 June at the latest, confirming that the available cash resources of the respective enterprise on a certain cut-off date exceed the sum to be provided in accordance with the statement of intent (double quota of the respective enterprise of the sum of EUR 2 244 billion). The verification by the auditor is based on the result of his review of the enterprise's year-end statements, for which the auditor has issued an unrestricted audit certificate containing the confirmation (pursuant to Section 233, paragraph 3 of the German Commercial Code) that the report provides an accurate reflection of the enterprise and accurately highlights the risks of future development.

The difference with regard to the financial security of EUR 2.5 billion, i.e. EUR 256 million (DEM 500 million) will continue to be covered by insurance.

VI. Summary

The phase-out of the use of nuclear power for electricity production has now been legally regulated by the 2002 Atomic Energy Act, based on the Agreement between the German Government and the energy utilities. The provisions of this Act comply with constitutional and European law, and take account of Germany's international commitments.

The new 2002 Atomic Energy Act is supplemented by additional steps towards the phase-out, in particular in the area of nuclear disposal. These steps are being taken primarily within the framework of a planned national disposal plan and a procedure to be developed for the selection of a location for a final disposal site for radioactive wastes. The key task for the Länder authorities and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety continues to be to ensure that operators of nuclear power plants comply with a high standard of safety during the residual operating periods of their plants.