

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.

COUNTRY AND REPRESENTATIVE IDENTIFICATION

- ❑ **Country:** Canada
- ❑ **Name of the Regulatory Body:** Canadian Nuclear Safety Commission
- ❑ **Name and post of the person(s) who fill in the questionnaire:** Christina Dodkin, Radiation Protection Division

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 references.

Legislation referenced below may be found at:

<http://www.nuclearsafety.gc.ca/eng/resource/regulations/>

Canada's *Nuclear Safety and Control Act* requires that activities involving nuclear substances be carried out in accordance with a licence. A licence may not be issued unless the applicant will make adequate provision for the health and safety of persons. Regulations made pursuant to the Act prescribe requirements for contamination control.

The General Nuclear Safety and Control Regulations prescribes general obligations for licensees to take all reasonable precautions to control the release of radioactive nuclear substances within the site of the licensed activity and into the environment as a result of the licensed activity (S.12).

Class I nuclear facilities includes nuclear fission or fusion reactors. The Class I Nuclear Facility Regulations requires licence applications for the operation of a Class I nuclear facility to include the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances on the environment and the health and safety of persons (S.6). The regulations also requires licence applications for decommissioning a Class I nuclear facility to include the nature and extent of any radioactive contamination at the nuclear facility (S.7).

The Nuclear Substances and Radiation Devices Regulations requires licence applications for nuclear substances and radiation devices to include methods, procedures and equipment that will be used to limit the spread of radioactive contamination within and from the site of the licensed activity, and to decontaminate any person, site or equipment contaminated as a result of the activity to be licensed and the circumstances in which the decontamination will be carried out (S.3).

- Does your legislation specify reference levels for contamination?

No legislation in Canada prescribes contamination levels for licensed NPPs. Canada's Packaging and Transport of Nuclear Substances Regulations do prescribe levels for non-fixed contamination on packages during transport to those in paragraphs 508 to 509 of the *IAEA Regulations for the Safe Transport of Radioactive Material No. TS-R-1. (ST-1, Revised)*.

S. 24 of Canada's General Nuclear Safety and Control Regulations prescribes a limit of contamination for a place or vehicle where no licensed activity is being carried on as any quantity of a radioactive nuclear substance that may increase a person's effective dose by 1 mSv or more per year in excess of the background radiation for the place or vehicle.

❑ **Reference contamination levels on official documents**

- Does some official document of the licensee specify levels for contamination? If so specify the document.
- Are the reference levels for contamination in NPP the same for all NPPs in your country?

NPP licensees are required by Canada's Radiation Protection Regulations to develop and implement a radiation protection program, to include polices, principles and requirements, including those for contamination control and contamination control limits, which are reviewed and approved by the CNSC. These documents are typically referenced in NPP licences and the licensee must operate the NPP as described in these documents. Contamination control levels vary facility to facility.

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

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

NPPs in Canada have typically defined the following zoned areas: zone 1, zone 2, zone 3, and the unzoned/exclusion zone areas.

- 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).

Unzoned or exclusion zones are areas expected to be free from radioactive contamination. Zone 1 is a clean area inside the zoned area, considered as equivalent to the public domain. Zone 2 is an area inside the zoned area that is normally free of contamination but may be subject to cross-contamination due to the movement of personnel and equipment from contaminated areas. Zone 3 is an area inside the zoned area that contains systems and equipment that may be sources of radiation or contamination. Rubber areas are constructed within a zone to segregate work where there is a reasonable probability of loose contamination to be present or created. Contamination control levels vary facility to facility.

- 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
- 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)?

To answer both questions, and as previously mentioned, NPP licensees develop instructions defining radiation protection polices, principles and requirements, including those for contamination control limits and contamination control measures (i.e. methods, policies and procedures, frequency of monitoring, methods of monitoring, etc.) which are reviewed and approved by the CNSC.

❑ **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?

NPP licensees develop a radiation protection program which defines radiation protection polices, principles and requirements, including those for contamination control and contamination control limits for personnel and personal protective equipment. The program is subsequently reviewed and approved by the CNSC, and referenced in the NPP licence, thereby obliging the licensee to operate in accordance with the program document. Contamination control levels vary facility to facility.

- Is it allowed to enter controlled areas with street clothes?
- Is it allowed to wear protective clothes outside controlled areas on the NPP site?

Controlled areas may be entered wearing street clothing if no radiation work is being performed. Transition between zones is controlled and includes requirements for personal contamination monitoring. Protective clothing must be removed prior to exiting the NPP site.

□ **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:

As discussed previously, NPP licensees develop a radiation protection program defining radiation protection polices, principles and requirements, including those for contamination control and contamination control limits for tools and equipment exiting controlled areas and the site. Contamination control limits vary facility to facility.

Canada's Packaging and Transport of Nuclear Substances Regulations do prescribe levels for non-fixed contamination on packages and materials being transported off site to those in paragraphs 508 to 509 of the *IAEA Regulations for the Safe Transport of Radioactive Material No. TS-R-1. (ST-1, Revised)*.

□ **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?
- What are the methods and criteria for assessment of internal doses?
- What are the reference levels for internal doses (please give examples for typical nuclides, allowed averaging volume or surface or ...)?

Canada's Radiation Protection Regulations prescribe effective dose limits for Nuclear Energy Workers (NEWs). "Effective dose" means the sum of the products, in sievert, obtained by multiplying the equivalent dose of radiation received by and committed to each organ or tissue. A portion of effective dose is dose received by and committed to the person from sources inside the body, measured directly or from excreta, as well as dose received by a person from sources outside the body

Regulatory effective dose limits for NEWs are as follows: 50 mSv in a one-year dosimetry period; 100 mSv in a five year dosimetry period; 4 mSv for the balance of pregnancy (pregnant NEWs).

NPPs in Canada operate internal dosimetry services licensed by the CNSC. Canada's Radiation Protection Regulations require the use of a licensed dosimetry service if there is a reasonable probability a NEW will receive an effective dose greater than 5 mSv in a one-year dosimetry period. Internal dose is assessed by the following methods: in-vitro bioassay for tritium and C-14; in-vivo thyroid counting for I-131; in-vivo whole body counting for mixed fission and activation products.

□ **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?
- What is the triggering level of contamination to carry out an assessment of skin dose?

Canada's Radiation Protection Regulations also prescribe equivalent dose limits. The regulatory equivalent dose limit for the skin of a NEW is 500 mSv in a one year dosimetry period. When skin is unevenly irradiated, the equivalent dose received by the skin is the average equivalent dose over the 1 cm² area that received the highest equivalent dose.

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

As discussed above, NPP licensees develop a radiation protection program defining radiation protection polices, principles and requirements, including those for contamination control and contamination control limits for personal contamination exiting controlled areas and the site. Contamination control limits vary from facility to facility.

- How contamination is measured in 1 cm²? For discussion in plenary session.

□ **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.

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

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