

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

## CZECH REPUBLIC

### 1 The implementation of European Directives

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

The European Directives have been implemented in Czech legislation since 1 July 2002.

References: Act No.18/1997 Coll. on Peaceful Utilisation of Nuclear Energy and Ionising Radiation (the Atomic Act) (Amendment Act No.13/2002 Coll.)

Regulation No. 307/2002 Coll. of the State Office for Nuclear Safety on Radiation Protection (Amendment Regulation No.499/2005 Coll.).

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?*

“Whoever utilises nuclear energy or performs radiation activities or interventions to reduce natural exposure or exposure due to radiation incidents must ensure that his or her action is justified by the benefits outweighing the risks arising or liable to arise from these activities.”

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

Any practice is explicitly named as unjustified.

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

State Office for Nuclear Safety.

Application of methods not yet introduced into clinical practice and involving exposure, including the exposure without direct health benefit for individuals undergoing such exposure shall only be performed under special legal regulations (Dept. of Health) and based on an affirmative position provided by the State Office for Nuclear safety.

### 3 Optimisation principle

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

“Whoever utilises nuclear energy or performs radiation activities, prepares or performs interventions to reduce emergency, lasting or natural exposure must maintain a level of nuclear safety, radiation protection, physical protection and emergency preparedness such that the risk to human life, health and to the environment shall be kept as low as reasonably achievable, economic and social factors being taken into account.”

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)?*

The optimisation of radiation protection shall be performed in advance of a commencement of radiation practices by assessing and comparing with radiation protection variants which for the intended activities should be taken into consideration, by assessing of necessary costs for the appropriate remedial measures and by assessing of collective doses and doses in appropriate critical groups of the public. The optimisation shall be performed also during radiation practices by a regular analysis of doses received in respect of working operations, by taking into account all possible other measures to ensure radiation protection, and by comparing with similar already practised and socially acceptable activities. No feedback report is required.

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

In 1998 the recommendation for building materials suppliers and drinking water suppliers was issued which is now being reviewed.

Other person who carries out radiation practices should follow Article 17 of the Regulation No.307/2002 Coll.

## 4 Dose limits

1. *Can you provide us with present regulatory dose limits established to reduce the probability of occurrence of stochastic effects?*

Radiation workers A - 50 mSv per calendar year and 100 mSv for a period of five consecutive years.

Apprentices and workers B – 6 mSv per calendar year

Public – 1 mSv per calendar year (5 mSv for a period of five consecutive years in specific cases)

### *Exposure Reduction in Special Cases*

Pregnant women – the exposure of foetus shall not exceed 1 mSv over the remaining period of pregnancy

Unusual events – 500 mSv in five consecutive calendar years

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

#### Radiation workers A :

- 150 mSv per calendar year for an equivalent dose for lens
- 500 mSv per calendar year for an average equivalent dose for 1cm<sup>2</sup> of skin
- 500 mSv per calendar year for an equivalent dose for the hands, forearms, feet and ankles

#### Apprentices and workers B:

- 50 mSv per calendar year for an equivalent dose for lens
- 150 mSv per calendar year for an average equivalent dose for 1cm<sup>2</sup> of skin
- 150 mSv per calendar year for an equivalent dose for the hands, forearms, feet and ankles

#### Public:

- 15 mSv per calendar year for an equivalent dose for lens
- 50 mSv per calendar year for an average equivalent dose for 1cm<sup>2</sup> of skin

## 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.*

“As a part of the optimisation of radiation protection, all exposures shall be planned and kept as low as reasonably achievable, taking into account economic and social factors. The variants of radiation protection assessed as a part of the optimisation of radiation protection shall not lead to exposure which exceeds the exposure limits or the dose constraints if these limits and dose constraints are laid down for this case. If dose constraints for particular radiation practices or a particular ionising radiation source are to be set out, the State Office for Nuclear Safety shall take into account all existing experience of similar radiation practises and handling of the sources so that the level of radiation protection shall not be lower than achieved in practice so yet, and the Office shall also consider a possible effect of the other activities and sources to avoid the limit exceeding.”

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?*

Dose constraints are given by the Regulation No. 307/2002 Coll. of the State Office for Nuclear Safety on Radiation Protection.

For patient doses the dose constraints are interpreted as guidance levels (diagnostic reference levels).

3. *What are the corresponding values and rationales behind these values?*

For public exposure, the dose constraint is an upper bound on the annual dose that members of the critical group of the public could receive from a discharge of radioactive substances into the environment.

“The dose constraint for a total discharge of radioactive substances from a workplace where radiation activities are performed shall be an average effective dose of 250  $\mu\text{Sv}$  per calendar year for the appropriate critical group of the public, from which 200  $\mu\text{Sv}$  shall be for discharges into the atmosphere and 50  $\mu\text{Sv}$  for discharges into watercourses from nuclear installations.”

For occupational exposures, the dose constraint is an upper bound on the collective effective dose of all exposed workers. (nuclear installation)

“A dose constrain for a nuclear installation operation shall be a collective effective dose of 4 Sv per year for each gigawatt being installed in the nuclear installation related to the exposure of all exposed workers who undergo personal monitoring.”

4. *What is(are) the status(es) of dose constraint(s)?*

Both dose constraints are upper bounds of optimisation. Then the Regulation gives guidance levels (lower bounds of optimisation) for occupational (1 mSv) and public exposure (50  $\mu$ Sv). A reasonably achievable level of radiation protection shall be considered to be sufficiently proved if an annual effective dose does not exceed these levels. In such cases it is not necessary to optimise radiation protection.

5. *What is effectively done if a constraint is exceeded?*