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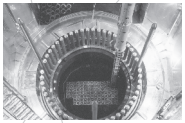
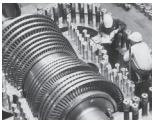

Summary

of top-level Statements from ILK Statements and ILK Recommendations

Für deutsche Fassung bitte umdrehen!

July 2009
No.: ILK-34 E

Foreword

The International Committee on Nuclear Technology (Internationale Länderkommission Kerntechnik, ILK) was established in October 1999 and since 2009 it is carried by the German states of Baden-Württemberg and Bavaria. It currently consists of 9 scientists and experts from Finland, France, Germany, Switzerland and USA. The ILK acts as an independent and objective advisory body to the two German states on issues related to the safety of nuclear facilities, radioactive waste management and the risk assessment of the use of nuclear power. In this capacity, the Committee's main goal is to contribute to the maintenance and further development of the high, internationally recognised level of safety of nuclear power plants in the southern part of Germany.

The International Committee on Nuclear Technology (ILK) will cease its activities in 2009. Since its inception in 1999, it has adopted over 30 statements. In the current publication, which was adopted at the 53rd ILK meeting held on July 28th, 2009 in Frankfurt, the ILK summarizes the main statements ILK has made on safety of nuclear power plants, disposal and on general issues relating to nuclear energy utilization.

The chairman

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Executive Summary

The International Committee on Nuclear Technology (ILK) will cease its activities in 2009. Since its inception in 1999, it has adopted over 30 statements. The topics range from individual technical issues to overall assessments of nuclear energy, particularly regarding safety.

This paper summarizes the statements ILK has made on the general issues relating to nuclear energy utilization mostly over several statements. They are substantiated in detail in the cited ILK statements:

- Germany should use nuclear energy beyond the limitations laid out in the Atomic Energy Act. There are no safety-related arguments that oppose this move.
- The preconditions for maintaining the current high level of safety and to further improve on it are available.
- Concerning disposal of high-level radioactive waste, rapid progress can be made. All essential preconditions are fulfilled in this case. They should be politically utilized.
- A modern set of regulatory guidelines for nuclear power plants should be prepared in cooperation between the Federation and the Laender.

1 International Character of the Committee

One important task of the Committee was to introduce the international state of knowledge into its advisory activities for the Laender. For this purpose, its composition was arranged in such a way that about half of its members represented international experts (Finland, France, Sweden, Switzerland and the United States) with good knowledge of approaches and perspectives adopted in their respective countries. The showcasing of the international state of discussion on the topics under consideration plays an essential role in the statements published by the ILK.

In several of its statements (in particular ILK-05, ILK-11), the ILK made recommendations concerning how licensees as well as Laender authorities should make increased use of an international exchange of experience, for instance by participating in international reviews such as OSART (Operational Safety Review Team) and IRRS (International Regulatory Review Service) of the IAEA (International Atomic Energy Agency). The ILK considers special measures of the Laender to be necessary since they are responsible for oversight while the Federation is in charge of international relations.

2 Safety of Nuclear Power Plants

2.1 Technical Status

In one of its first statements (ILK-03), the ILK made an inventory of the safety of nuclear energy utilization. The focus was primarily placed on the safety of nuclear power plants operated in Germany, yet the international context was always kept in mind. The main statements are:

- The internationally acknowledged safety philosophy is applied in German nuclear power plants. This philosophy is designed to prevent the release of fission products through a series of successively arranged measures that have been implemented in a conservative way.
- The safety level of German plants was progressively increased over the course of time. This was achieved on the one hand by improving and expanding the safety system necessary for controlling accidents and on the other by including additional measures which are able to prevent or mitigate damage outside of the plant even in the case of an assumed failure of the safety system.
- Aging phenomena of systems and components are controlled. Different countries envisage operating lifetimes of up to 60 years. In the US, the first license renewals were granted in the year 2000. In the meantime, more than 50 out of 104 nuclear power plants have been granted a license renewal.
- An important source for safety assessments and improvements lies in the assessment of operating experience. These assessments show that the safety philosophy has proven itself. The German population was not exposed to any radiological loads exceeding the permissible values for normal operation of a nuclear power plant. Documented improvements in safety have been achieved due to the experience gathered over time.
- Risk assessments represent a further important source for safety assessments and improvements. They enable a determination of the features of a nuclear power plant that contribute most to the overall residual risk and whose improvement thus is most efficient. Such probabilistic safety assessments show very favorable results for German nuclear power plants when compared to the internationally recommended reference values.

The ILK holds the opinion that the safety of the German nuclear power plants is at a high level internationally.

The ILK addresses the safety of existing nuclear power plants and the relevant technical and organizational measures that are employed to ensure this in its statement

on determining operating periods (ILK-23). Here, the focus is on measures employed to avoid deterioration in safety through aging-related effects as well as on increases in safety where existing plants are adapted to developments in the state-of-the-art in science and technology. The ILK concludes that there are no safety-related technical a priori reasons for limiting the operating periods of German nuclear power plants. In its view, they can even be operated safely beyond their initial design-basis lifetime of 40 years. This finding presupposes suitable measures for monitoring safety. The ILK makes a number of recommendations to this end. In the ILK's opinion, legal restrictions on electricity generation quotas should be revoked.

2.2 Safety Culture

Aspects of organization and safety culture are essential for the safe operation of nuclear power plants. The ILK has repeatedly outlined requirements from an MTO (man-technology-organization) perspective on the safety-related design of company and work organization, on safety management for ensuring a suitable safety culture as well as on staff qualification and training including maintaining a body of nuclear knowledge. The ILK has placed special focus on these topics especially in its statements on maintaining competence in the field of nuclear engineering in Germany (ILK-17), on regulator's management of licensee self-assessments of safety culture (ILK-19), on further development of periodic safety reviews in Germany (ILK-27) as well as on status and necessary requirements for safety management in nuclear power plants (ILK-32).

In ILK-17, the ILK evaluates the situation regarding nuclear engineering competence and its maintenance in Germany and makes recommendations on measures and initiatives for safeguarding and further developing nuclear engineering competence.

In statement ILK-19, the ILK recommends that the regulatory authorities should make sure that the licensees establish and continually use a self-assessment system that addresses organizational and personnel aspects. The authorities should review this system for appropriateness.

According to ILK-27 (see also below), periodical safety review investigations should include the interrelationships between man, technology and organization (MTO) and the safety management in force along with the indicators used as well as measures for maintaining and reinforcing safety culture.

In its statements on safety management in ILK-32, the ILK gave consideration both to requirements on licensees as well as to consequences for the oversight process.

As a key to this, a proactive approach to the management of safety and safety culture should be established so that problems are detected and solved at an early stage. In order to do this, the management system should use early warning signs that are known to precede organizational failures. Early warning signs already facilitate the prevention of the development of deficits in safety management, rather than dealing with deficits only after incidents have taken place. The regulatory authorities should monitor that the licensees are using suitable management systems incorporating early warning signs. The interdependencies between staff qualification and further training and the requirements of corresponding research were emphasized.

2.3 Oversight

The responsibility for the safe operation of a nuclear power plant lies with the licensee. However, an effective regulatory oversight also constitutes an important element for ensuring a high level of safety. The ILK has dealt with oversight issues in a number of statements. The majority of ILK statements belong to this topic area. The ILK gave particular attention to the oversight activities in the Land of Baden-Württemberg (ILK-28). In so doing, it followed the approach taken by the IAEA, i.e. after responding to an extensive list of written questions, five ILK members (of which 4 were international colleagues) carried out interviews with employees of the regulatory authority over a time period of four days and held a discussion with the licensee. The group concluded that Baden-Württemberg performs effective oversight over nuclear power plants. This positive assessment was in line with the result of the IRRS mission of the IAEA that was conducted in 2008 at the regulatory authority in Baden-Württemberg as well (and at the same time at the Federal Ministry of the Environment (BMU)).

Next to continuous regulatory oversight, every 10 years a self-contained safety review is undertaken. It provides a summary assessment of the safety of the plant. Next to the customary standards derived from deterministic regulations, it also employs a comprehensive set of probabilistic investigations. In its statement on performing periodic safety reviews (ILK-27) ILK concludes that the results of the performed safety reviews showed a balanced and sufficient safety level and that older plants displayed a safety status that corresponds to those of newer plants.

2.4 Operating Experience

The ILK repeatedly informed itself about incidents in German plants, yet only published a statement in one single case (ILK-09). The reason for focussing on this

particular incident was because of the general aspects associated with the events that occurred during the outage in KKP 2 in 2001. These were assigned to level 2 of the international rating scale INES which describes the safety-related significance of an incident. Since the introduction of the scale in 1991, there have not been any incidents assigned to a higher category than 2 in Germany. The ILK made recommendations on the deficiencies that surfaced in the wake of the incident but also established that in this particular case, the safety installations were sufficient to satisfy the conservative framework conditions laid out in the licensing procedure for controlling design-basis accidents.

2.5 Summary on Safety

The ILK's statements on the safety of nuclear power plants operating in Germany can be summarized as follows:

- German nuclear power plants have a high level of safety according to internationally acknowledged standards.
- The plants, particularly the older ones, were updated to current developments through backfits.
- An effective regulatory oversight of safety is in operation.
- Operating experience shows that a sufficient level of safety against damages due to plant operation existed for incidents that occurred.
- There are no safety-related reasons to restrict the operating period of plants to a fixed value. They can be safely operated beyond the design basis lifespan of 40 years.

3 Disposal of high-level Radioactive Waste

There has been no real progress in the disposal of high-level radioactive waste in Germany since 1998. The statements by ILK on the issue of disposal are therefore mainly reactions on statements and publications by the BMU.

The general statements by ILK (see also appendix) on the topic of disposal of radioactive waste can be summarized as follows:

- The methods for building and operating a safe repository and for proving its safety are available.
- The safety requirements for the repository should be established.
- Rock salt is suitable as a host rock for a repository. An international comparison does not provide any counterarguments.
- A procedure to determine a site for high-level radioactive waste should utilize the fact that with Gorleben a site is available which has been investigated to a large extent and the exploration results so far have been positive. The exploration of the salt mine Gorleben should be continued as soon as possible and a Total System Performance Assessment (TSPA) should be started as soon as possible for a repository in Gorleben.
- An effective organizational structure should be chosen for the repository project where the different roles of builder/licensee and regulatory authority can be clearly differentiated for the general public.
- Germany should invite an international peer review to assess its disposal concept.

Statement

4 General Assessments of Nuclear Energy

4.1 Sustainability

In its statement ILK-16, the ILK makes a comparison between the different technologies for generating electricity especially with regard to their sustainability. Although there is a general consensus in the discussion of this issue that technological developments should be sustainable and that the dimensions of economics, environment and society should be taken into account, there are diverse approaches to what this translates to in actual practice.

Thus, the ILK has used the work of the Paul Scherrer Institute (PSI) as a basis for proposing a set of indicators (5 - 7 for each of the three dimensions) to assess technologies for generating electricity and quantified these indicators on the basis of comprehensive data collections by the PSI. The description of the different technologies using quantitative indicators allows the definition of quantitative parameters by summarizing these indicators. These parameters, in turn, can lead to an integral evaluation and comparison of the technologies. The formation of these parameters can only be partially justified in an objective manner and largely reflects the significance that the assessor in question assigns to the various aspects. It thus helps to make the different assessments and the derived conclusions visible.

In the case of nuclear energy, the finding is that it has excellent characteristics in terms of economic, environment and health aspects and also a low collective risk. If the parameter is defined as the sum of internal and external costs, nuclear energy even achieves top marks of all technologies for generating electricity. The negative impact in the societal dimension is due to the high rating given to the worst-case consequences of a potential accident and the long timeframes involved in waste disposal.

In summary, the ILK takes the view in this statement that

- political decisions on energy supply should be based on considerations of sustainability,
- a transparent and unbiased evaluation process should be applied to it,
- its recommendation can be helpful in this regard.

4.2 Utilization of Nuclear Energy in Germany

The ILK statement ILK-24 from 2005 summarizes its view on the utilization of nuclear energy in Germany. It builds on the findings of its earlier sustainability statement (ILK-16). Since that statement views the individual technologies separately, i.e. independently of their possible contribution to an energy mix, the ILK in the later statement uses published scenarios to give consideration to possible combinations of an energy mix until the year 2020. It discusses in greater detail than in the sustainability statement issues concerning safety, protection against terrorist attacks, proliferation, disposal and also licensing and oversight.

The ILK concludes:

- The contribution of nuclear energy to a sustainable electricity-mix is indispensable. This conclusion is justified with reference to securing competitiveness, ensuring security of supply especially in terms of base load consumption and achieving the Kyoto targets.
- The safety of nuclear energy is ensured and is continuously being monitored.
- Advances in solving the disposal of radioactive waste can be achieved in the short-term.

5 Nuclear Regulatory Guidelines

For years, there has been a discussion in Germany about modernizing the set of non-legislative nuclear regulatory guidelines. The BMU has been trying to install a new set of guidelines for a long time. The ILK generally welcomes a revision of the regulatory guidelines since the existing set is not systematically structured, does not cover all required areas and in parts is relatively dated. In its statement ILK-22 it has spelled out the requirements that it deems necessary for a modern set of regulatory guidelines. In its statement ILK-29, the ILK holds the view that the safety requirements on nuclear power plants as outlined by the draft submitted by the BMU are not suited for supporting an implementation of the Atomic Energy Act. In ILK 31, in cooperation with the ISaR institute, it prepared its own proposal for fundamental safety requirements on nuclear power plants. The ILK believes that a first step in this project should be to establish a framework defining the fundamental requirements, which should be unanimously adopted by the Federation and the Laender. This would provide a basis for drafting more detailed regulations.

6 Conclusion

The main statements on safety of nuclear power plants, disposal and the utilization of nuclear energy are summarized in the relevant sections. In sum, they reflect the following beliefs of the ILK that are individually substantiated in the cited ILK statements:

- Germany should use nuclear energy beyond the limitations laid out in the Atomic Energy Act. There are no safety-related arguments that oppose this move.
- The preconditions of maintaining the current high level of safety and to further improve on it are available.
- Concerning disposal of high-level radioactive waste, rapid progress can be made. All essential preconditions are fulfilled in this case also. They should be politically utilized.
- A modern set of regulatory guidelines should be prepared in cooperation between the Federation and the Laender.

Statement

Cited ILK statements and ILK recommendations

ILK-02 International Committee on Nuclear Technology: "ILK Statement on the Final Storage of Radioactive Waste", ILK-02, July 2000, Augsburg, Germany

ILK-03 International Committee on Nuclear Technology: "ILK Statement on the Safety of Nuclear Energy Utilisation in Germany", ILK-03, July 2000, Augsburg, Germany

ILK-05 International Committee on Nuclear Technology: "ILK Recommendation on the Promotion of International Technical and Scientific Contacts of the Nuclear Safety Authorities of the German States", ILK-05, October 2001, Augsburg, Germany

ILK-08 International Committee on Nuclear Technology: "ILK Statement on the Potential Suitability of the Gorleben Site as a Deep Repository for Radioactive Waste", ILK-08, January 2002, Augsburg, Germany

ILK-09 International Committee on Nuclear Technology: "ILK Statement on the General Conclusions Drawn from the KKP 2 Incidents associated with the Refueling Outage of 2001", ILK-09, May 2002, Augsburg, Germany

ILK-11 International Committee on Nuclear Technology: "ILK Recommendation on Performing International Reviews in the Field of Nuclear Safety in Germany", ILK-11, September 2002, Augsburg, Germany

ILK-14 International Committee on Nuclear Technology: "ILK Statement on the Recommendations of the Committee on a Selection Procedure for Repository Sites (AkEnd)", ILK-14, September 2003, Augsburg, Germany

ILK-16 International Committee on Nuclear Technology: "ILK Statement on Sustainability Evaluation of Nuclear Energy and other Electricity Supply Technologies", ILK-16, January 2004, Augsburg, Germany

ILK-17 International Committee on Nuclear Technology: "ILK Statement on Maintaining Competence in the Field of Nuclear Engineering in Germany", ILK-17, March 2004, Augsburg, Germany

ILK-19 International Committee on Nuclear Technology: "ILK Statement on the Regulator's Management of the Licensee Self-Assessments of Safety Culture", ILK-19, January 2005, Augsburg, Germany

ILK-22 International Committee on Nuclear Technology: "ILK Recommendations on Requirements on Updated General Nuclear Regulatory Guidelines in Germany", ILK-22, July 2005, Augsburg, Germany

ILK-23 International Committee on Nuclear Technology: "ILK Statement on determining Operating Periods for Nuclear Power Plants in Germany", ILK-23, September 2005, Augsburg, Germany

ILK-24 International Committee on Nuclear Technology: "ILK Statement on the Utilization of Nuclear Energy in Germany", ILK-24, November 2005, Augsburg, Germany

ILK-25 International Committee on Nuclear Technology: "ILK Recommendation on the Revitalisation of the Repository Projects Gorleben and Konrad", ILK-25, November 2005, Augsburg, Germany

ILK-27 International Committee on Nuclear Technology: "ILK Recommendations on the Further Development of Periodic Safety Reviews in Germany", ILK-27, November 2006, Augsburg, Germany

ILK-28 International Committee on Nuclear Technology: "ILK Report on the Assessment of Nuclear Oversight Activities of the Ministry of Environment, Baden-Württemberg", ILK-28, December 2006, Augsburg, Germany

ILK-29 International Committee on Nuclear Technology: "ILK Statement on BMU Project “Update of Nuclear Regulatory Guidelines”", ILK-29, June 2007, Augsburg, Germany

ILK-30 International Committee on Nuclear Technology: "ILK Statement on BMU Paper „Taking on Responsibility: Implementing the Consensus Agreement on Final Disposal“", ILK-30, July 2007, Augsburg, Germany

ILK-31 International Committee on Nuclear Technology: "ILK Statement on Fundamental Safety Requirements for Nuclear Power Plants", ILK-31, September 2008, Augsburg, Germany

ILK-32 International Committee on Nuclear Technology: "ILK Statement: Safety Management in Nuclear Power Plants – Status and necessary Requirements for Development", ILK-32, April 2009, Augsburg, Germany

ILK-33 International Committee on Nuclear Technology: "ILK Statement on “Safety Requirements Governing the Final Disposal of Heat-Generating Radioactive Waste”, ILK-33, July 2009, Augsburg, Germany

Statement

Appendix: Disposal of Radioactive Waste

In terms of disposal of radioactive waste with negligible heat generation (low- and medium-level radioactive waste), the following developments have taken place since the federal government took office in October 1998:

The planning approval procedure for shaft Konrad has been in progress since 1982. The technical and scientific evidence proving the suitability of the mine as a repository had already been concluded. The license was issued in 2002. Subsequently, legal suits followed until all legal means were exhausted, thereby confirming the license. In 2008, the Bundesamt für Strahlenschutz (BfS, Federal Office for Radiation Protection) undertook work to prepare the construction of the repository with the aim of commissioning it in the year 2013.

For heat generating waste (mainly high-level radioactive waste: spent nuclear fuel elements and vitrified high-level waste from reprocessing) the situation in 1998 presented itself as follows:

The salt mine Gorleben has been explored for this type of waste since 1979. The exploration process was well-advanced: in about 800 m depth, passages of about 5 km length were constructed. By 1998, the findings arrived at were positive but were not sufficient to prove suitability of the mine. The original plan had been to gather the data needed for a final assessment of suitability by conducting another 4 -5 years of exploration.

The coalition agreement of the federal government from October 1998 makes the following statements:

- The disposal concept that had been valid up until that point has failed in terms of its content.
- A combined repository for all types of radioactive waste shall be constructed in deep geological formations and should be completed by 2030.
- The suitability of the salt mine Gorleben is deemed to be doubtful and its exploration shall thus be halted.

The exploration was interrupted on October 1st, 2000, by a moratorium which shall last from three to a maximum of ten years. Since then, the Bundesumweltministerium (BMU, Federal Ministry of the Environment) initiated the studies discussed below and published its own concepts, all of which have proven to be inconsequential. There has been no real progress in the disposal of heat generating waste.

Commensurate with the lack of progress in the disposal of this type of waste and the difficult developments for the disposal of non-heat generating waste, the majority of subject-related statements were already made in the first ILK statement on the final storage of radioactive waste dating from the year 2000 (ILK-02). They are still valid insofar as they have not been settled by the start of construction of the repository shaft Konrad. The later statements are essentially reactions to the mentioned publications by the BMU. Furthermore, the ILK summarized in the year 2005 (ILK-25) which steps need to be taken to revitalize final storage.

In its statement ILK-02, the ILK makes the following pronouncements:

- There is no scientific foundation for the assertion that the disposal concept pursued thus far has failed.
- It is a sensible and an entirely customary approach on an international level to separately store high-level radioactive waste as well as low- and medium-level radioactive waste.
- Correspondingly, the ILK recommends developing shaft Konrad as soon as possible into a repository.
- Rock salt is suitable as a host rock for final repositories.
- The suitability of the salt mine Gorleben is to be expected on the basis of findings secured to date, but still awaits confirmation.
- Interrupting the exploration of the salt mine cannot be justified on a scientific-technical basis.

Regarding the last point, the BMU published a list of scientific-technical open questions in the year 2000 that require clarification before proceeding with the exploration. In its statement ILK-08 dating from 2002, the ILK asserted that these topics are being discussed by the international scientific community but that none of these would exclude the construction of a repository for high-level radioactive waste in rock salt in general or in the Gorleben salt mine in particular.

In the mentioned statement, the ILK recommended to use the data derived from explorations to date for a Total System Performance Assessment (TSPA) and to update it with the results of further exploratory activity. This approach, which is in use world-wide, helps to focus further exploratory work on the significant safety-related issues.

The open issues were investigated by BfS in an extensive undertaking that was completed in 2005. As a result, no issues arose that speak against a further exploration of the salt mine. Even though the justification for the moratorium now became invalid, the exploration was not taken up again. Similarly, no TSPA was initiated.

In 1999, BMU established a working group AkEnd and commissioned it to develop a procedure for determining and establishing a site for a repository. The working group submitted its findings at the end of 2002. The ILK voiced its assessment in its statement ILK-14 in the year 2003. It generally welcomed the approach of establishing a transparent procedure that can be communicated to the general public. At the same time, it criticized the framework conditions the BMU had set the AkEnd:

- not to take the sites Konrad and Gorleben into account and instead to proceed from a so-called “clean-slate” map of Germany,
- to proceed from the assumption of a single repository for all types of waste.

ILK had already championed separate repositories with arguments mentioned earlier and recommended an approach that proceeds from the actual givens in Germany: a licensed repository for waste with negligible heat generation and a very well explored site for high-level radioactive waste. It pointed out that the procedure suggested by the AkEnd would lead to substantial additional expenses in terms of time and costs.

BMU did not implement the suggestions made by the AkEnd. Additionally, no other procedure for determining a repository site was agreed upon. The nuclear power plant licensees rejected the AkEnd suggestion. They are obliged to carry the necessary costs for constructing a repository, which are ultimately passed along to the electricity customer.

In its statement ILK-25 dating from 2005, the ILK presented a more detailed account of the measures it believed to be necessary for a revitalization of disposal:

- the Gorleben moratorium should be revoked,
- a TSPA should be performed,
- an international peer review on the German disposal concept should be requested,
- preparatory work for Konrad should be conducted even while legal proceedings are still in process,

- an organizational structure should be established that allows for a clear separation between the construction and operating organization of the repository on the one hand and the regulatory authority on the other.

In this statement, the ILK also addresses the aim pursued by the BMU, namely to find the best possible site. It points out that the international scientific community agrees in viewing this as an impossible objective. Instead, a guideline should be drafted which defines the safety requirements for a repository. If a site achieves these requirements, then it is suited as a repository. Currently, the BMU draft "Safety criteria for the disposal of heat-generating radioactive waste" is under discussion; the ILK takes a stand on this publication in its statement ILK-33.

In 2006 the BMU published a paper which suggested conducting a new site selection process from a clean slate. This is in agreement with the specification made by the AkEnd. The paper contained two new points:

- the claim that the approach suggested by the BMU is necessary due to international requirements and contractual obligations by the German state,
- the procedure could be terminated in favor of Gorleben at any point in time if there is no longer an expectation that one or several sites with a higher safety level than Gorleben can be found.

In its statement ILK-30, using excerpts from the literature cited by the BMU, the ILK showed that the international requirements and obligations claimed by the BMU do not in fact exist. Furthermore, the search for a best possible site propagated by the BMU is even explicitly rejected by the cited IAEA documents. The ILK also shows that the termination in favor of Gorleben mentioned in the BMU publication is not feasible in practice since the required data set is only available after an (underground) exploration of several sites has been completed.

In summary, the ILK concludes that the BMU recommendation from the year 2006 is not suitable for finding a timely solution to the issue of disposal but instead aims to keep it open in the longer term. It repeats its recommendation to give priority to a TSPA for Gorleben and to conclude exploratory work there.

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(Members are listed in alphabetical order)

ILK-01 ILK Statement on the Transportation of Spent Fuel Elements and Vitrified High Level Waste (July 2000)

ILK-02 ILK Statement on the Final Storage of Radioactive Waste (July 2000)

ILK-03 ILK Statement on the Safety of Nuclear Energy Utilisation in Germany (July 2000)

ILK-04 ILK Recommendations on the Use of Probabilistic Safety Assessments in Nuclear Licensing and Supervision Processes (May 2001)

ILK-05 ILK Recommendation on the Promotion of International Technical and Scientific Contacts of the Nuclear Safety Authorities of the German States (October 2001)

ILK-06 ILK Statement on the Draft Amendment dating from July 5, 2001 to the Atomic Energy Act (October 2001)

ILK-07 ILK Statement on Reprocessing of Spent Fuel Elements (November 2001)

ILK-08 ILK Statement on the Potential Suitability of the Gorleben Site as a Deep Repository for Radioactive Waste (January 2002)

ILK-09 ILK Statement on the General Conclusions Drawn from the KKP 2 Incidents associated with the Refueling Outage of 2001 (May 2002)

ILK-10 ILK Statement on the Handling of the GRS Catalog of Questions on the "Practice of Safety Management in German Nuclear Power Plants" (July 2002)

ILK-11 ILK Recommendation on Performing International Reviews in the Field of Nuclear Safety in Germany (September 2002)

ILK-12 Internal ILK-Report on the Intentional Crash of Commercial Airliners on Nuclear Power Plants (March 2003)

ILK-13 ILK Statement on the Proposals for EU Council Directives on Nuclear Safety and on Radioactive Waste Management (May 2003)

ILK-14 ILK Statement on the Recommendations of the Committee on a Selection Procedure for Repository Sites (AkEnd) (September 2003)

ILK-15 ILK Recommendation on the Avoidance of Dependent Failures of Digital I&C Protection Systems (September 2003)

ILK-16 ILK Statement on Sustainability Evaluation of Nuclear Energy and other Electricity Supply Technologies (January 2004)

ILK-17 ILK Statement on Maintaining Competence in the Field of Nuclear Engineering in Germany (March 2004)

ILK-18 ILK Summary Report of the 2nd International ILK Symposium „Harmonisation of Nuclear Safety Approaches – A Chance for Achieving more Transparency and Effectiveness?" (May 2004)

ILK Publications

ILK-19 ILK Statement on the Regulator's Management of the Licensee Self-Assessments of Safety Culture (January 2005)

ILK-20 ILK Statement on Requirements on Anticipated Transients without Scram (ATWS) (March 2005)

ILK-21 ILK-Report: Summary of the International ILK Workshop „Sustainability" (May 2005)

ILK-22 ILK Recommendations on Requirements on Updated General Nuclear Regulatory Guidelines in Germany (July 2005)

ILK-23 ILK Statement on determining Operating Periods for Nuclear Power Plants in Germany (September 2005)

ILK-24 ILK Statement on the Utilization of Nuclear Energy in Germany (November 2005)

ILK-25 ILK Recommendation on the Revitalisation of the Repository Projects Gorleben and Konrad (November 2005)

ILK-26 ILK Statement on the Impacts of the Chernobyl Accident – An Inventory after 20 years (January 2006)

ILK-27 ILK Recommendations on the Further Development of Periodic Safety Reviews in Germany (November 2006)

ILK-28 ILK Report on the Assessment of Nuclear Oversight Activities of the Ministry of Environment, Baden-Württemberg (December 2006)

ILK-29 ILK Statement on BMU Project „Update of Nuclear Regulatory Guidelines" (June 2007)

ILK-30 ILK-Statement on BMU Paper „Taking on Responsibility: Implementing the Consensus Agreement on Final Disposal" (July 2007)

ILK-31 ILK Statement on Fundamental Safety Requirements for Nuclear Power Plants (September 2008)

ILK-32 ILK Statement: Safety Management in Nuclear Power Plants – Status and necessary Requirements for Development (April 2009)

ILK-33 ILK Statement on the „Safety Requirements Governing the Final Disposal of Heat-Generating Radioactive Waste" (July 2009)

- CD with presentations held at the ILK Symposium "Opportunities and Risks of Nuclear Power" in April 2001
- Proceedings of presentations held at the 2nd ILK Symposium "Harmonisation of Nuclear Safety Approaches – A Chance for Achieving more Transparency and Effectiveness?" in October 2003