

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:** Republic of Korea
- ❑ **Name of the Regulatory Body:** Korea Institute of Nuclear Safety(KINS)
- ❑ **Name and post of the person(s) who fill in the questionnaire:** Won-Chul CHOI
Radiation Protection & Safety Management Department

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- ❑ **Legal framework on contamination control**
 - Does your legal framework have requirements on radioactive contamination control? Yes
 - If so, give a short description of the content of references.
Atomic Law has a definition of 'permissible surface contamination level' and MEST notice 2002-23 includes its levels which should be followed by utilities in Korea. Also KINS has 'Guidelines for Safety Inspection for NPP operation'. These documents include provisions for the following topics related to contamination control:
 - Definition and area classification
 - Use of personal protective equipment
 - Radiological and individual surveillance
 - Does your legislation specify reference levels for contamination? Yes
The definition of contamination is defined in Atomic Law and MEST Notice 2002-23
 - MEST : Ministry of Education, Science and Technology
 - MEST Notice 2002-23 : Standards for Radiation Protection, etc'
 - KINS : Korea Institute of Nuclear Safety
- ❑ **Reference contamination levels on official documents**
 - Does some official document of the licensee specify levels for contamination? Yes
 - If so specify the document.
KHNP(Korea Hydro & Nuclear Power Co.) as a utility has FSAR and Operating Procedures for contamination control in Korea. These documents are reflecting the practical implementation of the licensee responsibility for radiation protection through the adoption of management structures, policies, plans, training, procedures and other measures developed and implemented to achieve continuing compliance with the legislation in force and to apply the ALARA principle.

The Korea legislation on Licensing of Nuclear and Radioactive Facilities requires submission and approval of 'FSAR' in the licensing process of a Nuclear Power Plant.
 - 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?
Viewed point of design basis, there are 4 types of NPPs; Westinghouse, CE, Framatome and CANDU in Korea, thus they have various categories of controlled area from 6 to 8. However, during normal operation in NPP there are only two categories; radiation area and high radiation area.

In the other side, all NPPs have the same levels of the maximum contamination in controlled areas which are shown in next answer.

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).
Maximum contamination levels in Atomic Law : $4 \text{ Bq/cm}^2(\beta\text{-}\gamma)$, $0.4 \text{ kBq/cm}^2(\alpha)$ for removable contamination
Target levels in NPPs : $1.7 \text{ Bq/cm}^2(\beta\text{-}\gamma)$
- What are the basic technical requirements in NPP to control spread of contamination?
 - Signing of areas and Display detailed information on Website
 - Radiological surveillance of surfaces and atmosphere
 - Waiting and Passing zones between contaminated zones
 - Protective personal equipment
 - Ventilation
 - On-line Monitoring of external contamination
- Which of them are specified by legal or approved documents and on which the licensee may decide in his own responsibility?
Basic measures to control contamination are established in the legislation. General requirements on these measures are specified in the guidelines of KINS. More specific requirements may be decided by the licensee.
- Does your legislation or approved documents include requirements about the monitoring program? **Yes.**
- Which document? **The guidelines of KINS and FSAR of KHNP**
- What kind of requirements (periodicity, certificated instruments, exclusive performed by RP-personal with special education and training, averaging surface (volume, duration), registration and reporting)?
All these detailed requirement of surveillance depend on the type of risk and the classification of the area, instrumentation must be certified and/or verified at frequencies depending on the type of instruments. Monitoring must be performed by qualifies personnel. Average surface for surface contamination is 100 cm^2
- **Contamination control of personal protective equipment.**
 - Does your legislation or approved documents (company instructions) include requirements about contamination of protective personal equipment? **Yes**
 - Which document?. **The guidelines of KINS and FSAR of KHNP**
 - Which requirements?
In Korea there are reference levels for :
 - clothes in contact with the skin(Protective clothes are necessary in every area of radiation protection)
 - respiratory equipment for air contamination
 - reuse of respiratory equipment and protective clothes
 - What are the reference levels for contamination of protective personal equipment?
Maximum contamination levels in Atomic Law [$4 \text{ Bq/cm}^2(\beta\text{-}\gamma)$, $0.4 \text{ Bq/cm}^2(\alpha)$] are used for the protective clothes and the equipments.
 - 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?
Yes.
 - Which document? **MEST Notice 2002-23 ' Standards for Radiation Protection, etc'**

REGULATORY CONTROL ON CONTAMINATION MANAGEMENT IN NPP

- If affirmative, provide reference levels:
According to the Atomic Law, maximum contamination levels [4 Bq/cm² (β-γ), 0.4 Bq/cm² (α)] are used for the reusable working materials in Korea. Conservatively, utilities are applying one tenth of maximum contamination levels; 0.4 Bq/cm² for β-γ emitters, 0.04 Bq/cm² for α emitters.

- **Estimation of effective dose from internal contamination**
 - Does your legislation or approved documents include requirements about internal contamination of occupational exposed persons? **Yes**
 - Which document? **MEST Notice 2002-20 'Guidelines for measures internal radiation exposure'**
 - Which requirements?
 - **Requirements of methods, objects, procedures, related facilities, records and report**

 - What are the methods and criteria for assessment of internal doses?
Method : Whole Body Counter for routine monitoring and Bioassays in special cases.
Criteria :
 - **Internal dose controls must be carried out at the entrance and exit of the NPP or at least annually for permanent workers**
 - **Also whenever an intake is suspected**

 - What are the reference levels for internal doses (please give examples for typical nuclides, allowed averaging volume or surface or ...)?
 - **Only 2 mSv is using as a reference level in Korea.**

- **Estimation of effective dose from external contamination. Skin doses**
 - Does your legislation or approved documents (company instructions) include requirements about contamination of skin? **Yes**
 - Which document? **Enforcement Decree of Atomic Law**
 - Which requirements? **Dose limit; 500 mSv, is required for the skin doses.**
 - What is the triggering level of contamination to carry out an assessment of skin dose? **N/A**
 - What is the maximum level allowed for personal contamination at the exit of the controlled area?
Maximum contamination levels are used for personal contamination in the Atomic Law but utilities have been applying one tenth of it conservatively.
 - How contamination is measured in 1 cm²? **For discussion** in plenary session.
Basically, contamination is located in one area and then a collimated detector provided with a 1 cm² hole is used.

- **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 Korea, there is a great aversion to internal dose. From the regulatory point of view sometimes to prevent internal contamination, protective equipment is used that slow the work incurring in higher external doses.

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

- **How to distinguish between external and internal contamination of worker**
- **Requirement for portal monitor installed at the exit**