

This is an unofficial translation of the text.

The translation is prepared based on Ministerial Decree No. 15/2001 (VI. 6.) KöM of the Minister for Environment being effective as of April 01, 2015

**Ministerial Decree 15/2001. (VI. 6.) KöM of the Minister for Environment on radioactive discharges to the atmosphere and into waters during the use of atomic energy and on monitoring of the discharge**

Based on the authorisation given in Subsection (3) of Section 68 of the Act CXVI of 1996 on Atomic Energy (hereinafter referred to as AA) in agreement with the Minister supervising Hungarian Atomic Energy Authority, the Minister of Transport and Water Management, as well as the Minister of Health the following decree is issued:

**The Scope of the Decree**

**Section 1**

This Decree shall apply in the course of using atomic energy to:

- a) discharges of radioactive materials to the atmosphere and into water,
  - b) the protection of waters and water containing formations against radioactive contamination and heat pollution,
  - c) the monitoring of radioactive contamination of air and water environment,
- furthermore to any party undertaking the above activities.

**Definitions**

**Section 2**

For the purposes of this Decree, the following definitions shall apply:

- a) *continuous monitoring*: sampling and/or the measurements are performed continuously and the time-integrated value of the quantity can be produced by the summation of the measurement results;

- b) liquid radioactive discharge:* the discharge of radioactive material within a liquid substance;
- c) discharge limit:* annual activity of radionuclides or groups of radionuclides derived from dose limits, applied for liquid and airborne discharges under the normal operation of the facility. The unit of the discharge limit is  $\text{Bq}\cdot\text{yr}^{-1}$ ;
- d) discharge limit criterion:* in case of a discharge of more radionuclides and/or of more discharge modes the sum of the ratios of each of the discharged activities and the respective discharge limits is less or equal to 1;
- e) investigation criterion of discharge:* in case of a discharge of more radionuclides and/or of more discharge modes the sum of the ratios of each of the discharged activities and the respective discharge limits is greater than 0.3;
- f) discharge mode:* term of the airborne and liquid discharges;
- g) discharge point:* the point of the boundary line of a special facility, where the radioactive material is discharged. There can be more discharge points of a special facility. In case of other facilities it means the point, where the wastewater is introduced into living water;
- h) discharge pathway:* the path of the radioactive discharge including the discharge point;
- i) special facility:* nuclear power plant, training and research nuclear reactor, uranium mine, storage and disposal facility for radioactive waste, A-level isotope laboratory, interim storage facility for spent fuel;
- j) airborne radioactive discharge:* the discharge of radioactive material within an aerial medium;
- k) radioactive discharge:* the discharge of radioactive material originating from the application of atomic energy to the atmosphere or into waters in a controlled, monitored and permitted way;
- l) periodical monitoring:* sampling and/or the measurement is performed in discrete time intervals and the time-integrated value of the quantity can only be estimated by the summation of the measurement results;
- m) planned discharge level:* annual activity projected to be discharged under the normal operation of a special facility determined for each particular discharge pathway and radionuclide or group of radionuclides. The unit of the planned discharge level is  $\text{Bq}\cdot\text{yr}^{-1}$ .

## **Determination of the Discharge Limits**

### **Section 3**

(1) The user of atomic energy for special facilities

a) derives the annual discharge limits from the dose constraint specified by the Office of the National Chief Medical Officer according to a separate legal regulation;

b) performs the derivation based on the considerations of Annex 1 so that if the discharge limit or the discharge limit criterion is observed then the in annual dose of the population does not exceed the dose constraint;

c) cancelled

d) in order to specify the discharge limit, attaches the calculations, input data and results to the application providing full details necessary for the verification.

(2) cancelled

(3) The annual discharge limits for other facilities are set out in Chapters 1 and 2 of Annex 2. The facility may initiate the determination of adequate discharge limits based on the procedure as per Subsection (1) of this Section if the conditions of liquid discharge are substantially different from the modelling approaches used in Annex 2.

## **Planned Discharge Levels**

### **Section 4**

(1) cancelled.

(2) The planned discharge levels should be determined according to the considerations of Annex 3.

(3) The planned discharge levels shall be considered independently for each discharge mode, radionuclide or group of radionuclides.

## **Planning Requirements Concerning the Radioactive Discharges and Monitoring of the Environment**

### **Section 5**

(1) At the planning of a special facility the following conditions shall be determined for the radionuclides or radioactive materials discharged under normal operation:

- a) the place of origin,
- b) the way of origin,
- c) the originated activities,
- d) the mode of the discharge,
- e) the discharge pathways,
- f) the characteristics of the discharged radioactive materials: activity, activity concentration, physical and chemical properties, discharge as a function of time, mass and volume flow of the discharge,
- g) the planned discharge levels.

(2) The planned discharge limits are detailed in Annex 3.

## **Operational Requirements Concerning the Radioactive Discharges and Monitoring of the Environment**

### **Section 6**

(1) The licensee ensures the compliance with the discharge limit and/or discharge limit criterion.

(2) The licensee of a special facility:

- a) strives for an operation resulting in such radioactive discharges that do not exceed permanently the planned discharge levels;
- b) measures and determines the discharges in compliance with the Standard for Discharge Monitoring elaborated according to the requirements of Annex 4 and approved by the Inspectorate;
- c) makes the sampling and on-site measurements for monitoring of radioactive discharges by the Inspectorate possible and supplies it with samples if it is required;
- d) submits annual reports to the Inspectorate by 31 March of the year following the subject year based on the criteria of Annex 4;
- e) submits quarterly reports for nuclear facilities based on the criteria of Annex 4;

f) monitors the environment in compliance with the Standard for Environment Monitoring elaborated according to the requirements of Annex 4 and approved by the Inspectorate;

g) if justified, may be obliged by the Inspectorate to prepare a special report.

(3) At a special facility the user of atomic energy submits the Standard for Discharge Monitoring together with the discharge limits.

(4) The laboratory of a nuclear power plant performing the measurements as per Paragraphs b) and f) of Subsection (2) shall be accredited for the specific analyses. In case of other special facilities the measuring laboratory shall have a quality assurance system in accordance with a separate legal regulation.

(5) The licensee of other facilities:

a) ensures the necessary requirements for supervision at the request of the Inspectorate;

b) submits estimation on the annual discharges to the Inspectorate by 31 March of the year following the subject year based on the criteria of Annex 4.

## **Preliminary Reports**

### **Section 7**

The licensee of a special facility shall submit a written report to the Inspectorate on the operational schedule, furthermore on the planned events and measures affecting the radioactive discharges and their monitoring, and monitoring of the environment by 15 December of the year preceding the subject year.

## **Reporting of Abnormal Events**

### **Section 8**

(1) The licensee shall immediately submit a report to the Inspectorate on any alteration of the operation, which resulted or could result in a radioactive discharge exceeding the 3 tenths of the discharge limit or the investigation criterion of discharge.

(2) The report of the event as per Subsection (1) shall contain:

a) the description of the event from the point of view of radioactive discharges,

- b) the probable cause of the event,
  - c) the measures taken to restore the normal operational conditions and to mitigate the radioactive discharges,
  - d) the activity of the discharged radioactive materials.
- (3) The licensee shall correct the report as per Subsection (2) of this Section within 30 days of submission and, at the same time, determines the countermeasures to be taken to avoid similar events.
- (4) The Inspectorate may also prescribe reporting obligation in case of other events affecting the radioactive discharges and their monitoring, and monitoring of the environment.

### **Special Rules of the Protection of Waters and Water Containing Formations against Radioactive Contamination and Heat Pollution**

#### **Section 9**

- (1) The liquid discharge of radionuclides is permissible
- a) for special facilities excluding the nuclear power plant into surface waters or into the public channel;
  - b) for nuclear power plants into surface waters only,
  - c) for other facilities into the public channel only.
- (2) The liquid discharge of radionuclides is not permissible
- a) into natural lakes and into underground water formations;
  - b) in protected natural areas and other protected area.

#### **Section 10**

- (1) For the protection of surface waters and water containing formations against heat pollution caused by the operation of the special facility
- a) the temperature difference between the waste effluent and the recipient water shall not exceed 11 °C (or 14 °C if the temperature of the recipient is less than 4 °C);
  - b) the temperature of the recipient water shall not exceed 30 °C at any point of the cross section at 500 m downstream from the discharge point.

(2) The Inspectorate determines other restrictions concerning the heat load, which are necessary to sustain the water quality under the licensing procedure of the use of environment as per the Subsection (1) of Section 66 of Act LIII of 1995 on General Rules of Environment Protection.

### **Section 11**

Cancelled

## **Authority Inspection of Radioactive Discharges and Environment Protection**

### **Section 12**

(1) The Inspectorate supervises the compliance with the regulations concerning the radioactive discharges and their environmental effects.

(2) The Inspectorate supervises the special facilities at least yearly, the nuclear facilities quarterly and the other facilities at least every two years.

(3) In case of the violation of the regulations concerning the radioactive discharges and their environmental effects the Inspectorate shall initiate an action of the primary licensing authority to stop the legal offence and to restore the regular circumstances.

### **Section 13**

(1) cancelled

(2) The inspection shall be performed with the participation of a measuring laboratory accredited for the specific analysis.

(3) The Supreme Inspectorate of Environment and Nature approves the annual sampling and measurement program of the Inspectorate elaborated according to Annex 6.

(4) The Inspectorate transfers the environment monitoring results to the Data Collection and Evaluation Centre of the National Environmental Radiation Monitoring System via an information centre in accordance with a separate legal regulation.

## **Closing Provisions**

### **Section 14**

(1) This Decree, with the exception of Subsection (2) of this Section, shall enter into force on the 30th day following its promulgation.

(2) Subsection (4) of Section 6 and Subsection (2) of Section 13 shall enter into force on 1 January 2003.

(3) cancelled

(4) cancelled

## **Annex 1 to the Ministerial Decree 15/2001. (VI.6.) KöM**

### **Derivation of the Discharge Limits**

1. The discharge limits shall be derived for each mode of discharge, furthermore for each radionuclides or groups of radionuclides, which might be discharged.

2. The derivation of the discharge limit

2.1. Basic equation:

$$EL_{ij} = \frac{1}{\Gamma} \frac{DL}{DE_{ij}}$$

where

$EL_{ij}$  is the discharge limit for radionuclide or group of radionuclides  $i$  and discharge mode  $j$  ( $Bq \cdot yr^{-1}$ );

$DL$  is dose constraint for the given facility ( $Sv \cdot yr^{-1}$ );

$DE_{ij}$  is the annual dose due to unit discharge of radionuclide or group of radionuclides  $i$  through discharge mode  $j$  ( $Sv \cdot yr^{-1} / Bq \cdot yr^{-1}$ );

$\Gamma$  is a safety factor for taking into consideration the uncertainty of the derivation process ( $\Gamma \leq 5$ ). Its value shall be set by the Inspectorate for special facilities.

2.2. The annual dose due to unit discharge shall be determined by models internationally accepted. The parameter values used shall be defined by realistic approximation.

3. The discharge limit criterion:

$$\sum_{ij} \frac{R_{ij}}{EL_{ij}} \leq 1$$

and the investigation criterion of discharge:

$$\sum_{ij} \frac{R_{ij}}{EL_{ij}} > 0.3$$

where

$EL_{ij}$  is the discharge limit for radionuclide or group of radionuclides  $i$  and discharge mode  $j$  ( $Bq \cdot yr^{-1}$ );

$R_{ij}$  is the annual discharge of radionuclide or group of radionuclides  $i$  and discharge mode  $j$  ( $Bq \cdot yr^{-1}$ ).

4. The discharge limit could also be derived for appropriate groups of radionuclides (e.g. radioiodine) in exceptional cases justified by the monitoring and measuring possibilities. In such a case the discharge limit of a radionuclide resulting the highest annual dose from unit radioactive discharge shall be considered for the whole group of radionuclides.

**Annex 2 to the Ministerial Decree 15/2001. (VI.6.) KöM**

**Radioactive Discharge Limits of Other Facilities**

In case of simultaneous discharge of more radionuclides or more discharge mode the discharge limit criterion as per Annex 1 shall be applied.

I. Discharge limits for airborne effluents<sup>a</sup>

The annual discharge limit is 2 GBq for radionuclides not listed below.

Radionuclide	Discharge limit [GBq*yr <sup>-1</sup> ]	Radionuclide	Discharge limit [GBq*yr <sup>-1</sup> ]
H-3	2E+4	In-111	6E+1
C-14	6E+2	I-123	6E+2
F-18	4E+2	I-125	4E+0
Na-22	4E-2	Xe-127	4E+3
Na-24	2E+1	I-131	2E+0
Ar-41	6E+2	I-132	2E+1
Cr-51	8E+1	I-133	1E+1
Mn-54	4E-1	I-135	1E+1
Fe-55	1E+2	Xe-133	2E+4
Co-58	1E+0	Cs-134	6E-2
Fe-59	1E+0	Xe-135	4E+3
Co-60	2E-2	Xe-135m	2E+3
Ga-67	1E-2	Cs-137 <sup>b</sup>	6E-2
Ga-68	6E+2	Tl-201	2E+2
Se-75	1E+0	Ra-226 <sup>b</sup>	4E-2
Kr-85	2E+5	Th-232	4E-2
Kr-85 <sup>m</sup>	6E+3	U-235 <sup>b</sup>	6E-2
Kr-87	1E+3	U-238 <sup>b</sup>	2E+0

Kr-88	4E+2	Pu-238	4E-2
Sr-89	1E+1	Pu-239	4E-2
Sr-90	6E-1	Pu-240	2E-2
Tc-99 <sup>m</sup>	8E+1	Am-241	4E-2
Ag-110 <sup>m</sup>	1E-1	Cm-242	2E-1
		Cm-244	6E-2

<sup>a</sup> The fivefold amount of the discharge limit (the value of  $\Gamma$  safety factor is 5) results 30  $\mu\text{Sv}$  annual dose to the reference group of population living 100m from the discharge point. (30  $\mu\text{Sv}$  is identical to the value as per Paragraph a) of Subsection (2) of Section 23 of the Decree 16/2000. (VI.8.) EüM, numerically.)

<sup>b</sup> Valid for parent nuclides and their progeny included in secular equilibrium listed in the Annex of the Decree 23/1997. (VII.18.) NM on the Exempt Activity Concentrations and Exempt

## II. Discharge limits for liquid effluents<sup>a</sup>

1. The discharge limits listed below are valid for discharges through the wastewater channel to surface water with a minimal water flow lower than 10  $\text{m}^3/\text{s}$ . The discharge limits shall be multiplied by 5 for surface water with a minimal water flow between 10  $\text{m}^3/\text{s}$  and 100  $\text{m}^3/\text{s}$ , furthermore by 30 for surface water with a minimal water flow higher than 100  $\text{m}^3/\text{s}$ .

2. The annual discharge limit is 1000 GBq for other radionuclides with physical half-lives shorter than 1 day, otherwise it is 10 GBq.

Radionuclide	Discharge limit [GBq*yr <sup>-1</sup> ]	Radionuclide	Discharge limit [GBq*yr <sup>-1</sup> ]
H-3	2E+4	As-74	9E+0
C-14	2E+1	As-76	2E+3
Na-22	2E+1	Se-75	2E+1
P-32	7E+0	Se-79	1E+1
P-33	6E+1	Br-77	3E+4

S-35	7E+1	Br-82	1E+4
Cl-36	6E+1	Rb-84	1E+1
K-40	1E+1	Rb-86	1E+1
Ca-45	2E+2	Sr-85	9E+1
Ca-47	2E+2	Sr-89	4E+1
Sc-46	3E+1	Sr-90	2E+0
Sc-47	2E+3	Zr-95	7E+1
Cr-51	2E+3	Nb-94	5E+0
Mn-54	5E+1	Nb-95	1E+1
Fe-55	3E+2	Mo-99	3E+3
Fe-59	1E+1	Tc-99	3E+1
Co-57	1E+2	Ru-103	6E+0
Co-58	2E+1	Ru-106 <sup>b</sup>	3E+0
Co-60	6E+0	Ag-110 <sup>m</sup>	4E+1
Ni-59	1E+3	Cd-109	2E+1
Ni-63	6E+2	In-111	8E+2
Zn-65	9E+0	Sb-124	5E+1
Ga-66	3E+3	Sb-125	9E+1
Ga-67	1E+3	Sb-126	8E+1
Ga-68	2E+4	Te-127 <sup>m</sup>	4E+1
Ga-72	4E+3	Te-129 <sup>m</sup>	4E+1
As-72	6E+2	Te-131 <sup>m</sup>	3E+3
Te-132	2E+2	Hg-203	3E+1
I-124	1E+2	Tl-201	2E+3
I-125	8E+0	Pb-210b	1E-1
I-129	7E-1	Po-210	1E-1
I-131	3E+1	Ra-224 <sup>b</sup>	5E+1
Cs-129	1E+4	Ra-226 <sup>b</sup>	4E-1
Cs-131	6E+2	Ra-228 <sup>b</sup>	2E-1
Cs-134	9E-1	Th-228 <sup>b</sup>	2E+0
Cs-134 <sup>m</sup>	2E+5	Th-230	5E-1

Cs-136	1E+1	Th-232	5E-1
Cs-137 <sup>b</sup>	1E+0	Th-234 <sup>b</sup>	7E+1
Ba-131	2E+2	U-232 <sup>b</sup>	4E-1
Ba-133	6E+1	U-233	3E+0
Ba-133 <sup>m</sup>	2E+4	U-234	3E+0
Ba-135 <sup>m</sup>	6E+4	U-235 <sup>b</sup>	3E+0
Ba-140 <sup>b</sup>	2E+2	U-236	3E+0
La-140	7E+2	U-238 <sup>b</sup>	3E+0
Ce-139	5E+1	Np-237	1E+0
Ce-141	1E+2	Np-239	1E+4
Ce-144 <sup>b</sup>	3E+1	Pu-238	5E-1
Sm-153	1E+4	Pu-239	5E-1
Eu-152	6E+1	Pu-240	5E-1
Ho-166	6E+4	Pu-241	3E+1
Yb-169	2E+2	Am-241	6E-1
Ir-192	2E+1	Cm-242	1E+1
Au-198	5E+3	Cm-244	1E+0
Hg-197	2E+3	Cf-252	1E+0

<sup>a</sup> The fivefold amount of the discharge limit (the value of  $\Gamma$  safety factor is 5) results 30  $\mu\text{Sv}$  annual dose to the reference group of population living 500m from the place of inflow into the surface water. (30  $\mu\text{Sv}$  is identical to the value as per Paragraph a) of Subsection (2) of Section 23 of the Decree 16/2000. (VI.8.) EÜM, numerically.)

<sup>b</sup> Valid for parent nuclides and their progeny included in secular equilibrium listed in the Annex of the Decree 23/1997. (VII.18.) NM on the Exempt Activity Concentrations and Exempt Activities of Radionuclides.

***Annex 3 to the Ministerial Decree 15/2001. (VI.6.) KöM***

**Determination of the Planned Discharge Levels**

(1) The planned discharge levels

a) shall be determined for each mode of discharge, furthermore for each radionuclide or groups of radionuclides, which might be discharged,

b) shall be determined so that the reference group of population shall be estimated by considering all relevant and significant exposure pathways,

c) shall be determined so that takes into consideration the technological characteristics of the facility, the possibilities of discharge monitoring and the uncertainty of population dose estimation,

d) could also be determined for appropriate groups of radionuclides (e.g. radioiodine) in exceptional cases justified by the monitoring and measuring possibilities. In such a case the planned discharge level of a radionuclide resulting in the highest annual dose from unit radioactive discharge shall be considered for the whole group of radionuclides.

(2) At the planning of the regular operation of the facility the following conditions shall be ensured:

a) the collection of radioactive materials to be discharged separately from inactive materials, if it is possible technically and economical;

b) the reduction of the number of discharge points as low as possible,

c) the realisation of controlled and monitored discharges and of discharge pathways,

d) the provisions for discharge monitoring according to Annex 4,

e) the provisions for environment monitoring around the facility according to Annex 5.

**Annex 4 to the Ministerial Decree 15/2001. (VI.6.) KöM**

**Discharge Monitoring Requirements for Operation**

1. For special facilities:

1.1. The aim of discharge monitoring is to determine the activity of radionuclides discharged into the environment based on measurements.

1.2. The realisation of discharge monitoring is supported by the Standard for Discharge Monitoring, containing information on the system, methods and tools of discharge monitoring, furthermore the parameters of their effectiveness and capacity.

1.3. The discharges shall be measured along the discharge pathways.

1.4. The licensee monitors the airborne and liquid discharges by representative sampling on each possible discharge pathways and collaborates with the Inspectorate in the realization of its monitoring programme.

1.5. The volume and preparation method of the sample, furthermore the sensitivity of the measuring equipment and the measurement time shall be chosen so that the detection limits possibly guarantee the determination of the activity of discharged radionuclides. The activities below the detection limits shall be considered to be equal to the detection limits.

1.6. For the determination of activities and activity concentrations nuclide specific measuring methods shall be applied. Gross-beta, gross-gamma measurement results may be accepted only as indicators of changes in screening investigations, which shall be completed by adequate nuclide specific analyses.

1.7. The Standard for Discharge Monitoring determines:

1.7.1. the characteristics of discharge monitoring, which could be continuous or periodical. The frequency of periodical monitoring shall be fixed to provide the detection of radionuclides with physical half-lives of several days as well;

1.7.2. the measurement methods of discharge monitoring, which consist of nuclide specific methods principally and gross-beta or gross-gamma measurements in some cases;

1.7.3. the tools of discharge monitoring and parameters of their effectiveness and capacity;

1.7.4. the record keeping system for the results of discharge monitoring.

1.8. The licensee compiles an annual report on the results of discharge monitoring, the compliance with the discharge limit or discharge limit criterion.

1.9. The annual report contains:

1.9.1. a brief summary on the facility concerning the radioactive discharges;

1.9.2. the short description of the monitoring methods applied and a detailed review of the lately introduced ones;

1.9.3. the identification of the sampling and measuring points, the frequency of the periodical monitoring and the annual radioactive discharge values calculated from the monitoring results;

1.9.4. the demonstration of the compliance with the discharge limit or discharge limit criterion;

1.9.5. the comparison of the radioactive discharges to the planned discharge levels;

1.9.6. the evaluation of the discharge-monitoring results, furthermore their comparison with previous data and with discharge values of similar facilities;

1.9.7. proposals for decreasing the radioactive discharges and for improvement of monitoring effectiveness, when required.

1.10. The quarterly report of the licensee of a nuclear facility shall contain:

1.10.1. the short description of the monitoring methods applied;

1.10.2. the identification of the sampling and measuring points, the frequency of the periodical monitoring and the quarterly radioactive discharge values calculated from the monitoring results;

1.10.3. the evaluation of the discharge-monitoring results and their comparison with previous data;

1.10.4. proposals for decreasing the radioactive discharges and for improvement of monitoring effectiveness, when required.

2. In case of other facilities, to demonstrate the compliance with the discharge limit or discharge limit criterion, the annual discharge shall be estimated based on the activities of the received, used and decayed radionuclides.

***Annex 5 of the Decree 15/2001. (VI.6.) KöM***

**Environment Monitoring Requirements for Operation**

1. The aim of environmental radiation monitoring of special facilities is:

a) to complete the radioactive discharge monitoring with measurements in the environment of the facilities,

b) to inform the population, the authorities and the interested specialists on the environment monitoring results,

2. The realisation of environment monitoring is supported by the Standard for Environment Monitoring, containing information on the system, methods and tools of environment monitoring furthermore the parameters of their effectiveness and capacity.

3. In general, nuclide specific measuring methods shall be applied for the determination of activities and activity concentrations. Gross-beta measurement results may be accepted only as indicators of changes in screening investigations, which shall be completed by adequate nuclide specific analyses, when required.

4. The detection limits of the measuring methods applied shall correspond to the international and national quality levels, e.g. shall be 1 Bq/kg for gamma-spectrometric analyses, 0.01 Bq kg<sup>-1</sup> for alpha-spectrometry, 1 Bq/kg for tritium (HTO) determination and 0.1 Bq/kg for other beta-measurements, as a minimum.

5. Facility specific requirements

5.1. For nuclear power plants, nuclear heating plants and interim storage facilities for spent fuel:

5.1.1. the external gamma-dose rate, the air concentration and deposition of radionuclides shall be monitored continuously in several directions around the facility;

5.1.2. periodical monitoring, i.e. sampling and laboratory analyses are necessary for river water, sediment, ground water, furthermore for soil, grass, feed-stuff and indicator plant samples in several points biannually or quarterly, when required.

5.2. For research and training reactors, storage and disposal facilities for radioactive waste and uranium mine (including the recultivated areas, too) the continuous monitoring as per Subsection 5.1.1. of this Annex shall be performed at least at one point on ground level, furthermore the number of environmental sampling and measurements could be reduced, too.

5.3. For special facilities not mentioned in Subsections 5.1. and 5.2. of this Annex the activity concentration of radionuclides in soil, ground water, river water and sediment, and air, grass, indicator plant samples shall be measured 2-4 times annually, depending on the discharge modes and discharged radionuclides, while the determination of external gamma-dose rate shall be more frequent.

5.4. The licensee of a nuclear power plant apart from the measurements as per Subsection 5.1. of this Annex:

5.4.1. monitors continuously the meteorological parameters influencing the atmospheric dispersion, as wind directions, wind speeds, etc., at places and heights characteristic for the discharge points.

5.4.2. determines the annual river flow rate.

6. The licensee compiles an annual report on the results of environment monitoring.

7. The annual report contains:

7.1. a brief characterization of the facility concerning the radioactive discharges and the aim of the monitoring;

7.2. the short description of the monitoring methods applied and a detailed review of the lately introduced ones;

7.3. the identification of the sampling and measuring points, the frequency of the periodical monitoring, furthermore the monitoring results and their comparison with previous data;

7.4. proposals for improvement of monitoring effectiveness, when required.

## ***Annex 6 of the Decree 15/2001. (VI.6.) KöM***

### *I. Radioactive Discharge Monitoring by the Authority*

1. The annual sampling and measuring programme of the Inspectorate for the special facilities in its competence serves the judgement of the reliability of the discharge data submitted by the facility as per Annex 4. The Inspectorate collaborates with the facility in the realisation of its discharge-monitoring programme, however performs independent samplings and measurements of a proper number and frequency.

2. The annual discharge-monitoring program of the Inspectorate contains for each discharge modes and discharge pathways the number and timing of:

- a) samplings to be performed independently of the facility,
- b) samplings to be performed together with the facility,
- c) samples to be provided by the facility,

furthermore the sort and volume of samples and the measuring methods.

3. The volume and preparation method of the sample, furthermore the sensitivity of the measuring equipment and the measurement time shall be chosen so that the detection limit guarantee the determination of the activity of discharged radionuclides.

4. For the determination of activities and activity concentrations nuclide specific measuring methods shall be applied.

### *II. The Monitoring of Radioactive Contamination of the Air and Water Environment*

1. The Inspectorate monitors the radioactive contamination of the air and water environment based on its annual sampling and measuring programme and in co-operation with other monitoring and information systems:

- a) within the scope of country-wide monitoring,
- b) furthermore according to more complex programmes in the environment of special facilities.

2. The samples analysed by the measuring laboratory of the Inspectorate consist of:

- a) air: elemental, organic and inorganic chemical forms, aerosol components and fall-out,

b) water environment: surface and ground water, sediment, indicator aquatic plants, fish and other aquatic living organisms, when required.

3. At the allocation of the sampling points of the country-wide monitoring programme the previous practice and experiences of monitoring, furthermore the national and international obligations for data supply shall be taken into consideration. The selection of one air sampling point per Inspectorate, furthermore at least one sampling point for each major surface water and water base is justified.

4. The sampling points in the environment of a special facility shall be determined by consideration of the discharge pathways, meteorological and other conditions, which may result in spots with higher contamination in the environment. The number of sampling points shall be between 1 and 5, depending on the facility.

5. The sampling shall be performed within the scope of country-wide monitoring quarterly, as a minimum. The sampling frequency for the environment of a special facility shall ensure the detection of radionuclides with half-lives of several days, too.

6. The volume and preparation method of the sample, furthermore the sensitivity of measuring equipment and the measurement time shall be chosen so that the detection limit corresponds to the international and national quality levels. Reference levels are the following: 1 Bq/kg for gamma-spectrometric analyses, 0.01 Bq/kg for alpha- spectrometry, 1 Bq/kg for tritium (HTO) determination and 0.1 Bq/kg for other beta-measurements.

7. In general, nuclide specific measuring methods shall be applied for the determination of activities and activity concentrations. Gross-beta measurement results may be accepted only as indicators of changes in screening investigations, which shall be completed by adequate nuclide specific analyses, when required.