II

(Acts whose publication is not obligatory)

COMMISSION

COMMISSION RECOMMENDATION
of 6 December 1999
on the application of Article 37 of the Euratom Treaty

(notified under document number C(1999) 3932)

(1999/829/Euratom)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Atomic Energy Community, and in particular Articles 37 and 124 thereof,

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

(1) Whereas Article 37 requires that each Member State is to provide the Commission with such general data relating to any plan for the disposal of radioactive waste in whatever form as will make it possible to determine whether the implementation of such plan is liable to result in the radioactive contamination of the water, soil or airspace of another Member State. The Commission is to deliver its opinion within six months, after consulting the group of experts referred to in Article 31;

(2) Considering the experience acquired in the application of the Commission Recommendations of 16 November 1960 ([1]), 82/181/Euratom ([2]) and 91/4/Euratom ([3]) concerning the application of Article 37 of the Treaty;

(3) Whereas the Court of Justice of the European Communities in its judgement of 22 September 1988 in Case 187/87 ([4]) ruled as follows: 'Article 37 of the Treaty of 25 March 1957 establishing the European Atomic Energy Community must be interpreted as meaning that the Commission of the European Communities must be provided with general data relating to any plan for the disposal of radioactive waste before such disposal is authorised by the competent authorities of the Member State concernend';

(4) Whereas in the same judgement the Court stated that, 'Consequently, it must be acknowledged that, where a Member State makes the disposal of radioactive waste subject to authorisation, the Commission's opinion must, in order to be rendered fully effective, be brought to the notice of that State before the issue of any such authorisation';

(5) Whereas Article 37 has as its objective to forestall any possibility of radioactive contamination of another Member State; whereas the Commission, having consulted the abovementioned group of experts, has deemed disposal of radioactive waste associated with certain operations to be not liable to result in the radioactive contamination of another Member State;

([1]) OJ 81, 21.12.1960, p. 1893/60.
([2]) OJ L 83, 29.3.1982, p. 15.
([3]) OJ L 6, 9.1.1991, p. 16.
([4]) [1988] ECR, p. 5013.

(6) Whereas in exceptional cases due to information received, the Commission may call for general data to be submitted for a plan for the disposal of radioactive waste, otherwise deemed not to be liable to result in the radioactive contamination of another Member State on the basis of the present Recommendation; whereas the Commission's opinion may then pertain to an authorisation which has been granted at an earlier stage;

(7) Whereas the basic safety standards for the health protection of the general public and workers against the dangers of ionising radiation have been revised by Directive 96/29/Euratom [1] and the application of Article 37 should reflect these revisions where appropriate;

(8) Whereas to appraise disposal plans in a consistent manner, it is necessary to specify which types of operation may result in the disposal of radioactive waste within the meaning of Article 37 of the treaty, and to specify for the different types of operation which information is to be supplied as the general data;

(9) Whereas all Member States have now declared that they will desist from sea dumping,

HEREBY RECOMMENDS:

1. That the 'disposal of radioactive waste' within the meaning of Article 37 of the Treaty should cover any planned disposal or accidental release of radioactive substance associated with the operations listed below, in gaseous, liquid or solid form in or to the environment.

   1. The operation of nuclear reactors.

   2. The reprocessing of irradiated nuclear fuel.

   3. The mining, milling and conversion of uranium and thorium.

   4. U-235 enrichment of uranium.

   5. The fabrication of nuclear fuel.

   6. The storage of irradiated nuclear fuel in dedicated facilities [2].

   7. The handling and processing of radioactive substances on an industrial scale [3].

   8. The processing or storage of radioactive waste [2] arising from operations (1) to (7) and (9).

   9. The dismantling of nuclear reactors and reprocessing plants.

   10. The emplacement above or under the ground of radioactive wastes without the intention of retrieval.

   11. The sea dumping of radioactive waste [4].

   12. The sub-seabed burial of radioactive wastes [4].

   13. Work activities involving natural raiation sources and identified under the terms of Title VII of the Basic Safety Standards by the Member States involved as being of concern with regard to the resulting disposal of radioactive wastes and as requiring to be subject to prior authorisation.

   14. All other operations.

2. That 'general data' within the meaning of Article 37 of the Treaty be understood to mean:
   — for operations (1) to (8) the information set out in Annex 1
   — for operations listed under (9) the information set out in Annex 2
   — for operations listed under (10) the information set out in Annex 3

[1] OJ L 159, 29.6.1996, p. 1, to be implemented by May 2000.
[2] Provided that the operation is not incorporated in a plan submitted under another heading.
[3] Excluding industrial work activities (involving the presence of natural radiation sources) covered by Title VII of the Basic Safety Standards (Directive 26/29/Euratom).
[4] At this moment no Member State intends to carry out this operation.

— for operations listed under (11) and (12) such information as will be required by the Commission on a case-by-case basis

— for operations listed under (13) the relevant parts of the information set out in Annex 1, as required for the specific work activity (Chapters 6 and 7 are normally not applicable).

3. That operations falling within the scope of point 1 (14) are deemed not to be liable to result in the radioactive contamination of another Member State, significant from the point of view of health, unless the point of view of health, unless in any specific case the Commission calls for such general data to be provided.

4. That, if a Member State envisages modifying a plan for the disposal of radioactive waste, the submission of general data be governed by the following conditions:

4.1.(a) If a Member State envisages modifying a plan for the disposal of radioactive waste, on which an opinion has already been given under the terms of Article 37, a submission of general data containing at least the information set out in a standard form in Annex 4 is necessary if the authorised waste are less restrictive than in the existing plan or if the potential consequences of the reference accident(s) evaluated in the licensing procedure are increased.

4.1.(b) Unless the Commission calls for general data to be communicated, no submission of general data is necessary if no new authorisation or licence is required.

or if:

— the modification of the plan for the disposal of radioactive waste envisages unchanged or more restrictive authorised limits and associated requirements than in the existing plan and

— the potential consequences of the reference accident(s) are unchangend or decreased.

4.2. In the case of a plan for the disposal of radioactive waste on which no opinion has already been given under the terms of Article 37, a submission of the general data is necessary unless the Member State provides the Commission with a statement demonstrating that the conditions outlined in point 4.1.(b) are met.

5. That, the 'general data' be submitted to the Commission:

5.1. whenever possible one year but not less than six months

— before any authorisation for the disposal of radioactive waste is granted by competent authorities, or

— before start-up of those operations for which no disposal authorisation is foreseen, or

— for operations (9), if the proposed authorised limits and associated requirements for the disposal of radioactive waste are less restrictive than those in the plan for the existing installation, or if the potential conseuqences of reference accident(s) are increased, before any corresponding new authorisation for the disposal of radioactive waste is granted by the competent authorities, and,

5.2. in cases where the Commission has called for general data in accordance with point 3, no later than six months after the request, without prejudice to any authorisation duly granted by the competent authorities pending receipt of the Commission's request. Any authorisation granted before the Commission called for general data shall be reviewed in the light of the Commission's subsequent opinion.

6. That, since submission of a plan for the disposal of radioactive waste is the responsibility of the relevant Member State, that State accepts responsibility for all information submitted to the Commission in respect of such a plan.

7. That the Member State concerned informs the Commission of the actions it envisages in response to any recommendation given in an opinion of the Commission on a disposal plan.

8. That Member States communicate to the Commission for information:

(a) the authorisation(s) for disposal of radioactive waste for comparison with the information in the general data on which its opinion was based;

(b) preferably annually and at least every two years, a statement on the radioactive liquid and atmospheric waste discharges to the environment from nuclear power reactors and reprocessing plants and, where appropriate, revisions of the authorisation(s) for disposal of radioactive waste that occurred during the period covered. This statement should be provided within nine months of that period.

This recommendation is addressed to the Member States.

It replaces Recommendation 91/4/Euratom.

Done at Brussels, 6 December 1999.

For the Commission

Margot WALLSTRÖM

Member of the Commission

ANNEX 1

'GENERAL DATA'

applicable to Operations (1) to (8)

INTRODUCTION

— general presentation of the plan

— present stage of licensing procedure, envisaged commissioning steps.

1. **The site and its surroundings**

1.1. *Geographical, topographical and geological features of the site and the region with*

— a map of the region showing the location and geographical coordinates (degrees, minutes) of the site

— the relevant features of the region

— the location of the installation in relation to such other installations, the discharges from which need to be considered in conjunction with those from the installation in question

— the location of the site with regard to other Member States giving the distances from frontiers and closest conurbations, together with their populations.

1.2. *Seismology*

— the degree of seismic activity in the region; probable maximum seismic activity and designed seismic resistance of the installation.

1.3. *Hydrology*

For an installation situated near to a water body providing a potential contamination pathway to another Member State, a brief description of appropriate hydrological features, extending to the other Member State(s), for example:

— brief description of the path(s), tributaries, estuary, water abstraction, flood plains, etc.

— average, maximum and minimum water flows and their frequency of occurrence

— underground water table, levels and flows

— brief description of the littoral areas

— direction and force of currents, tides, circulation patterns, both local and regional

— flood risk and protection of the installation.

1.4. *Meteorology*

Local climatology with frequency distributions of:

— wind directions and speeds

— precipitation intensity and duration

— for each wind sector, atmospheric dispersion conditions, duration of temperature inversions.

1.5. *Natural resources and foodstuffs*

Brief description of:

— soil characteristics and ecological features of the region

— water utilisation in the region and as appropriate in neighbouring Member States

— principal food resources in the region and as appropriate in other Member States: crops, stock breeding, fishing, hunting and, for discharges into sea, data on fishing in territorial and extraterritorial waters

— foodstuff distribution system and particularly the export to other Member States from the regions concerned, in so far as they are related to the risk of exposure from discharges through the significant exposure pathways.

1.6. *Other activities in the vicinity of the site*

— where appropriate, any industrial or military activities, surface and aerial traffic and any other factors which may have an influence on the safety of the installation

— protection measures.

2. **The installation**

2.1. *Main features of the installation*

— brief description of the installation

— type, purpose and main features of the processes

— site layout plan

— safety provisions.

2.2. *Ventilation systems and the treatment of gaseous and airborne wastes*

Description of ventilation, decay, filtration and discharge systems, in normal conditions and in the case of an accident, including flow diagrams

2.3. *Liquid waste treatment*

Description of liquid waste treatment facilities, storage capacities and discharge systems, including flow diagrams

2.4. *Solid waste treatment*

Description of solid waste treatment facilities and storage capacities

2.5. *Containment*

Description including leaktightness specification and testing

2.6. *Decommissioning and dismantling*

— envisaged period of operation of the installation

— consideration given to decommissioning and dismantling

— outline of regulatory and administrative provisions for decommissioning and dismantling.

3. **Release from the installation of airborne radioactive effluents in normal conditions**

3.1. *Authorisation procedure in force*

— outline of the procedure in force

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

3.2. *Technical aspects*

— annual discharges foreseen

— origins of the radioactive effluents, their composition and physico-chemical forms

— management of these effluents, methods and paths of release.

3.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of the monitoring equipment

— alarm levels, intervention actions (manual and automatic).

3.4. *Evaluation of transfer to man*

3.4.1. Models and parameter values used to calculate the consequences of the releases:

— atmospheric dispersion of the effluents

— ground deposition and resuspension

— food chains, inhalation, external exposure etc.

— living habits (diet, exposure time, etc.)

— other parameter values used in the calculations.

3.4.2. Evaluation of concentration and exposure levels associated with the discharge limits cited in 3.1:

— annual average concentrations of activity in the atmosphere near the ground and surface contamination levels, for the most exposed areas in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States, corresponding annual exposure levels: effective dose to adults, children and infants, taking account of all significant exposure pathways.

3.5. *Radioactive discharges to atmosphere from other installations*

Procedures for coordination with radioactive discharges from other installations referred to in 1.1, third indent.

4. **Release from the installation of liquid radioactive effluents in normal conditions**

4.1. *Authorisation procedure in force*

— outline of the general procedure involved

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

4.2. *Technical aspects*

— annual discharges foreseen

— origins of the radioactive effluents, their composition and physico-chemical forms

— management of the effluents, methods and paths of release.

4.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of monitoring equipment

— alarm levels, intervention actions (manual and automatic).

4.4. *Evaluation of transfer to man*

4.4.1. Models and parameter values used to calculate the consequences of the releases:

— aquatic dispersion of the effluents

— their transfer by sedimentation and ion exchange

— food chains, inhalation of sea spray, external exposure, etc.

— living habits (diet, exposure time, etc.)

— other parameter values used in the calculations.

4.4.2. Evaluation of concentration and exposure levels associated with the discharge limits cited in 4.1:

— annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States: effective dose to adults, children and infants, taking account of all significant exposure pathways.

4.5. *Radioactive discharges into the same receiving waters from other installations*

Procedures for coordination with discharges from other installations referred to in 1.1, third indent.

5. **Disposal from the installation of solid radioactive waste**

5.1. *Categories of solid radioactive waste including, where appropriate, spent fuel, and estimated amounts*

5.2. *Processing and packaging*

5.3. *Storage arrangements*

5.4. *Radiological risks to the environment, precautions taken*

5.5. *Arrangements for the movement and destinations of the different waste categories transferred off site*

5.6. *Criteria for contaminated materials to be released from the requirements of the Basic Safety Standards*

— clearance levels established by competent authorities.

6. **Unplanned releases of radioactive effluents**

6.1. *Review of accidents of internal and external origin which could result in unplanned releases of radioactive substances*

List of the accidents studied in the safety report.

6.2. *Reference accident(s) taken into consideration by the competent national authorities for evaluating possible radiological consequences in the case of unplanned releases*

Outline of the accident(s) considered and reasons for its (their) choice.

6.3. *Evaluation of the radiological consequences of the reference accident(s)*

6.3.1. Entailing releases to atmosphere

— assumptions used to calculate the releases to atmosphere

— release paths; time patterns of the releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameter values used to calculate for the releases their atmospheric dispersion, ground deposition, resuspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— maximum time-integrated concentrations of radioactivity in the atmosphere near the ground and maximum surface contamination levels (in dry and wet weather) for the most exposed areas in the vicinity of the plant and for relevant areas in other Member States

— corresponding maximum exposure levels: effective dose to adults, children and infants living in relevant areas of other Member States taking account of all significant exposure pathways.

6.3.2. Entailing releases into an aquatic environment

— assumptions used to calculate the liquid release

— release paths, time pattern of releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameters used to calculate for the releases their aquatic dispersion, their transfer by sedimentation and ion exchange, their transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other Member States taking account of all significant exposure pathways.

7. **Emergency plans, agreements with other Member States**

In relation to possible radiological emergencies which may affect other Member States in order to facilitate the organisation of radiological protection in these States,

Brief description of:

— intervention levels established for different types of countermeasures

— emergency planning arrangements, including the emergency planning zones adopted for the installation

— arrangements in place for the early exchange of information with other Member States, bilateral or multilateral agreements on transfrontier information, coordination of emergency plans and their implementation and mutual assistance

— emergency plan testing arrangements with particular reference to the involvement of other Member States.

8. **Environmental monitoring**

— external radiation monitoring

— monitoring of radioactivity in air, water, soil and the food chains, whether undertaken by the operator or by competent authorities.

With reference to 3.1 and 4.1, monitoring programmes as approved by the competent national authorities, organisation, sample forms and frequency, type of monitoring instruments used in normal and accident circumstances; where appropriate, any collaboration arrangements in this respect with neighbouring Member States.

ANNEX 2

'GENERAL DATA'

applicable to Operation (9)

INTRODUCTION

— general presentation of the plan

— description of the different dismantling phases envisaged

— dismantling licensing procedures.

1. **The site and its surroundings**

1.1. *Geographical, topographical and geological features of the site and the region with*

— a map of the region showing the location and geographical coordinates (degrees, minutes) of the site

— the relevant features of the region

— the location of the installation in relation to such installations, the discharges from which need to be considered in conjunction with those from the installation in question

— the location of the site with regard to other Member States giving the distances from frontiers and closest conurbations, together with their populations.

1.2. *Hydrology*

For an installation situated near to a water body providing a potential contamination pathway to another Member State, a brief description of appropriate hydrological features, extending to the other Member State(s), for example:

— brief description of the path(s), tributaries, estuary, water abstraction, flood plains, etc.

— average, maximum and minimum water flows and their frequency of occurrence

— underground water table, levels and flows

— brief description of the littoral areas

— direction and force of currents, tides, circulation patterns, both local and regional

— flood risk and protection of the installation.

1.3. *Meteorology*

Local climatology with frequency distributions of:

— wind directions and speeds

— precipitation intensity and duration

— for each wind sector, atmospheric dispersion conditions, duration of temperature inversions.

1.4. *Natural resources and foodstuffs*

Brief description of:

— soil characteristics and ecological features of the region

— water utilisation in the region and as appropriate in neighbouring Member States

— principal food resources in the region and as appropriate in other Member States: crops, stock breeding, fishing, hunting and, for discharges into sea, data on fishing in territorial and extraterritorial waters

— foodstuff distribution system and particularly the export to other Member States from the regions concerned, in so far as they are related to the risk of exposure from discharges through the significant exposure pathways.

2. **The installation**

2.1. *Brief description and history of the installation to be dismantled*

2.2. *Ventilation systems and the treatment of gaseous and airborne wastes*

Description of ventilation, decay, filtration and discharge systems, in normal conditions and in the case of an accident, including flow diagrams

2.3. *Liquid waste treatment*

Description of liquid waste treatment facilities, storage capacities and discharge systems, including flow diagrams

2.4. *Solid waste treatment*

Description of solid waste treatment facilities and storage capacities

2.5. *Containment*

Description including leaktightness specification and testing

3. **Release from the installation of airborne radioactive effluents in normal conditions**

3.1. *Authorisation procedure in force*

— outline of the procedure in force

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

3.2. *Technical aspects*

— annual discharges foreseen

— origins of the radioactive effluents, their composition and physico-chemical forms

— management of these effluents, methods and paths of release.

3.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of the monitoring equipment

— alarm levels, intervention actions (manual and automatic).

3.4. *Evaluation of transfer to man*

3.4.1. Models and parameter values used to calculate the consequences of the releases:

— atmospheric dispersion of the effluents

— ground deposition and resuspension

— food chains, inhalation, external exposure, etc.

— living habits (diet, exposure time, etc.)

— other parameter values used in the calculations.

3.4.2. Evaluation of concentration and exposure levels associated with the discharge limits cited in 3.1:

— annual average concentrations of activity in the atmosphere near the ground and surface contamination levels, for the most exposed areas in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States, corresponding annual exposure levels: effective dose to adults, children and infants in other Member States, taking account of all significant exposure pathways.

4. **Release from the installation of liquid radioactive effluents in normal conditions**

4.1. *Authorisation procedure in force*

— outline of the general procedure involved

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition

4.2. *Technical aspects*

— annual discharges foreseen

— origins of the radioactive effluents, their composition and physico-chemical forms

— management of the effluents, methods and paths of release.

4.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of monitoring equipment

— alarm levels, intervention actions (manual and automatic).

4.4. *Evaluation of transfer to man*

4.4.1. Models and parameter values used to calculate the consequences of the releases:

— aquatic dispersion of the effluents

— their transfer by sedimentation and ion exchange

— food chains, inhalation of sea spray, external exposure, etc.

— living habits (diet, exposure time, etc.)

— other parameter values used in the calculations.

4.4.2. Evaluation of the concentration and exposure levels associated with the discharges cited in 4.1:

— annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States: effective dose to adults, children and infants, taking account of all significant exposure pathways.

5. **Disposal from the installation of solid radioactive waste**

5.1. *Categories of solid radioactive wastes and estimated amounts*

5.2. *Processing and packaging*

5.3. *Storage arrangements*

5.4. *Radiological risks to the environment, precautions taken*

5.5. *Arrangements for the movement and destinations of classified waste transferred off-site*

5.6. *Criteria for contaminated materials to be released from the requirements of the Basic Safety Standards, for disposal, recycling or reuse*

— clearance levels established by competent authorities.

5.7. *Envisaged types and amounts of released materials.*

6. **Unplanned releases of radioactive effluents**

6.1. *Review of accidents of internal and external origin which could result in unplanned releases of radioactive substances*

List of the accidents studied in the safety report.

6.2. *Reference accident(s) taken into consideration by the competent national authorities for evaluating possible radiological consequences in the case of unplanned releases*

Outline of the accident(s) considered and reasons for its (their) choice.

6.3. *Evaluation of the radiological consequences of the reference accident(s)*

6.3.1. Entailing releases to atmosphere

— assumptions used to calculate the releases to atmosphere

— release paths; time patterns of the releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameter values used to calculate for the releases their atmospheric dispersion, ground deposition, resuspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— maximum time-integrated concentrations of radioactivity in the atmosphere near the ground and maximum surface contamination levels (in dry and wet weather) for the most exposed areas in the vicinity of the plant and for relevant areas in other Member States

— corresponding maximum exposure levels: effective dose to adults, children and infants living in relevant areas of other Member States taking account of all significant exposure pathways.

6.3.2. Entailing releases into an aquatic environment

— assumptions used to calculate the liquid release

— release paths, time pattern of releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameters used to calculate for the releases their aquatic dispersion, their transfer by sedimentation and ion exchange, their transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other Member States taking account of all significant exposure pathways.

7. **Emergency plans; agreements with other Member States**

In relation to possible radiological emergencies which may affect other Member States in order to facilitate the organisation of radiological protection in these States, Brief description of:

— intervention levels established for different types of countermeasures

— emergency planning arrangements, including the emergency planning zones adopted for the installation

— arrangements in place for the early exchange of information with other Member States, bilateral or multilateral agreements on transfrontier information, coordination of emergency plans and their implementation and mutual assistance

— emergency plan testing arrangements with particular reference to the involvement of other Member States.

8. **Environmental monitoring**

— external radiation monitoring

— monitoring of radioactivity in air, water, soil and the food chains, whether undertaken by the operator or by competent authorities

With reference to 3.1 and 4.1 monitoring programmes as approved by the competent national authorities, organisation, sample forms and frequency, type of monitoring instruments used in normal and accident circumstances; where appropriate, any collaboration arrangements in this respect with neighbouring Member States.

ANNEX 3

'GENERAL DATA'

applicable to Operation (10)

INTRODUCTION

— general presentation of the plan

— present stage of project and licensing procedure, envisaged future steps

— time scale, envisaged starting date, operational period and closure date.

1. **The site and its surroundings**

1.1. *Geographical, topographical and geological features of the site and the region with*

— a map of the region showing the location and geographical co-ordinates (degrees, minutes) of the site

— the relevant features of the region

— the location of the repository in relation to such other installations, the discharges from which need to be considered in conjunction with those from the installation in question

— the location of the site with regard to other Member States giving the distances from frontiers and closest conurbations, together with their populations.

1.2. *Seismology*

— the degree of seismic activity in the region; probable maximum seismic activity and designed seismic resistance of the installation.

1.3. *Hydrology*

For an installation situated near to a water body providing a potential contamination pathway to another Member State, a brief description of appropriate hydrological features, extending to the other Member State(s), for example:

— brief description of the path(s), tributaries, estuary, water abstraction, flood plains, etc.

— average, maximum and minimum water flows and their frequency of occurrence

— underground water table, levels and flows

— brief description of the littoral areas

— direction and force of currents, tides, circulation patterns, both local and regional

— for geological disposal, relevant details of the hydrogeological regime, including seasonal variations

— flood risk and protection of the installation.

1.4. *Meteorology*

Local climatology with frequency distributions of:

— wind directions and speeds

— precipitation intensity and duration

— for each wind sector, atmospheric dispersion conditions, duration of temperature inversions.

1.5. *Natural resources and foodstuffs*

Brief description of:

— soil characteristics and ecological features of the region

— water utilisation in the region and as appropriate in neighbouring Member States

— principal food resources in the region and as appropriate in other Member States : crops, stock breeding, fishing, hunting and, for discharges into sea, data on fishing in territorial and extraterritorial waters

— foodstuff distribution system and particularly the export to other Member States from the regions concerned, insofar as they are related to the risk of exposure from discharges through the significant exposure pathways.

1.6. *Other activities in the vicinity of the site*

— where appropriate, any industrial or military activities, surface and aerial traffic and any other factors which may have an influence on the safety of the installation

— protection measures.

1.7. *Evolution of the site*

Anticipated evolution of the site over the time period considered for assessment of long term impact:

— the natural environment; anticipated changes in geography, topography, geology, hydrology, hydrogeology, meteorology and ecology, glacial effects, and (for coastal sites) sea level changes and coastal erosion

— the human environment; assumptions made on future population patterns, habits and food sources

— sources of information and uncertainties in data.

2. **The repository**

2.1. *Conceptual approach and design*

— main features of the repository

— location, depth and design in relation to geological strata

— emplacement methods, backfill and sealing methods, timing of backfill and sealing

— contingency plans for dealing with difficulties arising during the constructional/operational phases

— approach to retrievability of waste

— plans for closure (timing and stages)

— plans for management in post-closure period

— outline of regulatory and administrative provisions for closure and postclosure periods.

2.2. *Wastes to be disposed in repository*

— waste inventory; radionuclide concentrations and quantities and restrictions on e.g. substances, concentrations, specific radioisotopes or half lives

— types of waste packaging

— type and capacity of buffer stores to be used for incoming wastes, storage methods and conditions

— waste monitoring to ensure compliance with regulations and operators local rules.

2.3. *Ventilation systems and the treatment of gaseous and airborne wastes*

Description of ventilation, filtration and discharge systems, in normal conditions and in the case of an accident, including flow diagrams.

2.4. *Liquid waste treatment facilities*

Description of liquid waste treatment facilities, storage capacities and discharge systems, including flow diagrams

3. **Release from the installation of airborne radioactive effluents in normal conditions**

3.1. *Authorisation procedure in force*

— outline of the procedure in force

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

3.2. *Technical aspects*

— annual discharges foreseen

— origins of the radioactive effluents, their composition and physicochemical forms

— management of these effluents, methods and paths of release.

3.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of the monitoring equipment

— alarm levels, intervention actions (manual and automatic).

3.4. *Evaluation of transfer to man*

3.4.1. Models and parameter values used to calculate the consequences of the releases:

— atmospheric dispersion of the effluents

— ground deposition and resuspension

— food chains, inhalation, external exposure, etc.

— living habits (diet, exposure time, etc.)

— other parameter values used in the calculations.

3.4.2. Evaluation of concentration and exposure levels associated with the discharge limits cited in 3.1:

— annual average concentrations of activity in the atmosphere near the ground and surface contamination levels, for the most exposed areas in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States, corresponding annual exposure levels: effective dose to adults, children and infants, taking account of all significant exposure pathways.

3.5. *Radioactive discharges to atmosphere from other installations*

Where appropriate, procedures for coordination with radioactive discharges from other installations, where there may be an additive effect for the exposure levels.

4. **Release from the installation of liquid radioactive effluents in normal conditions**

4.1. *Authorisation procedure in force*

— outline of the general procedure involved

— discharge limits and associated requirements envisaged by the authorities, including the assumed radionuclide composition.

4.2. *Technical aspects*

— annual discharges foreseen

— origins of these radioactive effluents, their composition and physicochemical forms

— management of these effluents, methods and paths of release.

4.3. *Monitoring of discharges*

— sampling, measurement and analysis of discharges, whether undertaken by the operator or by competent authorities

— principal features of monitoring equipment

— alarm levels, intervention actions (manual and automatic).

4.4. *Evaluation of transfer to man*

4.4.1. Models and parameter values used to calculate the consequences of the releases:

— aquatic dispersion of the effluents

— their transfer by sedimentation and ion exchange

— food chains, inhalation of sea spray, external exposure, etc.

— living habits (diet, exposure time, etc.)

— exposure levels via the significant exposure pathways

— other parameter values used in the calculations.

4.4.2. Evaluation of the concentration and exposure levels associated with the discharge limits cited in 4.1:

— annual average concentrations of activity in surface waters, at the points where such concentrations are highest, in the vicinity of the installation and in other Member States

— for the reference group(s) in other Member States : effective dose to adults, children and infants, taking account of all significant exposure pathways.

4.5. *Radioactive discharges into the same receiving waters from other installations*

Where appropriate, procedures for coordination with discharges from other installations, where there may be an additive effect for the exposure levels.

5. **Disposal from the installation of solid radioactive waste**

5.1. *Categories of solid radioactive wastes and estimated amounts*

5.2. *Processing and packaging*

5.3. *Storage arrangements*

5.4. *Radiological risks to the environment, precautions taken*

5.5. *Arrangements for the movement and destinations of the different waste categories transferred off-site*

5.6. *Criteria for contaminated materials to be released from the requirements of the Basic Safety Standards*

— clearance levels established by competent authorities.

6. **Unplanned releases of radioactive effluents**

6.1. *Review of accidents of internal and external origin which could result in unplanned releases of radioactive substances*

List of the accidents studied in the safety report.

6.2. *Reference accident(s) taken into consideration by the competent national authorities for evaluating possible radiological consequences in the case of unplanned releases*

Outline of the accident(s) considered and reasons for its (their) choice.

6.3. *Evaluation of the radiological consequences of the reference accidents*

6.3.1. Entailing releases to atmosphere

— assumptions used to calculate the releases to atmosphere

— release paths; time patterns of the releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameter values used to calculate for the releases their atmospheric dispersion, ground deposition, resuspension and transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— maximum time-integrated concentrations of radioactivity in the atmosphere near the ground and maximum surface contamination

— levels (in dry and wet weather) for the most exposed areas in the vicinity of the plant and for relevant areas in other Member States

— corresponding maximum exposure levels: effective dose to adults, children and infants living in relevant areas of other Member States taking account of all significant exposure pathways.

6.3.2. Entailing releases into an aquatic enviromnent

— assumptions used to calculate the liquid release

— release paths, time pattern of releases

— amounts and physico-chemical forms of those radionuclides released which are significant from the point of view of health

— models and parameters used to calculate for the releases their aquatic dispersion, their transfer by sedimentation and ion exchange, their transfer via food chains and to evaluate the maximum exposure levels via the significant exposure pathways

— corresponding maximum exposure levels: effective dose to adults, children and infants living in the vicinity of the plant and in relevant areas of other Member States taking account of all significant exposure pathways.

7. **Emergency plans; agreements with other Member States**

In relation to possible radiological emergencies which may affect other Member States in order to facilitate the organisation of radiological protection in these States, brief description of:

— intervention levels established for different types of countermeasures

— emergency planning arrangements, including the emergency planning zones adopted for the installation

— arrangements in place for the early exchange of information with other Member States, bilateral or multilateral agreements on transfrontier information, coordination of emergency plans and their implementation and mutual assistance

— emergency plan testing arrangements with particular reference to the involvement of other Member States.

8. **Environmental monitoring**

— external radiation monitoring

— monitoring of radioactivity in air, water, soil and the food chains, whether undertaken by the operator or by competent authorities.

With reference to 3.1 and 4.1 monitoring programmes as approved by the competent national authorities, organisation, sample forms and frequency, type of monitoring instruments used in normal and accident circumstances; where appropriate, any collaboration arrangements in this respect with neighbouring Member States.

9. **Radiological impact during post-closure phase**

9.1. *Philosophy for assuring long term safety*

— dependence placed on respective barriers, redundancy of barriers, in respect of containment of part/all of the radionuclide inventory.

9.2. *Acceptance criteria applied to repository*

— use of quantitative and qualitative indicators of safety

— use of reference groups

— time periods considered for application of indicators.

9.3. *Techniques used to evaluate long term impact of repository*

— approach to survey scenarios

— description of scenario(s) assumed; features, events and processes taken into account, and features, events and processes deliberately omitted

— methods used for assessment of impact

— sources of uncertainties and approaches to managing them

— plans for review of impact or update of safety case during the operational period up to closure.

9.4. *Results of assessment of long term impact of repository*

— main exposure pathways in vicinity of repository and other Member States resulting from normal evolution (see 1.7)

— estimated amounts, of forms of those nuclides released, estimated rate and timing of release, gas and ground water return times after closure

— corresponding maximum exposure levels: effective doses and/or estimated risks to adults, children and infants living in relevant areas of other Member States taking account of all significant exposure pathways

— evaluation of the uncertainties in assessments.

9.5. *Authorisation procedure*

— outline of procedure to be put into place

— limitations to be incorporated into authorisation.

9.6. *Proposals for management of site post-closure*

— monitoring proposals for site post-closure

— form and management of records.

ANNEX 4

STANDARD FORM

Applicable to modifications to an existing plan for the disposal of radioactive waste

1. **Name and location of the facility concerned**

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2. **Date of the Commission's Opinion:** .....

3. **Brief description of the planned modifications**

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4. **Authorised discharge limits in the existing plan, and other relevant conditions**

4.1. *Gaseous effluents*

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4.2. *Liquid effluents*

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4.3. *Solid waste*

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5. **New discharge limits envisaged by the authorities, including modifications in the assumed radionuclide composition, and other relevant conditions**

5.1. *Gaseous effluents*

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5.2. *Liquid effluents*

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5.3. *Solid waste*

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6. **Consequences of the new discharge limits and associated requirements (gaseous and/or liquid effluents) in relation to the evaluation of the exposure of the population in other Member States**

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7. **Consequences of the modifications in relation to the disposal of solid waste:**

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8. **Consequences of the modifications in relation to the reference accident(s) taken into account in the previous opinion:**

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9. **In the case of new reference accident(s): description and evaluation of the radiological consequences**

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10. **Implications of the modifications in relation to the current emergency plans and the current environmental monitoring:**

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