

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:** Slovenia
- ❑ **Name of the Regulatory Body:** Ministry of Health - Slovenian Radiation Protection Administration (SRPA), Ministry of Environment and Spatial Planning – Slovenian Nuclear Safety Administration (SNSA)
- ❑ **Name and post of the person(s) who fill in the questionnaire:** Nina Jug, undersecretary - SRPA, Helena Janžekovič, senior inspector counsellor - SNSA

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.

The operator is obligated to carry out radiation protection measures including measurements of contamination and measures to prevent the contamination spreading. Legislation defines the limits for radioactive contamination:

surface	alpha (Bq/100 cm ²)	beta & gamma (Bq/100 cm ²)	type of contamination
skin and exposed mucous membrane for members of the public	4	40	fixed (there should be no removable contamination)
skin and exposed mucous membrane for radiation workers	8	80	fixed contamination
controlled areas & exterior surfaces of protective aprons	400	4000	removable contamination
controlled areas & exterior surfaces of protective aprons	40	400	fixed contamination
inaccessible surfaces in controlled areas	400.000	4.000.000	fixed & removable contamination

The operator is obligated to prepare "The Control Measurements Programme" which is a part of a more comprehensive document "Evaluation of the Protection of Exposed Workers against Radiation". The evaluation gives a preliminary estimation of the nature and the extent of radiation risks for exposed workers, and includes an optimisation plan for protection against ionising radiation in all working conditions in practices involving radiation. The evaluation should be confirmed by SRPA. The confirmed evaluation is a licensing condition. Such document is also required for activities of an outside worker in the licensing procedure of such activities.

- Does your legislation specify reference levels for contamination?
Legislation specifies the limits as described above. The NPP can specify its own reference levels (should be stricter than legislative limits).

❑ **Reference contamination levels on official documents**

- Does some official document of the licensee specify levels for contamination?
- If so specify the document.

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

The Radiation Protection Manual (RPM - NPP internal document) specifies limits of radioactive contamination in agreement with the legislative requirements described above (for personal contamination of radiation workers the RPM is stricter than legislation - 4 Bq/100 cm² (alpha) and 40 Bq/100 cm² (beta and gamma). Values apply for fixed contamination.

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

Yes (there is only one NPP in Slovenia, i.e. Krško NPP).

□ Contamination control in controlled or supervised areas in NPPs.

- How many controlled area categories could exist on NPP site?
- 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).

Legislation does not specify categories within the control areas. According to the RPM there are three types of areas with regard to radioactive contamination (beta & gamma):

green (<400 Bq/100 cm²)

yellow (400 - 4000 Bq/100 cm²)

red (> 4000 Bq/100 cm²)

In addition, areas with dose rates >10mSv/h are restricted. Access to such areas is a subject of strict control and supervision by the RP unit.

- 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?

Legislation requires (if appropriate):

- protective clothing and personal protection equipment, measuring equipment, storage facilities - at the control area entry points
- contamination measurement equipment for skin, clothes and footwear, contamination and activation measurement equipment for tools and other objects leaving the control area, personal decontamination facilities, storage facilities - at the control area exit points.

Where active particles could occur additional measures should be taken to limit the area and prevent the spreading.

The RPM and other written procedures of NPP define in more detail rules for entering and exiting the control areas, personal contamination control, contamination control of personal protective clothing and equipment, contamination control of tools and other objects leaving the control area, other technical measures at exit points (sticking step foils, etc.), measures to prevent spread of active particles ...

- 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)?

As described above the operator is obliged to elaborate "The Control Measurements Programme" which is confirmed by SRPA. In practice details are specified in the RPM and other written procedures and enclosed to the programme.

□ 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?
- What are the reference levels for contamination of protective personal equipment?

The RPM requires that cotton overalls should be measured before washing. Detection levels (beta & gamma) are set to 400 Bq. If contamination is detected, the overall should be decontaminated prior washing. Overalls contaminated with contamination above 4000 Bq are treated as radioactive waste (values refer to beta & gamma contamination). Other protective equipment leaving the control area should be measured as well.

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- Is it allowed to enter controlled areas with street clothes? **No.**
- Is it allowed to wear protective clothes outside controlled areas on the NPP site? **No.**

❑ **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:
For tools and equipment in general use (i.e. also outside the control area) limits 4 Bq/100 cm² (alpha) and 40 Bq/100 cm² (beta and gamma) are specified in the RPM. Values apply for fixed contamination. There should be no (detectable) removable contamination.

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

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

Legislation requires internal dose assessment if there is a possibility that radiation workers could be internally contaminated. Internal dose should be assessed by appropriate calculation methods on the basis of air contamination measurements, measurements of whole body (specific organ) activity, activity of biological samples or personal contamination measurement.

the RPM and other NPP documents specify in more detail internal contamination measurements procedures like action levels of air contamination, frequency and criteria of whole body activity measurements (once per year for workers entering control areas, before and after work activity for outside workers, every three months for specific workers, in cases of face or snivel contamination, if worker was exposed to high air contamination, in all other case if there is a reason to suspect that the worker could be internally contaminated), etc.

- What are the methods and criteria for assessment of internal doses?

The bases for internal dose assessment are measurements of whole body activity or activity of biological samples. If such measurements are insufficient the dose can be estimated from air contamination concentration. Later apply also in the case of alpha air contamination.

- What are the reference levels for internal doses (please give examples for typical nuclides, allowed averaging volume or surface or ...)?

The RPM sets the dose constraint due to internal contamination to 0.2 mSv/year. Results of whole body activity measurements which imply the individual internal dose of 0.02 mSv or more (action level for e.g. Co-60 is 690 Bq at the background condition of 400 Bq) should be documented and trends should be followed to define the cause of the contamination. Cases where measurements imply the individual internal dose of 0.2 mSv or more should be investigated, management board of the NPP should be informed and the individual dose should be estimated.

❑ **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?
- Which requirements?

All persons leaving control area should be checked with portal monitors as defined by RPM. Detection levels (beta & gamma) are set to 400 Bq for any body surface contamination, 80 Bq for each hand and 400 Bq a sole. To detect alpha (beta) contamination a hand held surface contamination detector is used with detection level of 4 Bq/100cm² for alpha and 40 Bq/100cm² for beta contamination.

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- What is the triggering level of contamination to carry out an assessment of skin dose? There are general legislative provisions regarding dose assessment on the basis of skin contamination measurements. In practice skin dose is assessed if a worker has been contaminated with an active particle attached to the skin. The NPP has a special procedure for skin dose assessment in such cases. The beta and gamma skin dose factors in a unit $\text{mSvcm}^2 / (\text{kBq h})$ are used for such assessments.

- What is the maximum level allowed for personal contamination at the exit of the controlled area?

4 Bq/100cm² for alpha and 40 Bq/100cm² for beta contamination.

- How contamination is measured in 1 cm²? For discussion in plenary session. In practice it applies to cases where there is a possibility of active particles attached to workers skin. The active particle is located, removed and measured with gamma spectrometry. Skin dose and contamination for 1 cm² are then calculated.

□ 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 general both risks are weighted the same. In practice more attention is paid to the dominant type of exposure. In some cases the dominant contribution to a dose is the internal exposure (e.g. in Žirovski vrh uranium mine (in closure) contribution to the effective dose due to radon inhalation is much higher than external exposure due to gamma radiation. For tourist workers in karst caves only internal contamination due to radon is monitored.)

In Krško NPP the internal dose contribution to the net collective dose is minimal. Since 1999 seven cases of internal contamination were reported with net internal collective dose 0.22 man mSv.

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