THE STORY OF THE GORLEBEN INTERNATIONAL REVIEW

A consortium of West German electric utilities wished to build at Gorleben (in the State of Lower Saxony, West Germany) a nuclear fuel centre encompassing spent fuel storage, reprocessing, waste disposal and fuel fabrication.

The Lower Saxony State Government (as licensing authority) responded to public unease by commissioning a review of the project by 20 international critical scientists. The resulting report (Chapter 3 herewith) was submitted in March 1979 and subjected to a semi-public examination during 28 March - 2 April, 1979, attended throughout by the state governor (Dr. Albrecht) and several of his cabinet. Five critical German scientists and approximately 35 scientists favourable to the project participated, in addition to the 20 international critics.

On 16 May 1979, Dr. Albrecht announced that the project would not now be licensed and that future re-application would not be considered without changes in design (copy of Albrecht's statement follows).

Declaration of the State Government, Lower Saxony, West Germany

by

Minister - President
Dr. Ernst Albrecht

May 16, 1979

Concerning the proposed nuclear fuel centre at Gorleben

(English Translation)

In November 1976 I had the honor to receive, in the presence of the fraction chairmen of CDU, SPD and FDP, the Federal Ministers Maihofer, Friderichs and Matthöfer. The members of the Federal Government informed the State Government about the planned integrated fuel cycle center ("Entsorgungszentrum") and requested the immediate selection of a preliminary site for this center.

On February 22, 1977, the State Government announced their readiness to examine applications for the construction of an Entsorgungszentrum on the Gorleben site. Independent of the examination as prescribed for the procedure according to atomic law, however, the question whether an integrated Entsorgungszentrum was fundamentally realizable from the viewpoint of safety technology was to be clarified first. The safety of the population, the State Government stated, had to have priority over all other considerations.

On March 31, 1977, the DWK (Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, German Association for Reprocessing of Nuclear Fuels Ltd.) submitted the application for the licensing of the construction of the nuclear Entsorgungszentrum. The application for the construction of a final deposit for radioactive wastes on the Gorleben site was submitted on July 28, 1977 by the Physikalisch-Technische Bundesanstalt (PTB, Physical-Technological Federal Institute).

The State Government has carefully examined the problems which arise in connection with the construction of an Entsorgungszentrum.

For this purpose, they relied on the council of numerous highly qualified experts. The reactor safety commission and the commission for radiological protection issued a statement. In March 1979, the topic was the subject of an intense debate between more than 60 international scientists (Gorleben-Symposium). After these careful investigations, the Lower Saxony State Government issues the following preliminary statement:

A. On the safety of the plant:

The State Government has arrived at the conclusion that the final disposal of radioactive wastes in a suitable salt dome entails no risk for the present generation as well as for those of the immediate future. For later generations, the risk is small compared to other risks of life.

Because of their plasticity, the salt domes in Northern Germany have endured for over 100 million years without being touched in their core. Several glaciations and geo-historical catastrophies, such as the separation of the american continent from the european continent, could not harm them. Nevertheless, not every salt dome and not every part of a salt dome is equally suited for final disposal. The suitability has to be examined by careful investigations (drillings, geophysical investigations, opening of shafts). Scientific and technological methods are available for this purpose.

By an adequate cooling-down period of the radioactive wastes and by storing them in a sufficiently large volume, it can be guaranteed that the stability of the salt dome will not be decreased by the heat released by the high-activity waste materials.

A risk for future generations would arise only if in the course of the centuries the knowledge about the disposal of radioactive materials would be lost and later generations, uninformed about the final disposal, would attempt to open up the salt dome by mining.

Although in this case, however, it is to be pointed out that the toxicity of final deposits with wastes from reprocessing will be drastically reduced after 500 to 1000 years and will then be comparable to the toxicity of natural deposits of mercury-, lead- and uranium-ores.

More problematical, however, are the facilities connected to the reprocessing plant. The question of the safety of these facilities has to be posed with the local population, the workers and employees of the Entsorgungszentrum, as well as the population of the Federal Republic of Germany and its neighbours in view.

1. The safety of the local population

Here, we have to distinguish between the normal operation of the nuclear Entsorgungszentrum (NEZ) and the results of possible incidents.

a) Normal operation

Like all nuclear facilities, the nuclear Entsorgungszentrum will release certain amounts of radioactivity to the environment. According to the regulations of the radiological protection ordinance, the yearly whole-body-dose for each single person living in the immediate vicinity of the NEZ must not exceed 30 mrem (rem is a unit for the radiation exposure of single persons. 1 rem = 1000 mrem) each via air and water. Beside this, corresponding limits for the maximal permissible radiation exposure of individual organs such as the thyroid are prescribed.

The State Government has come to the conclusion that it is possible to stay considerably below these maximal values. They would require the operator to stay below a dose of ten mrem per year.

The compliance with this limit would be controled by permanent monitoring of emmissions (in particular at the off-gas stacks) as well as by permanent monitoring of immissions in the surroundings of the NEZ

If necessary, the State Government would not hesitate to temporarily shut down the plant to guarantee that the maximal yearly dose is not exceeded.

Scientists agree that each radiation exposure in addition to the natural exposure can have health effects.

The risk entailed by the above-mentioned maximal dose of ten mrem pe year and person, however, is far smaller than other risks of life with which our population is acquainted. The natural radiation exposure in the Federal Republic is ca. 110 mrem per year. The use of x-rays for diagnostic purposes leads, in the population average to ca. 50 mrem per year and person.

In the Federal Republic of Germany, about 25 persons per year and per 10 000 inhabitants die of cancer. This is about 1/6 of all death The operation of the nuclear Entsorgungszentrum would increase this cancer risk for the local population from 25 to 25,01, if each person would be exposed to 10 mrem per year (estimation of the UN-committee for the investigation of the effects of atomic radiation). Due to the rapid reduction of radiation exposure with increasing distance, the majority of the local population will be subjected to a considerably lower risk.

If the calculation is based on the maximal values used by the nuclea energy critics at the Gorleben-Symposium, the risk is increased from 25 to 25,06.

b) Incidents in the interior of the plant

Incidents inside the chemical factory proper (part project 2), i.e. in the reprocessing plant itself, can be controled. This also applie to the retention technology which controls the release of radioactiv materials to the environment.

The State Government thinks that it can guarantee that incidents

inside the reprocessing plant itself will not lead to a radiation exposure of the population above the legal limits. This, however, will necessitate cost-intensive safety precautions.

The State Government recognizes that the stores, which contain over 95 % of the radioactive plant inventory, constitute a special hazard potential. This radioactive potential is so immense that it must not be possible to release it by an incident.

The State Government is not willing to license the concept of DWK in its present form. They insist, that

- the entry store for spent fuel elements is made inherently safe such that the cooling does not depend on the functioning of technical equipment or on human reliability;
- high-activity wastes are, in normal operation, not stored in liquid form and that buffer tanks, if such are necessary, are made inherently safe.

2. The safety of workers and employees

The State Government could convince themselves that the operational safety in the planned nuclear Entsorgungszentrum can be at least as good as in other industrial facilities.

All large industrial facilities contain certain risks. According to present experience, the radiation exposure (whole-body dose) of the personnel working in the control area of the plant will not exceed 1,5 rem per year. The risk given thereby, or in other words the reduction of the average life expectancy resulting from this exposure is of about equal size as the reduction of the life expectancy of steel workers and significantly smaller than the risk which professional drivers, fishermen and miners working underground take upon themselves when they are practicing their profession.

Incidents can in the short term lead to radiation exposures inside the plant which are higher than normal. In so far this has no

immediate health effects it will have to be decided in each single case whether the persons concerned will have to be removed temporarily or permanently from the control area of the plant.

The permanent health control of the whole personnel is important for the State Government. Whole-body monitoring permits a reliable determination of the radiation exposure of the individual workers and employees.

3. The safety of the population in the Federal Republic of Germany and the neighbouring countries

If the requirements of the State Government (see A. 1. b) are fulfilled, the population living further away from the plant will not be influenced by the normal operation of the facility and by incider taking place inside the plant.

There remain, however, two risks which can not be excluded with certainty.

One is the risk of the impact of war. One can assume that particularly if the geographic location is considered - the parties engaged in the conflict will try to avoid a destruction of the plant which would entail the risk of a release of a fraction of the radioactive potential. Furthermore, the State Government would shut down the plant in case of war. An impact due to war nevertheless cannot be completely excluded.

In order to exclude, in this case, risks, which exceed the average risk level already created by the war, the State Government requires in addition to the modifications formulated in 1. b) the development of a concept to store radioactive substances which could be dispersed underground in case of war.

A further risk is the possibility of a theft of plutonium for terrorist purposes.

The State Government is convinced that the plutonium store can be constructed and secured in a manner which renders access of terrorists from outside impossible.

Theft of plutonium by members of the personal, however, can not be excluded to the same extent. It is for the Federal Government to know whether they want to carry the political risk this constitutes.

The following summary can be given: On the assumption that the concept of DWK will be subject to essential modifications, it is possible to construct a nuclear Entsorgungszentrum in such a manner that population and personnel will not be exposed to higher risks in their life than they are by other industrial and technological facilities which the population is already accustomed to. This safety-technological answer, however, is not sufficient. Even if a reprocessing plant, in principle, can be built and operated so safely that it does not lead to unacceptable risks for the population, the question remains of whether the construction of such a plant is absolutely necessary and whether it appears to be politically realizable.

B. The political and energy-policy aspects

Today, 14 nuclear power plants are already in operation in the Federal Republic of Germany and nine more are being built at the moment. In any case, spent fuel from those plants has to be taken care of (the plants have to be "entsorgt"). Furthermore, it is the opinion of the Federal Government and the State Government that the energy demand of the future can only be covered in a satisfactory manner with a contribution from nuclear energy.

It would be wrong to consider the construction of an integrated Entsorgungszentrum as the only solution of the "Entsorgungs"-question. It has been established that long-term intermediate storage of spent fuel elements for several decades is technically possible in a save manner. Regarding final disposal, there is, in principle, the choice between final disposal after reprocessing and final

disposal without reprocessing.

The direct final disposal of spent fuel elements after a longer cooling-off period is possible in principle even if development work is still required for the technical realization. Direct final disposal avoids the problems of reprocessing. On the other hand, it means that wastes with a high content of plutonium have to be deposited for a long time in salt domes or in other geologic formations. The State Government is convinced that, in principle, the wastes can be stored in a safe manner; however, the remain toxic for a significantly longer period than a final deposit after reprocessing.

The advantages of reprocessing for waste management and waste disposal should not be regarded as small; however, it can be state that the real advantages of reprocessing will only materialize in combination with the fast breeder. Indeed, this combination permit a 60-fold utilization of the nuclear fuel. Thereby, the Federal Republic of Germany would be able to significantly reduce its dependence from other countries, an important aspect in the long-term perspective of a world in which a bitter fight for these scarce energy reserves cannot be excluded. This is a decision, however, which can only be taken in years and after the testing of the breeder at Kalkar.

There is no necessity to begin the construction of a reprocessing plant today as long as the decision on the fast breeder is open. This consideration gains particular weight in connection with the question of the political requirements for a realization of a nuclear Entsorgungszentrum.

It cannot be doubted that during the last years the fear of the risks of nuclear installations has grown in large parts of our population.

In spite of it being legally possible - with good reason - , the State Government does not consider it right to build a reprocessing plant as long as it has not been possible to convince large parts of the population of the necessity and safety-technological acceptability of the plant. In contrast to many other decisions, this is not a question of competing interests; it is a question of a judging health risks. Therefore, the opinion of the immediately concerned population carries particular weight.

Whether it will be possible to convince the population will depend not last on the position the parties take. It is not possible to expect the population to gain confidence in the nuclear Entsorgungszentrum if the politically responsible hold different opinions in this matter. Exactly that, however, is the case today. Leading politicians, organizations on State and district level as well as working groups of SPD and FPD have spoken against the reprocessing plant. Others go still further and take position against nuclear energy in general. It is a task of foremost political importance to create a clear situation in this field.

The Lower Saxony State Government cannot and does not want to force energy-political decisions upon the Federal Government. It is their duty, however, to point out to the Federal Government that the political preconditions for the construction of a reprocessing plant are not given at the moment.

C. Summary

Although a nuclear Entsorgungszentrum is, in principle, realizable from the viewpoint of safety-technology, the Lower Saxony State Government recommends the Federal Government to not further persue the project of reprocessing.

The new "Entsorgungs"-concept should be decided instead without delay The basic features of this concept can be described as follows:

- Immediate installations of inherently safe long-term intermediate stores for the "Entsorgung" of the nuclear power pla
- Pushing of research and development activities for the safe final disposal of radioactive waste.
- Deep drillings and, if the results are positive, opening up of a mine in the Gorleben salt dome. In case the drillings should lead to negative results, investigation of other fina disposal sites.
- Decision of the most appropriate form of treatment and final disposal of radioactive waste only after clarity on the ener political future has been reached.

This concept permits safe "Entsorgung". It does not foreclose any options for the future. It limits the risks connected to "Entsorgung" to a minimum.

Depending on whether the Federal Republic of Germany will in the future opt for light water reactors, for the high-temperature reactor or for the fast breeder, the question of reprocessing can then be taken up again. The long-term intermediate storage guarantees that no nuclear fuel gets lost.

The Lower Saxony State Government is willing to participate in the realization of such a concept. Concretely spoken, this means the willingness to install a long-term intermediate storage facility, to realize the final disposal of low- and intermediate-activity wastes in salt domes in Lower Saxony, after the procedures require by law have been executed, and to push the mining investigations for the final disposal of high-activity materials.

A part of this task, e.g. the construction of long-term intermedial stores, can also be taken over by other Federal States. The State Government would consider it wrong to let those states out of thei duty. We are, however, aware of the fact that Lower Saxony has a particular responsibility due to its geographic characteristics, and we will act according to this responsibility.