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New Developments Concerning Release of Low-level Radioactive Substances from Supervision

In July 2001 the amendment to the Radiation Protection Ordinance (Strahlenschutzverordnung, StrlSchV) came into force. Among others, the release of low-level radioactive substances from nuclear law supervision was for the first time regulated uniformly throughout the Federal Republic in § 28 StrlSchV. In particular the nuclide-specific release values for a number of release options are new. One of these options concerns the release of substances to be disposed of on waste sites or in incinerating plants. These values were calculated on the basis of investigations which had already been published more than 10 years ago and were taken up in the recommendation of the Commission on Radiological Protection in 1998 (Volume 16, 1998). In the meantime the scientific-technical findings have been extended and in particular the legal and technical basic conditions of waste disposal have been changed. Key points of waste law are the Recycling Management and Waste Law | *Kreislaufwirtschafts-/Abfallgesetz)* and the Ordinance on the Ecological Deposition of Consumer Wastes (*Verordnung über die umweltverträgliche Ablagerung von Siedlungsabfällen)*. The comprehensive amendments come into force on 1st July 2005. They are accommodated in a research project attended by BfS to update release criteria.

Among others, the new Waste Law (*Abfallgesetz)* provides for basic sealings which are to reduce or prevent to a large extent a discharge of substances into the groundwater. Additionally, waste sites have to be covered following discontinuation of operation. Thus the generation of seepage water and the discharge of radionuclides into the groundwater are reduced. In the aforementioned research project these measures are taken into account in the assessment of the radiation exposure of the population as a result of release.

A further call for action in the updating of release

values for disposal results from the dismantling of nuclear power plants expected for the years to come and the large amounts of low-level radioactive substances resulting from this. It is assumed that up to 1,000 tons of material released for disposal will be disposed of at a waste site per year. The currently valid release values for disposal were still based on amounts of 100 tons per year and waste site.

Since the major share of waste amounts arising in future will consist of debris resulting from the dismantling of nuclear facilities, the release characteristic of radionuclides of the debris has particularly to be taken into account in the models used to derive the release values. In analogy to the release of heavy metals from debris, an initially high lixiviation through a leaching effect and, in the following, a slower release rate affected by diffusion and solution processes with lower seepage water concentrations are assumed. As the respective nuclide-specific release parameters are subject to a high level of fluctuation, their determination must be evaluated critically. The model assumptions are also taken as a basis as being conservative but not unrealistic.

It is the objective to ensure altogether that the protective goal (10 µSv per year) is kept for single persons of the population.
Günther Schaller
Department Radiation Protection and the Environment

Results of the Nation-wide Representative Survey on the Perception of Mobile Telecommunication in 2003

In the scope of the German Mobile Telecommunication Research Programme, the Federal Office for Radiation Protection commissioned the "Infas Institut für angewandte Sozialwissenschaften" (Institute for Applied Social Sciences), in Autumn 2003, to carry out annual polls on the perception of mobile telecommunication. The new polls are based on a first questioning of Autumn 2001. The current survey in Autumn 2003 has been carried out again by telephone enquiry of 2500 target persons of a nation-wide representative sample of a population aged above 14 years and living in private homes.
Compared to the 2001 survey, the percentage of cell phone users has increased from 65 % to 73 %. The highest number of cell phone users was registered for persons aged under 18 years with 93 %, and for those aged from 18 to 24 with 95 %; the lowest number was registered for persons above 65 years with only 39 %. Somewhat more than a quarter of all questioned persons makes (nearly) daily cell phone calls – on average about 19 minutes per day. 18 % of all persons questioned call several times per week, 28 % rarely and 27 % not at all.
Compared to the year 2001, the concern regarding electromagnetic fields of mobile communication decreased from 35 % to 31 %, and 8 % of the interviewees feel impaired as compared to 6 % in 2001. These changes are still within the range of statistical variations – a trend will be detectable after the Autumn 2004 survey at the earliest.

A much more differentiated perception is included in the simple answers of the "yes" and "no" categories. Thus, e.g. 20 % of the concerned persons are "seriously concerned", and 14 % of the impaired are "seriously impaired". The indicated type of impairment included predominantly sleeping problems (about 11 %), a general indisposition, cardiovascular disorders, weakness, (10.5 %), headache, migraine, (9 % - compared to 30 % in 2001), mental disorders (8 %) as well as ringing in or heating of the ears (6 %).
Mostly independent of the degree of concern or impairment, the mobile base stations were predominantly indicated as being the most frequent cause. Only the group of the "less concerned" and the "less impaired", indicated (nearly equally) the mobile phone base stations and the cell phones as being the strongest sources. However, it was also shown that the health concern due to mobile telecommunication ranged widely behind the concern for other potential health hazards, such as air contamination, smoking or participation at road traffic.
Related to partners and children, the detriments to health caused by a frequent stay in the vicinity of mobile phone base stations are in general higher estimated than those caused by the use of cell phones. The highest sensitivity exists in those persons questioned whose children (aged under 16 years) attend an after school care centre, a nursery school or a day nursery near a mobile phone base station.

The degree of information of the population concerning the topic "mobile telecommunication" is the following: the majority of the persons questioned (57 %) consider themselves as a little informed; only 3 % consider themselves as very well and 17 % as well informed. Only nearly 30 % of the persons knew that the radiation intensity of each cell phone is described by the SAR value (specific absorption rate). The results of the survey are mainly intended to improve and develop the risk communication of BfS related to possible health consequences from mobile telecommunication. Due to repeated polls the changes in perception within the population shall be identified.
The report on the results of the survey is available for downloading on the BfS homepage http://www.bfs.de/elektro/papiere/umfrage2003.pdf.
Anne Dehos, Christiane Pölzl
Department Radiation Protection and Health

OECD/NEA Workshop on Confidence Building at Radiation Protection Authorities

From 18th to 20th May 2004 the OECD/Nuclear Energy Agency held a workshop in Ottawa, titled "Building, Measuring and Improving Public Confidence in Nuclear Regulation", on the occasion of which some remarkable findings regarding public relations and self-conception of authorities were achieved.

One has to act on the assumption that not only in Germany but also in other countries only little has been known about the work of the respective radiation protection organisations. Having confidence in an authority presupposes that the authority is known to the general public. The participants in the Workshop agree that the following factors are important for

confidence building: To date information, openness and transparency, honesty, stringency, competence, and regard for cultural circumstances of target groups in the representation.

There were, however, different opinions in the single countries regarding who is considered a target group for public relations. While in the Anglo-Saxon countries each person in the street is considered a contact person, the French side assumes certain educational requirements or steering of interests in the target groups as usually given in the case of journalists, teaching staff, students, etc..

It was controversially discussed at the workshop who should speak on behalf of an authority. In the case of the Finnish STUK each employee may (and must) render information to the public, accepting that answers are sometimes contradictory. The employees are trained for media work and internal position papers on important topics are available. Some organisations consult experts, for example from universities, for critical questions. Most countries seem to have a spokesman for public relations, as it is the case in our authority.

In case of an event (accident) the following points are considered essential in the communication with the public or the media:
Consistent, comprehensive and early communication, repetition of statements (learning effect), admitting misconduct and preparing answers to possible questions.

Some countries have special programmes to better involve the population and stakeholders in their work. In Sweden, for example, environmental organisations are financially supported (this does not apply to propaganda but such costs as for travelling etc. against proof) when they comply with certain conditions such as having at least 2000 members, democratic statutes of their association (Greenpeace is therefore no longer supported). Other countries have liaison officers or offices for certain groups of the population or regions (e. g. Indian reservations) that are affected by radiation protection measures.
Klaus Martignoni
Department Radiation Protection and Health

Preparing Study on Measurements of Carbon-14 in Plant Samples from the Vicinity of Nuclear Facilities

Besides the natural occurrence of carbon-14 (C-14) this radionuclide is also discharged into the environment by nuclear facilities or nuclear power plants, respectively. For example, the order of magnitude of discharge via exhaust air fluctuated in 2001 between 6.6×10^9 and 1.5×10^{12} Bq (C-14). Altogether, the discharge of radioactive substance via exhaust air led in 2001 to an estimated radiation exposure of 5 μSv for adults or 9 μSv for infants, respectively. The share of carbon-14 in this radiation exposure is mostly more than 90 %. The present natural content of carbon-14 in foliage plants is about 0.3 Bq/g. It is assumed that in case of an enhancement of the carbon-14 content due to emissions from nuclear facilities this enhancement can be detected near the emission point (most unfavourable affected place) of the nuclear facilities´ plume.

The running measuring programme is based on the representative registration of natural cover samples (annual plants, e. g. grass, crop) at the emission point of the plume at three selected nuclear power plant sites, in order to gain a survey of the activity content in these media. With a comparison with the total content of naturally occurring carbon-14 at a reference site as well as a C-14 standard it is to be clarified if an indication of an enhanced carbon-14 content in plant samples can be derived due to the radioactive discharge of carbon-14 from nuclear power plants.
Frank Bruchertseifer
Department Radiation Protection and the Environment

State of Development of European Research Projects in the Area "Protection of the Environment

The "FASSET" (Framework for Assessment of Environmental Impact) research project carried out with participation of BfS within the framework of the 5th EU Framework programme has elaborated rough goals and basic concepts for the protection of the environment from impacts due to ionising radiation. During the term of the research project a characterisation of the European Ecosystems was performed, potential reference organisms and key nuclides were identified, a rough dose estimation was carried out in model systems, and a data base was created for known and relevant dose-effect interrelations in ecosystems on the basis of the available scientific publications.

Within the 6th EU framework programme a following research project with the name "ERICA" (Environmental Risks from Ionising Contaminants: Assessment and Management) is currently running. The goals and basic concepts for the protection of the environment from the impacts of ionising radiation of the "FASSET" research project are to be put in more concrete terms for application in practice. The focus will be on risk assessment and the management for the protection of the environment from the impacts of ionising radiation.

The "ERICA" research project is subdivided into four work groups. One work group is to develop practical evaluation methods, another is to elaborate the basics of "risk characterisation", and a third is to verify the created basics in real ecosystems. The new thing in this research project is that another work group competent for the elaboration of recommendations and guidelines for the management of environmental protection involves – besides stakeholder groups (such as associations and environmental organisations) – in particular national technical authorities as well as so-called "end users". This is to ensure the development of the basics for marginal conditions that can be used in practice and be implemented. Also BfS actively participates as end user in this project. The "ERICA" project started in March 2004 and will be concluded after three years.
Frank Bruchertseifer
Department Radiation Protection and the Environment

BfS Annual Report 2003 Introduced

On 24th June 2004, the Federal Minister for the Environment, Nature Conservation and Nuclear Safety Jürgen Trittin and BfS President Wolfram König introduced the BfS annual report 2003 in Berlin. On 68 pages the annual report contains selected contributions from the BfS fields of responsibility, in addition to current figures and facts about BfS.

This year the focus of the report is on the interim storage of spent fuel elements and on better radiation protection in the medical field. Federal Environmental Minister Trittin at the press conference: "With BfS swiftly granting all licences for the twelve decentralised interim storage facilities at the nuclear power plant sites applied for, the prerequisites are fulfilled to drastically reduce transports of nuclear waste. The concept of the Federal Government for decentralised interim storage of spent fuel elements has already shown effect at this stage."

Better radiation protection in the medical field is the second emphasis in the BfS annual report. BfS President Wolfram König pointed out that radiation exposure of the German population for medical reasons were further on a high international level. Compared with the year 1996 the average radiation exposure had been increased by about 0.2 mSv to 1.8 mSv. This increase – so König – were to be a result of the increased application of dose-intensive computer tomography (CT).

Note: The complete BfS annual report 2003 can be downloaded from the Internet (http://www.bfs.de/bfs/druck/jahresberichte/jb2003.html) or can be ordered free of charge at the Bundesamt für Strahlenschutz, Postfach 10 01 49, 38226 Salzgitter, e-mail: info@bfs.de, fax: 01888/333-1150.

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Task Planning and Controlling