Survey on the implementation of the "justification", "optimisation" and "limitation of doses" radiological principles in national regulations in Europe

LATVIA

1 The implementation of European Directives

1. *Since when have the European Directives 96/29 and 97/43 been implemented in your country?*

Act on Radiation Safety and Nuclear Safety, adopted on 26 October 2000
Cabinet Regulation No. 149, "**Regulations for Protection against Ionising Radiation" ,** adopted on 9 April 2002
Cabinet Regulation No. 97, "**Regulations Regarding Protection Against Ionising Radiation in Medical Exposure"**, adopted on 5 March 2002

2. *If they are not implemented, is it expected and when?*

2 Justification principle

1. *What is the exact wording of the justification principle in the Law?*

Act on Radiation Safety and Nuclear Safety, adopted on 26 October 2000:
"The positive results achieved shall exceed the negative impact or loss caused by practices involving ionising radiation sources "

2. *Which practices are explicitly named as unjustified or forbidden?*

Cabinet Regulation No. 149, "**Regulations for Protection against Ionising Radiation"**, adopted on 9 April 2002
"It is prohibited to distribute food products, animal feed, toys, personal ornaments, jewellery and cosmetic products to which radioactive substances have been added or which have been irradiated thus giving rise to radio nuclides therein. Such food products, animal feed, toys, personal ornaments, jewellery and cosmetic products are permitted to be used only for purposes of scientific research. "

3. *Which regulatory body(ies) is (are) responsible to determine if a practice is justified or not?*

State supervision and control in the radiation safety and nuclear safety field is independently carried out by a state regulatory authority called the Radiation Safety Centre.

3 Optimisation principle

1. *Could you give is the exact wording (citation) of the optimisation principle (ALARA) as defined in the Law or national regulation?*

Act on Radiation Safety and Nuclear Safety, adopted on 26 October 2000:

"Optimum radiation safety measures are chosen, taking into account economical and social circumstances, as well as technical capabilities, so that the exposure level is reasonably low and does not exceed the established dose limits"

2. *Does the national regulation give a description on the practical way to implement the optimisation principle (e.g. need to perform dose prediction and to establish dose objectives, need to perform real-time dose follow-up, need to write feedback experience report, etc)?*

Fragments of Cabinet Regulation No. 149, "**Regulations for Protection against Ionising Radiation"**, adopted on 9 April 2002

5.1. Estimation of Potential Exposure

46. Before a worker, an apprentice or a student commences operations with sources of ionising radiation, the work supervisor shall evaluate the nature and magnitude of the potential exposure and determine appropriate measures for protection of the employee, apprentice or student.

5.4. Assessment and Implementation of Protection Measures of Workers, Apprentices and Students

73. In order to ensure protection of workers, apprentices and students against ionising radiation, as well as to prevent radiation accidents the operator shall:

73.1. ensure control and recording of exposure of workers, apprentices and students in the operator-controlled area;

73.2. appoint sufficient number of trained workers for work with sources of ionising radiation;

73.3. ensure appropriate training and instruction of the work supervisor and workers so that all workers, apprentices and students are informed of radiation safety and nuclear safety requirements and are trained as regards the protection against ionising radiation;

73.4. ensure informing of workers, apprentices and students about the potential harm to the health that may be caused by work with sources of ionising radiation;

73.5. ensure additional informing of women-workers in respect of the potential harm to their reproductive health and effect of ionising radiation on pregnancy;

73.6. ensure development of instructions for servicing the source of ionising radiation and performance of work, approval thereof and issuance to the workers;

73.7. control and register the readiness of each worker, apprentice and student to perform the work assigned;

73.8. ensure drawing up and storage of recording and control journals and other documents related to sources of ionising radiation, as well as the possibility to check the performance of protection measures; and

73.9. terminate operation with a source of ionising radiation if a fault therein or a violation of regulatory enactments in operation with sources of ionising radiation has been determined and rectify the relevant deficiencies.

74. The operator shall be responsible for insurance of workers against accidents at work and occupational diseases. Measures for protection of workers, apprentices and students against ionising radiation shall be determined by the work supervisor.

75. The operator shall provide the worker who is intended to be involved in elimination of the consequences of a radiation accident with appropriate information, instructions and preparedness.

76. In order to assess the quality and efficiency of the protection measures, the operator shall ensure:

76.1. regular checks of the effectiveness, readiness for use and correct use of the protective devices, auxiliary devices and materials utilised for radiation safety and nuclear safety;

76.2. evaluation of the construction and location of the sources of ionising radiation;

76.3. approval of the readiness for use of a new or modified source of ionising radiation;

76.4. checking of the effectiveness of technical devices; and

76.5. regular calibration of measuring instruments, as well as regular checking of their readiness for use and correct use.

3. *Does it exist a specific guidance to help operators / end-users in implementing the optimisation principle?*

Radiation Safety Centre disseminates informative materials translated in Latvian - for example,

- Material of European Commission (Radiation protection 118) about preference of X-ray examinations
- Material of European Commission (Radiation protection 81) " Radiation protection and Quality Assurance of X-ray examination in modern dental practices"

and others.

4 Dose limits

Act on Radiation Safety and Nuclear Safety, adopted on 26 October 2000:
"The public and the environment may not be exposed to a dose of ionising radiation which exceeds the established dose limits"

1. *Can you provide us with present regulatory dose limits established to reduce the probability of occurrence of stochastic effects?* [please separate public and occupational dose limits, permanent and interim workers, males and females, and other specific cases: pregnant women, post-accidental intervention limits, life dose, etc]

Fragments of Cabinet Regulation No. 149, "**Regulations for Protection against Ionising Radiation"**, adopted on 9 April 2002

4. Ionising Radiation Dose Limits

4.1. Ionising Radiation Dose Limits for Workers and Apprentices and Students of 16 to 18 Years of Age

29. The basic limit of the effective dose for **workers** shall be **20 mSv per year**. For a worker – **a pregnant woman and mother who breastfeeds a child**, the basic limit of the effective dose shall be **1 mSv per year**.

30. In addition to the basic limits of the effective dose (20 mSv per year) a worker shall have the following subordinated limits of the equivalent dose:

30.1. the equivalent dose for the **lens of the eye – 150 mSv per year**;
30.2. the equivalent dose for **any area of skin of 1 cm^2 – 500 mSv per year**; and
30.3. the equivalent dose for **hands**, **forearms**, **feet** and **ankles -500 mSv per year**.

31. The basic limit of the effective dose for **apprentices and students aged between 16 and 18** years (hereinafter – apprentices and students) shall be **6 mSv per year**.

32. In addition to the basic limits of the effective dose apprentices and students shall have the following subordinated limits of the equivalent dose:

32.1. the equivalent dose for the **lens of the eye – 50 mSv per year**;
32.2. the equivalent dose for **any area of skin of 1 cm^2 – 150 mSv per year**; and
32.3. the equivalent dose for **hands**, **forearms**, **feet** and **ankles – 150 mSv per year**.

33. In accordance with the potential exposure the work supervisor shall divide workers into two categories:

33.1. **category A** – workers whose committed effective dose may exceed 6 mSv per year or the equivalent dose may be by 3/10 higher than the subordinated limits of the equivalent dose specified in Paragraph 30 of these Regulations; and

33.2. **category B** – workers whose committed effective dose may not exceed 6 mSv per year or the subordinated limits of the equivalent dose specified in Paragraph 30 of these Regulations.

34. In addition to the provisions of Sub-paragraph 33.2 of these Regulations, the following persons shall be classified in category B:

34.1. employees who do not carry out operations with sources of ionising radiation but who undergo regular radiological examination in order to disclose illegal offences in respect of the property of the employer – if this is provided for in the labour agreement and assent from the relevant trade union has been received; and

34.2. persons undergoing radio diagnostic procedures for purposes of forensic expert-examination or insurance in order to disclose an unlawful activity.

4.2. Ionising Radiation Dose Limits for Specially Authorised Exposure of Workers

35. Specially authorised exposure is a systematic exposure if for the performance of a specific activity the basic limit of the effective dose for a worker (20 mSv per year) is expected to be exceeded, or exposure in case of a radiation accident in order to save human lives, prevent exposure of many people or preserve great material values.

36. Specially authorised exposure shall not be longer than five years.

37. Only category A workers may be subject to specially authorised exposure.

38. The work supervisor shall substantiate the necessity of specially authorised exposure and co-ordinate it with the relevant worker or his or her representative.

39. In each particular case of specific operations, if the necessity of specially authorised exposure has been substantiated (except radiation accidents), the Centre jointly with a certified practitioner of occupational diseases from a health care treatment institution of workers, apprentices and students (hereinafter – medical treatment institution) authorised by the Ministry of Welfare may allow a worker to exceed the basic limit of the effective dose (20 mSv per year) for a certain period of time for the performance of the relevant specific operations if the dose of ionising radiation does not exceed 50 mSv in the relevant year and 100 mSv per year over five consecutive years.

40. It is prohibited to subject to specially authorised exposure those workers of category A who over the last five years have already received a dose of ionising radiation exceeding 100 mSv per year.

41. The work supervisor may allow a worker to receive additional dose of ionising radiation up to 50 mSv per exposure during a radiation accident or elimination of consequences thereof. Exposure above 50 mSv per exposure may be permitted in exceptional cases in order to save human lives if the additionally received dose of ionising radiation does not exceed 200 mSv per exposure.

42. The operator shall provide workers with information regarding the risks of specially authorised exposure and the necessary protection, as well as ensure that ionising radiation doses and the number of employees subjected to exposure in the relevant economic and social circumstances is as low as possible.

4.3. Ionising Radiation Dose Limits for the Population

43. The basic limit of the effective dose for the **population** shall not exceed **1 mSv per year**, excluding irradiation from natural sources of ionising radiation and medical exposure.

44. In addition to the basic limit of the effective dose (1 mSv per year) the population shall have the following subordinated limits of the equivalent dose:

44.1. the equivalent dose for the **lens of the eye – 15 mSv per year**;

44.2. the equivalent dose for **any area of skin of 1 cm^2 – 50 mSv per year**; and

44.3. the equivalent dose for **hands**, **forearms**, **feet** and **ankles** -**50 mSv per year**.

45. If it is impossible to prevent intensified exposure of the population by means of protection measures (including the cases of a radiation accident), the basic limit of the effective dose for the population (1 mSv per year) may be exceeded but the dose of ionising radiation shall not be higher than 5 mSv per year and the average dose of ionising radiation shall not exceed 1 mSv per year over five consecutive years.

2. *What are the legal dose limits to prevent public and workers from deterministic health effects?*

Once more fragments of Cabinet Regulation No. 149, "**Regulations for Protection against Ionising Radiation"**, adopted on 9 April 2002

30. In addition to the basic limits of the effective dose (20 mSv per year) a worker shall have the following subordinated limits of the equivalent dose:

30.1. the equivalent dose for the lens of the eye – 150 mSv per year;

30.2. the equivalent dose for any area of skin of 1 cm^2 – 500 mSv per year; and

30.3. the equivalent dose for the hands, forearms, feet and ankles -500 mSv per year.

32. In addition to the basic limits of the effective dose apprentices and students shall have the following subordinated limits of the equivalent dose:

32.1. the equivalent dose for the lens of the eye – 50 mSv per year;

32.2. the equivalent dose for any area of skin of 1 cm^2 – 150 mSv per year; and

32.3. the equivalent dose for the hands, forearms, feet and ankles – 150 mSv per year.

44. In addition to the basic limit of the effective dose (1 mSv per year) the population shall have the following subordinated limits of the equivalent dose:

44.1. the equivalent dose for the lens of the eye – 15 mSv per year;

44.2. the equivalent dose for any area of skin of 1 cm^2 – 50 mSv per year; and

44.3. the equivalent dose for the hands, forearms, feet and ankles -50 mSv per year.

5. Dose constraints

1. *Here again, could you give is the exact wording (citation) of the Law or regulations where the concept of dose constraint is mentioned.*
2. *In which domain (e.g. public dose, occupational dose, patient dose, etc) and by whom (regulatory body, operators, etc) are dose constraints implemented in your country?*
3. *What are the corresponding values and rationales behind these values?*
4. *What is(are) the status(es) of dose constraint(s)?*
5. *What is effectively done if a constraint is exceeded?*

There are not dose constraints in Latvia's regulations.

But in order to be licensed, operator has to satisfy some requirements. One of them is quality assurance programme of radiation protection and nuclear safety. Radiation Safety Centre should advice to introduce in programme dose constraints, but it is not mandatory for operator.

Another measure for dose constraints is checking of workplace's plans and coordination with Radiation Safety Centre. For assessment of radiation protection ability of walls and protective shields experts use maximum eventual doses as ½ from basic dose limits.