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

DENMARK

1 The implementation of European Directives

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

Since October 2000

- National Board of Health order no. 954 of 23 October 2000
- National Board of Health order no. 765 of 6 October 1999
- National Board of Health order no. 663 of 16 August 1999
- National Board of Health order no. 209 of 6 April 1999
- National Board of Health order no. 48 of January 1999
- National Board of Health order no. 975 of 16 December 1998
- National Board of Health order no. 823 of 23 October 1997

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?*

Translated from Danish:
In any use of ionizing radiation the benefits should balance the possible elements of risks.

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

Deliberate addition of radioactivity into food stuff, toys, decorative items or cosmetics.

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

The Danish National Institute for Radiation Hygiene (NIRH)

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?*

Translated from Danish:
All doses shall be kept as low as reasonably achievable.

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)?*

No

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

No

4. Dose limits

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

Category	Workers > 18 y	Workers < 18 y	"Students[a]" > 18 y	"Students[a]" < 18 y	Other "students"	Individuals in the population
Effective dose (mSv/y)	20	1	20	6	1	1

a. Student working with radiation as an important part of their study

Pregnant women: equivalent dose to unborn foetus less than 1 mSv from the pregnancy has been told.

In the case of an accident intervention a limit of 50 mSv will apply for the effective dose unless the intervention aims at saving lives, avoid serious person damage or irradiation or avoid a disaster. In this case the effective dose should if reasonably possible be kept below 100 mSv.

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

Category	Equivalent dose (mSv/y)		
	Eye lenses	**Skin**	**Extremities**
Workers >18y	150	500	500
Workers <18y	15	50	-
"Students[a]" > 18y	150	500	500
"Students[a]" < 18y	50	150	150
Other "students"	15	50	Protected by the limit on effective dose
Individuals in the population	15	50	Protected by the limit on effective dose

a. Student working with radiation as an important part of their study.

In the case of intervention where the intervention is a life saving operation the above mention 100 mSv "limit" can be exceeded but all means should be applied to limit the effective dose to 500 mSv to avoid deterministic effects.

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.*

Translated from Danish:
For use in optimisation of radiation protection dose constraints can be used. The National Board of Health can for special uses of ionising radiation give dose constraints for the use of optimisation of the radiation protection in the planning phase.

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?*

A) Dose constraints (reference doses to patients) are used for X-ray examination and examinations using radioactive isotopes. Dose constraints are given in guidance's issued by

the NIRH. Dose constrains are also used in biomedical research involving doses to test persons.

B) Dose constraints (reference doses to member of the public (critical group)) are used for operation and decommissioning of the nuclear facilities in DK (only one site). The dose constraints are given in the operating license.

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

Regarding A: Values given as measurable doses and are based on "best practices".

Regarding B: Values given as effective doses (0.05 mSv/y for each facility and 0.1 mSv/y from all facilities). From these constrains, limits on release of radionuclides have been derived.

Below the constraints, optimisation should still be applied.

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

Regarding A: If the dose constraint in a given type of examination is exceeded almost always or considerable in a given department the reasons for this must be found and if possible removed.

Regarding B: These are considered limits that must not be exceeded.

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

If the authority observes, that the dose constraints are "ignored", actions will be taken to correct this.