COMMISSION RECOMMENDATION

of 8 June 2000

on the application of Article 36 of the Euratom Treaty concerning the monitoring of the levels of radioactivity in the environment for the purpose of assessing the exposure of the population as a whole

(notified under document number C(2000) 1299)

(2000/473/Euratom)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Article 124 and Article 36 thereof,

Having consulted the group of persons appointed in accordance with Article 31 of the Euratom Treaty by the Scientific and Technical Committee,

Whereas:

(1) Article 35 of the Euratom Treaty requires each Member State to establish the facilities necessary to carry out continuous monitoring of the level of radioactivity in the air, water and soil and to ensure compliance with the basic standards.

(2) Article 36 of the Euratom Treaty requires the appropriate authorities periodically to communicate information on the checks referred to in Article 35 of the Euratom Treaty to the Commission so that it is kept informed of the level of radioactivity to which the public is exposed.

(3) Experience has been gained in the application of Article 36 of the Euratom Treaty. It is current practice for the Commission to publish annual monitoring reports, on the basis of quality controlled data received by the Commission in application of Article 36 and Article 39 of the Euratom Treaty. The Commission should continue to publish such annual monitoring reports.

(4) To ensure that the exposure of the population is kept under review it is important that the Commission be informed in a timely fashion and on a uniform basis of the levels of radioactivity to which the population as a whole is exposed in every Member State.

(5) Article 14 of Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation [1] (the Basic Safety Standards) requires contribution to the exposure of the population as a whole from all practices to be regularly assessed.

(6) Article 45 of the Basic Safety Standards requires the competent authorities to ensure that dose estimates for the population as a whole are made as realistic as possible.

(7) Without prejudice to the requirements of Article 35 of the Euratom Treaty, it is sufficient for the review of the exposure of the population as a whole to provide a defined set of specific monitoring results.

(8) To ensure compliance with the Basic Safety Standards it is important that, in addition to air, water and soil, levels of radioactivity be determined in biological samples and in particular in foodstuffs, and that, to assess external exposure, the ambient dose rates be monitored.

(9) The monitoring of levels of radioactivity in soil does not allow a direct assessment of the exposure of the population. The exposure related to soil contamination is more directly assessed on the basis of ambient dose rate and foodstuff contamination. Experience has shown that the incorporation of soil data in the monitoring serves little useful purpose.

(10) It is necessary to keep under review which sampling media and which radionuclide categories are relevant indicators of actual and potential levels of radioactivity in the environment and of exposure of the population.

(11) There is consensus among Member States as to the adequacy of current monitoring programmes. Such monitoring may change in function of the evolution of levels of radioactivity, measurement technology, and the needs in view of emergency response. The Commission will keep under review the adequacy of monitoring programmes and will involve the group of experts established under Article 31 of the Euratom Treaty in this process.

[1] OJ L 159, 29.6.1996, p. 1.

(12) In the framework of Article 37 of the Euratom Treaty, the data on discharges of radionuclides to the environment from nuclear power plants and reprocessing plants are already requested in Commission Recommendation 1999/829/Euratom of 6 December 1999 on the application of Article 37 of the Euratom Treaty ([2]).

(13) Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption ([3]) provides for indicator parameters for radioactivity. This Recommendation is without prejudice to specific requirements under Annex II and Annex III to that Directive.

(14) The uniformity, comparability, transparency and timeliness of data reported in accordance with Article 36 of the Euratom Treaty should be ensured.

HEREBY RECOMMENDS:

1. In order to discharge their obligation under Article 36 of the Euratom Treaty periodically to communicate information on the results of the monitoring of the levels of radioactivity which they are bound to perform under the terms of Article 35 of that Treaty, the Member States should forward to the Commission, in accordance with the time periods set out in point 5(c), the monitoring results listed in Annex I. In case of an elevated concentration of a radionuclide not specified in Annex I, appropriate date should also be forwarded.

2. For the purposes of this Recommendation, the following definitions apply:

   (a) 'continuous monitoring' means the existence and implementation of a continuing monitoring programme. Depending on the medium monitored, this is achieved as appropriate through:

      (i) continuous sampling and assessment;

      (ii) continuous sampling and periodic assessment;

      (iii) periodic sampling and periodic assessment;

      (iv) direct continuous measurement;

   (b) 'facilities' means the monitoring programme, the direct measurement and sampling and analysis equipment and procedures (including quality control and the reporting and archiving of all relevant data), and the laboratories necessary to implement continuous monitoring of the levels of radioactivity;

   (c) 'monitoring network' means the combination of each medium of the sampling and direct measurement locations, as appropriate, used for the monitoring of that specific medium;

   (d) 'dense monitoring network' means a monitoring network comprising sampling locations distributed throughout the Member State's territory such as to allow the Commission to compute regional averages for radioactivity levels in the Community;

   (e) 'sparse monitoring network' means a monitoring network comprising for every region and for every sampling medium at least one location representative of that region. At such locations high sensitivity measurements should be performed thus giving a transparent representation of actual levels and trends of radioactivity levels;

   (f) 'region' means each representative area of a Member State for the assessment of the radiological exposure of the population as a whole under consideration of the radiological impact by emissions and ambient dose and the population distribution. The regions currently defined in the Commission monitoring reports are given in Annex II.

3. Member States should notify to the Commission the appropriate authorities referred to in Article 36 of the Euratom Treaty.

4. The following requirements should be met:

   (a) *Monitoring networks*

      (i) Each Member State should define representative geographical regions for its own territory.

      (ii) Each Member State should define for each type of medium a sparse monitoring network and a dense monitoring network.

      (iii) The sites comprising a network should be representative of the regional situation taking into account, where appropriate, the population distribution within the region.

   (b) *Sampling media, types of measurements, and periodicity*

      (i) The sampling media and types of measurements are listed in Annex I. Except where otherwise specified in this Recommendation, measurements should preferably be carried out for the sparse network on a monthly basis and for the dense network quarterly.

      (ii) For the sparse monitoring network, the detection limits and sensitivities of the measurement instruments should allow the actual levels to be quantified.

      (iii) For the dense monitoring network, the detection limits of the measurement devices should be lower than the reporting levels defined in Annex III.

([2]) OJ L 324, 16.12.1999, p. 23.
([3]) OJ L 330, 5.12.1998, p. 32.

(iv) The Member States should inform the Commission of the detection limits and of the uncertainties taken into account.

(v) The Member States should retain measurement techniques that have proven reliable and ensure quality control of the results.

(vi) Member State laboratories supplying data under the terms of this Recommendation should periodically participate in intercomparison exercises, in particular those organised by the Commission, so as to ensure the intercomparability of the data reported.

(c) *Sampling strategies and measurements in relation to each of the required sampling media*

(i) Airborne particulates

Measurements of gamma emitting radionuclides should be performed on a routine basis to detect and measure man-made radioisotopes as well as naturally occurring radionuclides. Beryllium-7 should be reported as a qualitative check of the methods used. Where gross beta activity [4] measurements are recorded these should also be reported.

Sampling locations should be in the vicinity of densely populated areas; adequate geographical coverage should be ensured by the choice of at least one sampling location per geographical region.

Sampling should be performed by systems operating continuously.

(ii) External ambient gamma dose rates should be measured continuously. No reporting level is defined.

(iii) Surface water

Samples should be taken from major inland waters of the Member States' territory and, if relevant, from coastal waters.

In the case of river water, sampling should be carried out, where practicable, at locations for which flow rate measurements are available. In such cases, the average flow rate during the sampling period should be reported to improve the representativeness of the mean values calculated by the Commission.

Gamma emitting radionuclides should be monitored. Where residual beta activity [5] measurements are recorded these should also be reported.

(iv) Water intended for human consumption

Monitoring of levels of radioactivity in drinking water should be such as to ensure compliance with the requirements of Directive 98/83/EC.

For the purposes of compliance with Article 36 of the Euratom Treaty, values should be reported for major ground or surface water supplies and for water distribution networks such as to ensure a representative coverage of the Member State.

The corresponding volumes of water distributed or produced in a year should be reported to improve the representativeness of the mean values calculated by the Commission.

(v) Milk

Milk samples should be taken from dairies. The necessary statistical information on production rates should be reported to improve the representativeness of the mean values calculated by the Commission. The spread of dairies should be sufficient to ensure representative coverage of the Member State.

Gamma emitters and strontium-90 should be monitored; potassium-40 should be reported as a qualitative check of the methods used.

(vi) Mixed diet

Due to the trade in foodstuffs, the mixed diet is not necessarily representative of the regional or national environmental contamination but is an indicator of public exposure.

Where appropriate, foodstuffs are measured as separate ingredients; in this case the Member State should report to the Commission the results of measurements of the individual ingredients and the composition of the diet. The sampling programme should take into consideration regional variations in dietary patterns. Individual ingredients should be from market places or local distribution centres providing food products to large population groups. Appropriate account should be taken of products from natural or semi-natural ecosystems, to the extent that the fallout from the Chernobyl accident may still affect such systems.

In addition, Member States should sample complete meals to give a representative figure for the average level of radioactivity in mixed diet. Actual meal samples should be taken from large consumption centres such as canteens or restaurants.

[4] The total measured beta activity in a sample; depending on the measurement methodology tritium and in general very low energy beta emitters are normally not included and short lived radon daughters are excluded through a sufficient delay time (e.g. five days) before counting.

[5] The total measured beta acitivity minus potassium-40 activity.

Gamma emitters and strontium-90 should be monitored; the measurements should be not less frequent than quarterly. Where carbo-14 measurements are performed, these should also be reported.

5. The procedure for reporting to the Commission should be as follows:

(a) *Treatment of data*

The Member States should forward to the Commission data which have been subject to quality control and cleared for public release. The data set should contain all details listed in Annex IV.

The Member States should forward the data in the format defined by the Commission and preferably use the specialised software provided by the Commission.

Tndividual non-aggregated measurement data should be transmitted for each medium and each site rather than average values. However, if the data correspond to direct continuous measurements, then the monthly averages for each site should be communicated.

(b) *Means of transmission*

Data should be forwarded in a digital form using the most appropriate electronic media.

(c) *Periodicity*

All available data should be forwarded to the Commission as soon as they are validated in order to allow for a prompt assessment by the Commission of the impact of environmental radioactivity on public health. All data for a calendar year should be submitted no later than 30 June of the following year.

(d) *Transmission of other data*

In addition to the data transmitted under point (a), Member States should transmit to the Commission their national monitoring reports to allow a fuller understanding of the significance of the data referred to in Annex I in relation to the national monitoring programmes. The Commission's annual monitoring reports will list references to those national reports.

(e) *Intergration of reporting practices*

Data regularly reported under Article 36 of the Euratom Treaty, data voluntarily reported other than national monitoring reports and large amounts of data of types potentially relevant in emergency situations should be forwarded through the same communication means and channels and in the same format in order to simplify reporting practices and to avoid duplication of efforts and to conduct regular exercises of the emergency arrangements.

6. This Recommendation is addressed to the Member States.

Done at Brussels, 8 June 2000.

For the Commission
Margot WALLSTRÖM
Member of the Commission

ANNEX I

Sample types and measurements

Media	Measurement category	
	Dense network	Sparse network
Airborne particulates	Cs-137, gross beta	Cs-137, Be-7
Air	Ambient gamma dose rate	Ambient gamma dose rate
Surface water	Cs-137, residual beta	Cs-137
Drinking water	Tritium, Sr-90, Cs-137 Natural radionuclides as monitored in compliance with Council Directive 98/83/EC	Tritium, Sr-90, Cs-137 Natural radionuclides as monitored in compliance with Council Directive 98/83/EC
Milk	Cs-137, Sr-90	Cs-137, Sr-90, K-40
Mixed diet	Cs-137, Sr-90	Cs-137, Sr-90, C-14

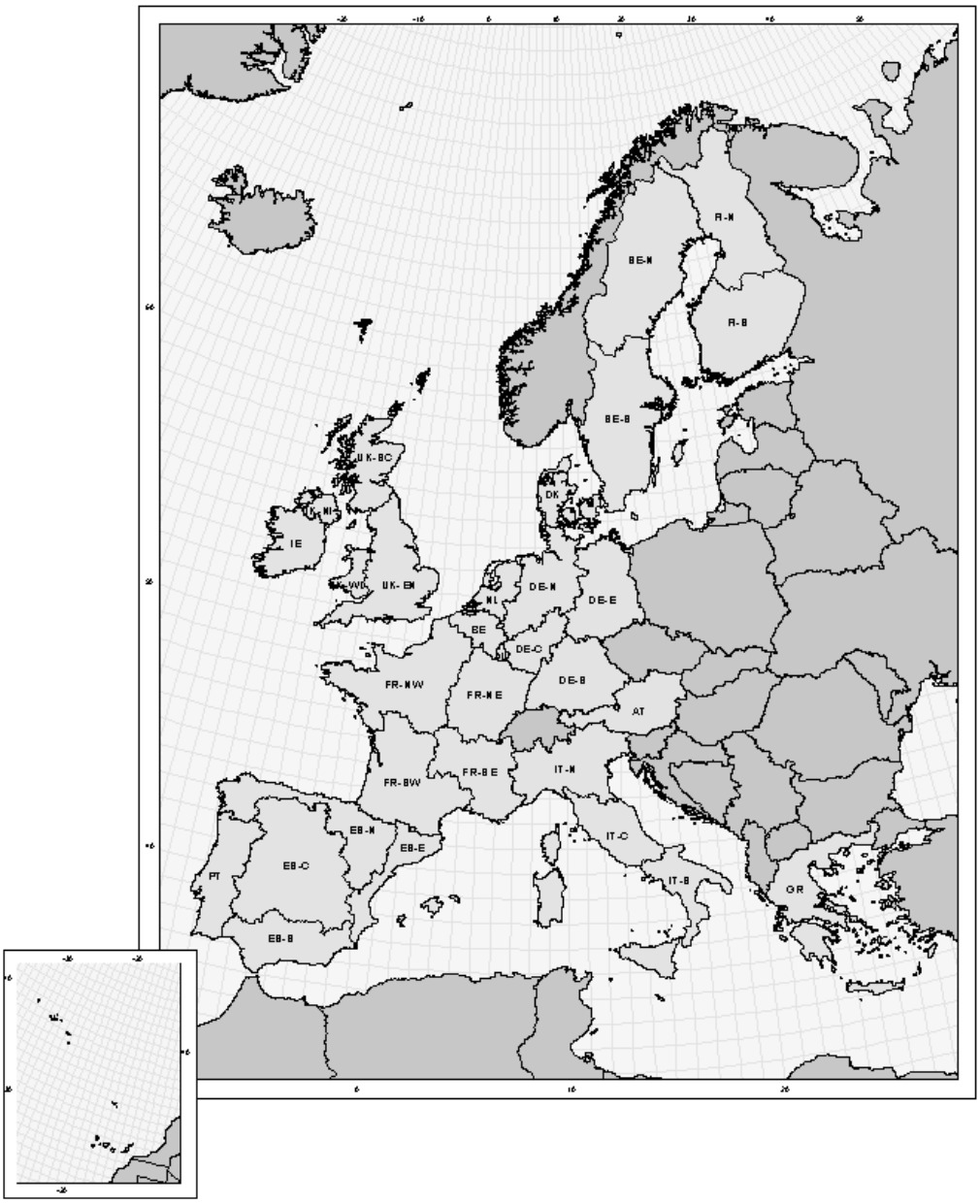
ANNEX II

Definition of country partitions and country codes according to ISO 3166/4217

Country	Geographical region	Detailed description
AT	Austria	
BE	Belgium	
DE-N	Germany — North	Bremen, Hamburg, Nordrhein-Westfalen, Niedersachsen and Schleswig-Holstein
DE-C	Germany — Central	Hessen, Rheinland-Pfalz and Saarland
DE-S	Germany — South	Baden-Württemberg and Bayern
DE-E	Germany – East	Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt and Thüringen
DK	Denmark	
ES-N	Spain — North	Aragón, Asturias, Cantabria, Galicia, Navarra, Pais Vasco and Rioja
ES-C	Spain — Central	Castilla-La Mancha, Castilla-León, Extremadura and Madrid
ES-S	Spain — South	Andalucia, Canarias, Ceuta and Melilla and Murcia
ES-E	Spain — East	Baleares, Cataluña and Communidad Valenciana
FI-N	Finland — North	Lappland and Oulu
FI-S	Finland — South	Ahvenanmaa, Central Finland, Hame, North Karelia, Kuopio, Kymi, Mikkeli, Turku and Pori, Uusimaa and Vaasa
FR-NW	France — Northwest	Brittany, Centre, Île de France, Nord-Pas-de-Calais, Haute Normandie, Basse Normandie, Pays de la Loire and Picardie
FR-NE	France — Northeast	Alsace, Burgundy, Champagne-Ardenne, Franche-Comté and Lorraine
FR-SW	France — Southwest	Aquitaine, Languedoc-Roussillon, Limousin, Midi-Pyrénées and Poitou-Charentes
FR-SE	France — Southeast	Auvergne, Corse, Provence-Alpes-Côte-d'Azur and Rhône-Alpes
GR	Greece	
IE	Ireland	
IT-N	Italy — North	Emilia-Romagna, Friuli-Venezia-Giulia, Liguria, Lombardy, Piemonte, Provincie di Trento e Bolzano, Val d'Aosta and Veneto
IT-C	Italy — Central	Abruzzo, Lazio, Marche, Molise, Tuscany, Umbria and Sardinia
IT-S	Italy — South	Basilicata, Calabria, Campania, Puglia and Sicily

Country	Geographical region	Detailed description
LU	Luxembourg	
NL	Netherlands	
PT	Portugal	
SE-N	Sweden — North	Jämtland, Norrbotten, Västerbotten and Västernorrland
SE-S	Sweden — South	Ålvsborg, Blekinge, Bohus Gävleborg, Gotland, Halland, Jönköping, Kalmar, Kopparberg, Kronoberg, Malmöhus, Örebro, Östergötland, Skaraborg, Skane, Södermanland, Stockholm, Uppsala, Värmland and Västmanland.
UK-EN	United Kingdom — England	East Anglia, Northern England, North-West England, South-East England, South-West England, East Midlands, West Midlands and North-East England
UK-SC	United Kingdom — Scotland	
UK-WL	United Kingdom— Wales	
UK-NI	United Kingdom— Northern Ireland	

Definition of the geographical regions



ANNEX III

Reporting levels

Uniform reporting levels have been defined on the basis of their significance from an exposure point of view, irrespective of the detection limits applied by the different laboratories.

Sample type	Radionuclide category	Reporting level
Air	Gross beta (based on Sr-90)	5 E−03 Bq/m^3
	Cs-137	3 E−02 Bq/m^3
Surface water	Residual beta (based on Sr-90)	6 E−01 Bq/l
	Cs-137	1 E+00 Bq/l
Drinking water	H-3	1 E+02 Bq/l
	Sr-90	6 E−02 Bq/l
	Cs-137	1 E−01 Bq/l
Milk	Sr-90	2 E−01 Bq/l
	Cs-137	5 E−01 Bq/l
Mixed diet	Sr-90	1 E−01 Bq/d.p ([1])
	Cs-137	2 E−01 Bq/d.p

([1]) Becquerel per person per day.

ANNEX IV

LIST OF MINIMUM REQUIREMENTS PER DATA RECORD

1. REQUIREMENTS FOR SAMPLING DATA

A. **Sample characteristics**

Sample type

Sample treatment (e.g. chemical treatment, delay of five days, etc.)

B. **Date and time**

Sampling date

Date type (e.g. begin date, end date, etc.)

Sampling time [1]

Time system [1] (e.g. GMT)

Duration of sampling (in hours)

C. **Location**

Locality name

NUTS-Code

Latitude, longitude specified in degrees, minutes or in decimal degrees

Catchment [1] (for surface waters: name of river, lake, reservoir or sea)

2. REQUIREMENTS FOR MEASUREMENT DATA

Laboratory name

Nuclide category

Apparatus type

Activity value

Uncertainty

Uncertainty type

Value unit

Value type

Reference date [1] (date for which the activity value is given)

Flow rate [1] (in case of river water)

Production rate [1] (for milk and drinking water)

Volume produced or distributed in a year (for drinking water).

[1] Only to be mentioned if appropriate.