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 ☒
The information can be used only in the RB-meeting

COUNTRY AND REPRESENTATIVE IDENTIFICATION

- **Country**: **Switzerland**
- **Name of the Regulatory Body: Swiss Federal Nuclear Safety Inspectorate (HSK)**
- **Name and post of the person(s) who fill in the questionnaire: S.G. Jahn, Section Occupational RP**

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. Yes
    Radiation Protection Ordinance Art 1: This Ordinance is available to materials which are contaminated above Reference Levels CS and LE, specified for each nuclide in the annex in Bq/cm2 (according to an effective dose of 0,5 mSv by exposure of skin in one year (8760 h) or daily ingestion of 10 cm2, measured as a mean of 100 cm2) or Bq/kg (according to an effective dose of 10 microSv by ingestion 1 kg or external exposure)
    Radiation Protection Ordinance Art 43: The licensee has to control the external and internal exposure of occupational exposed persons
    Radiation Protection Ordinance Art 49: The Personal Dosimetry Laboratory has to report any committed effective dose > 2mSv during a monitoring period from internal exposure
    Radiation Protection Ordinance Art 58: The use of radioactivity is only allowed in controlled areas.
    Radiation Protection Ordinance Art 67: Sealed radioactive sources have to be free of contamination.
    Radiation Protection Ordinance Art 71: The max. contamination of skin, clothes, materials and surfaces outside of controlled areas have to be lower than the Reference Levels CS, which are specified for each nuclide in the annex in Bq/cm2 (according to an effective dose of 0,5 mSv by exposure of skin in one year (8760 h) or daily ingestion of 10 cm2, measured as a mean of 100 cm2)
    Radiation Protection Ordinance Art 102: The concentration of radioactivity in air outside of the controlled area has to be lower 1/300 of the Reference level CA (as measured by a mean during one year), specified for each nuclide in the annex in Bq/m3 (according to 20 mSv effective dose breathing 1 CA for 2000 h)
    Radiation Protection Ordinance Art 110: The concentration of Radon at working place have to be lower than 3000 Bq/m3. Internal dose from Radon-contamination > 1000 Bq/m3 have to be recorded.
    HSK-Guideline R-07: Supervisied areas and controlled zones in nuclear facilities: The licensee has to classify each room in the controlled area in different zone types (0, I, II, III, IV), depending on the contamination levels, which may occure during normal operation. For each zone type requirements on ventilation (sealing of building), surface coating, monitoring on the exit are given.
    zone type 0: contamination is exclude, only external exposure may be possible
    zone type I: surface contamination < 1 CS, air contamination < 1/10 CA
    zone type II: surface contamination < 10 CS, air contamination < 1/10 CA
    zone type III: surface contamination < 100 CS, air contamination < 1 CA
    zone type IV: surface contamination > 100 CS, air contamination > 1 CA
  - Does your legislation specify reference levels for contamination?
    Yes see above Art 1 and 102.

- **Reference contamination levels on official documents**

  - Does some official document of the licensee specify levels for contamination? No
  - If so specify the document.

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- Are the reference levels for contamination in NPP the same for all NPPs in your country? YES

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

- How many controlled area categories could exist on NPP site? 5
- 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).
  See above.
  H-3 (HTO): 1 CS = 1000 Bq/cm2, 1 CA = 5 E+5 Bq/m3, 1 LE = 1 E+8 Bq/kg
  Co-60: 1 CS = 3 Bq/cm2, 1 CA = 500 Bq/m3, 1 LE = 1000 Bq/kg
  I-131 1 CS = 3 Bq/cm2, 1 CA = 800 Bq/m3, 1 LE = 500 Bq/kg
  Cs-137: 1 CS = 3 Bq/cm2, 1 CA = 1000 Bq/m3, 1 LE = 800 Bq/kg
  U-238: 1 CS = 1 Bq/cm2, 1 CA = 10 Bq/m3, 1 LE = 200 Bq/kg
  Pu-239: 1 CS = 0,3 Bq/cm2, 1 CA = 0,3 Bq/m3, 1 LE = 40 Bq/kg
  Am-241: 1 CS = 0,3 Bq/cm2, 1 CA = 0,3 Bq/m3, 1 LE = 50 Bq/kg
- 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?
  See above Guideline R-07, the licensee decides in his own responsibility for example the protective clothes, the monitoring inside the controlled zone
- 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)?
  Requirements about the contamination control in the controlled zones are not in the legislation. They are

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

- Does your legislation or approved documents (company instructions) include requirements about contamination of protective personal equipment? Which document? Which requirements? Only indirectly defined by Guideline R-07, sometimes defined in in-company regulations.
- What are the reference levels for contamination of protective personal equipment? 1 CS
- Is it allowed to enter controlled areas with street clothes? Yes in controlled zone type 0, sometimes in controlled zone type I with a smock beyond
- Is it allowed to wear protective clothes outside controlled areas on the NPP site? No, excluding underclothes on the facility side (supervised area).

❑ **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:
  The HSK-Guideline R-13 includes requirements on the clearance of materials. Criteria: < 1CS, < 1LE, < 0,1 microSv/h in 10 cm distance from the surface, instruments have to be calibrated, persons have to have an education and training recognised by the authority, measured values have to be documented, protocol have to be reported to authority if material > 1 m3 or > 1 Mg

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

- Does your legislation or approved documents include requirements about internal contamination of occupational exposed persons? Which document?

Radiation Protection Ordinance Art 43: The licensee has to control the external and internal exposure of occupational exposed persons
Radiation Protection Ordinance Art 49: The Personal Dosimetry Laboratory has to report any committed effective dose > 2mSv during a monitoring period from internal exposure
Ordinance about Personal Dosimetry Art. 8: The Personal Dosimetry Laboratory has to implement and apply a quality assurance programm
Ordinance about Personal Dosimetry Art. 32: Internal contamination has to be monitored by measuring activity of the body or of excrement.
Ordinance about Personal Dosimetry Art. 33: Internal contamination monitoring has to be done by an easy to use method by the lisencee himself (triage monitoring) and by an advanced apparatuses of an recognised institution (incorporation monitoring).
Ordinance about Personal Dosimetry Art. 34: Surveillance intervals are nuclide specific and listed in the Annex.
Ordinance about Personal Dosimetry Art. 39: Requirements for the recognition of incorporation monitoring laboratories as precision of measurements and periodical calibration
Ordinance about Personal Dosimetry Art. 40: Calculation method for determining internal effective dose from activity measured in the body or excrement. With nuclide specific parameters in the Annex

- Which requirements? See above
- What are the methods and criteria for assessment of internal doses? See above
- What are the reference levels for internal doses (please give examples for typical nuclides, allowed averaging volume or surface or …)? See above

❑ **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? Radiation Protection Ordinance Art 71:
- Which requirements? 1 CS
- What is the triggering level of contamination to carry out an assessment of skin dose? If > 100 CS or fixed contamination > 1CS (HSK-Guideline R-15/R25)
- What is the maximum level allowed for personal contamination at the exit of the controlled area? 1 CS
- How contamination is measured in 1 cm^2? For discussion in plenary session. Averaging 100 cm2

❑ **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.
  In swiss NPP the protection on incorporation is much more relevant than the protection against external exposure. External exposure is monitored continuing by electronic dosemeter therefore a reaction on situations with high dose rates is possible. Incorporation is difficult to monitor and therefore the risk to exceed the dose limits is higher. In Swiss NPP incorporation is very seldom (one person in 5 years in average). No one was registered with a dose > 20 mSv in the last 15 years.

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