Note:
This is a translation of the statement entitled “Beschleunigungs-/Optimierungsmöglichkeiten in der Schachtanlage Asse II”. In case of discrepancies between the English translation and the German original, the original shall prevail.

E S K

STATEMENT of the Nuclear Waste Management Commission (ESK)

Acceleration/optimisation possibilities in the Asse II mine

With request for advice [1] of 20.01.2012, the BMU requested the ESK to prepare a statement, with a view to assessing the safety situation in the Asse II and the risks associated with the implementation of retrieval, on the following questions:

1. What possibilities for accelerating the realisation of retrieval are feasible without compromising on safety?
2. Can planning and implementation of the emergency and precautionary measures be accelerated and optimised?

In order to answer these questions, the ESK had extensive discussions with the representatives of the Federal Office for Radiation Protection (BfS) in its joint meeting with the ad hoc working group ASSE of the ESK and SSK on 01.02.2012. Here, the results of technical workshop [2] held by the BfS on 18./19.01.2012 were taken into account. This statement was adopted at the 24th ESK meeting on 02.02.2012.

1 With reference to retrieval

1.1 Significantly higher time requirement

The estimates on the time necessary for the retrieval were discussed at the BfS workshop. Here, the participants agreed that, on average, a time period of 35 to 40 years is to be assumed; the estimate at the workshop with the shortest period was 25 years, the longest 50 years.

The ESK shares the view that the duration for retrieval will be several decades.

Thus, the unrealistically short time periods for the retrieval stated in the DMT/TÜV Nord study of 2009 [3] and used as a basis for the comparison of options conducted by the BfS are invalid. This has also been confirmed by the representatives of the BfS at the 24th ESK meeting.

1.2 Need for adequate shaft restoration and construction of a new shaft

Due to the required time period of several decades, the installations in the mine must have a technical standard that is appropriate for this long time of operation. According to the BfS, the installations have not been designed for it so far, since the former operator expected withdrawal from the mine around 2015 and therefore has not taken any measures to maintain the technical standard for operation beyond this time.

As a consequence, the existing Shafts 2 and 4 have to be extensively restored in any case. This leads to a time requirement of several years.

In addition, there is agreement that the retrieval of the waste requires the construction of a new appropriately dimensioned shaft (Shaft 5).

The existing shafts are located in the mine area affected by stresses induced by massive rock movements where infrastructure areas increasingly get lost due to the movements. At the BfS workshop, the participants therefore discussed the possibility of creating infrastructure areas in less disturbed areas of the Asse formation in the vicinity of the new Shaft 5 to be constructed.

The ESK regards the construction of a Shaft 5 as an option to be preferred under safety aspects to create a shaft operable for a period of several decades and stable infrastructure areas in less disturbed areas of the Asse.

The ESK points out that for continued operation of the mine it is necessary to maintain the spiral gallery, the necessary infrastructure areas and the connections required for access and ventilation in a safe condition.

1.3 No planning for retrieval in an application-ready form so far

The technical process of retrieval consists of three major steps that need to be integrated into an overall concept:

- Recovery of the waste from the emplacement chambers,
- transport of waste through the mine up to the surface, and
- buffer storage and conditioning of the waste and subsequent interim storage in an above-ground facility.

The recovery of waste can only take place if these three steps are technically available, since only after reconditioning the waste can be stored for several years after reconditioning. Without conditioning, the waste would pose a safety hazard.
At the ESK meeting on 01.02.2012, the BfS confirmed that plans that are ready for application are available for none of the three steps so far.

According to the BfS, the step "recovery of the waste from the emplacement chambers" has not been dealt with sufficiently to develop plans. From the point of view of the ESK, the following would have to be examined, in particular, as a preparatory work for plans that are ready for application:

- Which technical boundary conditions exist for the recovery measures or, in the case of unknown boundary conditions, which is the framework in which the boundary conditions may arise?
- Which technical measures are available for recovery operations (among others with regard to methodology, application areas, developability, and availability on the market)?
- What is the radiation protection situation for the workers and the population regarding the different technical measures?

On the basis of this examination, verifiable planning documents would have to be developed in a second step, if required for several variants of the recovery techniques.

Regarding the construction of a new Shaft 5, the BfS submitted information according to which preparatory work for reviewing the suitability of the intended starting point for drilling are in progress; an application for exploration drilling has been filed. An application-ready planning for the shaft, however, is not available. From the point of view of the ESK, retrieval will not be feasible without the completion of Shaft 5 and the restoration of Shafts 2 and 4.

Regarding the construction of the conditioning plant with buffer storage, the BfS commissioned the development of an application-ready planning. Since the unconditioned waste transported to the surface must be immediately stored and quickly converted into storable waste packages, the operation of the conditioning plant, including previous buffer storage, and of the interim storage facility for the conditioned waste is indispensable from the start of retrieval. Without final plans ready for application and subsequent review, construction will not be possible.

Without application-ready planning, safety review will neither be possible within a regular licensing procedure nor for a possible decision within the framework of hazard prevention.

1.4 Answer to the question: “What possibilities for accelerating the realisation of retrieval are feasible without compromising on safety?”

As described under Section 1.3, plans that are ready for application are available for none of the necessary steps:

- Recovery of the waste from the emplacement chambers,
- transport of waste through the mine up to the surface, and
- conditioning of the waste in an above-ground facility, including previous buffer storage and subsequent interim storage.

Considering the facts presented, the ESK notes that currently acceleration can only be achieved by requesting the BFS to immediately develop and submit verifiable planning documents for the steps of retrieval mentioned.

2 With reference to the planning and implementation of the emergency and precautionary measures

2.1 Need for emergency and precautionary measures

The technical assessment of the conditions in the Asse II mine still consistently assumes that an uncontrollable inflow of solution cannot be excluded. This was also noted in the discussions at the workshop of the BfS on 18./19.01.2012. Therefore, emergency and precautionary measures are absolutely necessary for such a case.

Due to the finding that the performance of retrieval requires several decades and not just years, emergency and precautionary measures become all the more necessary: With the much longer period, the probability of an uncontrollable solution inflow increases significantly during retrieval. Therefore, in the opinion of the ESK, the implementation of emergency and precautionary measures should have priority in the further planning.

2.2 With reference to the backfilling of the residual voids in the emplacement chambers

The considerations of the BfS on the effectiveness of the emergency and precautionary measures to reduce radiation exposure due to an uncontrollable inflow of solution have shown that backfilling of the residual voids in the emplacement chambers may reduce the potential radiation exposure of the population by about tenfold.

In view of the much longer time required now for retrieval, the ESK considers backfilling of residual voids necessary to ensure the protection of the population in the case of uncontrollable inflow of solution as far as possible. To this end, however, it is necessary to clarify once again whether, and if so, which negative impacts could result from it.

In addition, backfilling of the residual voids may contribute to the stabilisation of the mine, and thus will potentially contribute to reducing the likelihood of the occurrence of an uncontrollable inflow of solution.

In contrast, the somewhat increased effort for opening of a backfilled chamber for retrieval is to be regarded as being of secondary importance compared to the gain in safety.

2.3 Answer to the question: “Can planning and implementation of the emergency and precautionary measures be accelerated and optimised?”

In the last two years, the BfS has been working on the implementation of the emergency and precautionary measures. However, implementation requires more time; according to the BfS at the ESK meeting on 01.02.2012, these precautionary measures cannot be implemented before 2019. Emergency measures will be fully available in 2016.

The BfS explained that it does not see significant opportunities to accelerate this work.

From the point of view of the ESK, however, the following options should be checked once again:

- The measure of installing a higher-power electricity supply to the facility, already planned by the BfS, should be accelerated as far as possible, especially because this would provide a higher machine capacity for the implementation of the precautionary measures;
- Simplifying the procurement by foregoing extensive tendering procedures (reason: measures of hazard prevention);
- Use of additional staff, particularly in the planning.

3 With reference to other issues under discussion

3.1 Determination of potential radiation exposures for the different variants of further proceeding

The ESK assumes that in the course of further decision-making processes, comparisons regarding the radiation exposure of different variants and sub-variants of technical solutions will be required. This will already happen merely because all pending measures will be performed under consideration that potential and actual exposures to radiation are to be avoided, if possible, or to be reduced.

Therefore, the ESK considers it necessary that on the part of the BfS corresponding calculations and modelling on the radiation exposure of the population and the operating staff will be performed and updated continuously. This must cover all variants and options as well as potential emergencies (in particular the uncontrollable inflow of brine solution) at issue.

3.2 Licensing procedures performed so far

In the discussion at the 24th ESK meeting on 01.02.2012, the BfS gave a detailed statement on the licensing procedure for the first phase of fact finding. The presentation shows that there were no delays due to "unnecessary" requirements. As far as licensing conditions have been imposed, these were mainly due to the circumstance that for lack of time the licensing documents submitted did not include some data which then had to be requested subsequently by way of imposing the related conditions.

Accordingly, the ESK concludes that without refraining from the performance of reviews on safety and radiation protection issues previously considered to be necessary, there will be no further potential for shorter review times. This would also apply for a hazard prevention approach, since the contents of the scope of the review cannot differ from those of a licensing procedure.

.

3.3 Legal instrument of hazard prevention

At the ESK meeting on 02.01.2012, the BfS was questioned in detail by the ESK on the contents behind the discussion of an approach according to hazard prevention. On the part of the BfS, only such situations were mentioned where different interpretations of guidelines play a role, such as the applicability of rules and regulations from other areas of nuclear technology.

From the point of view of the ESK and according to the experience of the ESK member with other licensing procedures, such problems with room for interpretation also occur quite frequently in procedures for other nuclear installations. A proven means to provide a solution to this problem in a specific licensing procedure is to agree on a clear interpretation during the consultations on the application.

If further questions concerning the state of the art in science and technology should be relevant for the interpretation, expert commissions such as the ESK or the SSK may also give interpretation assistance for the specific case. Such specifications by the expert commissions will generally be considered by the court as a definition of the state of the art in science and technology.

3.4 With reference to fact finding

At its meeting on 01.02.012, the ESK had detailed discussions with the BfS about the situation regarding the finding of facts.

With respect to Step1 of fact finding (drilling into the chambers), the ESK agrees with the BfS that the work should be started and carried out as soon as possible. The findings obtainable this way are of considerable importance both in terms of further planning for the recovery of waste (see Section 1.3) and in terms of exploring the possibilities for the precautionary measure "backfilling the residual voids in the emplacement chambers" (see Section 2.2).

With respect to Steps 2 and 3 of fact finding, the ESK sees the need to carry out this work as quickly as possible, too (but without compromising the priority mentioned in Section 2.1 given to the emergency measures). Without the findings to be obtained in these two steps, a final determination of the recovery techniques and the development of an implementable plan will not be possible. As already stated in Section 1.3, the development of an implementable plan for the recovery techniques is the time-determining factor for retrieval.

On the part of the BfS it was declared at the workshop on 18./19.01.2012 that Steps 2 and 3 may possibly not be licensable. At the ESK meeting on 01.02.2012, the BfS explained that the main reason for this statement was the fact that without completion of emergency preparedness, which would not be achieved before 2016, licensability may be doubted.

From the point of view of the ESK, this requires weighting of the following aspects:

- On the one hand, only with the findings from Step 2 and 3, the final specifications for implementable planning of the recovery measures are to be achieved (see above and Section 1.3). Since this is decisive for the time requirement, a delay would have a direct impact on the overall project.
- On the other hand, in the case of an uncontrollable inflow of solution, not all of the emergency measures would be available. Possibly, reduced emergency measures with quick re-closure of the chamber under investigation would have to be realised.

The ESK recommends that the BFS immediately initiates measures to make these technical considerations, so that delays for the next steps will be avoided.

3.5 With reference to the transport of the waste from the Asse into a repository

The waste retrieved from the Asse has to be - as described in Section 1.3 - processed in a conditioning plant so that it can be stored at least in interim storage in the longer term. If, however, planning does not go beyond this point, this will lead to a long-term above-ground interim storage of waste in the area of the Asse.

For a final solution, the transport of the waste into a suitable repository is required. It is currently expected in a study conducted on behalf of the BfS [4] that the volume of conditioned waste will be up to 393,000 m³. A repository is currently not available for it. For the conditioned Asse waste, a repository would still have to be found.

However, there is also a direct technical retroactive effect of the repository on the design of the conditioning plant: The waste must be conditioned such that it meets the acceptance criteria and requirements of the respective repository. At the latest at the beginning of conditioning it must be clear which acceptance criteria and requirements for conditioning are applied, in order to avoid reconditioning of the waste.

From the point of view of the ESK, without the corresponding decisions, the situation will arise that there will be a long-term interim storage of waste that might not be appropriate for disposal in a repository. Therefore, decisions are urgently needed also on this issue.

Literature

[1] BMU letter RS III 2 – 17005/0 of 20.01.2012 to the Chairman of the ESK
Request for advice for the Nuclear Waste Management Commission (ESK)
Asse II mine

[2] Asse II mine – technical workshop on the current situation with regard to retrieval, results of the technical workshop on 18./19.01.2011 in the Stadthalle Braunschweig
Federal Office for Radiation Protection, Salzgitter (BfS), 27.01.2012

[3] Assessment of the possibility of retrieving the LAW from the Asse mine
DMT GmbH & Co. KG, TÜV NORD SysTec GmbH & Co. KG
25.09.2009

[4] "Standortunabhängiges Konzept für die Nachqualifizierung und Zwischenlagerung radioaktiver Abfälle aus der Schachtanlage Asse II"
(*site-independent concept for the requalification and interim storage of radioactive waste from the Asse II mine*)
GNS/WTI, Rev. 02, 21.07.2011

[5] Comparison of options - Asse
Technical assessment of the decommissioning options for the Asse II mine
BfS, 15.01.2010