QUESTIONNAIRE TO THE REGULATORY BODY MEETING
TURKU 2008

INVITATION

In conjunction with the 2008 ISOE Symposium, 25-27 June 2008, we are preparing a 3rd Senior Regulatory Body representatives meeting, to be held 24 June 2008 in Turku (Finland). We hope to encourage your participation in this meeting which follows on from the very successful Regulatory Body representatives meetings in 2004 (Lyon) and 2006 (Essen). The purpose of the meeting is to provide a forum for open exchange and discussion within specialised regulatory audience concerned with occupational radiation protection. For this occasion, the contamination management in NPPs from the occupational point of view has been chosen as the main topic.

OBJECTIVES OF THE MEETING

The main objectives of the meeting are:

- To meet with regulators from other organisations
- To exchange information regarding regulatory control on **contamination management in NPPs from the occupational radiation protection perspective** focusing on
  - controlled and supervised areas inside NPP
  - occupational exposure control and assessment due to both external and internal contamination.

  This meeting will not deal with aspects of contamination management other than those related to occupational radiation protection.
- To help to improve national regulatory effectiveness on occupational radiation protection by comparing national reality versus international context

AGENDA

- Introduction of the different representatives
- Brief presentation on national requirements on contamination management
- Discussion
- Conclusions

OBJECTIVES OF THE QUESTIONNAIRE

In order to introduce the Regulatory Body representatives meeting it is expected to draw an overview of regulatory control on contamination management in NPPs from an occupational perspective in the different ISOE member countries with their similarities and differences. Therefore we would like you to answer, briefly, to the following questionnaire to stimulate information exchange and discussions. Only one response per country is necessary.

Please do not go into the details, just describe a few “objective data”.

Even in case you will not be able to attend the meeting the information you can provide is precious. If you agree, questionnaires filled in by national authorities will be sent to the regulatory contacts participating in ISOE.

Yes, I agree X
The information can be used only in the RB-meeting

COUNTRY AND REPRESENTATIVE IDENTIFICATION

- **Country**: **Germany**
- **Name of the Regulatory Body: State competent authority in each Federal State with operating NPP; Federal Level: Federal Minister of Environment, Nature Conservation and Reactor Safety (BMU) as Supervisory Authority over States**
- **Name and post of the person(s) who fill in the questionnaire: W. Pfeffer, Gesellschaft für Reaktorsicherheit (GRS) mbH, (Consultant to BMU)**

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- **Legal framework on contamination control**

  - Does your legal framework have requirements on radioactive contamination control? If so, give a short description of the content of references.
    Radiation Protection Ordinance (RPO), § 44 with Annex 3 Table 1 prescribes contamination levels for controlled area, surveilled area (and public area), above which decontamination needs to be applied. For controlled area: if decontamination is not possible, other means to protect workers have to be applied.
    In addition, the technical regulation KTA 1301.2 requires measures to control contaminations and to avoid the volatile dissemination of radioactive material. e. g. by installation of contamination zones or by defining levels, that require immediate decontamination if exceeded. Although not part of the legally binding regulatory system the technical regulations KTA are applied by all German nuclear power plants as they are legally based and represent current state of the art of technology on technical nuclear issues (for more details on the regulatory system, please refer to the recent German report prepared for the 4th review meeting on the convention on nuclear safety in April 2008).
  - Does your legislation specify reference levels for contamination?
    Yes, nuclide specific reference levels are specified in Annex 3 Table 1 of the RPO (E.g. for Co 60: Controlled area: 100 Bq/cm² , surveilled area 10 Bq/cm², (public area: 1 Bq/cm²)

- **Reference contamination levels on official documents**

  - Does some official document of the licensee specify levels for contamination?
    Licensee specific levels mentioned above are laid down in the radiation protection manual, which is part of the operation manual. The operation manual is an official document, which is subject to the competent authority's supervision and authorization.
  - If so specify the document.
    Operating manual..
  - Are the reference levels for contamination in NPP the same for all NPPs in your country?
    Yes, as defined above.

- **Contamination control in controlled or supervised areas in NPPs**.

  - How many controlled area categories could exist on NPP site? "Controlled" area?
    Based on § 68 RPO: 5 areas: Restricted area (Doserate > 3 mSv/h), Controlled area: (Dose > 6mSv/a), Surveillance area (Dose > 1 mSv/a) Public area (Dose < 1 mSv; normally outside utility's fence), contamination area (as an area usually within the controlled area for which the contamination limits are mentioned above have been exceeded).

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- What are the maximum contamination levels allowed in the different categories of controlled areas of NPPs for different categories of radionuclides/ types of emissions? If levels are specific for each site, please give an order of magnitude of the range covered for the different reference levels (Registration, Investigation and Intervention).
  For Public area the radionuclide specific levels of RPO (see above) have to be met, for surveiiled area levels are a factor of 10, for controlled area a factor of 100 higher (no explicit numbers for restricted area)
  (levels are not "allowed", but have to be kept ALARA below the levels set by RPO)
- What are the basic technical requirements in NPP to control spread of contamination? Which of them are specified by legal or approved documents and on which the licensee may decide in his own responsibility?
  Design: Air-flow-control by pressure differences, in case suction between double gaskets (based on KTA 1301.1), in general: systems to monitor the air borne radioactivity inside a NPP are required to early detect sources for contaminations (based on KTA 1502.1)
  during work: special ventilation, tents, shoe zones, decontamination activities (based e.g. on KTA1301.2), further general requirements defined in KTA 3604
- Does your legislation or approved documents include requirements about the monitoring program? Which document? What kind of requirements (periodicity, certificated instruments, exclusive performed by RP-personal with special education and training, averaging surface (volume, duration), registration and reporting)?
  KTA 1301.2 gives some orientation, but most of the monitoring Program is left to the responsible RP-manager.
  Documentation laid down in KTA 1301.2
  Averaging surface prescribed by RPO (300 cm²)
  More technical orientation e.g. for wipe tests in DIN/ISO, further requirement for measurement of personal monitoring of contamination in "SSK-Empfehlung SSK zu Kontaminationskontrolle beim Verlassen eines Kontrollbereichs" (05.06.2002)

❑ **Contamination control of personal protective equipment.**

- Does your legislation or approved documents (company instructions) include requirements about contamination of protective personal equipment? Which document?
  Not directly
- Which requirements?
- What are the reference levels for contamination of protective personal equipment?
- Is it allowed to enter controlled areas with street clothes?
  It is not forbidden on legal basis but not accepted on corporate level, state of practice is:
  Not allowed for workers, in some plants exceptions are made for visitors, but at least protective overshoes will be applied
- Is it allowed to wear protective clothes outside controlled areas on the NPP site?
  Normally not, but for special tasks (e.g. handling of fuel flasks) this may be possible, but will afford special procedures (access from and to temporarily installed controlled area, contamination control,…)

❑ **Contamination control of reusable working materials at the exit of controlled areas.**

- Does your legislation or approved documents (company instructions) include requirements about the levels of contamination allowed for reusable working material at the exit of controlled areas? Which document? If affirmative, provide reference levels:
  Levels are laid down in the RPO. For reusable working material § 44 RPO (including Annex 3 Table 1) holds and levels of public area have to be applied (e.g. 1 Bq/cm² for Co60, 0,1 Bq/cm² for Alpha-emitters)

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- **Estimation of effective dose from internal contamination**

  - Does your legislation or approved documents include requirements about internal contamination of occupational exposed persons? Which document?
    RPO contains a requirement on when to perform internal dosimetry
    Guideline for the calculation of internal contamination (Richtlinie für die physikalische Strahlenschutzkontrolle zur Ermittlung der Körperdosen, Teil 2, Interne Exposition), which contains the concept of supervision, calculation procedures, and a detailed set of parameters including e.g. retentions factors
  - Which requirements?
    RPO: requirement on when to perform a dosimetry on internal exposure as part of the official / statutory dosimetry
    Guideline: Detailed prescriptions and data bases to calculate the internal exposure from internal contamination
  - What are the methods and criteria for assessment of internal doses?
    Too complex for short description, please refer to Guideline
  - What are the reference levels for internal doses (please give examples for typical nuclides, allowed averaging volume or surface or …)?
    Based on RPO: Basically all nuclides have to be considered as soon as a level of 1 mSv/a could be achieved
    No nuclide specific reference levels defined, as internal dose contributes directly to the effective dose (and the general dose limits for effective dose and organ doses of the RPO
    If an effective committed dose of 1 mSv in a year is reached a more detailed follow up procedure is required, leading at 6 mSv (or an organ dose is > 30 % of the limit for this organ) to individual and realistic dose calculations (compared to the basic calculation concept).

- **Estimation of effective dose from external contamination. Skin doses**

  - Does your legislation or approved documents (company instructions) include requirements about contamination of skin? Which document?
    In RPO, dose limits for the skin are prescribed and the calculation procedure to determine the skin dose is laid down in the Guideline for the calculation of iexternal contamination (Richtlinie für die physikalische Strahlenschutzkontrolle zur Ermittlung der Körperdosen, Teil 1, Externe Exposition)
  - Which requirements?
    Orientation levels for skin contamination may be taken from the RPO-contamination levels as prescribed in § 44 RPO, detailed to nuclides in Annex 3 Table 1. Further detailed guidance and requirements by “SSK-Empfehlung Maßnahmen nach Kontamination der Haut mit radioaktiven Stoffen” (22.09.1989)
  - What is the triggering level of contamination to carry out an assessment of skin dose?
    At a level of 10 Bq/cm² for NPP nuclides more detailed follow up, about 50 Bq/cm² for Co-60 skin dose calculation (SSK-Empfehlung)
  - What is the maximum level allowed for personal contamination at the exit of the controlled area?
    the RPO-contamination levels as prescribed in § 44 RPO, detailed to nuclides in Annex 3 Table 1, but if contamination success proves that the contamination is fixed or skin may be hurt by further decontamination measures, decontamination may be stopped. it will not be necessary to remove the skin (except of excessive and dangerous fixed contamination)
  - How contamination is measured in 1 cm^2? <u>For discussion</u> in plenary session.
    The averaging area is 1 cm², irrespective of the size of the contaminated/exposed area, but in reality measurement automatically with 100 cm² (frisker) or some 10 cm² for manual measurement by health physics service by means of probe.

- **External risk versus internal risk perception**
  - External risk versus internal risk perception and practice in your country? How and why do you weight the risks different? What is the practice in your country? What are the experiences? For discussion.
    From the formal point of view, external and internal risk are weighted equally, as there are no weighting factors.
    In practice (and due to personal perception of the workers [and the authorities]) internal exposure has a much higher consideration. This results in an increased precautionary application of incorporation protection (e. g. masks). Nevertheless, statutory dosimetry on internal exposure is in general not required for the NPPs as the measures are appropriate to keep the effective committed dose below 1 mSv/a – but, the NPPs perform internal dosimetry by quick counter measurements and regularly by measurements for their own staff to check and to demonstrate, that no relevant incorporations have occurred.

Do you have some additional topics, which you would like to discuss during the RB meeting:

None.