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## First Equalisation Plan of the Federal Office for Radiation Protection is in Force

The Federal Equalisation Law (Bundesgleichstellungsgesetz, BGleIG) was enacted on 5 December 2001. It replaces the second Women's Promotion Law from the year 1994.

The main objective of the law remains, as before, the promotion of women in order to enforce definitely equality in their treatment. Beyond this the regulations of compatibility between family and occupation for men and women have been improved. The tasks and competencies of the equalisation commissioner have been extended and enforced.

In order to achieve these aims, the BGleIG provides in § 11 the establishment of the equalisation plan as an instrument for the planning and development of staff, and for the equal treatment of women and men. The equalisation plan of the Federal Office for Radiation Protection has come into force in May 2003.

In the actual analysis, data are statistically evaluated and interpreted according to different criteria. In the part of standard objectives, the targets based on the legal standards to be achieved in the BfS are described. The third part of the equalisation plan is a catalogue of measures fixing the concrete aims to be achieved in the following areas:

- Increase of the proportion of women in areas where women are underrepresented,
- Promotion, upgrading, and advance in line for promotion,
- Education and training,
- Supporting the compatibility between family and occupation,
- Flexible work-times, offers of various forms of part-time employment, temporary leave or release from compulsory attendance, teleworking.

In addition, protection measures against sexual harassment of workers have been fixed.

The equalisation plan is valid four years and will be revised after two years, where both the successful aims and the reasons for the aims which had not been implemented have to be put down in writing. The plan is binding and has to be particularly observed by persons with supervisory or management functions.

*Edeltraud Stephan*

*Equalisation Commissioner*

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Bundesamt für Strahlenschutz  
Postfach 10 01 49  
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Tel.: 01888/ 333-0  
Fax.: 01888/ 333-1885  
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### Editorial Office

Lutz Ebermann  
Tel.: 01888/ 333-1122  
Fax: 01888/ 333-1105  
eMail: [LEbermann@bfs.de](mailto:LEbermann@bfs.de)

### **Final Report of the Risk Commission**

In October 2000, in the scope of its Action Programme Environment and Health (APUG), the Federal Environmental Ministry and the Federal Health Ministry have introduced the Risk Commission. On 6 June 2003, this interdisciplinarily composed risk commission has handed over their final report.

In the opinion of the Risk Commission fundamental changes in the risk regulation of environmental health risks are urgently required in Germany. The Commission has summarised their demands in the following 10-point programme:

1. A clear functional separation between risk estimate and risk management is necessary.
2. The framework conditions for the risk estimate have to be fixed, priorities for the development should be anticipated.
3. An unequivocal and comprehensible procedure with high transparency, scientific stringency as well as media- and context-related consistency is essential. The possibility to objection must be given.
4. This applies also to the risk management; a transparent comparison of optional measures has to be made. Extensive participation of involved persons, of the general public and interested parties is obligatory.
5. An adequate participation of the involved persons and organised social groups in decision-making is required with regard to the object, the rule of law, and democracy.
6. Risk communication must be integral component of the whole regulation process.
7. In view of the great number of risks, early warning systems covering all areas must be stipulated by the institutions.
8. The existing advisory structure consisting of a variety of committees has to be decreased.
9. The establishment of a coordinating institution is necessary: the Commission recommends to establish a council for environmental health risks (risk council).
10. Analogous to the handling of environmentally related health risks, corresponding approaches have to be made to harmonise and revise the regulation of environmental risks.

The report can be read and downloaded from the BfS internet pages (<http://www.bfs.de/bfs/fue/beitraege/apug.html>).

*Helmut Jahraus*

*Department Radiation Protection and Health*

### **Solar UV Measuring Network in Germany**

Since almost 10 years, BfS and the Federal Environmental Agency (UBA) carry out continuous measurements - including spectral resolution - of solar UV radiation near the soil in Zingst (Baltic Seacoast) in Langen (near Frankfurt/Main), on top of the Schauinsland mountain (Black Forest) and in Munich. Since 8 years, solar UV radiation has also been measured in collaboration with the German

Meteorological Service (DWD) in Potsdam, the Federal Institute for Occupational Safety and Health (BAuA) in Dortmund, the Christian-Albrechts-University of Kiel (CAU) on the Isle of Sylt, the Bavarian Environmental Protection Office (LfU) in Kulmbach, and the Office for Ecology of Lower-Saxony in Hannover and on the Isle of Norderney. Meanwhile, these 10 sites cover nearly all regions of concern about UV radiation climatology in Germany.

In yearly meetings with participants of all institutions involved, current problems are debated, and recent knowledge in the assessment of measuring values, evaluation of UV health measuring data, and public relations work are discussed. In the meeting of this year from 5 to 6 May 2003, in Dortmund, the organisation of the first Joint Annual Report was focussed which is planned to be available on the BfS homepage this summer.

Balancing of the currently available and evaluated measuring results shows no significant increase in the solar UV radiation level near the soil, in Germany, – at least with regard to the assumed general decrease of ozone in the atmosphere. However, short-term high UV values have been registered in springtime, which will mainly originate from the streaming of poor-in-ozone air masses from the equatorial region. From analysis of the UV long-term trend, it must be considered that UV radiation near the soil is highly influenced by the frequently changing weather conditions in Germany, and may therefore overlap a possible ozone effect.

Furthermore, measures to further improve the measuring quality were discussed in the meeting. Only solid and accurate measuring instruments may perform with sufficient accuracy long-term measurements in shortwave UV areas with sunburn risks. In this context the optimisation of system sensitivity by means of an intercomparison of calibration lamps and increase of the wave length accuracy by calculation procedures was discussed. For intercomparison measurements a filter radiometer and additional systems for integral measuring and erythema weighting was purchased and installed at nearly all measuring sites. Beyond this the filter radiometer serves for measuring campaigns, among others for measurements on top of the Zugspitze mountain during the winter season.

*Manfred Steinmetz*

*Department Radiation Protection and Health*

### **Realistic Population Dose Estimate According to the New EU Basic Standards, and Common Practice in Germany**

In Article 45 of the EU Directive 96/29/EURATOM the Member States are required to assess radiation exposure to the population from activities requiring a license, as realistic as possible

In the EU Member States different methods are used in both the identification of reference population groups and dose calculation, and in general realistic dose assessments are not carried out systematically. Therefore by order of the European Commission a guideline was established with recommendations about realistic dose assessments due to radioactive

discharge from nuclear installations during normal operation. It is the aim of harmonisation to make the comparability of radiation exposure possible that has been recorded by the Member States. The most important recommendation is in this case to use as much site-specific information as possible for the dose assessment. It is also recommended to involve critical groups as reference population group. Critical groups are real persons which receive the highest effective dose because of their living habits.

In Germany, for the assessment of radiation exposure of the public due to radioactive release from nuclear installations during normal operation, (hypothetic) reference persons are selected who stay at the most unfavourable point of exposure in the vicinity of the site and eat food that was produced in the critical zone. For this purpose models, generalised assumptions, and parameters are used, as legally stipulated in the General Administrative Provisions (AVV) to § 47 of the Radiation Protection Ordinance (StrlSchV). However, AVV is planned for dose calculations in licensing procedures and has to ensure that for the licensed release the currently valid dose limits are kept. In the scope of licensing procedures conservative models, model parameters, and other assumptions are appropriate and required. However, it is common practice to use these principles of calculation also to determine radiation exposure during the operation of a plant. In general the population doses calculated like this are overestimated.

In Germany there are currently no appropriate calculation principles to do realistic calculations with regard to radiation exposure from nuclear installations in normal operation, as required in Article 45 of the new EU Basic Standards. For this reason establishing of a calculation procedure for the realistic assessment of public radiation exposure during the operation of nuclear plants will become an essential task. However the conservatism of the current principles of calculation in the scope of licensing procedures shall be maintained for reasons of precautionary radiation protection.

*Liebetaut Hornung-Lauxmann, Martin Steiner  
Department Radiation Protection and Environment*

### **Investigations on the Influence of a Uranium Mining Waste Rock Pile on the Radon Concentration in the Surrounding Area**

Since the beginning of the nineties the Federal Office for Radiation Protection has operated networks for measuring long-term outdoor radon concentrations (Rn-222) in regions of Saxony, Saxony-Anhalt and Thuringia characterised by intensive old and uranium mining. The measurements are carried out with nuclear track detectors. The detectors are exchanged twice a year and their results evaluated. Within the scope of these investigations high outdoor radon concentrations of up to 600 Bq/m<sup>3</sup> were measured in the town area of Johannegeorgenstadt (Erzgebirge) at the bottom of a uranium mining waste rock pile. These radon concentrations are clearly above the

natural level. The natural concentration level for the area of Johannegeorgenstadt is in the range between 10 Bq/m<sup>3</sup> and 35 Bq/m<sup>3</sup>. As upper end of the natural range of outdoor radon concentration usually a level of 80 Bq/m<sup>3</sup> is considered.

To determine the cause and the consequences on radon concentration in a residential area, located immediately at the waste rock pile bottom, special investigations were carried out by BfS, in co-ordination with the Saxonian authorities. Over a period of two years measurements of radon release from the waste rock pile, of outdoor radon concentration between waste rock pile and residential area and in the immediate vicinity of buildings and of indoor radon concentration were carried out.

The investigations have shown that mainly area-wide radon releases from the waste rock pile are the reason for the enhanced outdoor radon concentration which are caused by seasonal differences in temperature between the interior of the waste rock pile and the outside air. Due to convective currents of air caused by this ("chimney effect") occurring particularly in large waste rock piles with large pieces of material, radon releases occur increasingly in the wintertime on the waste rock pile plateau and in the summertime at the waste rock pile bottom. In some adjacent buildings the high outdoor radon concentrations lead to clear increases in indoor radon concentration. In some cases the radon concentration in the living area is nearly exclusively determined by outdoor air and is not or only scarcely influenced by the building soil or building material. In the living rooms which are strongly influenced by outdoor air, the levels of radon concentration are highest in summer and lowest in winter, in analogy to outdoor air.

The investigations make particularly clear that radiation exposure of the population due to radon is a very complex problem. While under average conditions in Germany a third of the radon concentrations in buildings is caused by outdoor radon concentration, one third by radon release from building material and one third by radon from the building soil, radon releases from waste rock piles via outdoor air can considerably contribute to radiation exposure under special conditions.

The research results are taken into account in the development of inspection and evaluation methods for the site-specific investigation of mining relics. Currently the consequences for the respective residential area resulting from the investigations are evaluated by the Free State of Saxony.

*Michael Kümmel  
Department Radiation Protection and Environment*

### **Improvement of the ODL Measuring Network to Assess the Radiological Situation on the Area of the Federal Republic of Germany in 10-Minute Phases**

For the continuous measurement of external radiation exposure (gamma ambient dose rate, ODL) the Federal Office for Radiation Protection operates an automatic measuring network with 2150 on-site

probes, being distributed in a 15 x 15 km grid all over the Federal Republic. In the event of a passing radioactive cloud, the increase of external radiation exposure can be immediately and reliably evidenced by means of the network, and the exposed area can be limited. Therefore this network is essential for the estimation of the radiological situation, particularly in the early phase of an accident, when decisions must be taken about recommendations and measures for the protection of humans.

In the case of event the technology used to date allowed to read the measuring results covering the overall surface every two hours only. But from the view of precautionary emergency management it was considered necessary to follow-up the dispersion of the radioactive cloud, together with the changes of radiation exposure at the same time, i.e. almost online. It results from the network density that this can be achieved by interrogating the ODL measuring network centres in 10-minute phases. For the purpose of a corresponding acceleration, new transmitters of measuring values were additionally used. The number of modems was doubled and new efficient computers were provided. These retrofitting measures were concluded by middle of February. In the scope of a thorough operational exercise it has been evidenced that due to these technical improvements the aim of interrogating the measuring results of all 2150 measuring network centres in 10-minute phases could be achieved. The data are immediately automated and displayed as graph on a situation map which can be transferred to the documentation system of the Integrated Measuring and Information System (IMIS), where it is available to all decision-makers. With the acceleration of the data interrogation, it was possible to monitor any time the current radiological situation. Like this the basis for decisions on recommendations and measures in the case of event has been highly improved.

*Ulrich Stöhlker*

*Department Radiation Protection and Environment*

### **Maintenance Work in the 1 East Cross-cut of the Gorleben Exploratory Mine**

To ensure mining safety in the area of the 1 East Cross-cut, usual mining maintenance work has been carried out in the mine for the exploration of the Gorleben salt dome since the middle of May 2003. This work includes mechanical re-working of walls and roofs with a ramming vehicle or a roof milling tool. The reason for this maintenance work usual in mining, which must also be carried out in other salt mines, is cavity reduction due to convergence.

Salt rock is capable of creep and characterised by high plasticity. This feature leads, among others, to the closing of clefts and fissures in the salt structures. It must be emphasised that in the area concerned the main salt of the Staßfurt series, the so-called "older rock salt" leaves. Compared to the "younger rock salt" the older rock salt is characterised by the highest convergence rates. Just because of this feature the older rock salt would

be suitable for the safe enclosure of high-level radioactive waste.

If cavities (e. g. drifts) are drifted in such structures the salt attempts to close these cavities again because of the aforementioned features. This loss of height and breadth, referred to the dimensions immediately after drifting, is called convergence. Through this cavity reduction resulting from convergence excavation-damaged zones of few decimetres are generated in the near field. These excavation-damaged zones can lead to fissures near the excavation and must therefore be maintained by measures usual in mining, in order to keep up the possibility to work there safely. For this purpose, in the aforementioned concrete case of maintenance the excavation-damaged zones are worked with a ramming vehicle or a roof milling tool. To counteract convergence and to minimise the maintenance effort, a so-called supporting rock-bolting is additionally brought into the worked roof areas. The work will probably be concluded in October 2003.

*Frank Printz*

*Department Safety and Nuclear Waste Management*

### **BfS Annual Report 2002 introduced**

On 20 June 2003, Mr. Jürgen Trittin, Federal Environmental Minister, and Mr. Wolfram König, BfS President, have introduced the BfS Annual Report 2002, in Berlin. The Annual Report includes on 68 coloured pages, beside current data and facts about BfS, selected contributions from the tasks spectrum of BfS. Focal points in this year are radiation protection topics in connection with the precautionary protection of consumers.

The BfS Annual Report 2002 can be downloaded from the internet ([www.bfs.de](http://www.bfs.de)), or a copy can be ordered, free of charge, as brochure or CD-ROM at the Federal Office for Radiation Protection (BfS), Postfach 10 01 49, 38226 Salzgitter/Germany.

*Lutz Ebermann*

*Task Planning and Controlling*