COMMENTS TO THE GERMAN SOCIETY'S FOR RADIATION PROTECTION (GESELLSCHAFT FÜR STRAHLENSCHUTZ) PROPOSED PRINCIPLES FOR RADIATION PROTECTION

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INTRODUCTION

The German Society for Radiation Protection (in German Gesellschaft für Strahlenschutz) is a separate society for radiation protection in Germany in addition to the leading society named Association of German and Swiss Radiation Protection Specialists (in German Fachverband für Strahlenschutz). The Society is an international professional society. There are several hundreds members of the German Society for Radiation Protection. The German Society for Radiation Protection is not a member of IRPA (the International Radiation Protection Society). The IRPA member is the Association of German and Swiss Radiation Protection Specialists.

According to information given on the website of the Society for Radiation Protection (www.gfstrahlenschutz.de) the Society was founded in 1990 because in the opinion of the founding members the older professional societies and associations have not adequately considered and implemented the present knowledge of radiation risks and radiation protection. In accordance with its statutes the society pursues besides other aims the best possible protection of humans and the environment from the detrimental action of ionising and non-ionising radiation. The dealing with ionising and non-ionising radiation can according to the Society only be justified on the basis of biological and medical state of the art knowledge.

PRESENT ICRP RECOMMENDATIONS

ICRP has in its 1990 Recommendations (1) given a conceptual framework of radiological protection.. The ICRP Recommendations are based on science and value judgements and gives according to the present author a balanced view in between the "Environmental hypochondriacs" and the "Industrial Cannibals"; for a definition of these categories see the article on Risk and Ethics by Shrader-Frechette (2). The author and Shrader-Frechette have recently defended the ICRP principles of radiation protection in radiation protection (3).

PROPOSED NEW GUIDELINES FOR RADIATION PROTECTION

The German Society for Radiation Protection has formulated new guidelines for radiation protection.

The guidelines are summarised in eight principles and are including comments to each principle (see the English part of the website - www.gfstrahlenschutz.de). To each guideline the author has included his comments**:**

1. Minimization of radiation exposure with great emphasis
The requirement to minimise radiation exposure should be adjusted exclusively to the health risk and the obligation to take protection measures according to state-of-the-art science and technology. Internal and economic factors should not play a significant role. Violations of the minimising requirement should be regarded as contrary to the regulations and made a punishable offence.

Comments by the author: Today ICRP´s ALARA principle is a cornerstone in radiation protection. The ALARA says doses should be kept as low as reasonably achievable, economic and social factors being taken into account. Already today violations against ALARA are punishable. The author believe the economic and social factors are relevant in the ALARA process and must play a significant role.

2. Faster adaptation of radiation protection legislation to the start-of-the-art scientific knowledge
Recent scientific findings about risk factors for detrimental radiation effects should within 2 to 3 years be mandated to be reflected in updates in the radiation protection regulations.

Comments by the author: The recommendations of ICRP are widely used by international agencies and national regulatory agencies. ICRP avoids making frequent changes in its principal recommendations (latest recommendations were issued in 1990 and the previous ones in 1977). If any fundamental change of the risk from ionising radiation should appear the author believes ICRP will issue a new recommendation as soon as possible. ICRP is now working on an update of its 1990 recommendations.

3. Expert commissions regulating have to be disentangled from conflicting interests opposing stricter regulation
The procedure for selecting consultants to radiation commissions by the responsible ministry has to be changed. The present procedure leads to domination by the interests of the nuclear industry. To assure a broader spectrum of evaluation of the current state of knowledge and a representation of the interests of affected populations, independent experts should be appointed upon nomination by environmental groups and the unions.

Comments by the author: Today members of the German Society for Radiation Protection are represented in the German Federal Government's Commission for Radiation Protection called in German "Strahlenschutzkommission" (www.ssk.de). In Sweden there are representatives of unions and political parties in the Board of the Swedish Radiation Authority.

4. Drastic reduction of the dose limits for occupationally exposed persons and of permissible exposure for populations at large
With a continuing trend of increasing risks per unit dose found in more recent epidemiological studies of populations exposed to low doses of ionizing radiation, the originally intended level of protection for workers and the public was not maintained by unrevised dose limits. This applies to exposure limits for the public at large and to

occupational standards. However, when adjustments to standards are made, they should not only be based on the revised analyses from the Hiroshima and Nagasaki life-span study, but also on consistent patterns of findings of increased health detriment among populations exposed to low levels of radioactive fallout from the Chernobyl explosion and from weapons tests. The old equivalent dose concept needs to be replaced by a new concept, which will differentiate between various kinds of exposure conditions. Current radiation standards have grossly underestimated the potential genetic consequences of radiation exposure, and have completely neglected observed teratogenic and non-carcinogenic consequences.

Professor Wolfgang Köhnlein, president of the Society 1995-1999 has suggested that the actual risks of low-level ionising radiation are more than 20 times the official ones in a paper published on a homepage (http://www.foe.arc.net.au/kohnlein/kohnpaper.html).

Comments by the author: The biological effects of ionising radiation were summarized by ICRP in Annex B of ICRP Publication 60 (1). The effects of low doses of ionising radiation were then in 1997 studied at an international conference in Seville, Spain (4) confirming estimates of the detriment such as those of ICRP 60.

From the study of USA nuclear shipyard workers Professor John D Boice, Jr summarizes: Radiation risks that are about five to ten times higher than currently assumed can be excluded (5). The UNSCEAR 2000 Report (6) does not confirm any increased health detriment among populations exposed to low levels of radioactive fallout from the Chernobyl explosion. The UNSCEAR 2001 Report (7) does not confirm the view that genetic effects have been underestimated. The recent NCRP Report 136 (8) supports the present LNT hypothesis.

The author believes there is overwhelming evidence for LNT and for the ICRP 60 risk estimate today. The author thus concludes the German Society is exaggerating the radiation risk and sees no scientific reason for a drastic reduction of the dose limits for occupationally exposed persons and of the permissible exposure for populations at large.

5. Limitation of the collective dose

This recommendation results from the fact that for stochastic detriment the collective dose is an appropriate and tested measure for the expected number of excess cases of disease (morbidity) and deaths (mortality) in an exposed population. A strict limitation of the collective dose must be introduced into the radiation protection regulations.

Comments by the author: The author agrees to the collective dose is as an appropriate measure of detriment in a population and refers to the recent note by Bo Lindell (9), where he argues: “The ICRP continues to accept the assumption of the linear non-threshold dose-response (LNT) as the most likely one. In that case, basic logic as well as widely accepted ethics requires that the full collective dose be used for detriment assessments and in the procedures for optimisation of radiation protection”. The limitation of the collective dose from a source is thus a useful concept.

6. Special program targeted at minimizing medical diagnostic radiation exposure
Besides radon exposure in buildings, medical diagnostic radiation exposure is the main contributor to the radiation load of the average German citizen. Other European countries like England and Belgium show that the collective dose thus produced can be reduced by almost half without a loss of diagnostic quality.

Comments by the author: No objections.

7. Classification of airline pilots and cabin crew as radiation exposed personnel
Cosmic radiation levels and their inherent contribution of neutrons lead to substantial radiation exposure of flight personnel, especially during intercontinental flights. That exposure is on the average 2 to 4 times higher than that for workers at nuclear power plants.

Comments by the author: According to article 42 of Council Directive 96/29/Euratom (10) shall in each Member State arrangements be made for undertakings operating aircraft to take account of exposure to cosmic radiation of aircrew that are liable to be subject to exposure to more than 1 mSv per year. The undertakings shall take appropriate measures, in particular: to assess the exposure of the crew concerned, to take into account the assessed exposure when organizing working schedules with a view to reducing the doses of highly exposed aircrew, to inform the workers concerned of the health risks their work involves, to apply Article 10 (Special protection during pregnancy). Airline pilots and cabin crew are not "exposed workers" as defined in article 1 of the above-mentioned directive of Euratom but covered by the rules in articles 40-42. ICRP has in its publication 75 (11) recommended that the exposure of jet crew should be treated as occupational exposure. Germany has included protection of air personnel in paragraph 103 in the radiation protection regulation (in German the "Strahlenschutzverordnung") ruling since 1 July 2002 (12). The dose limit is 20 mSv for flying personnel. The limit for an unborn child, which is exposed via her mother working in aircrafts, is 1 mSv.

8. Minimisation of man-made increases in unavoidable background radiation
A control of radon exposure in buildings, at health resorts and in underground installations and of exposure during long-haul flights has to be introduced. In addition, the radioactivity content of mineral water and drinking water has to be declared and an upper limit has to be established.

Comments by the author: I agree and note that such measures have already been introduced in many countries.

CONCLUSIONS
Several of the eight proposed principles of the German Society for Radiation Protection the author finds acceptable. The German Society's for Radiation Protection new guidelines for radiation protection are, however, according to the author's view exaggerating the radiation risk. In view of the current status of knowledge, the author believes that the LNT assumption, the radiation risk estimates and the current ICRP system of protection given in ICRP Publication 60 be well justified for radiation protection purposes today.

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